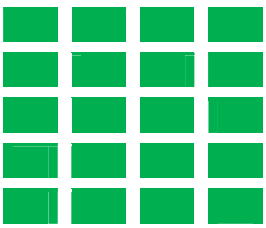
ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT STUDY REPORT

INTEGRATED ENVIRONMENTAL & SOCIAL IMPACT FOR THE PROPOSED FOUR-STAR RADISSON AIRPORT HOTEL ON PLOT No.LR 9042/300 WITHIN JOMO KENYATTA INTERNATIONAL AIRPORT, OFF MOMBASA ROAD NAIROBI COUNTY.

Prepared by:



AWEMAC

MAY 2024

INTEGRATED ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED FOUR-STAR RADISSON AIRPORT HOTEL ON PLOT No.LR 9042/300 WITHIN JOMO KENYATTA INTERNATIONAL AIRPORT, OFF MOMBASA ROAD NAIROBI COUNTY

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CERTIFICATION

ESIA EXPERT

I, **Prof. Jacob K. Kibwage** submit this ***Integrated Environmental and Social Impact Assessment Study for the proposed Four-Star Radisson Airport hotel on Plot No. L.R 9042/300 within Jomo Kenyatta International Airport, Nairobi County***. To the best of my knowledge, all information contained in this Report is an accurate and truthful representation of all findings relating to the proposed project as per project information provided by the proponent.

Signed in Nairobi on this 28th *day of* May, ***2024.***

Signature: .....

Designation: **Lead Environmental Consultant NEMA Firm Reg. 0527**

Africa Waste & Environment Management Centre (AWEMAC) P.O. Box 14365 - 00100 Nairobi

PROJECT PROPONENT

I, Vijay Kantaria on behalf of Esiway Investments Limited submit this **Integrated *Environmental and Social Impact Assessment Study for the proposed Four-Star Radisson Airport hotel on Plot No. L.R 9042/300 within Jomo Kenyatta International Airport, Nairobi County.*** To the best of my knowledge, all information contained in this TOR is an accurate and truthful representation of all findings relating to the proposed project.

Signed in Nairobi on this 28th *day of* May, ***2024.***

Signature: .....

Designation: Director

LIST OF PLANNING AND PARTICIPATING EXPERTS

A. TECHNICAL TEAM

NAME	QUALIFICATIONS
Prof Jacob K. Kibwage (Lead Expert, Reg. No. **0126**)	PhD in Environmental Studies
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Ms. Caroline Mokaya (Associate Expert Reg. No. **10910)**	BSc. Disaster Preparedness and Environmental Technology
Ms. Rachael Maithya (Associate Expert Reg. No. **7746**)	BSc. Environmental Conservation and Resource Management
Mr. Philip Abuor	Approved Air Quality Expert Certificate number: OSH/AQM/003

B. TECHNICAL SUPPORT TEAM

NAME	QUALIFICATIONS
Sound Research Laboratories South Africa (Pty) Ltd	Noise and Vibrations Survey Expert
Eng. Silas Mugendi	Traffic Impact Assessment Expert
Sylvia Nyamoita Morumbwa	Bachelor of Arts (Design)
Beryl Awuor Lumumba	Bachelor of Environmental Studies (Resource Conservation)
Victor Nyambu Mwasi	Bachelor of Science in Meteorology
Jane Mideva	Bachelor Of Science in Land Resources Management

LIST OF ACRONYMS

AWEMAC - Africa Waste and Environment Management Centre

BC - Building Code

CBD - Central Business District

COx - Carbon oxides

DOSH - Directorate of Occupational Safety and Health

DOSHS - Directorate of Occupational Safety and Health Services

EHS - Environmental, Health, and Safety

ELCA - Environment and Land Court Act

EMP - Environmental Management Plan

EMCA - Environmental Management and Coordination Act

EIA - Environmental and Social Impact Assessment

ESMP - Environmental and Social Management Plan

GDP - Gross Domestic Product

GHGs - Greenhouse Gases

GIS - Geographic Information System

GOK - Government of Kenya

GPS - Global Positioning System

HCVs - Heavy Commercial Vehicles

HASP - Health and Safety Plan

HRA - Hotels and Restaurants Authority

IESIA-Intergrated Environmental and Social Impact Assessment

ILO - International Labour Organization

ISWMS - Integrated Solid Waste Management System

JKIA - Jomo Kenyatta International Airport

KAA - Kenya Airports Authority

KCAA-Kenya Civil Aviation Authority

KBS - Kenya Bureau of Standards

KEBS - Kenya Bureau of Standards

KEFRI - Kenya Forestry Research Institute

KEWI - Kenya Water Institute

KFS - Kenya Forest Service

KNBS - Kenya National Bureau of Statistics

KPLC - Kenya Power and Lighting Company

KRA - Kenya Revenue Authority

KWTA - Kenya Water Towers Agency

KWS - Kenya Wildlife Service

L.N - Legal Notice

LOS- Level of Service

LR - Land Registry

LPG - Liquified Petroleum Gas

MEAs - Multilateral Environment Agreements

MTP - Medium-Term Plan

MSDS - Material Safety Data Sheet

MSME - Micro, Small, and Medium Enterprise

N/A - Not Applicable

NCA - National Construction Authority

NCWSC - Nairobi City Water and Sewerage Company

NEC - National Environmental Council

NECC - National Environment Complaints Committee

NET - National Environment Tribunal

NETFUND - National Environment Trust Fund

NEMA - National Environment Management Authority

NGEC - National Gender Equality Commission

OHS - Occupational Health and Safety

OSHA - Occupational Safety and Health Act

PCA - Penal Code Act

PLUPA - Physical and Land Use Planning Act

PPES - Personal Protective Equipment

SERC - Standards and Enforcement Review Committee

SGR - Standard Gauge Railway

SHE - Safety, Health, and Environment

SOx - Sulfur oxides

TMP- Traffc Management Plan

TOR - Terms of Reference

TRA – Tourism Regulation Authority

UACA - Urban Areas and Cities Act

UNDESA - United Nations Department of Economic and Social Affairs

UNFCCC - United Nations Framework Convention on Climate Change

UNICEF - United Nations International Children's Emergency Fund

VAT - Value Added Tax

WA - Water Act

WHO - World Health Organization

WIBA - Work Injury Benefit Act

WRA - Water Resources Authority

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EXECUTIVE SUMMARY

Introduction

Esiway Investments Limited proposes the construction of a Four-Star Radisson Airport Hotel on Plot No. L.R 9042/300 within Jomo Kenyatta International Airport, off Mombasa Road, Nairobi County. The proponent proposes to construct 233 guest accommodation rooms of varying options and typologies with basement parking and other support facilities such as a restaurant, meeting rooms, kids club, swimming pool, courtyard, Gym and a Spa. The land earmarked for the project is Approximately 1.2 Acres. The project aims to address the growing demand for modern and accessible accommodation near the airport, contributing to economic development.

The Kenya Government policy on such projects, programmes or activities requires that an Environmental Impact Assessment (EIA) 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. In accordance with the second schedule (Legal Notice No. 31 of 2019) of the Environmental Management and Coordination Act (EMCA) Cap 387, the project falls under the **'Urban Development'** class of "**High-Risk Projects**" Category i.e "***hotels with a bed capacity exceeding one hundred and fifty***". The proposed development will involve the construction of a hotel with 233 guest rooms and other support facilities.

The exercise was carried out in accordance with the National Environmental Management Authority (NEMA); and the Environmental (Impact Assessment and Audit) Regulations, 2003 and (Amendment) Regulations, 2019. The main purpose of this ESIA was to ensure adequate identification of potentially negative environmental and social impacts of the proposed project, propose workable mitigation measures and formulate an environmental monitoring and management plan articulating anticipated impacts.

The scope of the assessment covered impacts directly or indirectly associated with the construction, operation and decommissioning activities of the proposed project, supply of construction materials and other accessories. The consultant used both conventional and participatory approaches in identifying the potential environmental and social impacts and mitigation measures for the proposed project.

Project Description

The project site, situated within Jomo Kenyatta International Airport, Embakasi Sub County Nairobi County at GPS coordinates 1°20'23.8"S 36°54'48.7"E; 1°20'22.8"S 36°54'50.4"E and 1°20'26.1"S 36°54'50.2"E, is currently occupied by bushes, grass, and around 10 Acacia trees.

The proponent proposes to construct 233 guest accommodation rooms of varying options and typologies with a basement parking and other support facilities such as a lobby lounge, a bar, retail shops, a restaurant, board and meeting rooms, a gym, spa treatment rooms, a kids' club, a courtyard, and a swimming pool. Strategically located, the project is easily accessible from Nairobi CBD and other parts of the city via Nairobi Expressway Road and Mombasa Road. It also benefits from proximity to the Standard Gauge Railway at Syokimau and Jomo Kenyatta International Airport. The proposed project aims to provide affordable, modern and easily accessible accommodation to both local and international guests.

The proposed project is located within a specialized freight area and along First Freight Lane within Jomo Kenyatta International Airport. The area is occupied by various cargo operation companies such as: Kuehne + Nagel Limited to the western side, VegPro Limited to the Southern part, Engineering Development Limited warehouse to the Eastern side and Nzoia Freight abandoned site to the Northern Side. There also exists similar developments such as Crown Plaza Nairobi Airport Hotel located approximately 150m west of the proposed project site and Four

Points by Sheraton Airport Hotel located approximately 250m south of the project site. Buildings within Jomo Kenyatta International Airport have a height level ranging from Two to Five levels.

Key Policy, Legislative, and Administrative Framework

The project aligns with the Environmental Management and Co-ordination Act (EMCA) of 1999 and other relevant national and international environmental standards. The ESIA study adheres to legislative requirements set by the National Environmental Management Authority (NEMA), ensuring compliance with regulatory frameworks for sustainable development.

Public Participation and Consultation

Consultation and Public Participation was undertaken during the ESIA study. The process involved (a) Public participation interviews, (b) Key Informant Consultation and (c)Key Stakeholders' meeting.

A total of Fourty-Three (43) ESIA questionnaires were administered the business enterprises surrounding the Project site and other key stakeholders. Key informant interviews were undertaken with stakeholders from Kenya Airports Authority and Kenya Civil Aviation Authority.

A key stakeholders consultative meeting took place at the Crowne Plaza Nairobi Airport Hotel within Jomo Kenyatta International Airport on 29th February 2024 at 9.00am. The meeting had 29 participants with 17 (59%) being male and 12 (41%) being female. Stakeholder comments and concerns have been in cooperated in the report with key issues being highlighted in *Table 0-1.*

Key Positive Impacts

The proposed hotel is anticipated to bring several positive impacts to the area, including economic growth, employment generation, increased government revenue, and optimal land use. During the construction phase, the project will stimulate the informal sector, provide a market for building materials, and contribute to the growth of the hospitality industry in the operational phase.

