ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED JABALI TOWERS MIXED-USE DEVELOPMENT ON L.R NO. 28867/1, PARCEL NO.1AA-B11 AT TATU CENTRAL, CBD OF THE TATU CITY, RUIRU IN KIAMBU COUNTY

(SITE COORDINATES: -1.0901S, 36.5419E)

PREPARED BY:

PETER O. OGASO (EIA/ EA NEMA REG. No. 0409)

P.O Box 7490- 00200, NAIROBI

Tel: +254 723862986/ +254 738379712

Email: info@kogasoconsultants.co.ke

PROPONENT:

TATU HOUSE, OFF RUIRU KIAMBU ROAD,

P.O. BOX 2739-00621, NAIROBI.

FEBRUARY 2026

DECLARATION

SUBMISSION OF DOCUMENTATION

We, on behalf of **Kogaso Consultants Limited** a National Environment Management Authority (NEMA) Licensed Firm of Experts submit this Environmental and Social Impact Assessment (ESIA) Study Report for the proposed **Jabali Towers Mixed-Use Development on L.R No. 28867/1, Parcel No.1AA-B11 at Tatu Central, CBD of the Tatu City, Ruiru in Kiambu County.** To my knowledge, all information contained in this report is accurate and a truthful representation of all findings as relating to the proposed project.

Official Stamp

Peter O. Ogaso
NEMA Lead EIA/EA Expert Reg. No. 0409
Signature ..... **Date:** 10/2/2026.

Faith Seroney
NEMA Lead EIA/EA Expert Reg. No. 0825
Signature ..... **Date:** 10TH FEB/26.

SUBMISSION OF DOCUMENTATION

I, on behalf of **Tatu City** submit this ESIA Study Report for the proposed **Jabali Towers Mixed-Use Development on L.R No. 28867/1, Parcel No.1AA-B11 at Tatu Central, CBD of the Tatu City, Ruiru in Kiambu County**. To my knowledge, all information contained in this report is accurate and a truthful representation of all findings as relating to the proposed project.

Official Stamp
Name: ..... MARTIN OKELLO

Tatu City Limited
P.O. Box 2739 - 00621
Nairobi, Kenya

Designation: ..... Head of HSE, Tatu City

Signature ..... Date: 10/02/2026

Environmental and Social Impact Assessment Project Report

PLANNING AND PARTICIPATING CONSULTANTS

The planning and participating Consultants during the ESIA for the proposed **Jabali Towers Mixed-Use Development on L.R No. 28867/1, Parcel No.1AA-B11 at Tatu Central, CBD of the Tatu City, Ruiru in Kiambu County** were as presented in table 1 below.

Table 1: List of Planning and Participating Consultants

NAME	QUALIFICATIONS/PROFESSIONAL	SIGNATURE
Peter O. Ogaso **NEMA Lead Expert** **Project Team Leader (Senior Environmental & Occupation Health**	- Project Team Leader - Environmentalist & Occupation Safety and Health - Climate change risk and vulnerability assessment	
Faith J. Seroney **NEMA Lead Expert** **Environmental Expert and Disaster Preparedness Expert**	-B.ES. Environmental studies. -Diploma disaster management and preparedness -Certificate in Environment Impact Assessment	
Hazel Atieno Ogombe **Lead Sociologist/Socio-Safeguards Expert**	Social and GBV expert	
Sammy Luvisia **NEMA Associate Expert**	B.ES. Environmental studies. Certificate in Environment Impact Assessment	
Evans Nyonje **Environmental Technician**	Ambient Air Quality & Noise Survey	
Dennis Kibet Ndiema **Hydrologist**	Hydrologist for hydrogeological assessments	

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ACRONYMS

CEC	County Environment Committee
EA	Environmental Audit
EMC(A)A	Environmental Management and Co-ordination (Amendment) Act
EMCA	Environmental Management and Co-ordination Act
EMP	Environmental Management/Monitoring Plan
ESIA	Environmental and Social Impact Assessment
ha	hectares
km	kilometres
km^2	square kilometres
KPLC	Kenya Power and Lighting Company
L.N No.	Legal Notice Number
L.R No.	Land Reference Number
m	metres
mm	millimetres
NEMA	National Environment Management Authority
^OC	Degree Celsius
OHSO	Occupational Health and Safety Office
OSH	Occupational Safety and Health
OSHA	Occupational Safety and Health Act
PPE	Personal Protective Equipment
PPE	Personal Protective Equipment
RUJWASCo	Ruiru Juja Water & Sewarage Company
SHE	Safety Health and Environment
SWM	Solid Waste Management
SWM	Solid Waste Management
TATUWASCo	Tatu City Water & Sewarage Company
TOR	Terms of Reference

VAT	Value Added Tax
WRA	Water Resources Authority

DEFINITION OF TERMS

Environmental Audit: means a systematic evaluation of activities and processes of an ongoing project to determine how far these activities and programmes conform with the approved environmental management plan of that specific project and sound environmental management practices.

Environment Impact Assessment: means a systematic examination conducted to determine whether or not a programme, activity or project will have any adverse impacts on the environment.

Environmental Management: includes the protection, conservation and sustainable use of the various elements or components of the environment.

Environmental aspect: Element of the organization's activities, products and services that can interact with the environment.

Environmental impacts: Any changes to the environment, whether adverse or beneficial, wholly or partially resulting from an organization s activity, product or service.

Environmental management systems (EMS): Part of an organizations management system used to develop and implement its environmental policy and manage its environmental aspects.

Environmental performance: Measurable results of an organization's management of its environmental aspects.

Environmental Management Plan: means all details of project activities, impacts, mitigation measures, time schedule, costs, responsibilities and commitments proposed to minimize environmental impacts of activities, including monitoring and environmental audits during implementation and decommissioning phases of a project.

Environmental Monitoring: means the continuous or periodic determination of actual and potential effects of any activity or phenomenon of the environment whether short-term or long-term;

Mitigation measures: include engineering works, technological improvements, management and ways and means of minimising negative aspects, which may include socio-economic and cultural losses suffered by communities and individuals, whilst enhancing positive aspects of the project**.**

Natural resources: include resources of air, land, water, animals and plants including their aesthetic qualities.

Plan: A purposeful, forward-looking strategy or design, often with coordinated priorities, options, and measures that elaborate and implement policy.

Stakeholder: Those who may be interested in, potentially affected by, or influence the implementation of the project.

Sustainable Development: means development that meets the needs of the present generation without compromising the ability of future generations to meet their needs by maintaining the carrying capacity of the supporting ecosystem.

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EXECUTIVE SUMMARY

The proposed Project will involve construction of Jabali Towers which entails mixed-use high-rise development. The project will be located on L.R. No. 28867/1, Parcel No: 1AA-B11 and covers an approximate area of 9518 m^2. The land is held under leasehold ownership by the Proponent (ownership documents attached).

This Environmental and Social Impact Assessment study report provides relevant information and an environmental consideration for Jabali Towers proposed project with intention to seek approval from National Environment Management Authority (NEMA); The approximate GPS Co-ordinates for the Project site Latitude 1.0901 and Longitude 36.5419 at Tatu Central, within the Central Business District (CBD) of Tatu City in Ruiru, Kiambu County.

There is a need/ demand for modern, high-quality commercial, residential, and mixed-use spaces within Tatu City—which it is a the fastest-growing urban and economic nodes in the Nairobi Metropolitan region.

The project is consistent with Tatu City's masterplan, which emphasizes sustainable land use, compact development, and the establishment of a functional Central Business District (CBD) capable of supporting diverse commercial and residential activities. By providing modern high-rise space, Jabali Towers will support ongoing economic diversification within the SEZ and enhance the competitiveness of Tatu Central as a premier business address.

It is worthwhile to note that the proposed project is in line with The Sustainable Development Goal number 11: Sustainable Cities and Communities: Making urban areas safe and sustainable.

Technological progress is also key to finding lasting solutions to both economic and environmental challenges, such as providing new jobs and promoting energy efficiency.

In conformity with the Environmental Management and Coordination Act 2015 and the Environmental (Impact Assessment and Audit) regulations, 2003 contained in the Kenya gazette supplement No. 56, legislative supplement No. 31 Legal notice No. 101 of 13th June, 2003, the project Proponent has appointed NEMA certified experts, Kogaso Consultants Limited Bespoke Solutions to carry out an Environmental and Social Impact Assessment of the project and prepare a related project report.

For a long time, the world through policy makers directed all the efforts in economic development without due regard to the resource base on which the economic development depends on. As a result, there has been unprecedented environmental degradation due to lack of environmental conservation resulting to unsustainable development. More recently investors and developers, spurred on by regulators world over, have recognized the need for change in order to safeguard the environment.

The proposed development will be equipped with adequate service and utility infrastructure to ensure the safety, health and welfare of the occupants and utmost environmental protection and conservation

within and outside the premises e.g. connection to the existing Kenya Power & Lighting Company (KPLC) Plc mains, preferably water from Nairobi Water and Sewerage Company serving the general area backed by an underground water storage tank, Nairobi Water and Sewerage Company to manage liquid waste, central waste collection point protected from adverse weather and scavengers, parking space, masonry perimeter fence and a gate with a guard house to design for assured maximum security to the occupants. Parking lot and generator will also form part of the utilities.

The proposed design constitutes:

The Master plan includes:

1. Tower A
2. Tower B
3. Hotel
4. Office
5. residential
6. Playground
7. eat street plaza
8. Passage
9. Pool
10. Retail units

The proposed residential apartments will include:

- 49 sqm Studios
- 83 sqm 1 BR
- 106 sqm 2 BR Standard (Master Ensuite)
- 124 sqm 2 BR All Ensuite
- 168 sqm 3 BR Standard (Master Ensuite)
- 217 sqm 3 BR All Ensuite
- 258 sqm 3 BR All Ensuite plus DSQ
- 251 sqm 3BR Duplex

APARTMENT TYPE	TOTAL	PARKING NOS.
STUDIO	**85**	**0**
1 BR	**94**	**0**
2 BR	**125**	**125**
3 BR	**49**	**74**
4 BR	**4**	**8**

Duplex	**12**	**24**
Penthouse	**4**	**12**
S. Penthouse	**1**	**5**
TOTAL	**374**	**247**

The proposed Amenities will include:

1. Concierge Services
2. Residents Graden
3. Infinity pool
4. Fitness club
5. Co-working space
6. Business lounge
7. Shops
8. Valet parking
9. Restaurant and bar
10. Art gallery
11. Banks
12. Kids play area

To mainstream environmental aspects in the development agenda in Kenya, EMCA Cap 387 made it a legal requirement for all the projects involving the activities listed in the Second Schedule of the Act to undertake ESIA prior to commencement. The guiding principle being environmental concerns need to be part of the planning and development process and not an afterthought. In the spirit of sustainable development and also avoid unnecessary conflicts that retard development in the Country, the Proponent undertook this ESIA and incorporated environmental concerns as advised by the Authority.

This ESIA Study Report has therefore identified possible environmental impacts that could arise as a result of the proposed development, assessed them, suggested measures of intervention to curb or minimize the negative impacts and developed an environmental management plan (EMP) to guide all along the proposed Project phases namely construction phase, operation phase and decommissioning phase.

Basically, ESIA is a tool for environmental conservation and has been identified as a key component in new project implementation. Section 58(1) of EMCA Cap 387 require a proponent of any of the project listed in the Second Schedule of the Act to submit a Study Report to the Authority, in the prescribed form, giving the prescribed information and which shall be accompanied by the prescribed fee prior to commencement. Infrastructures e.g., the aforementioned should be subjected to the ESIA

process. It was therefore necessary for the Proponent to contract services of environmental experts herein referred to as the Consultant to subject the proposed Project to the ESIA process and compile a report for decision making and legal compliance. The Report of the same must be submitted to National Environment Management Authority (NEMA) for approval and issuance of ESIA license. This was necessary as many forms of developmental activities cause damage to the environment and hence the greatest challenge today is to maintain sustainable development without interfering with the environment.

The scope of the assessment covered all the Project phases namely construction, operational and decommissioning which included site clearance, excavation works, masonry works, structural works, roofing, plumbing and installation of service lines as well as the utilities required by the facility. The Consultant on behalf of the Proponent conducted the ESIA by incorporating but not limited to the following terms of reference (TOR): location of the proposed Project; a concise description of the national environmental legislative and regulatory framework; baseline information and any other relevant information related to the study area; the technology, procedures and processes to be used in the implementation of the project; the materials to be used in the construction and implementation of the project; the by-products, products and waste to be generated by the project; a description of the potentially affected environment; the environmental effects of the project including the social and cultural effects and the direct, indirect, cumulative, irreversible, short-term and long-term effects anticipated; to recommend a specific environmentally sound and affordable wastewater management system; analysis of alternatives including project site, design and technologies; develop an EMP proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment, including the cost, timeframe and responsibility to implement the measures; provide an action plan for the prevention and management of the foreseeable accidents and hazardous activities in the cause of carrying out development activities; propose measures to prevent health hazards and to ensure security in the working environment for the employees, students and for the management in case of emergencies; an identification of gaps in knowledge and uncertainties which were encountered in compiling the information and; an economic and social analysis of the project.

Since the reference site is located within an area with no rich natural resources which could be adversely affected by the proposed Project activities and noting that the intended development is in keeping with the surrounding area, an ESIA Study Report was considered. The general steps followed during the assessment were as follows: environment screening, in which the project qualified for an ESIA on the basis of the anticipated impacts; environmental scoping that provided the key environmental issues and development of TOR; desktop studies and interviews; physical inspection of the site and surrounding areas; ESIA public participation via the use of a structured questionnaire and; report writing.

Despite the fact that the proposed Project will be a long term investment for the Proponent whereby it will generate income to further the Proponent's mission to mankind, other positive impacts will as well come along with the project such as: promote the education sector, creation of employment, gains in

the county and national economy, creation of market for building materials, optimal use of land among others as has been exhaustively outlined within the report.

Negative impacts are as well likely to occur within the project cycle. They have been identified according to the respective project phases. The construction phase key negative biophysical, health, safety and socio-economic impacts from the proposed Project will include: extraction and use of building materials leading to negative impacts on their availability and sustainability; pressure on the existing service infrastructure e.g. roads, solid and liquid waste facilities, electricity and water; risks of accidents and injuries to construction workers; increased soil erosion and sediment release at the project site and surrounding areas; dust emissions resulting from construction machinery, fitting works; exhaust emissions from trucks transporting materials; noise and vibration caused by heavy trucks, and construction machinery; hydrology and water quality degradation amongst others.

The main roads leading to the site area will serve the additional vehicles used for the transportation of materials, equipment and staff to the site. Heavy trucks will not only have the risk of causing accidents due to their limited manoeuvrability but also place added pressure on the roads and can lead to failure (cracks and potholes). This failure is however a combination of factors including: The total of trips of heavy trucks and the strength of the roads in context of carrying the heavy loads.

Operational phase related key negative environmental impacts of the proposed Project will include: solid waste generation, liquid waste generation, increased demand for sanitation, high levels of energy consumption, high levels of water use, increased storm water flow and, risks of occupational accidents e.g. fire outbreak.

Decommissioning phase key negative environmental impacts of the proposed Project will include: generation of large quantities of demolition waste, dust emissions during demolition works, noise and vibration during demolition works among others.

To mitigate the anticipated negative impacts associated with the proposed Project, the Proponent shall put in place adequate measures which shall include: dust emissions will be controlled by the watering all active construction areas as required; covering all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard; paving; applying water when required or applying (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.

The following noise-suppression techniques will be employed to curb 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); co-ordinate with relevant agencies regarding all construction activities in the area; install sound barriers where applicable; limit pickup trucks and other small equipment to an idling time of a reasonable period, observe a common-sense approach to vehicle use, and encourage workers to shut off vehicle engines whenever possible; strictly adhere to the provisions of the Environmental

Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 regarding environmental noise production limits, and strictly adhere to the provisions of the Factories and Other Places of Work (Noise Prevention and control) Rules, 2005 regarding workplace noise production limits.

Exhaust emissions shall be controlled through the following measures during the construction phase: vehicle idling time shall be minimized; alternatively, fuelled construction equipment shall be used where feasible; equipment shall be properly tuned and maintained amongst other feasible measures.

Adequate measures shall be put in place to down scale the impacts that are likely to lead to hydrology and water quality degradation. The Proponent will prepare a hazardous substance control and emergency response plan that will include preparations for quick and safe clean-up of accidental spills. It will prescribe hazardous materials handling procedures to reduce the potential for a spill during construction, and will include an emergency response programme to ensure quick and safe clean-up of accidental spills. The plan will identify areas where refuelling and vehicle maintenance activities and storage of hazardous materials, if any, will be permitted.

Construction activities may result in a significant increase in movement of heavy vehicles for the transport of construction materials and equipment increasing the risk of traffic-related accidents and injuries to workers and local communities. The incidence of road accidents involving project vehicles during construction should be minimized through a combination of education and awareness-raising, and the adoption of procedures. Rapid onsite construction so as to reduce duration of traffic interference and therefore reduce emissions from traffic delays; Work planning shall be undertaken to reduce time spent by the trucks delivering materials to the site and when traffic is low; Traffic control will be developed and implemented and there will be a traffic marshal. Maintaining clear traffic ways to avoid driving of heavy equipment over loose scrap, Ensure Installation and maintenance of all construction signs, signals, markings, and other devices used to regulate traffic, including posted speed.

Adequate waste collection and temporary storage on site prior to transportation to a designated disposal site for such shall be ensured. Further, covers for refuse containers and appropriate personal protective equipment (PPE) to the responsible staff shall be provided by the Proponent. The Proponent shall ensure strict adherence to the provisions of the Environmental Management and Co-ordination (Waste Management) Regulations, 2006 when it comes to solid waste management and the Environmental Management and Co-ordination (Water Quality) Regulations, 2006 as it regards liquid waste management.

To curb workplace incidents (occupational diseases, accidents, near miss, and dangerous occurrence), the Proponent will strictly adhere to the provisions of the Occupational Safety and Health Act (OSHA), 2007 and the Public Health Act (Cap. 242).

The Proponent shall be committed to putting in place adequate measures to mitigate the negative environmental, safety, health and social impacts associated with the life cycle of the proposed Project.

It is recommended that in addition to this commitment, the Proponent shall focus on implementing the measures outlined in the EMP as well as adhering to all relevant national and international environmental, health and safety standards, policies and regulations that govern establishment and operation of such projects.

The Proponent having proved financially and environmentally credible, the Consultant hereby recommends the proposed Project for approval on condition that the mitigation measures outlined in this report shall be adhered to and the EMP shall be implemented to the extent practicable.

CONCLUSION

The EIA experts note that the proposed project is well conceived and is in line with the proponent's sustainability strategy in adhering to Sustainable Development Goals (SDGs), the Government's Vision 2030. Accordingly, as per part 11 section 10 (2) of the Legal Notice No. 101 on the Environmental (Impact Assessment and Audit) Regulations, 2003, we recommend that the project be granted an EIA license.

In conclusion, results from ESIA Study show that the proposed project will have numerous positive socio-economic impacts as outlined earlier. However, the negative environmental impacts resulting from establishment of the facility are mitigate-able. Therefore, implementation of the Environmental Management Plan will assist in dealing with environmental issues during the project cycle. There are also guidelines for addressing environmental health and safety.

This project is recommendable for approval by the National Environment Management Authority (NEMA) for the issuance of an EIA license subject to periodic monitoring and evaluation from the day of commencing construction operations and decommissioning phases, as long as the set standards, measures and regulations are thoroughly upheld and adhered to. This will be in compliance with the Environmental Management and Coordination Act of 1999 (Amended 2015) and the Environmental Impact Assessment and Audit regulations, 2003.

1 INTRODUCTION

1.1 Background and Rationale for an Environmental Impact Assessment

Tatu City is a 5,000-acre master-planned mixed-use urban development designated as a Special Economic Zone (SEZ) within Ruiru Sub-County, Kiambu County. The development is structured to integrate commercial, residential, institutional, industrial, and recreational land uses within a controlled, serviced, and sustainably managed urban environment. Tatu City is supported by modern utility networks including internal road systems, ICT infrastructure, power distribution networks, water supply, and wastewater management systems designed to meet international planning and environmental standards.

Tatu City hosts homes, schools, offices, a shopping district, medical clinics, nature areas, a sport & entertainment complex and manufacturing area for more than 250,000 residents and tens of thousands of day visitors. Schools and businesses are already open at Tatu City, and a range of homes suit all incomes.

The city's SEZ status provides regulatory and operational incentives such as simplified compliance processes, dedicated utility corridors, and preferential taxation frameworks, thereby enhancing its attractiveness for high-density commercial and residential developments such as the proposed Jabali Towers Project.

Tatu City is approximately 24–30 km from Nairobi CBD depending on the access route used. Travel time typically ranges between 35 to 60 minutes, influenced by traffic conditions along Thika Superhighway and surrounding connecting roads. The development is also accessible to Jomo Kenyatta International Airport (JKIA), with travel times generally ranging from 45 minutes to 1 hour, depending on the time of day and traffic flow.

The long-term planning vision of Tatu City is to ease pressure on Nairobi's congested urban core by providing a well-structured, efficiently managed, and sustainably designed alternative urban node.

In line with the above, Tatu City herein referred to as the proponent has proposed development of Jabali Towers which entails mixed-use high-rise development. The project will be located on L.R. No. 28867/1 and covers an approximate area of 9518 m^2. The land is held under leasehold ownership by the Latitude 1.0901 and Longitude 36.5419 at Tatu Central, within the Central Business District (CBD) of Tatu City in Ruiru, Kiambu County.

The proposed mixed-use development at Tatu City will contribute to the socio-economic growth of the area by supporting the provision of quality services and amenities in line with the Government's development and urbanization policies. The project will optimize land use and enhance land utility in accordance with the approved local physical planning framework and the Tatu City Master Plan.

During the construction and operational phases, the project will generate employment opportunities for skilled and unskilled labour. It will also create a market for goods and services, including

construction materials, machinery, professional services, and labour. In addition, secondary businesses are likely to emerge during the construction phase, particularly small-scale enterprises providing food, beverages, and other support services to construction workers, thereby boosting the local economy.

1.2 Rationale of the Environmental Impact Assessment

Environmental and social considerations are an integral part of sustainable planning and development and should be addressed at the early stages of project design rather than as an afterthought. In this regard, the Proponent has subjected the proposed mixed-use development at Tatu City to the Environmental and Social Impact Assessment (ESIA) process in compliance with the provisions of the Environmental Management and Co-ordination Act (EMCA), Cap 387, and the Environmental (Impact Assessment and Audit) Regulations.

Given the scale, nature, and location of the proposed project, the preparation and implementation of an Environmental and Social Management Plan (ESMP) is mandatory. The project is expected to generate solid waste and liquid effluents across the construction, operation, and decommissioning phases. In addition, the presence of workers and users within the development may give rise to occupational health and safety risks, while construction and operational activities are anticipated to result in noise, dust, smoke, and gaseous emissions.

The ESIA process therefore provides a structured framework for identifying potential environmental and social impacts, proposing appropriate mitigation measures, and establishing an effective environmental and social management and monitoring plan. This will ensure that the project is implemented in an environmentally sound, socially acceptable, and sustainable manner, without posing undue risk to any component of the biophysical or socio-economic environment within Tatu City and its environs.

1.3 Principles of ESIA

The main principles of ESIA for the proposed project are:

1. **Early integration in planning:** Environmental and social considerations are incorporated at the project planning and design stage to avoid or minimize adverse impacts.

2. **Sustainability:** The project promotes sustainable use of environmental resources while balancing social and economic development.

3. **Prevention and precaution:** Potential impacts are anticipated and prevented or minimized through appropriate mitigation measures.

4. **Public participation:** Stakeholder engagement is ensured to incorporate views and concerns of affected and interested parties.

5. **Compliance with legal and policy frameworks:** The ESIA adheres to EMCA Cap 387, relevant regulations, and applicable national and local development plans.

6. **Transparency and accountability:** The assessment process is conducted openly, with clear documentation and reporting of findings.

7. **Continuous monitoring and improvement:** Environmental and social performance is monitored throughout the project lifecycle, with corrective actions implemented where necessary.

1.4 TOR for the ESIA process

The screening process qualified the proposed project as a form of development that would impact the surrounding environment hence the need of an ESIA. It was therefore necessary for the proponent to contract services of the Consultant to undertake an ESIA with a view of establishing the likely impacts and point out the required mitigation measures to address them.

The ESIA included the necessary specialist studies to determine the environmental impacts relating to the biophysical, health and safety and socio-economic aspects and to determine the issues or concerns from the relevant authorities and interested and/or affected parties. The appropriate measures to ensure co-existence of the proposed development with other social and economic activities in the area are provided as part of the EMP.

The scope of the assessment covered construction works of the proposed development which included excavation works, masonry works, concrete works, structural & steel works, plumbing and installation of service lines as well as the utilities required by the project; operation phase activities and; the decommissioning phase activities. The output of this work was a comprehensive ESIA project report to assist the proponent in decision making and legal compliance. The Consultant on behalf of the proponent conducted the ESIA by incorporating but not limited to the following TOR:

a) Location of the proposed project.
b) A concise description of the national environmental legislative and regulatory framework, baseline information, and any other relevant information related to the project.
c) The objectives of the proposed project.
d) The technology, procedures and processes to be used, in the implementation of the project.
e) The materials to be used in the construction and implementation of the project.
f) The products, by-products and waste to be generated by the project.
g) A description of the potentially affected environment.
h) The environmental effects of the project including the social and cultural effects and the direct, indirect, cumulative, irreversible, short-term and long-term effects anticipated.
i) To recommend a specific environmentally sound and affordable wastewater management system.
j) Provide alternative technologies and processes available and reasons for preferring the chosen technology and processes.
k) Analysis of alternatives including project site, design and technologies.

l) Develop an EMP proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment, including the cost, timeframe and responsibility to implement the measures.
m) Provide an action plan for the prevention and management of the foreseeable accidents and hazardous activities in the cause of carrying out development activities.
n) Propose measures to prevent health hazards and to ensure security in the working environment for the employees, students and for the management in case of emergencies.
o) An economic and social analysis of the project.
p) Consultant to submit the ESIA project report to NEMA for review.

1.5 Purpose of the Report

The purpose of this Environmental and Social Impact Assessment (ESIA) study report is to evaluate the potential environmental and social impacts associated with the proposed project and to ensure that environmental and social considerations are fully integrated into project planning and decision-making. The report documents the baseline conditions of the project area, identifies and assesses anticipated impacts during the construction, operation, and decommissioning phases, and proposes appropriate mitigation and enhancement measures.

In addition, the report provides an Environmental and Social Management and Monitoring Plan (ESMMP) to guide the implementation of mitigation measures and ensure compliance with the Environmental Management and Co-ordination Act (EMCA) Cap 387 and relevant regulations. The report is submitted to the National Environment Management Authority (NEMA) to inform review, approval, and licensing of the proposed project to Tatu City.

1.6 Scope, objective and criteria of the ESIA

1.6.1 Scope of the ESIA

The Kenya Government policy on all the new projects listed in the Second Schedule of the Act require that an ESIA be carried out at the planning stages of the proposed undertaking to ensure that significant impacts on the environment are taken into consideration during the design, construction, operation and decommissioning of the project. The scope of this ESIA is limited to the provisions of the Environmental (Impact Assessment and Audit) Regulations, 2003 and her 2016 and 2019 amendments and therefore covered:

a) The objective and nature of the proposed project supported by design and plan drawn to scale and signed by an Engineer;
b) The location of the proposed project including proof of land ownership, any environmentally sensitive area to be affected, availability of supportive environmental management infrastructure, and conformity to land use plan or zonation plan;
c) Baseline information and any other relevant information related to the study area;

d) A concise description of the national environmental legislative and regulatory framework, baseline information, and any other relevant information related to the proposed project;
e) Evidence of comprehensive public consultation including duly signed minutes of consultation meetings with project affected persons and key stakeholders, attendance lists and filled questionnaires;
f) Analysis of alternatives including project site, design and technologies;
g) Potential environmental and social impacts of the proposed project;
h) The mitigation measures to be taken during and after implementation of the proposed project;
i) EMP for the entire project lifecycle; and
j) Consultant to submit the ESIA Project Report to National Environment Management Authority (NEMA) for consideration and make the necessary follow up including collection of the ESIA license.

1.6.2 Objective of the ESIA

1.6.2.1 Overall objective of the ESIA

The main objective of this ESIA was to establish the baseline conditions of the proposed site; evaluate the existing and the anticipated impacts and propose measures to enhance the positive impacts and measures to reduce the effects of the negative impacts. The key goal is to enhance a cleaner and sustainable environment during implementation and operation phases of the proposed project.

The main objective of the assignment was to assist the proponent to prepare a project report after carrying out an Environmental and Social Impact Assessment of the proposed development to ensure that appropriate measure to mitigate any adverse impact to the environment are taken into consideration. The Environment Impact Assessment carried out on the project identified existing and potential environmental impacts and possible concerns that interested and/or affected parties have with the development, as well as the associated prevention and mitigation measures for the negative impacts as stipulated in the environmental Management Plan (EMP) proposed.

1.6.2.2 Specific objectives of the ESIA

This objective is based on ensuring that environmental concerns are integrated in the proposed project activities in order to contribute to an overall sustainable development. Other objectives considered in this project report include:

a) To identify potential environmental impacts of proposed project; both positive and negative.

b) To assess the significance of these impacts to the environment and other stakeholders.

c) To assess the relative importance of the impacts of alternative plans to the proposed project.

d) To propose mitigation measures for the significant negative impacts of the proposed project on the environment and all involved stakeholders.

e) To propose measures that will enhance the positive impacts of the proposed project to the environment and all involved stake holders.

f) To generate baseline data for monitoring and evaluation of how well the mitigation measures are being implemented during the proposed project cycle;

g) To present information on the impact of alternatives;

1.6.3 Criteria of the ESIA

The criteria of undertaking ESIAs in Kenya as per the EMCA framework is provided in the Environmental Impact Assessment and Audit Regulations (2003), Environmental Impact Assessment and Audit (Amendment) Regulations (2016), and Environmental Impact Assessment and Audit (Amendment) Regulations (2019) as read together with NEMA's Public Notice on Processing of EIA Reports dated 12th March 2020.

