

**KENYA GREEN AND RESILIENT EXPANSION OF ENERGY (GREEN)
PROGRAM
(P180465)**

KENYA ELECTRICITY TRANSMISSION CO. LTD

**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE SUSWA
STATCOMS AS A SUBSET OF THE EASTERN ELECTRICITY HIGHWAY
PROJECT 500kV HVDC TRANSMISSION LINE**

ADDENDUM REPORT

Volume 1



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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 interpretation of the facts by the Environmental Social & Impact Assessors. It is issued without any prejudice.

Table of Contents

DOCUMENT CONTROL	ii
LIST OF FIGURES.....	viii
LIST OF TABLES.....	viii
LIST OF ABBREVIATIONS.....	ix
EXECUTIVE SUMMARY	x
1 CHAPTER ONE: INTRODUCTION.....	1
1.1 Project Background.....	1
1.2 The Project Development Objectives	1
1.3 Study Objectives.....	2
1.4 Terms of Reference (ToR) for the ESIA Process.....	2
1.5 Scope of the Study	3
1.6 ESIA Approach and Methodology	3
1.6.1. Screening	3
1.6.2. Desk Study.....	4
1.6.3. Site Assessment	4
1.6.4. Public Consultation	4
1.6.5. Data Analysis, Reporting and Documentation	5
1.6.6. Reporting	5
2 CHAPTER TWO: PROJECT DESCRIPTION	6
2.1. Introduction	6
2.2. Nature of the Project and Spatial Location.....	6
2.2.1. Project Location.....	6
2.2.2. Land tenure.....	1
2.3. Project Justification	2
2.4. STATCOM project Design and Layout.....	3
2.5. Project Cost	6
2.6. Construction Procedures	6
2.6.1. Construction Activities Outline	6
2.6.1.1.1. <i>Site Development</i>	6
2.6.1.1.2. <i>Material delivery</i>	6
2.6.1.1.3. <i>Foundation Installation</i>	7
2.6.1.1.4. <i>Equipment Installation</i>	7
2.6.1.1.5. <i>Final Restoration</i>	7
2.6.2. Input Materials	7
2.6.3. Labour Force.....	7
3 CHAPTER THREE: ANALYSIS OF PROJECT ALTERNATIVES	9
3.1 Introduction	9
3.2 No Project Alternative.....	9
3.3 Alternative site	9
3.4 Materials and technologies for the proposed Development alternative.....	9
3.4.1 Alternative I: installation of the proposed project as planned.	9
3.4.2 Alternative II: Installation of mechanically switched reactive power compensators.	10

4	CHAPTER FOUR: BASELINE INFORMATION OF THE PROJECT AREA	11
4.1	Introduction	11
4.2	Immediate project Setting.....	13
4.3	Biophysical Environment.....	15
4.3.1	Climate	15
4.3.2	Physical and topographic features	15
4.3.3	Soils and geology	16
4.3.4	Hydrology	16
4.3.5	Flora and Fauna	17
4.3.6	Environmental Degradation in the county.....	17
4.4	Socio-Economic baseline.....	17
4.4.1	Administrative units	17
4.4.2	Population Density and Distribution.	18
4.4.3	Economic activities.....	18
4.4.4	Infrastructure	18
4.4.5	History of the proposed site.....	19
5	CHAPTER FIVE: POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK	21
5.1	Introduction	21
5.2	KETRACO Guiding Frameworks.....	21
5.2.1	Draft Environmental and Social Management Framework (ESMF).....	21
5.2.2	KETRACO Strategic Plan 2018- 2022 and draft Plan for 2023- to 2027	21
5.3	National Policy framework	21
5.4	National legal and regulatory framework.....	25
5.4.1	Constitution of Kenya.....	25
5.4.2	National laws and regulations relevant to the proposed project.....	26
5.4.3	Alignment of WB and GOK Policies relevant to this ESIA	40
5.5	Relevant Multilateral International Treaties.....	41
5.5.1	The Rio Declaration and Agenda 21	41
5.5.2	The World Commission on Environment and Development (The Brundtland Commission of 1987)	41
5.5.3	United Nations Framework Convention on Climate Change (UNFCCC)	41
5.5.4	Convention on the rights of the Child	42
5.5.5	Convention on the Rights of Persons with Disabilities (CRPD).....	43
5.5.6	Montreal Protocol	43
5.5.7	Stockholm Convention on POPs	44
5.6	Administrative and Institutional framework	44
6	CHAPTER SIX: PUBLIC PARTICIPATION AND CONSULTATION	48
6.1	Introduction	48
6.2	Objectives of the Consultation and Public Participation.....	48
6.3	Outcome of the CPP	48
6.4	Project Opinions.....	52
7	CHAPTER SEVEN: ENVIRONMENTAL AND SOCIAL IMPACTS OF THE PROPOSED PROJECT	53
7.1	Introduction	53
7.2	Quantification of the magnitude of impacts	53
7.3	Construction phase.....	54
7.3.1	Positive impacts.....	54

7.3.2	Negative Environmental Impacts	55
7.3.3	Negative Social Impacts	61
7.4	Operational phase.....	63
7.4.1	Positive Impacts.....	63
7.4.2	Negative Environmental Impacts	63
7.4.3	Negative Social Impacts	64
7.5	Decommissioning Phase	64
7.5.1	Positive Impacts.....	64
7.5.2	Negative Impacts	64
8	CHAPTER EIGHT: PROPOSED MITIGATION MEASURES	66
8.1	Introduction	66
8.2	Proposed Mitigation Measures of the Construction Related Impacts.....	66
8.2.1	Increase storm water.....	66
8.2.2	Minimizing Soil erosion	66
8.2.3	Disposal of excavated rocks and soil.....	66
8.2.4	Controlling oil spills during construction phase.....	66
8.2.5	Minimization of water use.....	66
8.2.6	Minimize the effect of Air quality (dust and emissions).....	67
8.2.7	Management of Faecal waste generation and general sanitation	67
8.2.8	Solid Waste Management.....	68
8.2.9	Reduction of energy consumption.....	68
8.2.10	Minimize the effects of noise emitted and vibration from the site.....	68
8.2.11	Occupational Health and Safety issues.....	69
8.2.12	Reduction of impacts at extraction sites and efficient use of raw materials.....	71
8.2.13	Mitigating against introduction and spread of invasive alien species.	72
8.2.14	Moral decadence/ STIs and HIV/AIDS	72
8.2.15	Public Health safety and Awareness/ HIVAIDS/ STI control	73
8.2.16	Mitigating impacts of community Expectations on CSR	73
8.2.17	Mitigating Child labour and forced labour.	73
8.2.18	Mitigating SEA, SH, and other forms of GBV.....	74
8.2.19	Mitigating Cultural impacts.....	74
8.3	Proposed Mitigation Measures of the Operation Phase Impacts.....	74
8.3.1	Fire Outbreaks	74
8.3.2	Ensure general safety within the premises and risk of electrocution.	75
8.3.3	Wastewater management.....	75
8.3.4	Perceived Danger of Electrostatic and Magnetic force	75
8.4	Proposed Mitigation Measures of the Decommissioning Phase Impacts.....	75
8.4.1	Efficient solid waste management.....	75
8.4.2	Reduction of Dust Concentration and emissions.....	75
8.4.3	Minimization of Noise and Vibration.....	75
8.4.4	Community and Occupational health and safety concerns.....	75
8.4.5	GBV/SH/SEA issues	75
8.5	Enhancing Climate Change Mitigation and Adaptation Tree Planting initiative	76
8.6	Risks to the additional scope and the entire stations in extension	76
9	CHAPTER NINE: ENVIRONMENTAL AND SOCIAL ACTION PLAN (ESAP).....	77
9.1	Introduction	77
9.2	Environmental and Social Action Management Plan for the construction phase	77
9.3	Environmental and Social Action Management Plan for the operation phase	91
9.4	Environmental and Social Management Plan for the decommissioning phase.....	96

9.5	ESMP Cost Summary	98
10	CHAPTER TEN: ENVIRONMENTAL AND SOCIAL MONITORING PLAN (ESMoP)	99
10.1	Introduction	99
10.2	Monitoring Guidelines	99
11	CHAPTER ELEVEN: RECOMMENDATIONS AND CONCLUSION ...	107
11.1	Introduction	107
11.2	Recommendations	107
11.3	Conclusion	107
12	REFERENCES.....	109
13	ANNEXES.....	111

a

LIST OF FIGURES

Figure 2-1: STATCOM location about other facilities at site.....	0
Figure 2-2: Proposed STATCOM and Shunt Reactor Site.....	1
Figure 2-3: Land tenure system in project site	2
Figure 2-4: Suswa 400kV Substation Layout with Proposed STATCOMS and Shunt Reactors	4
Figure 2-5: SLD for Suswa 400kV Substation with Proposed STATCOMS and Shunt Reactors	5
Figure 4-1: Kajiado County Map.....	11
Figure 4-2: Site location in relation to Kajiado County.	12
Figure 4-3: Immediate project setting	13
Figure 4-4: Transformers adjacent to the STATCOM location	14
Figure 4-5: STATCOM Location (space with ballast on the left side of the access road)	14
Figure 4-6: View of the STATCOM Location	14
Figure 4-7 Mount Suswa in Rift Valley	15
Figure 4-8: Different levels of Rift Valley plains.....	16
Figure 7-1: Distance between the STATCOM site and the staff quarters	59
Figure 7-2: Noise receptor distance from the site	60
Figure 7-3: Crime rates in Kajiado as of 2020Source:	
https://www.crimeresearch.go.ke/kajiado/	63

about

LIST OF TABLES

Table 2-1: Project cost	6
Table 4-2: Area and Administrative Units by Kajiado Sub-counties.	17
Table 4-3: Population density and distribution	18
Table 5-1 Policies, Plans and Strategies	21
Table 5-2: Laws and Regulations	27
Table 5-3: Relevance of the ESF	40
Table 5-6:Key institutions	45
Table 6-1:Key informant Questionnaires’ respondents.....	49
Table 6-2: Community Questionnaires’ respondents.....	50
Table 7-1 Levels of Scale used in analysing the magnitude of potential impacts	53
Table 7-2: Impact characteristics: benefits to the local economy	54
Table 9-1: Environmental and Social Action Plan during the construction phase	78
Table 9-2: Environmental and Social Action Plan for the operation phase	91
Table 9-3: Environmental Management Plan for the decommissioning phase	96
Table 9-4: ESMP cost summary	98
Table 10-1: Environmental and Social Monitoring Plan	100

LIST OF ABBREVIATIONS

AC	Alternating Current
AIDS	Acquired Immune Deficiency Syndrome
CCTV	Closed Circuit Television
CPP	Consultation and Public Participation
CSR	Corporate Social Responsibility
CIDP	County Integrated Development Plan
CO ₂	Carbon Dioxide
DOHSS	Directorate of Occupational Health and Safety Services
EA	Environmental Audit
EHS	Environment Health and Safety
EMCA	Environmental Management and Coordination Act
ESIA	Environmental and Social Impact Assessment
EIA	Environmental Impact Assessment
ESMP	Environmental and Social Management Plan
ESF	Environmental and Social Framework
ESS	Environmental Safeguards and Sustainability
ESCP	Environmental and Social Commitment Plan
FPIC	Free, Prior, and Informed Consent
FACTS	Flexible AC Transmission System
GDC	Geothermal Development Company
GHGs	Green House Gases
GoK	Government of Kenya
HFO	Heavy Fuel Oil
HIV	Human immunodeficiency virus
HVDC	High Voltage Direct Current
IPP	Independent Power Producers
KenGen	Kenya Electricity Generating Company PLC
KETRACO	Kenya Electricity Transmission Company
KFS	Kenya Forest Service
KP	Kenya Power
Kshs.	Kenya Shillings
kV	Kilo Volt
KWH	Kilo Watt Hour
KWS	Kenya Wildlife Service
KWCA	Kenya Wildlife Conservancies Association
L.R	Land Registration
LMP	Labor Management Plan
mg/kg	Milli grams per kilogram
MoE	Ministry of Energy
MEAs	Multilateral Environmental Agreements
MVA	Mega Volt Amperes
MW	Mega Watts
NEMA	National Environment Management Authority
NOx	Oxides of Nitrogen
OSHA	Occupational Safety and Health Act
PPE	Personal Protective Equipment
REREC	Rural Electrification and Renewable Energy Corporation
STATCOM	Static Synchronous Compensator
SHE	Safety Health and Environment
SEP	Stakeholder Engagement Plan
SOx	Oxides of Sulphur
STDs	Sexually Transmitted Diseases
ToR	Terms of Reference
WB	World Bank

EXECUTIVE SUMMARY

The Government of Kenya plans to increase access to electricity in Kenya's 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 required for line protection and management purposes. The Kenya Power Least Cost Power Development Plan (LCPDP) 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), is mandated by the Energy Act, 2019 to plan, design, construct and maintain high voltage electricity transmission projects in Kenya. KETRACO is also the designated grid system operator.

To stabilize the grid, KETRACO is proposing to install a **Static Synchronous Compensator (STATCOM)** within the Suswa High Voltage Direct Current (HVDC) Converter station which is part of the Ethiopia Kenya Power Systems Interconnection Project (Eastern Electricity Highway Project HVDC 500kV project) with a financing from the World Bank. STATCOM is a fast-acting device capable of providing or absorbing reactive current and thereby regulating the voltage at the point of connection to a power grid.

The Environmental and Social Impact Assessment (ESIA) for the Ethiopia Kenya Power Systems Interconnection Project was done in January 2012 and was submitted to the National Environment Management Authority (NEMA) for review and decision. The project was approved and an EIA license with conditions issued on 25th July 2013 (**NEMA Reg. Number 0017046**) (see Annex I). The EIA license was also extended with effect of 31st May 2016 (**Ref. Number NEMA/EIA/VC/360**) on the premise of time validity (see Annex 2). The construction of the project was completed in 2022 and has since been partially commissioned while undergoing tests for eventual full commissioning.

The Kenya Government policy on all new projects requires that an ESIA study be carried out at the project planning phase to ensure that significant impacts on the physical and social environment are taken into consideration at the planning, construction, operations, and decommissioning stages. KETRACO's internal systems and procedures and World Bank's Environmental and Social Framework (ESF) provide for undertaking of requisite environmental and social safeguards prior to implementing of projects. To this end, KETRACO employed its internal human resource to undertake an environmental and social impact assessment study of the proposed Suswa STATCOM installation and develop an addendum report for the purpose of varying the Ethiopia Kenya Power Systems Interconnection Project EIA license to include the proposed scope.

Project Location

The proposed Suswa STATCOM site will be in Suswa substation within Kajiado County (approximate location 1°03'45.5"S 36°21'23.8"E). Suswa Substation is in Kajiado West Sub County, Ewaso Location, Olgumi sublocation. The project site is 2.5km east of Suswa town, off Mai Mahiu-Narok-Bomet road. It will occupy a section of plot LR No. KJD/EWUASO/KEDONG/3952 (**see Annex 12**) estimating 80.9 hectares which is fully owned by KETRACO.

Study Objectives

The principal objective of this assessment was to identify significant potential impacts of the project on environmental and social aspects, and to formulate recommendations to ensure that the proposed project additional scope takes into consideration appropriate measures to mitigate any adverse potential impacts to the physical and social environment and people's health through all of its phases (construction, operation and decommissioning phases).

In addition to the major objective as indicated above other study objectives are:

- i. To undertake a comprehensive public participation and stakeholders' consultation

- ii. To inform or educate the public about the project and the associated potential environmental and social risks.
- iii. To develop an adequate, comprehensive, and acceptable Environmental and Social Management Plan for the proposed expanded scope under the project.

Scope

The ESIA study done in consideration with the construction, operation and decommissioning phases of the project and was limited to:

- The baseline environmental and Socio - economic conditions of the project area,
- Description of the proposed additional project scope,
- Provisions of the relevant environmental laws,
- Public participation and stakeholder engagement and consultations,
- Identification and discussion of any adverse impacts to the physical and social environment anticipated from the proposed additional scope,
- Appropriate mitigation measures,
- Development of an environmental and social management plan outline.

Study Methodology

The approach to this exercise was structured such as to cover the requirements under the Environmental Management and Coordination Act (EMCA), 1999 (and 2015 amendments) and its constituent regulation, i.e. the Environmental Management and Coordination (Impact Assessment and Audit) Regulations of 2003 and the pertinent safeguard policies under the World Bank ESF. 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 Lead Agencies and 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 project proponent, community members, the local administration of Kajiado, Nakuru and Narok's county administration and opinion leaders. The consultations were based on the additional project scope e, site planning, the project implementation plan, the potential physical and social environmental impacts, and the mitigation measures thereof.
- Physical inspections of the proposed additional project scope and its area of influence area which included observation of available landmarks, photography and interviews with the local residents and local administration.
- Evaluation of the activities around the project site and the physical and social environmental setting of the wider area through physical observations Review of available project documents; and
- Report writing, review and submission.

Policy, Legal and Regulatory Framework

The Environmental Management and Co-ordination Act (EMCA), Cap 1999 (and 2015 amendments), is the legislation that governs EIA studies in Kenya. This project falls under the Second Schedule of EMCA, Cap 387, which lists the type of projects that are required to undergo EIA studies in accordance with Section 58(1-4) of the Act. Various other key national legislations that govern the management of environmental resources and those pertinent to the project have been discussed in the report. Also discussed are standards, and procedures relevant to the proposed additional project scope and good practices as contained in the World Bank Safeguard policies.

Due to the inherent nature of the project, the baseline and immediate project setting which is in character with the components of the proposed additional project scope, this report recognizes the proposal as a low risk 'project'.

Stakeholder engagement and Public Participation

To ensure public participation in the ESIA process, the ESIA team used community and key informant questionnaires, interviews, and public community meetings to gather views and comments relating to the proposed project. Overall, the information gathered was subsequently synthesized and incorporated into this ESIA Report notably Chapter 5-Public consultation, Chapter 6 on Environmental and Social Impact and Chapter 7-Proposed mitigation measures.

1. **Community questionnaires**- Among the stakeholders who were consulted through administration of ESIA questionnaires included local community members neighboring the proposed project site within Suswa. A total of 23 community questionnaires (Males-17, Females-06) were administered and subsequently analyzed.
2. **Public community meetings**: One (1) public community meeting was held at Suswa town on 27th July, 2023. A total of 33 community members participated in the meeting (males-24, Females 09)
3. **Key stakeholder Consultation**: One-on-one consultations with key stakeholders/ lead agencies within Suswa such as the County Government and Ministry of Interior and Coordination of National Government as described in detail in chapter 5 of this report. Interview questions aimed at obtaining information on likely impacts of the proposed project on biodiversity, community health and Safety and services delivery such as in schools were sought. A total of **13** key informants' questionnaires were administered during the public participation exercise.

To attain FPIC, the team worked closely with the area chief and local leadership structures for purpose of mobilization of attendants through established structures and means, and taking leadership of the public meeting in a manner that is culturally acceptable and inclusive to men, women and youth. The attendees agreed to the adoption of Swahili language in the meeting.

Identified Potential Environmental and Social Impacts

The following positive and negative impacts are likely to be associated with the proposed additional scope.

Positive Impacts

- National reliable and secure power supply
- Direct and indirect skilled and non-skilled employment opportunities (*cleaners, caterers, masons, carpenters, welders, drivers etc.*)
- Gains to the local and national economy and increase in revenue.
- Informal sectors benefits
- Development of other sectors
- Increased security in the area

Negative Impacts

- Noise pollution
- Generation of exhaust emissions
- Dust emissions
- Solid and liquid waste generation
- Oil spill hazards
- Destruction of existing vegetation and habitats
- Avifauna mortality
- Increased demand for material consumption
- Impacts on workers' and community health and safety
- Soil erosion
- Fire outbreaks
- Visual and aesthetic impacts
- Incidences of electrocution

- Perceived dangers of electrostatic and magnetic forces
- Increase in social vices such as moral decadence, Sexual Exploitation and Abuse (SEA), Sexual Harassment (SH), Gender Based Violence (GBV), drug and substance abuse, increased spread of STIs and HIV/AIDS in the project area.

Proposed Mitigation Measures

Mitigation of the potential impacts as described in chapter 7, and implementation of the Environmental and social Management Plan and Environmental and Social Monitoring Plan (chapter 8 and 9) will help to minimize the negative impacts and enhance the positive outcomes of the project.

Conclusion

The Suswa STATCOM is a critical component of the Ethiopia Kenya Power Systems Interconnection Project. The Environmental and Social Management Plan (ESMP) for this additional scope has been developed to ensure sustainability of the site activities from construction through operation to decommissioning. The plan provides a general outline of the project activities, associated impacts, and mitigation action plans, responsible actors, implementation timeline and the costs thereof.

An Environmental and Social monitoring plan has also been developed and highlights some of the physical and social environmental performance indicators that should be monitored. Monitoring creates possibilities to call to attention changes and problems in physical and social 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.

It is strongly recommended that a concerted effort is made by the site management, to implement the Environmental and Social Management and Monitoring Plan provided herein and specially to ensure health and safety mitigations are fully implemented to avert any possible human and equipment interference with electric fields.

It is quite evident from this study that the construction and operation of the proposed transmission equipment will bring positive effects in the national grid stabilization, reduction of harmonics, reduction of blackouts among others. During construction the project will source of skilled and non-skilled labor, market for construction material, skill transfer among others. The indirect national gains from its installation are immense as a result of stabilized grid.

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 no immitigable negative impacts were encountered, and that no community objection was received, the project may be allowed to proceed and the Ethiopia Kenya Power Interconnection (Eastern Electricity Highly 500kV HVDC) EIA license varied to include the expanded project scope.

1 CHAPTER ONE: INTRODUCTION

1.1 Project Background

Kenya Electricity Transmission Company ("KETRACO") is mandated by the Government of Kenya to develop the country's power transmission grid with the primary objective of meeting the country's power transmission needs efficiently, effectively, and reliably. The national peak demand in July 2023 was 2,164 MW, with an installed generation capacity of 3,321 MW as of December 2022. The installed generation mix comprises hydro 838.5 MW, geothermal 950 MW, medium – speed diesel (MSD) 586.3 MW, gas turbines (GT) 60 MW, wind 436.1 MW and solar 212.6 MW. The transmission network comprises of approximately 90 substations and 9,011 Km of transmission lines of which 39 substations and 5,474 km of transmission lines (1,282km of 500kV ,2,502.72 km of 400 kV, 575.48 km of 220 kV and 1,113.49 km of 132 kV) have been constructed by KETRACO within the last 10 years. By 2039, KETRACO is expected to have cumulatively established around 11 246 km of transmission lines and 129 substations.

The completed transmission line projects have enhanced the national grid capability, and this has greatly improved the transmission system efficiency, reliability, and adequacy. Despite these developments, the system has continued to experience challenges in operation largely due to lack of reactive power and voltage support. While these voltage issues are experienced in various parts of the grid, the challenges are more pronounced in West Kenya regions. In West Kenya, interventions such as imports from Uganda and deployment of gas turbines are required to support voltages in the area. These are short term measures that may impact the efforts to optimize the cost of power in the country.

Completion of key transmission lines to West Kenya will address the issues of constrained transmission transfer capacity to the region. This will however not be sufficient to entirely solve the power quality challenges in these regions. The expected development of intermittent power plants (Solar and Wind) within the medium term; on the backdrop of receding development of dispatchable power plants in these regions, may negatively impact on the power quality issues.

To stabilize the grid, KETRACO is proposing to install a **Static Synchronous Compensator (STATCOM)**, as well as shunt reactors, within the Suswa High Voltage Direct Current (HVDC) Converter station which is part of the Ethiopia Kenya Power Systems Interconnection Project (Eastern Electricity Highway Project HVDC 500kV project) with financing from the World Bank. STATCOM is a fast-acting device capable of injecting or absorbing reactive power immediately after system disturbances and thereby regulating the voltage at the point of connection to a power grid. The shunt reactors are mechanically switched reactive power compensation devices that absorb reactive power when the system is disturbed to maintain voltage stability.

The Environmental and Social Impact Assessment (ESIA) for Ethiopia Kenya Power Systems Interconnection Project was done in January 2012 and was submitted to the National Environment Management Authority (NEMA) for review and decision. The project was approved, and an Environmental Impact Assessment (EIA) license issued with conditions on 25th July 2013 (**NEMA Reg. Number 0017046**) (see Annex I). The EIA license was also extended with effect of 31st May 2016 (**Ref. Number NEMA/EIA/VC/360**) on the premise of time validity. The construction of the project was completed in 2022 and has since been partially commissioned while undergoing tests for eventual full commissioning.

This ESIA identified both positive and negative impacts of the proposed additional scope to the environment and proposes mitigation measures in the Environmental and Social Management Plan (ESMP) developed to address potential negative impacts, during the construction, operation, and decommissioning phases of the project, for overall environmental sustainability.

1.2 The Project Development Objectives

The proposed additional scope development objectives are:

- To increase power transfer capability by enhancing voltage stability.
- To maintain a smooth voltage profile under different network conditions.
- To perform active filtering for improvements in power quality.
- To improve the national grid's reactive power handling capacity
- To ensure a stable, secure, and reliable operation of the national grid.

1.3 Study Objectives

The principal objective of this assessment was to identify significant potential impacts of the project on environmental and social impacts, and to formulate recommendations to ensure that the proposed additional scope takes into consideration appropriate measures to mitigate any adverse impacts to the environment and people's health through all its phases (construction, implementation and decommissioning phases).

The specific objectives of this ESIA were to:-

- Identify and assess all potential environmental and social impacts of the proposed additional scope.
- Identify all potential significant adverse environmental and social impacts of the project and recommend measures for mitigation.
- Verify compliance with the pertinent local legislation and international standards.
- Identify problems (non-conformity issues) and recommend measures to improve the environmental and social management system.
- Generate baseline data that will be used to monitor and evaluate the mitigation measures implemented during the project cycle.
- Recommend cost effective measures to be used to mitigate against the anticipated negative impacts.
- Prepare an ESIA Project Addendum Report compliant to the Environmental Management and Coordination Act, 1999; Environmental (Impact Assessment and Audit) Regulations, 2003; and applicable standards under the World Bank (WB) Environmental and Social Framework (ESF)
- Develop a Stakeholder Engagement Plan (SEP) in consistence with the WB ESF standards; and
- Develop a Labor Management Plan (LMP) in consistence with the WB ESF standards.

1.4 Terms of Reference (ToR) for the ESIA Process

The following are the ToR for the ESIA process:

- Description of the baseline environment (physical, biological, social and cultural)
- Detailed description of the proposed additional scope
- Review Legislative and regulatory framework that relate to the project
- Identify potential environmental impacts that could result from the project
- Carry out public consultation on positive and negative impacts of the project
- Propose mitigation measures against identified environmental and social impacts of the project
- Analysis of alternatives
- Development of an ESMP for the additional scope.
- Develop an ESIA report.
- Develop a SEP in consistence with the WB ESF standards; and
- Develop a LMP in consistence with the WB ESF standards.

1.5 Scope of the Study

The ESIA scope largely covered the following areas:

- (1) Baseline Conditions:
 - Environmental setting (climate, topography, geology, hydrology, ecology, water resources, sensitive areas etc.),
 - Socio-economic activities in the surrounding areas (land use, human settlements, economic activities, institutional aspects, water demand and use, health and safety, public amenities, etc.),
 - Infrastructural issues (roads, water supplies, drainage systems, power supplies, etc.).
- (2) Legal and policy framework:
 - Focusing on the relevant national environmental laws, regulations and by-laws and other laws and policies focusing on allied activities relative to the project in question.
 - Pertinent WB ESF standards
- (3) Interactive approach was adopted for the immediate neighbourhood in discussing relevant issues including among others:
 - Land use aspects,
 - Neighbourhood issues,
 - Project acceptability,
 - Social, cultural and economic aspects.
- (4) Environmental impacts:
 - Physical impacts,
 - Biological impacts,
 - Legal Compliance.

1.6 ESIA Approach and Methodology

The approach to this exercise was structured such as to cover the requirements under the Environmental Management and Coordination Act (EMCA), 1999 as well as the Environmental Management and Coordination (Environmental Impact Assessment and Audit) Regulations, 2003. It involved largely an understanding of the project background, its justification, the preliminary designs, and the implementation plan as well as commissioning. 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, photography, and discussions with the project implementation team.

The key activities undertaken during the assessment included the following:

- Consultations with the key project stakeholder including the project proponent, community members, provincial administration, opinion leaders and district and provincial departmental heads. The consultations were based on the proposed additional scope, site planning and the project implementation plan;
- Physical inspections of the proposed additional scope area 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
- Report writing, review and submissions.

Below is an outline of the basic ESIA steps that were followed during this assessment:

1.6.1. Screening

Screening of the project was undertaken to evaluate the need of conducting an ESIA and the level of study. Power infrastructural projects are listed under schedule 2 of EMCA, 1999 among projects requiring EIA before commencement. In addition, other considerations considered 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.

1.6.2. Desk Study

Documentation review was a continuous exercise that involved a study of available documents on the project including the project set-up plans and architect's statement, land ownership documentation, environmental legislation and regulations, district development plans, location maps, etc.

1.6.3. Site Assessment

A site assessment was conducted on to establish:

- Land ownership, usage and conflicts.
- Flora, fauna and avifauna found on the site.
- The site landscapes.
- Surface water bodies within the neighbourhood of the site and.
- The general environment and its sensitive receptors found within the environs of the site.

1.6.4. Public Consultation

Detailed stakeholder's consultations for the Suswa STATCOM were undertaken from 24th July to 4th August 2023. To ensure effective stakeholders' consultation and public participation, stakeholders' mapping was conducted, and a database created consisting stakeholders. Assessment tools were prepared for effective and systematic interviews by the ESIA team. The tools included; key informant schedules, mapping, sampling of the areas to be assessed, field visits and observations; and triangulation of field data which focused specifically on the communities who stay within and neighbouring the proposed STATCOM project.

Various methods and instruments were identified and used for effective and efficient public consultation and participation. They include.

- **Use of questionnaires-** A total of **36** questionnaires (13 key informants, 23 community questionnaires) were administered and analysed during the field visit. Among the stakeholders who were consulted included, relevant government ministries, local administration officers, and local community members neighbouring the proposed additional scope.
- **Baraza's / meetings targeting local communities-1 (one)** public meeting was carried out in Suswa. The aim was to sensitize the residents to the project and seek their views on the likely impacts of the project on their livelihoods, community, local natural environment etc. A total of 33 community members were engaged during the meeting. Annex 7 provides the Public Baraza meeting minutes and Annex 8 provides the meeting attendance sheets.

To attain Free, Prior, and Informed Consent (FPIC), the team worked closely with the area chief and local leadership structures for purpose of mobilization of attendants through established structures and means, and taking leadership of the public meeting in a manner that is culturally acceptable and inclusive to men, women and youth. The attendees agreed to the adoption of Swahili language in the meeting.

- **Key informant interviews-** The key informant interviews sought views from the following institutions within the project area:
 - Ministry of Interior and Coordination, Chief- Suswa Location
 - Ministry of Interior and Coordination, Chief- Ewaso Location
 - Ministry of Interior and Coordination, Chief- Mai Mahiu Location
 - Ministry of Interior and Coordination, Assistant County Commissioner- Kajiado North Subcounty
 - Ministry of Interior and Coordination, Assistant County Commissioner- Kajiado West Subcounty
 - Ministry of Interior and Coordination, Assistant County Commissioner- Mai Mahiu Location

- Kenya Forest Service- Ngong station
- Kenya Wildlife Service- Kajiado West
- Kenya Ports Authority- Dry Port in Suswa
- Institutions around the project area including: Suswa Girls' High school, Soila Maasai Girls Centre, Suswa Dispensary and Mayian School.
- Kedong Ranch Ltd
- The community members within the projects Area of Influence.