Key Negative Impacts

While recognizing the positive contributions, the ESIA study identifies potential negative impacts associated with the construction, operational and decommissioning phases. The potential negative environmental impacts of the proposed project and possible mitigation measures are summarized below;

Table 0-1 Summary of Negative Environmental Impacts and the proposed Mitigation Measures

Impacts	Mitigation
Construction Phase	
Increased Noise and Vibration Generation	▪ Sensitize drivers of construction vehicles and machinery operators to switch off engines or machinery that are not being used. ▪ Ensure that all vehicles and construction machinery are well maintained and regularly services to avoid excessive noise generation. ▪ Ensure that all workers wear earmuffs and other personal protective gear/equipment when working in noisy sections. ▪ Undertake loud noise and vibration level activities during off-peak hours. ▪ Conduct continuous noise monitoring of construction activities at the site. ▪ Ensure sound insulation technologies are employed during the construction phase work effectively towards minimizing high noise levels from external environment in the vicinity. ▪ Comply with conditions provided by the Environment Management and Coordination, Noise and Excessive Vibrations Pollution Control Regulations 2009.
Traffic Impact	▪ Minimize the haulage and transportation of construction of materials during peak hours. ▪ Adopt a Traffic Management Plan and Delivery Management plan to enhance the traffic movement within the site and along the first freight lane. ▪ Ensure Installation and maintenance of all construction signs, signals, markings, and other devices used to regulate traffic at strategic locations. ▪ Employ traffic marshals to control the movement of vehicles during the construction phase of the project. ▪ Heavy Commercial Vehicles (HCVs) delivering construction materials should observe designated speed limits for the area. ▪ Ensure the construction doesn't occupy the road reserves and complys with traffic and land demarcation obligations. ▪ Ensure provision of adequate parking spaces for the vehicles transporting workers and heavy tracks offloading the construction materials. ▪ Construct acceleration and deceleration lanes to channel delivery trucks to the site without creating a backlog of traffic behind them as they navigate turns of entry. ▪ Selection of construction areas should be based on the existing road layout and the location of access to the various commercial and residential properties. ▪ Any change in the normal programming of activities that will significantly disrupt normalcy along the abutting project roads should be timely communicated.

Increased Solid Waste Generation	▪ Provide mechanisms to segregate wastes at source to enable recycling ▪ Engage a NEMA licensed waste handling firm to collect solid wastes on regular basis and dispose of in approved dumping sites. ▪ Use of an Integrated Solid Waste Management System (ISWMS); through a hierarchy of options including source reduction, recycling, composting and reuse; ▪ Develop and implement a Solid Waste Management Plan before start of the project. ▪ Composting of vegetation waste for reuse as a landscaping fertilizer. ▪ Provide a central waste receptacle. ▪ Efficient use of building material to reduce waste and recycle/reuse where feasible. ▪ Management of all paint materials suspected or confirmed of containing lead as a hazardous waste. ▪ Comply with provisions of the Environmental Management and Co-ordination, Waste Management Regulations 2006.
Air Pollution	▪ Erection of dust screens around the construction site. ▪ Dust control measures should be adopted by providing adequate PPE to staffs, canopying loading points and erecting dust screens around the plant. ▪ Regular Sprinkling of water on dry and dusty surfaces regularly including the access road. ▪ Comply with personal protective clothing requirement for dusty areas such as dust masks and protective glasses. ▪ Slowing the speed of traffic by using clearly marked road signs may contribute to reducing dust levels. ▪ Covering heaps and berms of soil. ▪ Regular and prompt maintenance of construction machinery and equipment to minimize generation of hazardous gases. ▪ Monitor the air pollution levels regularly as per the provisions of the Environmental Management and Coordination (Air Quality) Regulations, 2014.
Increased generation of Wastewater	▪ Water containing pollutants such as cements, concrete, lime, chemicals and fuels shall be discharged into a conservancy tank for removal from site; ▪ The contractor should install portable toilets that will be maintained, cleaned, and supplied with adequate water during the construction phase. ▪ Potential pollutants of any kind and in any form, should be kept, stored and used in such a manner that any escape can be contained, and the water table not endangered. ▪ Control of water usage during construction activities to minimize on wastage. ▪ Promote recycling of wastewater and storm water. ▪ Install meters to monitor consumption rates of water. ▪ Comply with the Environment Management and Coordination Water Quality Regulations 2006.

Increased Water abstraction and consumption	▪ Water should be recycled where possible without compromising on quality and health. ▪ Install gutters on the roof of the site offices to harvest rainwater. ▪ Construct underground reservoir for storage of harvested rainwater. ▪ Drilling of a borehole to supplement water from Nairobi County Water Sewerage Company. ▪ Ensure the project complies to the Water Act, 2016 and Environmental Management and Co-ordination (Water Quality) Regulations 2006
Occupational safety and health risks	▪ Ensure that provisions for reporting incidents, accidents and dangerous occurrences during construction using prescribed forms obtainable from the Directorate of Occupational Safety and Health (DOSH) are in place. ▪ Training of workers on construction safety, including but not limited to; work at heights, ergonomics, chemical safety, occupational first aid, fire safety, machine safety, transport safety, use of high-visibility safety apparel and emergency management. ▪ Enforcing adherence to safety procedures and preparing contingency plan for accident response in addition safety education and training shall be emphasized ▪ Ensure that machinery, equipment, personal protective equipment, appliances and hand tools used do comply with safety and health standards and be appropriately installed maintained and safeguarded ▪ Ensure that equipment and work tasks are adapted to fit workers and their ability including protection against mental strain ▪ The area around which elevated work is taking place should be barricaded to prevent unauthorized access. Working under personnel on elevated structures should be avoided. ▪ All machines and other moving parts of equipment must be enclosed or guarded to protect all workers from injury ▪ Arrangements must be in place to train and supervise inexperienced workers regarding construction machinery use and other procedures/operations ▪ 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. ▪ All floors, steps, stairs and passages of the premises must be of sound construction and properly maintained. ▪ Design suitable documented emergency preparedness and evacuation procedures to be used during any emergency. Such procedures must be tested at regular intervals ▪ Provide measures to deal with emergencies and accidents including adequate first aid arrangements ▪ Provision must be made for persons to be trained in first aid, with a certificate issued. ▪ Provision of a First aid room with a full-time nurse to attend to any injuries on site. ▪ Appoint a trained health and safety team for the duration of the construction work. ▪ Provide workers with adequate and appropriate PPEs.

Interference with storm water Drainage Systems and Surface Hydrology	▪ The drainage system should ensure that surface flow is drained suitably into the public drains to control flooding within the site. ▪ Adopt Green roofing Practices that capture and store rainfall in an engineered growing media that is designed to support plant growth. ▪ Implementation of roof water harvesting which can be combined with a secondary (down-gradient) stormwater practice to enhance stormwater retention and/or provide treatment of overflow from the rainwater harvesting system. ▪ Provide water storage tanks to collect storm water for cleaning uses. ▪ Adopt permeable pavement systems that capture and temporarily store the Stormwater Retention Volume by filtering runoff through voids in the pavement surface into an underlying stone reservoir. ▪ Existing trees can be preserved, or new trees can be planted to reduce stormwater runoff. ▪ The drainage channels should be installed in all areas that are expected to generate or receive surface water such as car parking, driveways and along the building block-edges of the roofs. ▪ The channels should be covered with gratings or other suitable and approved materials to prevent occurrence of accidents and entry dirt that would compromise flow of run-off. ▪ During the rainy seasons, vigilant drainage monitoring will be crucial to prevent blockages and potential property. ▪ Proper waste management especially the excavated material to prevent drainage blockages.
Operation Phase	
Noise Pollution	▪ Ensure sound insulation technologies are employed during the construction phase work effectively towards minimizing high noise levels from external environment in the vicinity. ▪ Using equipment with low noise ratings or noise reduction technologies such as silencers for the generators. ▪ Erecting signs and notifying other users of noisy activities. Conducting all noisy activities during the day when permissible levels are higher. ▪ Provision of PPES such as ear plugs for employees working in noisy conditions or with noisy equipment.
Traffic Congestion	▪ Ensure fast screening and access of the all vehicles entering the hotel premises to prevent traffic snarl-up at the entry point. ▪ Ensure that appropriate road signage is positioned strategically at the entry point alerting oncoming drivers of route diversion into the Hotel premises. ▪ Ensure that all drivers making use of the hotel parking adhere to all traffic rules to minimize incidences of accidents.
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 landfilling. ▪ Provide solid waste handling facilities such as waste bins and skips ▪ Ensure that solid waste generated is regularly disposed of appropriately at authorized dumping sites by a NEMA Licensed Firm.

	▪ Comply with the provisions of Environmental Management and Co-ordination (Solid Waste) Regulations 2006.
Oil Depot Risks	▪ The facility should be equipped with automatic fire detection systems and fire suppression equipment. ▪ The fire fighting equipment should be strategically placed within the building. ▪ There should be provision for periodic training programs on Fire Safety, Occupational Health and Safety and First Aid. ▪ Mock drills should be conducted once in six months. ▪ Develop an Emergency Response and Disaster Management Plan which should be updated based on findings of mock drills. ▪ Marking and checking to ensure all fire escape routes are available and clear at all times. ▪ Having a marked Fire Assembly Point at the Faclity
Water use management	▪ Prompt detection and repair of water pipe and tank leaks ▪ Install dual flash toilets that can help in conserving water. ▪ ake use of sensitisaton posters on water use ▪ Install water conserving taps that turn-off automatically when water is not being used. ▪ Install a discharge meter at water outlets to determine and monitor total water usage.
Waste Water Generation	▪ Channel all wastewater to Nairobi City Water and Sewerage Company sewer system. ▪ Regular inspection and maintenance of internal sewer system. ▪ Constant monitoring of water resources through regular sampling. ▪ Comply with the provisions of Environmental Management and Co-ordination (Water Quality) Regulations 2006.

Conclusion

In conclusion, the ESIA study concludes that the proposed Four-Star Radisson Airport Hotel is a worthwhile investment that, if executed with strict adherence to the outlined mitigation measures, will contribute positively to the local economy. The proponent of the proposed project shall be committed to putting in place several measures to mitigate the negative environmental, safety, health and social impacts associated with the life cycle of the project. The proponent's commitment to environmental compliance and performance standards, as well as the implementation of the ESMP, ensures responsible and sustainable development. It is recommended that the project proceed, contingent on adherence to the conditions of approval by NEMA and ongoing commitment to the outlined mitigation strategies.

1 INTRODUCTION

1.1 Background Information

Esiway Investments Limited contracted Africa Waste and Environment Management Centre (AWEMAC) to offer Integrated Environmental & Social Impact Assessment (ESIA) consultancy services for the proposed Four-Star Radisson Airport hotel on Plot No. L.R 9042/300 within Jomo Kenyatta International Airport, Nairobi County.

The proposed development will comprise of a new Hotel development for "Radisson Hotel" at JKIA, off Mombasa Road, Nairobi County within the Nairobi Metropolitan. The proponent proposes to construct 233 guest accommodation rooms of varying options and typologies with basement parking and other support facilities such as: restaurant, meeting rooms, kids club, swimming pool, courtyard, Gym and a Spa. The proposed project aims to provide affordable, modern and easily accessible accommodation to both local and international guests.

1.2 Rationale for the Environmental and Social Impact Assessment

The Kenya government policy on such projects, programmes or activities requires that an Environmental Impact Assessment 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.

In accordance with the second schedule (Legal Notice No. 31 of 2019) of the Environmental Management and Coordination Act (EMCA) Cap 387, the project falls under the **'Urban Development'** class of "**High-Risk Projects**" Category i.e "***hotels with a bed capacity exceeding one hundred and fifty***". The proposed development will involve the construction of a hotel with 233 guest rooms and other support facilities.

Part VI, sections 58 and 59 of EMCA, Cap 387, provides that the proponent shall: before any financing, commencing, proceeding with, carrying out, executing or conducting or causing to be financed, commenced, proceeded with, carried out, executed or conducted by another person any undertaking specified in the second schedule to this Act, submit a study report to the National Environment Management Authority, (NEMA), in the prescribed form, giving the prescribed information and which shall be accompanied by the prescribed fee. Further in section 58 (5), the Act states that the Environmental Impact Assessment (EIA) studies and reports required under the Act shall be conducted or prepared respectively by individual experts or a firm of experts authorized on that behalf by the Authority.