1.6.3.1 Data collection procedures

First, the Consultant undertook environmental screening and scoping to avoid unnecessary data. The data collection was carried out through a predesigned checklist, a predesigned public participation questionnaire, observation, photography, site visits and desktop environmental studies, where necessary in the manner specified in the Environmental (Impact Assessment and Audit) Regulations, 2003.

1.6.3.2 ESIA organization and structure

The proposed Project fall under the Second Schedule of the Act as per L.N No. 31 in Kenya Gazette Supplement Number 62 dated 30th April, 2019 which require an ESIA. As stipulated by L.N No. 101, 2003, Part V, Section 31 (3((a) (i) and (ii) it is required that an EIA be undertaken to provide baseline information upon which subsequent environmental control audit shall be based. Regulation 10(1) of the principal Regulations read together with Regulation 3 of the 2016 amendments, "On determination of the Project Report, the decision of the Authority together with the reasons thereof shall be communicated to the proponent within forty-five days of the submission of the Project Report. The Consultant coordinated the day-to-day functions and any related institutional support matters. Otherwise, all formal communications were directed to NEMA through the Proponent.

1.6.3.3 Reporting and documentation

The ESIA Project Report from the findings was compiled in accordance with the guidelines issued by NEMA for such works and was prepared and submitted to NEMA for consideration. The Consultant ensured constant briefing of the Proponent during the exercise.

1.6.4 Responsibilities and undertaking

The Consultant undertook to meet all logistical costs relating to the assignment, including those of production of the report and any other relevant material. The Consultant arranged for own transport and travels during the exercise. On the site of the proposed project, the proponent provided a contact person(s) to provide information required by the consultant. The proponent also provided site plan(s) showing roads, service lines, buildings layout and the actual sizes of the sites, details of raw materials, proposed process outline and anticipated by-products, future development plans, operation permits and conditions, land-ownership documents and site history.

The output from the consultants includes the following: -

- An Environmental and Social Impact Assessment study report comprising of an executive summary, study approach, baseline conditions, anticipated impacts and proposed mitigation measures,
- An Environmental Management Plan outlines and also forms part of the report recommendations.

1.6.5 Methodology outline

The ESIA is being undertaken in fulfilment of the Environmental Management Coordination Act of 1999 and 2015 (EMCA) Schedule II that identifies projects that require an Environmental and Social Impact Assessment (ESIA) to be conducted prior to the commissioning/operation in order to identify the potential adverse impacts of a project and thereby devise appropriate mitigation measures. The ESIA is also aligned to the relevant IFC Performance Standards on Environmental and Social Sustainability, 2012.Since the targeted site was located within an area with rich natural resources which could be adversely affected by the project activities, and noting that the intended development and use of the facility will be in line with what suits the area, an ESIA Project Report was settled at. The general steps followed during the assessment were as follows:

- Environment screening, in which the project was identified as among those requiring an EIA as per Section 58 (1) of EMCA Cap 387,
- Environmental scoping that provided the key environmental issues and development of TOR,
- Desktop studies,
- Physical inspection of the site and surrounding areas,
- Public participation, and
- Reporting.

1.6.5.1 Environmental screening

Screening involved determining whether or not an ESIA is required for a particular development activity. This depends on the significance of the project's environmental impacts. The significance itself depends on such factors as: the sensitivity of the area likely to be affected; public health and safety; the possibility of uncertain, unique or unknown risks; the possibility of having individually

insignificant but cumulatively significant impacts; whether the proposed activity affects protected areas, endangered or threatened species and habitats; size, working methods, project activities including their duration and proposals for waste disposal etc.

This is the initial phase in the ESIA process. The screening exercise usually involves the following steps:

1. Project and site description
2. Collection of baseline data
3. Data analysis
4. Evaluation of significance of environmental impacts
5. Evaluation of alternatives
6. Consultation and public participation;
7. Preparation of a project report;
8. Review of project report and
9. Approval process

Section 58 (2) of the principal Act require a proponent of a project to undertake or cause to be undertaken at his own expense and environmental impact assessment and prepare a report thereof where the Authority, being satisfied, after studying the project report submitted under subsection (1), that the intended project may or is likely to have or will have a significant impact on the environment, so directs.

The Environmental Management and Co-ordination (Amendment) Act, 2015 Sec 43, amended Section 58 of the principal Act (2), The proponent of any project specified in the Second Schedule (3,4,10,12) shall undertake a full environmental impact assessment and submit an environmental impact assessment report to the Authority prior to being issued with any license by the Authority:

Based on the considerations above the project requires an Environmental Impact Assessment.

1.6.5.2 Environmental scoping

The scoping process helped narrow down into the most critical issues requiring attention during the assessment. Environmental issues were categorized into physical, natural/ecological and social, economic and cultural aspects.

1.6.5.3 Desktop study

This included documentary review on the nature of the proposed activities, project documents, designs, policy and legislative framework as well as the environmental setting of the area among others. It also included discussions with proponent representatives as well as interviews with neighbours.

1.6.5.4 Site assessment and public participation

Field visits were meant for physical inspections of the site characteristics and the environmental status of the surrounding area to determine the anticipated impacts. To ensure adequate public

participation in the ESIA process, a predesigned questionnaire was administered to the project site neighbours and the information gathered was subsequently synthesized and incorporated into the ESIA Project Report. There was also a public baraza where they signed an attendance sheet and the inputs of the respondents are compiled in the minutes of the baraza meetings.

1.6.6 Stakeholder Engagement

Stakeholder Engagement ensures that the views and concerns of stakeholders (including the community) are incorporated as early as possible into the project development, i.e., at the planning, implementation and operations phase, to minimise any potential unexpected opposition to the proposed development, and potential adverse effects to the environment. Incorporating the views of the stakeholders into the design process is also very beneficial for adopting the best workable models and systems.

The main objective of the Stakeholder Engagement is to inform stakeholders and the public about the proposed project and its likely effects, and in turn incorporate their inputs, views and concerns into project planning

1.6.7 Reporting

In addition to constant briefing of the Proponent, this ESIA Study was prepared. The contents were approved for submission to NEMA as required under the law.

1.7 Proposed project justification

The proposed mixed-use development at Tatu City is justified by its alignment with national, county, and local development objectives, as well as the Tatu City Master Plan. The project supports sustainable urban development by optimizing land use through an integrated mix of residential, commercial, and support facilities within a planned urban environment.

The development will contribute to economic growth by creating employment opportunities during the construction and operational phases and by stimulating demand for goods and services from local and national suppliers. It will also enhance the availability of modern infrastructure and amenities, thereby improving the quality of life for residents, workers, and visitors within Tatu City.

From an environmental and planning perspective, the project promotes orderly development in a designated mixed-use zone, reducing urban sprawl and pressure on undeveloped areas. Through the implementation of proposed mitigation measures and adherence to the Environmental and Social Management and Monitoring Plan (ESMMP), potential environmental and social impacts will be effectively managed, making the project environmentally sustainable, socially acceptable, and economically viable.

2 PROJECT DESCRIPTION

2.1 Introduction

2.2 Site ownership

The project site is held under leasehold tenure by the Proponent, as evidenced by the ownership documents attached to this report. The parcel of land covers an approximate area of 9,518 m², which is adequate to accommodate the proposed development and its associated infrastructure.

2.3 Location and current status of the proposed site

The proposed project site is located within Tatu City approximately Latitude 1.0901 and Longitude 36.5419 at Tatu Central, within the Central Business District (CBD) of Tatu City in Ruiru, Kiambu County on L.R. No. 28867/1, Parcel No: 1AA-B11. The site lies within a planned urban zone that is supported by established infrastructure, including access roads, water supply, sewerage, electricity, and storm water drainage, in accordance with the Tatu City Master Plan.

Currently, the site is undeveloped and reserved for development in line with the approved land use zoning. There are no permanent structures on the site, and the land is generally clear, making it suitable for the proposed mixed-use development. The surrounding area comprises ongoing and completed developments consistent with the planned urban character of Tatu City.

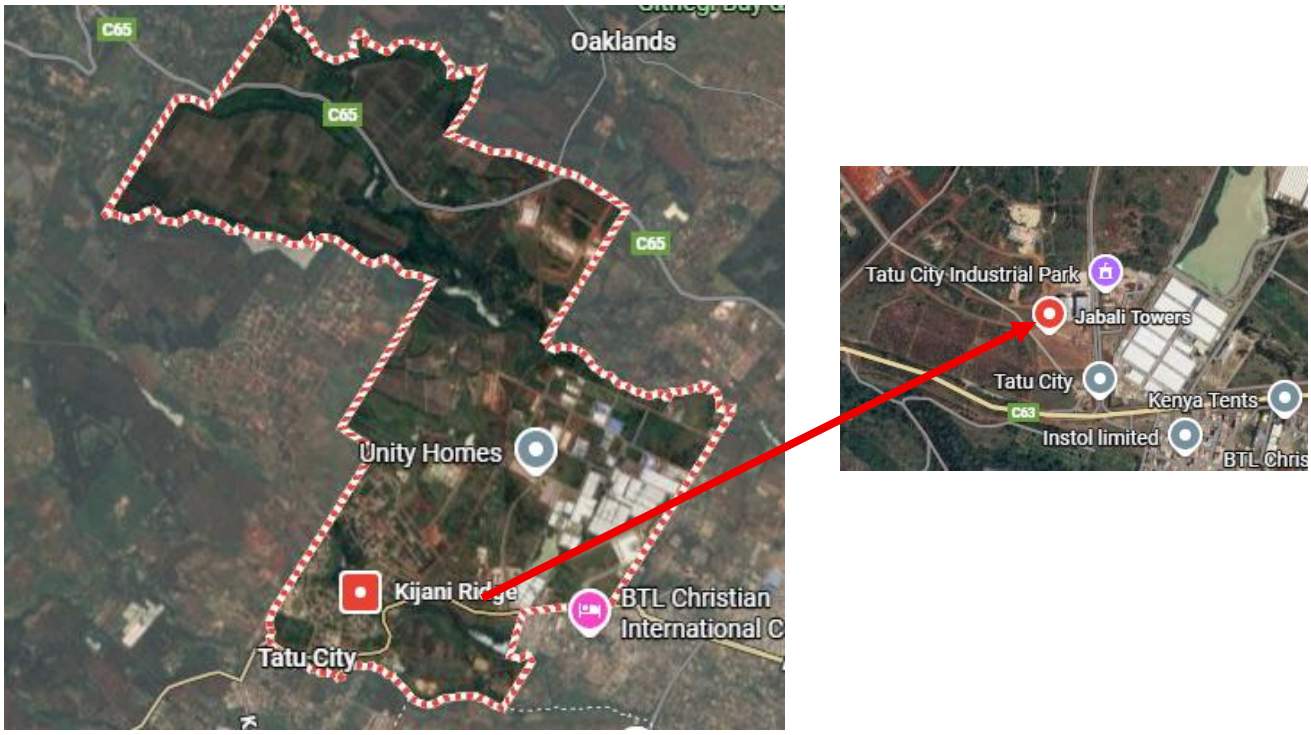


Figure 2-1: Google map extract of Tatu City where the project will be developed

2.4 Conformity to land use/zonation plan

The proposed Jabali Towers project site is located within Tatu Central, Tatu City, Ruiru Sub-County, Kiambu County, an area zoned for high-rise mixed-use development in accordance with the Tatu City

Master Plan. The site is generally gently sloping to fairly flat and is characterized by red volcanic soils with good bearing capacity, making it suitable for the proposed development.

The area is served by a natural drainage system capable of effectively handling surface runoff and stormwater. The site's terrain and soil conditions support high-rise construction with minimal earthworks and landscaping interventions required. Consequently, the proposed development conforms to the approved land use and zoning requirements and is compatible with the planned urban form and infrastructure framework of Tatu City.

	
Access road from behind the proposed site	Access road from the left side
	
Access road to the site	Access road from the right side and Cascade restaurant
	
Coffee plantation from the back side	Main Tatu City Road that also serves the proposed site
	
Eneo facility that neighbours the proposed site	One stop shops and medical clinic that are also the immediate neighbours

Table 2- 1 :Photographic representation of the access roads around the site and also the immediate neighbors

The surrounding environment includes planned commercial, residential, and institutional developments within Tatu City, in line with the city's master-planned integrated urban design. The immediate neighbours include Eneo which is a Business Process Outsourcing facility and business hub, Medical Clinic, Cascade Restaurant Tatu City and One Stop Shop.

2.5 Major Activities of the Project

The proposed Jabali Towers mixed-use development at Tatu City will involve a series of construction and operational activities, including:

- **Site clearance and preparation:** Removal of vegetation, debris, and any temporary structures to prepare the land for construction.
- **Excavation and earthworks:** Normal soil excavation, filling, and compaction with hardcore to create a stable base for foundations.
- **Foundation and structural works:** Laying of foundation slabs, walling, and other structural components.
- **Finishing works:** Plastering, painting, and other architectural finishes.
- **Landscaping:** Development of green spaces, gardens, and aesthetic elements within the site.
- **Stormwater and drainage construction:** Installation of drainage channels, stormwater management systems, and related infrastructure.
- **Paving works:** Laying of pavement blocks for walkways, driveways, and parking areas.
- **Electrical installations:** Setting up electrical infrastructure, including internal wiring, lighting, and connections to the power grid.
- **Government inspections and certification:** Compliance checks by relevant authorities, including issuance of occupation certificates upon completion.
- **Commencement of occupation:** Use of the development by residents, commercial tenants, and other occupants.

This sequence ensures orderly construction while minimizing environmental and social impacts when implemented alongside the Environmental and Social Management Plan (ESMP).

2.6 The Project Description and Layout Plan

The proposed Jabali Towers will feature two high-rise residential towers, one with 20 floors and the other with 30 floors. The ground levels of the towers will accommodate commercial spaces for retail and business activities.

The Master plan includes:

1. Tower A
2. Tower B
3. Hotel

4. Office
5. Residential
6. Playground
7. Eat street plaza
8. Passage
9. Pool
10. Retail units

The proposed residential apartments will include:

1. 49 sqm Studios
2. 83 sqm 1 BR
3. 106 sqm 2 BR Standard (Master Ensuite)
4. 124 sqm 2 BR All Ensuite
5. 168 sqm 3 BR Standard (Master Ensuite)
6. 217 sqm 3 BR All Ensuite
7. 258 sqm 3 BR All Ensuite plus DSQ
8. 251 sqm 3BR Duplex

APARTMENT TYPE	TOTAL	PARKING NO's.
STUDIO	**85**	**0**
1 BR	**94**	**0**
2 BR	**125**	**125**
3 BR	**49**	**74**
4 BR	**4**	**8**
Duplex	**12**	**24**
Penthouse	**4**	**12**
S. Penthouse	**1**	**5**
TOTAL	**374**	**247**

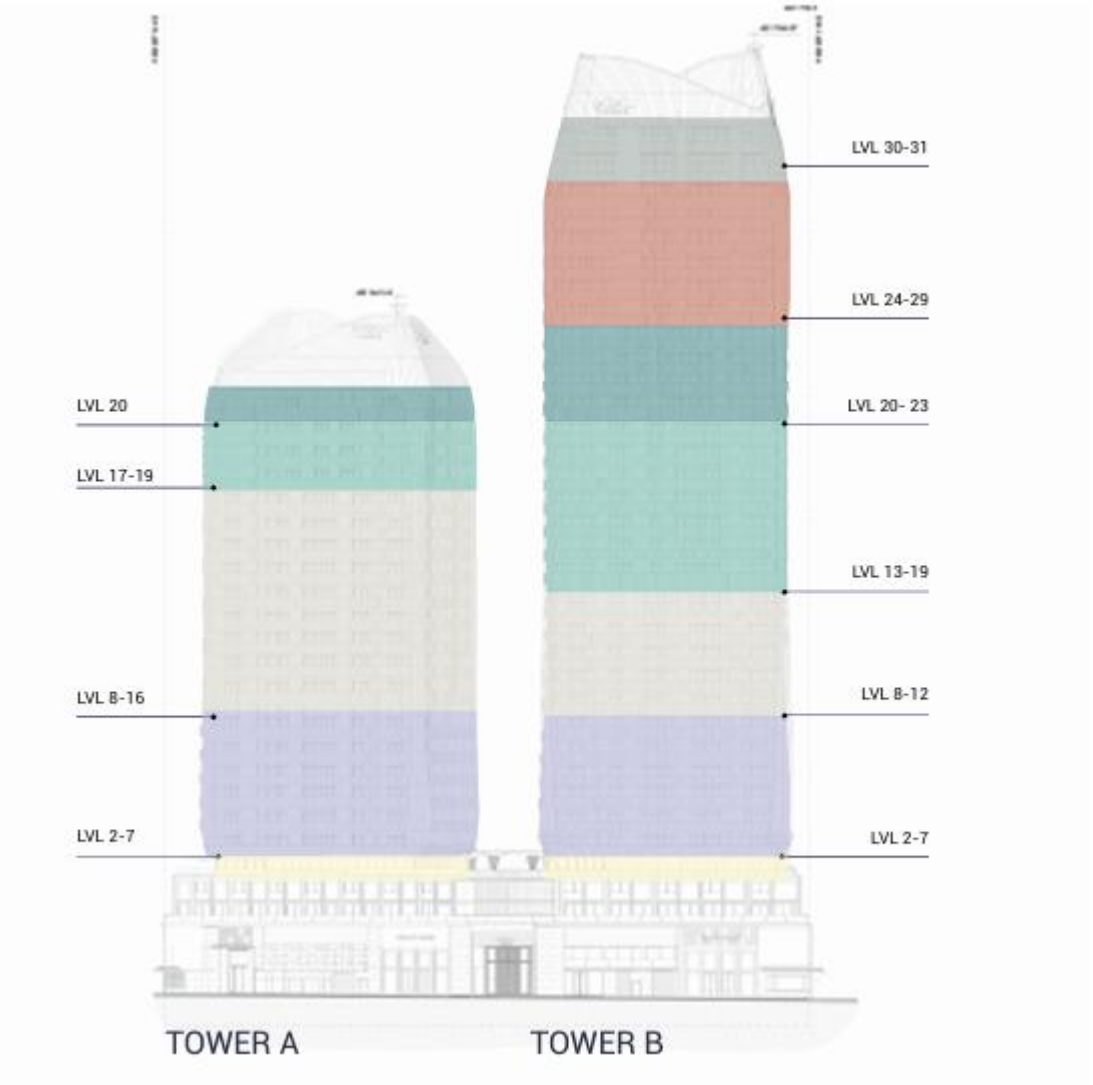


Figure 2-2:Tiers

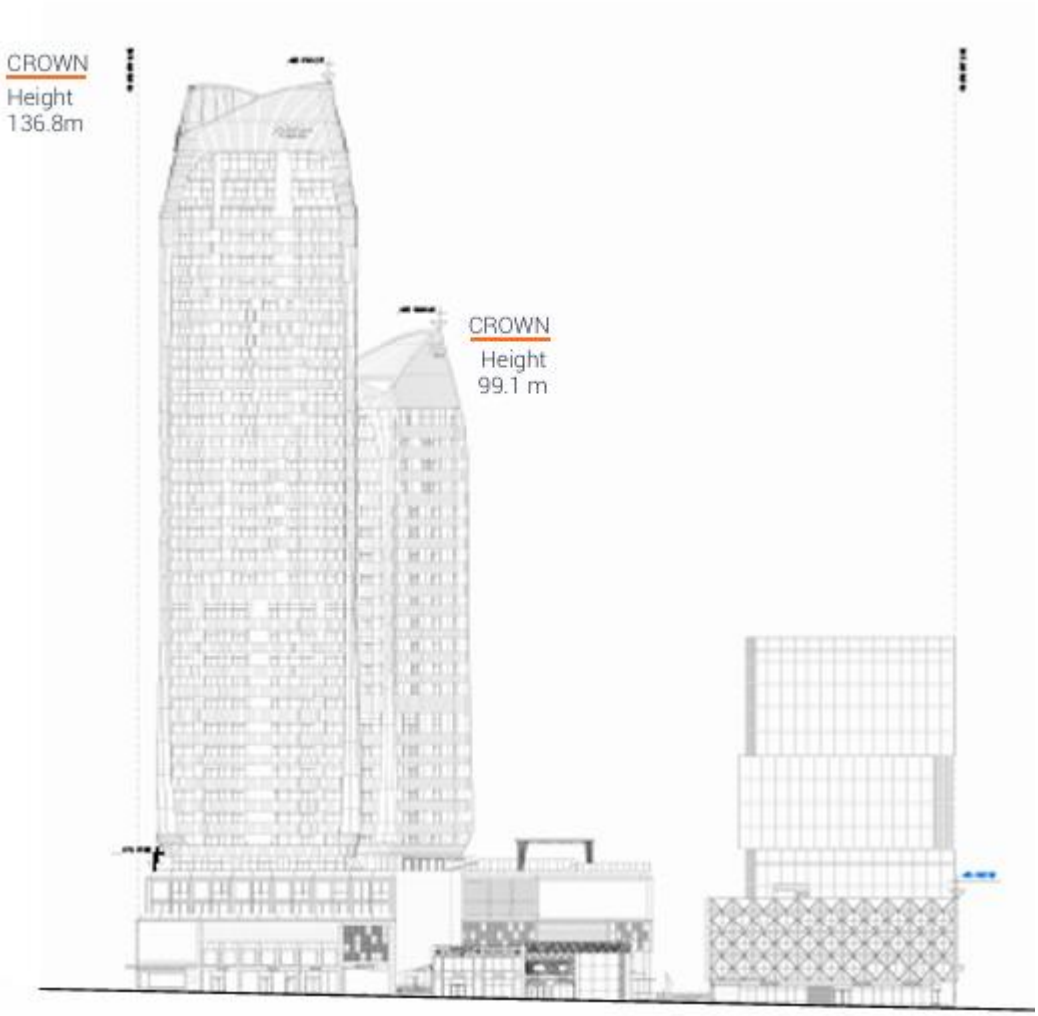


Figure 2-3: Elevations

The proposed Amenities will include:

1. Concierge Services
2. Residents Graden
3. Infinity pool
4. Fitness club
5. Co-working space
6. Business lounge
7. Shops
8. Valet parking
9. Restaurant and bar
10. Art gallery
11. Banks
12. Kids play area

Below are the building Metrics as per at the plan:

LEVEL		Super BUA	Unit	Balcony	Unit	Roof	Unit	BUA	Unit	Sellable	Unit	Efficiency
BASMENT 1	Podium	8056.7	m²									
GROUND FLOOR	Podium	3995.5	m²					1866.4	m²	1385.9	m²	74%
MEZZANINE	Podium	2962.4	m²	23.6	m²			1636.3	m²	1377.5	m²	84%
PODIUM 1	Podium	4536.5	m²									
PODIUM 2	Podium	4447.5	m²	489.0	m²			1304.7	m²	903.5	m²	69%
PODIUM 3	Podium	3997.9	m²	55.1	m²			1080.4	m²	903.1	m²	84%
LVL 1 WITHOUT OFFICE & TOWER	Podium	2740.9	m²			2740.9	m²					
TOTAL		30737.4	m²	567.7	m²	2740.9	m²	5887.8	m²	4570.0	m²	

TOWER A												
LEVEL		SUPER BUA	Unit	BALCONY	Unit	ROOF	Unit	BUA	UNIT	SELLABLE	UNIT	EFFICIENCY
Level 1	Tower A	716.8	m²					509.3	m²	467.4	m²	92%
Level 2	Tower A	926.8	m²	147.1	m²			745.7	m²	524.1	m²	70%
Level 3	Tower A	1008.8	m²	229.1	m²			827.7	m²	524.1	m²	63%
Level 4	Tower A	1008.8	m²	229.1	m²			827.7	m²	524.1	m²	63%
Level 5	Tower A	1008.8	m²	229.1	m²			827.7	m²	524.1	m²	63%
Level 6	Tower A	1008.8	m²	229.1	m²			827.7	m²	524.1	m²	63%
Level 7	Tower A	1008.8	m²	229.1	m²			827.7	m²	524.1	m²	63%
Techanical Level	Tower A	768.5	m²		m²							
Level 8	Tower A	976.6	m²	196.8	m²			795.6	m²	525.7	m²	66%
Level 9	Tower A	976.0	m²	196.2	m²			795.0	m²	525.7	m²	66%
Level 10	Tower A	976.0	m²	196.2	m²			795.0	m²	525.7	m²	66%
Level 11	Tower A	976.0	m²	196.2	m²			795.0	m²	525.7	m²	66%
Level 12	Tower A	976.0	m²	196.2				795.0	m²	525.7	m²	66%
Level 13	Tower A	949.3	m²	169.4	m²			768.3	m²	525.7	m²	68%
Level 14	Tower A	949.3	m²	169.4	m²			768.3	m²	525.7	m²	68%
Level 15	Tower A	949.3	m²	169.4	m²			768.3	m²	525.7	m²	68%
Level 16	Tower A	949.3	m²	169.4	m²			768.3	m²	525.7	m²	68%
Level 17	Tower A	949.3	m²	169.6	m²			768.3	m²	556.6	m²	70%
Level 18	Tower A	932.7	m²	153.0	m²			773.7	m²	556.6	m²	72%
Level 19	Tower A	932.7	m²	153.0	m²			773.7	m²	556.6	m²	72%
Level 20	Tower A	914.9	m²	137.5	m²			774.5	m²	581.1	m²	75%
Level 21	Tower A	907.4	m²		m²	S	m²					
Tower A Roof	Tower A	140.4	m²			140.4	m²					
TOWER A ROOF		20911.2	m²	3564.8	m²	140.4	m²	15554.2	m²	10594.2	m²	

TOWER B												
LEVEL		SUPER BUA	Unit	BALCONY	Unit	ROOF	Unit	BUA	UNIT	SELLABLE	UNIT	EFFICIENCY
Level 1	Tower B	731.9	m²					545.7	m²	528.3	m²	97%
Level 2	Tower B	955.8	m²	173.1	m²			730.2	m²	528.3	m²	72%
Level 3	Tower B	1033.6	m²	253.9	m²			852.5	m²	528.3	m²	62%
Level 4	Tower B	1045.2	m²	265.5	m²			864.2	m²	528.3	m²	61%
Level 5	Tower B	1030.1	m²	250.9	m²			849.6	m²	528.3	m²	62%
Level 6	Tower B	1017.5	m²	237.8	m²			836.5	m²	528.3	m²	63%
Level 7	Tower B	991.9	m²	212.1	m²			810.8	m²	528.3	m²	65%
Level 8	Tower B	978.9	m²	198.8	m²			797.8	m²	527.4	m²	66%
Level 9	Tower B	953.7	m²	173.5	m²			772.6	m²	527.4	m²	68%
Level 10	Tower B	952.5	m²	172.3	m²			771.4	m²	527.4	m²	68%
Level 11	Tower B	951.6	m²	171.5	m²			770.5	m²	527.4	m²	68%
Level 12	Tower B	950.2	m²	170.1	m²			769.2	m²	527.4	m²	69%
Techanical Level	Tower B	768.5	m²									
Level 13	Tower B	949.3	m²	169.6	m²			790.3	m²	557.0	m²	70%
Level 14	Tower B	948.1	m²	168.4	m²			789.1	m²	557.0	m²	71%
Level 15	Tower B	946.1	m²	166.3	m²			787.0	m²	557.0	m²	71%
Level 16	Tower B	946.4	m²	166.7	m²			787.4	m²	557.0	m²	71%
Level 17	Tower B	948.2	m²	168.5	m²			789.2	m²	557.0	m²	71%
Level 18	Tower B	951.8	m²	172.1	m²			792.8	m²	557.0	m²	70%
Level 19	Tower B	950.9	m²	171.2	m²			791.9	m²	557.0	m²	70%
Level 20	Tower B	950.5	m²	171.3	m²			787.0	m²	547.4	m²	70%
Level 21	Tower B	951.7	m²	172.6	m²			788.4	m²	547.4	m²	69%
Level 22	Tower B	950.7	m²	171.4	m²			787.2	m²	547.4	m²	70%
Level 23	Tower B	951.9	m²	172.6	m²			788.4	m²	547.4	m²	69%
Level 24	Tower B	952.2	m²	172.7	m²			786.0	m²	552.7	m²	70%
Level 25	Tower B	953.0	m²	173.6	m²			727.2	m²	499.7	m²	69%
Level 26	Tower B	954.5	m²	175.0	m²			788.3	m²	552.7	m²	70%
Level 27	Tower B	956.0	m²	176.5	m²			730.2	m²	499.7	m²	68%
Level 28	Tower B	958.1	m²	178.6	m²			792.0	m²	552.7	m²	70%
Level 29	Tower B	958.1	m²	178.6	m²			732.3	m²	499.7	m²	68%
Level 30	Tower B	860.7	m²	216.8	m²			720.3	m²	466.7	m²	65%
Level 31	Tower B	787.4	m²	275.5	m²			647.0	m²	350.1		54%
Level 32	Tower B	730.3	m²			589.9	m²					
Tower B Roof	Tower B	140.4	m²			140.4	m²					
Total		31057.5	m²	5697.6	m²	730.3	m²	23972.7	m²			

LEVEL		Super BUA	Unit	Balcony	Unit	Roof	Unit	BUA	Unit	Sellable	Unit	Efficiency
GROUND	Office	**975.8**	**m²**					**529.3**	**m²**	**423.9**	**m²**	**80%**
MEZZANINE (L1)	Office	**1044.3**	**m²**	**88.5**	**m²**			**742.0**	**m²**	**627.7**	**m²**	**85%**
PODIUM 1 (L2)	Office	**1044.3**	**m²**	**55.8**	**m²**			**742.0**	**m²**	**649.5**	**m²**	**88%**
PODIUM 2 (L3)	Office	**1044.3**	**m²**	**101.0**	**m²**			**742.0**	**m²**	**615.0**	**m²**	**83%**
PODIUM 3 (ROOF 1)	Office	**1044.3**	**m²**			**1011.2**	**m²**					
PODIUM 4 (ROOF 2)	Office	**33.2**	**m²**			**33.2**	**m²**					
TOTAL		**5186.1**	**m²**	**245.3**	**m²**	**1044.4**	**m²**	**2755.3**	**m²**	**2316.1**	**m²**	

LEVEL		Super BUA	Unit	Balcony	Unit	Roof	Unit	BUA	Unit	Sellable	Unit	Efficiency
GROUND FLOOR	Retail	393.8	m²					393.8	m²	364.3	m²	93%
MEZZANINE (L1)	Retail	393.8	m²					393.8	m²	346.7	m²	88%
PODIUM 1 (ROOF)	Retail	430.7	m²			430.7	m²					
TOTAL		1044.3	m²	0	m²	430.7	m²	787.6	m²	711.0	m²	

LEVEL	Super BUA	Unit	Balcony	Unit	BUA	Unit	Sellable	Unit	Efficiency
BASEMENT 1	8056.7	m²							
GROUND FLOOR (WITHOUT OFFICE)	3995.5	m²			1866.4	m²	1385.9	m²	74%
MEZZANINE (WITHOUT OFFICE)	2962.4	m²			1636.3	m²	1377.5	m²	84%
PODIUM 1 (WITHOUT OFFICE)	4536.5	m²							
PODIUM 2 (WITHOUT OFFICE)	4447.5	m²	489.0	m²	1304.7	m²	903.5	m²	69%
PODIUM 3 (WITHOUT OFFICE)	3997.9	m²	55.1	m²	1080.4	m²	903.1	m²	84%
RETAIL	1218.3	m²			787.6	m²	711.0	m²	
LEVEL 1 (WITHOUT OFFICE AND TOWERS)	2740.9	m²							
OFFICE	5186.1	m²	245.3	m²	2755.3	m²	2316.1	m²	84%
TOWER A (INCLUDING L1 APARTMENTS)	20911.2	m²	3564.8	m²	15554.2	m²	10594.2	m²	68%
TOWER B (INCLUDING L1 APARTMENTS)	31057.5	m²	5697.6	m²	23972.7	m²	16397.7	m²	68%
TOTAL	89110.5	m²	10051.8	m²	48957.6	m²	34589.0	m²	

2.7 Parking space

The architectural plans detail a high-capacity facility with a total designed supply of 348 parking spaces. A parking demand study for the 374 residential apartments supports providing 348 parking spaces. To optimize usage and avoid unnecessary costs, parking will be unbundled from leases for smaller units (studios and one-bedrooms) and allocated through a tiered system. Guaranteed Resident Parking – 247 spaces Every two-bedroom and larger unit will have one parking space included in the lease. Dynamic Pool – 101 spaces- These spaces will be leased to residents in smaller units and office tenants. Any unused spaces will be offered for hourly retail customer parking.