In line with the objectives of the public participation and consultation exercise, the results of the stakeholder engagement have been incorporated into the report in the following ways:

- Impact identification has been informed by the outcomes of the consultation and engagement process.
- Development of mitigation measures has been informed by the consultation exercise.
- The development of the ESMP has been informed by the consultation exercise.
- The identification and mapping of stakeholders has led to the development of a comprehensive database of stakeholders to be consulted in the future.

1.6.5. Data Analysis, Reporting and Documentation

Upon data collection, potential environmental and social impacts (both positive and adverse) were predicted based mainly on concerns raised by the public, stakeholders and expert observations on the ground and available tools. The magnitude, significance, and acceptability of predicted impacts were evaluated with a view to determine whether observed adverse impacts were significant enough to warrant mitigation. Impacts were further screened for occurrence and significance of residual (those which cannot be mitigated satisfactorily) and cumulative impacts with a view to provide a basis of making recommendations on the way forward for the project.

The ESIA study report compilation was a continuous exercise throughout the process until final submission. The study report was compiled from the field work and desktop review findings in accordance with the WB ESF guidelines, KETRACO Environmental and Social Management Framework, relevant legislations and guidelines issued by NEMA for such works.

1.6.6. Reporting

The outline of the ESIA Report chapters include:

- Name of the proponent, address and contact person.
- Title of the project
- Objectives and scope of the project
- Nature of the project.
- Location of the proposed additional scope,
- Types of activities that will be undertaken during the project construction, operation and decommissioning phases.
- Design of the project.
- Proposed additional scope budget.
- Materials to be used, products and by-products, including waste to be generated by the project and the method(s) of their disposal.
- Potential environmental and social impacts of the project.
- Economic and social impacts to the local community and the nation in general.
- Views of the public/potentially affected people about the project.
- An ESMP for the entire project cycle including mitigation measures to be taken during and after implementation of the project and an action plan for the prevention and management of foreseeable accidents during the project cycle.
- SEP and LMP

2 **CHAPTER TWO: PROJECT DESCRIPTION**

2.1. **Introduction**

This section presents a description of the project by providing its administrative location, geographical location, technical and financial descriptions of the proposed additional scope.

2.2. **Nature of the Project and Spatial Location**

2.2.1. **Project Location**

The proposed Suswa STATCOM site will be located in suswa substation within Kajiado County (approximate location 1°03'45.5"S 36°21'23.8"E). Suswa Substation is in Kajiado West Sub County, Ewaso Location, Olgumi sublocation. The project site is 2.5km east of Suswa town, off Mai Mahiu-Narok-Bomet road. It will occupy a section of plot LR No. KJD/EWUASO/KEDONG/3952 (**see Annex 12**) estimating 80.9 hectares which is fully owned by KETRACO. The 80.9 hectares host the following KETRACO projects:

- a. The Ethiopia Kenya 500kV HVDC bipolar converter station
- b. 400kV AC substation (switchyard)
- c. 220kV AC substation
- d. Ground Electrode station
- e. Staff houses
- f. Offices
- g. Temporary workers' camp
- h. Temporary security houses
- i. Yet-to be decommissioned batching plant

The following are the approximate coordinates for the proposed Suswa STATCOM Site. Coordinates are referred to UTM Arc 1960 zone 37 South.

EASTINGS	NORTHINGS
205866	9882802
205893	9882804
205895	9882653
205876	9882652

.



Figure 2-1: STATCOM location in relation to other facilities at site



Figure 2-2: Proposed STATCOM and Shunt Reactor Site

2.2.2. Land tenure

The proposed additional scope site is KETRACO owned. The surrounding community has subdivided the land among themselves. The parcel of land under which the project will be developed was initially owned by Muriaso Ole Kendi, who sold 80.9 ha to KETRACO on a willing-buyer, willing-seller basis.

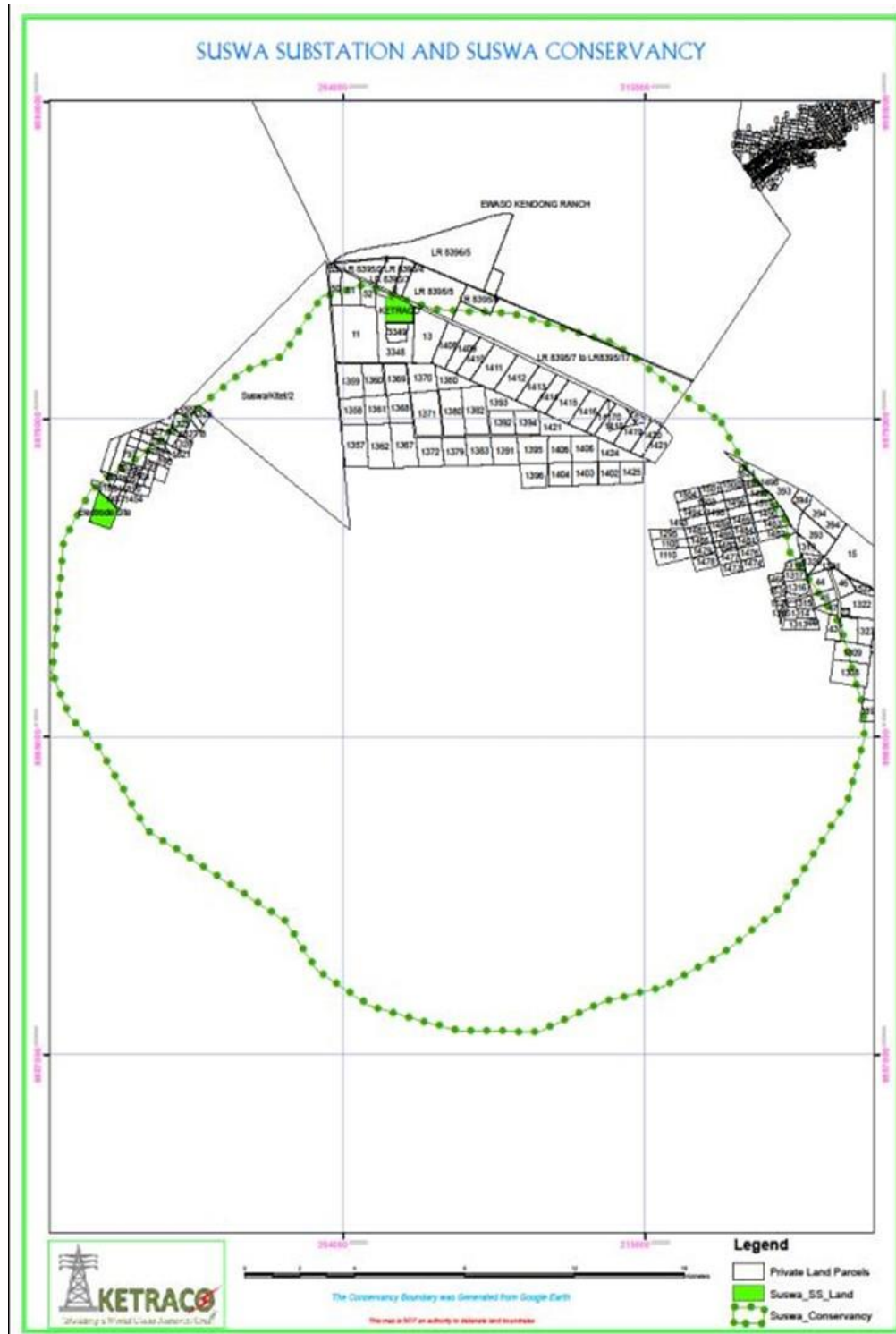


Figure 2-3: Land tenure system in project site

Source: Author

2.3. Project Justification

Despite the recent investments in transmission reinforcement projects, the Kenyan system has continued to experience challenges in operation due to lack of reactive power and poor voltage support. These challenges appear to be more pronounced in the Western region of the country.

In the short-term, local diesel generators, imports from Uganda and gas turbines are being used to support the voltages in the region. While the completion of key transmission lines to the western parts

of Kenya is expected to address the constrained transmission capacity, it is not expected to solve the power quality challenges experienced in these regions.

The projected increase of variable renewable plants (such as solar and wind) in the medium term is expected to displace the development of new conventional power generation and potentially pose additional power quality challenges in the region. The reactive power compensation devices currently on the network are unable to alleviate these challenges because they are predominantly fixed or mechanically switched shunt reactors that lack the required flexibility and speed of response required to maintain acceptable steady state and/or dynamic voltage regulation.

KETRACO has therefore proposed that fast-acting dynamic reactive power compensation and voltage control devices be installed at strategic locations on the national grid to assist in resolving the aforementioned voltage constraints and reduce system voltage variations on the Kenyan network during operation of the Ethiopia - Kenya HVDC system. It is within this context that KETRACO intends to install 1 x 400kV 120 MVar STATCOM and 3 x 400kV 100 MVar shunt reactors at Suswa 400kV substation.

The purpose of this installation is 3-fold as set out below:

- With the AC filters in service, the voltage at the Suswa 400 kV busbar can exceed allowable limits, the shunt reactors are required to ensure the voltage at Suswa 400 kV is maintained at an acceptable level. Switching of these reactors and AC filters can lead to large changes in voltage thus the STATCOM is required to smooth the voltage changes as the right combination of AC filters and reactors is implemented for the required transfer on the HVDC.
- The hierarchy implemented in the HVDC control system requires the voltage at the Suswa 400 kV busbar to remain within a certain band in order to ensure correct operation of the HVDC system – the STATCOM in combination with the reactors will be utilised to ensure the required voltage band is maintained at all times.
- When the 400 kV lines emanating from Suswa substation experience AC faults the voltage recovery at the Suswa 400 kV busbar can take > 1.5s; with a STATCOM in service this time can be reduced.

2.4. STATCOM project Design and Layout

The STATCOM project design, layout and pictures of the proposed site for the STATCOMS and Shunt Reactors are as shown in figure 2-4 and 2-5 below. It is approximated that the land size required for the project is an eighth of an acre as shown in figure 2-2.

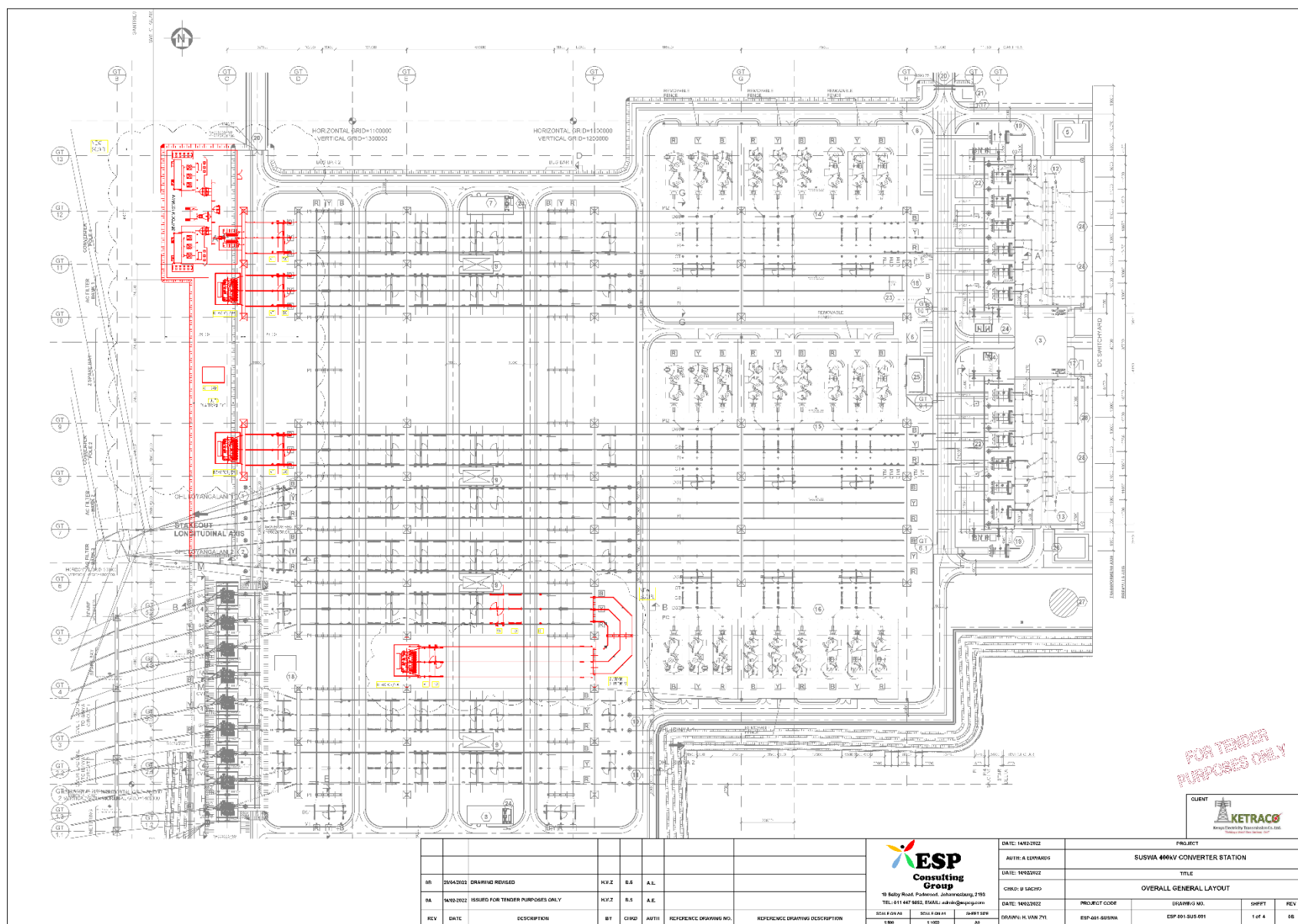


Figure 2-4: Suswa 400kV Substation Layout with Proposed STATCOMS and Shunt Reactors

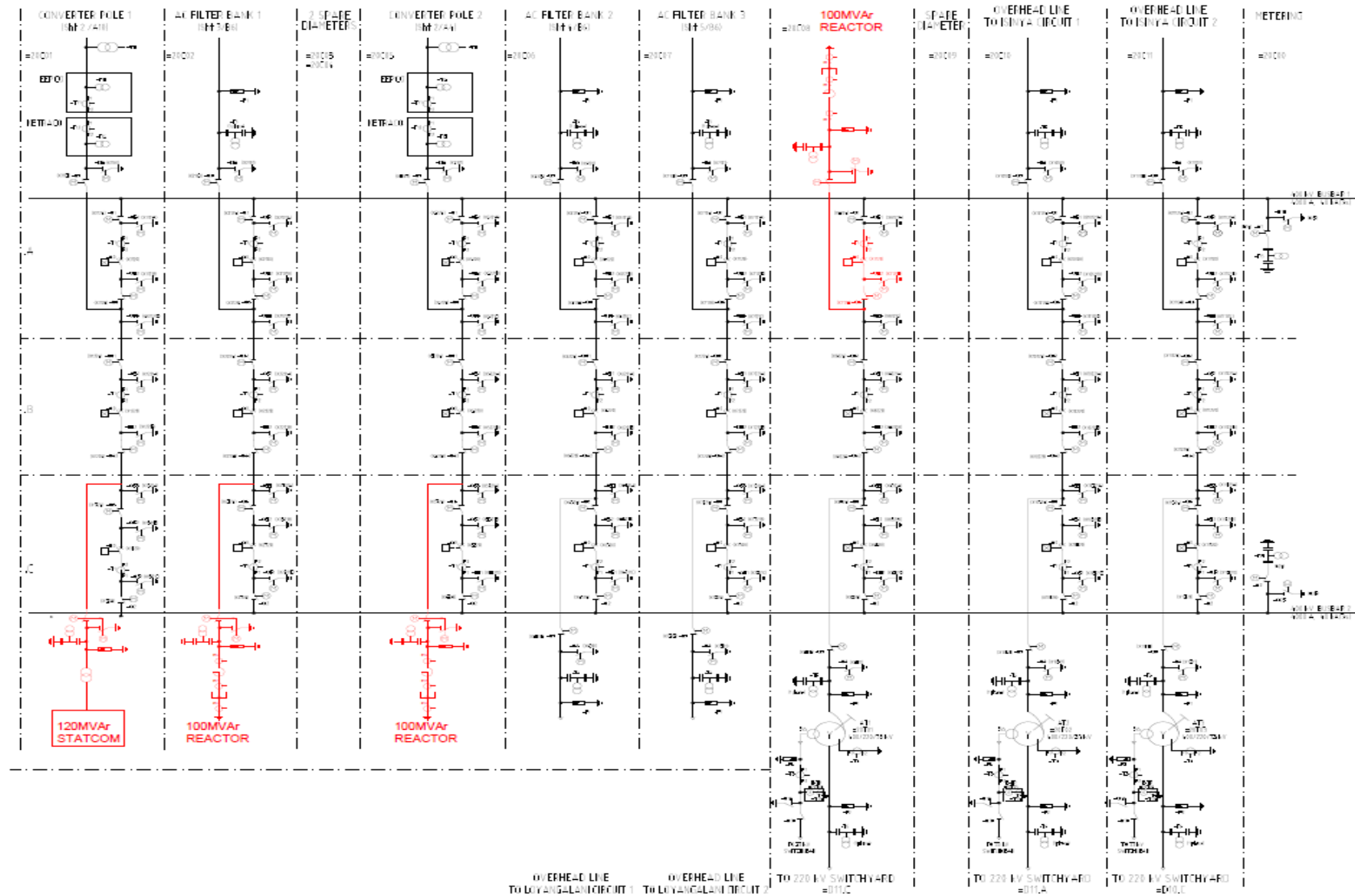


Figure 2-5: SLD for Suswa 400kV Substation with Proposed STATCOMS and Shunt Reactors

2.5. Project Cost

The Proponent, KETRACO has commissioned qualified Engineers to undertake detailed investigations and detailed design for the proposed development project and determine the project cost among other aspects as per specified project timelines. The project's construction cost estimates as per the Design Engineers amounts to **MUSD 31.4375** (*exclusive of cost of equipment*) The summary of the BoQ is as broken down in Table 2-1 below:

Table 2-1: Project cost

SUSWA 400kV Extension (incl. 120MVAR STATCOM and 3x100MVAR Bus Reactors)			
COST OF EQUIPMENT			
PARTICULARS	QTY	UNIT	TOTAL (MUSD)
400Kv STATCOM TE	1	200	2
400Kv Reactor Bays TE	3	200	6
400Kv Diameters	2	750	15
STATCOM 120MVAR	1	12500	125
100MVAR 400Kv Reactors	3	875	26.25
			174.25
CONSTRUCTION COSTS (CIVIL +INSTALLATION)			
Civil Works	Lot		14.4375
SS Building Extension	Lot		1
			15.4375
Design and Installation (Incl.)			8.25
Total 400kV Extension			197.9375
Total (Incl. PM and Cont.)			232.5765

2.6. Construction Procedures

All construction activities including but not limited to ground preparation, earth moving, materials delivery, building, walling, roofing, and the installation of amenities (power, water, communication equipment, etc.), fittings (doors, windows, safety provisions, etc.) will be carried out by competent personnel obtained through rigorous tendering procedure to ensure the set quality standards and timelines are met. The estimated construction period for the project is 18 months.

2.6.1. Construction Activities Outline

Subject to permitting requirements, the proposed STATCOM project construction will occur in the following sequence:

2.6.1.1.1. Site Development

Site development begins with the clearing of vegetation at the site. Temporary environmental controls, such as silt fence, are also installed at this stage. The area is then levelled by cutting and filling as necessary to bring the site up to subgrade. Sand and aggregate fill materials may be brought in to make a level site for construction. The site development also includes the installation of any required environmental controls such as plunge pools, retention ponds, or rip-rap slopes.

2.6.1.1.2. Material delivery

Foundation and construction materials, including steel and gravel, are delivered to the work site. Construction equipment such as backhoes, semitrailers, moving equipment, concrete haulers and cranes may also be brought onsite. If required, a storage yard to store materials and equipment will be used.

2.6.1.1.3. Foundation Installation

Soon after site development is completed, the equipment foundations will be installed. The foundations are reinforced concrete and may be drilled pier or spread footing foundations depending on the size and weight of the equipment.

2.6.1.1.4. Equipment Installation

Following installation of the foundations, the STATCOM equipment will be delivered and installed at the station. The equipment installed at the stations includes, but is not limited to, security fence, steel structures, circuit breakers, transformers, capacitor banks, and a small control buildings. After the equipment is installed, a finish layer of crushed stone (typically 6 inches deep) is installed over the entire station up to the base of the structure foundations.

2.6.1.1.5. Final Restoration

Upon completion of construction, the contractor will do the final restoration of the site. Final restoration consists of the removal of all temporary environmental controls, final seeding, and the installation of any vegetative buffers.

2.6.2. Input Materials

The construction of the proposed 120 MVar STATCOM, 100 MVar shunt reactors and all the associated substation primary equipment, secondary systems and associated civil works at Suswa 400kV substation will be undertaken using conventional construction materials and construction procedures that are not expected to compromise the safety of the neighboring communities as well as the general environment. The materials that will be used are like most used in other construction projects for permanent structures. These will include cement, sand, concrete, stones(blocks), steel, tiles, ceramics, plastics, rubber, glass, timber and roofing sheets. In order to avoid conflict with the local communities during the sourcing of materials, the following actions will be followed:

- a) Community members will be given the priority in the delivery of materials.
- b) The contractor in consultation with the local authorities i.e. the chief and village elders will source materials from members of the community who are able to deliver the required materials in the required quality and quantity.
- c) Different community members will be given an opportunity to deliver different materials. This will give an opportunity for more members to participate.
- d) If no member of the community can deliver the required materials, the contractor will source from the neighboring communities and counties.

In the event that the contractor is handling materials that are hazardous, chemicals or controlled substances, the contractor will be expected to:

- a) Obtain a Prior Informed Consent (PIC) permit from NEMA in handling of Controlled substances.
- b) Label and mark all chemical hazards according to national and internationally recognized requirements and standards, including the International Chemical Safety Cards (ICSC), Materials Safety Data Sheets (MSDS), or equivalent. Any means of written communication should be in an easily understood language and be readily available to exposed workers and first-aid personnel.
- c) Train workers in the use of the available information (such as MSDSs), safe work practices, and appropriate use of PPE.
- d) Handle all waste in accordance to the EMCA waste management regulations, 2006.

2.6.3. Labour Force

During construction, the project will draw a workforce of between 50-80 inclusive of contractors' staff, skilled semi-skilled, and non-skilled workers. The unskilled and semi-skilled workers will be hired from the local community as guided in the LMP. It is expected that Skilled labourers will rent houses in Suswa and Mahi Mahi towns but will be transported to and from construction site daily by the contractor's vehicle(s). Labour management shall be guided by the labour Management Plan for the Green Program.

During project's operation and maintenance, the project is likely to have between 10-15 staff fully dedicated to its operation. These staff shall be drawn from the Operations and Power Maintenance directorate at KETRACO. They will include grounds-person, technicians, and engineers.

The substation where the project will be sited is a highly controlled area and is manned on a 24hr/ 7 days basis through a contracted company.

3 CHAPTER THREE: ANALYSIS OF PROJECT ALTERNATIVES

3.1 Introduction

This section analyses the project alternatives in terms of site, technology scale and shall involve studying design alternatives and analysing them based the environmental costs and benefits this shall involve studying the technology, design, capital investments, operation, and maintenance requirements among others.

3.2 No Project Alternative

The No-Project option in respect to the proposed additional scope implies that the status quo is maintained. This option is the most suitable alternative from an extreme environmental perspective as it ensures non-interference with the existing conditions. ‘

This option, however, is the least preferred from the technical standpoint due to the adverse effects on the network operation. It will lead to voltage instability in the network caused by poor reactive power control. Voltage instability is the cause of system voltage collapse, in which the power system voltage decays to a level from which point it is unable to recover. Voltage collapse may lead to partial or full power interruption in the system.

Further, the No Project Option is the least preferred from the socio-economic and partly environmental perspective due to the following factors:

- The economic status of the Kenyans and the local people would remain unchanged.
- The local skills would remain underutilized.
- No employment opportunities will be created for of the few locals who will work in the proposed development.
- Increased urban poverty and crime in Kenya.
- Economic and social benefit from stable reliable energy will not be achieved.

From the analysis above, it becomes apparent that the No Project alternative is no alternative to the local people, Kenyans, and the Government of Kenya.

3.3 Alternative site

3.4 Materials and technologies for the proposed Development alternative

3.4.1 Alternative I: installation of the proposed project as planned.

This option will involve the installation of STATCOMs, in addition to the shunt reactors. STATCOM has the capability to increase voltage stability by providing dynamic control and compensation of the system voltage. The advantage of this device is that when the voltage drops its compensating current does not depend on the level of the system voltage at the point of common coupling (PCC); it operates at full capacity. The use of the STATCOM switching control allows faster control response and improved power systems performance. It is also more resilient to changes in power system conditions, such as variations in harmonic levels, and requires smaller outdoor equipment.

This option will involve the installation of STATCOMs which are Flexible AC Transmission System (FACTS) devices. FACTS technologies are available in various forms, including:

- SVC –Static VAr Compensator
- STATCOM- Static Synchronous Compensators
- Thyristor –controlled series capacitor (TCSC) , and
- Unified power flow controller (UPFC).

Among them, SVC and STATCOM are classified as dynamic reactive power compensation resources which quickly inject or absorb VARs (Volt Amp Reactive also referred to as reactive power) immediately after system disturbances to support power system voltage.

The preferred option -STATCOM has the capability to increase voltage stability by providing dynamic control and compensation of the system voltage. The advantage of STATCOM over its counterpart i.e. the SVC system includes:

1. When the voltage drops, its compensating current does not depend on the level of the system voltage at the point of common coupling (PCC); it operates at full capacity.
2. The use of the STATCOM switching control allows faster control response compared to SVC and improved power systems' performance.
3. STATCOM is also more resilient to changes in power system conditions, such as variations in harmonic levels.
4. STATCOM requires smaller outdoor equipment compared with SVC. Therefore, it requires less land footprint during installation, leading to minimal impacts.

The main disadvantage of the STATCOM over other dynamic voltage compensators is that the high CAPEX cost.

The proposed project will be constructed using modern, locally and internationally accepted materials to achieve public health, Occupational health and safety and environmental aesthetic requirements. The steel structures, concrete, ballast, sand and other materials will be bought from local companies that have been approved by the proponent and that meet the Kenya Bureau of Standards requirements.

Under the proposed development alternative, the developer of the proposed additional scope would be issued with a varied EIA License under the Eastern Electricity Highway Project (EEHP). In issuing the license, NEMA would approve the proponent's proposed additional scope to stabilize the national grid, provided all environmental and social measures are complied with during the construction period and operational phases. This alternative consists of the applicant's final proposal with the inclusion of the NEMA regulations and procedures as stipulated in the environmental impacts to the maximum extent practicable.

3.4.2 Alternative II: Installation of mechanically switched reactive power compensators.

This option will involve the installation of mechanically switched reactive power compensation devices such as capacitors and shunt reactors. This option will however have its limitations in operations since they are majorly single step causing either under- voltages or over-voltages when turned on and off respectively. In addition, due to the manual/ mechanical operation required, the human interface required can further act as a weak link in ensuring timely responses are achieved.

4 CHAPTER FOUR: BASELINE INFORMATION OF THE PROJECT AREA

4.1 Introduction

This section is vital to this report since it provides the baseline state of the environment covering biophysical, social, and economic prior to commencement of the project. The section is significant in undertaking the project's impact prediction and analysis. The baseline information has been categorized into two: general baseline at the County level (Kajiado West Subcounty) and at the project site specific level.

Kajiado county is in the Southern part of Kenya. It borders the United Republic of Tanzania to the South West, Taita Taveta County to the South East, Machakos and Makueni Counties to the East, Nairobi County to the North East, Kiambu County to the North and Narok County to the West. It is situated between longitudes 36° 5' and 37° 5' East and between latitudes 1° 0' 30' South. The county covers an approximated area of 21,900.9 square kilometres as shown in **Error! Reference source not found.** below.

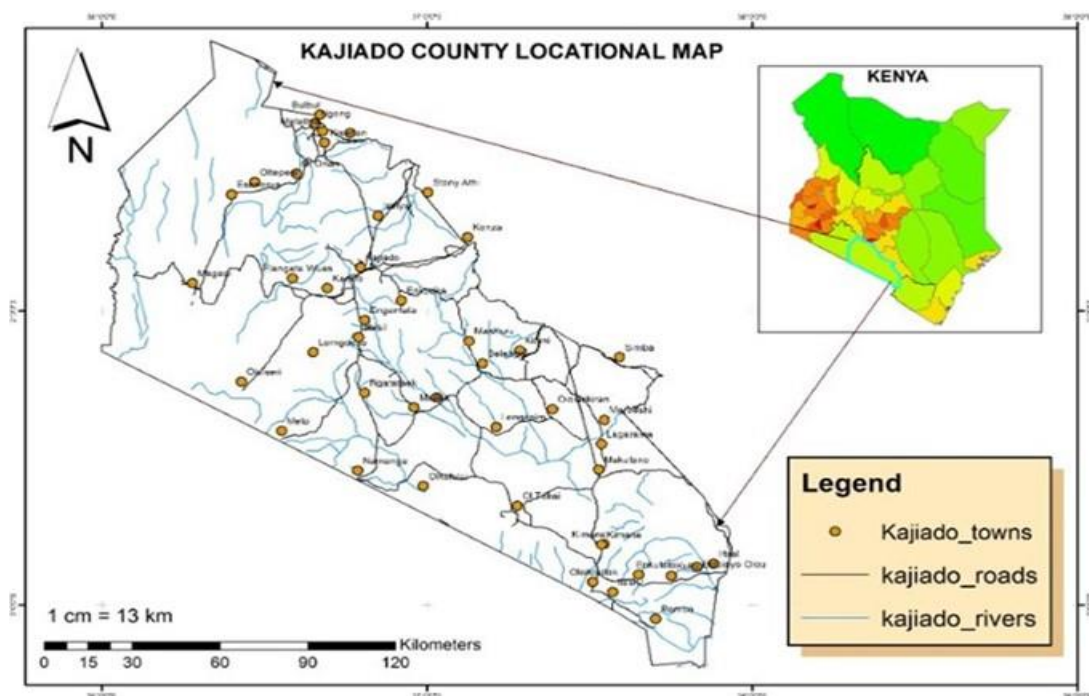


Figure 4-1: Kajiado County Map

The proposed project is located within Kajiado West subcounty, in Ewaso location, Olgumi Sublocation bordering to Nakuru and Narok counties. The location of the site in relation to Kajiado County is as depicted in Figure 4-2 below.