1.3 Scope, Approach, and Criteria of the Integrated Environmental Impact Assessment

The "Integrated Environmental Assessment," which is a more holistic approach to the evaluation of the proposed project, was used to undertake a detailed and integrated study of the project. It entailed the following:

- ***Environmental Impact Assessment***: This involved an examination, analysis, and assessment of planned activities with a view of ensuring environmentally sound and sustainable development. It is the evaluation of a project's potential environmental risks and impacts in its area of influence; examination of project alternatives; identification of ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation.

- ***Social Impact Assessment***: This entailed analyzing, monitoring, and managing the intended and unintended social consequences, both positive and negative, of the projects and any social change processes invoked by the proposed project.

The scope of the assessment covered impacts directly or indirectly associated with the construction, operation and decommissioning activities of the proposed project, supply of construction materials and other accessories. The consultant used both conventional and participatory approaches in identifying the potential environmental and social impacts and mitigation measures for the proposed project. In pursuing the exercise in accordance with the Environmental (Impact Assessment and Audit) Regulations, 2003 (rev 2012) and (subsequent amendments 2016 & 2019), the consultant:

a) Identified the anticipated environmental, social, health and safety impacts of the project and the scale of the impacts;

b) Identified and analyzed alternatives to the proposed project;

c) Proposed mitigation measures to be taken into consideration during and after the implementation of the project; and

d) Developed an environmental and social management plan with mechanisms for monitoring and evaluating the compliance and environmental performance, which shall include the cost of mitigation measures and the time frame of implementing the measures.

The objective of this work was to deliver an Integrated Environmental and Social Impact Assessment study report for the purposes of applying for an EIA License.

1.4 Objectives

The principal objective is to highlight the possible positive and negative environmental and social impacts expected during the establishment and operation of the proposed project, with the aim of proposing possible mitigation measures. This is in line with ensuring that such a development does not negatively impact the environment in terms of the social, health, economic and physical (soil, water, plant and animals) state of the area. The study identified the possible environmental impacts during the implementation and operational phases of the project. The exercise was carried out in accordance with: National Environmental Management Authority (NEMA); and the Environmental (Impact Assessment and Audit) Regulations, 2003 and (Amendment) Regulations, 2019

1.5 Purpose and Terms of Reference

The purpose and terms of reference developed for this project were to assess the impacts that may arise during the construction, operational and decommissioning phases of the proposed project. The consultants, on behalf of the proponent, conducted the study by committing themselves to the integrated study report standard terms of reference which requires that the report specify: -

a) The nature of the project;

b) The location of the project including;

   i. proof of land ownership,
   ii. the Global Positioning System coordinates, and
   iii. the physical area that may be affected by the project activities;

c) The activities that shall be undertaken during the project construction, operation and decommissioning phases;

d) A description of the relevant International, National and County environmental legislative and regulatory frameworks on environmental and socio-economic matters;

e) Preliminary design of the project;

f) The materials to be used, products and by-products, including waste to be generated by the project and the methods of their disposal;

g) The potential environmental impacts of the project and the mitigation measures to be taken during and after implementation of the project;

h) An analysis of available alternatives including an alternative

   i. project site,
   ii. design,
   iii. technologies and processes; and
   iv. the reasons for preserving the proposed site design, technologies and processes;

i) An action plan for the prevention and management of possible accidents during the project cycle;

j) A health and safety plan of the workers and neighboring communities;

k) The economic and socio-cultural impacts on the local community and the nation in general;

l) Strategic communication plan to ensure inclusive participation during the study and provide a summary of issues discussed at the public participation forum;

m) An environmental management plan;

n) Integration of climate change vulnerability assessment, relevant adaptation and mitigation actions;

o) The Project cost;

p) Any other information the Authority may require.

2 ENVIRONMENT AND SOCIAL IMPACT ASSESSMENT METHODOLOGY

2.1 Introduction

Given the scale of the proposed project, a full Environmental and Social Impact Assessment (ESIA) study was undertaken to ensure the comprehensiveness and completeness of the assessment. The study was conducted as guided by the Environmental Management and Coordination Act Cap 387 and the Environmental Impact Assessment/ Audit Regulations of 2003 and Amendment in 2019.

The general steps that were followed during the assessment included:

- Environmental screening, in which the project was identified as a high-risk project requiring an Environmental Impact Assessment study under the Amendment of the Second Schedule of EMCA 1999 *and the* Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019
- Environmental scoping, which provided the key environmental issues, desktop studies, biodiversity studies and interviews.
- Physical inspection of the proposed project site and surrounding areas, Observations and Application of Geographic Information System (GIS), Noise and Air quality measurements and Traffic Impact Assessment.
- ESIA Public participation and stakeholder consultation, through a key stakeholder's consultation meeting and Administration of questionnaires.
- Desktop Studies
- Data analysis; and
- Report preparation.

The environmental assessment aimed at examining, analysing, and assessing the proposed project activities to ensure environmentally sound and sustainable development systems.

2.2 Environmental Screening

A screening exercise was conducted in the month of January 2024 to determine whether an Environmental and Social Impact Assessment (ESIA) would be required and what level of assessment was necessary. This was done in line with the requirements of the Environmental Management and Coordination Act (EMCA) Cap 387 and the Environmental (Impact Assessment and Audit) Regulations, 2003 and (Amendment) Regulations, 2019 (L.N No. 32 of 2019).

The screening exercise identified that the proposed project is listed in the amended Second Schedule of EMCA 1999 (L.N No. 31 of 2019), and the Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019 as a project for which an Integrated Environmental and Social Impact Assessment study report is necessary.

2.3 Environmental Scoping

The scoping exercise was carried out during in the month of January 2024, where key issues identified during screening were further investigated through desktop analysis, field data collection and key stakeholders' engagement to ascertain whether additional information was needed to evaluate baseline conditions and potential impacts within the proposed project area. The desktop evaluation included reviewing applicable environmental and social data collected from external

sources with published information. In addition to desktop review, primary data was collected through field studies conducted by the Consultant. The key objectives for the Scoping phase were: -

- To identify stakeholders and inform them of the proposed project and the ESIA process.
- To provide stakeholders with the opportunity to identify any issues and concerns associated with the proposed project; and equally propose potential interventions to the issues raised for consideration in the ESIA process.
- To identify environmental and social issues that may require further investigation at the study level.
- To determine the final Terms of Reference (ToR) for the specialist's baseline and impact assessment studies in response to initial stakeholder input.

The scoping exercise established the need for an ESIA study due to the nature of the project; its classification by the regulating authorities in Kenya; and the complexity of environmental issues that required further assessment. The outputs of the scoping exercise were the project's Terms of Reference (ToR).

2.4 Data Collection Procedures

The Environmental Management and Co-ordination Act No.8 of 1999, (CAP 387) stipulates that an integrated ESIA study shall be conducted in accordance with the general ESIA guidelines and administrative procedures issued by the National Environment Management Authority ("NEMA" or "the Authority"). The Authority therefore oversees all aspects of Environmental and Social Impact Assessments (ESIA).

It is worth noting that there are multiple methods to meet the necessary requirements for an ESIA and hence our objective was to select an array of methods that could collectively meet the assessment's needs. It is therefore for this reason that AWEMAC undertook environmental screening and scoping to identify the key issues and data requirements.

The full ESIA Study was carried out based on the NEMA-approved ESIA Terms of Reference and in compliance with the government of Kenya's Environment Management and Coordination Act Cap 387 and the Environmental (Impact Assessment and Audit) Regulations 2003 and its amendment of 2019.

The process of conducting the ESIA Study involved the following methods:

- Administration of ESIA Questionnaires the business entities surrounding the project site as well as relevant key stakeholders.
- ESIA Scoping Checklists.
- Field visits, observations, and measurements.
- GIS/ GPS Technologies.
- Stakeholder consultation and participation meeting.

2.5 Description of the Proposed Project

To provide a comprehensive description of the proposed project, the consultant relied mainly on the review of available literature in regard to the project. Additionally, the consultant reviewed the proposed project drawings as provided by the proponent.

2.6 Description of the Environmental and Socio-economic Condition of the Project Area

The consultant sought to provide a clear description of the proposed project including its area of influence and provide baseline information on the existing environmental and socio-economic situation. The Consultant undertook baseline surveys aiming to provide a measure of the existing environment and the socio-economic situation against which future changes due to the project can be monitored. This entailed conducting detailed environmental assessment and carrying out preliminary social surveys. Further, the following studies were conducted to supplement existing baseline information for the project site: Baseline Air Quality Assessment, Noise and Vibration Survey and Traffic Impact Assessment.

The Consultant collected, evaluated, and presented baseline data and information on the relevant environmental characteristics of the present environment, determined from actual site visits, site-specific and regional baseline studies in physical, biological, and socioeconomic domains. The collection of baseline data was designed to satisfy information requirements and focused on relevant aspects that were likely to be affected by the proposed project.

2.6.1 Desktop Study

The following key documents were reviewed: -

- Project Drawings
- Applicable Multilateral Environment Agreements (MEAs).
- Applicable legislation and policies in Kenya.
- Nairobi County Government laws
- Existing documentation on other studies undertaken within the project area.

2.6.2 Project Site Assessment

Field visits were meant for physical inspections of the site characteristics and the environmental status of the surrounding areas to determine the anticipated impacts. Transect walks within the project area were undertaken to collect baseline information for the project area. Observations were made regarding the following:

- Flora;
- Fauna;
- Business enterprises surrounding the project site;
- Characteristics of existing structures surrounding the Project site;
- Existing Social Infrastructure;

2.7 Policy, Legislative, Regulatory and Administrative Framework

The Consultant identified the pertinent policies, regulations and standards - both local and international- governing the environmental quality, health and safety, protection of sensitive areas, land use control at the national and local levels and ecological and socioeconomic issues. The examination of the legislation included the relevant international conventions to which the Kenyan government is a signatory. The consultant assessed the relevant government agencies involved in environmental and social management issues, to ensure that the Environmental and Social

Management Plan (ESMP), will be effectively implemented. The consultant described how the identified legislations, regulations and policies constrain or support the project designs and implementation.

2.8 Stakeholder Engagement and Public Participation

The Consultant carried out stakeholder analysis and prepared a participation plan for the inclusion and consultation with all identified key stakeholders throughout the ESIA process.

Questionnaires were administered within the project area to ensure adequate public participation and stakeholder involvement in the ESIA process. The information gathered was essential in drafting of the baseline information and determining potential project impacts and mitigation measures. Additionally, a key stakeholder consultative meeting was convened. This was done to incorporate the concerns and views of all stakeholders and individuals in the project area. The venue selection was based on the ease of site accessibility.

2.9 Environmental and Social Impact Analysis

The Consultant predicted and assessed the environmental and social benefits and negative impacts of the Project as well as any environmental enhancement that may occur. The assessment distinguished between positive and negative impacts, direct and indirect impacts, and immediate and long-term impacts as well as impacts that are unavoidable or irreversible.

2.9.1 Impacts Prediction and Analysis

When predicting and analysing the impacts, the consultant considered the ***Intensity*** and ***severity*** of the Impacts. Impact prediction was done through: **Checklists**; **Environmental modelling**; **GIS** & **Overlays**; and **Professional judgment**.