Parking Demand Analysis Report: The Traffic estimates were derived using ITE Trip Generation Manual (10th Edition) codes. A 15% Internal Capture Rate was applied, recognizing that a significant portion of trips (e.g., residents visiting the on-site gym or retail podium) will remain within the site boundary and not impact the external road network.

Proposed development particulars: The analysis is based on the Gross Floor Areas (GFA) and unit counts.

Land Use Component	Size / Metric	Description
Residential	374 Units	Mix of Studio, 1BR, 2BR, 3BR, Penthouses
Office Space	2,894 m²	Dedicated Office Building
Commercial (Podium)	2,080 m²	Ground & Mezzanine Retail
Free Standing Comm.	711 m²	Retail / F&B
Restaurant	263 m²	Dedicated F&B
Coworking & Gym	945 m²	Shared Amenities
TOTAL COMMERCIAL	6,893 m²	

2.8 Sustainability Aspect of the project

The proponent stated that the proposed development has been conceptualized as a green building, with sustainability integrated into the overall design. The project will adopt resource-efficient measures, including optimized water and energy use, and will prioritize the use of environmentally friendly and sustainable construction materials to minimize environmental impact. The following information has been obtained from the sustainability report for the proposed development:

Overview of Energy Efficiency Measures

Measure	Conventional	Selected	Improvement	Contribution
EEM01 Window-to-Wall Ratio	40%	84.1%	+110% daylighting	8.2%
EEM02 Roof SRI	30	80	+167% reflectivity	3.5%
EM03 Wall SRI	5	10	+100% reflectivity	1.8%
EEM04 Shading (AASF)	0.2	0.02	-90% solar gain	4.2%
EEM05 Roof U-Value	0.35	0.24	-31% heat transfer	6.1%
EEM06 Floor U-Value	2.0	1.47	-26.5% heat transfer	2.3%
EEM08 Wall U-Value	2.0	1.55	-22.5% heat transfer	2.8%
EEM09 Glazing Properties	U 2.8 / SHGC 0.7	U 1.3 / SHGC 0.54	-53.6% heat transfer	7.5%
EEM11 Natural Ventilation	None	Enabled	Reduced cooling	3.1%
EEM13 VRF Cooling COP	2.5	3.1	+24% efficiency	12.8%
EEM18 DHW Instantaneous	Storage (60%)	Instantaneous (80%)	+33% efficiency	4.5%
EEM22 Internal Lighting	8 W/m²	4 W/m²	-50% energy use	5.7%
EEM23 External Lighting	2 W/m²	0.8 W/m²	-60% energy use	1.9%
EEM24 Dimming Controls	None	Enabled	-30% lighting energy	2.6%

Water Efficiency Measures

Measure	Conventional	Selected	Improvement	Contribution
WEM01 Showerheads	15 L/min	7.3 L/min	-51.3% water use	8.5%
WEM02 Bathroom Faucets	12 L/min	5 L/min	-58.3% water use	7.2%
WEM04 Dual Flush Toilets	9 L	6/3 L	-50% water use	9.8%
WEM06 Bidet	8 L/min	4 L/min	-50% water use	2.1%
WEM08 Kitchen Tap	15 L/min	9 L/min	-40% water use	3.5%
WEM09 Dishwasher	25 L/cycle	17 L/cycle	-32% water use	1.8%
WEM11 Washing Machine	50 L/cycle	35 L/cycle	-30% water use	1.4%
WEM17 Smart Water Meters	None	Enabled	-15% water use	0.6%

Materials Efficiency Measures

Material Component	Conventional	Selected	Carbon Reduction	Contribution
Concrete for Slabs	100% OPC	Concrete Slab | In-situ Reinforced Slab - 30% GGBS (Bamburi)	980 tCO_2e	45.3%
External Walls	100% Concrete	90% Solid Block of Dense Concrete + 10% Curtain Wall	420 tCO_2e	19.4%
Floor Finishes	100% Ceramic	60% Ceramic + 40% Wood	350 tCO_2e	16.2%
Internal Walls	100% Concrete	95% Solid Block of Dense Concrete + 5% AAC Blocks	210 tCO_2e	9.7%
Windows/Glazing	Single Glazing	Double Glazing 14mm	125 tCO_2e	5.8%
Roof Insulation	None	XPS (100% use, EC 79 kg/m^2)	78.3 tCO_2e	3.6%

2.9 Significance of the proposed Project

The proposed mixed-use development at Tatu City will support sustainable urban growth by providing modern residential, commercial, and recreational facilities. It will create employment, stimulate local businesses, optimize land use, and align with the Tatu City Master Plan and government urbanization policies, contributing to a well-planned and vibrant urban environment.

2.10 Project Budget

The total estimated cost for the proposed mixed-use development at Tatu City is approximately Kenya Shillings 7,087,472,817.00.

2.11 Context, Components and Activities of the Project

To provide a comprehensive description of the project and the surrounding environment specifying any information necessary to identify and assess the environmental effects of the project. This includes project objectives and information on, rationale for the project and background, the nature, location/existing setting, timing, duration, frequency, general layout including relocation of people and any additional impacts on the surroundings communities, pre-construction activities, construction methods, works and duration, and post construction plans. A description of raw material inputs, technology and processes to be used as well as products and by-products generated, should be provided. Note areas to be reserved for construction and areas to be preserved in their existing state as well as activities and features which will introduce risks or generate impact (negative and positive) on the environment. The ESIA study shall include an assessment of the context, components and activities of the project.

This includes among others:

- *Context*: Description and assessment of the *location* of the land, the *land use characteristics*, including the planned use of the land and description of the existing land use and their patterns within 3-km radius from the boundary of the Project Area and *project characteristic*
- *Activities*: Description and assessment of the specific phases and activities; including timing and location, for:

(i) *pre-construction (planning) phase* (Plan preparation and seeking of the appropriate approvals from the relevant authorities, baseline condition appraisal),

(ii) *construction phase* (base camp establishment, site clearance, acquisition and transportation of building materials, construction of the institution in all the three phases);

(iii) *Occupation phase* (running and managing the facility as per the laid down rules and procedures; and

(iv) Decommissioning/abandonment phase (demolition of facility).

2.12 Roads/Accessibility

Tatu City is approximately 24–30 km from Nairobi CBD depending on the access route used. Travel time typically ranges between 35 to 60 minutes, influenced by traffic conditions along Thika Superhighway and surrounding connecting roads. The development is also accessible to Jomo Kenyatta International Airport (JKIA), with travel times generally ranging from 45 minutes to 1 hour, depending on the time of day and traffic flow.

The proposed site is strategically situated within the Tatu Central CBD, providing easy access to major road networks including Thika Superhighway and the Nairobi Eastern Bypass.

The proposed Jabali Towers is accessed through Tatu City's internal TC-numbered that serve Tatu Central, where the towers will be located.

The Main entry roads into Tatu City are:

- Ruiru–Kiambu Road (B115) – primary access
- Ng'enda Road (D399)
- Ruiru–Githunguri Road (C65)

The Regional links feeding into Tatu City are:

- Thika Road (A2)
- Eastern Bypass
- Northern Bypass
- Kamiti Road

Therefore, the access to the proposed Jabali Towers is via Tatu City internal roads within Tatu Central, after entering Tatu City from B115, D399, or C65, which connect to major highways.

2.13 Traffic Impact Assessment of the proposed project

ITEC Engineering Ltd was commissioned to undertake a Traffic Impact Assessment study for Tatu City along the Kiambu-Ruiru (B115) Road and Githunguri-Ruiru (B116) road in Kiambu County, Kenya. (Attached is the report)

Based on analysis of the sampled peak motorised traffic (November 2024), the Levels of Service (LOS) of the road sections adjacent to Tatu City were generally better than LOS C in the peak periods. The exception was the Kiambu - Ruiru B115 / TC101 road intersection and the Eastern Bypass intersection at LOS F, which means that the intersections and approaches' roads capacity are inadequate for the current traffic volumes. Analysis of the sampled peak Non-Motorized Transport (NMT) volumes (November 2024) using the pedestrian crossing warrant method indicates signalised NMT crossings are required along the frontage of Tatu City currently.

The traffic volumes were forecasted within and around Tatu City over a 10-year horizon (2024-2034). The total normal traffic will be computed as the sum of generated/attracted traffic from the proposed expansion works and forecasted normal traffic at a growth rate of 5.0% per annum. The following 5- and 10-year traffic scenarios were considered:

1. Future (2029) traffic conditions with the development and with road capacity improvements; and,
2. Future (2034) traffic conditions with the development and with road capacity improvements.

The Trip Generation analysis integrated data from the Kiambu County Integrated Development Plan (CIDP) and the Kenya National Bureau of Statistics (KNBS) on daily trip rates, projecting an annual growth of 2.81% for the initial five-year period (2024-2029). For the subsequent five years (2029-2034), a more conservative growth rate of 5% is assumed to account for potential economic fluctuations and infrastructure developments.

KeNHA's projected improvement of the B115 road to dual carriageway is anticipated to increase

capacity for the current road, and has been adopted for the analysis of 2029 and 2034.

In future (2029), with the expected growth of existing motorised traffic and with the completion of the proposed expansion, the road sections will experience conditions better than LOS C during the peak periods. Therefore, Tatu City's generated traffic has a slight effect on the projected normal traffic, but not detrimental. The future (2029) pedestrian volumes indicate a slight increase in pedestrian volumes, with the same interventions required to ensure safer crossing conditions for pedestrians (signalised crossings).

2.14 Electrical system

Tatu City Limited has a reliable power supply network from a dedicated substation, back-up supply and alternative renewable sources. Power is fed from the KPLC grid. Tatu City has its own dedicated onsite substation and internal distribution network managed by Tatu Power to ensure reliable supply within the development.In addition, Tatu City has solar installations projects as supplementary power

sources for reliability and sustainability**.** The existing power within Tatu City is what had been installed by KPLC to service existing structures and upcoming developments; the proposed development being one of them. There are multiple transformer rooms across the city to step power down for local use.

Tariffs charged by Tatu City Power are styled after the national utility (Kenya Power and Lighting Company) but managed locally under regulation by the Energy and Petroleum Regulatory Authority (EPRA). As per the architectural drawing the project will have a generator room.

The necessary guidelines and precautionary measures relating to the use of electricity shall be adhered to.

2.15 Water Supply system

Water in Tatu City (including Jabali Towers) is supplied by Tatu City Water and Sanitation Company (TATUWASCo) — a licensed water utility serving residents, businesses, and commercial developments within the city.

TATUWASCo draws and treats water from multiple sources to ensure reliable supply:

- Bulk water from Ruiru-Juja Water and Sewerage Company (RUJWASCo) — treated potable water pumped into Tatu City's network.
- Groundwater from boreholes within Tatu City to supplement supply.

The system includes a main water trunk line**,** storage tanks (including large ground storage), pumped distribution pipelines**,** and internal pipes delivering water directly to customers. Smart meters are used for monitoring consumption and billing. Water supplied is treated and disinfected to potable standards (meeting regulatory requirements). Tatu City promotes 24/7 water availability in its developments.

Therefore, the proposed project will receive the treated potable water through Tatu City's integrated internal water network managed by TATUWASCo, using bulk supply from RUJWASCo and local boreholes, delivered via modern piped infrastructure with smart metering and reliable round-the-clock service.

2.16 Wastewater management

Tatu City Water and Sanitation Company (TATUWASCo) is the licensed utility that manages sewage collection and wastewater services across Tatu City, including residential, commercial, and industrial developments.

The city has internal and external sewer trunk lines installed as part of its integrated utility system. These collect *wastewater (from toilets, sinks, showers, etc.)* TATUWASCo also continues to enhance its wastewater treatment capacity as part of infrastructure expansion and sustainable service delivery.

Wastewater is collected via sewer mains and then treated or conveyed to treatment works so that effluent meets required sanitation standards before disposal or reuse.

The proposed project will be connected to the existing TATUWASCo system through internal sewer network. To curb environmental pollution through wastewater from the premises, the proponent shall closely monitor the sewer system and ensure full compliance to the Environmental Management and Co-ordination (Water Quality) Regulations, 2006 provisions.

2.17 Storm water run-off

Storm water run-off in Tatu City is managed through planned drainage networks (including underground storm conduits and road drainage) built as part of the estate's infrastructure, designed to handle increased surface water flow from built surfaces and reduce flooding and environmental impact. Environmental planning also emphasizes storm water treatment, controlled flows and protection of local water bodies as part of sustainable urban development.

Measures will be put in place to successfully deliver the resultant storm water into the storm water drainage for the proposed project, Jabali Towers. The Proponent should consider harvesting rain water to the extent feasible with a view of minimizing the rain water that ends up as surface runoff. Further, the Project should facilitate localized infiltration (e.g. through establishment of green areas) of rain water to the extent feasible not only to minimize storm water but also to facilitate ground water recharge which is of environmental importance.

2.18 Waste management strategy

The principal objective of waste management program is to minimize pollution of the environment as well as to utilize waste as a resource. This goal should be achieved in a way that is environmentally and financially sustainable by coming up with waste management plan during the project cycle.

Inadequate management of solid and sewerage waste from the developments will lead to pollution and creation of human health hazards endangering the residents and the public. Proper effluent management plans including treatment and discharge into the existing trunk sewer systems and recycling of waste water will be required to mitigate the potential adverse impacts of the generated effluent.

An integrated solid waste management strategy that includes reduction at source, reuse, recycling, incineration and disposal in designated landfill site(s) will also be required for management of solid waste from the developments. Opportunities for generation of energy from solid waste and/or effluent should be explored. It will be important for the development to pursue waste minimization at source principles e.g. zero generation, reduction, re-use and/or recycling. Separation of waste per respective zones domestic, commercial and industrial waste will be best suited to ensure effectiveness in waste management. Tatu Limited should also ensure mechanisms to segregate wastes at source to enable recycling.

Enactment of relevant laws such as Environmental Management and Coordination (Water Quality) Regulations, 2003 and Waste Management Regulations, 2006.

2.19 General security

Tatu City operates a well-coordinated, multi-layered security system to ensure the safety of residents, businesses, and visitors. Tatu City has in place adequate security measures to secure the facility. These include security lights, CCTV system and security team. The proposed project will therefore have adequate security measures to secure the facility.

2.20 Life and Fire Safety Design for the proposed project

Tatu City engaged Karina Design, Consultancy and Training Services Ltd. Co in August 2025 to conduct a Life and Fire Safety design and analysis for the proposed project.

From the report, the Emergency Command Centre shall be designed in the building to observe and control Life and Fire Safety related systems. It will be a protected room easily accessible from the reception desk and within an access distance nor more than 10m from outside

Prior to installation, the location, size, and fire department access of Emergency Command Centre shall be coordinated with and approved by the local fire department. All the below requirements can be monitored and /or controlled in the room.

The following shall be provided in the emergency command centre:

- Fire department communication unit
- Fire Fighters telephone
- Building schematics showing floor plans, building core means of egress, fire department access, fire protection systems, fire-fighting equipment (such as pump room) and 2ea.A3 Sized laminated fire alarm system plans.
- The emergency voice/ Alarm Communication System Unit
- Fire detection and Alarm System plan.
- Fire Alarm Panel.

The objective of the proposed building from the safety point of view shall be achieving occupant protection, therefore the proposed building will be designed, constructed, and maintained to protect occupants who are not intimate with the initial fire development for the time needed to evacuate and relocate. The prescriptive measures for maintain this objective will be handled under the following:

- Means of Egress.
- Evacuation strategies in the building
- Arrangement of means of egress
- Components of means of egress
- Special features of egress
- Firefighting lift and lobby

- Door locking and access-controlled doors
- Assembly point
- Exit signage and marking
- Fire Brigade access and Ingress features
- Labelling and Signage
- Smoke Control

There will be manual intervention means for the proposed construction and it will include among others:

- Portable extinguishers
- Indoor Fire Main (standpipe) system
- Outdoor hose (hydrant) system and private fire service mains
- Fire water supply and pumping arrangements which will have fire pumps, fire pump control and power source.

The automatic intervention means that will be incorporated in the proposed building which will include:

- Automatic sprinkler systems
- Gas suppression systems
- Self-contained kitchen hood suppression systems
- Engineering design drawings
- Hydraulic circulations
- Gas suppression systems design

The fire detection and alarm system will be installed to help notify the occupants during operational stage in case of fire; this also helps the untrained and unequipped individuals the opportunity to control and extinguish the fire with relative ease and it will have the following features:

- Fire detection systems
- Alarm system
- Auxiliary functions

If the life safety system fails due to the loss of power, an additional power source shall be required. Standby power shall be provided in accordance with NFPA 110 to be utilized in the event of a fire have been supplied from the standby power system for 120 minutes as follows:

- Fire pumps
- Sump pumps
- Telephone equipment
- Mechanical equipment for smokeproof enclosures
- Emergency lighting
- Smoke control equipment

- Fire alarm system
- Gaseous suppression system
- Elevators (including elevator communication, emergency lighting and ventilation system)

The loading distribution shall be evaluated according to the number equipment to operate simultaneously including the devise other than fire and life safety systems. Each connection to the power supply should be via an isolating protective device reserved solely for the Life Safety Systems and independent of any other main or sub -main circuit. They should be secured against unauthorized operation and should, expect for maintenance, be kept locked-on. The supply and be appropriately labelled. The wiring systems should be separate from any circuit provided for any other purpose.

2.21 Geotechnical and Geophysical survey

A geotechnical and geophysical investigation was conducted at the proposed site for Jabali Towers in Tatu City by Rock Link Geological Consultants Ltd in September 2025. This was carried out by drilling 23 boreholes, excavating 8 trial pits, 1 plate loading, using Seismic Multichannel Analysis of Surface Waves (MASW) and Vertical Electrical Sounding (VES) and laboratory testing. The purpose of the investigation was to establish the subsurface stratigraphy at the project site as well as determine the geotechnical parameters of the subsurface materials for use in developing recommendations for safe and cost-effective foundations. (Attached is the report)

- 23 boreholes, excavating 8 trial pits revealed a top layer of soil to a depth of about 0.8m to 1.5m. Below the soil layer is a bedrock was encountered to the end of the investigation.
- Twelve (12) VES points and six (6) MASW profiles revealed a multi-layered system comprising:
  - Top dry to moist lateritic soils (resistivity range: 7.4 – 295 Ωm; S-wave velocity: 736 – 1100 m/s)
  - Intermediate soft to weathered tuff (resistivity: 9 – 25 Ωm; S-wave velocity: ~800 – 1000 m/s)
  - Deep competent tuff (resistivity: 106 – 250 Ωm; S-wave velocity: up to 1799.89 m/s)
- Key parameters include a maximum Shear Modulus of 7.38 GPa and Young's Modulus of 18,989.52 MPa in competent rock. All six MASW profiles yielded Vs_{30} values exceeding 800 m/s, supporting classification of the site as IBC Site Class B (Soft Rock to Strong Rock).
- Seismic hazard evaluation based on recent regional models (e.g. GEM Global Model 2018.1) and local geophysical context suggests a Peak Ground Acceleration (PGA) range of 0.05g to 0.08g (10% exceedance probability in 50 years) for the site on rock (Vs_{30} ~760–1000 m/s). However, considering historical seismicity, local zoning maps (Zone VII – WHO), and updated structural design guidance (ASCE 7-22; Eurocode 8), a conservative design PGA of 0.15g is recommended for structural calculations and base shear analysis.
- Piled raft foundation are recommended for this project, as it offers the combined benefits of both raft and pile systems, providing improved load distribution and better control of settlement conditions.

2.22 Construction activities

The construction activities shall begin from the time the proponent obtains all relevant approvals/permits including the NEMA License.

2.22.1 Project implementation sequencing

- Pre-construction stage

This involved the following: -

a) Plan preparation and seeking of the appropriate approvals from the relevant authorities.

b) ESIA Study Report preparation to seek ESIA License.

- **Description of the project's Construction stage**

This will involve the following:

a) Mobilization of resources

Once all relevant licenses and approvals have been granted, the main contractor shall commence with the resource mobilization to include but not limited to; transportation and delivery of all relevant equipment and machinery on site; deployment of workers on site in readiness to start up the works; The machinery would involve excavators; mixer, trucks and setting up of tower cranes when need be; Trucks for use in transportation of excavated materials and required construction materials; setting up of the construction site office for use during the works; The contractor will also mobilize human workforce casual, permanent, skilled and unskilled; site hording.

b) Establishment of related works and all support infrastructures that are significant for the construction work

This would involve the transportation of machinery and deployment of the workers to the construction site. The machinery would be used for ground breaking and transportation of materials from the sources to the site. The major machineries that will be used include mixers, welding machines and transmission machines. The contractor will also mobilize human workforce casual, permanent, skilled and unskilled.

c) Acquisition and transportation of building materials

The contractor shall source for construction materials from the various available suppliers. Supply of materials will be a continuous activity throughout the project life since different materials will be needed at future phases of the construction. Such materials include building stones, sand, ballast, cement, timber, reinforced concrete frame, steel, bars, G.I pipes, PVC pipes, pavement blocks, concrete slabs, murram, hardcore, insulated electrical cables and timber among others.

d) Site clearance

Site clearance entails the removal of all physical barriers, all the vegetation on the actual site for the construction works. The anticipated clearance shall entail clearing of the land to the extent required by the engineer for checking the setting out of the works. The contractor shall also clear out that part of the site to be occupied by the permanent works. The contractor shall backfill with appropriate material those cavities and losses of soil which result from clearing the part of the site not subsequently to be

occupied by the work. Clearance of none 'essential' parts of the land should be discouraged as much as possible with comprehensive landscaping encouraged on the cleared areas after construction works are over.

This will involve the use of heavy earthmoving machinery such as excavators and bulldozers and trucks to cart away the excavated materials for disposal.

e) Excavation and land filling works

Excavation will be carried out to prepare the site for construction of foundations and drainage systems. This will involve the use of heavy earthmoving machinery such as excavators and bulldozers.

f) Storage of materials

Building materials shall be stored on site. Bulky materials such as ballast, tiles, sand and steel shall be carefully piled on site. To avoid piling large quantities of materials on site, the contractor shall order bulky materials such as sand, gravel and stones in quotas. Materials such as cement, paints and glass among others shall be stored in temporary storage structures built for that purpose.

g) Masonry, Concrete Work and Related Activities

The engineering designs and site layout plans that have been approved shall be implemented. The setting will comply with the specifications set out by the client to the contractor under the supervision of qualified engineers. In accordance with the designs and the layout plans, the construction of the proposed project and associated infrastructure will begin immediately NEMA approves it. The contractor will then be supplied with all the approved documents including the ESIA report.

The construction of the building walls, foundations, floors, pavements, drainage systems among other components of the project will involve a lot of masonry work and related activities. General masonry and related activities will include stone shaping, concrete mixing, plastering, slab construction, construction of foundations, and erection of building walls and curing of fresh concrete surfaces. These activities are known to be labour intensive and will be supplemented by machinery such as concrete mixers.

h) Structural Steel Works

The buildings will be reinforced with structural steel for stability. Structural steel works will involve steel cutting, welding and erection.

i) Transportation of the construction wastes from the site for disposal

Construction waste that cannot be used for landscaping work at the site will be deposited in approved dumpsites by a contracted licensed waste handler.

j) Electrical work

Tatu City Limited has a reliable power supply network from a dedicated substation, back-up supply and alternative renewable sources therefore the electrical work during construction will include installation of electrical gadgets and appliances including electrical cables, lighting apparatus, sockets etc. In addition, there will be other activities involving the use of electricity such as welding and metal

cutting. The necessary guidelines and precautionary measures relating to the use of electricity shall be adhered to.

k) Plumbing

Installation of pipe work for water supply and distribution will be carried out within the buildings and associated facilities. In addition, pipe work will be done to connect sewage from the premises to the sewer line, and for drainage of storm water. Plumbing activities will include metal and plastic cutting, the use of adhesives, metal grinding and wall drilling among others. The proposed project will be connected to the existing TATUWASCo system through internal sewer network. To curb environmental pollution through wastewater from the premises, the proponent shall closely monitor the sewer system and ensure full compliance to the Environmental Management and Co-ordination (Water Quality) Regulations, 2006 provisions.

a) Landscaping

The Proponent will ensure that landscaping activities are carried out in accordance with approved architectural and landscape designs, and that regular maintenance—such as watering, pruning, and replacement of damaged plants is undertaken to sustain the visual appeal and environmental benefits of the site over the long term.

- Description of the project's operational activities

The proposed project shall upon completion be rented out to tenants for their businesses.

a) Solid waste and liquid waste management

By design, the project shall come along with a central solid waste collection point to the principal Engineer's specification. The occupier shall provide facilities for collecting solid waste at source which shall include dust bins/skips for temporarily holding waste before final disposal at the sentry area. Services of a NEMA registered waste collector and transporter shall be sought to collect the waste from the central waste disposal area, transport and dispose to an authorized dump site. The Environmental Management and Co-ordination (Waste Management) Regulation, 2006 will guide and The Sustainable Waste Management Act 2022.

The proposed project will be connected to the existing TATUWASCo system through internal sewer network. To curb environmental pollution through wastewater from the premises, the proponent shall closely monitor the sewer system and ensure full compliance to the Environmental Management and Co-ordination (Water Quality) Regulations, 2006 provisions.

b) General repairs and maintenance

The infrastructure and associated utilities will be repaired and maintained regularly during the operational phase of the project. Such activities will include repair and maintenance of electrical gadgets, painting and replacement of worn-out materials among others which will be coordinated by the property manager.

c) General security

The Proponent has the responsibility to ensure general security within the premises at any one given time. Tatu City has an existing competent security firm who has been engaged to guard the premises and control access to the facility to ensure only authorised persons are allowed into the facility. The Proponent will also put in place adequate security measures to secure the facility. These shall include but not limited to installation of security lights, CCTV system and guard to man the facility.

d) Utilities maintenance

The utilities installed at the facility including lifts, server, CCTV system etc shall undergo regular preventive and corrective maintenance which shall be undertaken by appointed competent persons who shall ensure they are in good working condition at all times and available for use. Maintenance works will generate waste including hazardous waste such as used oil; replaced parts such as oil filters; etc the service contract shall require the maintenance team to service and carry the replaced parts and waste such as used oil for safe disposal.

- Description of the project's decommissioning activities

a) Demolition works

Upon decommissioning, the project components including buildings, pavements, drainage systems and perimeter fence will be demolished. This will produce considerable solid waste, which will be re-used for other construction works or if not re-usable, disposed off appropriately by a licensed waste disposal company.

b) Dismantling of equipment and fixtures

All equipment including electrical installations, furniture, finishing fixtures partitions, pipe-work and sinks among others will be dismantled and removed from the site on decommissioning of the project. Priority will be given to reuse of this equipment in other projects. This will be achieved through resale of the equipment to other building owners or contractors or donation of this equipment to schools, churches and charitable institutions.

c) Site restoration

Once all the waste resulting from demolition and dismantling works is removed from the site, the site will be restored through replenishment of the top soil and re-vegetation using indigenous plant species.

2.23 Climate Change risk and vulnerability assessment

Climate change refers to long-term shifts in temperatures and weather patterns. Such shifts can be natural, due to changes in the sun's activity or large volcanic eruptions. However, human activities have been the main driver of climate change, primarily due to the burning of fossil fuels (like coal, oil and gas), which produces heat-trapping gases.

The purpose of the Climate Risk and Vulnerability Assessment is to develop an understanding of the current and future climate risks that will be attributed to the existence of the proposed project in the larger Tatu City area.

Objectives

- To inform participatory action planning processes that lead to community-driven and owned adaptation mechanisms.
- To identify lower risk areas in which climate-resilient infrastructure can be developed
- To develop targeted early warning systems, training programs in environmental management and risk reduction and community capacity building within the project area
- To select, prioritize, and design appropriate resilient infrastructure development options.