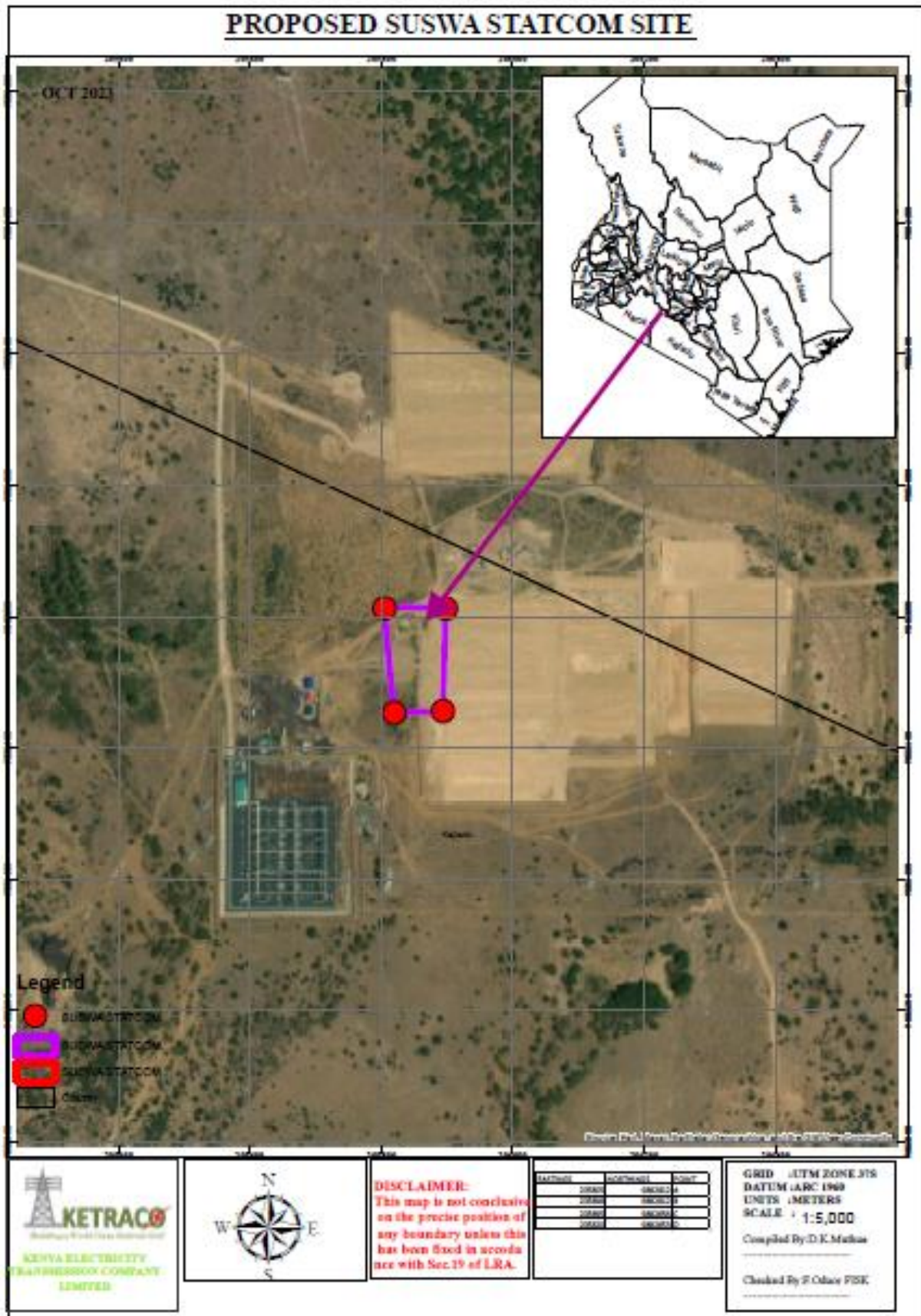


Figure 4-2: Site location in relation to Kajiado County.
 Source: Author

4.2 Immediate project Setting

The immediate project setting for the proposed scope is purely industrial with a mix of brick, motor, ballast, concreted access roads, control rooms, series of electrical installations, underground drainage system and support structures such offices, security houses, and staff houses as shown in the images below.

The proposed project scope entails the installation of STATCOM thus is tandem with the prevailing site setting (electricity transmission equipment installations) in terms of land use at the site.



Figure 4-3: Immediate project setting

Adjacent to the exact location for the additional scope is a series of 400kV transformers (see figure 3-4), substation access road (see figure 3-5)



Figure 4-4: Transformers adjacent to the STATCOM location



Figure 4-5: STATCOM Location (space with ballast on the left side of the access road)

The STATCOM shall be located on the free narrow strip laid with ballast .



Figure 4-6: View of the STATCOM Location

4.3 Biophysical Environment

4.3.1 Climate

Kajiado County experiences long rains between March and May every year with short rains falling between October and December. The rainfall patterns vary from place to place depending on the converging – ascending air flow, air temperature, moisture bearing winds and mountain ranges. As at the year 2022, the average highest rainfall recorded was 389.9mm around Ngong hills and the slopes of Mt. Kilimanjaro. The lowest was 2.3mm recorded around Amboseli basin and the western parts of the county. This shows a negative trend in the average yearly rainfall received owing to the effects of climate change.

Kajiado County has a cool dry climate with mean annual temperatures. Over the last seven (7) years, the mean annual temperature was 38.2°C with the years 2021, 2020, 2019 and 2017 receiving 29.2°C, 28.6°C, 28.4°C and 28.4°C, consecutively. This shows an increasing trend of temperatures recorded over the past years.

The proposed project site predominantly exhibits ASAL -like conditions in the better part of the year except during the long rains. Its short rains have been suppressed in the recent past.

4.3.2 Physical and topographic features

The main physical features of Kajiado County are plains, valleys and occasional volcanic hills ranging from an altitude of 500 meters at Lake Magadi to 2500 meters in ngong Hills. Topographically, the county is divided into three different areas namely; Rift Valley, Kapiti and Central Broken Ground.

The Rift Valley is a low depression on the Western side of the county from north to south. It is made up of steep faults giving rise to plateau, scarps and structural plains. The depression has important features such as Mount Suswa, Lake Magadi and Lake Natron (in Tanzania). Both Lakes have substantial deposits of soda ash, although commercial exploitation takes place only at Lake Magadi. The altitude range is between 600-1740m above sea level. The images are as shown in Figure 4-7 and Figure 4-8 below.



Figure 4-7 Mount Suswa in Rift Valley
Source: Author



Figure 4-8: Different levels of Rift Valley plains

Source: Author

The Athi Kapiti Plains consist mainly of gently undulating slopes, which become rolling and hilly towards the Ngong hills. The altitude range is 1580- 2460 m above mean sea level. The hills are catchment areas for Athi River, which is fed by the permanent Mbagathi and Kiserian tributaries.

The proposed site is located on a flat topography sitting at the bottom of the Rift Valley at an elevation of 524f asl.

4.3.3 Soils and geology

The County consists of three geological regions; quaternary volcanic, Pleistocene and basement rock soils. Alluvia soils are also found in some areas. Quaternary Volcanic soil is found in the Rift Valley floor around Entonet areas. Basement System Rocks which comprise various gneisses, cysts, quartzite and crystalline limestone are found mainly along the river valleys and some parts of the plains. Pleistocene soils are found in the inland drainage lake systems around Lake Amboseli. Quarrying of building materials is also done within the county.

The soils in the project area appear shallow, loose and a bit rocky. The soils are infertile judging by the vegetation type dominating the project area.

4.3.4 Hydrology

The Rift Valley has an internal drainage system with its main rivers draining from both the Aberdares and the Mau escarpments into the various inland lakes in the floor of the rift valley. Lake Naivasha is the main significant surface water source near the project site. There are however, numerous seasonal streams with high runoff volumes during the rainy season. There are occasional flash floods that appear to cause severe soil erosion around the project area.

The main source of water around the project area is the Kijabe-Ewuaso Kedogo catchment that is in its two streams the main Ewuaso Kedong River (which has more than ten (10) tributaries) and the Little Ewuaso Kedong River. The main Ewuaso Kedong River is heavily harvested in the upstream Kijabe area and hardly any water flows beyond the escarpment. The main source of water for the communities around the project area are boreholes, dams/pans, shallow wells, and seasonal streams.

4.3.5 Flora and Fauna

Vegetation is scarce in low altitude areas and increase with altitude as more rain is received. Ground cover throughout the county varies seasonally with rainfall and grazing intensity. Canopy cover ranges from less than 1% on heavily settled areas to about 30% on steep hills.

The project area falls within a savannah range land. This can be observed beyond the boundaries of the KETRACO-owned land where grass is predominant dotted with a few trees yellow-bark acacia trees, and shrubs. Notably, the station's neighbour is Suswa town, there has been disturbance of the natural state of the immediate environment by the town's hinterland due to prevailing socioeconomic activities. The vegetation on site comprised of grassland for the grazers and sparse acacia thickets.

The county has a wide range of wild animals which include wild beasts, gazelles, zebras, warthogs, hyenas, giraffes, elephants, lions, leopards, and elands. The environs of the project area is the mount Suswa conservancy that was established to halt the massive degradation of Mt. Suswa ecosystem and promote sustainable use of its resources. It is home to baboons, lions, leopards, spotted hyenas, civet cats, wild dogs, and rock hyraxes.

No wild animals have been reported in the project area since KETRACO operations at the site. However, snakes are common around the project area.

4.3.6 Environmental Degradation in the county

Environmental degradation is one of the main concerns in the county. Degradation is mainly brought about by overstocking, deforestation/logging, uncontrolled mining, and quarrying. Effluents from industries and clearing of land for farming activities and human settlement. Overstocking mainly brought about by the local culture of keeping many livestock as status symbol has led to acute erosion due to overgrazing.

Suswa area is experienced a number of projects (planned and implemented) in the recent past. These include geothermal well exploration by Geothermal Development Company (GDC), the construction of Nairobi-Naivasha railway, construction of Suswa converter station and Electrode site at Duka Moja, construction of Eastern Electricity Highway Project and Loiyangalani-Suswa 400 kV transmission line by KETRACO. All these projects have contributed towards environmental degradation which has impacted majorly on available grazing areas and the movement of domestic and wild animal in the areas. In addition, the area being characterized by volcanic-ash soil which is vulnerable to soil erosion.

The key emerging threat to the infrastructure and community resilience and wellbeing of in the area has been instigated and driven by the dynamism of climate exacerbated by the anthropogenic activities. The logging down of natural trees in the area especially on the South of the site facing Mt. Suswa where deep gullies are forming channelling storms of water collecting from the hill-top creating torrents of floods in the deep gullies below.

4.4 Socio-Economic baseline

4.4.1 Administrative units

Kajiado County is divided into five administrative sub-counties namely; Kajiado, Central, Kajiado North, Loitokitok, Isinya and Mashuuru, with a total of 17 administrative divisions as shown in Table 4-1 below. The proposed additional scope will be in Kajiado North.

Table 4-1: Area and Administrative Units by Kajiado Sub-counties.

Sub-County	Area (sq km)	No. of Divisions	No. of locations.	
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Kajiado North	111	2	10	23
Kajiado West	7862	3	321	55
Kajiado East	3322	6	20	36
Kajiado South	6337	4	18	38
Kajiado Central	4240	4	31	55
Total	21,872	19	105	215

Source: Draft Kajiado County Development Profile 2023-27, 2013.

4.4.2 Population Density and Distribution.

The county has a population of 1,117,840 people with 557,098 (49.8%) males and 560,704 (50.2%) female, according to the 2019 National Census. The county has a population density of 51 person's per km². According to the Draft Kajiado county development profile 2023-2027, urban areas have relatively high densities compared to rural areas, hence differences in the constituencies is as shown in Table 4-2 below.

Table 4-2: Population density and distribution

Subcounty	2019 census		2022 projections		2025 projections		2027 projections	
	population	density	population	density	Population	density	Population	Density
Kajiado Central	161862	38	179319	42	192281	45	200807	47
Kajiado North	306596	2773	339679	3071	364221	3293	380361	3493
Kajiado East	274687	83	304302	92	326310	98	340779	103
Kajiado West	182849	23	202573	26	217214	28	226844	29
Kajiado South	191846	30	212545	34	227903	36	238003	38

Source: Draft Kajiado County Development Profile 2023-27.

Kajiado West has the lowest density of 26 persons km² due to its vast area. It's also sparsely populated due to harsh climatic conditions unfavourable for farming and settlement.

The project site is not habited since it is a portion of the larger 500kV HVDC convertor station.

4.4.3 Economic activities

Dairy farming with pastoralism being predominant, forms the major economic activity in Kajiado county. In the Kajiado west subcounty. The following economic activities are evident: pastoralism, small scale trade and tourism.

The main economic activity in the area surrounding the project site ie KETRACO boundaries is pastoralism.

4.4.4 Infrastructure

4.4.4.1 Roads and accessibility

The proposed additional scope is situated along Mahi Mahiu- Narok-Bomet road. The road is a single carriage way, providing access to the south region of rift valley to and from Nairobi. It has high economic importance and therefore the traffic sometimes is heavy. The site location will be accessed by a concreted road.

4.4.4.2 Water supply and drainage

The county is a semi-Arid area and the water availability is scarce. Most of the people depend on boreholes, water pans and a few from available streams. The project site will be supplied by a water service provider and tanks are already at site serving the facility.

Most of the surface water will mainly be absorbed into the soil during the construction phase. Appropriate drainage system has been provided already in place at site to handle the resultant storm water. The site is well drained with high-capacity water drainage systems that drain into 4 existing and interlinked evaporation ponds and underground tank with an automated oil and water separator.

4.4.4.3 Energy

The county connectivity electricity has improved. This was made possible by the government program, Rural electrification through Rural Electrification and Renewable Energy Corporation (REREC) which aimed at connecting rural to electricity. The project site is serviced by electricity distribution line and the nearby Suswa town has a gas station which will provide fuel to power the machinery that will be used during construction and operation phase.

The site hosts 220kV Suswa substation, the 500kV DC convertor station, the 400kV AC substation, staff quarters, staff offices, control rooms and a warehouse. The site is also projected to host the National Systems Control centre (NSCC) back-up making it one of the critical electricity transmission hubs in Kenya and the East African Region. It is the connecting point for the following electricity transmission line projects;

- i. 500kV Eastern Electricity Highway Project- *Completed*.
- ii. 400kV Isinya – Suswa line- *Completed*.
- iii. 220kV double circuit Olkaria IV – Nairobi North- *Completed*.
- iv. 400kV 430km double circuit Loiyangalani – Suswa – *Complete*
- v. 220kV double circuit Olkaria – Suswa transmission line- *Completed*.
- vi. 220kV double circuit Olkaria II – Suswa transmission line- *Completed*.
- vii. 220kV double circuit Olkaria 1AU - Suswa line - *Completed*.
- viii. 220kV double circuit Olkaria II - Suswa line – *Completed*.

4.4.4.4 Communication

The area is well covered by communication facilities by the main telephone services providers which includes Safaricom, Airtel and Telkom. These enables voice calls, Short Message Services (SMS) and internet. All these will facilitate communication during all phase of the project.

4.4.4.5 Security

The county is not prone to any security issues. The project location site will be manned 24 hours daily by qualified security personnel and Kenya Police and will be operational for twenty-four hours a day. The design also takes care of installation of security lights and cameras. A fence will be constructed around the building to enhance its security.

4.4.5 History of the proposed site

The site is within a KERTACO-owned property. The entire property measures 80.9 hectares. The land previously belonged to Mr. Muriaso Ole Kendi who willingly sold it to KETRACO (see attached appendix on title documents) for development of a number of integrated projects under KETRACO. The GPS location for the NSCC site are (1° 3'47.28"S, 36°21'21.36"E).

Before its purchase the piece of land was already fenced by the owner for his exclusive private use i.e. pasture for his cattle. Because of this community were not allowed within the property nor were there any squatters or tenants staying within it. The proposed additional scope therefore does not affect nor displace any member of the local community.

The adjacent community is predominantly Maasai but in proximity to the site they are sparsely populated with nod of concentration of the populace being the shopping centres, i.e. Suswa and Duka Moja.

5 CHAPTER FIVE: POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

5.1 Introduction

Kenya has in place a wide range of institutional, policy, and legislative framework to address the major causes of environmental degradation and negative impacts on ecosystems emanating from industrial and economic development programmes. This chapter includes a summary of the policies, laws, regulations, and institutional setup relevant to environmental and social management in Kenya and pertinent to this project. A review of the most pertinent regulations and standards governing health and safety has been included. In addition, analysis for international good practice (World Bank's Environmental and Social Framework (ESF) and the Multilateral Environmental Agreements (MEAs) and their applicability to the proposed STATCOM were reviewed and presented to guide the proponent.

5.2 KETRACO Guiding Frameworks

5.2.1 Draft Environmental and Social Management Framework (ESMF).

The ESMF is being prepared by the KETRACO a guide in the integration of environmental and social considerations in internal operations. The ESMF sets out the principles, rules, guidelines, and procedures to assess the environmental and social impacts of subprojects prepared during Project implementation. It includes guidelines to prepare measures and plans to reduce, mitigate and/or offset adverse impacts and enhance positive impacts of subprojects, provisions for estimating and budgeting the costs of such measures, and information on the agencies responsible for addressing project impacts.

5.2.2 KETRACO Strategic Plan 2018- 2022 and draft Plan for 2023- to 2027

The KETRACO Strategic Plan 2018- 2022 and draft Plan for 2023- to 2027 have been reviewed in preparation of this document

5.3 National Policy framework

Table 5-1 below highlights the key policies plans and strategies in tandem with the proposed additional scope.

Table 5-1 Policies, Plans and Strategies

Policies, Plans and Strategies	Key areas of application
Bottom- Up Economic Transformation Agenda (BETA)	BETA lists the governments priority areas for five years as from 2018/2019 to 2027. The five key priority areas are: Agriculture, MSMEs (Micro, Small and Medium Enterprises), Affordable housing, Digital & creative economy, and Health. <i>Energy is an enabler of these five key priority areas. The proposed STATCOM project thus seeks to improve power reliability and stability through voltage stabilization on the national grid.</i>
Kenya Vision 2030	<ul style="list-style-type: none"> Vision 2030 (GOK, 2007) is divided into three fundamental pillars: economic, social, and political. The social pillar aims at realising a just and cohesive society enjoying equitable social development in a clean and secure environment. These pillars are anchored on the following foundations: macroeconomic stability; continuity in governance reforms; enhanced equity and wealth creation opportunities for the poor; infrastructure; energy; science, technology and innovation; land reform; human resources development; security and public sector reforms. The Vision 2030 aims at transforming Kenya into a globally competitive, newly industrialized, middle income and prosperous

Policies, Plans and Strategies	Key areas of application
	<p>country. The growth objectives underpinning the Vision 2030 require a sustainable annual economic growth rate of more than 10% supported by industry, agriculture, and services.</p> <ul style="list-style-type: none"> ▪ Efficient, accessible, and reliable infrastructure has been identified as an enabler for achieving sustained economic growth, development and poverty reduction by lowering cost of doing business and improving the country's global competitiveness. <p><i>The STATCOM aims to support stabilize the transmission system to enhance electricity level of service in Kenya in tandem with Vision 2030 on energy as a key enabler.</i></p>
Third Medium Term Plan (MTP IV) (2013-2027)	<ul style="list-style-type: none"> ▪ As per its concept note, the Fourth Medium Term Plan (MTP IV) of the Kenya Vision 2030 outlines the main policies, legal and institutional reforms as well as programmes and projects that the Government plans to implement during the period 2023-2027. It builds on the achievements of the first, second and third MTPs and prioritizes implementation of the BETA initiatives. ▪ The concept note identifies the following thematic areas of concerns that are relatable to the proposed STATCOM. <ul style="list-style-type: none"> ➢ Increase installed power generation capacity from Hydro, Geothermal, and Wind, Liquefied Natural Gas (LNG), Biomass and Solar Power Projects; ➢ Enhanced power transmission and distribution <p><i>The proposed additional scope is hence in line with the MTP IV as it will support the enhancement and quality of electricity transmission.</i></p>
Sessional Paper No. 10 of 2014 on the National Environment Policy	<ul style="list-style-type: none"> ▪ The policy seeks to provide the framework for an integrated approach to planning and sustainable management of natural resources in the country. <ul style="list-style-type: none"> ➢ The broad objectives of the national environmental policy in Kenya are: -To ensure optimal use of natural resources while improving environmental quality. ➢ To conserve natural resources such that the resources meet the needs of the present without jeopardizing future generations in enjoying the same. ➢ To develop awareness that inculcates environmental stewardship among the citizenship of the country. ➢ To integrate environmental conservation and socio-economic aspects in the development process. ➢ To ensure that national environmental goals contribute to international obligations on environmental management and social integrity. ➢ To achieve the above policy objectives, it is a policy directive that appropriate reviews and evaluations of all forms of developmental project plans and operations are carried out to ensure compliance with the environmental policy and legal frameworks. ▪ It recognizes the various vulnerable ecosystems and proposes various policy measures not only to mainstream sound environmental management practices in all sectors of society throughout the country but also recommends strong institutional and governance measures to support achievement of desired objectives and goals. ▪ In chapter 4 on Management of Ecosystems and Sustainable Use of Natural Resources the policy notes that ecosystems provide a wide range of goods and services which include provisioning, regulating,

Policies, Plans and Strategies	Key areas of application
	<p>cultural and supporting services. Despite the services they provide, ecosystems are under pressure from human activities.</p> <ul style="list-style-type: none"> ▪ The most critical ecosystems in Kenya include forests, freshwaters, wetlands, coastal and marine, mountains, arid, semi-arid and spectacularly diverse wildlife populations. Within these ecosystems are key natural and cultural heritage resources which support diverse biodiversity and provide natural capital for economic development and support livelihoods. <p><i>The proposed STATCOM is not within a critical ecosystem.</i></p>
Sessional Paper No. 1 of 2017 on National Land Policy	<ul style="list-style-type: none"> ▪ The overall goal of the national land use policy is to provide legal, administrative, institutional and technological framework for optimal utilization and productivity of land related resources in a sustainable and desirable manner at national, county and community levels. ▪ The Policy is premised on the philosophy of economic productivity, social responsibility, environmental sustainability and cultural conservation. ▪ Key principles informing it include efficiency, access to land use information, equity, elimination of discrimination and public benefit sharing. <p>The land-use policy underpins the relationship between culture and land use management. It indicates that, there is value attached to historical and archeological sites and preservation of these sites is therefore an integral component of the overall land use framework.</p> <p>The policy also indicates that the ecological zones provide a means of livelihood for the communities that have settled there over the years. Communities have attachment to the land which they consider to be a cultural inheritance from previous generations, and they tend to be highly protective of their spatial jurisdictions from potential migrants.</p> <p>The spiritual life of such communities is also deeply connected to land use.</p> <p><i>The proposed STATCOM will need to be consistent with the provisions of this Policy.</i></p>
Sessional Paper No. 6 of 1999 on Environment and Sustainable Development Policy.	<ul style="list-style-type: none"> ▪ The policy defines approaches that will be pursued by the Government in mainstreaming environment into development. ▪ The policy harmonized environmental and developmental objectives with the broad goal of achieving sustainable development. <p><i>The policy paper also provides guidelines and strategies for government action regarding environment and development. This policy is relevant to the proposed STATCOM in view of the potential impacts on the environment and involvement of the public in project planning.</i></p>
National Energy Policy, 2018	<ul style="list-style-type: none"> ▪ The level and the intensity of energy use in a country is a key indicator of economic growth and development. The Kenya Vision 2030 identified energy as one of the infrastructure enablers of its social economic pillar. Sustainable, affordable and reliable energy for all citizens is a key factor in realization of the Vision. ▪ The overall objective of the energy policy is to ensure affordable, sustainable and reliable supply to meet national and county

Policies, Plans and Strategies	Key areas of application
	<p>development needs, while protecting and conserving the environment.</p> <ul style="list-style-type: none"> ▪ Specifically, the policy aims to; <ul style="list-style-type: none"> ➢ Utilize energy as a tool to accelerate economic empowerment for the National and County Governments as well as urban and rural development. ➢ Improve access to quality, reliable and affordable energy services. ➢ Ensure that prudent environmental, social, health and safety considerations are factored in energy sector developments. ➢ Promote diversification of energy supply sources to ensure supply security. ➢ Provide for the phased transfer of provision of energy services to the Counties in <p><i>The proposed STATCOM installation is in line with the tenets of the energy policy and should ensure prudent environmental, social, health and safety considerations are factored in the development.</i></p>
National Policy on Gender and Development (NPGD), 2019	<ul style="list-style-type: none"> ▪ The Policy spells out a policy approach of gender mainstreaming and empowerment of women and clearly states that it is the right of women, men, girls and boys to participate in and benefit equally from the development process. ▪ The NPGD provides a framework for mainstreaming gender in all policies, planning and programming in Kenya and puts in place institutional mechanisms to ensure effective implementation. <p><i>The proposed additional scope should hence ensure gender concerns are mainstreamed into the development to ensure that the needs and interests of each gender are addressed.</i></p>
Kenya National Youth Policy (2016)	<ul style="list-style-type: none"> ▪ The Youth policy provides for Youth inclusion in the different sectors to identify specific Youth issues and how to address and include them. ▪ Article 260 of Kenya's Constitution defines a Youth as a person aged between eighteen (18) years and thirty-four (34) years. <p><i>It is expected the proposed additional scope will identify the needs and concerns of youth and include their views with emphasis to provision of equal business and employment chances to the youth within the project's AoL.</i></p>
Sessional Paper No. 2 of May 2006 on Gender Equality and Development	<ul style="list-style-type: none"> ▪ The Sessional Paper provides a framework for gender mainstreaming and recognizes that socio-cultural attitudes held by men and women, and socialization process are of great significance in determining the unequal status between men and women. ▪ It also recognizes that development initiatives impact differently on men and women and in turn women and men impact differently on development process. <p><i>The proposed STATCOM should hence ensure gender equality concerns are mainstreamed into the development. Men, women and youth will be provided with equal opportunities in project benefits such as employment in all phases.</i></p>
HIV/AIDS Policy of 2009	<ul style="list-style-type: none"> ▪ The policy identifies HIV/AIDS as a global crisis that constitutes one of the most formidable challenges to development and social progress.

Policies, Plans and Strategies	Key areas of application
	<ul style="list-style-type: none"> The Pandemic heavily affects the Kenyan economy through loss of skilled and experienced manpower due to deaths, loss of man hours due to prolonged illnesses, absenteeism, reduced performance, increased stress, stigma, discrimination, and loss of institutional memories, among others. <p><i>The contractor will provide condoms and voluntary testing and counselling as captured in ESMP.</i></p>
The National Climate Change Response Strategy (NCCRS), 2010	<ul style="list-style-type: none"> NCCRS has the following key recommendations: adaptation and mitigation measures in key sectors; necessary policy, legislative and institutional adjustments; enhancing climate change awareness, education and communication in the country; capacity building requirements; enhancing research and development as well as technology development and transfer in areas that respond to climate change, among many others. It is prudent to ensure that the proposed additional scope infrastructure design is climate-proof over its lifespan, which includes carrying out geotechnical site investigations (GSIs) to determine appropriate sites for infrastructure development; factoring a maintenance component into all infrastructural development funds; and designing infrastructure that can withstand the prevailing climatic conditions, e.g. structures that can withstand strong winds, tides.
Least Cost Power Development Plan, 2017-2037	<ul style="list-style-type: none"> This is a long term 20 year rolling plan covering the period 2017-2037. It integrates Feed-In-Tariff Policy approvals and provides a focus on the Government Big 4 Agenda in which energy is expected to be a central enabler of the programme. The report covers a comprehensive load forecast, addresses the committed generation projects between 2017-2024 and the expansion programme for the period 2025-2037. The main objective of the plan and its update (from 2011 -2030) is to take into account new assumptions, reflect on emerging technologies as well as market dynamics that may influence future power expansion plan and accommodate new Government policy guidance on renewable energy expansion in the immediate long term. A key objective of the plan is to simulate the generation plants; - and prepare a Transmission System expansion plan in line with the generation expansion. <p><i>On transmission the report covers the target network for the period 2017-2037 ensuring that the target network is adequate, secure and cost effective.</i></p>

5.4 National legal and regulatory framework

The Republic of Kenya has numerous laws and regulations that guide environmental management and conservation; and social integration issues in the country. Most of these laws are sector specific and cover a wide range of issues including public health, soil conservation, protected areas conservation, endangered species, public participation, water rights, water quality, air quality, excessive noise control, vibration control, land use, among others.

5.4.1 Constitution of Kenya

The Constitution of Kenya is the country's supreme legislation and has Environmental provisions in Chapter Four, under 'Rights and Fundamental Freedoms', Chapter Five, under 'Environment and Natural Resources', and Chapter Ten, under 'Judicial Authority and Legal System'. The Fourth

Schedule also includes environmental provisions under ‘Distribution of functions between National and County Governments’ and the Fifth Schedule titled ‘Legislation to be enacted by Parliament’. Environmental rights and freedoms are presented in Article 42 of the new constitution, which states: Every person has the right to a clean and healthy environment, which includes the right –

- To have the environment protected for the benefit of present and future generations through legislative and other measures, particularly those contemplated in Article 69; and
- To have obligations relating to the environment fulfilled under Article 70.

The Kenyan constitution also gives prominence to public participation, as a general national value in environmental protection. Article 69(1) states that the State shall encourage public participation in the management, protection, and conservation of the environment. Chapter 5 Part II -Environment and Natural Resources - Article 69 (1) of the Constitution of Kenya, 2010 commits the State to:

- a) Ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits.
- b) Work to achieve and maintain a tree cover of at least ten per cent of the land area of Kenya.
- c) Protect and enhance intellectual property in, and indigenous knowledge of, biodiversity and the genetic resources.
- d) Encourage public participation in the management, protection and conservation of the environment.
- e) Protect genetic resources and biological diversity.
- f) Establish systems of environmental and social impact assessment, environmental audit and monitoring of the environment.
- g) Eliminate processes and activities that are likely to endanger the environment; and
- h) Utilize the environment and natural resources for the benefit of the people of Kenya.

Article 69 (II) 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.” Moreover, the Constitution includes aspects around land acquisition and compensation. It also mandates the development of a national land policy to implement the principles and establishes the National Land Commission.