2.9.1.1 Intensity of Impacts

Intensity covers all dimensions of the predicted impact on the natural and social environments, namely:

- the nature of the change (which resource or which receiver is allocated and how).
- the spatial extent of the affected area or the part of the population or affected community.
- its temporal extent (duration, frequency, reversibility); and if so,
- the probability of an impact following an accidental or unexpected phenomenon.

Table 2-1: Predicting the intensity of impacts.

Intensity	Impacts
Type	**Direct** - resulting from direct interaction between the project and resource/receiver.
	Indirect -resultant direct interaction between the project and its environment, due to interactions occurring thereafter.
	Armature - impacts from other follow-up activities to the project.
Scope	**Local** - limited impact in the project area and its surroundings.
	Regional - impacts felt beyond the local areas, even in the extended region.
	International - impacts felt at the international level, thus affecting another country.
Duration	**Temporary** - Short-term impacts, on the order of hours to weeks.
	Short-term - impacts predicted to last only during drilling and construction operations (up to about 2 years).
	Medium-term - impacts predicted to last between two years and the end of the project (20 years)

	Long-term - anticipated impacts of a longer duration than the project but which will cease in time.
	Permanent - impacts causing a permanent change on the receiver or the affected resource (s) and extending well beyond the lifetime of the project.
Frequency	**Recurrent**- impacts occurring frequently or continuously
	intermittent- occasional impacts or appearing only in specific circumstances.
	Unlikely- but unlikely event that may take place during the project.
Probability	**Possible** - event likely to occur at some point during the project.
	Likely- the phenomenon will occur during the project (e.g. it is inevitable)

2.9.1.2 Severity of Impacts

The consultant assessed the severity of impacts to provide information on the importance of different impacts of the project. It is important to note that there is no statutory definition of the severity of an impact. Thus, as part of the ESIA, the evaluation of the severity of impacts is based on the Consultant's professional judgments using objective criteria, when available, legal norms, national government policies, regionally recognized good industry practices and opinions of stakeholders.

An impact is **negligible** when a resource/receptor (including people) is assigned in any way by a particular activity or when the intended effect is judged "Imperceptible" or indistinguishable, from natural background.

An impact is **minor** when a resource / receptor is affected, but the intensity of the impact is small enough to remain within the limits of applicable standards (i.e., regulations and guidelines applicable) or in the absence of standards when sensitivity/vulnerability/importance of the resource / receptor is low.

An impact is **moderate** when its intensity remains within the standards but is between a threshold below which the impact is minor and a level likely to be on the verge of a legal offense. For moderate impacts, it should reduce impacts to a level "as low as reasonably practicable" (ALARP). This does not necessarily mean that the so-called impact "moderates" must be reduced to minor impacts, but they are managed efficiently and effectively.

A **major** impact is when the acceptable or allowable standards limits may be exceeded, or high intensity impacts can allocate resources/receptors quality / importance / high sensitivity. One of ESIA's goals is to get to a configuration where the project is not associated with any major residual impact, or any impact that would remain in the long term or a significant extent. However, in some respects, there may be major residual impacts, once all mitigation options (a level as low as reasonably achievable is then applied) have been exhausted. It can be for example the visual impact of an installation. Regulators and stakeholders must then balance these negative factors with respect to the positive aspects such as employment.

The consultant assessed the magnitude and significance of impacts based on the following factors:

- Location or extent: The area/volume covered.
- Timing: Whether immediate or delayed
- Duration: Short-term, long-term, intermittent or continuous
- Reversibility or irreversibility
- Likelihood: Probability of the impact taking place
- Significance: Whether it is local, regional, or global

The consultant used the scale in the table below in the analysis of impacts and quantified them in a scale of 0 – 5.

Table 2-2: Levels of Scale to be used in the Analysis of Impacts

Value	Description	Scale Description
0	No impact	This means that to the best knowledge of the expert, the activity/action will not have any known impact on the environment. Such an impact will not in any way affect the normal functioning of either the human or the natural systems and does not therefore warrant any mitigation.
1	Minimal impact	Any activity with little impact on the environment calls for preventive measures, which are usually inexpensive and manageable. Such activities have minimum impacts on either natural or human environment or both.
2	Moderate impact	A moderate impact will have a localized effect on the environment. If the effect is negative and cumulative, action in form of mitigation measures needs to be put in place to ensure that it doesn't become permanent and /or irreversible.
3	High impact	An impact is high if it affects a relatively large area (spatial), several biological resources (severity) and/or the effect is felt for a relatively long period (temporal) e.g. more than one year. In case the effect is negative, such an impact needs to be given timely consideration and proper mitigation measures put in place to prevent further direct, indirect, or cumulative adverse effects.
4	Very high impacts	Such an activity rates highly in all aspects used in the scale i.e., temporal, spatial and severity. If negative, it is expected to affect a huge population of plants and animals, biodiversity in general and a large area of the geophysical environment, usually having trans-boundary consequences. Urgent and specialized mitigation measures are needed. It is the experts' opinion that any project with very high negative impacts MUST be suspended until sufficient effective mitigation measures are put in place.
5	Not known	There are activities for which impacts are not yet known e.g. some chemicals are suspected to produce carcinogenic effects, but this has not yet been confirmed.

2.9.2 Occupational Health and Safety Concerns

The ESIA Consultant analyzed and described the potential occupational health and safety concerns that are associated with the proposed project construction and operation activities. The Consultant further made recommendations on both preventive and corrective or remedial measures to be implemented under the environmental management plan.

2.9.3 Analysis of Alternatives

The Consultant systematically compared feasible alternatives to the proposed project site, technology, design, and operation including the "without project" situation in terms of their potential environmental and social impacts; the feasibility of mitigating these impacts; their capital and recurrent costs; their suitability under local conditions; and their institutional, training, and monitoring requirements. After the analysis, the Consultant recommended the preferred alternative and stated why it was chosen.

2.9.4 Preparation of an Environmental and Social Management Plan

During the ESMP preparation, the consultant presented the mitigation measures that will need to be implemented by the proponent/contractor to prevent or reduce significant negative impacts to acceptable levels. The ESMP has highlighted recommendations for actions and procedures for their implementation in the short and long term, and the cost of their implementation.

2.9.5 Preparation of an Environmental and Social Monitoring Plan

The consultant has developed a monitoring plan with a characteristic description of all project impacts that can be quantitatively or qualitatively monitored including technical details, of monitoring measures for the ESMP, including the parameters to be measured, methods to be used, sampling locations and frequency of measurements.

3 PROJECT DESCRIPTION

3.1 Introduction

This chapter gives a detailed description of the proposed project. It starts by a highlight of the project background before describing the project location and site accessibility. A review of the proposed drawings explaining various floor plans are discussed with architectural maps illustrations in the (Annex 4)

3.2 Site Location

The Proposed project site is located on Plot No. L.R 9042/300 within Jomo Kenyatta International Airport, Embakasi Sub County Nairobi County and within the following GPS Co-ordinates: 1°20'23.8"S 36°54'48.7"E; 1°20'22.8"S 36°54'50.4"E and 1°20'26.1"S 36°54'50.2"E. The proposed project site is occupied by bushes, grass and approximately 10 Acacia trees. The land earmarked for the project is Approximately 1.2 Acres.

Figure 3-1 Google Earth Image of the proposed Project site

3.3 Project Components

The Proponent -Esiway Investments Limited- a Kenyan registered company *(Annex 2 KRA PIN and Annex 1 – Certificate of Incorporation)* intends to develop the land into a Four-Star Airport Hotel with 233 guest rooms and other support facilities. The development will entail the following facilities:

- 233 hotel guest rooms
- Basement car parking
- Lobby Lounge and bar
- Retail Shop
- Restaurant and bar
- Meeting and Board rooms
- Conference rooms
- Gym
- Spa Treatment rooms
- Kids club indoor and outdoor
- Courtyard
- Swimming pool

The development proposes to accommodate guest rooms in varying options and typologies as listed shown below;

Typology		Quantity			No. of Keys | Provisional	Total		Size/Rm		No of Bays	
Guest Room:	Standard Rooms Type 01	78	No.		1	78	no	24.7	Sqm	1.0	78.0
	Standard Rooms Type 02	54	No.			54	no	24.7	Sqm	1.0	54.0
	Superior Rooms	64	No.			64	no	27.1	Sqm	1.1	70.1
	Accessible Rooms	3	No.			3	no	27.1	Sqm	1.1	3.3
	Suite Type 01	10	No.	233 No		10	no	62.5	Sqm	2.5	25.3
	Suite Type 02	10	No.			10	no	53.0	Sqm	2.1	21.4
	Suite Type 03	2	No.			2	no	60.5	Sqm	2.4	4.9
	Suite Type 04	6	No.			6	no	24.7	Sqm	1.0	6.0
	Suite Type 05	2	No.			2	no	25.5	Sqm	1.0	2.1
	Suite Type 06	4	No.			4	no	25.5	Sqm	1.0	4.1
				233	no	233	no				269.1 Bays

The development further allows for the construction of support spaces - Public Areas, Back of House, Parking all on G+4no Levels as below:

			Rooms Qnty		GFA/ Floor	
Basement	accomodating	Parking, Driveways and Plant Rooms	-	no	4,509	Sqm
Ground Floor	accomodating	Back of House, Front of House and Public Areas	-	no	2,851	Sqm
1st Floor	accomodating	Guest Rooms	35	no	2,815	Sqm
2nd Floor	accomodating	Guest Rooms	48	no	2,235	Sqm
3rd Floor	accomodating	Guest Rooms	50	no	2,235	Sqm
4th Floor	accomodating	Guest Rooms	50	no	2,235	Sqm
5th Floor	accomodating	Guest Rooms	50	no	2,235	Sqm
			233	no	19,115	Sqm

Figure 3-2 Typology and distribution of the rooms

The proposed project drawings detailing the facilities within the proposed Four-Star Airport Hotel are attached as ***Annex 4.***

3.4 Project Design

In terms of site planning, the project design team has ensured maximum utilization of the plot with consideration of the best land usage, in the most efficient way to layout the hotel rooms to achieve the maximum number of rooms possible and most importantly the best spacial quality for the hotel.

In order to achieve efficiency, the design team developed a grid that will provide the guiding principle for the development. Not only does this grid organize the car parking and driveways in the basement but also allows the hotel rooms and suites to be laid out efficiently within this grid.

A separation wall is proposed to act as a noise and fire barrier, but most importantly creates a courtyard of 33 x 31 metres, the sanctum of the hotel.