Vulnerability assessment is a function of exposure, sensitivity, and adaptive capacity. Proposed project proponent together experts will identify critical, sectors, and populations vulnerable to climate hazards. The adaptive capacity of these assets population groups to climate change will also be evaluated. The aspects of vulnerable conditions that will be examined include the following; physical, social, economic, environmental factors.

This assessment involves the following methods;

- Critical assets, sectors, and services will be identified, organized, and mapped
- Vulnerable populations will be identified and mapped using area population data previous studies. This may also involve engaging with community members, vulnerable groups, and climate experts.
- A vulnerability assessment will be conducted, taking into account the exposure sensitivity, and adaptive capacity of assets and groups

Risk assessment is a function of the probability of a hazard impact and the overall consequence of the impact.

For instance;

Risk - Probability x Consequence

This assessment allows for the prioritization of the most at-risk assets, systems, and groups, focusing on the most vulnerable ones identified during vulnerability assessment.

3 BASELINE INFORMATION OF THE STUDY AREA

3.1 Introduction

Baseline information (background information on the biophysical, social and economic settings) is important reference point for conducting ESIA. Baseline data is essential for the assessment of the potential impacts of the project. The conditions of the natural environment form a basis for the selection by planners of the area to be developed for various land uses for the sustainability of the proposed project and therefore evaluation of the baseline information is important in understanding the existing environmental set up. The main objective of baseline information is to provide adequate and accurate environmental baseline information and this can be broken down as follows:

- To provide a description of the status and trends of environmental factors, against which predicted changes can be compared and evaluated in terms of importance
- To provide a means of detecting actual change by monitoring once the project is implemented.

3.2 Location of the Project

The proposed project site is located within Tatu City approximatelyLatitude -1.0901S and Longitude 36.5419E at Tatu Central, within the Central Business District (CBD) of Tatu City in Ruiru, Kiambu County on L.R. No. 28867/1. The site lies within a planned urban zone that is supported by established infrastructure, including access roads, water supply, sewerage, electricity, and storm water drainage, in accordance with the Tatu City Master Plan.

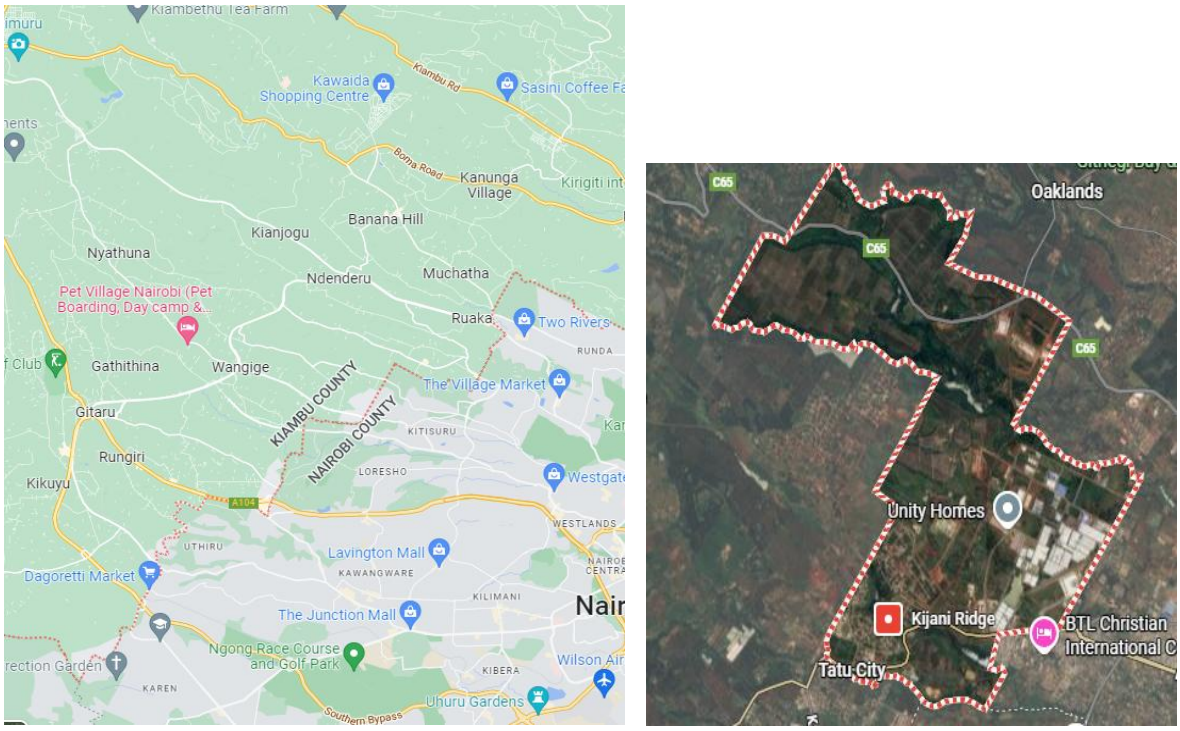


Figure 3-3-1: Google map extract of Kiambu County and Tatu City where the project will be developed

3.3 Environmentally sensitive area to be affected

The targeted project site is not located in or near a wetland or any other environmentally sensitive area. Hence, the proposed project activities will not impact negatively on any known environmentally sensitive area.

3.4 Climate

The County experiences bi-modal type of rainfall. The long rains fall between mid - March to May followed by a cold season usually with drizzles and frost during June to August and the short rains between mid- October to November. The annual rainfall varies with altitude, with higher areas receiving as high as 2,000 mm and lower areas of Thika Town constituency receiving as low as 600 mm. The average rainfall received by the County is 1,200 mm.

The mean temperature in the County is 26 °C with temperatures ranging from 7 °C in the upper highlands areas of Limuru and some parts of Gatundu North, Gatundu South, Githunguri and Kabete constituencies, to 34 °C in the lower midland zone found partly in Thika Town constituency (Gatuanyaga), Kikuyu, Limuru and Kabete constituencies (Ndeiya and Karai). July and August are the months during which the lowest temperatures are experienced, whereas January to March are the hottest months. The County‘s average relative humidity ranges from 54 percent in the dry months and 300 percent in the wet months of March up to August.

The climate in Kiambu is warm and temperate. There is a great deal of rainfall in Kiambu, even in the driest month. This climate is considered to be Cfb according to the Köppen-Geiger climate classification. The temperature here averages 18.8 °C. In a year, the average rainfall is 962 mm. The climate is mild, and generally warm and temperate, and is classified as Cwb by the Köppen-Geiger system. Rainfall in the area averages 797 mm, and is lowest in July, with an average of 13 mm. In April, the precipitation reaches its peak, with an average of 170 mm. the difference in precipitation between the driest and wettest months is 157 mm (Figure 3:3). The temperatures here average 19.5 °C. March is the hottest month of the year at an average temperature of 21.0 °C, while July is the coldest month of the year at 17.2 °C on average. The variation in annual temperature is around 3.8 °C.

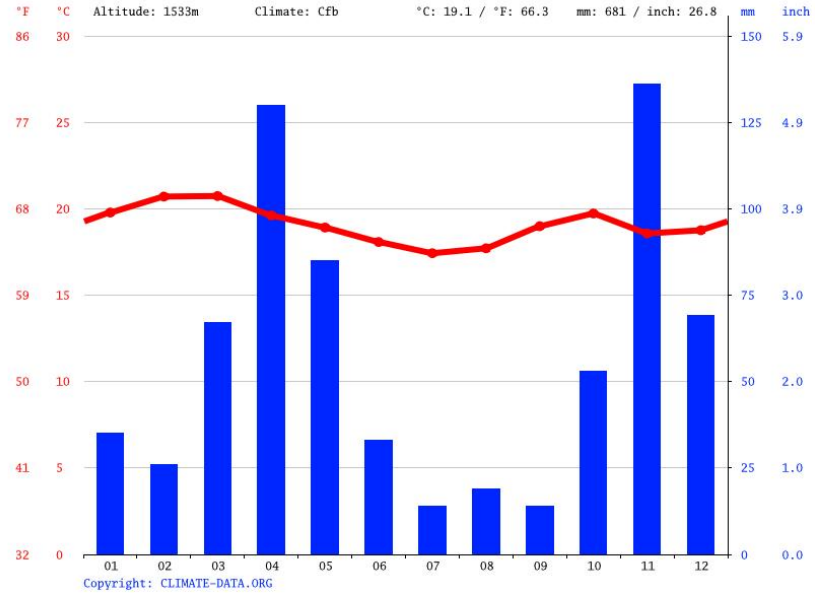


Figure 3-2: Rainfall in Ruiru

3.5 Physical and Topographic feature

Kiambu County is divided into four broad topographical zones; Upper Highland, Lower Highland, Upper Midland and Lower Midland Zone. The Upper Highland Zone is found in Lari constituency and it is an extension of the Aberdare ranges that lies at an altitude of 1,800-2,550 meters above sea level. It is dominated by highly dissected ranges and it is very wet, steep and important as a water catchment area. The lower highland zone is mostly found in Limuru and some parts of Gatundu North, Gatundu South, Githunguri and Kabete constituencies. The area is characterized by hills, plateaus, and high-elevation plains. The area lies between 1,500-1,800 metres above sea level and is generally a tea and dairy zone though some activities like maize, horticultural crops and sheep farming are also practiced.

The upper midland zone lies between 1,300-1,500 meters above sea level and it covers mostly parts of Juja and other constituencies with the exception of Lari. The landscape comprises of volcanic middle level uplands. The lower midland zone partly covers Thika Town (Gatuanyaga), Limuru and Kikuyu constituencies. The area lies between 1,200-1,360 meters above sea level. The soils in the midland zone are dissected and are easily eroded. Other physical features include steep slopes and valleys, which are unsuitable for cultivation. Some parts are also covered by forests.

The lower highland zone is mostly found in Limuru and some parts of Gatundu and the area is characterized by hills, plateaus and high elevation plains. The area lies between 1500-1800m above the sea level and it's a tea, dairy, and horticultural zone.

The county is covered by three broad categories of soils which are: high level upland soils, plateau soils and volcanic footbridges soils. These soils are of varying fertility levels with soils from high-level uplands, which are from volcanic rocks, being very fertile. Their fertility is conducive for livestock keeping and growth of various cash crops and food crops such as tea, coffee, horticultural products,

pyrethrum, vegetables, maize, beans, peas and potatoes. These soils are found in the highlands, mostly in Gatundu South, Gatundu North, Githunguri, Kiambu, Kiambaa, Lari, Kikuyu, Kabete and Limuru Constituencies. Low fertility soils are mainly found in the middle zone and the eastern part of the county which form part of the semi-arid areas. The soils are sandy or clay and can support drought resistant crops such as soya beans and sunflower as well as ranching. These soils are mostly found in parts of Juja, Thika Town, Ruiru, Kabete, Limuru, Gatundu North and Gatundu South Constituencies. Most parts of the county are covered by soils from volcanic footbridges. These are well drained with moderate fertility. They are red to dark brown friable clays, which are suited for cash crops like coffee, tea and pyrethrum. However, parts of Thika Town, Ruiru, Juja and Lari constituencies are covered by shallow soils, which are poorly drained, and these areas are characterized by low rainfall, which severely limits agricultural development. However, these areas are suitable for ranching and growth of drought resistant crops.

3.6 Geology and Soils

Kiambu County is covered by three broad categories of soils which are: high level upland soils, plateau soils and volcanic footbridges soils. These soils are of varying fertility levels with soils from high-level uplands, which are from volcanic rocks, being very fertile. Their fertility is conducive for livestock keeping and growth of various cash crops and food crops such as tea, coffee, horticultural products, pyrethrum, vegetables, maize, beans, peas and potatoes. These soils are found in the highlands, mostly in Gatundu South, Gatundu North, Githunguri, Kiambu, Kiambaa, Lari, Kikuyu, Kabete and Limuru Constituencies.

Most parts of the County are covered by soils from volcanic footbridges. These are well drained with moderate fertility. They are red to dark brown friable clays. However, parts of Thika Town, Ruiru, Juja and Lari constituencies are covered by shallow soils, which are poorly drained, and these areas are characterized by low rainfall, which severely limits agricultural development. The proposed Master Plan area has well drained, very deep kaolinitic clayey soils, Igneous bed rock, with rolling slope relative factor 8%, CLAY: KA, dominated with ridges.

There is potential flooding towards the area proposed for high-density housing. Once vegetation is cleared, it may lead to increased surface run off and therefore, a proper drainage network needs to be developed during implementation of the Master Plan, as well as use of block pavement ‘çabro’ on the paved ground to allow infiltrations. Around one-third of the land is set aside for natural green spaces and water bodies.

3.7 Hydrology

The county is divided into two sub-catchment areas. The first one is Nairobi River Sub- Catchment which occupies the southern part of the county, and then the Kamiti and Ruiru Rivers Sub Catchment which is located to the north of the Nairobi River Sub Catchment.

The county receives bi-modal rains with long rains occurring between March and May followed by a cold season usually with drills and frost while the short rains fall between mid-October and November.

Rainfall quantity received varies with altitude averaging about 2000mm in the highlands and lower receiving about 600mm. The average rainfall received by the county is 1200mm per annum.

The county's average relative humidity ranges from 54% in the dry months and 300% in the wet months.

With a lot of rainfall contributed by a lot of plantation and ground water sources are a key to the provision of water especially in Kabuku area where the flower farm is located.

3.8 Ecological conditions

Water in the county is from two principal sources-surface and sub-surface. The county is divided into several sub-catchments areas. The first one is Nairobi River Sub-catchment which occupies the southern part of the county with the major rivers being Nairobi, Gitaru, Gitathuru, Karura, Rui Rwaka, and Gatharaini. The second one is Kamiti and Ruiru Rivers Sub-catchment which is located to the north of the Nairobi river sub-catchment. It has eight permanent rivers which include Riara, Kiu, Kamiti, Makuyu, Ruiru, Bathi, Gatamaiyu and Komothai.

The third one is the Aberdare plateau that contributes to the availability of two sub-catchments areas comprising of Thiririka and Ndarugu Rivers. The main streams found in the two areas include Mugutha, Theta, Thiririka, Ruabora, Ndarugu and Komu. They flow from Nairobi, Kamiti, Ruiru, Thiririka, and Ndarugu sub-catchments to form Athi River sub-catchment. The fourth is the Chania River and its tributaries comprising of Thika and Karimenu Rivers which rise from the slopes of Mt. Kinangop in the Aberdares range.

3.9 Socio-economic conditions

Agriculture is the major economic activity in the county and contributes 17.4 % of the county's population. It's the leading sub sector in terms of employment, food security, income earnings and overall contribution to the socio economic well-being of the people.

Beside agriculture, other major economic activities include; real estate development, commercial forestry, major manufacturing or processing industries like The Bata Shoe Factory which is the country's major producer of leather products is located in Limuru and the agro processing like the Ndumberi Dairies, Limuru Milk and Palmside Dairies.

3.10 Infrastructure Development

3.10.1 Roads and Rail Network

The county has a total of 5533 Km of roads network. 249 Km of road are yet to be opened. The roads under bitumen standards are 865.4 KMs, 1051km on gravel, 3167km on earth surface. The county is served by Thika Super Highway from Githurai-Ruiru-Juja-Thika on average of 50Kms and A104 Uthiru-Kikuyu-Kamandura- Kinungi on average of 65 which 25.1km of it is on rehabilitation expansion programme. It is also served by a railway line which is 131km and has Railway stations in Kahawa,

Ruiru, Juja, Thika, Kikuyu and Limuru. There exist bus parks in all sub counties 9 paved and 4 unpaved.

3.10.2 Information, Communication Technology

Kiambu County has 98 percent mobile network coverage owing to its location and proximity to the city. Landline coverage has been on the decline due to adoption of new technology and ease of using mobile phones. There are a total of 19 post offices and 14 sub post offices which are fairly distributed in the county. These post offices are; Ruiru, two at Thika, Juja, Githunguri, Karuri, Kiambu, Kikuyu, Limuru and Matathia-Lari post office. There are quite a number of cyber cafes offering internet access hence easy access of communication. This has been possible due to introduction of fibre optic cables in the county. Many residents listen to local FM and radio stations mainly Kameme, Inooro and Coro FM for primary information in addition to other national stations. The citizens are able to watch a variety of TV stations operating in the country. There is one Huduma center located at Thika where citizens access government services.

3.11 Energy access

Kiambu county 98 percent coverage of electricity with effective coverage on the last mile programme. There has been an increase in the connectivity of rural household to electricity due to rural electrification programme. The total household connected to electricity is 70 percent, and this number is expected to rise to 100 percent in the year 2022. Solar energy has less than 5percent coverage, while Biogas use is at 25 percent especially by farmers in Githunguri, kikuyu, Limuru and other sub-counties where dairy farming is practiced. Wind coverage as a source of energy is not active; however, it is being tested in a pilot project in Nachu-Ndeiya. This has been supported by UN habitat in the promotion of renewable energy. Utility directorate has installed flood mast as follows; 56 no. 30m high, 9no. 20M high and 139 no. 15 M high all distributed in all the sub counties and 235 street lighting through WB financing. Kenya power and Lighting Company has played a key role in street lighting, installation of flood masts; 12 in Thika, 11 in Kiambu, 5 in Kikuyu, 11 in Limuru, 11 in Ruiru, 11 in Juja and 9 in Kiambaa. These flood masts are of 30M in height.

3.12 Water and Sanitation

3.12.1 Water Resources

Kiambu County is endowed with both surface and ground water resources. The County has sixteen permanent rivers originating from Aberdare Ranges, which is the main water tower for the county. The major rivers in the County are Ndarugũ, Thiririka, Ruiru, Kamiti and Kiu rivers, all of which eventually drain into Athi River. Kikuyu, Lari, Theta, Kiganjo and Gacii wetlands are the major wetlands in the County.

3.12.2 Water Supply

Kiambu County has a total of eight main licensed water management institutions namely, Limuru water and Sewerage Company, Kikuyu Water Company, Kiambu Water and Sewerage Company, Karuri Water and Sanitation Sompany, Githuguri Water and Sanitation Company, Ruiru Juja Water and Sewerage Company, Gatundu Water and Sanitation Company and THIWASCO.

3.13 Sanitation

Public sanitation facilities in Kiambu County are spread in the various Sub-Counties as follows: one in Juja Sub-County, two in Gatundu South Sub-County, two in Lari Sub-County, three in Ruiru Sub-County, four in Gatundu North Sub-County, three in Githunguri Sub-County, five in Kiambu Sub-County, three in Kiambaa Sub-County, four in Limuru Sub-County, six in Kikuyu Sub-County, five in Kabete Sub-County and twenty-one in Thika Sub-County.

3.14 Housing

In Kiambu County, 48.3% of all homes are stone-walled, 4.9% are brick/block walled, and 4.8% are mud/wood walled. There are 74.6% of the houses that have cemented floors and 87.5% have corrugated iron sheets roof.

Only 0.1% has used other forms of roofing materials. The proximity of the Kiambu County to the City of Nairobi has seen transformation of large pieces of land into residential houses. The presence of good all weathered roads have given an opportunity to those working in Nairobi to reside within the County. This has led to the establishment of residential estates with the Tatu City being one of the major housing projects currently under implementation.

3.15 Health Access

Kenya health system is broadly categorized into 5 levels. Level 1 comprising of the community and outreach level of care, level 2 representing dispensaries, level 3 representing health centres and clinics, level 4 representing Sub-County hospitals and level 5 is the referral hospitals.

Thika Teaching and Referral Hospital, a Level 5 Hospital, is the major referral hospital. There is one Level-4 in Gatundu South, Kiambaa and Kikuyu Constituencies, four level-three in Gatundu North, Juja, Kiambaa and Limuru Constituencies. There are 20 level-two (Health Centres) and 54 level-ones also known as dispensaries which are well distributed within the County. The rest of the facilities are private with 17 mission hospitals, five nursing homes, 36 dispensaries and 169 private clinics.

The doctor/population ratio in the County is 1:17,000 and the nurse/population ratio stands at 1:1,300. The average distance to the health facility is 7 km and the facilities are well accessed since the road network is good.

Munyu Health Care Centre and Gatuanyaga Dispensary are some of the medical facilities found along the A3 (Garissa Road) - Munyu via Kisii Estate A3 Road.

3.16 Fire and Rescue Services

The Directorate has measures in place for emergency fires and accident in the section of Fire and rescue. The Directorate plans to build capacity in all the Sub-Counties to ensure timely fire response. All sub-counties fire stations should be operational on 24hours. Besides other achievements which includes; Emergency response time was reduced, Fire Safety Audit Training of Fire Officers, Installation of Fire hydrants, Construction of Fire Stations, projects for Limuru, Githunguri and Kiambu

ongoing. There twelve fire vehicles, one utility vehicle and three terrain vehicles that were received from NAMSIP and the National Government.

3.17 Environmental conservation and management

Kiambu County is made up of forests, fresh water systems and biodiversity that hold vast potential for development when managed properly. However, the growing urban population in Kiambu puts a lot of pressure on the existing environmental resources.

Air pollution is also a major concern due to climate change and deteriorating air quality. Main sources of atmospheric pollution include vehicles, industries, emissions as well as open burning of wastes which equally lead to loss of biodiversity, damage to vegetation and animal health due to acid rain.

However, there are attraction sites in Kiambu that also conserves the environment and boosts the economy of the county such as; the Paradise Lost along Kiambu road, is a breathtaking picnic forest with rich fauna and flora and the Limuru viewpoint on the Nakuru-Nairobi highway offers a fantastic view of the Great Rift Valley and antique curio shops.

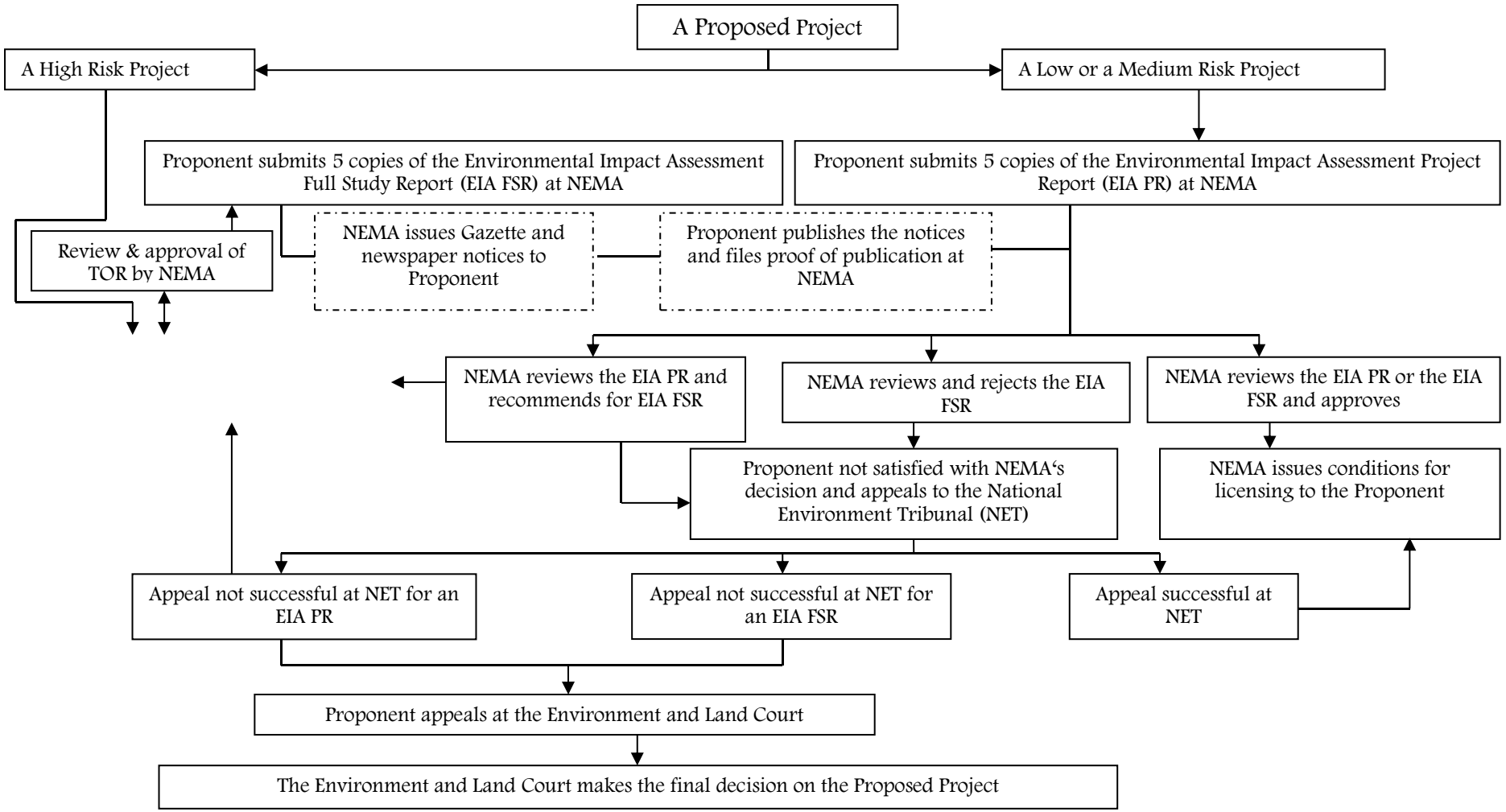
4 RELEVANT LEGISLATIVE AND REGULATORY FRAMEWORK

4.1 Introduction

Kenya has a policy, legal and administrative framework for environmental management. Under the framework, the National Environment Management Authority (NEMA) is responsible for ensuring that Environmental and Social Impact Assessments (ESIA) are carried out for new projects and environmental audits on existing facilities as per the Environmental Management and Coordination Act 1999. ESIA are carried out in order to identify potential positive and negative impacts associated with the proposed project with a view to taking advantage of the positive impacts and developing mitigation measures for the negative ones.

The government has established regulations to facilitate the process on ESIA and environmental audits. This in accordance with the requirements and provisions of the Constitution of Kenya under Part VI, Section 58 of the Environmental Management and Coordination Act No. 8 of 1999 and Regulation 10 of the Environmental (Impact Assessment and Audit) Regulations, 2003 Legal Notice No. 101 and Legal Notice 15 of the Environmental (Impact Assessment and Audit) Regulations, 2016. In the past, the government has established a number of National policies and legal statutes to enhance environmental conservation and sustainable development. The proponent will need to observe the provisions of the various statutes that are aimed at maintaining a clean, healthy and sustainable environment. Some of the policy, legal and institutional provisions are explained in the following sub sections

Figure 4-2: Overleaf is a schematic presentation of the current EIA process in Kenya.


A Proposed Project
A High Risk Project
A Low or a Medium Risk Project
Proponent submits 5 copies of the Environmental Impact Assessment Full Study Report (EIA FSR) at NEMA
Proponent submits 5 copies of the Environmental Impact Assessment Project Report (EIA PR) at NEMA
Review & approval of TOR by NEMA
NEMA issues Gazette and newspaper notices to Proponent
Proponent publishes the notices and files proof of publication at NEMA
NEMA reviews the EIA PR and recommends for EIA FSR
NEMA reviews and rejects the EIA FSR
NEMA reviews the EIA PR or the EIA FSR and approves
Proponent not satisfied with NEMA's decision and appeals to the National Environment Tribunal (NET)
NEMA issues conditions for licensing to the Proponent
Appeal not successful at NET for an EIA PR
Appeal not successful at NET for an EIA FSR
Appeal successful at NET
Proponent appeals at the Environment and Land Court
The Environment and Land Court makes the final decision on the Proposed Project

4.2 Policy Framework

The Kenya Government policy on all new projects, plans, programs or activities requires that an Environmental Impact Assessment Study is carried out at the planning stages of the proposed development.

This is to ensure that significant potential impacts on the environment and health are taken into consideration during the design, construction, operation, and decommissioning of the facility. The ESIA

report will include but not limited to the following information:

- Human Environment: socio-economic, socio-cultural and socio-legal aspects.
- Built Environment: material assets.
- Natural Environment: flora, fauna, soil, water, air, climate, landscape, historical landmarks, archeological and ecological aspects.

Environmental policies cut across all sectors and government departments. As such policy formulation should be consultative steered by interdisciplinary committees.

4.2.1 National Environmental Action Plan (NEAP)

National Environmental Action Plan was a deliberate policy effort to integrate environmental concerns into the country's development initiatives/plans. This assumed a consultative and multisectoral approach. Such an approach ensured that environmental management and the conservation become integral in various decision-making platforms. As a result of its adoption and implementation, establishment of appropriate policies and legal guidelines as well as harmonization of the existing ones have been and/or are in the process of development. Under the NEAP process, Environmental Impact Assessments were introduced targeting the industrialists, business community and local authorities.

4.2.2 The Kenya National Climate Change Response Strategy

The purpose of this strategy is to put in place robust measures needed to address most of the challenges posed by climate variability and change through thorough impact assessments and monitoring of various projects. According to Climate Change Projections, the country is likely to experience hotter drier sunny seasons, warmer wetter rainy seasons, rise in sea levels and an increase in extreme weather events. In the construction sector, priority inclusion areas should include energy efficient innovations and technologies, and utilization of low-carbon appliances and tools; the utilization of eco-friendly energy resources such as wind, solar, biogas, etc.; as well as possible utilization of biofuels.

The proponent shall incorporate the use of energy efficient fixtures and fittings for the development and use solar power as a renewable and green energy source.

4.3 LEGAL FRAMEWORK

4.3.1 The Constitution of Kenya 2010

The Constitution of Kenya is the supreme law of the Republic of Kenya and binds all persons and all state organs at all levels of government. In relation to environment Article 42 on the Bill of Rights confers to every person the right to a clean and healthy environment, through legislative and other measures, particularly those contemplated in Article 69; and to have obligations relating to the environment fulfilled under Article 70.

Article 32 (2) on Freedom of conscience, religion, belief and opinion stipulates that every person has the right, either individually or in community with others, in public or in private, to manifest any religion or belief through worship, practice, teaching or observance, including observance of a day of worship. Article 69 (1) (d) also stipulates that the state shall encourage public participation in the management, protection and conservation of the environment. Section 2 of article 69 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.