5.4.2 National laws and regulations relevant to the proposed project

The relevant legislations are as described in **Error! Reference source not found.** below:-

Table 5-2: Laws and Regulations

Laws and Regulations	Key areas of application	Permits required
Environmental Management and Coordination Act (EMCA, 1999) and relevant amendments	<ul style="list-style-type: none"> ▪ EMCA, 1999 is the principal law in Kenya that governs the management, use and regulation of environmental resources including natural capital. ▪ The law provides for several policy and institutional arrangements aimed at ensuring that Kenya's environmental resources are utilized in a sustainable and equitable manner. ▪ EMCA establishes among others the following institutions: National Environment Management Authority, National Environment Complaints Committee, National Environment Tribunal, National Environment Action Plan Committees, and County Environment Committees. ▪ NEMA was established as the principal instrument of government charged with the implementation of all policies relating to the environment, and to exercise general supervision and coordination over all matters relating to the environment. ▪ In consultation with the lead agencies, NEMA is empowered to develop regulations, prescribe measures and standards and, issue guidelines for the management and conservation of natural resources and the environment. The Act provides for environmental protection through; <ul style="list-style-type: none"> ➢ Environmental impact assessment ➢ Environmental audit and monitoring ➢ Environmental restoration orders, conservation orders, and easements. ▪ The law provides for a series of measures to be taken in pursuance to achieving this aim, i.e., establishment of various organs from the county level (County Environmental Committee) to the national level, development of County/National Environmental Action Plans and monitoring and compliance plans among others. ▪ Other aspects provided for include Strategic Environmental Assessment, Standards and Quality Monitoring, and Environmental Impact assessment. ▪ Schedule 2 of the Act (amendments 2015) provides details on projects that require Environmental Impact Assessment by categorizing the projects into Low Risk Projects, Medium Risk Projects and High-Risk Projects. The High-Risk Projects include any activity out of character with its surrounding; and any structure of a scale not in keeping with its surrounding. High risk projects also include other projects of high magnitudes such as high voltage transmission lines. <p><i>The converter listed as a High Risk Project as power and infrastructure projects, specifically (a) high voltage electrical transmission lines; for which an Integrated Environmental and Social Impact Assessment study report was prepared and approved.</i></p>	<ul style="list-style-type: none"> ▪ Obtain variation of Converter station EIA License prior to commencement of the project

Laws and Regulations	Key areas of application	Permits required
	<i>The proposed additional scope will be undertaken on a brownfield within the converter station on a site that is already disturbed and that is fenced-out, bears aggregates and adjacent to the existing 400kV switchyard. Thus, the STATCOM project can be categorised as MEDIUM Risk project.</i>	
The Environmental Impact (Assessment and Auditing) Regulations, 2003 and Regulations, 2016 (L.N 149) & 2019 (L.N 32)	<ul style="list-style-type: none"> The regulations stipulate the ways in which environment impact assessment and audits should be conducted. The project falls under the second schedule of EMCA, Cap 387 High Risk Project that requires an Environmental Impact Assessment Study be undertaken to provide baseline information upon which subsequent environmental control audit shall be based. The EMCA, Cap 387 requires that during the EIA process a proponent shall in consultation with the Authority seek views of persons who may be affected by the project or activity through posters, newspaper, radio and public meetings with the affected parties and communities. <p><i>This Report complies with the requirements of the Environmental Regulations in the coverage of environmental issues, project details, impacts, legislation, mitigation measures, management plans and procedures. The Proponent shall be required to commit to implementing the environmental management plan laid out in this report and any other conditions laid out by NEMA.</i></p>	<ul style="list-style-type: none"> Undertake Annual Environmental Audit (EA) of the entire project during operation inclusive of the expanded scope.
Environmental Management and Coordination (Water Quality) Regulations, 2006	<ul style="list-style-type: none"> These regulations provide for the protection of lakes, rivers, streams, springs, wells and other water sources. The objective of the regulations is to protect human health and the environment. The effective enforcement of the water quality regulations will lead to a marked reduction of water-borne diseases and hence a reduction in the health budget. The regulations also provide guidelines and standards for the discharge of poisons, toxins, noxious, radioactive waste or other pollutants into the aquatic environment in line with the Third Schedule of the regulations. The regulations have standards for discharge of effluent into the sewer and aquatic environment. <p><i>Prohibition is required to refrain from any actions, which directly or indirectly cause water pollution.</i></p>	<ul style="list-style-type: none"> The existing Suswa complex is compliant with provision of these regulations. The construction of the additional scope will be in line with the existing structures.
Environmental Management and Coordination (Waste Management) Regulations, 2006	<ul style="list-style-type: none"> These Regulations are meant to streamline the handling, transportation and disposal of various types of waste. The aim of the Waste Management Regulations is to protect human health and the environment. Currently, different types of waste are dumped haphazardly posing 	<ul style="list-style-type: none"> The contractor shall contract a licensed waste handler to manage the waste at site.

Laws and Regulations	Key areas of application	Permits required
	<p>serious environmental and health concerns. The regulations place emphasis on waste minimization, cleaner production, and segregation of waste at source.</p> <p><i>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.</i></p>	
<p>Environmental Management and Coordination of Controlled Substances Regulations, 2007 (Legal Notice No.73 of 2007)</p>	<ul style="list-style-type: none"> ▪ This regulation mandates NEMA to monitor the activities of persons handling controlled substances, in consultation with relevant line ministries and departments, to ensure compliance with the set requirements. ▪ The regulations stipulate that controlled substances must be clearly labelled with among other words, “Controlled Substance-Not ozone friendly”) to indicate that the substance or product is harmful to the ozone layer. Advertisement of such substances must carry the words, “Warning: Contains chemical materials or substances that deplete or have the potential to deplete the ozone layer.” ▪ Persons are prohibited from storing, distributing, transporting or otherwise handling a controlled substance unless a material safety data sheet accompanies the controlled substance. ▪ NEMA must license manufacturers, exporters or importers of controlled substances. Further, NEMA must authorize any person wishing to dispose of a controlled substance. The licensee should ensure that the controlled substance is disposed of in an environmentally sound manner. <p><i>These regulations also apply to any person transporting such controlled substances through Kenya. Such a person is required to obtain a Prior Informed Consent (PIC) permit from NEMA.</i></p>	<ul style="list-style-type: none"> ▪ Obtain a Prior Informed Consent (PIC) permit from NEMA
<p>Environmental Management and Coordination (Noise and Excessive Vibration Pollution Control) Regulations, 2009</p>	<ul style="list-style-type: none"> ▪ 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: <ul style="list-style-type: none"> ➢ 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, 	<ul style="list-style-type: none"> ▪ Compliance with the Noise and Excessive vibration Regulations.

Laws and Regulations	Key areas of application	Permits required
	<ul style="list-style-type: none"> ➤ Whether the noise is subject to be controlled without unreasonable effort or expense to the person making the noise. ▪ These regulations also relate noise to its vibration effects and seek to ensure that the level of noise causes no harmful vibrations. Any person(s) intending to undertake activities in which noise is suspected to be injurious or endangers the comfort, repose, health or safety of others and the environment, must make an application to NEMA and acquire a license <p><i>Noise is expected during construction phase therefore, contractor is required to implement the provisions of the ESMMP, to ensure noise reduction. In addition, he shall be required to adhere to the provisions of maximum permissible levels for construction sites.</i></p> <p><i>The Proponent/management shall observe policy and regulatory requirements and implement the measures proposed in this documenting an effort to comply with the provisions of the Regulations.</i></p>	
Environmental Management and Coordination (Air Quality) Regulations, 2014	<ul style="list-style-type: none"> ▪ The objective this regulation is to provide for prevention, control and abatement of air pollution to ensure clean and healthy ambient air. ▪ It provides for the establishment of emission standards for various sources, including as mobile sources (e.g. motor vehicles). ▪ Emission limits for various areas and facilities have been set. ▪ The regulations provide the procedure for designating controlled areas, and the objectives of air quality management plans for these areas. <p><i>Although impacts on air pollution is listed minor, the Proponent shall observe policy and regulatory requirements and implement the mitigation measures proposed in this document to comply with the provisions of these Regulations on abatement of air pollution.</i></p>	<ul style="list-style-type: none"> ▪ Conduct ambient air quality analysis of the generators as recommended under the third schedule of the regulations.
Building Code, 2000;	<ul style="list-style-type: none"> ▪ This law recognizes the county governments as the leading planning agencies. It compels potential developers to submit development applications for the approval. ▪ The county governments are hence empowered to approve or disapprove any plans if they do or don't comply with the law, respectively. ▪ Any developer who intends to erect a building must give the respective local authority a notice of inspection before the erection of the structure. ▪ On completion of the structure, a notice of completion shall be issued by the local authority to facilitate final inspection and approval. ▪ No person therefore shall occupy a building whose certificate of completion has not been issued by the county government. 	<ul style="list-style-type: none"> ▪ Obtain County approval of Building plans (such as campsites)

Laws and Regulations	Key areas of application	Permits required
	<i>In the development of the project, the proponent will have to comply with the provisions of this Act by complying to the building code provisions in specific sites where buildings or support facilities will be required.</i>	
Energy Act, 2019;	<ul style="list-style-type: none"> ▪ The energy Act aims to consolidate the laws relating to energy, to provide for National and County Government functions in relation to energy, to provide for the establishment, powers and functions of the energy sector entities; promotion of renewable energy; exploration, recovery and commercial utilization of geothermal energy; regulation of midstream and downstream petroleum and coal activities; regulation, production, supply and use of electricity and other energy forms; and for connected purposes ▪ Article 179, gives the Cabinet Secretary compulsory acquisition of land for purposes of constructing, modifying, or operating any energy infrastructure or for incidental purposes where reasonable attempts to acquire the land had failed. ▪ Article 193, gives the County Governments power to ensure efficient use of energy and its conservation. ▪ On Article 148 highlights that a person who wishes to carry out electrical installation work must be licensed as an electrical contractor by the Authority. 	<ul style="list-style-type: none"> ▪ Obtain Permit and License to carry out electrical installation work (for contractor) ▪ Ensure electrical workers have a certificate for electrical works.
Forest Conservation and Management Act, No. 34 of 2016;	<ul style="list-style-type: none"> ▪ The Forest Conservation and Management Act, 2016 gives effect to Article 69 of the Kenyan 2010 Constitution about forest resources; to provide for the development and sustainable management, including conservation and rational utilization of all forest resources for the socio-economic development of the country and for connected purposes. ▪ The Act applies to all forests on public, community and private lands. The principles of the Act lay emphasis on (a) good governance in accordance with Article 10 of the Constitution; (b) public participation and community involvement in the management of forests; (c) consultation and co-operation between the national and county governments; (d) the values and principles of public service in accordance with Article 232 of the Constitution; (e) protection of indigenous knowledge and intellectual property rights of forests resources; and (f) international best practices in management and conservation of forests. ▪ Further, the act forms the baseline to develop a national forest policy and formulate a public forest strategy for the sustainable use of forests and forest resources. ▪ In addition, the Act, establishes the Kenya Forest Service to conserve, protect and manage all public forests in accordance with the provisions of this Act. <p><i>The proposed additional scope for the project is not in conflict with the provisions of this Act.</i></p>	<ul style="list-style-type: none"> ▪ The contractor will ensure that material sourcing does not conflict with this Act

Laws and Regulations	Key areas of application	Permits required
The Land Registration Act, 2012	<ul style="list-style-type: none"> This is an Act of Parliament that revises, consolidates and rationalizes the registration of titles to land, to give effect to the principles and objects of devolved government in land registration, and for connected purposes. <p><i>The proposed expansion is to be undertaken on a portion of land registered under KETRACO</i></p>	<ul style="list-style-type: none"> The Land belongs to KETRACO.
The Land Act, 2012; and The Land Laws (Amendment) Act, 2019	<ul style="list-style-type: none"> The Land Act was enacted by Parliament to give effect to Article 68 of the Constitution, to revise, consolidate and rationalize land laws; to provide for the sustainable administration and management of land and land-based resources, and for connected purposes. <p>The land to host the additional scope (STATCOM) is owned by KETRACO and hence no acquisition is required.</p>	<ul style="list-style-type: none"> Land is legally owned by KETRACO
Occupational Safety and Health Act, No. 15 of 2007;	<ul style="list-style-type: none"> The Occupational Safety and Health Act 2007 applies 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 regarding, the activities of persons at work. Section (3) Every occupier shall carry out appropriate risk assessments in relation to the safety and health of persons employed and, on the basis of these results, adopt preventive and protective measures. Section 9.(1) Every occupier shall establish a safety and health committee at the workplace in accordance with OSH Committee regulations. Section 11. (1) requires the occupier of a workplace to cause a thorough safety and health audit of his workplace to be carried out at least once in every period of twelve months by a safety and health advisor. Section 19 of the Act provides that an occupier of any premises likely to emit poisonous, harmful, injurious or offensive substances, into the atmosphere shall use the best practicable means to prevent such emissions into the atmosphere and render harmless and inoffensive the substances which may be emitted. Section 16 provides that no person shall engage in any improper activity or behavior at the workplace, which might create or constitute a hazard to that person or any other person. Section 44. (1) requires before a person occupies or uses any premises as a workplace, he shall apply for the registration of the premises by sending to the Director a written notice containing the particulars set out in the Fourth Schedule 	<ul style="list-style-type: none"> Obtain Registration of Workplace Certificate for workplaces (Campsites, substation offices etc) Undertake Annual Safety and Health Audit Establish a Safety and Health Committee Undertake appropriate risk assessment of the Workplace

Laws and Regulations	Key areas of application	Permits required
	<i>It is thus recommended that all Sections of the Act related to this additional scope, such as provision of protective clothing, clean water, and insurance cover are observed to protect all from work related injuries or other health hazards.</i>	
Penal Code Act (Cap 63);	<ul style="list-style-type: none"> The Penal Code (Cap. 63) chapter on “Offences against Health and Conveniences” strictly prohibits violation of the atmosphere at any place, to make it noxious to health of persons in general dwelling or carrying out business in the neighbourhood or passing along public ways is guilty of misdemeanour and shall be subjected to imprisonment not exceeding two years with no option of fine. Under this code, any person who for trade or otherwise makes loud noise or offensive awful smell in such places and circumstances as to annoy any considerable number of persons in the exercise of their rights, commits an offence, and is liable to be punished. <p><i>The contractor of the will therefore needs to ensure that all emissions are controlled during the construction phase of the project to avoid interference on health of the local communities and the workers.</i></p>	<ul style="list-style-type: none"> -None
Physical and Land Use Planning Act, 2019;	<ul style="list-style-type: none"> The Physical and Land Use Planning Act, 2019 provides for the preparation and implementation of physical development plans. Section 55 of the Act provides for development control to protect and conserve the environment and to ensure orderly physical and land use development amongst others. These includes process and procedures for processing of easements and wayleaves; siting of base transmission station, power generation Plants, etc. <p><i>The proposed additional scope is consistent with the physical setting of the entire complex hence doesn't conflict the Act.</i></p>	<ul style="list-style-type: none"> The project is consistent with the physical setting of the entire Suswa complex.
Public Health Act (Cap 242);	<ul style="list-style-type: none"> The Public Health Act (Chapter 242) is an Act of Parliament that provides for securing and maintaining good health of citizens. The Act contains directives that are focused on ensuring protection of human health. There are provisions within the Act that deal with water, air and noise quality as they pertain to human health. An environmental nuisance includes the emission from premises of waste waters, gases and smoke which could be regarded as injurious to health. The owner and/or occupier of premises responsible for such nuisances are liable to prosecution under the Act. <p><i>The contractor will need to ensure that water pollution is controlled.</i></p>	<ul style="list-style-type: none"> -None
Climate Change Act, 2016;	<ul style="list-style-type: none"> The Act provide for a regulatory framework for enhanced response to climate change; to provide for mechanism and measures to achieve low carbon climate development, and for connected purposes. 	<ul style="list-style-type: none"> Installation of STATCOM is critical for a stable grid. As

Laws and Regulations	Key areas of application	Permits required
	<ul style="list-style-type: none"> ▪ The Act should be applied for the development, management, implementation and regulation of mechanisms to enhance climate change resilience and low carbon development for the sustainable development of Kenya. ▪ The Act should be applied in all sectors of the economy by the national and county governments to— <ul style="list-style-type: none"> ➢ Mainstream climate change responses into development planning, decision making and implementation. ➢ Build resilience and enhance adaptive capacity to the impacts of climate change. ➢ Mainstream the principle of sustainable development into the planning for and decision making on climate change response; and ➢ Integrate climate change into the exercise of power and functions of all levels of governance, and to enhance cooperative climate. <p><i>The proposed scope should ensure the design is climate-proof over its lifespan and undertaken as per provisions of the Act specifically on planning and implementation stages.</i></p>	<p>such the grid will be critical in carbon offsets in the economy.</p>
County Governments Act, No. 17 of 2012; together with its Amendment Act, 2016	<ul style="list-style-type: none"> ▪ This is an Act of parliament to give effect to Chapter Eleven of the Kenyan Constitution; to provide for County government's powers, functions and responsibilities to deliver services and for connected purposes. ▪ This Act vests responsibility upon the County Governments in planning of development projects within their areas of jurisdiction be it projects of importance to the county government or those of national importance. ▪ Section 102 of the Act provides the principles of planning and development facilitation which include integration of national values in county planning, protect the right to self-fulfilment within the county communities and with responsibility to future generations, protection of rights of minorities and marginalized groups and communities, promotion equity resource allocation, among others. ▪ Section 103 of the Act sets out the prime objective of county planning which aligned to the bill of rights and the constitution of Kenya. ▪ Section 113 of the Act makes public participation in County planning processes compulsory. ▪ Section 114 and 115 indicate and give guidelines in planning of projects of national significance and instil the aspect of public participation in every aspect of the planning process through that: clear strategic environmental assessments; clear environmental impact assessment reports; expected development outcomes; and development options and their cost implications. 	<ul style="list-style-type: none"> ▪ -Ensure involvement of the Kajiado County Government's pertinent departments planning (including public participation) and execution of the project.

Laws and Regulations	Key areas of application	Permits required
	<i>In the execution of the proposed additional scope, the County Government of Kajiado forms a key stakeholder in project planning, implementation, including all provisions on public participation and information disclosure.</i>	
Employment Act, No 11, 2007;	<ul style="list-style-type: none"> ▪ The Employment Act, 2007 defines the fundamental rights of employees including the basic conditions of employment of workers. It also regulates employment of children. ▪ The contractor on site will have to employ casual labourers probably from the communities where the transmission traverses during construction. <p><i>The basic conditions of employees should be observed to avoid unnecessary conflicts during the construction works. The Contractor shall pay the entire amount of the wages earned by or payable to the workers. Payment of such wages should be done at the end of a working day at or near the place of work. The Contractor shall also ensure that all statutory deductions are submitted without delay to appropriate government agencies e.g., Kenya Revenue Authority, NSSF, NHIF, among others.</i></p>	<ul style="list-style-type: none"> ▪ None
Water Act, 2016;	<ul style="list-style-type: none"> ▪ The Water Act No. 43 of 2016 repealed the water Act 2002. The enactment of this law aimed at aligning national water management and water services provision with the requirements of the Constitution of Kenya 2010 particularly on the clauses devolving water and sanitation services to the county governments. ▪ The Act highlights regulation of Water Rights and Works with Section of 36 of the act requiring a water permit be obtained for any use of water from a water resource, except as provided by section 37; ▪ Section 40 stipulates procedures for obtaining a water permit including subject of public consultation and, where applicable, of environmental impact assessment in accordance with the requirements of the Environmental Management and Coordination Act, 1999 (No. 8 of 1999). ▪ Section 55 highlights abstraction of ground water. The Fourth Schedule has effect with respect to the abstraction of ground water and respective works including application for a permit. <p><i>During the entire project lifecycle, regulations, and guidelines as per the Water Act provision should be considered.</i></p>	<ul style="list-style-type: none"> ▪ Apply for Water Extraction Permit where necessary.
HIV and AIDS Prevention and Control Act, 2006;	<ul style="list-style-type: none"> ▪ Section 3 of The Act indicated the purpose of the legislation including public awareness and rights to people living with HIV/AIDS. ▪ Public awareness shall be achieved through education, public campaigns even at workplaces. <p><i>This Act's provisions then give the guidelines unto which the project shall follow in educating workers and staff and providing of incentives to combat HIV/AIDs. The</i></p>	<ul style="list-style-type: none"> ▪ Align operations of the contractor to this provision.

Laws and Regulations	Key areas of application	Permits required
	<i>proposed additional scope should adopt the guidelines as set in the provisions of the act to enhance public awareness and rights to people living with HIV/AIDS.</i>	
The Sexual Offences Act, 2006 and its amendment 2012	<ul style="list-style-type: none"> ▪ The act of Parliament makes provision about sexual offences, their definition, prevention, and the protection of all persons from harm from unlawful sexual acts, and for connected purposes. ▪ The act emphasis on observing a standard work ethic to ensure persons from both genders are not subjected to sexual offences. ▪ The Act highlights key aspects within its provisions as follows. <ul style="list-style-type: none"> ➤ Rape. ➤ Attempted rape. ➤ Sexual assault. ➤ Compelled or induced indecent acts. ➤ Acts which cause penetration or indecent acts committed within the view of a child or person with mental disabilities. ➤ Defilement. ➤ Attempted defilement. ➤ Gang rape. ➤ Indecent act with child or adult. ➤ Promotion of sexual offences with a child. ➤ Child trafficking. ➤ Child sex tourism. ➤ Child prostitution. ➤ Child pornography. ➤ Exploitation of prostitution. ➤ Trafficking for sexual exploitation. ➤ Prostitution of persons with mental disabilities. ➤ Incest by male persons. ➤ Incest by female persons. ➤ Sexual harassment. ➤ Sexual offences relating to position of authority and persons in position of trust. ➤ Sexual relationship which pre-date position of authority or trust. ➤ Deliberate transmission of HIV or any other life threatening sexually transmitted disease. ➤ Administering a substance with intent. ➤ Distribution of substance by juristic persons. 	<ul style="list-style-type: none"> ▪ -None

Laws and Regulations	Key areas of application	Permits required
	<ul style="list-style-type: none"> ➤ Cultural and religious sexual offences. ➤ Non-disclosure of conviction of sexual offences. ➤ Vulnerable witnesses. ➤ Vulnerable witnesses to be notified of protective measures. ➤ Evidence of surrounding circumstances and impact of sexual offence. <p><i>Ample working environment should prevail in all workplaces in the project, to be enhanced through implementation of a Sexual Misconduct Policy.</i></p>	
The National Gender and Equality Act, 2011	<ul style="list-style-type: none"> ▪ National Gender Equality Commission is a constitutional Commission established by an Act of Parliament in August 2011, as a successor commission to the Kenya National Human Rights and Equality Commission pursuant to Article 59 of the Constitution. ▪ NGEC derives its mandate from Articles 27, 43, and Chapter Fifteen of the Constitution; and section 8 of NGEC Act (Cap. 15) of 2011, with the objectives of promoting gender equality and freedom from discrimination. <p><i>Gender mainstreaming in projects ensures that the concerns of women and men form an integral dimension of the project design, implementation, operation and the monitoring and evaluation ensures that women and men benefit equally, and that inequality is not perpetuated.</i></p>	<ul style="list-style-type: none"> ▪ -None
Work Injury Benefits Act, 2007;	<ul style="list-style-type: none"> ▪ The Work Injury Compensation Benefit Act 2007 provides guideline for compensating employees on work-related injuries and diseases contracted in the course of employment. ▪ The Act also requires provision of compulsory insurance for all employees. ▪ The Act defines an employee as any worker on contract of service with employer. <p><i>It will be important for the proponent of the proposed scope to ensure that all workers contracted during the project implementation phase are provided with appropriate insurance covers so that they can be compensated in case they get injured while working</i></p>	<ul style="list-style-type: none"> ▪ Provision of compulsory insurance for all employees
Wildlife Conservation and Management Act, No. 47 of 2013.	<ul style="list-style-type: none"> ▪ The Wildlife and Conservation Act deals with the conservation and management of wildlife in Kenya. ▪ The Act provides that wildlife should be conserved so as to yield optimum returns in terms of cultural, aesthetic, scientific and economic benefits. ▪ The Act requires that full account be taken of the inter-relationship between wildlife conservation and land use. ▪ The Act controls activities within the national parks, which may lead to the disturbance of wild animals. Unauthorized entry, residence, burning, damage to 	<ul style="list-style-type: none"> ▪ -None

Laws and Regulations	Key areas of application	Permits required
	<p>objects of scientific interest, introduction of plants and animals and damage to structure are prohibited under this law.</p> <p><i>Construction of the proposed additional scope will not conflict with the Act</i></p>	
<p>The National Construction Authority Act, 2011.</p>	<p>The National Construction Authority Act 2011 is an act of parliament that established the National Construction Authority (NCA), a state corporation that oversees and coordinates the development of the construction industry in Kenya. The act provides for the functions, powers, and structure of the NCA, as well as the registration and regulation of contractors, joint ventures, skilled workers, and construction site supervisors. The act also imposes a levy on construction works and establishes an appeals board to hear disputes arising from the NCA's decisions.</p> <p>Some of the main objectives of the act are to:</p> <ul style="list-style-type: none"> ▪ Promote and stimulate the development of the construction industry. ▪ Establish and maintain a register of contractors in accordance with the classes of contract works. ▪ Ensure quality assurance and compliance with standards in the construction industry. ▪ Undertake or commission research into any matter relating to the construction industry. ▪ Advise the government on matters relating to the construction industry. ▪ Provide training, consultancy, and advisory services to contractors and other stakeholders in the construction industry. ▪ Facilitate the export of construction services. ▪ The act also empowers the NCA to make regulations for the better carrying out of its functions. Some of the regulations that have been made under the act are: ▪ The National Construction Authority Regulations, 2014, which provide for the registration of contractors, joint ventures, skilled workers, and construction site supervisors, as well as the collection and payment of construction levy and enforcement measures. ▪ The National Construction Authority (Accreditation of Foreign Contractors) Regulations, 2017, which provide for the criteria and procedure for accrediting foreign contractors who wish to undertake construction works in Kenya. 	<ul style="list-style-type: none"> ▪ Renewed and up-to-date Certificate of registration for the contractor/subcontractors) ▪ Engage Contractor/subcontractors with valid practicing licenses

Laws and Regulations	Key areas of application	Permits required
	<i>The act is a key legal instrument that governs the construction industry in Kenya and aims to ensure its growth, sustainability, and quality. KETRACO will ensure contractors, local and foreign, engaged for the implementation of the STATCOM project comply with the requirements of this act.</i>	

5.4.3 Alignment of WB and GOK Policies relevant to this ESIA

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

The ESF sets out the standard requirements for relating to the identification and assessment of environmental and social risks and impacts associated with projects supported by the Bank.

These standards as highlighted in **Error! Reference source not found.:-**

- support in achieving good international practice relating to environmental and social sustainability.
- assist in fulfilling national and international environmental and social obligations; enhance non-discrimination, transparency, participation, accountability and governance; and
- enhance the sustainable development outcomes of projects through ongoing stakeholder engagement.

Table 5-3: Relevance of the ESF

ESS	Applies	Application
ESS 1: Assessment and management of environmental and social risks and impacts	Yes	Project will undergo mandatory ESIA process and be subject to all necessary steps as stipulated
ESS 2: Labor and working conditions	Yes	The project will require and attract labor force that will be managed under the provisions of the ESS and pertinent national legislation
ESS 3: Resource efficiency and pollution prevention and management	Yes	The project will involve vehicular and mechanical equipment usage that may lead to emissions. Adequate measures in tandem with ESS 3 provisions have been provided in the ESMP
ESS 4: Community Health and Safety	Yes	There will be interaction of projects elements and personnel with the community that may raise concerns public health, noise, dust, traffic, SEA, SH and GBV. Adequate measures have been provided in the ESMP to manage these risks.
ESS 5: Land Acquisition, restrictions on land use and involuntary resettlement	No	None
ESS 6: Biodiversity conservation and sustainable management of living natural resources	Yes	The substation land and LILO have indigenous trees that are likely to be lost. Mitigation measures have been provided in the ESMP
ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Yes	The project is located within the Maasai region who are regarded as vulnerable and marginalized as per the Kenyan constitution.
ESS 8: Cultural heritage	Not certain as at the time of study	Chance find procedures incorporated
ESS 9: Financial Intermediaries	No	N/A
ESS 10: Stakeholder engagement and information disclosure	Yes	Content stakeholder engagement and information disclosure as guided and provide under the stakeholder engagement plan.

Both the World Bank safeguards, and Government of Kenya (GoK) legislation are generally aligned in principle and objective:

- Both require screening of subproject investments in order to determine if further environmental assessments (ESIAs) is needed
- Both require Environmental Impact Assessment before project design and implementation. This also includes an assessment of social impacts.
- Both require public disclosure of ESIA reports and stakeholder consultation during preparation.
- EMCA recognizes other sectorial laws while WB has safeguards for specific interests;

- v. The Bank requires that stakeholder consultations be undertaken during planning, implementation and operation phases of the project which is consistent to the requirements of EMCA.
- vi. Additionally, statutory annual environmental audits are required by EMCA.

5.5 Relevant Multilateral International Treaties

5.5.1 The Rio Declaration and Agenda 21

The Rio Declaration and Agenda 21, the action plan for the 21st century are two non- legally binding instruments adopted by the 1992 United Nations Conference on the Environment and Development (UNCED). While the Rio Declaration contains general principles and objectives, Agenda 21 contains detailed guidance on their practical implementation. Principle 4 of the Rio Declaration provides that to achieve sustainable development environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it. Principle 25 accentuates this by stating that peace, development, and environmental protection are interdependent and indivisible.

5.5.2 The World Commission on Environment and Development (The Brundtland Commission of 1987)

The Commission in its 1987 report dubbed “Our Common Future” focused on the environmental aspects of development, in particular the emphasis on sustainable development that produces no lasting damage to the biosphere and to ecosystems. In addition to environmental sustainability is economic and social sustainability. Economic sustainable development is development for which progress towards environmental and social sustainability occurs within available financial resources. While social sustainable development is development that maintains the cohesion of a society and its ability to help its members work together to achieve common goals, while at the same time meeting individual needs for health and well- being, adequate nutrition, and shelter, cultural expression, and political involvement.

The key aspect of sustainability is the interdependence of generations. The concept of EIA is embodied in many multilateral environmental agreements. Principle 17 of the Rio Declaration provides that environmental impact assessment as a national instrument shall be undertaken for proposed activities that are likely to have a significant impact on the environment and are subject to a decision of a competent national authority.

The ESIA process and the preparation of this ESIA study report is in acknowledgment of the need to carry out sustainable development, a major tenant of the Rio declaration, Agenda 21 and the objectives of the Brundtland Commission of 1987. This ESIA study is cognizant of the need for the protection of the physical, biological, and social environments before, during and after the STATCOM project’s implementation within Suswa substation.

5.5.3 United Nations Framework Convention on Climate Change (UNFCCC)

The United Nations Framework Convention on Climate Change provides the basis for concerted international action to mitigate climate change and to adapt to its impacts. Its provisions are far-sighted, innovative, and firmly embedded in the concept of sustainable development. With 189 Parties, the Convention has nearly a universal membership.

According to Article 2, the Convention's ultimate objective is "to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic [originating in human activity] interference with the climate system". This objective is qualified in that it "should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner". In stating this objective, the Convention reflects concerns that the earth's climate system is threatened by a rise in atmospheric greenhouse gas (GHG) concentrations, which is caused by increased anthropogenic GHG emissions. The Convention does not state a limit for total anthropogenic GHG emissions which would have to be respected to reach the objective. Nor does it indicate the level of total GHG concentrations beyond which "dangerous anthropogenic interference with the climate system" would occur. Estimates of where these levels lie evolve continually with scientific advances and are complicated by the political need to consider the changing ability of societies to adapt to climate change. Another important factor is that stabilizing atmospheric concentrations of GHGs near current levels would require a steep reduction of current emissions. This is because, once emitted, GHGs remain in the atmosphere for a considerable length of time: Carbon Dioxide (CO₂), for instance, stays in the climate system, on average, for a century or more.

Renewable energy generation has become the inevitable development trend of the electric power industry. Since renewable energy generation is uncontrollable and its output is intermittent, its connection to the power transmission networks leads to many problems such as voltage fluctuation. The STATCOM project's development at suswa substation seeks to solve this by providing dynamic voltage stabilization.

5.5.4 Convention on the rights of the Child

The Convention on the Rights of the Child is a human rights treaty that was adopted by the United Nations in 1989. The Convention recognizes that children are not just objects who belong to their parents or adults in training, but human beings and individuals with their own rights. The Convention defines a child as anyone under the age of 18 unless the relevant laws recognize an earlier age of majority. The Convention covers all aspects of a child's life and sets out the civil, political, economic, social and cultural rights that all children everywhere are entitled to. It also explains how adults and governments must work together to make sure all children can enjoy all their rights. The Convention has 54 articles that cover different types of rights, such as:

- The right to life, survival and development
- The right to a name and a nationality
- The right to express their views and be heard
- The right to education, health care and nutrition
- The right to protection from violence, abuse and exploitation
- The right to play, rest and leisure
- The right to special care and assistance if they have a disability or are refugees
- The right to live in a family environment or alternative care
- The right to participate in cultural life and respect their identity

During construction and operation of the proposed STATCOM project, KETRACO/Contractor will ensure no persons under the age of 18 years is employed at the construction/operation sites. All persons seeking employment (contractor, subcontractor) will be required to provide a national identity card for age verification. In addition, measures to ensure indirect involvement of children and minors such as vending/, petty trade around the work sites, loading and offloading of materials at source by primary

suppliers etc. will be implemented. In conjunction with the local area administration, cases of children repeatedly observed near the work sites and not attending school shall be reported for investigation.