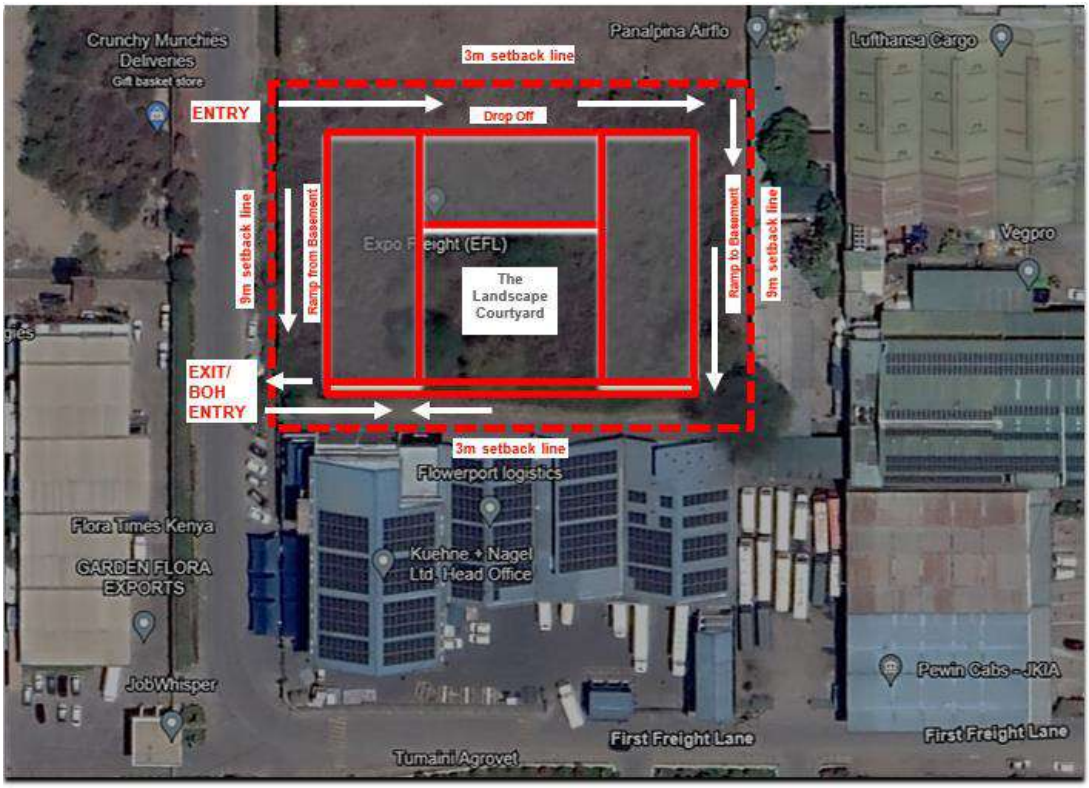

Figure 3-3 Proposed entry, exit points and traffic flow of the proposed development.

Figure 3-4 Section layout of the proposed development

Figure 3-5 Ground Floor Schematic Plan

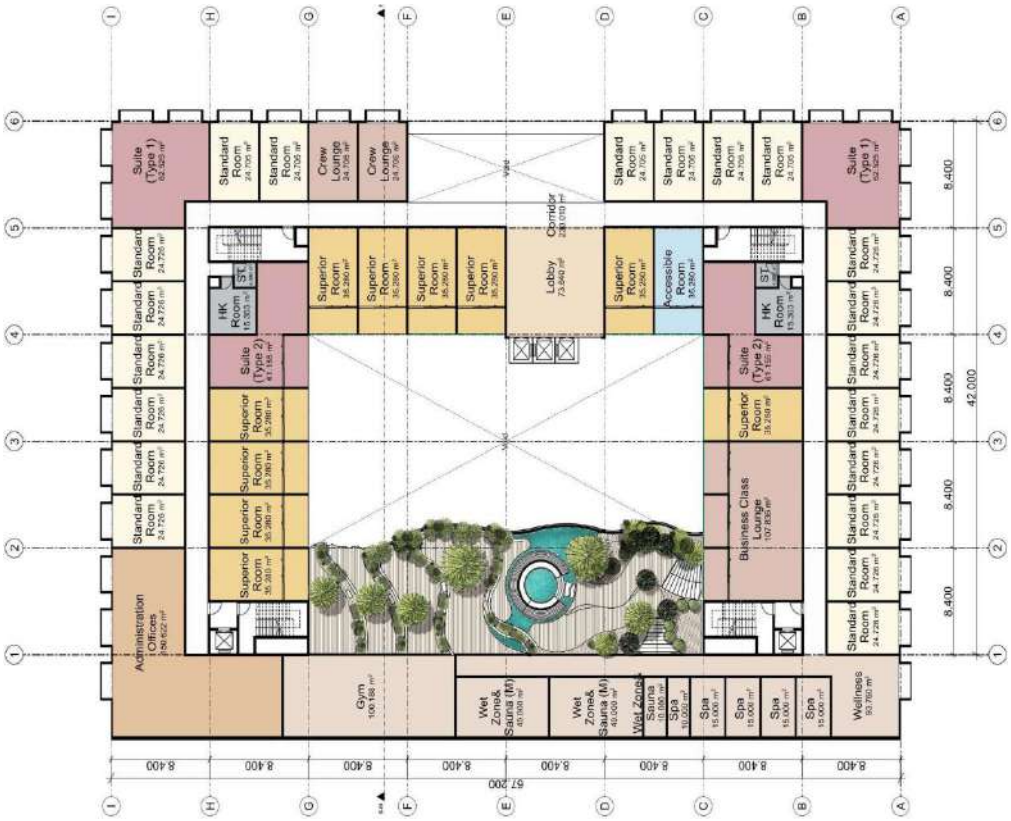

Figure 3-6 1st Floor Schematic Plan

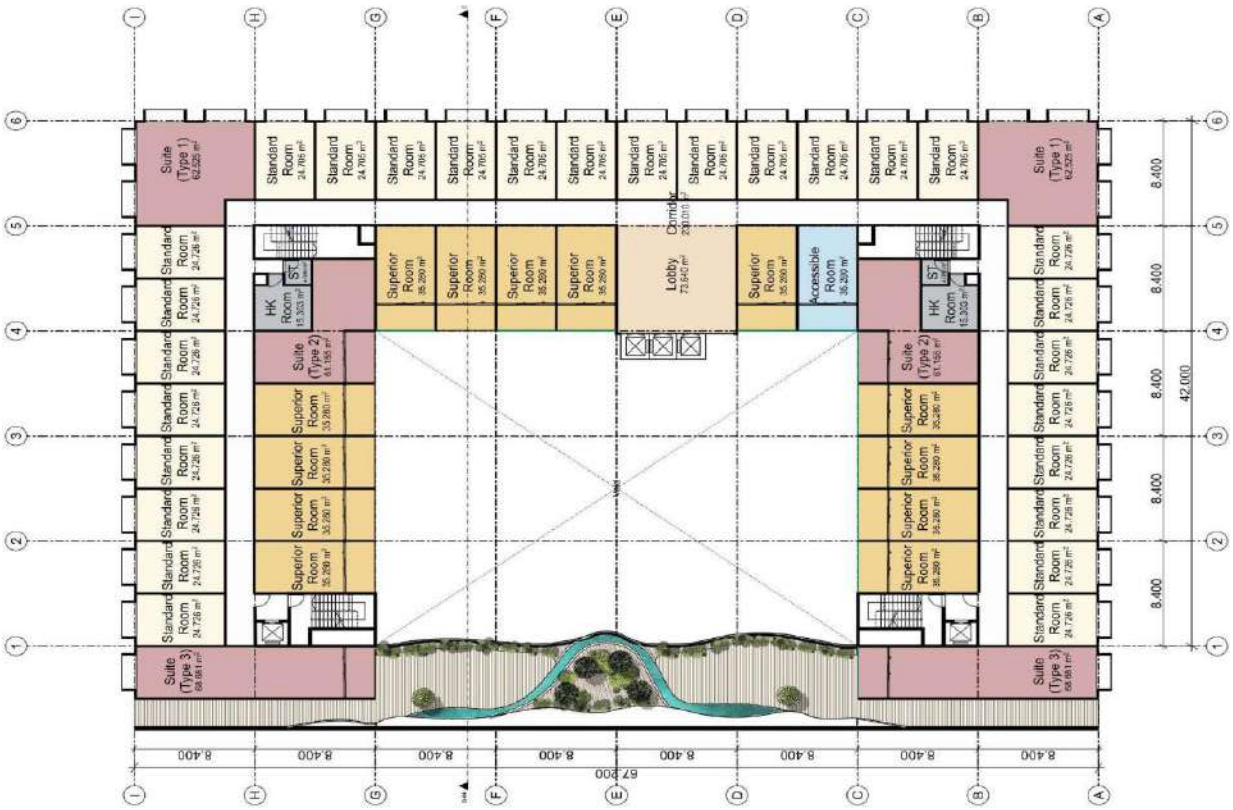

***Figure 3-7* 2nd Floor Schematic Plan**

3.5 Project Site accessibility

The project is easily accessible to:

- Nairobi CBD and other parts of Nairobi through Nairobi Expressway Road and Mombasa Road.
- The Standard Gauge Railway at Syokimau
- Jomo Kenyatta International Airport.

3.6 Project Activities

3.6.1 Key project activities during the construction phase

The Key Construction Works will include:

a) Site Preparation works

The proposed project site will be prepared for construction. This will involve clearing of vegetation, excavation works and transportation of construction materials. This will be undertaken in a phased approach to mitigate soil erosion and the impacts of excessive dust generation. Hoarding all-round the site shall be done before the commencement of any works The construction will involve the use of heavy earth-moving machinery such as excavators and bulldozers. The engineers will also utilize human labour where feasibly possible to create employment opportunities for the youth.

b) Excavation and Earthworks;

Excavation shall be done using backhoes for removing top clay soil and jackhammers for areas with hard rock. Blasting activities are strictly prohibited. The excavated clay soil will be transported off-site, while any excavated rock material will be reused for backfilling on-site and off-site in the event of an excess, to ensure efficient excavation while minimizing environmental impact and adhering to safety regulations.

c) Storage of materials

Temporary stores for building materials will be erected on-site during the construction phase. Bulky materials such as stones, ballast, sand and steel will be carefully piled at designated areas on site. To avoid piling large quantities of materials on site, the proponent will order bulky materials such as sand, gravel and stones in quotas.

d) Masonry, concrete work and related activities

The construction of the building walls, foundations, floors, pavements, drainage systems, and parking among other components of the project involves a lot of masonry work, laying of plumbing and related activities. General masonry and related activities include 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.

e) Structural steel works

Structural steel shall be used for the top-pitched roof and also for entrance canopy construction. The building will be reinforced with structural steel for stability. Structural steelworks involve steel cutting, welding and erection.

f) Roofing

A reinforced Concrete flat roof will be constructed to the Engineers detail. The rooftop will entail a Nippon paint floor Pro cool coating to the Engineer's specification and comprise of solar panels on 100 X 100mm. A Square Hollow Section galvanized mild steel beam and post Nippon enamel steel paint will be used to the specifications of the engineer. No reflective materials shall be used.

g) Electrical Installations

Electrical work during the construction of the premises will include the installation of electrical gadgets and appliances including electrical cables, lighting apparatus, sockets, Lifts, security installations and ICT Installations. In addition, there will be other activities involving the use of electricity such as welding and metal cutting.

For the electrical power supply of all electrical circuits and loads of the development, a private substation (transformer & generator sets) shall be installed with a medium/low voltage rating of 11 Kv / 415 V. ups system to be installed for critical loads. Given the size and topography of the building, bus bars will be used for the low-voltage distribution. The supplies from main distribution Board shall feed a submain distribution board at each level (via bus bar). From the submain distribution board departs the feeder cables to the distribution boards (via cables). At the main distribution board, the Moulded Case Circuit Breaker shall have an electronic unit and for the motors (firefighting booster set, etc.) they shall have Moulded Case Circuit Breaker suitable for motors. Earthing and lightning installation shall be provided for the building and substation. Electrical installation shall comply with national regulations and international standards.

h) Plumbing Activities

Installation of pipework will be done while doing plumbing works and drainage and Sanitary fittings to connect sewage from the hotel to a sewer system. The water supply service shall contain the following systems and equipment for the distribution and treatment of cold and hot water, the production of hot water and its recirculation:

- Booster set and water tanks (used for both water supply and firefighting).
- Solar system and hydro boxes connected to the variable refrigerant flow (VRF) heat recovery units for the production of domestic hot water.
- Hot water storage tanks.
- Water treatment systems.
- Cold, hot and recirculated hot water manifolds and piping networks.