The proponent shall adhere to the provisions of the EMP provided in this report and ensure the right to a clean and safe environment is not infringed.

4.3.2 Environment Management and Coordination Act, EMCA Cap 387 and Amendment 2015

The Act states in section 3 (1) and (2) that every person is entitled to a clean and healthy environment and has the duty to safeguard and enhance the environment and that the entitlement to a clean and healthy environment.

Part VI Section 58 (1) of the Act states that notwithstanding any approval, permit or license granted under this Act or any other law in force in Kenya, any person, being a proponent of a project, shall submit a CPR to the Authority, in the prescribed form, giving the prescribed information. Section 58 (5) states that EIA studies and reports required under the Act shall be conducted or prepared respectively by individual experts or a firm of experts authorized in that behalf by the Authority. The Authority shall maintain a register of all individual experts or firms of all experts duly authorized by it to conduct or prepare environmental impact assessment studies and reports respectively. The register shall be a public document and may be inspected at reasonable hours by any person on the payment of a prescribed fee. Subsection (7) further states that EIA shall be conducted in accordance with the EIA regulations, guidelines and procedures issued under this Act.

The proponent has engaged the services of the environmental experts to conduct the ESIA Study report in line with the provisions of this Act.

4.3.3 The Environmental (Impact Assessment and Audit) Regulations, 2003

These regulations stipulate how study report should be prepared and specifies all the requirements that must be complied with. It highlights the stages to be followed, information to be made available,

role of every stakeholder and rules to be observed during the whole ESIA Study Report making process. Section 4 (1) states that no proponent shall implement a project likely to have a negative environmental impact or for which an ESIA is required under the Act or these Regulations unless an EIA has been concluded and approved in accordance with these regulations.

Part II section 7 (3) stipulates that a project report shall be prepared by an EIA expert registered as such under these Regulations. It also requires that during the EIA process, the proponent shall in consultation with the authority seek views of persons who may be affected by the project or activity.

The experts have undertaken this ESIA *in line with all the provisions set out in these regulations.*

4.3.4 Environmental Management and Co-ordination (Water Quality) Regulations, 2006

Water Quality Regulations apply to water used for domestic, industrial, agricultural, and recreational purposes; water used for fisheries and wildlife purposes, and water used for any other purposes. Different standards apply to different modes of usage. These regulations provide for the protection of lakes, rivers, streams, springs, wells and other water sources. 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.

Part II Section 4 (1) states that every person shall refrain from any act which directly or indirectly causes, or may cause immediate or subsequent water pollution, and it shall be immaterial whether or not the water resource was polluted before the enactment of the Act. Subsection (2) further states that no person shall throw or cause to flow into or near a water resource any liquid, solid or gaseous substance or deposit.

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. While it is the responsibility of the sewerage service providers to regulate discharges into sewer lines based on the given specifications, NEMA regulates discharge of all effluent into the aquatic environment. Everyone is required to refrain from any actions, which directly or indirectly cause water pollution, whether or not the water resource was polluted before the enactment of the Environmental Management and Coordination Act (EMCA Cap 387). *The proposed Project will generate some waste water from its construction activities. Therefore, the waste must comply with the standards specified in this regulation. The proponent will incorporate these regulations to protect human health and the environment.*

4.3.5 Environmental Management and Co-ordination (Waste Management) Regulations, 2006

The regulations are contained in the Kenya Gazette No. 69, Legal Notice No. 121. Section 4 (1) states that no person shall dispose of any waste on a public highway, street, road, recreational area or any other public place except in a designated waste receptacle.

Section 4 (1) and (2) states that no person shall dispose any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle and that any person whose activities generate waste shall collect, segregate and dispose of or cause to be disposed of such waste in the manner provided for under these Regulations. Section 9 states that any person licensed to transport waste shall collect waste from the designated area of operations or storage areas and shall deliver such waste to the designated storage site, disposal site or plant.

The proponent shall engage the services of a licensed waste transporter to transport and dispose wastes generated from activities of the proposed development to the designated areas.

4.3.6 The Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009

Section 3 (1) and (2) of the regulations state that no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment except as otherwise provided in the Regulations. These regulations also relate noise to its vibration effects and seek to ensure no harmful vibrations are caused by controlling the level of noise.

Part II Section 4 states that except as otherwise provided in these regulations, no person shall make or cause to be made excessive vibrations that annoys, disturbs, injures or endangers the comfort, response, health or safety of others and the environment; or cause to be made excessive vibrations which exceed 0.5 centimeters per second beyond any source property boundary or 30 meters from any moving source.

The contractor shall ensure that all installation activities are carried out during the day and on weekdays and also ensure that all machineries used are in good working condition to reduce frictional noise.

4.4.7 The Environmental Management and Co-Ordination (Air Quality) Regulations, 2014

The objective of these regulations is to provide for the prevention, control and abatement of air pollution to ensure clean and healthy ambient air. Section 5 states that no person shall act in a way that directly or indirectly causes, or is likely to cause immediate or subsequent air pollution; or emit any liquid, solid or gaseous substance or deposit any such substance in levels exceeding those set out in the first Schedule.

In addition, section 6 stipulates that no person shall cause or allow emission of the priority air pollutants prescribed in the second schedule to cause the ambient air quality tolerant limits prescribed in the first schedule to be exceeded.

The proponent shall ensure that sprinkling of water is done especially during the dry spell that the site is screened to arrest construction related dust and that routine maintenance of the machinery and construction vehicles if any is done regularly to minimize emission of hazardous gases.

4.4.8 Environmental Management and Coordination (Conservation of Biodiversity) Regulations, 2006

These regulations prohibit any person from engaging in any activity that may have an adverse impact on any ecosystem, lead to the introduction of any exotic species or lead to unsustainable use of natural resources without an Environmental Impact Assessment License issued by the Authority under the Act. It stipulates the measures to be undertaken in a bid to conserve any threatened species, and provides for the protection of environmentally significant areas. Any identified affected species need to be determined during an ESIA process and restoration plan established before any Project implementation can commence The regulation will be applied during the collection and measurement of data on air quality for construction monitoring.

4.4.9 The Penal Code (Cap. 63)

An Act of Parliament to establish a code of criminal law. Section 191 states that any person who voluntarily corrupts or fouls the water of any public spring or reservoir, so as to render it less fit for the purpose for which it is ordinarily used, is guilty of a misdemeanor. Section 192 states that any person who voluntarily vitiates the atmosphere in any place, so as to make it noxious to the health of persons in general dwelling or carrying on business in the neighbourhood or passing along a public way, is guilty of a misdemeanour. Section 193 states that any person who, for the purposes of trade or otherwise, makes loud noises or offensive or unwholesome smells in such places and circumstances as to annoy any considerable number of persons in the exercise of their common rights commits an offence and is liable to be punished as for a common nuisance.

4.4.10 The Energy Act, 2006

The Act was promulgated in 2006 with the effective date being July 1st 2007. The Energy Act, 2006 is the primary legislation in Kenya that contains provisions for the management of the energy sector. The Energy Regulatory Commission (ERC) is the lead agency created under the Act and one its powers is to formulate, enforce and review environmental, health and safety and quality standards for the energy sector, in coordination with other statutory authorities; Section 90 of the Act requires a Proponent to seek permission to construct an energy sector related project from the ERC. Section 91 (1) (b) of the Act requires a Proponent to ensure compliance with the requirements of the EMCA. Section 98 of the Act requires the Proponent to comply with HSE standards set by the ERC.

4.4.11 Petroleum Act, Cap. 116

The legislation has noted several challenges that face the sector which include proliferation of substandard Petroleum Products dispensing and storage sites which pose environment health and safety risks; diversion of petroleum products destined for export into the local market by unscrupulous business people to evade tax and a dominance of the market by a few companies among others. The Government noted these challenges in its energy policy contained in Session Paper No. 4 of 2004. It also recommended the formation of a single energy sector regulator to regulate electricity, downstream petroleum, renewable energy and other forms of energy. The act makes provisions for

restricting and regulation for the importation, transport and storage of petroleum. A license to store petroleum in an installation shall authorize the keeping of the quantity and description of the petroleum product specified therein within the confines of the installation whether in tanks, storage sheds or otherwise in accordance with the specifications and plans attached to the license.

The Act provides for specifications in the granting of a license of the premises to be licensed giving particulars of the materials and construction of each building. The position of the premises in relation to adjoining property and distances from neighbouring buildings should be specified. The position and capacity of each tank, the position of all buildings, structures or other works within the installation, all lighting arrangements including position of electric cables, switches and fuse boxes, drainage systems, water connections, fire hydrants and fire-fighting appliances should also be specified.

4.4.12 Occupational Health and Safety Act, 2007

This is an act of Parliament to provide for the safety, health and welfare of workers and all persons lawfully present at workplaces, to provide for the establishment of the National Council for Occupational Safety and Health and for connected purposes. Section 6 of this act dictates that every occupier is obliged to ensure safety, health and welfare of all persons working in his workplace. The occupier shall achieve this objective by preparing and as often as may be appropriate, revising a written statement of his general policy with respect to the safety and health at work of his employees and the organization and arrangements for the time being in force for carrying out that policy (Section 7). He is also required to establish a safety and health committee at the workplace in a situation where the number of employees exceeds twenty (section 9) and 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 registered safety and health Advisor (Section 11).

To ensure machinery safety, every hoist or lift (section 63) and all chains, ropes and lifting tackles (section 64 (l, d)), shall be thoroughly examined at least once in every period of six months by a person approved by the Director of Occupational Health and Safety Services.

In relation to fire safety, section 78 (3) requires spillage or leaks of any flammable liquid to be contained or immediately drained off to a suitable container or to a safe place, or otherwise treated to make it safe. Furthermore, section 78 (5) states that a clear and bold notice indicating that smoking is prohibited should be conspicuously displayed in any place in which explosive, highly flammable or highly combustible substances, are manufactured, used, handled or stored. In summary, this act will be used a guideline to ensure health and safety of workers is guaranteed.

The proponent shall ensure that the site is registered with Directorate of Occupational Safety and Health Services. The proponent shall further engage competent Environment Health and Safety personnel to oversee the safety and health of the workers during installation. The proponent shall as well provide insurance cover for all the workers and the public against all risks related to construction activities.

4.4.12.1 The Occupational Safety and Health (First Aid in The Workplace) Regulations, 2023

These rules describe the contents of a First Aid box or cupboard for workplaces depending on the number of employees i.e. less than ten or more than fifty employees. It also stipulates that there should be employees who are trained on First Aid on every shift. The rules will be applicable during the execution of the proposed project. It will be noble to ensure availability of enough First Aid supplies and trained personnel in all development/project workplaces.

4.4.12.2 The Factories & Other Places of Work (Safety and Health Committee) Rules, 2004

These rules stipulate that all workplaces which regularly employ twenty or more employees must establish Safety and Health Committees. The committees should have representatives from the management and all other departments in the workplace. The duties of the committees will be to oversee all the safety issues within the workplace and provide effective corrective measures for any safety incidences or accidents to ensure the Safety and Health of all employees and visitors. The proposed development will incorporate these rules to ensure the safety and Health of all employees, visitors and the surrounding community.

4.4.12.3 **The Factories and Other Places of Work (Fire Risk Reduction) Rules, 2007**

These rules stipulate the measures that should be put in place in all workplaces, processes or operations as provided for by the Act. They provide guidance on the storage and handling of flammable substances, measures to prevent the occurrence and spread of fires, measures to evacuate employees and measures to provide First Aid care or treatment in case of injuries during fires.

4.4.12.4 **The Factories and Other Places of Work (hazardous Substances) Rules, 2007**

These rules apply to every factory, premises, places, process, operation, or work to which the provisions of the Factories and Other Places of Work Act apply, and also to employees and occupiers of premises. The rules stipulate that it is the responsibility of the employer to ensure that the hazardous substances are within the required limits, and should provide personal protective equipment to protect the employees. The rules provide for measures to control, handle and dispose of the hazardous substances. The rules will be considered in the envisioned developments to ensure the hazardous substances are controlled.

4.4.12.5 **The Factories and other places of Work (Medical Examination) Rules, 2005**

The rules stipulate that a medical examination should be carried out on employees who may be exposed to various hazards within the workplaces in order to control the spread of occupational diseases. The employees working in occupations described in the Eighth Schedule of the Act should

undergo medical examinations as stipulated in the First Schedule of these rules. The rules will be incorporated in the proposed project to ensure the health of the employees during the execution.

4.4.12.6 The Factories and other places of Work (Noise Prevention and Control), 2005

The rules stipulate the maximum level of noise that employees should be exposed to at given times. It also stipulates measures that should be put in place to ensure that the noise generated and exposed to workers at the workplace such as in the industrial sector envisioned by the proposed project.

4.4.13 The Occupiers Liability Act (Cap. 34)

Section 3 requires that an occupier of premises owe the "common duty of care" to all visitors and workers.

4.4.14 Climate Change Act, 2016

This Act provides 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. This Act is applicable 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's main objectives related to the various development zones for the proposed project are;

a) Mainstream climate change responses into development planning, decision making and implementation;

b) Build resilience and enhance adaptive capacity to the impacts of climate change;

c) Formulate programmes and plans to enhance the resilience and adaptive capacity of human and ecological systems to the impacts of climate change;

d) Mainstream and reinforce climate change disaster risk reduction into strategies and actions of public and private entities;

e) Mainstream intergenerational and gender equity in all aspects of climate change responses;

f) Provide incentives and obligations for private sector contribution in achieving low carbon climate resilient development;

g) Promote low carbon technologies, improve efficiency and reduce emissions intensity by facilitating approaches and uptake of technologies that support low carbon, and climate resilient development;

h) Facilitate capacity development for public participation in climate change responses through awareness creation, consultation, representation and access to information;

i) Mobilize and transparently manage public and other financial resources for climate change response;

j) Mainstream the principle of sustainable development into the planning for and decision making on climate change response.

The proponent shall comply with the standards.

4.4.15 The Physical and Land Use Planning Act No. 13 of 2019

An Act of Parliament to make provision for the planning, use, regulation and development of land and for connected purposes. Section 55(1) of the Act provide the objectives of development control as: to ensure orderly physical and land use development; to ensure optimal land use; to ensure the proper execution and implementation of approved physical and land use development plans; to protect and conserve the environment; to promote public safety and health; to promote public participation in physical and land use development decision-making; to ensure orderly and planned building development, planning, design, construction, operation and maintenance; and to promote the safeguarding of national security.

In Section 56 of the Act, the Urban Areas and Cities Act (2011) and the County Governments Act (2012), the County Governments shall have the power within their areas of jurisdiction to: prohibit or control the use and development of land and buildings in the interests of proper and orderly development of its area; control or prohibit the subdivision of land; consider and approve all development applications and grant all development permissions; ensure the proper execution and implementation of approved physical and land use development plans; formulate by-laws to regulate zoning in respect of use and density of development; reserve and maintain all the land planned for open spaces, parks, urban forests and green belts in accordance with the approved physical and land use development plans; and consider and determine development planning applications made in respect of land adjoining or within reasonable vicinity of safeguarding areas.

The Third Schedule states that any Planning Authorities shall require applications for major developments to be subjected to ESIA. The Proponent shall have to apply for approval from the relevant authorities including the County Government of Nairobi and secure approvals prior to commencement.

The proponent is in compliance with the county requirements before setting up of such property.

4.4.16 Public Health Act Cap 242

Part IX section 115 of the Act states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.

Section 116 requires that the county governments take all lawful, necessary and reasonably practicable measures for maintaining its sub counties at all times in clean and sanitary condition, and for preventing the occurrence therein of, or for remedying or causing to be remedied, any nuisance or condition liable to be injurious or dangerous to health, and to take proceedings at law against any person causing or responsible for the continuance of any such nuisance or condition.

For all projects with direct or indirect implications on the health of the workers or the neighbouring communities. All health and safety measures should be in place to ensure the workers and the neighbouring communities are not exposed to risks. *The proponent shall contract a licensed waste transporter to collect and dispose of all solid waste if any at designated area.*

4.4.17 County Government Act, 2012

The main purpose of the enactment of this Act was to give effect to Chapter Eleven of the Constitution; to provide for county governments' powers, functions and responsibilities to deliver services and for connected purposes. The Act gives county the responsibility of planning and co- coordinating all developments within their areas of jurisdiction. The proposed project is within the Nairobi Government and thus there will be need of working in liaison with the County Government. The plans for the proposed project must be approved by the County Government.

The proponent shall work in liaison with County Government.

4.4.18 Building Code 2000

Section 194 requires that where sewer exists, the occupants of the nearby premises shall apply to the local Authority for permit to connect to the sewer line and all the wastewater must be discharged into sewers. The code also prohibits construction of structures or building on sewer lines.

4.4.19 The Penal Code (Cap. 63)

Section 191 of the Penal Code makes it an offence for any person or institution that voluntarily corrupts, or foils water for public springs or reservoirs rendering it less fit for its ordinary use. Similarly, section 192 of the same act prohibits making or vitiating the atmosphere in any place to make it noxious to health of persons/institution in dwellings or business premises in the neighborhood or those passing along a public way.

The proponent will be required to ensure strict adherence to the Environmental Management Plan throughout the project cycle in order to mitigate against any possible negative impact.

4.4.20 Land Registration Act, 2012

Section 26 subsection (1) states that the certificate of title issued by the Registrar upon registration, or to a purchaser of land upon a transfer or transmission by the proprietor shall be taken by all courts as prima facie evidence that the person named as proprietor of the land is the absolute and indefeasible owner, subject to the encumbrances, easements, restrictions and conditions contained or endorsed in the certificate, and the title of that proprietor shall not be subject to challenge, except on the ground of fraud or misrepresentation to which the person is proved to be a party; or where the certificate of title has been acquired illegally, unprocedurally or through a corrupt scheme. A certified copy of any registered instrument, signed by the Registrar and sealed with the Seal of the Registrar, shall be received in evidence in the same manner as the original.

Copy of land ownership documents is attached to this report.

4.4.21 The National Land Commission Act, 2012 (No. 5 of 2012)

Section 5 of the Act outlines the Functions of the Commission, which include to manage public land on behalf of the national and county governments and to recommend a national land policy to the national government, to conduct research related to land and the use of natural resources, and make recommendations to appropriate authorities and to initiate investigations, on its own initiative or on a complaint, into present or historical land injustices, and recommend appropriate redress as well as monitor and have oversight responsibilities over land use planning throughout the country.

The subject plot is a private property leased to the project proponent and does not constitute part of disputed public/private utility land/allocations. Attached in the report is the ownership document.

4.4.22 Standards Act Cap. 496

This Act is meant to promote the standardization of the specification of commodities, and to provide for the standardization of commodities and codes of practice. It also provides for the establishment of a Kenya Bureau of Standards, definition of its functions and provides for its management and control. The Code of practice is interpreted in the Act as a set of rules relating to the methods to be applied or the procedure to be adopted in connection with the construction, installation, testing, sampling, operation or use of any article, apparatus, instrument, device or process. The Act will be incorporated in the development to ensure that all the commodities that will be purchased and used during the execution will adhere to the provisions of this Act.

4.4.23 Traffic Act Cap 403

This is an Act of Parliament consolidating the laws that govern the use of traffic on the roads. It stipulates the procedures for vehicle registration, licensing, training of drivers and conduct of drivers when using the road. It also stipulates the offences committed on the road and the penalties to be imposed in relation to these offences. The proposed development of the roads execution stage will have a lot of traffic hence the Act provisions will be quite relevant.

4.4.24 National Environmental Action Plan (NEAP) According to NEAP, 1994

The Government recognized the negative impacts on ecosystems emanating from development programmes that disregarded environmental sustainability. Established in 1990, the Plan‘s effort was to integrate environmental considerations into the country‘s economic and social development. Under the NEAP process EIA was introduced.

4.4.25 The world commission on environment and development–the Brundtland Commission of (1987)

The Brundtland Commission addresses the environmental aspects of development. It has emphasized on sustainable development that produces no lasting damage to the biosphere and to particular ecosystems. In addition to environmental sustainability is the economic and social sustainability. Economic sustainable development is development for which progress towards environmental and social sustainability occurs within available financial resource. The guidelines will be used to develop an EMP to guide the developer in order to ensure environmental enhancement.

4.4.26 National Policy on Water Resources Management and Development

It enhances a systematic development of water facilities in all sectors for the promotion of the Country ‘s socioeconomic progress, and also recognizes the by-products of these processes as wastewater. It calls for development of appropriate sanitation systems to protect people’s health and water resources from pollution. The policy guideline will be used to provide an effective and efficient waste water management system.

4.4.27 The Sustainable Waste Management Act 2022

12. Waste classification and segregation (1)

All public and private sector entities shall segregate non-hazardous waste into organic and non-organic fractions. (2) The segregated waste shall be placed in properly labeled and colour coded receptacles, bins, containers and bags. (3) All waste service providers shall collect, handle and transport segregated waste as provided for under this Act. (4) Hazardous waste will be handled and managed as prescribed by the Environmental Management and Co-ordination Act (Cap. 387) and any other relevant written law. (5) A waste service provider who contravenes the provisions of this section commits an offence and shall, on conviction, be liable to a fine not exceeding fifty thousand shillings or imprisonment for a term not exceeding six months or both. (6) The Cabinet Secretary shall, in consultation with the Authority and county governments, Gazette the National Colour Coding System for waste management.

13. Extended producer responsibility

Every producer shall bear extended producer responsibility obligations to reduce pollution and environmental impacts of the products they introduce into the Kenyan market and waste arising therefrom. (2) Every producer shall fulfill their extended producer responsibility obligations

individually or collectively in a compliance scheme. (3) The Cabinet Secretary shall, within two years of the coming into operation of this Act make regulations on extended producer responsibility.

14. Materials recovery facilities (1)

Each county government shall establish a materials recovery facility. (2) A materials recovery facility shall be used for final sorting, segregation, composting and recycling of waste generated or transported to the county and transport the residual waste to a long-term storage or disposal facility or landfill. (3) A materials recovery facility shall be licensed by the Authority. (4) The Cabinet Secretary shall, in consultation with the Authority and county governments, make regulations for the establishment and proper management of materials recovery facilities.

18. Waste management plans (1)

Each county government shall prepare and submit to the county assembly for approval an integrated county waste management plan once every five years. (2) Each county government shall include the approved integrated county waste management plan in the integrated county development plan.

19. Duties of private sector entities (1) A private sector entity shall prepare a three-year waste management plan and submit an annual monitoring report to the Authority which shall specify— (a) the actual quantities of waste generated by the entity; (b) the waste management methods applied by the entity; and (c) any other information that the Authority may require. (2) Notwithstanding the generality of subsection (1), the Cabinet Secretary shall, within six months of the coming into force of this Act, Gazette the category of private sector entities that shall be required to prepare waste management plans which shall be based on the volume of production of waste. (3) A private sector entity that fails to comply with the provisions of subsection (1) commits an offence and shall, on conviction, be liable to a fine of not more than two hundred thousand shillings and the person responsible for the private sector entity shall, in addition to the fine imposed on the entity, be liable to imprisonment for a term not exceeding three months. (4) A private sector entity shall— (a) adopt the following cleaner production principles including— (i) improvement of production processes through conserving raw materials and energy; (ii) (iii) (iv) limiting the use of toxic raw materials to safe laws within such time as may be prescribed by the Authority; reducing toxic emissions and wastes; and monitoring the product cycle from beginning to end by; (b) identify and eliminate potential negative impacts of the product; (c) enable the recovery and reuse of the product where possible; (d) reclaim and recycle; (e) incorporate environmental concerns in the design, process and disposal of the product; (f) collect, segregate and dispose of or cause to be disposed of the waste in accordance with this Act; (g) shall segregate waste by separating hazardous waste from non-hazardous waste and dispose of the waste in a facility provided by the county government or the Authority; (h) transfer the waste to a person who is licensed to transport and dispose of the waste in accordance with this Act; (i) clean up and restore the site it was using to its natural state; (j) prepare a waste management plan and integrate it in its corporate strategies and plans; and (k) provide waste segregation receptacles at its premises for organic, plastic and general dry waste. (5) A private entity that generates waste shall

segregate the waste by separating hazardous waste and dispose of the hazardous waste in a facility provided by the county government or the Authority. (6) A private entity or any its officers that fails to manage waste in accordance with this Act commits and offence and on conviction, shall be liable to a fine— (a) of at least five per cent of the entity's net income registered in the previous tax year or five million shillings whichever is the higher; and (b) of at least two hundred thousand shillings for the entity's officers. (7) Where a private entity or any of its officers has been convicted of an offence under subsection (3), and the entity continues to fail to comply with the provisions of this Act, the entity or the officer commits a further offence and for each day the failure continues on conviction, shall be liable to a fine (a) not exceeding zero-point-five per cent of the entity's net income registered in the previous tax year, for the private entity; and (b) not exceeding twenty thousand shillings for the entity's officers.

20. Duty to segregate and dispose waste (1)

A person who generates waste in Kenya shall— (a) segregate the waste at source in accordance with the provisions of this Act; and (b) dispose the waste to only licensed waste service providers or at collection points designated in accordance with the provisions of this Act. (2) A person who does not manage waste in accordance with subsection (1) commits an offence and shall, on conviction, be liable to a fine not exceeding twenty thousand shillings or imprisonment for a term not exceeding six months or both.

21. Duties of waste service providers (1)

A waste service provider shall handle segregated waste in accordance with the provisions of this Act. (2) A waste service provider shall deliver segregated waste collected to facilities licensed and designated in accordance with the provisions of this Act. (3) A waste service provider who fails to handle or manage waste in accordance with this Act commits an offence and shall, on conviction, be liable to a fine not exceeding fifty thousand shilling or imprisonment for a term of six months or both.

4.5 INSTITUTIONAL FRAMEWORK

4.5.1 National Environment Management Authority (NEMA)

The objective and purpose for which NEMA is established is to exercise general supervision and co-ordinate over all matters relating to the environment and to be the principal instrument of the government in the implementation of all policies relating to the environment. The Authority is mandated to co-ordinate the various environmental management activities being undertaken by the lead agencies and promote the integration of environmental considerations into development policies, plan, programs and projects with a view to ensuring the proper management and rational utilization of the environmental resources on a sustainable yield basis for the improvement of the quality of human life in Kenya.

The ESIA Project Report shall be submitted to the authority for review and licensing. The proponent shall work in liaison with the authority in complying with the provisions of EMCA and all other subsidiary legislations under the Act.

4.5.2 National Environment Tribunal (NET)

The tribunal is formed under section 125 of the Environmental Management and Coordination Act, Cap 387. All cases related to environmental offences in the Republic of Kenya are handled by the tribunal. If there will be any disputes to the proposed project, they will be presented to the tribunal for hearing and determination. Any person aggrieved by the decision or order of the tribunal may appeal against such decision or order to the High Court.

Any disputes arising from the development and construction of the proposed project shall be presented to the NET for resolution.

4.5.3 National Environmental Complaints Committee

The National Environmental Complaints Committee performs the following functions:

- 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.

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.

4.5.4 National Environment Action Plan Committee

The Authority is responsible for the development of a 6-year National Environment Action plan and shall ensure that it has undertaken public participation before the adoption of the plan. The National Environment Action Plan shall:

▪ Contain analysis of the Natural Resources of Kenya with an indication as to any pattern of change in their distribution and quantity over time.

▪ Contain analytical profile of the various uses and value of the natural resources incorporating

▪ Considerations of intergenerational and intra-generational equity.

4.5.6 County Environment Committees

Governors shall by notice in the gazette constitute a County Environment Committee that shall be responsible for the proper management of the environment within the County for which it is appointed. They should also perform such additional functions as prescribed by the Act or as may, from time to time be assigned by the Governor by notice in the gazette. The decisions of these committees are legal and it is an offence not to implement them.

4.5.7 National Environment Restoration Fund

The objective of the Restoration Fund shall be to serve as supplementary insurance for the mitigation of environmental degradation where the perpetrator is not identifiable or where exceptional circumstances require the Authority to intervene towards the control or mitigation of environmental degradation. There is a draft EMC (deposit bonds) regulation 2014, but it is yet to be gazette.

4.5.8 National Environment Trust Fund

The trust fund is vested in NEMA and subject to EMCA Cap 387. A board of five trustees appointed by the Cabinet Secretary administers it. These funds may be received from donations, endowments, grants and gifts from whatever source or sums of money or from monies designated by NEMA for this fund.

4.6 INTERNATIONAL TREATIES

4.6.1 Kyoto Protocol

Kyoto protocol was as a result of United Nations Framework Convention on Climate Change (UNFCC) held in Japan. It is an international treaty that sets binding obligations on industrialized countries to reduce emissions of greenhouse gases. The UNFCC is an environmental treaty with the goal of preventing “dangerous” anthropogenic interference of climate system. Many of UN member state parties have agreed to legally binding limitations/ reductions in their emissions of greenhouse gases. Kenya has ratified the Kyoto protocol and is committed to reducing her greenhouse gases emissions. To achieve the state targets individuals, companies and corporations will be required to reduce their emissions in this regard it is recommended that the proponent reduces or avoids using any substance that will emit greenhouse gas in the site.

4.6.2 Montreal Protocol

The Montreal Protocol on Substance that Deplete the Ozone Layer (a Protocol to the Vienna Convention for the Protection of the Ozone Layer) is an international treaty designed to protect the ozone layer by phasing out the production of numerous substances believed to be responsible ozone depletion such as Hydro fluorocarbons. Some of these hydro fluorocarbons are used as coolants and therefore it is strongly recommended that the proponent avoids use of such coolants in the site.