5.5.5 Convention on the Rights of Persons with Disabilities (CRPD)

The Convention on the Rights of Persons with Disabilities (CRPD) is an international human rights treaty that aims to protect and promote the rights of persons with disabilities. It was adopted by the United Nations General Assembly in 2006 and entered into force in 2008. The CRPD is based on the principles of dignity, autonomy, inclusion, equality, and non-discrimination. It covers a wide range of civil, political, economic, social, and cultural rights that are relevant to persons with disabilities, such as accessibility, education, health, work, participation, and access to justice. The CRPD also has three optional protocols that address specific issues such as children with disabilities, involvement in armed conflict and communication of complaints.

The CRPD is a landmark treaty that recognizes the diversity and potential of persons with disabilities. It is a tool for advancing their human rights and well-being around the world. It also encourages cooperation and dialogue among states parties, civil society, international organizations, and other actors to ensure that persons with disabilities are fully included and respected in all aspects of society.

During construction and operation of the proposed STATCOM project, special consideration will be given for People living with disabilities (PLWDs).

5.5.6 Montreal Protocol

The Montreal Protocol is a global treaty that aims to protect the ozone layer by phasing out the production and consumption of substances that deplete it, such as chlorofluorocarbons (CFCs), halons, hydrochlorofluorocarbons (HCFCs), methyl bromide, and hydrofluorocarbons (HFCs).

The Montreal Protocol was adopted on 16 September 1987 and entered into force on 1 January 1989. It has been ratified by 198 countries, making it one of the most successful and widely supported environmental treaties in history. The Protocol has been amended and adjusted six times to reflect new scientific, technical, and economic developments. The most recent amendment, the Kigali Amendment, was adopted in 2016 and calls for the phase-down of HFCs, which are potent greenhouse gases that contribute to climate change.

The Montreal Protocol has achieved remarkable results in reducing the global consumption and production of ozone-depleting substances by over 99% since 1987 (UNEP). According to scientific assessments, the ozone layer is expected to recover to its pre-1980 levels by the middle of this century. The Protocol has also contributed to mitigating climate change by avoiding the emission of more than 135 billion tonnes of CO₂ equivalent gases. The Montreal Protocol is widely regarded as a model of international cooperation and environmental protection.

*Kenya ratified the Montreal Protocol on 15 September 1988 and became a party to it on 14 December 1988. Further, **Kenya is one of the 136 parties that have ratified or acceded to the Kigali Amendment as of April 2020. By ratifying the Kigali Amendment, Kenya has agreed to limit its use of HFCs and to phase them down by more than 80 per cent over the next 30***

years. *KETRACO aims to contribute to this protocol as it carries out its mandate in power transmission and ensure energy access by use of low emission potential construction material and technology. The choice of STATCOM device, capacitor banks and transformer materials, oils and cooling systems to be installed at Suswa substation will be done to ensure alignment with the requirements of the Montreal protocol.*

5.5.7 Stockholm Convention on POPs

The Stockholm Convention on Persistent Organic Pollutants (POPs) is a global treaty that aims to protect the environment and human health from the harmful effects of POPs. POPs are chemicals that persist in the environment, bioaccumulate in living organisms, and can travel long distances through air, water, and migratory animals. POPs can cause adverse effects such as cancer, reproductive disorders, immune system damage, and neurological problems.

The Stockholm Convention was signed on 22 May 2001 in Stockholm, Sweden, and entered into force on 17 May 2004. It has been ratified by 186 parties as of 2022. The Convention requires the parties to take measures to eliminate or reduce the production, use, release, and stockpiling of POPs. The Convention also establishes a scientific review process to identify and evaluate new POPs for possible inclusion in the treaty.

The Convention currently covers 30 chemicals, including 16 original POPs (also known as the "dirty dozen") and 14 additional POPs that were added later by amendments. Some of the POPs covered by the Convention are:

- DDT: a pesticide used to control malaria and other insect-borne diseases
- PCBs: industrial chemicals used in transformers, capacitors, and other electrical equipment
- Dioxins and furans: unintentional by-products of industrial processes such as waste incineration and metal smelting
- PFOS: a surfactant used in firefighting foams, textiles, and other products
- Endosulfan: an insecticide used on crops such as cotton, coffee, and tea

The Stockholm Convention is one of the most successful and widely supported environmental treaties in history. It has achieved significant progress in reducing the global production and use of POPs, as well as their presence in the environment and human body. The Convention has also contributed to enhancing cooperation and coordination among different stakeholders, such as governments, civil society, industry, academia, and international organizations. The Convention is a living instrument that continues to evolve and respond to new challenges and opportunities for protecting the environment and human health from POPs.

Kenya ratified the Stockholm Convention on 14 June 2004 and became a party to it on 13 September 2004. *KETRACO is carrying out its mandate in power transmission and ensure energy access by use of low emission potential construction material and technology. In particular, the choice of STATCOM device, capacitor banks and transformer materials, oils and cooling systems to be installed at Suswa substation will ensure that Polychlorinated biphenyls are not utilized.*

5.6 Administrative and Institutional framework

There are various national institutions that are important in matters related to environmental management in Kenya. At present there are over twenty (20) institutions and departments, which deal with environmental issues in Kenya. Some of the institutions include the National Environment Tribunal (NET), National Environment Management Authority (NEMA), the Kenya Forest Service (KFS), Kenya Wildlife Services (KWS), and Water Resources Authority (WRA) among others. There are also local and international NGOs involved in environmental issues in the country. From the above institutions, NEMA plays the regulatory and oversight role in the management of environment in Kenya. Below is a highlight of the key institutions and their mandate in relation to the proposed STATCOM project. Table 8 below shows the key institutional framework pertinent for this project

Table 5-4: Key institutions

Institutions / Departments	Key Mandate
The Ministry of Energy	<ul style="list-style-type: none"> ▪ The Ministry of Energy and Petroleum is responsible for energy policy and regulation of electricity and gas reticulation. The ministry's mission statement is to facilitate provision of clean, sustainable, affordable, reliable, and secure energy services for national development while protecting the environment. The mandate of the ministry is <ul style="list-style-type: none"> ➤ Hydro power Development. ➤ Geothermal Exploration and Development. ➤ Thermal Power Development. ➤ Oil and Gas Exploration. ➤ Oil/Gas and Minerals sector capacity development. ➤ Rural Electrification Programme. ➤ Petroleum products, import/export/marketing policy Management. ➤ Renewable Energy Promotion and Development ➤ Energy Regulation, Security and Conservation. ➤ Fossil Fuels Exploration and Development. <p><i>MOE will be the coordinating agency for the proposed project.</i></p>
Kenya Electricity Transmission Company Ltd (KETRACO)	<p>KETRACO was incorporated in 2008 through an Act of parliament to plan, design, construct, operate and maintain high voltage electricity transmission lines in Kenya. Since its establishment, KETRACO has sought to resource itself and build the institutional capacity required to carry out its mandate. KETRACO's mandate is to plan, design, construct, own, operate and maintain high voltage electricity transmission grid and regional power interconnectors that will form the backbone of the National Transmission Grid. In carrying out this mandate, the Company is expected to develop a new and robust grid system to:</p> <ol style="list-style-type: none"> 1. Improve quality and reliability of electricity supply throughout the country. 2. Transmit electricity to areas that are currently not supplied from the national grid. 3. Evacuate power from planned generation plants. 4. Provide a link with the neighbouring countries to facilitate power exchange and develop electricity trade in the region. 5. Reduce transmission losses that currently cost the country heavily every year and 6. Reduce the cost of electricity to the consumer by absorbing the capital cost of transmission infrastructure. <p><i>KETRACO is the implementing agency for the proposed STATCOM project.</i></p>

Institutions / Departments	Key Mandate
Ministry of Environment and Natural Resource	<ul style="list-style-type: none"> This Ministry is responsible for policies and programmes aimed at improving, maintaining, protecting, conserving and managing the Country's natural resources (water, forestry, wildlife and environment). <p><i>The proposed project is expected to align with the policies and programs of this Ministry.</i></p>
National Environmental Tribunal	<ul style="list-style-type: none"> The National Environment Tribunal (NET) created under Section 125 of EMCA Cap 387 has the following functions: <ul style="list-style-type: none"> ➤ To hear and determine appeals from NEMA's decisions and other actions relating to issuance, revocation or denial of (EIA) licenses or amount of money to be paid under the Act and imposition of restoration orders; ➤ To give direction to NEMA on any matter of complex nature referred to it by the Director General; and <p><i>If the proponent or any other stakeholder disagrees with NEMA decisions in exercising the above-mentioned functions, then they may lodge a case at the NET to seek to overturn the decision. Should this avenue not lead to a favorable ruling from the NET, an appeal may be lodged in the Environment and Land Court.</i></p>
National Environment Complaints Committee	<ul style="list-style-type: none"> The National Environment Complaints Committee performs the following functions: <ul style="list-style-type: none"> ➤ Investigate any allegations or complaints against any person or against the authority in relation to the condition of the environment in Kenya and on its own motion, any suspected case of environmental degradation and to make a report of its findings together with its recommendations thereon to the Cabinet Secretary. ➤ Prepare and submit to the Cabinet Secretary periodic reports of its activities which shall form part of the annual report on the state of the environment under section 9 (3) and ➤ To undertake public interest litigation on behalf of the citizens in environmental matters. <p><i>This committee will act as a safeguard for members of the public who feel aggrieved by actions taken under the proposed project and can exercise their constitutional rights to launch a complaint should they have exhausted all other grievance redress mechanisms available to them.</i></p>
National Environment Management Authority (NEMA)	<ul style="list-style-type: none"> The National Environment Management Authority (NEMA) exercises general supervision and, co-ordination of all matters relating to the environment. NEMA is also the principal instrument of the government in the implementation of all policies relating to the environment. NEMA is also the Designated National Authority for certain Multilateral Environmental Agreements. <p><i>The Authority reviews EIA project and study reports for the proposed projects, visits the project sites to verify information provided in the report and issues EIA licenses if it considers that all the issues relevant to proposed projects have been identified and mitigation measures to manage them have been proposed.</i></p>
Kajiado County Government	<ul style="list-style-type: none"> The proposed project project is within the jurisdiction of Kajiado County Government <p><i>Ketraco shall collaborate with the County government on physical planning.</i></p>

Institutions / Departments	Key Mandate
The County and Sub-County Environment Committees	<ul style="list-style-type: none"> ▪ The County and Sub-County Environmental Committees contribute to decentralization of activities undertaken by NEMA. ▪ This has enabled local communities to have greater access to environmental management information. It has also enabled the County and Sub-County Environment Committees to conduct quick site visits and review of reports of proposed projects. <p><i>Since the proposed project is of national importance, the review of the report will be done at a National level for issuance of EIA license. However, it is also notable that the EIA study report should also be reviewed at Kajiado County level to create awareness and obtain local institutional ownership.</i></p>
Water Resources Authority (WRA)	<p>Water Resources Authority (WRA) is a state corporation established under Section 11 of the Water Act, 2016.</p> <ul style="list-style-type: none"> ▪ Pursuant to Section 6 of the Act, the Authority is an Agent of the National Government responsible for regulating the management and use of water resources. ▪ The Water Act, 2016 makes extensive provisions on the Authority's role in regulating the use and management of water resources. ▪ WRA was operationalized on 21st of April 2017 vide Gazette Notice No. 59. However, the Authority has been in existence for 12 years following its establishment under the Water Act, 2002 as Water Resources Management Authority (WRMA). <p><i>WRA will provide the necessary water extraction permits envisioned / required for the project.</i></p>
The Directorate of Occupational Safety and Health Services (DOSHS)	<ul style="list-style-type: none"> ▪ The Directorate of Occupational Safety and Health Services (DOSHS) is one of departments within the Ministry of Labour and East African Community Affairs, whose primary objective is to ensure safety, health and welfare of all workers in all workplaces. ▪ Unsafe and unhealthy work environment causes accidents, diseases, disasters and environmental pollution that occasion huge economic and social burdens to individuals and enterprises thereby stifling economic and social growth. <p><i>DOSHS is a key stakeholder based on the role they play regarding safety, health and welfare of all workers in all workplaces and in registration of all workplaces which are envisioned in the proposed project.</i></p>

6 CHAPTER SIX: PUBLIC PARTICIPATION AND CONSULTATION

6.1 Introduction

The Consultation and Public Participation (CPP) and disclosures process is a policy requirement by the Government of Kenya which is enshrined in the Constitution of Kenya and a mandatory procedure as stipulated by the Environmental (Impact Assessment and Audit) Regulations, 2003 (Part III, section 17) and EMCA (Cap 387) section 59 on ESIA for the purpose of achieving the fundamental principles of sustainable development. World Bank also requires that stakeholder consultations be undertaken throughout the project cycle, and from project onset.

This chapter describes the process of the public participation and consultation that was adopted to identify the key issues of the proposed STATCOM project. Views and concerns from the residents, local leaders, and surrounding institutions, who in one way or another would be affected or have interest in the proposed additional scope, was sought through interviews, key stakeholder and public meetings.

6.2 Objectives of the Consultation and Public Participation

Consultation and public participation are an important process through which stakeholders including beneficiaries and members of the public living around the proposed additional scope (both public and private), are given an opportunity to contribute to the overall project design by making recommendations and raising concerns on the project before it is implemented. In addition, the process creates a sense of responsibility, commitment, and local ownership for smooth implementation.

The key objectives of the consultation and public participation for the proposed additional scope was to:

1. **Inform:** Promote stakeholder understanding of issues about the project with special reference to its key components and description, problems, alternatives, opportunities and solutions through balanced and objective information sharing.
2. **Consult:** To obtain feedback and acknowledge concerns and aspirations of stakeholders and interested parties on analysis, alternatives, and decisions regarding the project.
3. **Engage:** Work directly with stakeholders to ensure that their concerns and aspirations are understood and considered in the ESIA report and to assure them that their concerns / aspirations would be directly reflected in the developed alternatives; and that feedback will be provided on how their input influenced the final decision.
4. **Empower:** Make stakeholders partners in each aspect of the decision, including development of alternatives and identification of preferred solution to ensure ownership of subprojects at grassroots level.

In addition, the process enabled the establishment of a communication channel among the stakeholders, the project proponent, and the Government. The consultation and public participation also offered a platform for concerns of the stakeholders to be known to the decision-making bodies at an early phase of project development. Further, to ensure that all stakeholders are meaningfully engaged and consulted throughout the project cycle; a Stakeholder Engagement Plan (SEP) has been designed.

6.3 Outcome of the CPP

To attain FPIC, the team worked closely with the area chief and local leadership structures for purpose of mobilization of attendants through established structures and means, and taking leadership of the public meeting in a manner that is culturally acceptable and inclusive to men, women and youth. The attendees agreed to the adoption of Swahili language in the meeting.

The exercise of public consultation was conducted between 24th July to 4th August, 2023. The exercise was conducted through public meetings, informative interviews, and administration of questionnaires

to capture the concerns, comments, and issues that the stakeholders, neighbours and businesspeople around the project site. The completion of such questionnaires allowed for the synthesis and analysis of issues that arose.

The list of key informants that were interviewed is shown in Table 6-1. The key informants' questionnaires administered are attached as Annex 9 of this report. Below is a summary of the views of the key informants.

Table 6-1:Key informant Questionnaires' respondents

No.	Name	Institution/Organization	Designation	Address/Contact No.	Date Consulted
1	Gilbert Maina	Ministry of Interior and Coordination of National Government.	Assistant County Commissioner, Mahi Mahiu Division	0713146265	28/07/2023
2	L. K. Igena	Ministry of Interior and Coordination of National Government.	Senior Chief-Mahi Mahiu Location	0722249440	27/07/2023
3	Soila Maasai Girls centre	Ministry of Education	Institution near the project area.	0723692253 0790525833	04/08/2023
4	Sylvia Soila	Ministry of Health	Nurse	0716736727	02/08/2023
5	Jakob Sunkuiyia	Ministry of Education	Mayian School	0703587827	02/08/2023
6	Victor Otieno	Kenya Ports Authority	Dry port in Suswa.	0729680284	28/07/2023
7	Wainaina Joyce	Ministry of Education	Suswa Girls Secondary School	0715840325	28/07/2023
8	Dansen Reson	Ministry of Interior and Coordination of National Government	Chief-Enoosupukia Location	0722241806	28/07/2023
9	Simon Fatuya	Ministry of Interior and Coordination of National Government	Assistant Chief-Kisharu Sublocation	0720906718	27/07/2023
10.	Julius Ntete	Ministry of Interior and Coordination of National Government	Assistant Chief-Olgumi Sublocation	0721262949	27/07/2023
11	Amos Otieno	Kedong Ranch Ltd	Manager-Kedong Ranch	0722639333	02/08/2013
12.	Taari Rwaria	Ministry of Interior and Coordination of National Government	Deputy County Commissioner, Kajiado North Subcounty		27/07/2023
13	James Nyaga	Kenya Wildlife Service (KWS)	The Warden-KWS Ngong Station	0722799148	26/07/2023

Issues raised by the key informants.

Environmental, Social and Economic Benefits

- Job Creation.

- Sourcing construction materials in the local area will improve the livelihood of the locals.
- Growth and emergence of other businesses and shopping centers in the area.
- Stable power supply that will enhance learning in schools and better economic operations.
- Increase in the number of investors in the area.

Environmental, Social and Economic Negative Impacts

- Destruction of vegetation.
- Dust Emission-Air pollution.
- Soil erosion during the undertaking of the civil works.
- Noise pollution from construction activities.
- Rise in the price of basic goods in the area because of the project.
- Language barrier between the communities and the foreign contractors.
- Impacts on health due to radiation emission from the project.
- Electrocution risks.
- Create of waste from the project.
- Possibility of oil spillage.
- The project may lead to insecurity in the area.
- Drug and substance abuse may also increase because of the project.

Suggested Mitigation Measures

- Proper and continuous public participation involving all stakeholders.
- Equal and fair job opportunities. These should be shared across the three counties: Narok, Nakuru and Kajiado.
- Proper supervision of the project.
- Regular maintenance activities to the project.
- Proper waste management.
- Use of modern soundproof machines.
- Undertake the project to the best international standards.
- Provision of enough security personnel in the project area.
- Workers to be provided with PPEs.
- Dust control measures to be put in place.
- Rehabilitate the affected areas after construction work is complete eg.by landscaping.

General Opinions

- The project should be implemented.
- Consider CSR project around the project area e.g., Working with schools for tree planting activities, building of classrooms, provision of water to the communities etc.
- The benefits outweigh the perceived negative impacts, and the project should therefore be implemented.

Community questionnaires that were administered are shown in Table 6-2. Sample filled community questionnaires are attached as Annex 10 of this report. Below is a summary of the views of the community members.

Table 6-2: Community Questionnaires' respondents

No.	Name	Location	Occupation	Contact No.
1.	Petro Kusero	Suswa	-	0720844399
2.	Saruwi Parsitali	Suswa	Farmer	0746018859
3.	Samuel Katoyi	Suswa	Farmer	0758471874
4.	William Sipai	Olgumi	Community Secretary	0720314797
5.	Kepue Moses	Suswa	Farmer	0720120800
6.	John Maijodo	Olgumi	Farmer	0791984504
7.	Philip Kantim	Suswa	Farmer	0729396054

No.	Name	Location	Occupation	Contact No.
8.	Tunim M.	Suswa	Farmer	0727832220
9.	Peter Ntete	Suswa	Farmer	0716716322
10.	Kotikosu	Suswa	Farmer	
11.	Roshani Nanyala	Suswa	Housewife	0724677674
12.	Nancy Mureithi	Suswa	Business lady	0724675599
13.	Pricilla Tanin	Suswa	Housewife	
14.	Ann Kaloi	Suswa	Housewife	
15.	Sapati Sayo	Olgumi	Farmer	0798714398
16.	Evans Sipitiek	Suswa	Pastoralist	0727688461
17.	Alex Naadokila	Suswa	Farmer	0725969209
18.	Turpesio William	Suswa	Farmer	0714794408
19.	Isaiya Pulei	Ewaso kegong	Farmer	0792539770
20.	Robert Kerenke Punyua	Olgumi	Farmer	0703233958
21.	Tima Kotikot	Olgumi	Farmer	0714804350
22.	Patrick Aket	Suswa	-	0746092561
23.	Johanna Topasiany	Suswa	Pastoralist	0724389714

Issues raised by the community.

Environmental, Social and Economic Benefits

- Job creation.
- Improvement of the economy of the area.
- Stable power supply that will improve power reliability nationally.
- The project will reduce blackouts thus saving lives especially in preservation of medicine at the hospitals.
- Security will improve due to consistent lighting.
- Increase in forest cover due to reduced dependance on firewood and charcoal.
- Reduced infections that are caused by smoke from firewood.
- The project will lead to growth of Suswa town which in turn lead to increase in land values in the area.
- Improve the living standards of the locals, especially through employment.

Environmental, Social and Economic Negative Impacts

- Air Pollution especially from dust and smoke from diesel engines.
- Destruction of vegetation in the project area.
- Noise pollution from construction activities.
- The project may contribute to climate change due to clearing of vegetation.
- Radiations from the STATCOM.
- Soil Erosion due to vegetation clearance.

Suggested Mitigation Measures

- Ensure the safety of workers at the project site is given priority.
- Ensure the STATCOM is radiation free.
- Avoid the use of diesel machines.
- Use noise suppressing mechanisms to reduce noise from the project.
- The project needs to consider avoiding cutting down of indigenous trees.

General Opinions

- Request to KETRACO to undertake a tree planting activity around schools and the centers to compensate for the lost trees as a way of mitigating climate change.
- Consider CSR project around the project area e.g., Working with schools for tree planting activities, building of classrooms, provision of water to the communities etc.

6.4 Project Opinions

All key stakeholders and communities consulted supported the project.



Plate 6-1: Public meetings at Suswa Town

7 **CHAPTER SEVEN: ENVIRONMENTAL AND SOCIAL IMPACTS OF THE PROPOSED PROJECT**

7.1 Introduction

The STATCOM addition will have both positive and negative environmental and socio-economic effects in terms of nature of impacts. Through an intensive and extensive field survey; key stakeholder consultation and public participation forums; literature review and professional judgement, impacts were identified and analysed. The impacts were categorised according to different phases/timing of the project i.e. construction, operation and decommissioning phases. Under the different phases, the impacts were further analysed into their corresponding nature i.e. either positive or negative and given a rating figure to depict its magnitude.

The negative and positive impacts likely to originate from the project have generally been linked to the social and biophysical environment and the economic aspects along the power transmission project area. Among the broad linkages are as follows:

- I. Biophysical Environment:
 - Biodiversity: Flora and Fauna.
 - Water: hydrology of the area.
 - Land and Soil.
 - Climate and Weather
- II. Social Environment:
 - Population characteristics.
 - Settlement trends.
 - Land use patterns.
 - Health and Safety.
 - Culture.
- III. Economic Issues:
 - Trade and industries.
 - Transportation and communication.
 - Income generation activities.

7.2 Quantification of the magnitude of impacts

The magnitude of each impact is described in terms of, no impact, minimal impact, moderate impact, high impact, very high impacts and those whose magnitude is not known. Each impact magnitude was assigned a corresponding value that expresses the scale of the impact. In order to make the following observation, expert knowledge based on the magnitude of the predicted impacts was relied upon. The scale that was applied in the analysis of impacts is highlighted in Table 7-1 below.

Table 7-1 Levels of Scale used in analysing the magnitude of potential impacts

Value	Description	Scale Description
0	No impact	This means that to the best knowledge of the expert, the activity/action will not have any known impact on the environment. Such an impact will not in any way affect the normal functioning of either the human or the natural systems and does not therefore warrant any mitigation.
1	Minimal impact	Any activity with little impact on the environment calls for preventive measures, which are usually inexpensive and manageable. Such activities have minimum impacts on either natural or human environment or both.
2	Moderate impact	A moderate impact will have localized effect on the environment. If the effect is negative and cumulative, action in form of mitigation measures needs to be put in place to ensure that it doesn't become permanent and/or irreversible.

3	High impact	An impact is high if it affects a relatively high area (spatial), several biological resources (severity) and/or the effect is felt for a relatively long period (temporal) e.g. more than one year. In case the effect is negative, such an impact needs to be given timely consideration and proper mitigation measures put in place to prevent further direct, indirect or cumulative adverse effects.
4	Very high impacts	Such an activity rates highly in all aspects used in the scale i.e., temporal, spatial and severity. If negative, it is expected to affect a huge population of plants and animals, biodiversity in general and a large area of the geophysical environment, usually having trans-boundary consequences. Urgent and specialized mitigation measures are needed. It is the experts' opinion that any project with very high negative impacts MUST be suspended until sufficient effective mitigation measures are put in place.
5	Not known	There are activities for which impacts are not yet known e.g. some chemicals are suspected to produce carcinogenic effects, but this has not yet been confirmed.

7.3 Construction phase

7.3.1 Positive impacts

7.3.1.1 Employment Opportunities

The construction during civil works, electrical installation and other activities 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 non-skilled labour. Recruitment of locals as casuals will be done by the contractor in consultation with the local administration (chiefs) for equity and fairness across the gender divide.

Reporting on recruitment shall also register if people belong to the local community and record if they are men or women.

7.3.1.2 Gains in the Local and National Economy

Expected gains in the local and national economy from the construction and operation of the proposed additional scope will be in the form of consumption of locally available materials including, sand, ballast, metal, and cement among other construction materials; taxes levied from employees; and income from business associated with the project.

Direct impacts will be most significant during the construction and decommissioning phases of the project thus a likelihood of having the largest impact on local economy as shown in Table 7-2 below.

Table 7-2: Impact characteristics: benefits to the local economy

Summary	Construction	Operation	Decommissioning
Project aspect/activity	<ul style="list-style-type: none"> Employment and Procurement of local contractors/workers. 	<ul style="list-style-type: none"> Employment and Procurement of local contractors/workers. 	<ul style="list-style-type: none"> Employment and Procurement of local contractors/workers.
Impact type	<ul style="list-style-type: none"> Direct, indirect and induced positive impact. 	<ul style="list-style-type: none"> Direct, indirect and induced positive impact 	<ul style="list-style-type: none"> Direct, indirect and induced positive impact
Stakeholders/receptor affected	<ul style="list-style-type: none"> Local community, Local County Suppliers throughout Kajiado West subcounty 	<ul style="list-style-type: none"> Local community, Local County Suppliers throughout 	<ul style="list-style-type: none"> Local community, Local County Suppliers throughout Kajiado west subcounty

		Kajiado west subcounty	
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7.3.1.3 Informal Sector Benefits

The project will require supply of building materials most of which will be sourced locally. It will also enhance further growth of small business enterprises within Suswa Town which will be crucial in provision of services to the workers at site such as meals and accommodation.

7.3.1.4 Development of other Sectors

Increase in reliability and security of power supply in national power grid will enhance efficiency and productivity of other sectors including health, education, water supply, agriculture and livestock production, industry, etc.

Key to the context of Kajiado and the neighbouring counties the will creating of investment opportunities for industries within the areas with the presence of a number of pull factors available such as road, inland port, the standard gauge railway and the convertor station.

7.3.1.5 Enhancement measures for the positive impacts

Enhancement is meant to optimize the benefits of the project to local economy. This may be made possible through the following suggested ways.

- Establishing a LMP which sets reasonable targets for the employment of residents and suppliers and promote the employment of women as a means of ensuring that gender equality is attained. Criteria will be set for prioritizing, where possible, residents and suppliers over county or national people and suppliers. All contractors will be required to recruit and procure in terms of KETRACO's recruitment and procurement policy.
- Working closely with relevant county government, community representatives, and organizations to ensure that the use of local labour and procurement is maximized. This includes.
 - ✓ Sourcing and using available databases on skill of employment-seekers that local authorities may have.
 - ✓ Advertising job opportunities and criteria for skills and experience needed through local and national media.
 - ✓ Assessing the capacity within the local community, county and Kenya (in order of priority) to supply goods and services over the operational lifetime of the project.
 - ✓ Working closely with the suppliers to provide the requisite training to the workers. The training provided will focus on development of local skills.
- Ensuring that the appointed project contractors and suppliers have access to Health, Safety, Environmental, and Quality training as required by the Project. This will help to ensure that they have future opportunities to provide goods and services to the sector.

7.3.2 Negative Environmental Impacts

7.3.2.1 Increased storm water

The site hosting the STATCOM will entail some civil works as part of the whole set of the convertor station. These include excavation, backfilling, compaction, cable laying and laying of ballast.

The other section of the site was used for material holding and due to the weight of the material, the ground has been compacted with time.

Further civil work, compaction, paving, laying of cable trenches and drainage systems will be done. With this compaction, the rate of percolation of water will considerably reduce in the event of rain which will significantly increase the volume of surface run-off per a unit area within the paved area.

Due to the existing drainage plan and architecture serving the entire site, this impact is likely to be minimal and with a low frequency hence a weighting of 1.

7.3.2.2 Soil Erosion

The prevailing edaphic properties at the Ewaso location are characterized by a deep profile of light volcanic soil which is easily eroded in the event of rains and floods, if disturbed. If unchecked the soil at site can be easily eroded during construction leading to clogging of drainage systems.

Due to the existing drainage measures at site, this impact is expected to be minimal hence a weighting of 1.

7.3.2.3 Disposal of excavated rocks and soil

Site excavations shall be done, and some excavated materials will be rendered as waste including rocks and overburden soil. These rejected materials will be collected as waste for disposal if not to be reused elsewhere. Disposal of this category of waste may have adverse impacts on the receiving environment depending on their content, type, and intensity. This waste may compromise the aesthetic value, soil biogeochemical content, air quality water quality at the receiving end if not handled as per the laid regulations and proposed ESMP as best practice.

This impact is likely to be moderate with a weighting of 2.

7.3.2.4 Oil spills

Mechanization will be part of implementation of the project especially while undertaking civil works. The contractor shall have construction motor-powered equipment such as excavators, ground compressors back hoes, lorries, etc. These equipment for use will need to be regularly serviced either onsite or off the site depending on the level of need. Due to their nature, the equipment will require regular oiling to minimize the usual corrosion or wear and tear. Possibilities of such oil spills are eminent due to such activities which could result to soil contamination; and surface and ground water contamination during rains through infiltration and percolation. But these dangers are contained by maintaining the machinery in specific areas designed and designated for this purpose. In event of soil contamination, it will be prudent for the service to contact the project Environment, Health and Safety (EHS) staff for advice on how to handle such as per the ESMP table provided in this report.

With administrative measures to be instituted, this impact will be minimal hence a weighting of 1.

7.3.2.5 Increased water demand

The convertor station is currently being supplied water through water bowzers since it is yet to be connected to the main reticulation in the area. Generally, the wider Ewaso and Suswa areas are under water stress due to the prevalent ASAL-like conditions prevalent in the better parts of the year.

The proposed additional scope to the station will require significant amount of water requisite for construction, drinking among other uses. This would necessitate the contractor to source for own water sources for use during the period of contractual tenure. Coupled with many other needs for the finite resource in the area, the additional scope, will have an impact on the demand.

It is however, not anticipated that this project will be requiring huge volumes of water due to the minimal construction activities that will be required on site. This impact is therefore weighed 1.

7.3.2.6 Dust emissions

Particulate matter and fugitive dust are likely to be produced during the site's clearance, excavation, spreading of the topsoil and during construction. There is a possibility of PM₁₀ suspended and settle able particles affecting the site workers' health.