Hot water production will be provided by the solar panels on the roof and heat recovery from the VRF systems.

Water Piping Materials: The main domestic cold and hot water piping network shall be made using 3rd generation, polypropylene pipes with a working pressure rating of SDR7,4MF. The heating hot water network from the boilers, up to the calorifiers shall be constructed with the same polypropylene pipes. Plumbing installation shall comply with national regulations and international standards.

i) Mechanical Installations

Mechanical installations shall include: Water supply and irrigation, connection of fire systems to the water source, installation of spa equipment and drilling of a borehole on site. The proponent will also install mechanical Ventilation systems (HVAC), Liquified Petroleum Gas and Kitchen Equipment.

Communication facilities and systems/ ICT Infrastructure; ICT systems of the hotel will consist of main server room and cable system as per client's requirements. Connection from the telephone provider will be terminated in a dedicated room at the basement.

Air conditioning and refrigeration equipment: *VRF* systems with heat recovery will be used for areas air-conditioning and Domestic Hot Water production. Also, ventilation units with heat recovery systems will be installed where applicable (Front of House areas). Dedicated ventilation systems will be installed for use in kitchen areas, waste collection System and basement parking.

j) Traffic Management

To ensure the protection of motorists, pedestrians and cyclists, the proponent will employ Traffic marshals to ensure the proposed development construction activities do not bring traffic snarl-ups around the proposed project site. A detailed Traffic Impact Assessment has also been done to address traffic related issues.

3.6.2 Key project activities during the operation phase

a) The facility users

The Proposed Four-Star Airport Hotel, when completed will target both local and foreign visitors visiting Kenya or Nairobi. The targeted occupancy is 233 hotel room units.

b) Electrical System

The proposed facility will be connected to the Kenya Power Limited Company (KPLC) electricity main line which will be used in all phases of the project. The necessary guidelines and precautionary measures relating to the use of electricity shall be adhered to.

c) Water Reticulation System

Water from the Nairobi City Water and Sewerage Company (NCWSC) supplemented with water from the hotel Borehole will be used during the construction and operation phases of the project.

d) Solid waste Management

In terms of operational waste, spaces will be provided on-site for separation of waste; and recycling bins will be clearly labelled for use by the staff and guests. Paper and cardboard, plastic, metal and cans, glass bottles, and food waste will all be separated during operations. The proponent will contract a NEMA-licensed waste transporter company to handle all wastes on the basis that they will collect the separated waste in trucks that maintain separation, and that will have an extensive sorting site. The proponent will also develop a solid waste management plan to ensure that the volume of solid waste generated within the entire facility is minimized through the principles of reduce, re-use and recycle.

e) Sewerage System/Liquid Waste Management

The proposed development will be connected to Nairobi County Public Sewer System. The sewage service shall contain the following systems and equipment:

- Wastewater (rooms and public washrooms) and ventilation piping network.
- Grease traps/separator system for kitchen waste.
- Sewage pumping station (for basement facilities).
- Oil interceptor with lifting station for basement parking drainage.

Sewage water will be collected and routed to the connection manhole of municipal sewage.

f) General Repairs and Maintenance

The proposed hotel and support facilities will be repaired and maintained regularly during the operational phase of the project. Such activities will include the repair of building walls and floors, repair and maintenance of electrical gadgets, painting and replacement of worn-out materials among others.

g) Storm Water Drainage System

The client will apply soil erosion control measures such as leveling of the project site to reduce run-off velocity and increase the infiltration of stormwater into the soil. A stormwater drainage infrastructure is recommended for the facility. In select areas, a dedicated manhole and stormwater drainage connections will be provided to serve the facility.

h) Fire Fighting

The firefighting system shall consist of a fire alarm, water tank, hose water reel systems along the staircases and corridors. Portable fire extinguishers will also be provided within the development. The portable fire extinguishers are of two types, one for normal fires and one for electric fires. As part of fire safety systems in place, the proposed development will have fire-resistant doors and fire escape staircases of one hour fire resistance, with automatic door closers. It is recommended that the developer also provide fire instructions, fire exit signs, fire action plan and well-labelled fire assembly points in the development.

The proposed development will have one electrical and one diesel main fire pumps that are UL listed and/or FM approved for automatic sprinkler system as well as manual intervention of local fire department. Fire pumps shall be fed by dedicated fire water tanks located underground of the building. Diesel generators located outside of the building (carpark) shall supply fire & life safety systems such as fire pumps, sump pumps, pressurization system fans, fire alarm and notification system devices as well as emergency lighting system.

i) Emergency and Disaster Preparedness

The contractor and proponent have endeavored to provide a safe environment which is required of any investment through internal policies and protocols, risk mitigation strategies, creating direct links with the relevant civic authorities (including the JKIA police, NEMA, fire department and the nearby Port health facility), and establishing contracts with professional private contractors able to respond to emergency situations.

In addition, adequate backup to critical power, water, fire-fighting and telecommunications systems is required in the event of accidents or damage. In case of an emergency relating to fire, spill of materials, theft or major injury the EIA team recommends Emergency telephone numbers to the nearest fire station, JKIA Police unit, and Health facility are strategically displayed.

j) Security systems

The proponent will put in place the following measures to guarantee security within the proposed development;

- Hostile Vehicle Mitigation bollards, gatehouse, and lockdown gates at road entrance and exits into site.
- Boundary walls with electric fencing top guard and perimeter CCT.

- Walkthrough metal detectors and x-ray luggage/baggage screening at all entrance points into the main hotel building.
- Lockdown shutters at basement parking entrance and exits.
- CCTV coverage of all entry/exit points into the, public areas, guest floors and critical assets.
- Motion detection CCTV monitoring staircase access to guest floors and other critical asset areas.
- Duress alarms and lockdown alarms at reception and main access into the hotel.
- Separate CCTV security control room and security employee/contractors entrance office.

3.7 Description of the Project's Decommissioning Activities

a) Demolition Works

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

b) Dismantling of Equipment and Fixtures

All equipment including electrical installations, furniture, finishing fixtures partitions, pipework and sinks among others will be carefully dismantled and removed from the site on decommissioning of the project. Priority will be given to the reuse of this equipment in other projects. This will be achieved through the 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 topsoil and vegetation.

3.8 Green-Building Technologies

The Proponent will put in place the following Waste Management, Energy and Water conservation technologies to ensure sustainability of the hotel:

a) Water Conservation System; The development will make use of low flow water-saving Water Conditioning System and brassware. Photocells shall be used for wash hand basin mixers and urinals flushing.

b) Waste Recycling and Recovery System; In terms of operational waste, spaces will be provided on site for separation of waste; and recycling bins will be clearly labeled for use by the staff and guests. Paper and cardboard, plastic, metal and cans, glass bottles, and food waste will all be separated during operations. The appointed waste collection company will be awarded a contract on the basis that they collect the separated waste in trucks that maintain separation, and they have an extensive sorting site.

c) Energy Conservation: The proponent will put in place the following measures in a bid to reduce energy consumption:

- Solar panels and variable refrigerant flow systems with heat recovery will be used for domestic hot water production.
- LED lighting and lighting controls will be installed for low energy consumption.
- A building Management System for Mechanical, Electrical and Plumping systems monitoring and operation optimization will be installed.

d) Use of Renewable Materials: The proposed development will in cooperate the use of the following renewable materials:

- Organic fabrics
- Bamboo
- Sustainable wood
- Cork
- Reclaimed materials
- Stone

e) Facilities for the aged and disabled persons: The proposed hotel design is user-friendly and accessible to all persons. The hotel has provided for 3 accessible rooms among the 233 proposed hotel rooms.

f) Smoking facilities/ areas: Designated external smoking areas shall be provided.

g) Use of local materials: Majority of the building will be built from locally available materials, with the exception of fixtures, furniture, and equipment.

3.9 Materials to be Used, Products and By-products

a) Materials to be used/ Inputs

The materials to be used in the project include:

- Construction raw materials: i.e. sand, cement, stones, crushed rock (gravel/ ballast), ceramic tiles and other ceramic fittings, parquet, clay vent blocks, steel and wooden fixtures and fittings (such as doors and windows), glass, steel metals, timber, painting materials among others. All these should be obtained from licensed dealers and especially those that have complied with the environmental management guidelines and policies.
- Construction machines: including machinery such as trucks, concrete mixers, tools and other construction equipment.
- A construction labour force: of both skilled and non-skilled workers. These will require services such as, water supply and sanitation facilities.
- Large volumes of water for construction purposes: It will be supplied NCWSC and Supplemented by a borehole.
- Power will be sourced from the main KPLC grid.

b) Expected Waste

i. **Construction Waste**: paper, polythene, metal shavings, cement, concrete, welding particles, plastics, sand, grey water, adhesives, paints, soil, plants, cloth, rubber.

ii. **Air Emissions** from vehicle engines and burning and friction operations (CO_2 and SO_x). Oil and fuel spills from vehicles and storage of oil and fuel. Dust from the movement of vehicles and excavation activities.

iii. **Sewerage and domestic/Municipal waste;** emanate from sanitary systems and wastewater generated from construction activities and make their way to drainage systems or possible lines.

c) Output

The output will be a 233-key hotel with support facilities such as a restaurant, swimming pool, spa, kids club, meeting rooms, business lounge and Basement and ground floor parking.

3.10 The Proof of land ownership

Esiway Investments owns the parcel of land on Reference No. 9042/300. The land ownership document has been attached as *Annex 3.*

3.11 Project Cost

The project is anticipated to be undertaken within Three (3) years at a cost of approximately ***One Billion One Hundred and Forty-Six Million Nine Hundred and Fifty-Nine Thousand One Hundred and Forty-Eight Kenya shillings*** (**Kshs. 1, 146,959,148.00/=**). The Bill of Quantity document detailing a breakdown of the project costs is attached as *Annex 13.*

4 BASELINE INFORMATION OF THE STUDY AREA

4.1 Introduction

This chapter describes the current environmental baseline setting around the proposed project site. The information presented here has been obtained from primary and secondary sources. The chapter commences with a highlight of the character of the surrounding. The detailed baseline survey on physical environment, biological environment and, socio-cultural and economic environment are discussed in this chapter.

Jomo Kenyatta International Airport (JKIA) serves as a hub for most airlines' operations in the Eastern Africa region. Jomo Kenyatta International started as an airstrip in the 1950s named Embakasi Airport and mainly handled domestic flights. Between 1962 to 1978, it was renamed Nairobi International Airport. The airport underwent major expansion in the 1980s under the leadership of President Daniel Moi, including construction of new terminals and runways. It was renamed Jomo Kenyatta International in 1978 after Kenya's first president. Today it continues to undergo periodic upgrades of facilities, with the latest Phase 1 of the Greenfield Terminal launched in 2019. This increased the airport's capacity from 2.5 million to 7.5 million passengers annually.

4.2 Project Location

The proposed Four-Star Radisson Airport Hotel project by Esiway Investments Limited is situated on Plot No. L.R 9042/300 along the first freight lane within Jomo Kenyatta International Airport, Nairobi County, Kenya. The project site lies within the following GPS Co-ordinates: 1°20'23.8"S 36°54'48.7"E; 1°20'22.8"S 36°54'50.4"E and 1°20'26.1"S 36°54'50.2"E. The land earmarked for the project is Approximately 1.2 Acres. The proposed project area is a piece of land occupied by bushes, overgrown grass and approximately 10 Acacia trees. The project site is located in the Embakasi suburb 18 kilometres Southeast of Nairobi's Central Business District and is easily accessible further enhancing its strategic location for both local and international guests.