4.6.3 International Commission on Non-Ionizing Radiation Protection

i. The International Commission on Non-Ionizing Radiation Protection (ICNIRP) is a body of independent scientific experts consisting of a main Commission of 14 members, 4 Scientific Standing Committees covering Epidemiology, Biology, Dosimeter and Optical Radiation and a number of consulting experts. This expertise is brought to bear on addressing the important issues of possible adverse effects on human health of exposure to non-ionising radiation.

ii. ICNIRP's principal aim is to disseminate information and advice on the potential health hazards of exposure to non-ionizing radiation to everyone with an interest in the subject. ICNIRP's information and advice covers all of the non-ionizing radiations including, the optical radiations (ultraviolet, visible and infrared - and lasers), static and time-varying electric and magnetic fields and RF (including microwave) radiation, and ultrasound. Much of the information that ICNIRP provides is published in the form of scientific reviews and reports and the proceedings of scientific meetings. The results of these reviews combined with risk assessments carried out in collaboration with the World Health Organization, WHO, result in the publication by ICNIRP of Exposure Guidelines. Examples of these are guidelines limiting exposure to electromagnetic fields, to laser radiation, to ultraviolet radiation, to incoherent optical radiation and to ultrasound.

iii. The core components of the ICNIRP can be listed as follows:

- It is independent from industry in both membership and funding;
- It is a non-profit making body and is legally registered as such in Germany;
- It seeks to provide a service of information provision or advice to all persons, whether professionally involved with non-ionizing radiation protection or with a personal interest;
- It’s information and advice is provided, wherever possible, at no cost;
- It promulgates its information and its publications through its Webpage www.icnirp.org;
- Its members are independent experts in the scientific disciplines necessary for non-ionizing radiation protection. In carrying out their voluntary work for the Commission they do not represent either their countries of origin or their institutes; and
- It works in close collaboration with much health protection related agencies both national and international.

5 ANALYSIS OF PROJECT ALTERNATIVES

5.1 Introduction

This chapter analyses the proposed Project's alternatives in terms of site, technology scale and waste management options.

5.2 The proposed Action Alternative

The alternative consists of the Proponent 's final proposal with the inclusion of the legal guidelines, regulations and procedures as stipulated in the EMCA Cap 387 which aims at reducing environmental impacts to the maximum extent practicable. Appropriate ESMMPs will be prepared as per the proposed Project.

5.3 Relocation alternative

Relocation option to a different site is an option for the Project implementation. At the moment, the Proponent has no alternative sites for relocation though can look for another site. Finding and acquiring similar property in a suitable place and completing official transaction on it may take a long period. Besides, there is no guarantee that such land would be available and suitability is another very important factor, which cannot be ignored. While we appreciate that monetary costs should not be used to justify a wrong project, this would also call extra costs in terms of money and time for example whatever has been done and paid to date would be a direct loss to the Proponent. This may also lead to a No Action Alternative situation. The other consequence is that it would discourage both foreign and local investors especially in the education sector that has a big deficit. In consideration of the above concerns and assessment of the current proposed site, relocation of the proposed Project is not a viable option. The problem is further aggravated by the fixed characteristics of land and the bottlenecks of the planning policy.

5.4 The No Action Alternative

The No Action Alternative in respect to the proposed Project 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. The anticipated insignificant environmental impacts resulting from proposed Project would not occur. This option will however, involve several losses to both the Project Proponent/land owner and other stakeholders; society and government. The No Project Option is the least preferred with reasons such that there will be no access to higher education to our growing youth where is much needed, forfeiture of economic benefits that would accrue to the Proponent, the public and the government, and it could also discourage investors wishing to invest in the sector. From the analysis, it becomes apparent that the No Project Alternative is not the appropriate alternative.

5.5 Alternative design, layout and technology

Various alternative designs and technology has been evaluated by the Proponent and various professionals involved i.e. the architect, engineers, physical planner and surveyors. After extensive discussions and relevant considerations, the various options were assessed and the most optimal design and technology were agreed as per the proposed plans, materials and technology.

5.6 Alternative land use

The Proponent has an option to use the land for other purposes other than the proposed Jabali Towers. The Proponent may decide to use the land for agriculture or even industrial, may opt to sell the leasehold interest; or for the myriad of the alternative other land uses. This option however calls for change of use and whatever the type of project, it will still have its potential impacts some even worse than the proposed Project depending on their nature for example industrial activity.

5.7 The comparison of alternatives

Under the proposed development alternative, the proposed Project would create residential and commercial facility with all the amenities and would provide employment directly and indirectly to the public over. Under the No Action Alternative, there would be no development at all. There would be no benefits from the site and neither would there be insignificant environmental Impacts. Layout redesign may perhaps give an optimal design and should be explored for optimization of the benefits and environmental enhancement. Provided the Environmental Impact mitigation measures are implemented as well as adoption of sound management practices, negative impacts will be avoided/minimized. However, commitments related to development alternative would ensure that potential impacts are minimized to levels of insignificance.

5.8 Wastewater management alternatives

Four locally available technologies are discussed below:

5.8.1 Alternative one - Connection to sewer system and wastewater treatment plant

Connection to TATUWASCo system through internal sewer network is one of the likely alternatives in these projects. It solves the wastewater management issue at a very minimal cost and in an environmental efficient manner. Since the proposed project study area is served by a TATUWASCo sewer line, then this option turned out to be the preferred option for this project.

5.8.2 Alternative two - Use of stabilization ponds/lagoons

This refers to the use of a series of ponds/lagoons which allow several biological processes to take place, before the water is released to the outside environment. The lagoons can be used for aquaculture purposes and irrigation. However, they occupy a lot of space but are less costly. No chemicals are used/heavy metals sink and decomposition processes take place. They are usually a nuisance to the public because of smell from the lagoons/ponds. This option is not preferable in the area because the stakeholders are not likely to accept the option.

5.8.3 Alternative three - Use of Constructed/Artificial wetland

This is one of the powerful tools/methods used in raising the quality of life and health standards of local communities in developing countries. Constructed wetland plants act as filters for toxins. The advantages of the system are the simple technology, low capital and maintenance costs required. However, they require a longer time to function. Long term studies on plant species on the site will also be required to avoid weed biological behavioural problems. Hence it is not the best alternative for this kind of project.

5.8.4 Alternative four - Use of septic tanks

This involves the construction of underground concrete-made tanks to temporarily store the sludge with soak pits. In Kenya, this option has been widely accepted in those areas without a sewer line. There is adequate knowledge among investors on this method of waste management and has been customized locally. The challenge regarding this mode of liquid waste disposal presently has been on where the exhausters dump the contents exhausted from the septic tanks. Incidents of waste from septic tanks being dumped in unauthorized dumpsites have of late been reported causing wide public outcry. Such incidents are not only a real threat to public health but also a contravention of the provisions of the Environmental Management and Co-ordination (Water Quality) Regulations, 2006 and not recommended for this project.

5.8.5 Alternative five - Wastewater treatment plant

Waste water treatment plant involves the construction of a plant and use of chemicals to treat the effluents to locally/internationally acceptable environmental standards before it is re-used or discharged in to a nearby river. Technology has brought forth cheap technologies to construct and maintain making it an option to embrace for a project of this kind. The sludge obtained can be composted and used for agricultural and gardening purposes. This option also favors larger projects like this one and therefore it is an option to be considered in future.

5.9 Solid waste management alternatives

Considerable solid wastes will be generated from the proposed Project. An integrated solid waste management system is recommendable. First, the Proponent will give priority to Reduction at Source of the materials. This option will demand a solid waste management awareness programme in the management and the occupiers. Recycling, reuse and composting of the waste will be the second alternative in priority. This will call for a source separation programme to be put in place. The recyclables will be used around. The third priority in the hierarchy of options is combustion of the waste that is not recyclable. Finally, sanitary landfilling will be the last option for the Proponent to consider.

5.10 Water Sources alternatives

Various water sources have been evaluated by the proponent and various professionals involved. After extensive discussions and relevant considerations, the various options were assessed and the most optimal water source agreed on is the treated potable water through Tatu City's integrated internal water network managed by TATUWASCo, using bulk supply from RUJWASCo and local boreholes, delivered via modern piped infrastructure with smart metering and reliable round-the-clock service.

5.11 ESIA with/without EMP

5.11.1 Without EMP

This scenario was based upon the assumption that the proposed development would go ahead without any environmental management plan/options being implemented. The total project impact for

the scenario is on the appreciably adverse side. This shows that if the project goes ahead without EMP, the adverse impact on the existing environment would be several times that of the impact without the project. Thus, this assumption is disqualified and not applicable since the greatest challenge worldwide presently is geared towards sustainable developments and sustainable use of natural resources.

5.11.2 With EMP

If the environmental management strategies discussed in chapter 9 are fully implemented, the adverse impact of the project would be reduced, and there will be an overall improvement in physical, chemical, biological and socioeconomic environment of the region. Therefore, the proposed activity will be beneficial for the environment of the area, provided the EMP is in place. It is clear from the above, that the proposed Project would have negative effect without implementing certain environmental management strategies. If EMP, as discussed in chapter 9, is adopted and implemented, the adverse impacts will be reduced and the overall environmental quality of the area would improve hence this remains a preferred option.

6 PUBLIC PARTICIPATION & STAKEHOLDERS ENGAGEMENT

Public Participation and Stakeholder Engagement form a fundamental component of decision-making within the ESIA process, aimed at promoting the core principles of sustainable development. Public consultation is a statutory requirement anchored in Articles 10(2) and 69(d) of the Constitution of Kenya (2010), Legal Notice No. 101 under the Environmental Management and Coordination Act (EMCA), 1999 (Cap 387), the Environmental (Impact Assessment and Audit) Regulations, 2003, and Sections 87 and 113 of the County Governments Act, 2012.

This process provides affected communities, stakeholders, and interested parties with an opportunity to express their views, concerns, and recommendations regarding the proposed Jabali Towers Project prior to its implementation. The issues raised, particularly environmental and social concerns, will be considered and incorporated into the project design and management measures to enhance long-term environmental sustainability and social acceptability.

A public participation meeting/baraza for the proposed project was held on 21st January 2026 at Tatu Central, the CBD of Tatu City, adjacent to the project site. The meeting was attended by immediate neighbours and key stakeholders, including the Assistant Chief, representatives from Tamambo Restaurant, Naivas Supermarket, Cascade Restaurant, Roast Restaurant, Bospack Limited, and various Tatu City departments. Prior to the public participation a public notice giving the PAPs, immediate neighbors adjacent to the project 7 days' notice of the meetings. The public notices were were prominently displayed in public places and the in the vicinity of the site informing the affected persons and communities of the proposed project.

Public Notices Prominently displayed in public places and in the vicinity of the site

The session began with registration and introductions, followed by opening remarks outlining the purpose of the meeting. A presentation was made describing the project stages (design, construction, and decommissioning) and an overview of the Environmental and Social Impact Assessment (ESIA) and compliance requirements. Participants were then given an opportunity to raise questions, comments, and concerns, which were addressed, and the way forward discussed. Public participation questionnaires were issued to stakeholders before the meeting concluded with closing remarks.

Furthermore, stakeholder engagement fosters a sense of inclusivity, shared responsibility, and community ownership, which are essential for the effective and smooth implementation of the project. A list of neighbouring stakeholders consulted and the completed questionnaires are attached as supporting documentation. Below is the summary of the feedback:

6.1 Summary of the stakeholder's engagement feedback

6.1.1 Implementation (Construction) Phase

6.1.1.1 Perceived Positive Socio-Economic and Environmental Impacts

Stakeholders acknowledged that the project is likely to:

- Create employment opportunities for the local community.
- Improve livelihoods and living standards.
- Stimulate local businesses and attract new investors to Tatu City.
- Enhance land value within the area.
- Contribute to local and national revenue.
- Promote planned and organized urban development.

6.1.1.2 Key Concerns on Socio-Economic and Environmental Impacts

The main issues anticipated during construction include:

- Dust emissions affecting nearby residents.
- Noise and vibration from heavy machinery.
- Increased traffic congestion from construction vehicles.
- Population pressure within the city.
- Generation of construction waste.
- Potential disruption of natural storm water runoff patterns.

6.1.1.3 Suggested Mitigation measures

Stakeholders recommended that the proponent should:

- Conduct detailed risk assessments.
- Improve infrastructure and increase parking capacity.
- Deploy traffic marshals to manage vehicle movement.
- Strengthen site security.
- Implement proper waste segregation and disposal in line with NEMA regulations.
- Install dust control measures (water sprinkling/dust nets) and noise barriers.
- Develop and implement an effective storm water drainage system.
- Ensure safe systems of work and adherence to occupational health and safety procedures.

6.1.2 Operation Phase

6.1.2.1 Perceived Positive Socio-Economic and Environmental Impacts

During operation, the project is expected to:

- Increase property value in surrounding areas.
- Provide long-term employment opportunities.
- Improve service availability due to enhanced infrastructure.
- Enhance drainage systems.
- Add a high-quality landmark development within Kenya.

6.1.2.2 Key Concerns on Socio-Economic and Environmental Impacts

Stakeholders expressed concerns about:

- Increased security risks.
- Higher levels of pollution.
- Occupational injuries.
- Population growth and labour influx.
- Traffic congestion.
- Increased demand for water, power, and waste management services.
- Possible conflicts with local businesses.
- Health risks related to dust exposure.

6.1.2.3 Suggested Mitigation measures

To address these concerns, stakeholders proposed:

- Adoption of energy-efficient building designs.
- Proper waste management and recycling systems.
- Strengthened security systems and checks.
- Strict adherence to safety standards and provision of PPE.
- Prioritization of local employment.
- Effective storm water and flood control systems.
- Regular monitoring meetings (quarterly).
- Development of a labour influx and population management plan.
- Traffic management plans and alternative routes.
- Continuous dust suppression and provision of dust masks.
- Routine EHS inspections.
- Annual Environmental Audits by a licensed expert.
- Employment of a competent HSE team.
- Development and implementation of HSE and related policies.

Overall Conclusion

Stakeholders demonstrated strong support for the project due to its economic and urban development benefits. However, they emphasized the need for robust environmental management, traffic control, infrastructure planning, occupational safety measures, and continuous stakeholder engagement to ensure sustainable implementation and operation of the proposed Jabali Towers development.

7 POTENTIAL ENVIRONMENTAL IMPACTS

7.1 Introduction

An impact assessment was undertaken following full characterization of the environmental and social baseline, and identification of all project aspects. The anticipated impacts of the proposed project on the environmental elements are both positive and negative. The magnitude of each impact is described in terms of being significant, minor or permanent, short-term or long term, specific (localized) or widespread, reversible or irreversible.

The scope of the assessment will cover the proposed project site, and will be undertaken in accordance with, the National Environmental legal requirements, and guidelines triggered for the project. All the relevant environmental, social and economic aspects will be identified for the proposed activities, the activities will be considered in terms of their potential to interact with the (physical, biological, socio-economic) environment. The ESIA project report shall distinguish the impacts through the following phases

- Construction phase
- Operational phase
- Decommissioning phase

Most of the impacts have been addressed in the proactive design of the project and other mitigation measures can only be guaranteed through active and responsible management committed to the propositions of the environmental management plan.

7.2 Construction phase

7.2.1 Positive impacts

There are a number of positive benefits associated with the proposed Jabali Towers Mixed use development.

The following are some of the positive benefits anticipated:

1. **Employment Creation:** The project will generate job opportunities during both the construction and operational phases, benefiting skilled and unskilled workers.
2. **Economic Growth:** Increased commercial activity will contribute to local and county revenue through taxes, permits, and business operations.
3. **Improved Infrastructure:** The development will enhance local infrastructure such as access roads, water supply, sewer systems, and electricity connectivity.
4. **Enhanced Land Value:** The project will increase the value of adjacent properties and stimulate further investment at Tatu City.
5. **Modern Housing & Office Space:** Provision of quality residential units, office spaces, and retail facilities will meet rising demand for modern urban living within Tatu City.
6. **Business Opportunities:** The mixed-use nature will promote small and medium enterprises (SMEs) through retail spaces, restaurants, and services.

7. **Urban Aesthetics:** Introduction of modern architectural designs will enhance the visual appeal and urban character of Tatu City.
8. **Social Benefits:** Availability of amenities such as recreational spaces, community facilities, and convenient services that improve quality of life at Tatu City.
9. **Efficient Land Use:** Mixed-use developments promote compact, sustainable urban planning by combining residential, commercial, and recreational aspects in one space.

Below are some expounded positive impacts of the proposed project:

7.2.1.1 Promote the informal sector

During the construction period, the informal sector will benefit from the operations thereof from the demand for food, fruits and other consumable due to high number of workers –both skilled and unskilled considering the vastness of the project, to be engaged at the construction site. This will involve food and fruit vendors who will be selling food and fruits to the workers on site. This will promote Jua-Kali entrepreneurs in the study area.

7.2.1.2 Job opportunities

Employment opportunities are beneficial both in economic and social sense. In the economic sense it means abundant unskilled labour will be used in economic production. In the social sense these young and energetic people will be engaged in productive employment other than remaining idle.

The proposed Project will directly and indirectly create employment for a number of workers, especially casual or unskilled workers However, the exact number cannot be predetermined at this stage. All in all, the services of the following groups of people will be required during the construction phase among others:

- Contractor;
- Casual Labourers;
- Engineers;
- Site Manager;
- Inspector of Works;
- Laboratory Technologist;
- Survey Assistant / Leveller;
- Laboratory Assistants;
- Environmentalist/ Sociologist;
- Safety officers
- Office Assistants;
- Transporters;
- Security Officers; and

- Other Technical Staff.

Though employment will be temporary (only during construction), those who will be employed will earn income hence use the money to satisfy some of their needs.

7.2.1.3 Stimulation of Trade and Services

The Project will require supply of large quantities of construction materials. Sewerage materials, piping systems most of which will be sourced in the region and from surrounding regions. The increase in the demand for these materials such as hard stones, sand, gravel, sewer materials and piping systems and aggregates for the periodic maintenance of the proposed Project required during the planning and construction will stimulate local and regional trade.

Producers and suppliers of materials will thus get market for their goods as the proposed; In addition, the owners of the nearby business premises are also likely to benefit as a result of the construction workers purchasing some of the items from their shops.

7.2.1.4 Gains in the local and national economy

There will be gains in the local and national economy through the consumption of locally available materials like sand, ballast, hardcore, tiles, timber and cement. The consumption of these materials including fuel, oil and others will attract tax including VAT which will be payable to the government. The cost of the materials will be payable directly to the producers.

7.2.1.5 Increased economic activities and revenue

The construction phase of the project will also increase the economic activities in the region, and revenue for the central government through taxes, through businesses that will be formed to service the increased population. These services include health, food and nutrition, transport and recreation that the workers taking part in the construction will require from time to time.

7.2.1.6 Increase in property value

Once the proposed plan executed, the land will appreciate hence leading to the overall increase in property value around. The local community within the area may benefit from selling the property at higher profit margins as compared to when there was no development.

7.2.1.7 Provision of Market for Building Materials

The proposed project will require supply of building materials most, of which will be sourced locally in Nairobi and the surrounding areas. This provides ready market for building material suppliers such as quarrying companies, hardware shops and individuals with such materials.

7.2.1.8 Increased population

The influx of labour into the area and subsequent people/workers to service them or provide them with goods such as food will be another positive impact of the proposed Project. This is taken as

positive since the population increase if sustainable will create additional market for goods and services offered in the area, increase the amount of mobilized capital and also increase the social capital in the area.

7.2.1.9 Livelihood improvement

The project can also be an income generating project as the management will charge for use in order to ensure sustainability of the project. The profits can then form a source of income.

7.2.2 Negative impacts

7.2.2.1 Construction Material Sourcing

Impacts related to the construction material sites such as gravel sites, sand harvesting sites and quarry sites include clearance of vegetation, landscape scars, dust and general disturbance during excavation and the need to reinstate or landscape the gravel sites when the contractors have completed excavation works.

Material sites if not reinstated and rehabilitated after project completion, will create a badlands type of landscape with water bodies, scattered boulders and rubble of ballast on the soil surface. This calls for economic use of these stone resources by the Contractor to avoid wastage. The pools of water that will form during the rainy season, without outflow on the burrow pits shall be suitable habitats for disease vectors for example: malaria, bilharzias and liver fluke. Further impacts in case such burrow pits are abandoned, and left without being rehabilitated are:

- Once burrow pits and quarry sites are filled with water, their banks can burst hence causing flood and associated damage within the nearby sites;
- Unfenced quarry and burrow pits sites full of water will be risky to public especially children, livestock and wildlife due to drowning associated deaths, therefore should be fenced off when in use; and
- Illegal excavation of ballast for sale from abandoned quarries will lead to development of bad-lands leading to erosion of topsoil.

Sand harvesting on the other hand should not be done in rivers as it may cause the following environmental problems:

- Siltation of the river; and
- Drying of river beds hence affecting the water table/storage capacity of the river.

7.2.2.2 Soil erosion

The activities involved in the site preparation and construction phase of the development may have a major negative and moderate impact on soil and geology of the Project site. This is due to the removal of vegetation from the area which will leave considerable areas of soil exposed to the elements, which may result in soil erosion. Heavy machinery will be traversing the site due to the construction activities this may lead to soil compaction and erosion of the soil. Uncontrolled soil erosion can have adverse effects on the local water bodies.

7.2.2.3 Dust generation

Particulate matter pollution is likely to occur from the construction activities during landscaping, demolition of the existing old one floor building, loading and transportation of the construction waste, there is a possibility of suspended and settle-able particles affecting the site workers' and even neighbours' health. Dust is also generated in concrete production and transport. Common sources are sand and aggregate mining, material transfer, storage (wind erosion from piles), mixer loading, and concrete delivery (dust from unpaved roads).

7.2.2.4 Noise pollution

Development works will most likely result in noise generation as a result of the machines in use e.g. excavation equipment, mixers and construction vehicles delivering materials to active construction sites. The noise is expected to last for the entire execution period, respective developments operations and is likely to affect the neighbouring residents and institutions. Off-site noise will also be experienced near and along the access roads to the construction materials sources.

7.2.2.5 Air Quality

Air pollution is the single biggest environmental health risk, which include black carbon, methane, ozone, and airborne particles produced by industrial operations and the burning of diesel, coal, kerosene or biomass (UNEP, 2018). These pollutants are also contributing to global warming, lowering labour productivity, and increasing food insecurity around the world.

The local ambient air quality will be impacted both during the execution and operation phases of the envisioned development. This will mostly be from dust emitted during excavation/earthworks and aggregate transportation to construction sites, and from construction vehicles and machinery emitting oxides of carbon, nitrogen, and sulphur into the atmosphere during the construction phase.

The sources of air emission can be grouped into three categories namely:

- Point Source;
- Area Source; and
- Line Source.

A point source is a single source emission with an identified location; an area source is when the source of emission are mainly widely distributed point sources having relatively comparable significance; and a line source is when the sources of emission from a number of fixed or moving facilities have relatively comparable significance, such as roads.

Dust emission is likely to occur during site clearance, excavation and spreading of top soil during construction of the proposed Project especially if the activities are taking place during dry season. However, there will be very small possibility of particulate matter (PM) suspended and settle-able particles affecting the site workers and even neighbour's health, since construction method of

minimum excavation and nil cart away of soil will be applied and only residential material and debris carted away.

Dust in construction areas originates mainly from the scraping of the earth surfaces, from the movement of heavy machinery on earth roads especially deviation routes and from haulage activities of the ballast chipping.

During the period of maximum construction activity, the fuel consumption at the Project site is expected to rise significantly and the background concentrations of suspended particulate matter (SPM), respiratory particulate matter (RPM), sulphur dioxide (SO_2), nitrogen dioxide (NO_2) and both carbon monoxide (CO) and lead (*Pb*) are also expected to rise.

These emissions can have significant cardio-pulmonary and respiratory effects on the local population; the health effects may range from subtle biochemical and physiological changes to difficulty in breathing, wheezing, coughing and aggravation of existing respiratory and cardiac condition. The impact of such emissions can be greater in areas where the materials are sourced and at construction site. Activities associated with site clearance, excavations, spreading of the top soil during construction, frequent vehicle turning and slow vehicle movement loading, and offloading areas can be implicated in this process. Table 4 below is a summary of the impact of these emissions on human health.

Table 2: Summary of Impacts of Emissions on Human Health

Pollutant	**Source**	**Primary effects**
Sulphur Dioxide (SO_2)	Combustion of sulphur containing fossil fuels for: ▪ Construction equipment; ▪ Vehicle; and ▪ Diesel engine	▪ Plant injury; ▪ Reduced visibility; ▪ Deterioration of metals, textiles, leather, finishes and coatings; ▪ Aggravation of respiratory diseases (asthma, emphysema); and ▪ Irritation.
Nitrogen Oxides (NO_X)	Combustion of fossil fuel from: ▪ Construction equipment; ▪ Vehicles; and ▪ Diesel generators.	▪ Aggravation of respiratory illness; ▪ Reduced visibility; ▪ Reduced plant growth; and

Pollutant	Source	Primary effects
		▪ Formation of acid rain.
SPM (Dust)	▪ Construction activities; ▪ Combustion of fossil fuels for construction equipment, vehicles and diesel generators.	▪ Soiling; ▪ Reduced visibility; ▪ Aggravation of the effects of gaseous pollutants; ▪ Increased cough and chest discomfort; ▪ Reduced lung function; and ▪ Aggravation of respiratory and cardio-respiratory diseases.
Carbon Monoxide (CO)	Combustion of fossil fuels from: ▪ Construction equipment; ▪ Vehicles; and ▪ Diesel generators.	▪ Plant visibility; ▪ Reduced visibility; ▪ Deterioration of metals, textiles, leather, finishes, coatings; ▪ Irritation of eyes; and ▪ Aggravation of respiratory diseases (asthma, emphysema).

Even then, dust and exhaust gas emissions from construction machineries will be temporary. Therefore, no adverse impacts, except for those close to the Project and the construction workers, are likely to be affected. On completion of the construction, the adverse impacts of SPM, RPM and engine emissions on ambient air close to the construction site will be eliminated.

7.2.2.6 Excavation

Landscaping will likely lead to rejection of some soil which will call for a judicial disposal manner e.g. landfill, authorized dump site, etc. and also due to deep excavations it would lead to risks of falling into the excavated areas by the workers or passersby.

7.2.2.7 Oil spills

The machines on site will be containing moving parts which will require continuous oiling to minimise the usual friction cum wear and tear. Possibilities of such oils spilling and contaminating the soil and

water on site are real. Likewise, moving vehicles on site may require oil change and therefore will lead to fire risks in the area.

7.2.2.8 Increased water demand

The development is likely to lead to increased demand on water resources. This water will be sourced from TUTUWASCO line and the existing borehole. Without conservative use of these water resources, there is likely to be adverse impacts such as depletion of groundwater resources from over-abstraction, and increased water scarcity in Nairobi area. Water will be mostly used in the preparation of concrete for construction works and for wetting surfaces or cleaning completed structures.

7.2.2.9 Generation of exhaust emissions

Exhaust emissions are likely to be generated by the construction equipment during the construction phase. Motor vehicles used to mobilise the work force and materials for construction would cause a potentially significant air quality impact by emitting pollutants through exhaust emissions. Because considerable quantities of building materials are required, some of which are sourced outside the project area, such emissions can be enormous and may affect a wider geographical area. The impacts of such emissions can be greater in areas where the materials are sourced and at the construction site as a result of frequent gunning of vehicle engines, frequent vehicle turning and slow vehicle movement in the loading and offloading areas.

7.2.2.10 Increased runoff from new impervious areas

Construction of paved roads and pavements could result in additional runoff through creation of impervious areas and compaction of soils. Impervious areas and compacted soils generally have higher runoff coefficients than natural area, and increased flood peaks are a common occurrence in developed areas.

7.2.2.11 Surface & groundwater hydrology and water quality degradation

Changes in surface hydrology alter the flow of water through the landscape. Construction of impervious surfaces such as roads and water reservoir increase the volume and rate of runoff, resulting in habitat destruction, increased pollutant loads, and flooding. Built or paved areas and changes in the shape of the land also influence groundwater hydrology (i.e. recharge rates, flow, conditions). Project related excavation could lead to surface and groundwater quality degradation. Contaminated soil or groundwater in the path of the project could be disturbed by excavation resulting in a potential transfer of the contamination to surface waters. The excavated area, if linear could act as a conduit to extend groundwater contamination to new areas. Spills of hazardous materials in excavated areas during construction could introduce contaminants to groundwater. Development activities such as the proposed development as well as the spillover effects of development such as increased demand for drinking water and increased water use can impact water quality by contributing sediment, nutrients, and other pollutants to limit water supplies, increasing the temperature of the water, and increasing the rate and volume of runoff.

7.2.2.12 Impact on Soils and Geology

Development of the proposed project will affect the soil and geology of the land in ways such as depletion of the local soil resource from excavation and carting away of spoil material, and soil degradation from compaction and soil sealing leading to increased surface runoff and soil erosion. Soil compaction happens during construction or when remodeling of some type occurs near trees. Other causes of compaction are hardscape or landscape modifications such as driveways, sidewalks, or patios. Any time that equipment, vehicles, or people are driving or operating under trees, there will likely be soil compaction, leading to unhealthy and possibly dead trees.

Spillage of hazardous construction chemicals (such as oils, fuel, grease, paints, solvents, curing compounds, adhesives, acids, soil stabilizers and binders etc.) may also lead to soil contamination while importation of soil in landscaping and fill activities may lead to introduction of invasive species / noxious weeds and pathogens such as bacteria, fungi and nematodes.

Increased soil erosion and sedimentation is likely to be expected, usually an indirect impact of vegetation clearance Such bare land will be prone to wind and water erosion.

7.2.2.13 Water Pollution

Another environmental issue with cement and concrete production is water pollution. The concern is the greatest at the concrete production phase. "Wash-out water with high pH is the number one environmental issue for the ready mix concrete industry," and the alkalinity levels of wash water can be as high as pH 12. Highly alkaline water is toxic to fish and other aquatic life.

Effluent from the proposed developments has potential to cause ground/surface water pollution, and health hazards to human and aquatic life. Management of construction wastewater, spill control mechanisms, and treatment of effluent will be required to ensure protection of water resources.

7.2.2.14 Occupational incidents

During construction of the proposed Project, it is expected that construction workers will be exposed to varied hazards and the risk of suffering from a work-related incident is real. Construction works involve the interaction between man and machine/plant/equipment in the varied activities which constitute construction works e.g. deep trenching, welding, metal grinding and cutting, concrete work, steel erection, working at height, use of hand tools, among others. Some of these activities are high risk and construction workers are likely to suffer from the incidents (accidents, occupational diseases, near miss or dangerous occurrences) thereof.