Particulate matter and dust depending on the content can pose a serious health hazard (respiratory and even carcinogenic) unto the workers and neighbours if not well contained and controlled. Additionally, the STATCOM components will be implemented t a site with operational electrical equipment that could at risk in the event of uncontrolled dust and particulate matter.

Noteworthy, the site there are staff staying and working within the convertor stations and will be significant receptors of dust if uncontrolled or well managed.

With the sensitivity of the equipment at site and to safeguard the staff at site mitigations measures will be adopted to make the impact minimal (weight of 1).

7.3.2.7 Faecal waste generation and general sanitation

The construction workers will generate faecal waste during their day-to-day operations on site. The generated waste needs proper handling (through latrines and toilets) as stipulated in the waste management regulations, 2006 to prevent contamination with water and other environmental parameters hence which may otherwise cause diseases, such cholera, diarrhoea, typhoid, and dysentery.

With expected the number of workers on site (approximately 40), open defaecation and urination on site is unsightly and unsanitary with a potential of causing community health hazards especially in event of rains.

This impact is expected to be minimal hence weighted 1.

7.3.2.8 Generation of exhaust emissions and air pollution

Exhaust emissions will be generated by the construction equipment during the construction phase and vehicular operations. Motor vehicles used to mobilize the work force and materials for construction would cause a potentially significant air quality impact by emitting pollutants through exhaust emissions. Some of the material will be sourced off Suswa area. Such emissions do have a significant contribution to greenhouse gases concentration with residual impact on ozone layer depletion and resultant increased global temperatures. The content of the emissions from these operations includes the following CO₂, methane (CH₄), and nitrous oxide (N₂O). area. The impacts of such emissions can be greater in areas where the materials are sourced and at the construction site because of frequent gunning of vehicle engines, frequent vehicle turning and slow vehicle movement in the loading and offloading areas.

With the small size of the additional scope, the amount GHGs emitted will be low hence minimum (weighting of 1).

7.3.2.9 Solid waste generation

During construction phase solid waste will be generated. These include papers used for packing cement, excavated soils, plastics, and timber remains from pallets among others. Dumping around the site will interfere with the aesthetic status of the area and its surrounding. This has a direct effect to the surrounding community. Disposal of the same solid wastes off-site could also be a social inconvenience if done in the wrong places. The off-site effects could be aesthetic, pest breeding, pollution of physical environment, invasion of scavengers and informal recycling communities. Stacking of excavated soil will also contribute to the general anaesthetic nature of the site if unchecked.

Improper handling of solid waste at site will have attract rodent invasion that may result to potential damage of critical equipment. This impact is weighted as 2.

However, with a well instituted integrated solid waste management plan, the magnitude and severity of the impact will be considerably reduced from moderate to minimal.

7.3.2.10 Excessive energy consumption and its footprint

Equipment use and vehicular movement associated with the proposed additional scope is anticipated. These motor-based tools will consume fossil fuels (mainly diesel). Fossil fuels are hydrocarbon based and therefore emit important greenhouse gases upon combustion such as CO₂, NO_x and NH₄. The CO₂ potential per a litre of diesel is 2.7 kg which translates to an immense CO₂ footprint per annum of diesel combustion. Fossil energy is non-renewable, and its excessive use may have serious environmental implications on its availability, price, and sustainability.

The project will also use electricity supplied by Kenya Power (KP) Ltd. Electricity in Kenya is generated mainly through natural resources, namely, water and geothermal resources. In this regard, there will be needed to use electricity sparingly since high consumption of electricity negatively impacts on these natural resources and their sustainability.

The anticipated project period that will lead to emission will be short. Coupled with the national significance of the additional scope will have a minimal impact (weighted as 1) in this regard.

7.3.2.11 Noise and Excessive vibration

The civils works will most likely generate noise and vibration due to the moving machines (mixers, tippers, communicating workers) and incoming vehicles to deliver construction materials and workers to site. To be affected mostly are the site workers and KETRACO staff working and residing at the converter stations since they will be the key receptors. The exposure limit to noise and excessive vibration at 85 Db/ 8 hours as WHO standards. Excessive vibration also from the construction activities of blasting and excavation can cause economic and physical damage of the neighbouring properties. The distance between the STATCOM site to the staff quarters is around 220m to 250m on a straight on as shown in Figure 2-1 below.

Exposure of workers beyond the specified limits (80db for 8 working hours) will lead to hearing complication such as tinnitus, partial even complete hearing loss.

Figure 7-2 shows that the other close receptors to the site are around 1.8km to 2.8km to the East of the site. With this distance the noise will be completely attenuated before getting to these receptors.

The impact is expected to be moderate (weighting of 2) due to the presence of significant receptors at site.

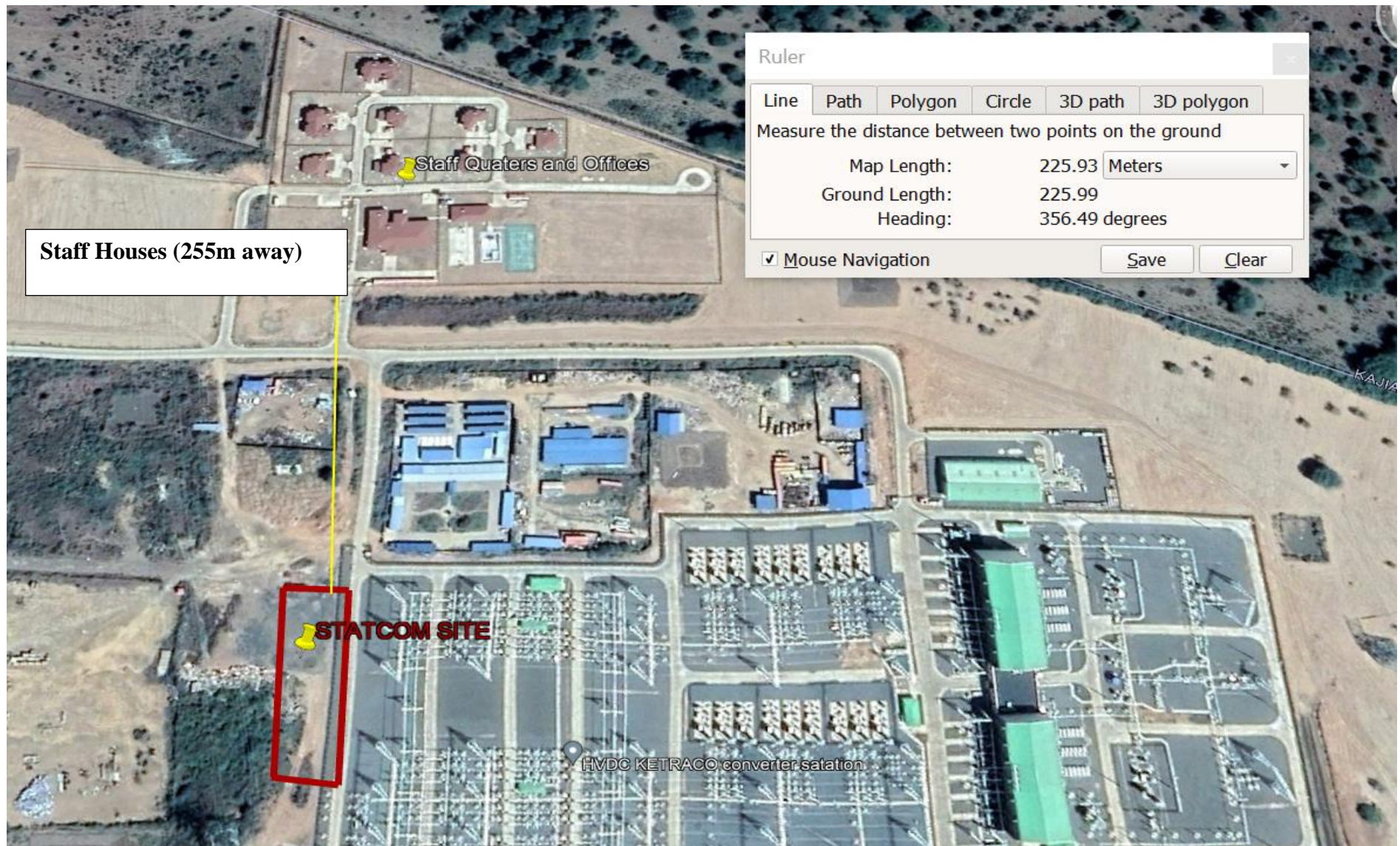


Figure 7-1: Distance between the STATCOM site and the staff quarters

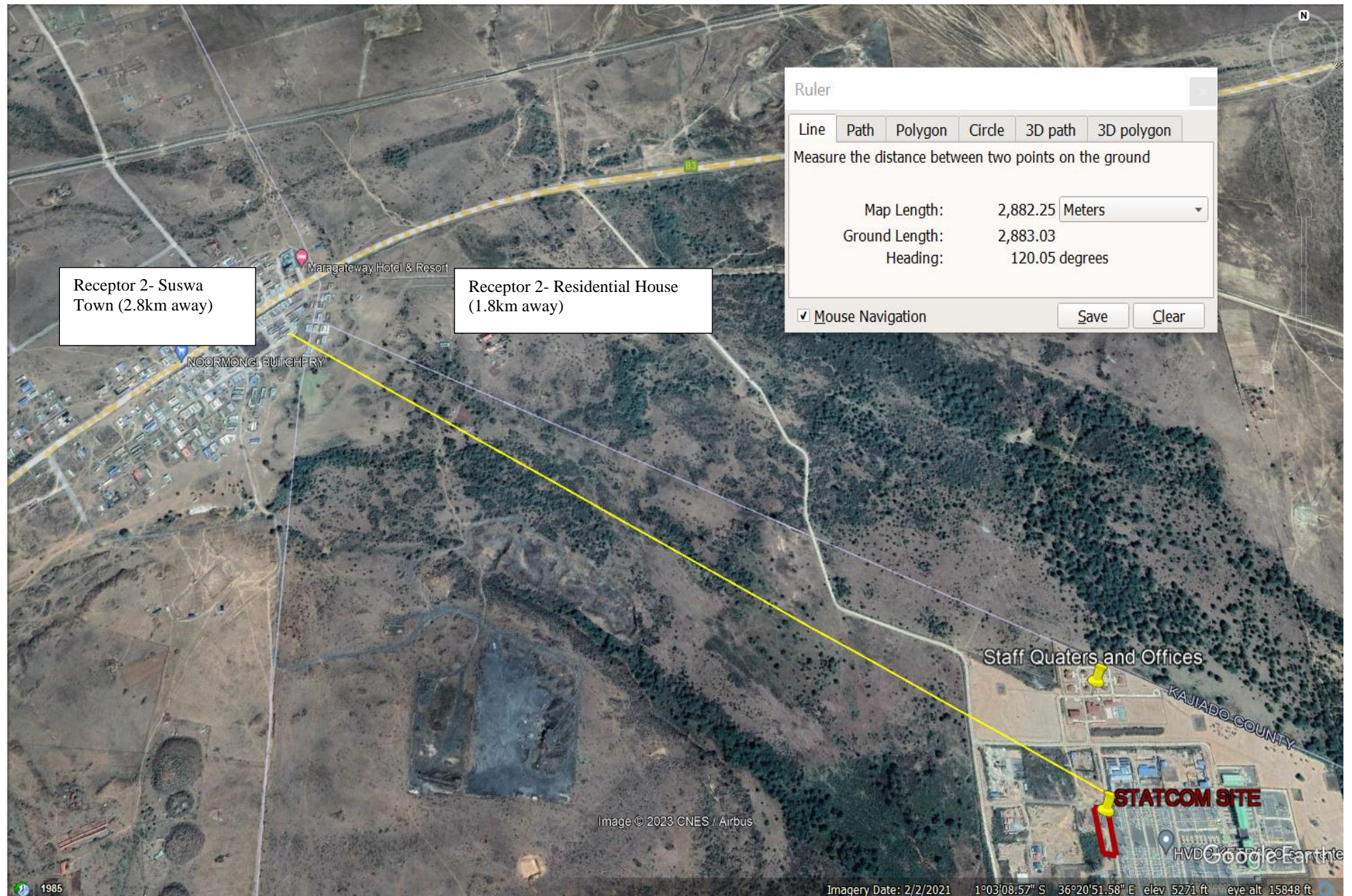


Figure 7-2: Noise receptor distance from the site

7.3.2.12 Introduction and spread of invasive alien species.

During the collection of environmental baseline data collection at the project site, the ESIA team did not observe any invasive species. However, the risk of introduction of invasive species is likely and poses a serious threat to the health and functioning of natural ecosystems and human well-being. Such introduction and spread can be through material sourced from contaminated sites, disposal of cut-to-spoil and other debris from the construction site to other areas thus aiding dispersal, and shipment of contractor equipment from other areas thus aiding dispersal. This impact will be moderate, hence value of 2.

7.3.2.13 Offsite impacts – material extraction sites

The at the convertor station additional scope will require material during construction especially when undertaking civil works. Such material is naturally occurring shall be obtained from quarries within the area.

If sufficient care is not undertaken, suppliers may extract such requisite material from unlicensed quarries and borrow pits hence putting the environment and community at risk of such off-site impacts.

7.3.3 Negative Social Impacts

7.3.3.1 General Occupational Health and Safety Issues

During construction of the proposed additional scope, it is expected that construction workers are likely to have accidental injuries and hazards due to human and workplace interactions. Because of the intensive engineering and construction activities including erection and hoisting of materials, metal grinding and cutting, concrete work, steel erection and welding among others, construction workers will be exposed to risks of accidents and injuries. Such injuries can result from accidental falls from high elevations, injuries from hand tools and construction equipment cuts from sharp edges of metal sheets and collapse of building sections among others. It's recommended an appropriate approach to ergonomics be sought PPE's should be issued to all workers on site. Trainings on Fire Management, First Aid, occupational Health, and Safety also be conducted occasionally.

Chief of the occupational health and safety concerns is electrical safety. It is noteworthy, that the STATCOM shall be installed in an existing and operational substation, next to the edge of the 400kV switch yard and a few meters away from the wayleave corridors of the 400kV Loyiang'alani Suswa Transmission Line. There is sufficient clearance between the ground the nearest bus-bars, transformers and other electrical equipment. This notwithstanding, all operations within the will have to be carefully planned, closely manned and with clear and robust job electrical risk and hazard assessment.

Additionally, in ensuring workers' safety hazard/risk assessment should be done comprehensive hazard/ risk management plans documented and certified by DOSHS. These plans will complement the ESMP developed and the NEMA license conditions in managing EHS issues at the site.

Due to the severity of this risk, it is weighed 4 (very high) and will require joint KETRACO/contractor collaboration to ensure necessary safeguards are well laid.

7.3.3.2 Moral decadence/ STIs and HIV/AIDS

According to the residents of Suswa and as recorded during the public meeting held on (28th July 2023), the area is experiencing gradual moral decadence among the general populace. The hinterland of Suswa has seen lots of projects inflow for the last decade which would have had a pie to the prevailing moral situation.

Construction activities, however minimal, usually involves people from different regions, with different backgrounds, whereby they interact on daily basis. If these workers and the general populace are not properly educated on morality, STIs and HIV/AIDS, their health will be at risk. Provisions of such condoms by a contractor and frequent trainings to project staff and workers on prevention methods will reduce the risks that the workers will be exposed to.

7.3.3.3 Community Expectations on the Project including CSR

During the stakeholder's engagement and public consultation and participation exercises, the local community highlighted various corporate social responsibility (CSR) proposals outlined in section 5.4. Some of the expectations varied in sectors such as education and social services. Notably most of the expectation require establishment of social infrastructures hence falling short of the proponent legal mandate. It is therefore imperative to ensure community expectations are well managed throughout the project cycle to reduce on level of disappointment and tensions. The impact scale is moderate hence a value of 2.

7.3.3.4 Child Labour and Forced labour.

The adolescent and youth survey undertaken in 2015 identifies drug and substance abuse, lack of school fees, teen pregnancy and child labour as among the key challenges facing the youth in Kajiado. The public during a public engagement meeting decried of the heightening loss of moral fabric in the county especially in the Ewaso and Suswa areas. The public opined that there is need for proper and continuous consultations with the entire community to sensitise on respecting the rights and welfare of children and refrain from violating them. Further, due to perceived temporary increased opportunities for the local community to sell goods and services to the incoming workers, pupils may drop out of school to produce and deliver such goods and services, which in turn can result to child labour.

Although child labour may not be so heavily pronounced in the proposed additional scope due to existing laws that prohibit the act, there are possible risks hence need for establishing stringent mitigation measures. The impact value is 1 hence minimal.

7.3.3.5 Sexual Exploitation and Abuse (SEA) and Workplace Sexual Harassment (SH) and other forms of Gender-Based Violence (GBV)

The number of contractors' workers expected to implement the project is low as indicated in Labor Management Plan (LMP). Regardless of the numbers, cases of gender-based violence (GBV) such as sexual harassment (SH) and sexual exploitation and abuse (SEA) cannot be overlooked.

Perceived project benefits such as higher income in the community for the few workers could lead to in prostitution and extra-marital affairs. The risk of incidents of sexual exploitation and abuse for minors, even when it is not transactional / prostitution, could also increase. There was also highlight of possible risk of sexual exploitation and abuse through unwanted sexual advances to women and men mainly by project workers, contractors, and service providers.

Sexual harassment (SH) between workers / staff working on the project, unwelcome sexual advances, requests for sexual favours, and other unwanted verbal or physical conduct of a sexual nature might arise at the project workplace. Regardless, the prevailing rates of GBV, SEA and SH in Kajiado as shown in the image graph below as at 2020 (adopted from <https://www.crimeresearch.go.ke/kajiado/>). This impact is likely to be low hence a rating of 1.

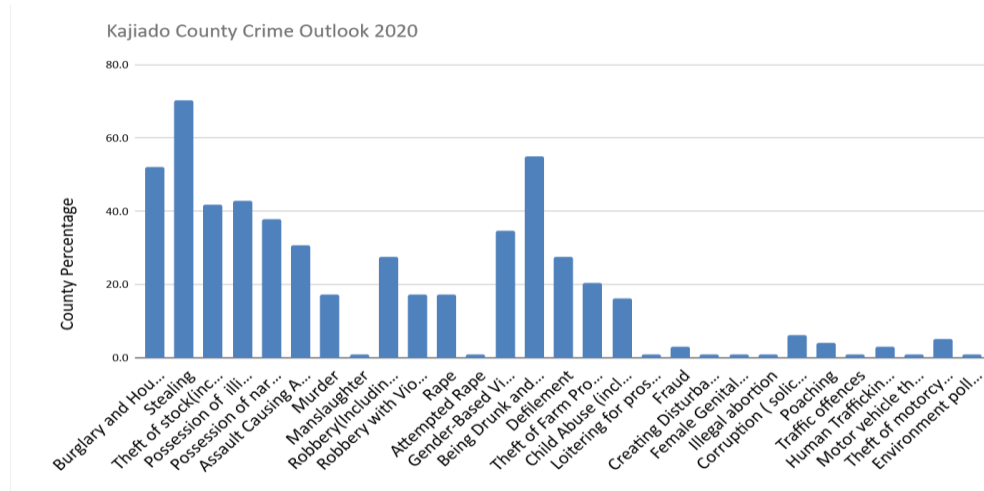


Figure 7-3: Crime rates in Kajiado as of 2020 Source: <https://www.crimeresearch.go.ke/kajiado/>

7.4 Operational phase

Some of the impacts both positive and negative that may be as a result of the proposed additional scope during the operation stage will include.

7.4.1 Positive Impacts

7.4.1.1 Employment creation

Employment opportunities are one of the long-term major impacts of the development project that will be realized after construction and during the operation and maintenance. These will involve security personnel, solid waste management staff, technicians, etc. Other sources of employment will involve direct service provision to the office services.

7.4.1.2 Reliable and Secure Electricity Power Supply

The proposed STATCOM will enhance the reliability and security of electricity supply in the country due to its inherent nature of **responding** speed, stabilization voltage of power grid, reduction system power loss and harmonics, increase both transmission capacity and limit for transient voltage. This will help meet the increasing demand for power supply and minimize the frequency of power outages.

7.4.2 Negative Environmental Impacts

7.4.2.1 Fire Outbreaks

Fire due to electrical faults and flammable substance in the substation is a possible effect of the proposed additional scope. Fires started outside the substation may also spread into the substation.

The impact rating is 1

7.4.2.2 Incidences of Electrocutation

Since the proposed additional scope will be dealing with electricity, workers and other people who gain access to the site risk being electrocuted or receiving electric shocks. The impact rating is 1.

7.4.2.3 Perceived Danger of Electrostatic and Magnetic force

High Voltage electrical are considered a source of power frequency, electric and magnetic fields, which may have a perceived health effect. The strength of both electric and magnetic fields is a function of the voltage and the lateral distance from the installation to the receptor. Many studies published during the last decade on occupational exposure to Electro-Magnetic Fields (EMF) have exhibited several 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 decreases very rapidly with distance from source and there should be no potential health risks for people living outside of 60m from the installation.

The impact rating is minimal, hence a rating of 1.

7.4.3 Negative Social Impacts

On a social scale, the additional scope is not expected to draw any impact further to impacts that had been identified in the parent report.

7.5 Decommissioning Phase

Some of the anticipated impacts during the decommissioning phase of the proposed additional scope include;

7.5.1 Positive Impacts

7.5.1.1 Rehabilitation and restoration of the site to its original status

Upon decommissioning of the project, rehabilitation of the project site will be carried out to restore the site to its original status. This will include replacement of topsoil and re-vegetation which will lead to improved visual quality of the area.

7.5.1.2 Employment opportunities

Several employment opportunities will be created for the demolition staff.

7.5.2 Negative Impacts

7.5.2.1 Solid waste generation

Demolition of the project buildings and related infrastructure will result in large quantities of solid waste. The waste will contain the materials used in construction including concrete, metal, drywall, wood, glass, paints, adhesives, sealants, and fasteners. Although demolition waste is generally considered as less harmful to the environment since they are composed of inert materials, there is growing evidence that large quantities of such waste may lead to release of certain hazardous chemicals into the environment. In addition, even the generally non-toxic chemicals such as chloride, sodium, sulphate and ammonia which may be released as a result of leaching of demolition waste, are known to lead to degradation of groundwater quality.

7.5.2.2 Dust emission

Large quantities of dust will be generated during demolition works. This will affect demolition staff as well as the neighbouring residents.

7.5.2.3 Noise and Vibration

The demolition works will lead to significant deterioration of the acoustic environment within the project site and the surrounding areas.

7.5.2.4 Community/ Occupational Health and Safety Risks

Decommissioning of electrical installations is fragile activity due to the live currents in place presence of faulty electrical equipment, old connections and mong others risks to the operators and community.

7.5.2.5 Sexual Harassment, Gender Based Violence and Sexual Exploitation and Abuse

The decommissioning of the STATCOM will draw workers and specialized technical persons for the phase which may draw sexual and gender related risks to the existing community.

8 CHAPTER EIGHT: PROPOSED MITIGATION MEASURES

8.1 Introduction

KETRACO acknowledges the fact that the proposed additional scope activities will have some impacts on the biophysical environment, health and safety of its employees and members of the public, and socio-economic wellbeing of the residents. Thus, the focus will be on reducing the negative impacts and maximizing the positive impacts associated with the project activities through a program of continuous improvement.

An environmental management/monitoring plan has been developed to assist the KETRACO in mitigating and managing environmental impacts associated with the life cycle of the project.

8.2 Proposed Mitigation Measures of the Construction Related Impacts

8.2.1 Increase storm water.

Increased run off from paved grounds and expansive roofs causing extreme flooding and overflows of drainage systems shall be mitigated. Surface runoff and roof water shall be harvested and stored in underground reservoir for reuse. 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 structures will be designed.

8.2.2 Minimizing Soil erosion

To control soil erosion, it is recommended that the following measures be employed:

- Monitor areas of exposed soil during periods of heavy rainfall throughout the construction phase of the project to ensure that any incidence of erosion is quickly controlled.
- Compacting areas with loose soil and controlling activities during the rainy season.
- Protecting the structural foundations of the structures where necessary to enhance their resilience against natural agents of erosion.
- Terracing and levelling the project site to reduce run-off velocity and increase infiltration of rainwater into the soil.
- Construction vehicles will be restricted to designated areas to avoid soil compaction within the project site, while any compacted areas will be ripped to reduce run-off.

8.2.3 Disposal of excavated rocks and soil

The overburden from the civil works on site will be managed by adoption of the following measures:

- Avoid ripping off the overburden soil from location outside the project's actual footprint.
- Use the overburden material to landscape other sections of the complex.
- Enquire with the community of their needs for the material for use.

8.2.4 Controlling oil spills during construction phase

The proponent will control the dangers of oil, grease and fuel spills during construction by maintaining the machinery in specific areas designed for this purpose. Machinery site repair will be discouraged, and repair work restricted to only approved garages to avoid pollution from oil, grease and fuel.

8.2.5 Minimization of water use

The proponent shall ensure that water is used efficiently at the site by sensitizing construction staff to avoid irresponsible water use. The contractor will make own-arrangement on water-sourcing for use at site and shall be required to install water-conserving taps and toilets. Moreover, any water leaks through damaged pipes and faulty taps will be fixed promptly by qualified staff.

8.2.6 Minimize the effect of Air quality (dust and emissions)

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 (NO_x, CO₂, SO_x, and diesel related PM₁₀) that would occur in the exhaust from heavy equipment are also included. KETRACO 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. This means that construction workers will be trained regarding the minimization of emissions during construction. Specific training will be focused on minimizing dust and exhaust gas emissions from heavy construction vehicles. Construction vehicles drivers will be under strict instructions to minimize unnecessary trips, refill petrol fuel tanks in the afternoon, and minimize idling of engines.

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.
- Sweep daily (with physical sweepers) all paved access roads, parking areas and staging areas at construction sites.
-

In order to control exhaust emissions, the following measures shall be implemented during construction:

- Vehicle idling time shall be minimized.
- Alternatively, fuelled construction equipment shall be used where feasible.
- Equipment shall be properly tuned and maintained.

This will also be achieved through proper planning of transportation of materials to ensure that vehicle fills are increased in order to reduce the number of trips done or the number of vehicles on the road.

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- Vehicle idling time shall be minimized.
- Alternatively, fuelled construction equipment shall be used where feasible.
- Equipment shall be properly tuned and maintained.

This will also be achieved through proper planning of transportation of materials to ensure that vehicle fills are increased in order to reduce the number of trips done or the number of vehicles on the road.

8.2.7 Management of Faecal waste generation and general sanitation

The Suswa Converter station complex is as at an operational phase with different types of human resource at site undertaking various activities. The Sanitation and hygiene of the complex is a top priority for KETRACO. All facilities buildings have clean gender differentiated sanitary conveniences which are all connected to a central septic tank.

To achieve the prevailing hygienic standard at site, the contractor will need to make own-arrangements for provision of sanitary facilities commensurate to the number of staff at site. The facilities should be gender differentiated, well-marked, accessible and supplied with sufficient and clean water for flushing and washing hands.

Due to the sensitivity of the site, food vendors will not be granted access to site. Therefore, to enhance public health, it would be prudent to undertake surveillance of food vending at Suswa to ensure that site workers remain healthy and vigorous.

8.2.8 Solid Waste Management

All storage and construction sites are to be kept clean, neat and always tidy. No burying or dumping of any waste materials, metallic waste, litter or refuse shall be permitted. The Contractor must adhere to Environmental Management and Co-ordination (Waste Management) Regulations 2006. The Contractor shall implement measures to minimize waste and develop a waste management plan to include the following: -

- Use of an integrated solid waste management system i.e. the 3 R's: 1. Reduction at source 2. Reuse 3. Recycle, including donating of pallets not laced with oil to the community for use.
- Accurate estimation of the dimensions and quantities of materials required;
- 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;
- Provide facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage;
- Use building materials that have minimal or no packaging to avoid the generation of excessive packaging waste;
- Reuse packaging materials such as cartons, cement bags, empty metal and plastic containers to reduce waste at site;
- Waste collection bins to be provided at designated points on all active sites;
- Dispose waste more responsibly by contracting a NEMA registered waste handler who will dispose the waste at designated sites or landfills only and in accordance with the existing laws.
- Develop and implement a Construction Waste Management Plan before start of the project.
- Comply with provisions of the Environmental Management and Co-ordination, Waste Management Regulations 2006.

8.2.9 Reduction of energy consumption

To ensure efficient use of energy site the contractor shall ensure: -

- Responsible electricity uses at the construction site through sensitization of staff to conserve electricity by switching off electrical equipment or appliances when they are not being used. \
- Proper planning of transportation of materials will ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts.
- Shall monitor energy use during construction and set targets for reduction of energy use.
- Use energy-efficient construction machinery and trucks during construction phase of the project.
- Ensure compliance with Energy Management Regulations of 2012.

To ensure that the use of energy (fossil fuels) GHG footprint is lessened the contractor shall implement measures proposed under section 7.2.6.

8.2.10 Minimize the effects of noise emitted and vibration from the site

Significance of noise impacts depends on whether the project would increase noise levels above the existing ambient levels by introducing new sources of noise. Noise impacts would be considered significant if the project would result in the following:

- Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

- Exposure of persons to, or generation of, excessive ground-borne vibration or ground-borne noise levels.
- A substantial permanent increase in ambient noise levels (more than five dBA) in the project vicinity above levels existing without the project.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

The contractor shall put in place several measures that will mitigate noise pollution arising during the construction phase. The following noise-suppression techniques will be employed to minimize the impact of temporary construction noise at the project site.

- Install portable barriers to shield compressors and other small stationary equipment where necessary.
- Use quiet equipment (i.e. equipment designed with noise control elements).
- Limit pickup trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use, and encourage workers to shut off vehicle engines whenever possible.
- Construction/Demolition works should be done during the day when people are away and also the outside environment is also noisy.
- Adhere to the Environmental Management and Coordination (Noise and Excessive Vibration Pollution (Control) Regulations, 2009) regarding noise limits at the workplace.
- Application of modern methods of construction that avoids excessive vibrations.

8.2.11 Occupational Health and Safety issues

The following should be undertaken including adopting and implementing the following measures as guided by the IFC EHS power sector guidelines

- Live power lines**
- Only allowing trained and certified workers to install, maintain, or repair electrical equipment;
 - Deactivating and properly grounding live power distribution lines before work is performed on, or in proximity, to the lines;
 - Ensuring that live-wire work is conducted by trained workers with strict adherence to specific safety and insulation standards. Qualified or trained employees working on transmission or distribution systems should be able to achieve the following-
 - Distinguish live parts from other parts of the electrical system
 - Determine the voltage of live parts
 - Understand the minimum approach distances outlined for specific live line voltages
 - Ensure proper use of special safety equipment and procedures when working near or on exposed energized parts of an electrical system
 - Workers should not approach an exposed energized or conductive part even if properly trained unless:
 - The worker is properly insulated from the energized part with gloves or other approved insulation; or,
 - The energized part is properly insulated from the worker and any other conductive object; or,
 - The worker is properly isolated and insulated from any other conductive object (live-line work).