Plate 4-1 A view of the proposed project site

4.3 Project Surrounding

The proposed project is located within a specialised freight area and along First Freight Lane within Jomo Kenyatta International Airport. The proposed project area is occupied by various business enterprises such as: Kuehne + Nagel Limited to the western side, VegPro Limited to the Southern part, Engineering Development warehouse to the Eastern side and Nzoia Freight abandoned site to the Northern Side. The project site is further surrounded by the following business enterprises Siginon Global Logistics Limited: Black Tulip Business Support Limited; Garden Freight Logistics Limited and Acceler Global Logistics Limited within a 500m radius.

There also exists similar developments such as Crown Plaza Nairobi Airport Hotel located approximately 150m west of the proposed project site and Four Points by Sheraton Airport Hotel located approximately 250m south of the project site. Buildings within Jomo Kenyatta International Airport have a height level ranging from Two to Five levels.

Plate 4-2 A view of the project surrounding

4.4 Administrative Setting

The airport is a public utility operated by Kenya Airports Authority (KAA) and it serves Nairobi Metropolitan Region. The proposed project will be located within JKIA grounds in Embakasi location within Embakasi sub-county. It is sandwiched to the south by Katani and Mlolongo locations in Athi River sub-county, to the East and North by Mihang'o location in Embakasi sub-county and, Githunguri location in Athi River sub-county and to the West Embakasi and Mukuru Kwa Njenga locations Nairobi East sub-county. Politically, JKIA entirely falls within Embakasi South (Embakasi and Mukuru Kwa Njenga locations) and Embakasi East constituencies.

Jomo Kenyatta International Airport (JKIA) is currently owned and administered by the Kenya Airports Authority (KAA) - a State Corporation that oversees the operation and management of all international airports in Kenya. As the country's largest airport, JKIA is a key strategic asset for KAA and the Kenyan government.

4.5 Physical Environment

4.5.1 General Climate

Nairobi, the capital city of Kenya, is situated at a high altitude, and its climate is influenced by its elevation and proximity to the equator. The climate within JKIA identifies with that of the greater Nairobi region; a tropical city located about 140km south of the equator and approximately 500km west of the Indian Ocean coast. The area is characterized by a semi-humid climate that is highly

influenced by semi-aridity on the east (towards the Machakos) and southern (towards Kajiado) directions.

4.5.1.1 Average Daily Temperatures

The average daily temperature throughout the year varies slightly from month to month with average temperatures of around 17^0C during the months of July and August to about 20^0C in March. But the daily range is much higher, with the differences between maximum and minimum temperatures each day around 10 degrees in May and up to 15 degrees in February.

The minimum temperatures also remain low during cloudy nights, usually hovering around 8 degrees Celsius and sometimes even reaching 6 degrees Celsius. Clear skies in January and February also bring colder nights.

4.5.1.2 Average Humidity Values

Because of Nairobi's location just south of the equator in combination with humid air pumped in from the Indian Ocean, the humidity values for each day are generally on the higher end**.** This is not to say that values are always high since the Easterly winds coming off the Indian Ocean tend to keep the temperatures standard throughout the country; therefore the "warm sticky" feeling is usually not associated with Nairobi. In the months of January to April, relative humidity values have been known to plummet to anywhere from 10% to 20%. The typical day, humidity-wise, starts with nearly saturated in the morning hours and steadily decreases throughout the remainder of the day. The average annual percentage of humidity in Nairobi city is 72%. May is the most humid month while February is the least humid month. The figure below represents the average relative humidity level of Nairobi city.

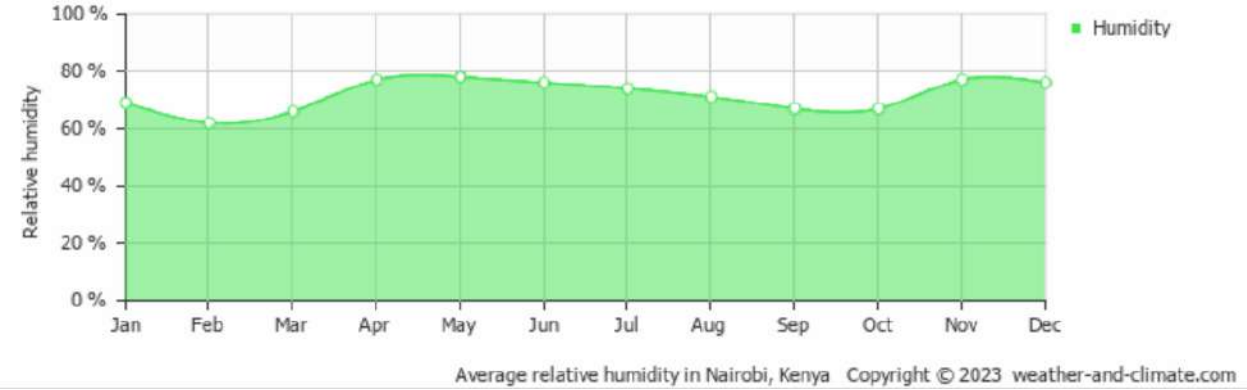

Figure 4-1 Average relative humidity in Nairobi. (Source: weather and climate.com)

4.5.1.3 Average Rainfall Amounts

With these routinely high relative humidity figures, it is not surprising that the Nairobi climate produces much rain annually. In fact, from the past 50 years, the expected amount of rain could be anywhere in the range of 500 to 1500 mm, with the average ranging in at 900 mm. The majority of these rainfall figures crash down in Nairobi in one major and one minor monsoon seasons respectively.

The major monsoon season occurs between March to May and is called the "Long Rains" by the locals. The minor monsoon seasons emerge within the October to December Months and is called the "Short Rains" by the Nairobi citizens. That is what the meteorologists as a whole know about the monsoon seasons. What they do not know is exactly when these seasons will start. There is usually not an indication of when these rainy seasons will start, since it is difficult to determine when one starts and

when the other finishes. Consequently, one may think there is only one rainy season when looking at the annual rainfall amounts.

April marked the peak of the Long Rains (March-April-May) season over most parts of the country. This rainfall was near to above average over the whole country except over Voi Meteorological station where below-average rainfall was recorded. By 26th April, the highest monthly rainfall total (767.9mm) was recorded in Miad Kandongu rainfall station in Kirinyaga county, followed by Kabete Meteorological station with 623.9mm.

4.5.1.4 Average Winds

Winds along the surface are predominantly easterly throughout the entire year. They are shifted to the Northeast between October and April, and they are shifted Southeast between May and September. Right before the "Long Rains" season, the strongest winds occur, reaching speeds of 20 to 25 miles per hour. During the rest of the year, winds are usually at speeds of 10 to 15 miles per hour. During the night, the winds are calm.

The figure below shows the average wind speed in Nairobi;

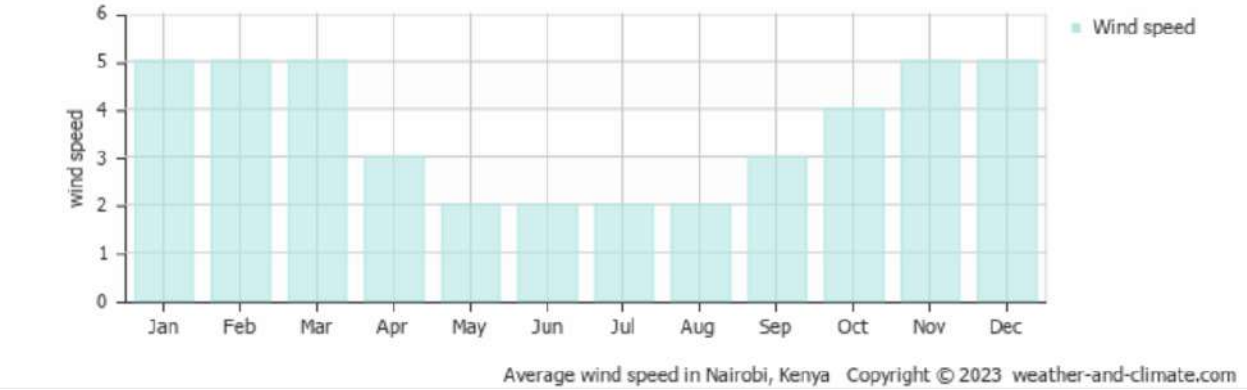

Figure 4-2 Average wind speed in Nairobi

4.5.1.5 Average Sunshine

Early mornings in Nairobi are often cloudy, but the sun peeks through by mid-morning. Throughout the year, there is an average of seven hours of sunshine per day. Thirty percent more sunlight reaches the ground during the afternoon than in the morning. Of course, there is more sunshine during the summer months, when the sun is more overhead in the southern hemisphere. Infrequently during the rainy season, the sun never shows through the clouds. Even in August, the cloudiest month, there is an average of four hours of sunshine.

4.5.2 Topography and Drainage

Nairobi lies at an average altitude of 1,680m above sea level, but this height ranges from 1500m (to the East) to 2300m (to the West). It is located at longitude 36° 50'East and latitude 1° 18' South about 140 km South of the Equator and situated at an elevation of about 5,500 feet above sea level, placing its high effect for the cooler air to keep its temperatures moderate.

Jomo Kenyatta International Airport (JKIA) is situated within the low-lying plains to the southeast of Nairobi City. This region is strongly influenced by the topography of the Athi Plains spanning across Machakos and Kajiado counties. The airport area itself consists of mild undulating and relatively flat terrain, sloping gently downwards in a south-easterly direction.

The overall drainage pattern is determined by the greater Athi River basin. There are no major permanent surface water formations in the immediate vicinity. The typical altitude ranges from around 1,500 meters near Athi River, located approximately 8 km to the southeast of JKIA, up to 1,800 meters further west towards the Ngong Hills where fault lines have created slightly more varied relief.

The landscapes around JKIA comprise open grassland savanna and scattered small farms. Soil types tend towards well-drained, sandy loams interspersed with patches of darker cracking clay. Although the natural environment has been modified substantially by airport infrastructure, sections of indigenous vegetation remain, while seasonal streams thread across parts of this topography during Kenya's rainy seasons before evaporating in the dry months. There are no natural permanent surface water bodies in the immediate neighborhoods. Due to the relatively flat terrain of JKIA, the project area is susceptible to flooding in scenarios of heavy rains similar to the ones currently experienced in the country.

4.5.3 Soils and Geology

The soils in Nairobi County are products of weathering of mainly volcanic rocks. This weathering has produced red soils of more than 50 feet in thickness. Various subdivisions are recognized in Nairobi according to the drainage, climatic regions and slopes. Particularly soils found at the project site area are defined as black clay or black cotton soils characteristically having high to extreme plasticity. The rocks in the Nairobi area mainly comprise of a succession of lavas and Pyroclastic of the Cainozoic age and overlying the foundation of folded Precambrian schists and gneisses of the Mozambique belt. The crystalline rocks are rarely exposed but occasionally fragments and found as agglomerates derived from the former Ngong volcano. Weathering has produced red soils that reach more than 15m in thickness in some parts of Nairobi.

The project area is mainly underlain by volcanic rocks, tuff and metamorphic rocks. The area is characterized with the Nairobi phonolite separated from the underlying Mbagathi phonolite trachyte's by some thickness of a few feet of dark grey tuff, which belongs to the Athi Tuffs and Lake Beds Series. The soils around the JKIA airport are black clays referred to as black cotton soils described as being high to extremely high plasticity clays, silty clays or silty clays with sand.