7.2.2.15 Vector borne and water borne disease incidence

When solid wastes are not well managed there is potential of disease outbreak due to suitable breeding conditions for vectors of cholera and typhoid. If the wastes find their way to water body its quality may be lowered. Malaria outbreak could also be exacerbated by the presence of open water

ditches for breeding of anopheles' mosquitoes. The major vulnerable groups are children who could be exposed to these conditions.

7.2.2.16 Solid waste generation

All the proposed developments and land uses will generate a substantial amount of solid and liquid waste. During development phase spoil materials (soil, rocks, vegetation) packaging materials (e.g. paper, polythene, plastic and metallic packaging), reject materials (including damaged bricks, concrete and mortar, plastics), among others will be generated. Other non-hazardous solid wastes include office, kitchen wastes when these types of operations are part of construction project activities. Hazardous solid waste includes contaminated soils, which could potentially be encountered on-site due to previous land use activities, or small amounts of machinery maintenance materials, such as oily rags, used oil filters, and used oil, as well as spill cleanup materials from oil and fuel spills. During construction, solid waste will be generated both hazardous and non-hazardous. These shall include paint tins, paper used for packing cement, plastics and timber remains among others. Dumping around the site will interfere with the aesthetic status of the area. 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.

Inadequate management of solid and sewerage waste from the developments will lead to pollution and creation of human health hazards endangering the residents and the public.

7.2.2.17 Clearing of Vegetation

The main vegetation to be affected includes grasses, hedges and shrubs. The vegetation will be cleared to pave way for the construction activities the proposed works.

7.2.2.18 Disaster Preparedness

During and construction works, there might be cases of injuries, accidents or occupation hazards which might result in injuries of construction workers, service station employees, pedestrians, motorists, private properties and infrastructure.

7.2.2.19 Extraction and use of building materials

Building materials such as hard core, ballast, cement, rough stone, tar and sand required for construction will be obtained from quarries, hardware shops and sand harvesters who extract such materials from natural resource banks such as rivers and land. Since substantial quantities of these materials will be required for construction works, the availability and sustainability of such resources at the extraction sites will be negatively affected as they are not renewable in the short term. In addition, the sites from which the materials will be extracted may be significantly affected in several ways including landscape changes, displacement of animals and vegetation, poor visual quality and opening of depressions on the surface leading to several human and animal health impacts.

7.2.2.20 Energy consumption

The proposed development will result in a higher demand on energy resources both during execution of the planned developments and operation phases. The forms of energy to be utilized include grid energy and fossil fuel.

Construction activities will mostly require fossil fuel in the running of construction vehicles, and generators. Some grid energy will also be required during construction but will be more so required for lighting and powering of machinery/equipment.

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 KPLC Plc. Electricity in Kenya is generated mainly through natural resources, namely, water and geothermal resources. In this regard, there will be need to use electricity sparingly since high consumption of electricity negatively impacts on these natural resources and their sustainability.

7.2.2.21 Increased Heavy Traffic

The main roads leading to the site area will serve the additional vehicles used for the transportation of materials, equipment and staff to the site. Heavy trucks will not have the risk of causing accidents due to their limited maneuverability but also place added pressure on the roads and can lead to cracks and potholes on the road. This failure is however a combination of factors including: The total of trips of heavy trucks and the strength of the roads in context of carrying the heavy loads.

7.3 Operation phase

7.3.1 Positive impacts

7.3.3.1 Revenue to the proponent

On completion, the proponent shall let the available space to willing persons. This shall generate direct revenue to the proponent to further her business agenda hence economic well-being.

7.3.3.2 Revenue to national and county government

Through payment of relevant rates and fees to the national and county government, the facility will contribute towards the national and county revenue earnings.

7.3.3.3 Employment creation

Employment opportunities are some of the long-term major positive impacts anticipated from the proposed Project which will be realized after construction and during the operation. These will involve security personnel, solid waste management staff and electricity maintenance staff, etc.

7.3.3.4 Optimal use of land

The adopted design has considered the land factor in that land is a scarce resource and through the maximization theory assigned each component within the building the minimum appropriate space. This was rather vital in the determination on the number of floors to at most to save ground space for establishment of other projects.

7.4.1 Negative impacts

7.4.1.1 Increased pressure on infrastructure

The expected increase in population and the needs of this population would place more pressure on existing infrastructure such as roads, water, waste facilities, electricity, social amenities, etc. This is basically because of increase in the dependants of the infrastructure without a commensurate expansion on the existing infrastructures. A considerable amount of demand will be placed on KPLC Plc mains and Ruiru - Juja Water and Sewerage Company (RUJUWASCO). Additionally, the roads in the area will experience probability of traffic hazards.

7.4.1.2 Electricity consumption

The proposed project will consume considerable amount of electricity. Since electric energy in Kenya is generated mainly through natural resources, namely water and geothermal resources, increased use of electricity have adverse impacts on these natural resources base and their sustainability.

7.4.1.3 Water use

The operational activity will involve the use of substantial quantity of water being in an urban set up.

7.4.1.4 Solid waste generation

The project is expected to generate substantial amount of solid waste during its operation phase. The bulk of the solid waste generated during the operation of the project will basically be domestic wastes. Some of these wastes can be injurious to the environment through blockage of drainage systems, choking of water bodies and negative impacts on animal health. Other waste materials especially the plastic are not biodegradable hence may cause long-term injurious effects to the environment. Even the biodegradable ones such as organic wastes may be injurious to the environment because as they decompose, they produce methane gas, a powerful greenhouse gas known to contribute to global warming.

7.4.1.5 Liquid waste generation

The project is expected to generate liquid waste during the operation phase. This will be through the sanitation system, kitchen and general cleaning activities.

7.4.1.6 Increased storm water flow

The building roof and pavements will lead to increased volume and velocity of storm water or run-off flowing across the area covered by the facility. This will lead to increased amounts of storm water entering the drainage systems, resulting in overflow and damage to such systems in addition to increased erosion or water logging in the neighbouring areas.

7.4.1.7 Workplace incidents

The operational phase of the proposed Project will fully assume the status of a workplace and like any other place where people are working, workers may get injuries in the cause of work e.g. back injuries, muscle strain, skin inflations etc.

7.5 Decommissioning phase

7.5.1 Positive impacts

7.5.1.1 Improved visual quality

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 Job creation

For demolition to take place on schedule, several people will be involved. As a result, several employment opportunities will be created for the demolition staff during the demolition phase of the proposed Project.

7.5.2 Negative impacts

7.5.2.1 Dust

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

7.5.2.2 Noise and vibration

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

7.5.2.3 Solid waste

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.

8 MITIGATION MEASURES AND MONITORING PROGRAMMES

8.1 Introduction

This chapter presents the mitigation measures for the likely negative impacts from the proposed Project. The potential negative impacts and the possible mitigation measures have herein been analyzed under three categories: construction, operational and decommissioning phases.

8.2 Mitigation of construction related negative impacts

8.2.1 Minimize the effects of noise emitted 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.

Construction activities such as excavation, drilling, and operation of heavy equipment can generate significant noise, affecting both construction workers and nearby residents. Prolonged exposure may lead to hearing impairments and nuisance complaints from the community.

Mitigation Measures:

- Use well-maintained equipment with noise-reducing features.
- Provide appropriate PPE such as ear muffs to workers and enforce their use.
- Install portable barriers to shield compressors and other small stationary equipment where necessary.
- 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.
- Adhere to the provisions of the Factories and Other Places of Work (Noise Prevention and Control) Rules, 2005 regarding workplace noise limits.
- Adhere to the provisions of the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 regarding environmental noise and vibration limits.

8.2.2 Air quality

Construction activities such as demolition, excavation, and transportation generate dust and gaseous emissions, which may degrade local air quality and pose respiratory health risks. There may be air pollution due to combustion of fossil fuels expected from construction machinery.

Mitigation Measures:

- Use project management strategies to reduce the duration of dusty works.
- Enforce low-speed driving on-site to minimize dust generation.
- The Proponent will ensure that plant and equipment which will be acquired for on site preparation of pre-cast materials and concrete mixing will utilize the latest technology to have minimum emission.
- Provision of full protective gear for workers. Workers shall also be sensitized on hazards encountered in such work environment and shall undergo regular health check-ups.
- Watering access roads and the site to suppress dust
- Covering truck loads using tarpaulins
- Buildings under construction will be covered with adequate screens to contain dust.
- The Proponent should ensure all idle machines are switched off when not in use.
- The proposed site Fence should be well covered to avoid dust from interfering with the neighbours.

8.2.3 Impact on Raw Materials

Excessive use or poor sourcing of construction materials can lead to depletion of natural resources and increase the project's environmental footprint. Irresponsible procurement may also breach environmental regulations.

Mitigation Measures:

- Source raw materials from suppliers that are compliant to the respective regulations.
- Limit material procurement to project-specific requirements.
- Encourage recycling of construction materials where practical.
- Promote the use of recycled materials without compromising safety or quality.

8.2.4 Minimise the effects of exhaust emission

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

- Vehicle idling time shall be minimized;
- Equipment shall be properly tuned and maintained;
- Vehicles shall be maintained and serviced regularly;
- Vehicles and equipment shall be fuelled with high quality fuels sourced from renowned marketers;
- Work planning shall be undertaken to reduce time spent by the trucks delivering materials to the site and when traffic is low;

- Development and implementation of preventive maintenance of all equipment at the site;
- Traffic control will be developed and implemented.

8.2.5 Solid Waste Generation

The construction process will generate various types of solid waste including packaging, scrap material, stones, wood, broken glasses, containers, rods of metal, sharp objects (nails) etc. and debris. If not properly managed, these wastes may result in site contamination and pose a risk to human and environmental health.

Mitigation Measures:

- Develop and implement an integrated waste management system focused on reduction, reuse, and recycling.
- Comply with the Environmental Management and Co-ordination (Waste Management) Regulations, 2006.
- 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.
- Provision of facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements.
- Use of building materials that have minimal packaging to avoid the generation of excessive packaging waste.
- Use of construction materials containing recycled content when possible and in accordance with accepted standards.

8.2.6 Soil Contamination from Spills

Accidental spills of fuels, lubricants, and other chemicals used during construction may contaminate soil and groundwater if not promptly contained. It is important to note that oil/grease spills are prevalent in construction sites and in most areas that make use of petroleum products. Such products contain detrimental elements to the environment. They contain such heavy metals as mercury, lead, and sulphur among others. Though this may not be common at the site, it is wise to control and observe the little that could occur especially during maintenance of the involved machinery.

Mitigation Measures:

- Implement a spill response plan that includes containment and clean-up protocols.
- Conduct spill response training for site personnel.
- Store and handle hazardous substances in line with legal and best practice guidelines.
- All machinery must be keenly observed not to leak oils on the ground. This can be done through regular maintenance of the machinery.
- Maintenance must be carried out in the protected service bays only and where oils are completely restrained from contaminating the ground. Such areas should be covered to avoid storm water from carrying away oils into the soil or water systems. Waste water/ wash water from these areas should be passed through an oil-water interceptor to filter out oil & grease spillages.

8.2.7 Traffic Impact

Increased movement of heavy trucks and machinery could disrupt local traffic, increase road wear, and elevate the risk of accidents.

Mitigation Measures:

- Develop and implement a Traffic Management Plan (TMP).
- Enforce speed limits for Heavy Commercial Vehicles (HCVs).
- Place proper signage and warning notices at key locations.
- Schedule material deliveries during off-peak hours.
- Ensure materials are offloaded within the site boundaries.
- Deploy flagmen/traffic marshals at entry points to manage vehicle flow.

8.2.8 Water resources - supply and use

The proposed Project will consume a lot of water due to the need for hygiene and the various activities that are conducted. The volumes of water used are highly dependent on the number of people, the more activities during construction.

Potential Mitigation Measures

- Avoid excessive use of the water.
- Sufficient Storage water tanks should be provided.
- The water supplier should ensure long lasting and reliable water supply within its jurisdiction.
- Provide notices and information signs to the involved stakeholders and especially construction workers on means and needs to conserve water resource i.e. ‘KEEP/LEAVE THE TAP CLOSED ‘, ‘WATER IS LIFE. SAVE IT’.
- Install water conserving taps that turn-off automatically when water is not in use. The taps should have reduced hand-wash cycle.

8.2.9 Soil erosion

The activities involved in the site preparation and construction phase of the development may have a major negative and moderate impact on soil and geology of the Project site. This is due to the removal of vegetation from the area which will leave considerable areas of soil exposed to the elements, which may result in soil erosion. Heavy machinery will be traversing the site due to the construction activities this may lead to soil compaction and erosion of the soil. Uncontrolled soil erosion can have adverse effects on the local water bodies.

Mitigation measures

- Excavation should be done under controlled conditions which will include minimizing vegetation removal, avoiding creating large open expanses of bare soil, creating wind breaks, installation of silt traps near the stream, using of single or few designated tracks to bring vehicles into the area and watering using water.
- The contractor should block the construction entrance and exit to keep sediment from being tracked onto adjacent roads and keep vehicles off bare soils.

8.2.10 Increased energy demand

The construction phases of the development will impact slightly on the electricity supply in the area as the demand will increase.

Mitigation measures

The proponent shall ensure responsible electricity use at the construction site through sensitization of staff to conserve electricity by switching off electrical equipment or appliances when they are not being used. In addition, proper planning of transportation of materials will ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts. Complementary to these measures, the proponent shall monitor energy use during construction and set targets for reduction of energy use.

8.2.11 Occupational Safety and Health Impacts

Construction workers face numerous risks including falls, machinery accidents, and exposure to hazardous materials if appropriate safety protocols are not observed.

(i) Heat and Sun Exposures

The project area may have high ambient temperatures especially during day time, increasing the risk of heat-related illnesses for workers.

Mitigation measures

- Implement heat stress management programs, including acclimatization periods, scheduled rest breaks, and access to shaded areas.
- Provide adequate hydration stations with potable water and encourage workers to drink fluids frequently.
- Educate workers about the signs, symptoms, and preventive measures of heat-related illnesses

(ii) Ergonomic Hazards/ manual handling

Works on the site may involve repetitive tasks and awkward postures.

Mitigation measures

- Ensure workers have access to ergonomically designed tools and equipment.
- Provide training on proper lifting techniques and body mechanics.
- Encourage regular stretching exercises and rest breaks to reduce fatigue.

(iii) Equipment & machinery safety.

This will be from the equipment used for construction.

Mitigation measures

- Ensure proper training and certification for equipment operators.
- Conduct regular inspections and maintenance of equipment to ensure their safe operation.

(iv) Weather related hazards.

Workers may face weather-related risks, such as lightning, high winds, or slippery surfaces during adverse weather conditions.

Mitigation measures

- Monitor weather forecasts and suspend work during unsafe conditions.
- Use non-slip footwear and implement safety measures for wet surfaces.
- Have an emergency evacuation plan in place for severe weather events.

Other OSH Mitigation Measures:

- Comply with OSHA, 2007 requirements.
- Implement health and safety measures detailed in the table below

Potential hazards and control measures during construction phase

Potential Hazard	Control Measures
Falls from height	● Use of fall arrest systems ● Scaffolding and guardrails ● Safety training for working at heights
Trips and slips	● Maintain clean and organized site ● Use of slip-resistant footwear ● Regular housekeeping and inspections
Struck by moving equipment or materials	● Use of high-visibility clothing ● Establish exclusion zones ● Supervised machine operation
Exposure to dust and airborne particles	● Use of dust masks/respirators ● Water spraying on dusty surfaces ● Regular air quality monitoring
Noise exposure	● Provision of hearing protection ● Use of low-noise equipment ● Noise level monitoring
Manual handling injuries	● Training on proper lifting techniques ● Use of mechanical lifting aids ● Team lifting for heavy loads
Electrical hazards	● Ensure proper grounding and insulation ● Use of lock-out/tag-out procedures ● Regular inspection of tools and cables
Chemical exposure (e.g., fuels, lubricants)	● Proper labelling and storage ● Use of appropriate PPE ● Spill response procedures in place
Fire risk	● No smoking policy ● Fire extinguishers on site ● Staff fire safety training
Fatigue and heat stress	● Provision of rest breaks ● Access to drinking water ● Work scheduling to avoid peak heat hours

Table 8- 1: Potential hazards and control measures during construction phase

8.3 Mitigation of Operation phase impacts

8.3.1 Water Demand

Operational activities will increase water consumption for sanitation, dust suppression, and emergency use. This may strain local water supply systems.

Mitigation Measures:

- Install rainwater harvesting infrastructure to supplement county water supply.
- Use water-efficient plumbing fixtures such as self-closing taps and low-flow toilets.
- Educate staff and visitors on the importance of water conservation.
- Conduct routine training on water-saving practices.
- Assess and adopt feasible water recycling or greywater reuse systems.
- The water supplier should ensure long lasting and reliable water supply within its jurisdiction.

- Provide notices and information signs to the involved stakeholders on means and needs to conserve water resource i.e. 'KEEP/LEAVE THE TAP CLOSED', 'WATER IS LIFE. SAVE IT', etc. this will awaken the civic consciousness of the community with regard to usage and management of the water resources.
- Install water conserving taps that turn-off automatically when water is not in use. The taps should have reduced hand-wash cycle.

8.3.2 Air quality

During operational phase air quality is likely to be affected from vehicle moving in and out of the facilities.

Mitigation Measures:

- Regularly monitor air quality to ensure compliance with standards and prompt response to anomalies.

8.3.3 Soil erosion

The building roofs and pavements will lead to increased volume and velocity of storm water or run-off flowing across the area covered by the buildings. This will lead to increased amounts of storm water entering the drainage systems, resulting in overflow and damage to such systems in addition to increased erosion or water logging in the neighbouring areas.

mitigation measures

- The proposed Project design will include a water harvesting strategy which will greatly contribute to reducing the water flowing to the drains from roof surface.
- Landscaping should be done on the land during the operation phase and decommissioning phase to ensure that the same is returned to its original state.

8.3.4 Solid and Liquid wastes generation

The project is expected to generate enormous amounts of solid waste during its operation phase. The bulk of the solid waste generated during the operation of the project will consist of paper, plastic, glass, metal, and organic wastes. Such wastes can be injurious to the environment through blockage of drainage systems, choking of water bodies and negative impacts on animal health. Some of these waste materials especially the plastic/polythene is not biodegradable and may cause long term injurious effects to the environment. Even the biodegradable ones such as organic wastes may be injurious to the environment because as they decompose, they produce methane gas, a powerful greenhouse gas known to contribute to global warming.

Mitigation measures

- The Contractor and Proponent shall work hand in hand with private solid waste handlers to facilitate sound waste management.
- The occupier will adhere to the provisions of the Environmental Management and Coordination (Waste Management) Regulations, 2006.
- The tenants shall also be provided with waste bins for various wastes to facilitate separation at source.

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

8.3.5 Noise Pollution

Noise from vehicles, machinery, and operational equipment including the generator may cause discomfort to workers and neighboring residents.

Mitigation Measures:

- Install sound barriers and utilize noise-absorbing materials where applicable.
- Carefully position noisy equipment to minimize impact.
- Monitor noise levels and ensure compliance with prescribed thresholds.

8.3.6 Increased energy demand

The operational phases of the development will impact slightly on the electricity supply in the area as the demand will increase.

Mitigation measures

- The proponent to install an energy-efficient lighting system (LED lighting) within the proposed site and use of sensor along the corridor to light when people are passing by. To complement these measures, it will be important to monitor energy use during the operation of the project and set targets for efficient energy use.

8.3.7 Workplace accidents

During operation period, accidents may include exposure to exposed electrical parts or falls on slippery floor.

Mitigation measures

- Ensuring all electrical equipment and machinery are properly grounded.
- Only properly trained employees to operate equipment or machinery and proper instructions in their safe operation is provided.
- Ensure provision of a first aid kit and a trained first aider should always be at the common place.
- In case of slippery floors, signage should be displayed at strategic places e.g. at the entrance to warn the public.
- Fire escapes should always be clear during operation phase.
- Provision and regular servicing of firefighting equipment at the common place.

8.3.8 Security

An appropriate fence will be erected round the premises and maintained with a security lighting system installed. A competent security firm preferably will be engaged to ensure the general safety and security at all times within and around the premises.

8.3.9 Fire hazards

The operations that lead to fire outbreaks include smoking within the buildings, poor handling of electricity systems, leaking gas, faulty electrical equipment, carelessness at the kitchen etc.

Mitigation measures

- Installation of an automatic fire alarm system for the building.
- Provision of firefighting equipment and hydrant points.
- Display fire evacuation procedures and emergency at the buildings.
- Regular maintenance of fire electrical and first aid equipment.
- Provision of sufficient emergency exit points and marked fire assembly points.

8.3.10 Traffic management

Traffic accidents have become one of the most significant causes of injuries and fatalities among members of the public worldwide. Traffic safety should be promoted by all project personnel during displacement to and from the workplace, and during operation of project equipment on private or public roads. Prevention and control of traffic related injuries and fatalities should include the adoption of safety measures that are protective of project workers and of road users, including those who are most vulnerable to road traffic accidents. Road safety initiatives proportional to the scope and nature of project activities should include adoption of best transport safety practices across all aspects of project operations with the goal of preventing traffic accidents and minimizing injuries suffered by project personnel and the public.

There is already a road reserve at the proponents' site/land to give space for the construction vehicles and machines as they await access and exit into the construction site.

Measures should include:

- Provision of both exit and entrance of the vehicles accessing and exiting the construction site which will assist in reduce congestions on both the provided road reserve.
- Improving driving skills and requiring licensing of driver's
- Adopting limits for trip duration and arranging driver rosters to avoid overtiredness.
- Avoiding dangerous routes and times of day to reduce the risk of accidents.
- Use of speed control devices (governors) on trucks, and remote monitoring of driver actions.

Regular maintenance of vehicles and use of manufacturer approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure. The project will contribute to a significant increase in traffic along existing roads, and road transport is a significant component of the project, recommended measures include:

- Minimizing pedestrian interaction with construction vehicles
- Collaboration with local communities and responsible authorities to improve signage, visibility and overall safety of roads, particularly along stretches located near schools or other locations where children may be present.
- Coordination with emergency responders to ensure that appropriate first aid is provided in the event of accidents

- Using locally sourced materials, whenever possible, to minimize transport distances. Locating associated facilities such as worker camps close to project sites and arranging worker bus transport to minimizing external traffic
- Employing safe traffic control measures, including road signs and flag persons to warn of dangerous conditions

Any construction work that is carried out on, in or adjacent to a road, or other traffic corridor that is in use by traffic other than pedestrians is a high risk construction work and a solid waste management system must be prepared before this work commences.

Managing traffic is essential to providing a safe and healthy construction workplace. Traffic can include construction vehicles (for example, cars, and trucks), non-construction vehicles (for example, delivery trucks, and private vehicles), powered mobile plant and pedestrians. Vehicles and powered mobile plant moving in and around workplaces, reversing, loading and unloading, are activities frequently linked with workplace injuries and fatalities.

Traffic management planning details the work to be undertaken and the stages involved, identifies the frequency of interaction of construction vehicles, powered mobile plant and pedestrians, evaluates the effectiveness of any risk control measures, lists contacts and who has responsibilities or needs to be notified, describes the management of emergencies, the impact on the general area and how these impacts are to be managed.

Elements to take into account in traffic management planning include pedestrian and traffic routing, traffic demand, traffic controls and the types of controls needed, requirements for special vehicles (over-dimensional), emergency services and workplace access, parking requirements and welfare facilities for visiting drivers.

Traffic management planning shall set out the preferred travel paths for vehicles associated with a workplace, including points to enter and leave the workplace, haul routes for debris or plant/materials, or traffic crossing another stream of traffic. Planning shall include traffic taming concepts to limit speed and limit the potential to take incorrect paths. The planning shall include arrangements for persons, powered mobile plant and vehicle traffic in the work area and also identify travel paths on routes remote from the workplace such as places to turn around, dump material, access ramps and side roads.

The site shall be arranged so that persons are able to move safely to and from as well as within the workplace. Pedestrian and vehicle pathways need to be kept free of obstruction and the movement and speed of vehicles and plant should be managed in a way to minimise the risk of injury to pedestrians and operators.

Vehicle and pedestrian movement shall be planned and controlled so that pedestrians and plant can operate safely at the workplace at the same time. Where practicable, the two should be kept separate and work in separate areas. The movement of visitors shall be limited with barriers and signage.

Prior to commencement of any excavation that affects roads or traffic movement, traffic management planning shall be completed to include, where necessary, a traffic controller, traffic signals (portable or permanent), barricades and any road closures. Traffic management planning shall be in written form and available at the workplace at all times.

8.4 Mitigation of decommissioning phase impacts

8.4.1 Demolition waste

- Use of an integrated solid waste management system i.e. through a hierarchy of options: 1. Source reduction 2. Recycling 3. Composting and reuse 4. Combustion 5. Sanitary land filling.
- All buildings, machinery, equipment, structures and partitions that will not be used for other purposes must be removed and recycled/reused as far as possible
- All foundations must be removed and recycled, reused or disposed off at a licensed disposal site
- Donate reusable demolition waste to charitable organizations, individuals and institutions.

8.4.2 Site degradation

- Implement an appropriate re-vegetation programme to restore the site to its original status
- Consider use of indigenous plant species in re-vegetation
- Trees should be planted at suitable locations so as to interrupt slight lines (screen planting), between the adjacent area and the development.

8.4.3 Safety and Health Risks

Demolition activities can pose occupational hazards such as injuries, dust exposure, and equipment-related incidents.

Mitigation Measures

- Hire a licensed demolition contractor with experience in hazardous material management.
- Install warning signage around the demolition area.
- Ensure proper use of PPE and enforce safety compliance.
- Maintain fully stocked first aid kits on site.
- Provide the correct tools and equipment for each task.
- Fully comply with EMCA regulations.

8.4.4 Potential Environmental Risks

The decommissioning process may disturb previously stabilized waste and contaminated areas, posing risks to soil, water, and air quality.

Mitigation Measures

- Develop and implement an environmental management plan for the decommissioning phase.
- Conduct detailed site assessments to identify hazardous materials.
- Handle, transport, and dispose of contaminants in accordance with environmental and industry standards.
- Comply with environmental regulations and industry best practices.

9 ENVIRONMENTAL MANAGEMENT PLAN

9.1 Introduction

The Proponent of the proposed Project acknowledges the fact that the proposed Project activities will have some impacts on the biophysical Environment, Health and Safety of its employees and members of the public, and socio economic well-being of the local residents. Thus, the main 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 EMP has been developed to assist the Proponent in mitigating and managing environmental impacts associated with the life cycle of the project. The EMP has been developed to provide a basis for an environmental management system (EMS: ISO 14001 principles) for the project. 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 EMP. As such, the EMP will be subject to a regular regime of periodic review.

9.2 Objectives of the Environmental Management Plan

The objectives of the EMP are to:

- Place the proposed/existing activity in the context of the local and regional environment;
- Adequately describe all components of the proposed/existing activity, so that the Authority can consider approval of a well-defined project;
- Identify the environmental issues/risks associated with the proposed/existing activity;
- Provide the basis of the Proponent's environmental management programme, which shows that the environmental impacts resulting from the proposed/existing activity, including cumulative impact, can be acceptably managed, and
- Provide a document that clearly sets out the reasons why the proposed/existing activity should be judged by the Authority to be environmentally acceptable.

9.3 Types of Environmental Management Plans

There are three broad categories of EMPs in the project lifecycle: The construction EMP, the operation EMP and the decommissioning EMP.

9.4 Construction phase Environmental Management Plan

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 Project are outlined in the table overleaf.