- Specific training, safety measures, personal safety devices, and other precautions should be defined in a health and safety plan.
- Workers not directly associated with power transmission and distribution activities who are operating around power lines or power substations should adhere to local legislation, standards, and guidelines relating to minimum approach distances for excavations, tools, vehicles, pruning, and other activities;

Working at height

- Testing structures for integrity prior to undertaking work;
- Implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers, among others;
- Establishment of criteria for use of 100 percent fall protection (typically when working over 2 meters above the working surface, but sometimes extended to 7 meters, depending on the activity). The fall protection system should be appropriate for the tower structure and necessary movements, including ascent, descent, and moving from point to point;
- Installation of fixtures on tower components to facilitate the use of fall protection systems.
- Provision of an adequate work-positioning device system for workers. Connectors on positioning systems should be compatible with the tower components to which they are attached.
- Hoisting equipment should be properly rated and maintained and hoist operators properly trained.
- Safety belts should be of not less than 16 millimeters (mm) (5/8 inch) two-in-one nylon or material of equivalent strength. Rope safety belts should be replaced before signs of aging or fraying of fibers become evident.
- When operating power tools at height, workers should use a second (backup) safety strap.
- Signs and other obstructions should be removed from poles or structures prior to undertaking work.
- An approved tool bag should be used for raising or lowering tools or materials to workers on structures.
- No drunk worker should be allowed on site to reduce risk falling from height and ensuring proper communication on site.

Electric and magnetic fields

- Identification of potential exposure levels in the workplace, including surveys of exposure levels in new projects and the use of personal monitors during working activities.
- ✓ Training of workers in the identification of occupational EMF levels and hazards.
- ✓ Establishment and identification of safety zones to differentiate between work areas with expected elevated EMF levels compared to those acceptable for public exposure, limiting access to properly trained workers.

Exposure to chemicals

- Replacement of the hazardous substance with a less hazardous substitute.
- Implementation of engineering and administrative control measures to avoid or minimize the release of hazardous substances into the work

environment keeping the level of exposure below internationally established or recognized limits.

- Keeping the number of employees exposed, or likely to become exposed, to a minimum.
- Communicating chemical hazards to workers through labelling and marking according to national and internationally recognized requirements and standards, including the International Chemical Safety Cards (ICSC), Materials Safety Data Sheets (MSDS), or equivalent. Any means of written communication should be in an easily understood language and be readily available to exposed workers and first-aid personnel.
- Training workers in the use of the available information (such as MSDSs), safe work practices, and appropriate use of PPE.

Risk of occupational accidents and diseases/physical hazards

- Set up a health and safety committee and periodic site inspections, training and annual safety audits.
- Provide appropriate PPEs to workers and visitors to the proposed route.
- Adhere to the provisions of the occupational Health and Safety Act of 2007.
- Have a qualified EHS Officer; first aider/ medic on site.

Incidents, accidents and dangerous occurrences

- Ensure that provisions for reporting incidents, accidents and dangerous occurrences during construction and operation is as per prescribed forms obtainable from the local Occupational Safety and Health Office are in place.

Ergonomics, Repetitive Motion, Manual Handling

- Use of mechanical assists to eliminate or reduce exertions required to lift materials, hold tools, and work objects, and requiring multi-person lifts if weights exceed thresholds ·
- Selecting and designing tools that reduce force requirements and holding times, and improve postures ·
- Providing user adjustable workstations ·
- Incorporating rest and stretch breaks into work processes, and conducting job rotation ·
- Implementing quality control and maintenance programs that reduce unnecessary forces and exertions.
- Taking into consideration additional special conditions such as left-handed persons

8.2.12 Reduction of impacts at extraction sites and efficient use of raw materials

The proponent will source building materials such as sand, ballast and hard core from registered quarry and sand mining firms, whose projects have undergone satisfactory environmental impact assessment/audit and received NEMA approval. Since such firms are expected to apply acceptable environmental performance standards, the negative impacts of their activities at the extraction sites are considerably well mitigated.

To reduce the negative impacts on availability and sustainability of the materials, the proponent will only order for what will be required through accurate budgeting and estimation of actual construction requirements. This will ensure that materials are not extracted or purchased in excessive quantities. Moreover, the proponent will ensure that wastage, damage, or loss (through run-off, wind, etc) of

materials at the construction site is kept minimal, as these would lead to additional demand for and extraction or purchase materials.

In addition to the above measures, the proponent shall consider reuse of building materials and use of recycled building materials. This will lead to reduction in the number of raw materials extracted from natural resources as well as reducing impacts at the extraction sites.

8.2.13 Mitigating against introduction and spread of invasive alien species.

This will be mitigated as follows:

- Inspecting and cleaning vehicles, equipment, that may carry invasive species before entering or leaving an area i.e. material sources, construction sites etc.
- Educating the public and stakeholders about the risks and impacts of invasive species and how to prevent or report them.
- Monitoring and detecting invasive species early and reporting them to the relevant authorities such as Kenya Plant Health Inspectorate Services (KEPHIS), National Environment Management Authority (NEMA), the Kenya Wildlife Service (KWS), the Kenya Forestry Service (KFS), and the International Centre of Insect Physiology and Ecology (ICIPE).
- Implementing rapid response and eradication programs for newly detected or localized invasive species.
- Applying biological, chemical, mechanical, or cultural methods to control or reduce the population of established invasive species.

8.2.14 Moral decadence/ STIs and HIV/AIDS

On illicit behaviour, women cited that their men, youths would resort to substance abuse (alcoholism and smoking). Men highlighted the possibility of prostitutes migrating to the area due to availability of money. The community explained that alleged illicit behaviours might jeopardise marriages and family wellbeing, and harmonious existence.

The following should be undertaken:

- Elders and local administration in the project area to manage illicit behaviour / drug and alcohol abuse at the community and family level whereas the contractor and proponent should be responsible for worker conduct on site.
- Contractors, subcontractors and all project staff to behave in a culturally appropriate manner.
- The contractor and proponent to establish a code of conduct and ensure workers conduct at site adheres to set rules and regulations e.g. on drug use and alcohol, interactions with locals and Gender Based Violence (GBV) – Sexual Exploitation and Abuse (SEA) / workplace sexual harassment (SH).
- Civic and health education on HIV/AIDS and STIs
- Ensure an adequate and accessible provision of condoms to workers both male and female.
- Elderly and social protection officers can be used to uphold moral standards and dignity in the affected community.
- Establish Grievance Redress Committee (GRC) and have in place the elderly to liaise and identify such situation and address them before escalating to pressing social problems.
- Adopt and implement a Grievances Redress Mechanism to receive and address illicit behaviour / drug and alcohol abuse complaints before escalating to pressing social problems.
- Implement the stakeholder's engagement plan (SEP) to ensure effective communication with the host community.
- Adhere to and implement the HIV and AIDS Prevention and Control Act, 2006 and the Sexual Offences Act, 2006 and its amendment 2012.

8.2.15 Public Health safety and Awareness/ HIVAIDs/ STI control

The following measures are aimed at ensuring wellness and safety of employees within the construction site and general safety and suitability of the development: -

- i. The contractor should provide a small section of the construction site with a shed and a water stand where the food can be served to the construction workers to promote hygiene and health of the employees.
- ii. A fully equipped first aid kit should be provided at the site.
- iii. The contractor must have workmen's compensation cover as required by law (The Workmen's Compensation Act), as well as relevant ordinances, regulation and union's agreements.
- iv. The workers, immediate neighbour and other stakeholders should be sensitized on the dangers and risk associated with the construction works for enhanced self-responsibility on personal safety.
- v. The proponent should ensure that the completed substation is fitted with safety facilities including fire detectors, firefighting equipment, fire exits, adequate access and buffer between the residential premises.
- vi. Appropriate sanitation conveniences should be provided at the site as required in the OSHA, 2007 and echoed in the Public Health Act.

8.2.16 Mitigating impacts of community Expectations on CSR

The following should be undertaken:

- KETRACO to establish deliberations / procedures on donation to local community of facilities used by the contractor, at the conclusion of the project. Such facilities could include wooden pallets among others.
- Implement the stakeholder's engagement plan (SEP) to ensure effective communication, community buy in and ownership of the project without lowering realistic expectations.
- KETRACO to consider liaising with or bringing to attention the relevant Ministries and County departments on critical community needs.
- Ensure implementation of plans in Annex 5 such as labour management plan, gender mainstreaming plan, to ensure host community accesses the project benefits.
- Adopt and implement a Grievances Redress Mechanism to receive and address grievances from host community.

8.2.17 Mitigating Child labour and forced labour.

The following should be undertaken to protect the rights of children and elimination child labour and forced labour:

- The following should be undertaken to protect the rights of children and elimination of forced labour:
- No employment for anyone under the age of 18
- All persons seeking employment (contractor, subcontractor) should be required to provide a national identity card.
- The client and contractor should not employ forced labour, which consists of any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty.
- Implement a labour management plan – Annex 5 to promote fair and equitable labour practices including the project cycle for the fair treatment, protection of workers' rights, non-discrimination and equal opportunity of workers.
- Adopt and implement a Grievances Redress Mechanism to receive and address grievances from host community during the project cycle.
- Implement the stakeholder's engagement plan (SEP) Annex 6 to ensure effective communication with host community on raising awareness to prevent child labour and forced

labour, with particular attention given to domestic work and the worst forms of child labour during the project cycle.

8.2.18 Mitigating SEA, SH, and other forms of GBV.

The following should be undertaken:

- Ensure sensitization of the contractor, their sub-contractors, and consultants on GBV -SEA/SH issues including refraining from unacceptable conduct towards local community members.
- Introduce a worker Code of Conduct as part of the employment contract, to be signed by all with physical presence on site as well as within the project area, and to include sanctions for non-compliance (e.g., termination).
- Ensure mandatory trainings regarding GBV -SEA/SH to be provided to all project workers including temporary and casual workers.
- Undertake awareness meetings for the project affected communities on GBV-SEA/SH issues. Participants should be informed about the Code of Conduct, related national legislations and available GRM including available services/referral mechanism mechanisms for seeking help.
- Implement the GBV-SEA/SH Management Plan as part of the ESMP and Labour Influx Management Plan. The contractor to incorporate GBV-SEA/SH in the c-ESMP.
- Ensure separate sanitation and hygiene facilities (toilets, utility rooms and changing rooms) for men and women in the workers' camps / workplaces are provided.
- Adopt a policy to cooperate with law enforcement agencies in investigating complaints about GBV-SEA/SH should a survivor choose the legal redress. Survivors should be facilitated to understand that this may require them to commit to cooperate with the agencies.
- Inform workers and local community about national laws such as the Sexual Offences Act. No 3 of 2006 that make GBV-SEA/SH a punishable offence which is prosecuted.
- Implement the stakeholder's engagement plan (SEP) to ensure effective communication on GBV-SEA/SH.

8.2.19 Mitigating Cultural impacts

The following should be undertaken:

- Avoid constructing substations or tower spotting by transmission line design changes / changing tower spans to avoid spotting the pylons in areas of archaeological or cultural heritage importance if such sites be found.
- Work together with local elders to identify and map any other physical cultural resource and other areas of cultural heritage importance, not identified during the ESIA process.
- Use existing utility and transport corridors for transmission and distribution, and existing roads and tracks for access roads, whenever possible.
- Work in close liaison with national agencies that deal with areas of archaeological and cultural importance such as the National Museums of Kenya (NMK) to offer guidance in chance finds procedure if unknown heritage resources, particularly archaeological resources, are encountered during project construction or operation.
- Implement the stakeholder's engagement plan (SEP) to ensure effective communication in relation to cultural resources with the host community.

8.3 Proposed Mitigation Measures of the Operation Phase Impacts

8.3.1 Fire Outbreaks

To mitigate against fire outbreaks, the contractor will; ensure compliance with fire safety regulations and install all necessary fire safety equipment; conduct regular trainings and fire drills to employees; conduct periodic maintenance to ensure that, there are;- no overloaded electrical systems; no incorrectly installed wiring; no live naked wires; and fuel store areas are continuously monitored;

Additionally, in accordance with the existing ESIA license, no fire lighting will be allowed at site and all hot works will have to be undertaken within laid safety procedures.

Notably, the convertor station has an already installed automatic fire suppression systems full with alarms, hydrants, fire balls, smoke detectors, heat detectors, sprinklers and handheld extinguishers for different classes of fire. Visible signage has been installed, escape routes, marked and workers trained.

8.3.2 Ensure general safety within the premises and risk of electrocution.

A perimeter fence (Boundary Wall) is erected round the plot, street lighting done, a 24-hour CCTV surveillance system and a security lighting system installed. A competent security firm is engaged to always ensure the general safety and security within and around the premises.

To reduce the risk of electrocution, it will prudent for the STATCOM to be operated by authorised personnel under strict operational guidelines and be off reach by unauthorised persons. Additionally, KETRACO should provide automation services through SCADA to reduce physical human contact and provide pertinent PPEs for the technical staff.

8.3.3 Wastewater management

The proponent will ensure that there are adequate means for handling the sewage generated at the substation. Wastewater shall be disposed in compliance with the provisions of the Environmental Management and Coordination (Water Quality), Regulations 2006.

8.3.4 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. Notably, the additional scope is in tandem and contextual with existing equipment and electrical infrastructure.

8.4 Proposed Mitigation Measures of the Decommissioning Phase Impacts

8.4.1 Efficient solid waste management

Solid waste resulting from demolition or dismantling works will be managed as described in Section 7.2.7.

8.4.2 Reduction of Dust Concentration and emissions

High levels of dust concentration resulting from demolition or dismantling works will be minimized as described in Section 8.2.6.

8.4.3 Minimization of Noise and Vibration

Significant impacts on the acoustic environment will be mitigated as described in Section 8.2.10.

8.4.4 Community and Occupational health and safety concerns

Management of associated impacts shall be undertaken as per measures under section 8.2.11.

under section 7.2.14.

8.4.5 GBV/SH/SEA issues

Management of associated impacts shall be undertaken as per measures under section 8.2.18.

Potential seismic activities

8.5 Enhancing Climate Change Mitigation and Adaptation Tree Planting initiative

The contractor shall undertake a tree planting exercise at location(s) to be identified in consultation with KETRACO, the community and relevant authorities. The contractor shall plant trees worth KES 5,000,000 or at least 30,000 trees whichever is less. The cost shall be deemed to cover the entire exercise which shall involve the following:

1. Selection of trees species with highest survival rate and can grow with baseline environmental conditions at the selected planting locations.
2. Transportation of the seedlings to the selected planting locations.
3. Preparation of the land including but not limited to clearing the site of invasive species and preparing the hole.
4. Planting the seedlings at the onset of rainy seasons.
5. Protection and care of the planted tree for a period of 12 months.

8.6 Risks to the additional scope and the entire stations in extension

These are the potential risks to the additional scope and the entire converter station in extension.

- Flooding risk: The converter station lies at the floor of the rift valley. The area has been the last few years, especially in the event of heavy of rains, been developing deep gullies extending from the foots of the hills and mountains.
- Fire risk
- Electrode line failure
- Public expectations and acceptance
- Terrorism attacks

9 CHAPTER NINE: ENVIRONMENTAL AND SOCIAL ACTION PLAN (ESAP)

9.1 Introduction

KETRACO project acknowledges the fact that the proposed additional scope and its activities will, however be minimal, have some impacts on the biophysical environment, health and safety of its employees and members of the public and socio-economic wellbeing of the local residents. Thus, the focus will be on reducing the negative impacts and maximizing the positive impacts associated with the project activities through a programme of continuous improvement.

An Environmental and Social Management Plan had been developed to assist the proponent in mitigating and managing environmental impacts associated with the life cycle of the project, during the undertaking of the Ethiopia Kenya Power Systems Interconnection Project ESIA. The ESMP has been developed to provide a basis for an Environmental Management System (EMS; ISO 14001 principles) for the project.

Therefore, for the additional scope i.e., STATCOM project, an Environmental and Social Action Plan (ESAP) has been developed to assist the proponent to mitigate and manage the impacts associated with the additional scope. It is noteworthy that key factors and processes may change through the life of the project and considerable provisions have been made for dynamism and flexibility of the ESMP. As such, the ESMP will be subject to a regular regime of periodic review.

Tables Table 9-1 to Table 9-3 form the core of this ESMP for the construction, operational and decommissioning phases of the proposed additional scope respectively. In general, the tables outline the potential safety, health and environmental risks associated with the project and detail all the necessary mitigation measures, their financial costs, as well as the persons responsible for their implementation and monitoring. The ESMP will be used as checklist in future environmental audits.

The ESIA, that includes an elaborate ESAP has been prepared for use by different stakeholders to be involved in the construction and operation of the proposed STATCOM. The report contains useful information on policies and procedures to be adhered to, implementation modalities, analysis of potential environmental and social impacts and suggested mitigation measures at various stages of project activities. The information will be useful in planning, implementation, management, and maintenance of the substation.

In this regard, the report is useful to the following stakeholders:

- The Proponent.
- The World Bank.
- Relevant government ministries and agencies for policy implementation.
- Affected and Interested persons.
- Planners and Engineers to be involved in preparation of designs of the STATCOM.
- Contractors to be engaged in the construction works.
- People to be involved in the management and operation of the the greater Suswa complex.

9.2 Environmental and Social Action Management Plan for the construction phase

The necessary objectives, activities, mitigation measures, and allocation of costs and responsibilities pertaining to prevention, minimization and monitoring of significant negative impacts and maximization of positive impacts associated with the construction phase the proposed additional scope are outlined in Table 9-1 below.

Table 9-1: Environmental and Social Action Plan during the construction phase

Potential Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
1. Soil Erosion and Storm Water Management				
Soil Erosion and stormwater management	Fitting in the designs to the existing drainage plan for the station	KETRACO-ESS Team and Contractor	Entire construction period	0
	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.	KETRACO-ESS Team and Contractor	Entire construction period	250,000
	Ensure that construction vehicles are restricted to use existing graded roads	Contractor	Entire construction period	0
	Ensure that any compacted areas are ripped to reduce run-off.	KETRACO-ESS Team and Contractor	Entire construction period	250,000
2. Minimization of Noise and Vibration				
Noise and vibration	Sensitise construction vehicle drivers and machinery operators to switch off engines of vehicles or machinery not being used.	KETRACO-ESS Team and Contractor	Entire construction period	0
	Sensitise construction drivers to avoid running of vehicle engines or hooting	KETRACO-ESS Team and Contractor	Entire construction period	0
	Regular servicing of engines and machine parts to reduce noise generation	Contractor	Entire construction period	500,000
	Ensure that all generators and heavy-duty equipment are insulated or placed in enclosures (containers) to minimize ambient noise levels.	Contractor	Entire construction period	50,000
	The noisy construction works will entirely be planned to be during daytime when most of the neighbours will be at work.	Contractor	Entire construction period	0
	Provide necessary PPE to workers who may be exposed to high levels of noise and ensure proper and constant use	KETRACO-ESS Team and Contractor	Entire construction period	900,000
	All construction equipment and machinery to be used must be tested to verify if they are compliant with Kenya and the internationally acceptable standards of noise.	KETRACO-ESS Team and Contractor	Entire construction period	2,000,000

Potential Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
3. Management of Excavated Rocks and Soils				
Management of Excavated Rocks and Soils	Avoid ripping off the overburden soil from location outside the project's actual footprint.	KETRACO-ESS Team and Contractor	Continuous	0
	Use the overburden material to landscape other sections of the complex.	KETRACO-ESS Team and Contractor	One-off	500,000
	Enquire with the community of their needs for the material for use	KETRACO-ESS Team and Contractor	Continuous	0
4. Oil spill management				
Oil spill management	Install oil trapping equipment in areas where there is a likelihood of oil spillage e.g. during maintenance of vehicles.	Contractor	Continuous	100,000
	In case of an oil spill, immediate clean up measures will be instituted	KETRACO-ESS Team and Contractor	Continuous	150,000
	Storage and liquid impoundment areas for fuels, raw and in-process material solvents, wastes and finished products should be designed with secondary containment to prevent spills and the contamination of soil, ground and surface water	KETRACO-ESS Team and Contractor	One off	50,000
	Collected used oils should be re-used, disposed of appropriately by licenced waste handlers, or be sold for reuse to licensed firms	Contractor	Continuous	100,000
5. Reduce demand for material consumption and ensure efficiency in material consumption				
Increased Water Demand	Install water conserving taps that turn-off automatically when water is not being used	KETRACO-ESS Team and Contractor	Entire construction period	50,000
	Promote recycling and reuse of water as much as possible	Contractor	Entire construction period	20,000
	Promptly detect and repair water pipe and tank leaks	Contractor	Entire construction period	0
	Sensitise construction workers to conserve water by avoiding unnecessary use.	Contractor	Entire construction period	50,000
	Ensure taps are not running when not in use	Contractor	Entire construction period	0
Increased Consumption	Energy Ensure electrical equipment, appliances and lights are switched off when not being used	Contractor	Entire construction period	0

Potential Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
	Install energy saving bulbs/tubes at all lighting points instead of incandescent bulbs which consume higher electric energy	Contractor	Entire construction period	10,000
	Plan well for transportation of materials to ensure that fossil fuels (diesel, transformer oil, petrol) are not consumed in excessive amounts	Contractor	Entire construction period	0
	Monitor energy use during construction and set targets for reduction of energy use.	Contractor	Entire construction period	0
Increase in raw material demand	Ensure accurate budgeting and estimation of actual construction material requirements to ensure that the least amount of material necessary is ordered.	Contractor	Entire construction period	0
	Ensure that damage or loss of materials at the construction site is kept to a minimum through proper storage and use.	Contractor	Entire construction period	0
	Encourage material recycling	Contractor	Entire construction period	0
6. Abate Air Pollution				
Dust emission	Ensure strict enforcement of on-site speed limit regulations	KETRACO-ESS Team and Contractor	Entire construction period	0
	Avoid excavation works in extremely dry weather	KETRACO-ESS Team and Contractor		0
	Sprinkle water on graded access routes when necessary to reduce dust generation by construction and vehicles	Contractor		100,000
	Stockpiles of earth should be enclosed / covered / watered during dry or windy conditions to reduce dust emissions	KETRACO-ESS Team and Contractor		0
	PPE to be provided to employees and ensure proper and constant use	Contractor		1,000,000
Exhaust emission	Sensitise truck drivers and machine operators to switch off engines when not in use	KETRACO-ESS Team and Contractor		0
	Regular servicing of engines and machine parts to reduce exhaust emission generation	KETRACO-ESS Team and Contractor		500,000
	Alternative non-fuel construction equipment shall be used where feasible	KETRACO-ESS Team and Contractor		0
Minimize solid and liquid waste generation and ensure efficient waste management during construction				

Potential Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
Increased solid waste generation	Use of an integrated solid waste management system i.e. the 3 R's: 1. Reduction at source 2. Reuse 3. Recycle	KETRACO-ESS Team and Contractor	Entire construction period	0
	Accurate estimation of the dimensions and quantities of materials required.	KETRACO-ESS Team and Contractor		0
	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	KETRACO-ESS Team and Contractor		0
	Provide facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage	KETRACO-ESS Team and Contractor		450,000
	Use building materials that have minimal or no packaging to avoid the generation of excessive packaging waste	KETRACO-ESS Team and Contractor		0
	Reuse packaging materials such as cartons, cement bags, empty metal and plastic containers to reduce waste at site	KETRACO-ESS Team and Contractor		0
	Waste collection bins to be provided at designated points on site	Contractor		10,000
	Dispose waste more responsibly by contracting a registered waste handler who will dispose the waste at designated sites or landfills only and in accordance with the existing laws.	Contractor		120,000
Faecal waste management and general hygiene	Provide means for handling sewage generated at the construction site	KETRACO-ESS Team and Contractor	One-off	100,000
	Make own arrangements for provision of sanitary facilities commensurate to the number of staff at site.	Contractor	One -off	150,000
	The facilities should be gender differentiated, well-marked, accessible and supplied with sufficient and clean water for flushing and washing hands.	Contractor		

Potential Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
	Due to the sensitivity of the site, food vendors will not be granted access to site. Therefore, to enhance public health, it would be prudent to undertake surveillance of food vending at Suswa to ensure that site workers remain healthy and vigorous.	Contractor	Continuous	50,000
7. Minimizing excessive noise and vibration				
Minimizing excessive noise and vibration	Install portable barriers to shield compressors and other small stationary equipment where necessary.	Contractor	When necessary	100,000
	Use quiet equipment (i.e. equipment designed with noise control elements).	Contractor	Continuous	0
	Limit pickup trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use, and encourage workers to shut off vehicle engines whenever possible.	Contractor	Continuous	0
	Construction works should be done during the day when people are away and also the outside environment is also noisy.	Contractor	Continuous	0
	Adhere to the Environmental Management and Coordination (Noise and Excessive Vibration Pollution (Control) Regulations, 2009) regarding noise limits at the workplace.	Contractor	Continuous	0
	Application of modern methods of construction that avoids excessive vibrations.	Contractor	Continuous	150,000
8. Occupational Health and Safety Issues				
Live electrical equipment	Train and certify workers to install, maintain, or repair electrical equipment;	KETRACO Safety and Electrical Engineers and Contractor	Continuous	100,000
	Deactivating and properly grounding live power distribution lines before work is performed on, or in proximity, to the lines;	KETRACO Safety and Electrical Engineers and Contractor	Continuous	0

Potential Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
	Ensuring that live-wire work is conducted by trained workers with strict adherence to specific safety and insulation standards. Qualified or trained employees working on transmission or distribution systems should be able to achieve the following- <ul style="list-style-type: none"> ✓ Distinguish live parts from other parts of the electrical system. ✓ Determine the voltage of live parts. ✓ Understand the minimum approach distances outlined for specific live line voltage. <p>Ensure proper use of special safety equipment and procedures when working near or on exposed energized parts of an electrical system</p>	KETRACO Safety and Electrical Engineers and Contractor	Continuous	100,000
	Specific training, safety measures, personal safety devices, and other precautions should be defined in a health and safety plan	KETRACO Safety and Electrical Engineers and Contractor	Continuous	50,000
	Workers should not approach an exposed energized or conductive part even if properly trained unless: <ul style="list-style-type: none"> - The worker is properly insulated from the energized part with gloves or other approved insulation; or, - The energized part is properly insulated from the worker and any other conductive object; or, - The worker is properly isolated and insulated from any other conductive object (live-line work). 	KETRACO Safety and Electrical Engineers and Contractor	Continuous	0
	Workers not directly associated with power transmission and distribution activities who are operating around power lines or power substations should adhere to local legislation, standards, and guidelines relating to minimum approach distances for excavations, tools, vehicles, pruning, and other activities;	KETRACO Safety and Electrical Engineers and Contractor	Continuous	0
Working at height	Testing structures for integrity prior to undertaking work;	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	80,000
	Implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures;	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	50,000

Potential Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
	inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers, among others;			
	Establishment of criteria for use of 100 percent fall protection (typically when working over 2 meters above the working surface, but sometimes extended to 7 meters, depending on the activity). The fall protection system should be appropriate for the tower structure and necessary movements, including ascent, descent, and moving from point to point;	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	100,000
	Installation of fixtures on tower components to facilitate the use of fall protection systems;	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	50,000
	Provision of an adequate work-positioning device system for workers. Connectors on positioning systems should be compatible with the tower components to which they are attached;	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	50,000
	Hoisting equipment should be properly rated and maintained and hoist operators properly trained;	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	50,000
	Safety belts should be of not less than 16 millimeters (mm) (5/8 inch) two-in-one nylon or material of equivalent strength. Rope safety belts should be replaced before signs of aging or fraying of fibers become evident;	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	50,000
	When operating power tools at height, workers should use a second (backup) safety strap;	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	
	Signs and other obstructions should be removed from poles or structures prior to undertaking work;	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	15,000
	An approved tool bag should be used for raising or lowering tools or materials to workers on structures;	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	50,000
	No drunk worker should be allowed on site to reduce risk falling from height and ensuring proper communication on site	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	0
Minimizing exposure to EMFs	Identification of potential exposure levels in the workplace and the use of personal monitors during working activities;	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	500,000
	✓ Training of workers in the identification of occupational EMF			

Potential Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
	levels and hazards; Establishment and identification of safety zones to differentiate between work areas with expected elevated EMF levels compared to those acceptable for public exposure, limiting access to properly trained workers.			
	Implementation of action plans to address potential or confirmed exposure levels that exceed reference occupational exposure levels	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	
Risk of occupational accidents and diseases/physical hazards	Set up a health and safety committee and periodic site inspections, training and annual safety audits;	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	100,000
	Provide appropriate PPEs to workers and visitors to the proposed route;	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	250,000
	Adhere to the provisions of the occupational Health and Safety Act of 2007;	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	0
	Have a qualified first aider on site or medic	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	1,000,000
Incidents, accidents and dangerous occurrences	Ensure that provisions for reporting incidents, accidents and dangerous occurrences during construction and operation is as per prescribed forms obtainable from the local Occupational Safety and Health Office are in place.	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	0
Ergonomics, Repetitive Motion, Manual Handling	Use of mechanical assists to eliminate or reduce exertions required to lift materials, hold tools and work objects, and requiring multi-person lifts if weights exceed thresholds.	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	300,000
	Selecting and designing tools that reduce force requirements and holding times, and improve postures	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	0
	Providing user adjustable workstations.	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	500,000
	Incorporating rest and stretch breaks into work processes, and conducting job rotation	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	0
	Implementing quality control and maintenance programs that reduce unnecessary forces and exertion	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	0
	Taking into consideration additional special conditions such as left-handed persons	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	100,000
9. Reduction of impacts at extraction sites and efficient use of raw materials				

Potential Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
Reduction on impact at extraction sites and efficient use of raw material	Source building materials such as sand, ballast and hardcore from the registered quarry and sand mining firms	KETRACO Environmental/ Social Safeguards / Contractor Environmental Safeguards Team	Continuous	150,000
	Order for what will be required through accurate budgeting and estimation of actual construction requirements.			
	Consider reuse of building materials and use of recycled building materials	Contractor		
10. Managing community expectations				
Minimizing expectations	KETRACO to establish deliberations / procedures on donation to local community of facilities used by the contractor, at the conclusion of the project.	KETRACO Environmental/ Social Safeguards /	Continuous	0
	Implement the stakeholder’s engagement plan (SEP) to ensure effective communication, community buy in and ownership of the project without lowering realistic expectations.	KETRACO Environmental/ Social Safeguards	Continuous	900,000
	KETRACO to consider liaising with or bringing to attention the relevant Ministries and County departments on critical community needs.	KETRACO Environmental/ Social Safeguards	Continuous	100,000
	Ensure implementation of plans: SEP and LMP	KETRACO Environmental/ Social Safeguards / Contractor	Continuous	0
11. Minimizing forced labor and child labor				
	No employment for anyone under the age of 18	KETRACO Environmental Safeguards/ Safety & Health Team / Contractor Environmental / Social Safeguards Team	Continuous	0
Forced labour and child labour	All persons seeking employment (contractor, subcontractor) should be required to provide a national identity card.	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	0
	The client and contractor should not employ forced labour, which consists of any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty.	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	0
	Implement a labour management plan	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	0

Potential Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
	Adopt and implement a Grievances Redress Mechanism to receive and address grievances from host community	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	0
	Implement the stakeholder's engagement plan (SEP) to ensure effective communication with host community on raising awareness to prevent child labour and forced labour,	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	0
12. Fire outbreaks				
Fire safety	Conduct a fire risk assessment	KETRACO ESS/ Safety & Health Team / Contractor	Quarterly	100,000
	Ensure compliance with fire safety regulations and install all necessary fire safety equipment	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	100,000
	Conduct regular trainings and fire drills for employees	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	100,000
	Periodic maintenance to ensure that, there are;- no overloaded electrical systems; no incorrectly installed wiring; no live naked wires; and fuel store areas are continuously monitored	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	100,000
	Build capacity for community on fire related issues including fighting and vigilance	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	100,000
13. Moral Decadence				
Increase in social vices including HIV/AIDS	Periodic sensitization forums for employees on ethics, morals; general good behaviour and the need for the project to co-exist with the neighbours	KETRACO Environmental Safeguards/ Safety & Health Team / Contractor Environmental / Social Safeguards Team	Continuous	100,000
	Guidance and counselling on HIV/AIDS and other STDs to employees	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	50,000
	Provision of condoms	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	50,000
14. Sexual Exploitation and Abuse (SEA) and Workplace Sexual Harassment (SH) and other forms of Gender-Based Violence (GBV)				
Sexual Exploitation and Abuse (SEA) and Workplace Sexual Harassment (SH) and other forms of Gender-Based Violence (GBV)	<ul style="list-style-type: none"> Ensure sensitization of the contractor, their sub-contractors, and consultants on GBV-SEA/SH issues including refraining from unacceptable conduct towards local community members. Introduce a worker Code of Conduct as part of the employment contract, to be signed by all with physical presence on site as well as within the project area, and 	KETRACO Environmental Safeguards/ Safety & Health Team / Contractor Environmental / Social Safeguards Team	One off prior to construction	200,000

Potential Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
	<p>to include sanctions for non-compliance (e.g., termination).</p> <ul style="list-style-type: none"> • Ensure mandatory trainings regarding GBV -SEA/SH to be provided to all project workers including temporary and casual workers. • Undertake awareness meetings for the project affected communities on GBV-SEA/SH issues. Participants should be informed about the Code of Conduct, related national legislations and available GRM including available services/referral mechanism mechanisms for seeking help. • Adopt and implement a grievance redress mechanism (GRM) and referral mechanism to address all emerging complaints including risks such as COVID 19 related to Sexual Exploitation and Abuse (SEA) / Sexual Harassment (SH). • Implement the GBV-SEA/SH Management Plan and Labour Influx Management Plan • Ensure separate sanitation and hygiene facilities (toilets, utility rooms and changing rooms) for men and women in the workers' camps / workplaces are provided. • Adopt a policy to cooperate with law enforcement agencies in investigating complaints about GBV-SEA/SH should a survivor choose the legal redress. Survivors should be facilitated to understand that this may require them to commit to cooperate with the agencies. • Inform workers and local community about national laws such as the Sexual Offences Act. No 3 of 2006 that make GBV-SEA/SH a punishable offence which is prosecuted. <p>Apply all Kenyan Constitutional / legal requirements on gender and sexual based violence throughout the project.</p>			
Climate Change Mitigation	The contractor shall undertake a tree planting exercise at location(s) to be identified in consultation with KETRACO, the community and relevant authorities. The	KETRACO Environmental Safeguards/ Corporate communications team	One -off	5,000,000

Potential Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
	<p>contractor shall plant trees worth KES 5,000,000 or at least 30,000 trees whichever is less. The cost shall be deemed to cover the entire exercise which shall involve the following:</p> <ol style="list-style-type: none"> 1. Selection of trees species with highest survival rate and can grow with baseline environmental conditions at the selected planting locations. 2. Transportation of the seedlings to the selected planting locations. 3. Preparation of the land including but not limited to clearing the site of invasive species and preparing the hole. 4. Planting the seedlings at the onset of rainy seasons. 5. Protection and care of the planted tree for a period of 12 months 			
15. Introduction and spread of invasive alien species.				
Introduction and spread of invasive alien species.	<ul style="list-style-type: none"> • Inspecting and cleaning vehicles, equipment, that may carry invasive species before entering or leaving an area i.e. material sources, construction sites etc. • Educating the public and stakeholders about the risks and impacts of invasive species and how to prevent or report them. • Monitoring and detecting invasive species early and reporting them to the relevant authorities such as Kenya Plant Health Inspectorate Services (KEPHIS), National Environment Management Authority (NEMA), the Kenya Wildlife Service (KWS), the Kenya Forestry Service (KFS), and the International Centre of Insect Physiology and Ecology (ICIPE), • Implementing rapid response and eradication programs for newly detected or localized invasive species. • Applying biological, chemical, mechanical, or cultural methods to control or 	<p>Contractor Site Manager & Environmental Team (Implementing role)</p> <p>KETRACO Site Manager & Environmental Safeguards Team (supervisory and monitoring role)</p>	Continuous	100,000

Potential Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
	reduce the population of established invasive species.			
Mitigating Cultural Impacts	Avoid constructing substations or tower spotting by transmission line design changes / changing tower spans to avoid spotting the pylons in areas of archaeological or cultural heritage importance if such sites be found.	KETRACO and Contractor	Entire period construction	Nil
	Work together with local elders to identify and map any other physical cultural resource and other areas of cultural heritage importance, not identified during the ESIA process.	KETRACO and Contractor	Entire period construction	30,000
	Use existing utility and transport corridors for transmission and distribution, and existing roads and tracks for access roads, whenever possible.	KETRACO and Contractor	Entire period construction	Nil
	Work in close liaison with national agencies that deal with areas of archaeological and cultural importance such as the National Museums of Kenya (NMK) to offer guidance in chance finds procedure if unknown heritage resources, particularly archaeological resources, are encountered during project construction or operation.	KETRACO and Contractor	Entire period construction	30,000
	Implement the stakeholder's engagement plan (SEP) to ensure effective communication in relation to cultural resources with the host community.	KETRACO and Contractor	Entire period construction	As PER SEP Budget

9.3 Environmental and Social Action Management Plan for the operation phase

The necessary objectives, activities, mitigation measures, and allocation of costs and responsibilities pertaining to prevention, minimization and monitoring of significant negative impacts operational phase the proposed additional scope are outlined in Table 9-1 below.

Table 9-2: Environmental and Social Action Plan for the operation phase

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) per year
1. Abate Air Pollution				
Generation of exhaust emission	Vehicle idling time shall be minimised	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Entire implementation / time	Administrative costs
	Regular servicing of engines and machine parts to reduce exhaust emission generation			
2. Minimization of solid and liquid waste generation and ensuring more efficient waste management				
Solid waste generation	Use of an integrated solid waste management system i.e. the 3 R's: 1. Reduction at source 2. Reuse 3. Recycle	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Continuous	Administrative costs
	Provide solid waste handling facilities such as rubbish bags and skips	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	One-off	Administrative costs
	Ensure that wastes generated at the substation are efficiently managed through recycling, reuse and proper disposal procedures.	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Continuous	Administrative costs
	A private licensed company to be contracted to collect and dispose solid waste on regular intervals	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Continuous	
		KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M		Administrative costs

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) per year
	Place in strategic places signs against littering and dumping of wastes	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	One-off	Administrative costs
	Audits on waste generation and development of Waste Reduction Action Plans (WRAP)	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Annually	Administrative costs
Liquid waste generation	Conduct regular checks for sewage pipe blockages or damages since such vices can lead to release of the effluent into the land and water bodies	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Continuous	Administrative costs
	Monitor effluent quality regularly to ensure that the stipulated discharge rules and standards are not violated	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Annually	
	Audits on liquid waste generation and development of liquid Waste Reduction Action Plans	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Annually	
Release of sewage into the environment	Provide adequate and safe means of handling sewage generated at the substation	KETRACO Environmental Safeguards/KETRACO Adminstration / KETRACO O&M	One-off	Administrative costs
	Conduct regular inspections for sewage pipe blockages or damages and fix appropriately	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Continuous	Administrative costs
	Ensure regular monitoring of the sewage discharged from the project to ensure that the stipulated sewage/effluent discharge rules and standards are not violated	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M		Administrative costs
3. Minimize Oil Spills				

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) per year
Oil spills Hazards	Install oil trapping equipment in areas where there is a likelihood of oil spillage e.g. during maintenance of vehicles	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Continuous	Administrative costs
	In case of an oil spill, immediate clean up measures will be instituted	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M		
	The substation should be designed with spill prevention and detection systems to protect the environment especially where the transformers will be located.	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	One-off	Design cost
	Design appropriate protection devices against accidental discharge of transformer oil substances.	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	One-off at design stage	
	The STATCOM design should provide adequate storage areas for the transformer oil	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	One-off at design stage	
	Drains should be routed through an oil/water separator	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	One-off at design stage	Design cost
	Frequent inspection and maintenance of the transformers should be done to minimize spilling	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Continuous	Administrative costs
	The substation operator should ensure the proper containment or collection and disposal for the waste oil or used oil	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Continuous	Administrative costs

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) per year
	All waste oils from maintenance of transformers and other associated equipment should be segregated and disposed properly by a reputable/registered waste handler in accordance with the waste disposal plan	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Continuous	Administrative costs
	Storage and liquid impoundment areas for fuels, raw and in-process material solvents, wastes and finished products should be designed with secondary containment to prevent spills and the contamination of soil, ground and surface water	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	One-off	Design cost
6. Minimize occupational health and safety risks				
Impacts on workers' and community health and safety	Implement all necessary measures to ensure health and safety of the substation workers and the general public during operation of the proposed substation as stipulated in the Occupational Safety and Health Act, 2007	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Continuous	Administrative costs
7. Fire outbreaks				
	Ensure compliance with fire safety regulations and install all necessary fire safety equipment	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Continuous	Administrative costs
	Conduct regular trainings and fire drills for employees	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Annually	Administrative costs
	Periodic maintenance to ensure that, there are;- no overloaded electrical systems; no incorrectly installed wiring; no live naked wires; and fuel store areas are continuously monitored	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Continuous	Administrative costs
		KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Continuous	Administrative costs

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) per year
		KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M		Administrative costs
8. Minimize Electrocuting Incidents				
Electrocution from live power lines or electric equipment	Put in place a maintenance system to ensure physical integrity of substation equipment is maintained	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Planning stage	Administrative costs
	Deactivating and properly grounding live wires before repair works are performed	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Continuous	
	Ensure that live wire works is conducted by trained personnel	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Continuous	
	Access to the STATCOM should only be by authorization and trained personnel.	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Continuous	
	Clear warning signs to be placed on strategic places	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Continuous	Administrative costs
	Personnel should not approach an exposed energized or conductive part unless the personnel is ;-properly insulated from the energized part with gloves or other approved insulation; the energized part is properly insulated from the personnel and other conductive objects; the personnel is properly isolated and insulated from any other conductive object	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Continuous	Administrative costs

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) per year
	Conduct periodic awareness and sensitization campaigns for the neighbouring communities	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Continuous	Administrative costs
9. Electrostatic and magnetic forces				
Perceived danger of Electrostatic and Magnetic force	Conduct education and awareness campaigns to dispel fear among community on the effects of electrostatic and magnetic forces	KETRACO Environmental Safeguards/KETRACO Administration / KETRACO O&M	Continuous	Administrative costs

9.4 Environmental and Social Management Plan for the decommissioning phase

The necessary objectives, activities, mitigation measures, and allocation of costs and responsibilities pertaining to prevention, minimization and monitoring of significant negative impacts operational phase the proposed additional scope are outlined in Table 9-3 below.

Table 9-3: Environmental Management Plan for the decommissioning phase

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
1. Reduction of Noise and vibrations				
Increase noise and vibration	Install portable barriers to shield compressors and other small stationary equipment where necessary.	KETRACO ESS/ Safety& Health Team / Contractor	Continuous	1,000,000
	Demolish mainly during the day. The time that most of the neighbours are out working.	KETRACO ESS/ Safety& Health Team / Contractor	Continuous	0
	Provide appropriate PPE to workers	KETRACO ESS/ Safety& Health Team / Contractor	Continuous	1,000,000
	Co-ordinate with relevant agencies and neighbouring communities regarding all substation demolition activities	KETRACO ESS/ Safety& Health Team / Contractor	Continuous	0
2.Abatement of air pollution				

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
Generation of dust	Watering all active demolition areas as and when necessary to lay dust.	KETRACO ESS/ Safety& Health Team / Contractor	Continuous	500,000
	Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard.	KETRACO ESS/ Safety& Health Team / Contractor	Continuous	500,000
	Pave, apply water when necessary, or apply (non-toxic) soil stabilizers on all unpaved areas, parking areas and staging areas at demolition sites.	KETRACO ESS/ Safety& Health Team / Contractor	One-off	100,000
	Provide appropriate PPE to all workers	KETRACO ESS/ Safety& Health Team / Contractor	Continuous	1,000,000
Generation of exhaust emission	Vehicle idling time shall be minimised	KETRACO ESS/ Safety& Health Team / Contractor	Continuous	200,000
	Regular servicing of engines and machine parts to reduce exhaust emission generation			
3. Waste management				
Demolition waste	Use of an integrated solid waste management system i.e. through a hierarchy of options: 1.Source reduction 2.Reusing 3. Recycling 4.Incineration 5. Sanitary land filling.	KETRACO ESS/ Safety& Health Team / Contractor	Continuous	500,000
	All machinery, equipment, structures and partitions that will not be used for other purposes must be removed and recycled/reused as far as possible or they be taken to a licensed waste disposal site	KETRACO ESS/ Safety& Health Team / Contractor	One-off	0
	Dispose waste more responsibly by contracting a registered waste handler who will dispose the waste at designated sites or landfills only and in accordance with the existing laws.	Contractor	Continuous	Cost borne by the contractor
4. Oil spills				
Oil spills Hazards	Install oil trapping equipment in areas where there is a likelihood of oil spillage e.g. during maintenance of construction facility and vehicles.	KETRACO ESS/ Safety& Health Team / Contractor	Continuous	500,000
	In case of an oil spill, immediate clean up measures will be instituted	KETRACO ESS/ Safety& Health Team / Contractor		
	Close surveillance of the fuel and cooling oil store	KETRACO ESS/ Safety& Health Team / Contractor		
5. Impacts on workers' and community health and safety				

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
Health and Safety for workers' and community members	Ensure strict compliance with the Occupational Safety and Health Act (OSHA) 2007	KETRACO ESS/ Safety & Health Team / Contractor	Continuous	100,000
	Prohibit access by unauthorized personnel into the demolition site			
	Place warning signs where necessary			

9.5 ESMP Cost Summary

Below is the cost summary of the ESMP costing per phase :-

Table 9-4: ESMP cost summary

Phase	Costs (KES)
Construction phase	18,415,000
Operation phase	0
Decommissioning phase	4,400,000
TOTAL	22,815,000

10 CHAPTER TEN: ENVIRONMENTAL AND SOCIAL MONITORING PLAN (ESMoP)

10.1 Introduction

Monitoring will be a continuous process essential for identification of unforeseen impacts during the ESIA study. Monitoring parameters/indicators have been identified and programmes developed for their observation and action.

10.2 Monitoring Guidelines

Monitoring programmes were developed taking into cognizant the following: frequency of monitoring; personnel; recording; equipment; baseline information and data analysis and review. The environmental indicators to be monitored during the project phases namely the construction; operation and decommissioning are described in table below. The monitoring parameters will be revised as the project development proceeds to enable incorporate and foreseen indicators. On environmental and social monitoring, both KETRACO and the Contractor will have monitoring responsibilities. For instance, KETRACO will require that contractors monitor, keep records, and report environmental and social issues. In general, monitoring for the project will include the following: -

(a) Pre – construction phase

- Groups who might be disproportionately impacted put measures in place to ensure they have access to development benefits and opportunities.

(b) Construction phase

- Monitor to ensure that occupational health and safety measures are carried out in accordance with the established ESMP.
- Monitor the impacts from construction such as, solid waste disposal, hazardous materials (including fuels and lubricants) management, are being mitigated in accordance with the ESMP.
- If applicable, monitor that any cultural heritage that may be found or affected during construction is treated in accordance with procedures (annex 13).
- Monitor Community, Health, and Safety issues in accordance with the ESMP.

(c) Operation phase

- Monitor for all potential impacts i.e., social, cultural, archaeological, visual, cumulative, biodiversity, health and impacts on environmental quality (i.e., air quality, water quality and noise levels)
- Ensure that restoration of any disturbance during construction has occurred.

(d) Decommissioning phase

- Ensure that restoration of any disturbance during construction, operation and demolition has occurred.

Table 10-1: Environmental and Social Monitoring Plan below summarizes the key parameter to be monitored during the STATCOM project cycle.

Table 10-1: Environmental and Social Monitoring Plan

Impact	Parameters	Receptors	Frequency	Sampling Points/ Total samples	Cost	Requirements/ Equip.	Responsibility
Environmental Issues							
Noise and Vibrations	Decibels (dBs)	(Nearby receptors) These include areas such as;- Zone A- Control room Zone B- Staff Houses Zone C- Security Staff Houses Zone D- Gate 2	Monthly/ during the construction and decommissioning phase	3 key receptor points 18 months*4 sample points- Total=72	72*10,000=720,000	Noise & vibrations Meter	KETRACO Health and safety team / Contractor health and Safety team
Air Quality	TSP, NO _x , SO ₂ , CO, Dust particles, particulate matter etc.	Construction site, control room, workers campsite	Quarterly air quality measurement during construction and decommissioning phase	6 samples for 5 quarters (to cover 18 months)	30,000*6*5 = 900,000.00	Air sampling equipment	KETRACO Environmental Safeguards Team / Contractor Environmental Safeguards Team
Solid Waste Generation	Slag, domestic refuse, metallic scraps, sludge, waste composition, treatment methods	Construction sites, workers; campsite	Monthly during construction, operation, and decommissioning phases	N/A		Waste inventory	KETRACO Environmental Safeguards Team / Contractor Environmental Safeguards Team
HIV/AIDS Incidences	-Training programmes, number of incidents, number of condoms distributed, seminars, and participants trained etc. -COVID 19 prevention strategies in place during sensitization / training (Hand washing facilities, physical distancing, use of masks, adherence to restrictions)	Campsites, construction site, Ewuaso village and Suswa Town	Quarterly throughout the project cycle	N/A		Administrative/ Office Supplies	KETRACO Social Safeguards Team / Contractor Social Safeguards Team
Soil Erosion	Soils eroded, Turbidity in storm water and other water sources, sources and causes	Excavated areas, sloppy areas	Continuous throughout the project cycle	N/A		Camera, field vehicle	KETRACO Environmental Safeguards Team / Contractor

Impact	Parameters	Receptors	Frequency	Sampling Points/ Total samples	Cost	Requirements/ Equip.	Responsibility
							Environmental Safeguards Team
Storm Water Drainage	Rainfall volume, topography	Flood prone areas, culverts, water ways, low lying areas	Continuous throughout the project cycle	N/A		Rain-gauge, field survey maps	KETRACO Environmental Safeguards Team / Contractor Environmental Safeguards Team
Environmental Risks	Fire outbreak, floods etc.	Possible hazardous areas only	Continuous throughout the project cycle	N/A		Field inspections and information from lead agencies	KETRACO Environmental Safeguards Team
Health and Safety Issues							
Occupational Health and Safety Issues	<ul style="list-style-type: none"> - Evaluation against ICNIRP published occupational exposure limits guidelines to electric and magnetic fields. - Number of occupational diseases and accidents - Record(s) of occupational accidents, near misses and dangerous occurrences - Record(s) of occupational diseases 	Campsites, construction sites, within the station	Continuous throughout the project cycle	N/A		Field inspections and information from EHS Personnel	KETRACO Health & Safety Team and Contractor Health and Safety team
Community Health issues and spread of diseases	<ul style="list-style-type: none"> -Trend of infectious diseases for example: HIV/AIDS, STI's -Correlation between project team and local community -COVID 19 prevention strategies in place during sensitization / training (Hand washing facilities, physical distancing, use of masks, adherence to government restrictions as per Gok directive.) 	Campsites, construction sites, staff quarters, Ewaso village and Suswa Town	Continuous throughout the project cycle	N/A		Field surveys and information from EHS Personnel	KETRACO Health & Safety Team/ Contractor social safeguards team.
Tree planting/ climate change mitigation	No. of planted trees (target of 10,000 trees)	Tree planting sites to be determined in collaboration with KFS, CFA's	Continuous throughout the project cycle	3,000,000 kes monitoring component to monitor afforested areas.		Field surveys and information from EHS Personnel	KETRACO environmental & social safeguards Team
Social Impacts							

Impact	Parameters	Receptors	Frequency	Sampling Points/ Total samples	Cost	Requirements/ Equip.	Responsibility
Community sensitization	<ul style="list-style-type: none"> - Number of meetings - Number and type of participants disaggregated by gender. - Number of staff trained in implementation of the ESMP. - COVID 19 prevention strategies 	<ul style="list-style-type: none"> - Immediate receptors - Site workers - Community - KETRACO staff 	Continuous throughout the project cycle.	N/A		Field surveys and information from EHS Personnel	KETRACO social safeguards Team/ Contractor social safeguards team.
Grievance management	Number & type of grievances received Number & type of grievances resolved and resolutions reached. -Number& type of grievances not resolved in time but completed -Number & type of outstanding grievances not resolved -Average timelines for resolution of grievances disaggregated by the various levels of grievance redress mechanism/institutions -Number of grievances referred to Level 3 (Courts of Law) -Number of complaints referred to KETRACO	<ul style="list-style-type: none"> - Nearby receptors - Construction workers; - Ketraco staff - Community 	continuous throughout project cycle	N/A		Field surveys; grievance log / acknowledgment form and information from EHS Personnel	KETRACO social safeguards Team / Contractor social safeguards team.
Gender Based Violence (GBV) Sexual Exploitation and Abuse (SEA) / Sexual Harassment (SH)	<ul style="list-style-type: none"> - Number of training courses related to GBV – SEA/SH delivered. - Percentage of workers that have signed a Code of Conduct (CoC); and/or - Percentage of workers that have attended CoC training. - Implementation of labour influx management plan 	<ul style="list-style-type: none"> - Nearby receptors - Construction workers; - Ketraco staff - Community 	Continuous throughout project cycle	N/A		Field surveys; grievance log / acknowledgment form and information from EHS Personnel	KETRACO social safeguards Team / Contractor social safeguards team
Stakeholder engagement and information disclosure;	<ul style="list-style-type: none"> - Implementation of Stakeholder Engagement plan. - Disclosure of ESIA report on KETRACO and World Bank websites. - Availability of ESIA report at the county level. 	<ul style="list-style-type: none"> - Nearby receptors - Construction workers; - Ketraco staff - Community 	Continuous throughout project cycle	SEP budget		Field surveys / information from EHS Personnel	KETRACO via social safeguards Team / Contractor social safeguards team.

Impact	Parameters	Receptors	Frequency	Sampling Points/ Total samples	Cost	Requirements/ Equip.	Responsibility
	<ul style="list-style-type: none"> - Disclosure of ESIA report summary at in a culturally appropriate language, and in locations accessible to all. - Number of consultative meetings held, by type. - Stakeholders' awareness of ESIA - Number of County and National Government leaders engaged/briefed about the ESIA process. - Number of stakeholders consultative meetings held. - Type of information provided in meetings. - Type of issues raised at public consultation meetings, and response rate. - The number of participants attending public consultation meetings related to project disaggregated by gender. - Modes and language of communication. - Minutes of meetings held and lists of attendance. - Number of people seeking information on displacement and compensation - COVID 19 prevention strategies in place 	Also Key Local administration at Nakuru East, Kajido West and Naivasha Sub counties					
Local recruitment. / Creation of employment / Labour Influx	<ul style="list-style-type: none"> - Grievances lodged by type and number, illustrated with graphs. Open grievances by type and number - Disciplinary cases – type and number - Disciplinary action by type and number, including graphs. - Induction training numbers, queries, and comments - Pay slip queries -Type and number. - Food and accommodation complaints – Type and number - Issues raised by workers' committees and action taken. - Workforce numbers by local employees and immigrant workers (labour influx)- actual against planned. 	Construction and Camp sites	Continuous throughout project cycle	LMP budget		Field surveys / Project Implementation Team (PIT)	KETRACO Site Managers social safeguards Team / Contractor Site Managers , social safeguards team

Impact	Parameters	Receptors	Frequency	Sampling Points/ Total samples	Cost	Requirements/ Equip.	Responsibility
	<ul style="list-style-type: none"> - Industrial relations incidents – stoppages go slows, threats, damage to property, violence. - Lost hours by category - Absenteeism, sick leave, and late arrivals - Issues raised by camp committees and action taken. - Workers Camp numbers by local and foreign workers – actual against planned. - Camp incidents - COVID 19 prevention strategies in place for all workers (skilled, semiskilled, and unskilled), (Hand washing facilities, physical distancing, use of masks, adherence to restrictions as per Gok directive.) - Existence of COVID 19 preparedness management action plan applicable to all workers (skilled, semiskilled, and unskilled), 						
HIV/AIDs and other STDs;	<ul style="list-style-type: none"> - Number of HIV/AIDs and other STDs awareness trainings held disaggregated by target group/institutions / Gender and issues amongst stakeholders / workers / community. - The number of condoms distributed per gender. - Adequacy and accessibility in provision of condoms to workers both male and female - Levels and knowledge of condom use or other safer sex methods. - Knowledge and attitudes about HIV and STDs - Potential channels, methods, materials, and messages for reaching target groups. - Factors that can facilitate or hinder intervention. 	<p>Project's area of influence</p> <p>Construction workers, KETRACO staff and community</p>	Continuous throughout project cycle	N/A		Field surveys / Project Implementation Team (PIT)	KETRACO Site Managers social safeguards Team / Contractor Site Managers , social safeguards team

Impact	Parameters	Receptors	Frequency	Sampling Points/ Total samples	Cost	Requirements/ Equip.	Responsibility
	<ul style="list-style-type: none">- Cultural beliefs about sex, sexuality, sexual health and HIV/AIDs and STDs- Involvement of community stakeholders- Number of workers who have signed a code of conduct.- COVID 19 prevention strategies in place for all workers (skilled, semiskilled, and unskilled), (Hand washing facilities, physical distancing, use of masks, adherence to restrictions as per Gok directive.)-						
Child labour and forced labour	<ul style="list-style-type: none">-Number of workers employed and ID numbers-implementation of Labour Management Plan-Implementation of Grievances Redress Mechanism and recorded grievances on child and forced labour-Implementation of stakeholder's engagement plan (SEP) – with awareness creation sessions on child and forced labour	<p>Project's area of influence</p> <p>Construction workers, KETRACO staff and community</p>	Continuous throughout project cycle	LMP and SEP budgets	Project Implementation Team (PIT)	KETRACO Site Managers, social safeguards Team / Contractor Site Managers, social safeguards team	
Community demonstrations in pursuit for employment opportunities	<ul style="list-style-type: none">- Implementation of a Grievances Redress Mechanism- Implementation of the stakeholder's engagement plan (SEP)- Implementation of labour management plan.- No of the engaged Community Liaison Officers (CLOs)- No. of direct employment opportunities disintegrated by gender such as wayleave officers, community liaison officers (CLOs) and project vacancies.	<p>Project's area of influence</p> <p>Construction workers, KETRACO staff and community</p>	Continuous throughout project cycle	LMP and SEP budgets	Field surveys	KETRACO via Social safeguards team / Contractor social safeguards team.	
Provision of market and supply for building materials	<ul style="list-style-type: none">- Receipts and LPOs on the purchase of building materials such as sand, cement etc. from suppliers including hardware shops in nearby towns.	Camp, construction sites	During construction phase	N/A	Field surveys	KETRACO via Social Safeguards Team / Contractor Social Safeguards Team	

Impact	Parameters	Receptors	Frequency	Sampling Points/ Total samples	Cost	Requirements/ Equip.	Responsibility
Improvement of local trade and business opportunities	- Enhancement of skills on small-scale businesses such as food vendors and kiosk owners	Project's area of influence Construction workers, KETRACO staff and community	Throughout construction and operation phases	N/A		Field surveys	KETRACO via Social Safeguards Team / Contractor Social Safeguards Team
Interference of existing development infrastructure	- Implementation of the stakeholder's engagement plan (SEP) (- Adoption and implementation of a Grievances Redress Mechanism - Liaison with Kenya Power at design stage and on planned shutdowns.	Construction site	During construction phase	SEP budget		Field surveys	KETRACO via Social safeguards team / Contractor Social Safeguards Team
Insecurity / Theft and Vandalism	- Insecurity incidences in the project area - Implementation of the Grievances Redress Mechanism - Implementation of the stakeholder's engagement plan (SEP) - Existence of screening for workers, suppliers, and distributors - Vehicle scanning systems in place at Suswa substation and construction sites. - Existence of 24-hour surveillance by Administration Police services	Project's area of influence Construction workers, KETRACO staff and community	Throughout the project cycle	SEP budget		Field surveys	KETRACO via Social safeguards team / Contractor Social Safeguards Team
Moral decadence	- Existence of a code of conduct to ensure workers conduct. - Trainings on civic and health education on HIV/AIDS and STIs - Accessible provision of condoms to workers both male and female - Implementation of Stakeholder engagement plan (SEP) - Implementation of a Grievances Redress Mechanism -	Project's area of influence Construction workers, KETRACO staff and community	Throughout project cycle	SEP budget		Field surveys	KETRACO via Social Safeguards Team / Contractor Social Safeguards Team

11 CHAPTER ELEVEN: RECOMMENDATIONS AND CONCLUSION

11.1 Introduction

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.

It is strongly recommended that a concerted effort is made by the site management, to implement the Environmental Management and Monitoring Plan provided herein. Following the commissioning of the STATCOM and the entire Suswa Converter Station, statutory Environmental and Safety Audits must be carried out in compliance with the national legal 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 addition of the scope (STATCOM) will bring positive impact to the stability and reliability of the grid, fostering the economy, reducing reliance of self-generating systems based on fossil fuels due to low current situations and outages, and reduction of the GHG load to the atmosphere due to an unstable grid creation. Other co-benefits include employment opportunities both skilled and unskilled, gains in the local and national economy, provision of market for supply of construction materials, Informal sectors benefits, Increase in revenue, Improvement in the quality of life for the workers and community members, and among others.

Considering the proposed location, construction, management, mitigation and monitoring plan that will be put in place, the proposed additional scope is considered to be natural in line with the prevailing physical setting of the immediate environment. It is not anticipated to cause any irreversible harm or any footprint out of character that can warrant the need to submit a fresh ESIA study. Nonetheless, KETRACO is cognizant of its role in safeguarding the environment and communities' interest in this project area and has undertaken this ESIA addendum report to provide a good practice approach in the implementation of the proposed STATCOM for the benefit of the national grid.

11.2 Recommendations

Following the impact analysis presented in the previous sections, the following recommendations were made

- The proposed additional scope to be implemented in compliance with the relevant legislation and planning requirements
- KETRACO to ensure implementation of the mitigation measures provided in the ESMP
- The proponent to monitor implementation of the ESMP using the developed ESMoP
- The proponent to conduct annual Environmental Audits of the entire Eastern Electricity Highway 500kV HVDC project and submit to NEMA
- NEMA to consider, approve and grant a variation EIA license inclusive of the proposed additional scope under the Eastern Electricity Highway 500kV HVDC project (**NEMA Reg. Number 0017046**) issued on 25th July 2013.

11.3 Conclusion

From the foregoing, it is noted that;

- No immitigable negative impacts were encountered
- No objection from the community was received.
- Identified potential negative impacts can be mitigated.
- Benefits to the environment and country are immense.
- A Grievance Redress Mechanism (GRM) has been provided in the LMP and SEP.

The ESIA addendum team, therefore, recommends to NEMA to consider, approve, and grants a variation of License the Eastern Electricity Highway 500kV HVDC project (**NEMA Reg. Number 0017046**) issued on 25th July 2013 and the proponent to implement the project with strict adherence to the proposed ESMP.

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13 ANNEXES

1. Annex 1: EEHP ESIA License
2. Annex 2: EEHP Variation of License
3. Annex 3 ESIA Experts' Licenses
4. Annex 4: Grievance Redress Mechanism
5. Annex 5: Labor Management Plan
6. Annex6: Stakeholder Management Plan
7. Annex 7: Public *Baraza* Minutes
8. Annex 8: Public *Baraza* Attendance Sheet
9. Annex 9: Key Informant Questionnaires
10. Annex 10: Community Questionnaires
11. Annex 11: Project Designs and Layouts
12. Annex 12: Land Ownership Documents
13. Annex 13: Chance Find Procedures