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
1. Minimize extraction site impacts and ensure efficient use of raw materials during construction				
High Demand of Raw material	Source building materials from local suppliers who use environmentally friendly processes in their operations	Project Manager & Contractor	Throughout construction period	0.00
	Ensure accurate budgeting and estimation of actual construction material requirements to ensure that the least amount of material necessary is ordered	Project Manager & Contractor	Throughout construction period	0.00
	Ensure that damage or loss of materials at the construction site is kept minimal through proper storage.	Project Manager & Contractor	Throughout construction period	0.00
	Use at least 5%-10% recycled, refurbished or salvaged materials to reduce the use of raw materials and divert material from landfills	Project Manager & Contractor	Throughout construction period	0.00
2. Minimize vegetation disturbance at and or around construction site				
Vegetation disturbance	Ensure proper demarcation and delineation of the project area to be affected by construction works.	Contractor, Civil engineer & Project Manager	1 month	50,000.00
	Specify locations for trailers and equipment, and areas of the site which should be kept free of traffic, equipment, and storage	Civil Engineer, and Project Manager	1 month	0.00
	Designate access routes and parking within the site	Civil Engineer, Architect and Project Manager	1 month	10,000.00
	Introduction of vegetation (trees, shrubs and grass) on open spaces and their maintenance	Architect & Landscape specialist	Monthly to Annually	15,000.00

	Design and implement an appropriate landscaping programme to help in re-vegetation of part of the project area after construction	Architect & Landscape specialist	2 months	100,000.00
3. Reduce storm-water, runoff and soil erosion				
Increased storm water, runoff and soil erosion	A storm water management plan that minimizes impervious area infiltration by use of recharge areas and use of detention and/or retention with graduated outlet control structure will be designed	The Civil Engineer, Mechanical Engineer and Project Manager	1 month	0.00
	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.	The Civil Engineer, Mechanical Engineer and Project Manager	1 months	
	Ensure that construction vehicles are restricted to existing graded roads to avoid soil compaction within the project site	The Civil Engineer, Mechanical Engineer and Project Manager	Throughout construction period	
	Ensure that any compacted areas are ripped to reduce run-off.	The Civil Engineer, Mechanical Engineer and Project Manager	2 months	
	Open drains all interconnected will be provided on site	Civil Engineer	Throughout construction period	5,400.00
	Put in place some measures aimed at minimizing soil erosion and associated sediment release from the proposed Project site during construction. These measures will include levelling the proposed Project site to reduce run-off velocity and increase infiltration of rain water into the soil. 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.	The Civil Engineer, Mechanical Engineer and Project Manager	One-off	250,000.00
4. Minimisation of Soil Geology and Degradation				

Soil Geology and Degradation	• Use properly maintained hoses and fittings • Make the cement screeds in all the chambers using water proof material. • Excavated materials should be removed promptly from the site to avoid erosion • Avoid unnecessary movement of soil materials from the site • Control activities especially during rainy any windy conditions • Regular sprinkling of water to reduce dust • Landscaping after completion with appropriate local vegetation. • Apply soil erosion control measures including: • Control speed and operation of construction vehicles. • Sprinkle water on excavated areas. • Maintenance of construction equipment. • All bare areas should be landscaped after • Provide workers with dust masks if working on sensitive areas.	The Civil Engineer, Mechanical Engineer and Project Manager	One-off	250,000.00
5. Minimize solid waste generation and ensure efficient solid waste management				
Increased solid waste generation	Use of an integrated solid waste management system i.e. through a hierarchy of options: 1. Source reduction 2. Recycling 3. Composting and reuse 4. Combustion 5. Sanitary land filling	Project Manager & Contractor	Throughout construction period	30,000.00
	Thorough accurate estimation of the sizes and quantities of materials required, order materials in the sizes and quantities they will be needed rather than cutting them to size, or having large quantities of residual materials	Project Manager & Contractor	One-off	0.00

	Ensure that construction materials left over at the end of construction will be used in other projects rather than being disposed off.	Project Manager & Contractor	One-off	0.00
	Ensure that damaged or wasted construction materials including cabinets, doors, plumbing and lighting fixtures, marbles and glass will be recovered for refurbishing and use in other projects	Project Manager & Contractor	One-off	25,000.00
	Donate recyclable/reusable or residual materials to local community groups, institutions and individual local residents or homeowners.	Project Manager & Contractor	One-off	0.00
	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	Project Manager & Contractor	Throughout construction period	0.00
	Provide facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements	Project Manager & Contractor	One-off	50,000.00
	Purchase of perishable construction materials such as paints should be done incrementally to ensure reduced spoilage of unused materials	Project Manager & Contractor	Throughout construction period	0.00
	Use building materials that have minimal or no packaging to avoid the generation of excessive packaging waste	Project Manager & Contractor	Throughout construction period	0.00
	Use construction materials containing recycled content when possible and in accordance with accepted standards.	Project Manager & Contractor	Throughout construction period	0.00
	Reuse packaging materials such as cartons, cement bags, empty metal and plastic containers to reduce waste at the site	Project Manager, Mechanical Engineer & Contractor	Throughout construction period	0.00
	Dispose waste more responsibly by dumping at designated dumping sites or landfills only.	Project Manager, Mechanical Engineer & Contractor	Throughout construction period	15,000.00/month

	Waste collection bins to be provided at designated points on site	Project Manager, Mechanical Engineer & Contractor	Throughout construction period	5,000.00/month
	Private waste disposal company to be contracted to transport and dispose the solid waste from site	Project Manager, Mechanical Engineer & Contractor	Throughout construction period	
	Running an educational campaigns amongst employees, e.g. through use of posters, to encourage reuse or recycling of the solid waste	Project Manager, Mechanical Engineer & Contractor	Throughout construction period	10,000.00
	Comply with the provisions of Environmental Management and Co-ordination (Solid Waste) Regulations, 2006	Project Manager & Contractor	Throughout construction period	0.00
6. Reduce dust emission				
Dust emission	Ensure strict enforcement of on-site speed limit regulations	Project Manager & Contractor	Throughout construction period	55,000.00
	Avoid excavation works in extremely dry weather	Project Manager & Contractor	Throughout construction period	
	All dusty materials shall be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet;	Project Manager & Contractor	Throughout construction period	
	Cover stockpiles of sand, soil and similar materials or surround them with wind breaks;	Project Manager & Contractor	Throughout construction period	
	Watering all roads used for any vehicular traffic when necessary;	Project Manager & Contractor	Throughout construction period	

	Down wash of trucks (especially tyres) prior to departure from site;	Project Manager & Contractor	Throughout construction period	
	Vehicles delivering loose and fine materials like sand and fine aggregates shall be covered to reduce spills on roads;	Project Manager & Contractor	Throughout construction period	
	The height from which excavated materials are dropped shall be controlled to a minimum practical height to limit fugitive dust generation from unloading;	Project Manager & Contractor	Throughout construction period	
	Rapid onsite construction so as to reduce duration of traffic interference and therefore reduce emissions from traffic delays;	Project Manager & Contractor	Throughout construction period	
7. Minimization of Air Pollution				
Air Quality	The engine size of the construction equipment shall be the minimum practical size;	Project Manager & Contractor	Throughout construction period	0.00
	The number of construction equipment operating simultaneously shall be minimized through efficient management practices;	Project Manager & Contractor	Throughout construction period	0.00
	Construction machinery idling time shall be minimized;	Project Manager & Contractor	Throughout construction period	0.00
	All vehicles and plant shall be regularly serviced in accordance with the manufacturer's recommendations to ensure that they operate efficiently and without excessive noxious emissions;	Project Manager & Contractor	Throughout construction period	100,000.00

	The burning of waste, such as vehicle tyres causing noxious emissions shall be prohibited;	Project Manager & Contractor	Throughout construction period	0.00
	Alternatively, fuelled construction equipment shall be used where feasible equipment shall be properly tuned and maintained; and	Project Manager & Contractor	Throughout construction period	0.00
	Sensitise truck drivers to avoid unnecessary racing of vehicle engines at loading/offloading points and parking areas, and to switch off or keep vehicle engines at these points.	Project Manager & Contractor	Throughout construction period	0.00
	Use of clean fuels e.g. unleaded and de-sulphurized fuels.	Project Manager & Contractor	Throughout construction period	0.00
8. Minimization of exhaust emissions				
Exhaust emission	Vehicle idling time shall be minimized	Project Manager & Contractor	Throughout construction period	0.00
	Equipment shall be properly tuned and maintained;	Project Manager & Contractor	Throughout construction period	0.00
	Vehicles shall be maintained and serviced regularly;	Project Manager & Contractor	Throughout construction period	0.00
	Alternatively fuelled construction equipment shall be used where feasible equipment shall be properly tuned and maintained	Project Manager & Contractor	Throughout construction period	0.00
	Work planning shall be undertaken to reduce time spent by the trucks delivering materials to the site and when traffic is low	Project Manager & Contractor	Throughout construction period	0.00

	Development and implementation of preventive maintenance of all equipment at the site;	Project Manager & Contractor	Throughout construction period	125,000.00
	Sensitise truck drivers to avoid unnecessary racing of vehicle engines at loading/offloading points and parking areas, and to switch off or keep vehicle engines at these points	Project Manager & Contractor	Throughout construction period	0.00
	Traffic control will be developed and implemented.	Project Manager & Contractor	Throughout construction period	0.00
9. Minimization of Construction Material Sourcing Impacts				
	Aggregates and rock will be sourced locally from an established quarry	Project Manager & Contractor	Throughout construction period	350,000.00
	Gravel and sub-grade soil-murram will be sourced locally also from an established quarry instead of starting another quarry;	Project Manager & Contractor	Throughout construction period	350,000.00
	Carry out inspection of each of the site's soil stability before excavation;	Project Manager & Contractor	Throughout construction period	200,000.00
	Cordon off the gravel site areas to keep livestock and the general public;	Project Manager & Contractor	Throughout construction period	100,000.00
	The use of burrow pits for material spoil sites may be approved by the RE (and/or with the appropriate consent of the "landowner"). Where this occurs, the materials spoiled in the burrow pit shall be profiled to fit into the surrounding landscape and covered with topsoil;	Project Manager & Contractor	Throughout construction period	350,000.00
	The Contractor is expected to follow the National Sand Harvesting Guidelines published by NEMA in 2007;	Project Manager & Contractor	Throughout construction period	0.00

10. Minimization of Oil and Spill leakages				
Oil and Spill leakages	1. Spill kits shall be provided at all areas where chemicals are stored. 2. All the chemical handlers shall be trained appropriately on safe use and disposal of the chemicals and emergency procedures. 3. Provision of material safety data sheets at all areas where the chemicals are handled prominently displayed. 4. Refuelling within the site shall be restricted to the excavators and other equipment for vehicles they shall be fuelled at petrol stations. 5. The frequency of refuelling shall be minimised by ensuring during refuelling the vehicle is refuelled to the maximum. 6. Refuelling shall be done away from drainage lines. 7. Fuel storage at the site shall be minimised.	Project Manager & Contractor	Throughout construction period	0.00
11. Hydrology, drainage and storm water				
Hydrology, drainage and storm water	• A well-drained area should be identified for parking, maintenance of the vehicles and equipment. • Provide drainage channels should during construction to minimize any possible water logging. • Provide a segregated drainage system where water contaminated with oils drains to instead of draining into the open storm drains. • The drainage system should ensure that surface flow is drained suitably into the public drains provided to control flooding within the site. • The channels should be covered with gratings or other suitable and approved materials to prevent occurrence of	Project Manager & Contractor	Throughout construction period	200,000.00

	accidents and entry dirt that would compromise flow of run-off. • The drainage channels should ensure the safe final disposal of runoff • /surface water and should be self-cleaning which means it should have a suitable gradient. Implementation of roof water harvesting			
12. To minimize OSH incidents				
OSH incidents	• Registration of all workplaces by the Director, Directorate of Occupational Health and Safety (DOHSS) • Erect warning signs • Allocate a fire assembly point • Comply with all standards and legally required health and safety regulations as set out by the Occupational Safety and Health Act (Part XI: Section 96) as pertains to construction activities; • Provide fully functional standard First Aid Kit on site. • Demarcate all works which may pose a employees and other site workers • For fire and safety the Contractor, should ensure the following: • Place portable fire extinguishers at suitable locations • Training all staff on fire safety policy and procedures	Project Manager & Contractor	Throughout construction period	300,000.00

	• Clearly mark all fire exits within the site			
	Provision of appropriate PPE as well as ensuring a safe and healthy environment for construction workers.	Project Manager & Contractor	Throughout construction period	150,000.00
	Risk of accidents and ill health as a result of construction activities shall be mitigated by ensuring that appropriate health and safety measures are applied in all activities; fencing of all dangerous areas; placing warning signs; consulting with the local community and health workers and enforcing maximum traffic speeds through the Roads. In addition, preparing a contingency plan for accident response, safety education and training shall be emphasized.	Project Manager & Contractor	Throughout construction period	400,000.00
13. Increased pressure on utilities				
Increased pressure on utilities	• Employing water conservation techniques and using the required amounts of water to prevent wastage. • Employing power saving techniques such as switching off equipment when not in use, using natural light whenever possible. • Using machines with power saving technologies. • Providing proper sanitary facilities for construction workers. • Inspecting the drainage facilities regularly to ensure they are free of debris that may reduce their efficiency.	Project Manager & Contractor	Throughout construction period	400,000.00
14. Minimisation of increased traffic				
increased traffic	• Placing signs around the site notifying other ✓ vehicles about the heavy traffic and to set the speed	Project Manager & Contractor	Throughout construction period	400,000.00

	✓ limit around the site. • Ensuring all drivers for the project comply to speed ✓ regulations. • Making sure the construction doesn't occupy the ✓ road reserves and complying with traffic and land ✓ demarcation obligations. • Ensuring all vehicles used for the project are in ✓ good working condition both legally and ✓ commensurate to their intended use.			
15. Minimisation of Occupational Safety and Health risks				
Occupational Safety and Health risks	• Provide all workers with the necessary protective gears • Ensure all workers are in protective gears all the time when on site • Place fire extinguishers in strategic areas within the station • Designate and mark smoking areas • Workers to be trained as fire marshals • Fire escape routes to be shown clearly • Provide enough first aid kits within the project site • Train workers in administering first aid • Label all potential hazards such as movable	Project Manager & Contractor	Throughout construction period	400,000.00

	machine parts • Raise awareness and educating workers on risks from equipment and training them on the use of the equipment. • Placing visible and readable signs around where there are risks. • Ensuring security in and around the site to control the movement of people. • Providing safe and secure storage for equipment and materials in the site. Placing visible and readable signs to control the movement of vehicles and notify motorists and pedestrians around the, and workers in the site.			
16. To Minimize Clearing of Vegetation				
Clearing of Vegetation	Ensure proper demarcation of the Project area to be affected by the construction works. This will be aimed at ensuring that any loss of vegetation is restricted to the actual Project area and avoid spill over effect on the neighbouring areas.	Project Manager & Contractor	Throughout construction period	0.00
	Clearing of work sites and roadside vegetation will be done to an acceptable minimum.	Project Manager & Contractor	Throughout construction period	150,000.00
17. Minimization of noise and vibration				
Noise and vibration	Install portable barriers to shield compressors and other small stationary equipment where necessary.	Project Manager & Contractor	Throughout construction period	10,000.00
	Use quiet equipment (i.e. equipment designed with noise control elements).	Project Manager & Contractor	Throughout construction	120,700.00

			period	
	Co-ordinate with relevant agencies regarding construction activities in the area.	Project Manager & Contractor	Throughout construction period	0.00
	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.	Project Manager & Contractor	Throughout construction period	0.00
	The proponent to schedule most of the operations during the day. Only operations that meet the required permissible noise levels should be allowed to operate at night	Project Manager & Contractor	Throughout construction period	0.00
	Install 'no hooting' signs in zones where noise will be of most nuisance like the education area.			0.00
	Sensitization of motorists within these zones against unnecessary noise making	Project Manager & all site foremen	Throughout construction period	0.00
	Construction/demolition works should be done during the day when people are away and also the outside environment is also noisy.	Project Manager & all site foremen	Throughout construction period	0.00
	Adhere to the provisions of the Factories and Other Places of Work (Noise Prevention and Control) Rules, 2005 regarding workplace noise limits	Project Manager & all site foremen	Throughout construction period	0.00
	Ensure that construction machinery are kept in good condition to reduce noise generation	Project Manager & Contractor	Throughout construction period	20,400.00
	Ensure that all generators and heavy-duty equipment are insulated or placed in enclosures to minimize ambient noise levels	Project Manager & Contractor	Throughout construction period	26,200.00

	Establishment of buffer zones between different land uses will attenuate noise, further reducing the potential impacts. Adherence to noise ordinances such as the Environmental Management and Coordination (Noise and Excessive Vibration Pollution Control) Regulations, 2009 and employment of noise attenuation mechanisms for point sources will mitigate the impact.	Project Manager & all site foremen	Throughout construction period	300,000.00
18. Minimization of energy consumption				
Increased energy consumption	Ensure electrical equipment, appliances and lights are switched off when not being used	Project Manager & Contractor	Throughout construction period	0.00
	Install energy saving fluorescent tubes at all lighting points instead of bulbs which consume higher electric energy	Project Manager & Contractor	Throughout construction period	10-40 % higher than ordinary lighting
	Ensure planning of transportation of materials to ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts	Project Manager & Contractor	Throughout construction period	3,500.00/month
	Monitor energy use during construction and set targets for reduction of energy use.	Project Manager & Contractor	Throughout construction period	22,500.00
19. Minimize water consumption and ensure more efficient and safe water use				
High water demand	Install water conserving taps that turn-off automatically when water is not being used	Project Manager & Contractor	One-off	10-40 % higher than ordinary taps
	Promote recycling and reuse of water as much as possible	Project Manager & Contractor	Throughout construction	3,400.00

			period	
	Install a discharge meter at water outlets to determine and monitor total water usage	Project Manager & Contractor	One-off	2,500.00
	Promptly detect and repair of water pipe and tank leaks	Project Manager & Contractor	Throughout construction period	2,000.00 per month
	Sensitise staff to conserve water by avoiding unnecessary water use	Project Manager & Contractor	Throughout construction period	0.00
	Ensure taps are not running when not in use	Project Manager & Contractor	Throughout construction period	0.00
20. Minimize release of liquid effluent				
Generation of wastewater	Provide means for handling liquid waste generated by construction workers	Mechanical Engineer & Project Manager	One-off	7,500.00/ month
	Conduct regular checks for pipe blockages or damages since such vices can lead to release of the effluent into the land and water bodies	Mechanical Engineer & Project Manager	Throughout construction period	
	Dispose liquid waste in accordance with the provisions of Environmental Management and Co-ordination (Water Quality) Regulations, 2006	Mechanical Engineer & Project Manager	Throughout construction period	
21. Minimize occupational health and safety risks				
Approval of building plans	Ensure that all building plans are approved by the Ministry of Lands and Physical Planning and the local OSH office	Developer	One-off	done
Registration of the premises	Registration of the premises under OSHA, 2007 laws of Kenya is mandatory	Developer	One-off	5,050.00 per year
General register	A general register should be kept in the facility as stipulated in	Project Manager &	One-off	1,000.00

	Sec 122&123 of OSHA, 2007.	Contractor		
Posting of abstract of Act, rules and notices	There shall be displayed at prominent places within the site the prescribed abstract of the OSHA and the relevant notices as stipulated in Section 121 of the OSHA, 2007.	Project Manager & Contractor	One-off	5,00.00
Incidents, accidents and dangerous occurrences.	Ensure that provisions for reporting incidents during construction using prescribed forms obtainable from the local OSH office are in place.	Project Manager, Developer & Contractor	Continuous	0.00
	Enforcing adherence to safety procedures and preparing contingency plan for accident response in addition safety education and training shall be emphasized.	The Contractor, Project Manager& Site Safety Officer	Continuous	0.00
Insurance	Ensure that the premises are insured as per statutory requirements (WIBA, 2007)	Developer	Annually	0.00
Safety, health and environment (SHE) policy	Develop, document and display prominently an appropriate SHE policy for construction works	Project Manager, Developer & Contractor	One-off	35,000.00
Health and safety committee	Provisions must be put in place for the formation of a health and safety committee, in which the employer and the workers are represented	Project Manager	One-off	0.00
Sanitary conveniences	Suitable, efficient, clean, well-lit and adequate sanitary conveniences should be provided for construction workers	Project Manager	One-off	3,500.00/month
Medical examination	Arrangements must be in place for the medical examination of all construction employees before, during and after termination of employment	Project Manager, Developer & Contractor	Continuous	5,00.00 per examination
Machinery/equipment safety	Ensure that machinery, equipment, PPE, appliances and hand tools used in construction do comply with the prescribed safety and health standards and be appropriately installed maintained and safeguarded	Project Manager, Developer & Contractor	One-off	0.00
	Ensure that equipment and work tasks are adapted to fit workers	Project Manager, Developer &	Continuous	0.00

	and their ability including protection against mental strain	Contractor		
	All machines and other moving parts of equipment must be enclosed or guarded to protect all workers from injury	Project Manager	One-off	0.00
	Arrangements must be in place to train and supervise inexperienced workers regarding construction machinery use and other procedures/operations	Project Manager	Continuous	5,000.00 per training
	Equipment such as fire extinguishers must be examined by a government authorized person. The equipment may only be used if a certificate of examination has been issued	Project Manager	Continuous	5,500.00 per examination
	Reports of such examinations must be presented in prescribed forms, signed by the examiner and attached to the general register	Project Manager	Continuous	2,500.00per examination
Storage of materials	Ensure that materials are stored or stacked in such manner as to ensure their stability and prevent any fall or collapse	Project Manager	Continuous	11,700.00
	Ensure that items are not stored/stacked against weak walls and partitions	Project Manager	Continuous	
Safe means of access and safe place of employment	All floors, steps, stairs and passages of the premises must be of sound construction and properly maintained	Project Manager & Contractor	Continuous	0.00
	Securely fence or cover all openings in floors	Project Manager & Contractor	One-off	0.00
	Provide all staircases with suitable handrails on both sides	Project Manager & Contractor	One-off	0.00
	Ensure that construction workers are not locked up such that they would not escape in case of an emergency	Project Manager & Contractor	Continuous	0.00
	All ladders used in construction works must be of good construction and sound material of adequate strength and be properly maintained	Project Manager & Contractor	One-off	0.00

Emergency preparedness and evacuation procedures	Design suitable documented emergency preparedness and evacuation procedures to be used during any emergency	Project Manager & Contractor	One-off	0.00
	Such procedures must be tested at regular intervals	Project Manager & Contractor	Every 3 months	
	Ensure that adequate provisions are in place to immediately stop any operations where there in an imminent and serious danger to health and safety and to evacuate workers	Project Manager & Contractor	One-off	
	Ensure that the most current emergency telephone numbers posters are prominently and strategically displayed within the construction site	Project Manager & Contractor	One-off	
	Provide measures to deal with emergencies and accidents including adequate first aid arrangements	Project Manager & Contractor	Continuous	
First Aid	Well stocked first aid box which is easily available and accessible should be provided within the premises	Project Manager & Contractor	One-off	5,500.00
	Provision must be made for persons to be trained in first aid, with a certificate issued by a recognized body.	Project Manager & Contractor	One-off	6,000.00 per person
22. Ensure the general safety and security of the site and surrounding area				
Increased Pressure on Infrastructure	Coordinate with other planning goals and objectives for the region	Architect, Project Manager, Contractor and the Developer	Continuous	30,000.00
	Upgrade existing infrastructure and services, if and where feasible.	Architect, Project Manager, Contractor and the Developer	Continuous	
Insecurity	Ensure the general safety and security at all times by providing day and night security guards and adequate lighting within and around the construction site.	Security Officer, Project Manager & Police	Continuous	20,000.00/ month
	Body-search the workers on entry, to avoid getting weapons on site, and leaving site to ensure nothing is stolen.	Security Officer	Continuous	

	Ensure only authorised personnel get to the site	Security Officer	Continuous	
	Security alarms will be installed	Security Officer	Continuous	
21. Environmental monitoring of the project				
Environmental concern during the construction phase	As required by the law, the Proponent will liaise with the environmental consultant throughout the construction phase and ensure that the EIA licensing conditions are adhered to	Proponent, Contractor and EIA/EA Experts	Throughout construction phase	0.00
24. Minimisation of Community Impact				
Community Impact	• Initiate good public relation between the Initiate good public relation between the proponent, contractor and the community • Erect and maintain information boards in the position, quantity, design and dimensions of the proposed sugar factory • Keep a "Complaints Register" on Site	Proponent	Throughout construction phase	50,000.00

Table 5: Construction phase EMP for the proposed Project

Operation Phase EMP of the proposed Project

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
1 Minimization of solid waste generation and ensuring more efficient solid waste management				
Solid waste generation	Use of an integrated solid waste management system i.e. through a hierarchy of options: 1. Source reduction 2. Recycling 3. Composting and reuse 4. Combustion 5. Sanitary landfill.	Proponent/Property Managers	Continuous	0.00
	Provide solid waste handling facilities such as waste bins and skips	Proponent/Property Managers	Continuous	30,000.00
	Ensure that solid waste generated is regularly disposed off appropriately at authorised dumping sites	Proponent/Property Managers	Continuous	15,000.00/month
	Donate redundant but serviceable equipment to charities and institutions	Proponent/Property Managers	Continuous	0.00
	Comply with the provisions of Environmental Management and Co-ordination (Solid Waste) Regulations, 2006	Proponent/Property Managers	Continuous	0.00
2 Minimise risks of liquid waste release to the environment				
Liquid waste release to the environment	Provide adequate and safe means of handling liquid waste at the premises	Proponent/Property Managers	One-off	0.00
	Conduct regular inspections for pipe blockages or damages and fix appropriately	Proponent/Property Managers	Continuous	500.00 per inspection
	Comply with the provisions of Environmental Management and Co-ordination (Water Quality) Regulations,	Proponent/Property Managers	Continuous	0.00

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
	2006			
3 Minimize energy consumption				
Increased energy use	Switch off electrical equipment, appliances and lights when not being used	Proponent/Property Managers	Continuous	0.00
	Install occupation sensing lighting at various locations such as the stores which are not in use all the time	Proponent/Property Managers	One-off	10-40 % higher than ordinary lighting
	Install energy saving fluorescent tubes at all lighting points within the building instead of bulbs which consume higher electric energy	Proponent/Property Managers	One-off	10-40 % higher than ordinary lighting
	Monitor energy use during the operation of the project and set targets for efficient energy use	Proponent/Property Managers	Continuous	7,500.00/month
	Sensitise workers and the premises occupiers to use energy efficiently	Proponent/Property Managers	Continuous	2,000.00/month
4 Minimize water consumption and ensure more efficient and safe water use				
Water management	Promptly detect and repair of water pipe and tank leaks	Proponent/Property Managers	Continuous	3,500.00/month
	Occupier of the premises to conserve water e.g. by avoiding unnecessary toilet flushing	Proponent/Property Managers	Continuous	2,500.00/month
	Ensure taps are not running when not in use	Proponent/Property Managers	Continuous	2,500.00/month
	Install water conserving taps that turn-off automatically when water is not being used	Proponent/Property Managers	One-off	10-40 % higher than ordinary taps

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
	Install a discharge meter at water outlets to determine and monitor total water usage	Proponent/Property Managers	One-off	3,000.00
5 Minimization of health and safety impacts				
Implement all necessary measures to ensure health and safety of the Occupier and the general public during operation of the premises as stipulated in OSHA, 2007 and the Public Health Act		Proponent/Property Managers	Continuous	0.00
6 Ensure the general safety and security of the premises and the surrounding area				
Ensure the general safety and security at all times by providing day and night security guards and adequate lighting within and around the premises		Proponent/Property Managers	Continuous	20,000.00/month
7 Ensure environmental compliance				
Undertake an EA within 12 months after operation commences as required under the law		Licensed lead EIA/EA Expert(s)	12 months after operation commences	80,000.00

9.5 Decommissioning Phase

In addition to the mitigation measures provided in the tables above, it is necessary to outline some basic mitigation measures that will be required to be undertaken once all operational activities of the project have ceased. The necessary objectives, mitigation measures, allocation of responsibilities, time frames and costs pertaining to prevention, minimization and monitoring of all potential impacts associated with the decommissioning and closure phase of the project are outlined in table overleaf.

Table 5: Decommissioning phase EMP for the proposed Project

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
1. Demolition waste management				
Demolition waste	Use of an integrated solid waste management system i.e. through a hierarchy of options: 1. Source reduction 2. Recycling 3. Composting and reuse 4. Combustion 5. Sanitary land filling.	Project Manager & Contractor	Once-off	100,000.00
	All buildings, machinery, equipment, structures and partitions that will not be used for other purposes must be removed and recycled/reused as far as possible	Project Manager & Contractor	Once-off	50,000.00
	All foundations must be removed and recycled, reused or disposed off at a licensed disposal site	Project Manager & Contractor	Once-off	60,000.00
	Where recycling/reuse of the machinery, equipment, implements, structures, partitions and other demolition waste is not possible, the materials should be taken to a licensed waste disposal site	Project Manager & Contractor	Once-off	0.00
	Donate reusable demolition waste to charitable organizations, individuals and institutions	Project Manager & Contractor	Once-off	0.00
2. Rehabilitation of project site				

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
Site degradation	Implement an appropriate re-vegetation programme to restore the site to its original status	Project Manager & Contractor	Once-off	60,000.00
	Consider use of indigenous plant species in re-vegetation	Project Manager & Contractor	Once-off	
	Trees should be planted at suitable locations so as to interrupt slight lines (screen planting), between the adjacent area and the development.	Project Manager & Contractor	Once-off	

10 CONCLUSION AND RECOMMENDATIONS

The proposed Project according to this EIA study shall come along with numerous positive impacts as exhaustively discussed within the report. Negative impacts are as well anticipated which however, according to this EIA study can be adequately mitigated.

This EIA study recommends that the positive impacts arising from the establishment of the proposed Project be maximised to the extent feasible. It is expected that these measures will go a long way in ensuring the best possible environmental compliance and performance standards.

Further, this EIA study report recommends that the Proponent implement adequate measures to mitigate the negative environmental, safety, health and social impacts associated with the life cycle of the proposed Project. In addition to this commitment, the Proponent shall adopt the measures outlined in the ESMP as well as adhering to all relevant national and international environmental, health and safety standards, policies and regulations that govern establishment and operation of such projects.

On the basis of the above and taking cognizance of the fact that the Proponent has proved financially and environmentally credible, it is the Consultant's submission that the proposed Project be allowed to go on provided the mitigation measures outlined in this report shall be adhered to and the ESMP shall be fully implemented.

11 REFERENCES

1. Kenya gazette supplement Acts 2015, Environmental Management and Coordination (Amendment) Act Number 5 of 2015. *Government printer,*
2. Kenya gazette supplement Acts 2000, Environmental Management and Coordination Act Number 8 of 1999. Government printer, Nairobi
3. Kenya gazette supplement number 56. Environmental Impact Assessment and Audit Regulations 2003, Government Printers, Nairobi
4. Kenya gazette supplement Acts Building Code 2000, Government Printers, Nairobi
5. Kenya gazette supplement Acts Penal Code Act (Cap.63) Government Printers, Nairobi
6. Kenya gazette supplement Acts Physical Planning Act, 1999, Government Printers, Nairobi
7. Kenya gazette supplement Acts Public Health Act (Cap. 242) government printer, Nairobi
8. Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 regarding noise production limits. Government Printers, Nairobi
9. Kenya gazette supplement number 57, Environmental Management and Coordination (Controlled Substances) Regulations, 2007, Government printer, Nairobi
10. Kenya gazette supplement number 68, Environmental Management and Coordination (Water Quality) Regulations, 2006, Government printer, Nairobi
11. Kenya gazette supplement number 69, Environmental Management and Coordination (Waste management) Regulations, 2006, Government printer, Nairobi
12. Noise Prevention and Control Rules 2005, Legal Notice no. 24, *government printer, Nairobi*
13. The Occupational Safety and Health Act, 2007, Government Printers, Nairobi
14. Constitution of Kenya, 2010.
15. Convention on Biological Diversity, 1993.
16. County Government Act, 2012
17. Kenya Vision, 2030.
18. Kyoto Protocol, 1997.
19. Montreal Protocol on Substances that Deplete the Ozone Layer, 1987.
20. National Occupational Safety and Health Policy, 2012.

12 APPENDICES

1. NEMA Practicing License for the Consultant
2. Lease Agreement
3. Design Plans for the Proposed Project.
4. KRA Pin
5. Bill of Quantities
6. Life and Fire Safety Report
7. Geotechnical and Geophysical Survey Report
8. Baseline Air Quality Report.
9. Noise Survey Report.
10. Traffic Impact Assessment Report
11. Parking and Traffic Strategy Report
12. Public Consultation Questionnaire