The map below represents the geology of Nairobi city.

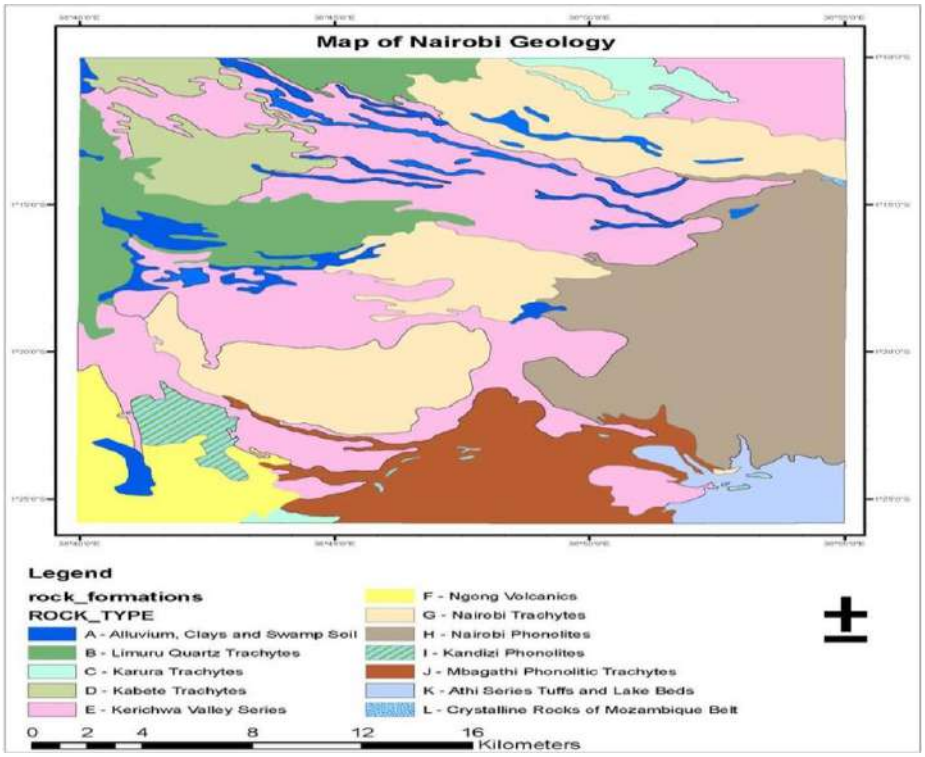

Figure 4-3 Map of Nairobi city geology

4.5.4 Water Resources

Due to a lack of natural surface freshwater bodies in the immediate JKIA vicinity, the airport depends on municipal water supplies from Nairobi City alongside groundwater extraction. The Nairobi Water and Sewerage Company (NWSC) provides the main domestic water lines to the airport from the city along the Outer Ring Road via a 200mm diameter pipeline. This links to storage tanks with 8,300 cubic meter capacity within JKIA's infrastructure network.

In addition, JKIA operates seven drilled boreholes scattered around the airport grounds tapping into the underlying aquifers. Combined, these locally abstracted groundwater sources supplement piped municipal supplies, contributing to JKIA's overall water security and providing backup during periodic city water shortages.

The boreholes tap localized shallow aquifers containing fresh groundwater lenses floating above deeper saline layers. Yield and water quality from these varies - while some produce potable supplies, higher salinity in certain wells restricts use to non-potable applications like landscaping irrigation. Monitoring and governance of sustainable yields from the airport's borehole fields remains an ongoing imperative to manage this valuable groundwater resource over the longer term.

4.5.5 Land Use Planning and Zoning

The land occupied by JKIA itself remains fully government-owned, under the jurisdiction of the Kenya Airports Authority (KAA). However, the surrounding neighborhoods have undergone extensive changes in land tenure and usage over recent decades. Initially consisting of large group-owned ranch properties like Syokimau, Katani and Githunguri focused on livestock rearing, these rangelands have gradually given way to intensified subdivision and development. Through the process of demarcation, communal ranch lands were apportioned out to individual members, who incrementally sold off plots for private residential and commercial building construction.

This land privatization and sale for real estate has rapidly converted the previous ranching landscape into clustered high-density housing estates, retail parks, warehouses and light industrial plants. Enabled by infrastructure expansion like roads leading to JKIA, virtually all adjoining land has transitioned from expansive grazing uses into mixed residential-industrial neighbourhoods accommodating Nairobi's sprawl. Planning policies strive to retain open spaces and impose zoning restrictions. However, the area remains characterized by intense, often unregulated small-scale building activity on tightly subdivided plots. These changes in land tenure and usage patterns right up to the airport perimeter continue shaping a built landscape that bears ever less resemblance to its recent ranching past.

Land use around the JKIA ranges from residential settlements to industrial and commercial establishments. Jomo Kenyatta International Airport is currently under Zone 20 of the Nairobi Zone Guide. The zone allows for Special/strategic facilities and developments whose boundaries need to be clearly defined.

The proposed project site parcel of land L.R. No. 9043/300 lies within the Specialized freight Area at the Jomo Kenyatta International Airport (JKIA). The land is owned by Esiway Investments Limited whose Title deed is attached as *Annex 3*. The client has obtained necessary approvals from Kenya Airports Authority to develop the land, Kenya Civil Aviation Authority on height Approval and change of use from Light Industrial activities to development of a Hotel by Nairobi City County.

4.5.6 Air Quality

Emissions within JKIA are associated with aircrafts (that accounts for 98% of the total CO2 generated) dependent on among other factors fuel type, aircraft type, engine type, load and flying altitude. The main source from the operations is experienced during the landing and take-off events that are within the 1,000m above ground level, taxing-in, taxing-out, climb-out and approaching landing. Recent air quality assessments conducted at JKIA have shown compliance with national and international air quality standards (Ministry of Environment and Forestry, Kenya, 2020). Air quality monitoring programs are conducted at JKIA to assess the concentration of air pollutants such as particulate matter (PM10, PM2.5), nitrogen dioxide (NO2), sulfur dioxide (SO2), carbon monoxide (CO), and volatile organic compounds (VOCs) in the ambient air. These pollutants originate from aircraft emissions, ground support equipment, vehicular traffic, and industrial activities within the airport premises.

Data from air quality monitoring stations located at strategic locations within and around JKIA provide real-time measurements of air pollutant levels, enabling authorities to evaluate compliance with air quality standards and identify potential sources of pollution. Comprehensive air quality assessments include dispersion modelling, source apportionment studies, and health risk assessments to quantify the impact of air pollution on human health, ecosystems, and sensitive receptors.

A baseline ambient air quality measurement was conducted on ***5th March 2024.*** The objective of the assignment was to determine the concentration levels of gaseous and particulate matter pollutants of concern within the boundary of the premises. The scope of the measurement survey involved air quality sampling at four monitoring stations that collected 60-minute air samples at 1-minute intervals. The Short-term concentration for the ambient air pollutants of concern were compared with ***the Environmental Management and Coordination Act (EMCA) Air Quality regulations, 2014*** and the ***World Health Organization (AAQG, 2021),*** and target values for the protection of human health.

The following Measurements were sampled during the survey: Particulate Matter (TSP, PM10 and PM2.5 particles with a resolution of 0.1 µg/m^3), Nitrogen Dioxide (NO_2), Sulphur Dioxide (SO_2),

Carbon Monoxide (CO) and Volatile Organic Compounds (VOCs).(*Refer to Annex 14 for detailed information on the sampling methodology)*.

Four Ambient Air Quality Monitoring Stations (AAQMS) were established on site and within the boundary of the proposed project site.

Figure 4-4 Google earth image showing the four monitoring points

The measurements were done continuously for a period of 60 mins at each monitoring point. The Table below shows the results of the measurements:

Table 4-1 Particulate Matter Results

Sampling Location	**Time Weighted Average**	**Concentration Levels (µg/m³)**	
		PM 2.5 (µg/m³)	**PM10 µg/m³**
MP 1	60 mins	3.03	7.3
MP 2	60 mins	2.91	7.95
MP 3	60 mins	2.58	6.30
MP 4	60 mins	2.63	8.96
EMCA (AQG)		**75 µg/m³**	**150 µg/m³**

Table 4-2 Gaseous Pollutant Results

	Average Concentration Levels

Sampling Location	CO	NO2	SO_2	TVOC
MP 1	BDL	53.21	400	550
MP 2	BDL	58.88	465.75	500
MP 3	BDL	64.02	463.76	330
MP 4	BDL	31.43	465.89	260
EMCA –AQG	**300ppm**	**100 µg/m³**	**125 µg/m³**	**600 µg/m³**

Particulate Matter Results: The average PM 2.5 and PM 10 results were found to be within the EMCA Air Quality regulations, 2014 at all monitoring points.

Gases results: The level of the gaseous pollutants of concern which include (CO, NO2 and TVOCs) were within the recommended EMCA Air Quality Regulations limits at all monitoring points.

SO2 levels were however found to be higher than the limit of **125 µg/m³** established under EMCA Air Quality regulations, 2014. SO2 levels within the four monitoring points ranged between 465.89 µg/m³ at monitoring point 4 and 400 µg/m³ at Monitoring point 1. This could be attributed to vehicular emissions from the nearby roads. *Refer to Annex 14 for the detailed report.*

The potential mobile sources of air pollutants emissions from the proposed development during the construction stage will mainly consist of: vehicular traffic emissions as a result of the contractor's batching plant, movement of trucks ferrying in construction materials, and ferrying out waste products; dust emissions during the construction phase and emissions from generators during the operational phase. The ESMP Chapter outlines some of the measures the proponent/contractor will put in place to reduce emissions.

4.5.7 Noise and Vibrations

Noise pollution is a significant environmental concern at JKIA due to the continuous operation of aircraft, ground handling equipment, and vehicular traffic within the airport vicinity. Noise levels are measured using decibel (dB) scales and are influenced by factors such as aircraft engine noise, ground operations, and nearby road traffic. Comprehensive noise monitoring programs are implemented to assess and mitigate the impact of noise pollution on surrounding communities, wildlife habitats, and airport personnel. Regulatory standards set by the International Civil Aviation Organization (ICAO) and national aviation authorities govern permissible noise levels and require airports to implement noise abatement strategies to minimize adverse effects on the environment and public health.

These main sources of noise at JKIA are associated with aircraft operations and reach peaks during flight events (landing, takeoff and taxiing) of different aircraft types (large and small). Noise pollution levels at JKIA are monitored to mitigate the impact of aircraft operations on surrounding communities (Environmental Management and Coordination Act, 2015). Noise mapping studies have identified areas of concern, prompting measures such as flight path optimization and sound insulation for affected buildings.

The proposed project site is located within a specialized freight area surrounded by light industrial companies dealing with Cargo operations that are noisy especially at night with the peak hours being 8pm to 4pm. The potential sources within the project area include: Vacuum Pump Chillers from nearby cargo operating company Kuhne & Nagel, Air Compressors, Aircrafts, Dollies used in transporting Cargo Trucks and Lorries.

The noise and vibration survey exercise was conducted on **26th and 27th March 2024.** There are various industrial noise sources as well as occasional air traffic noise. The loudest and most intrusive noise source was found to be road noise from tractor-drawn dollies. Unloaded dollies were noticeably noisier than loaded dollies. Unloaded dollies had more 'clatter' noise and were likely driven at a faster speed. In the absence of vehicular noise, the predominant noise source is plant noise from the neighbouring Kuehne+Nagel site to the west.

Noise and Vibration measurements were taken at proxy locations near the site borders as shown in the figure below:

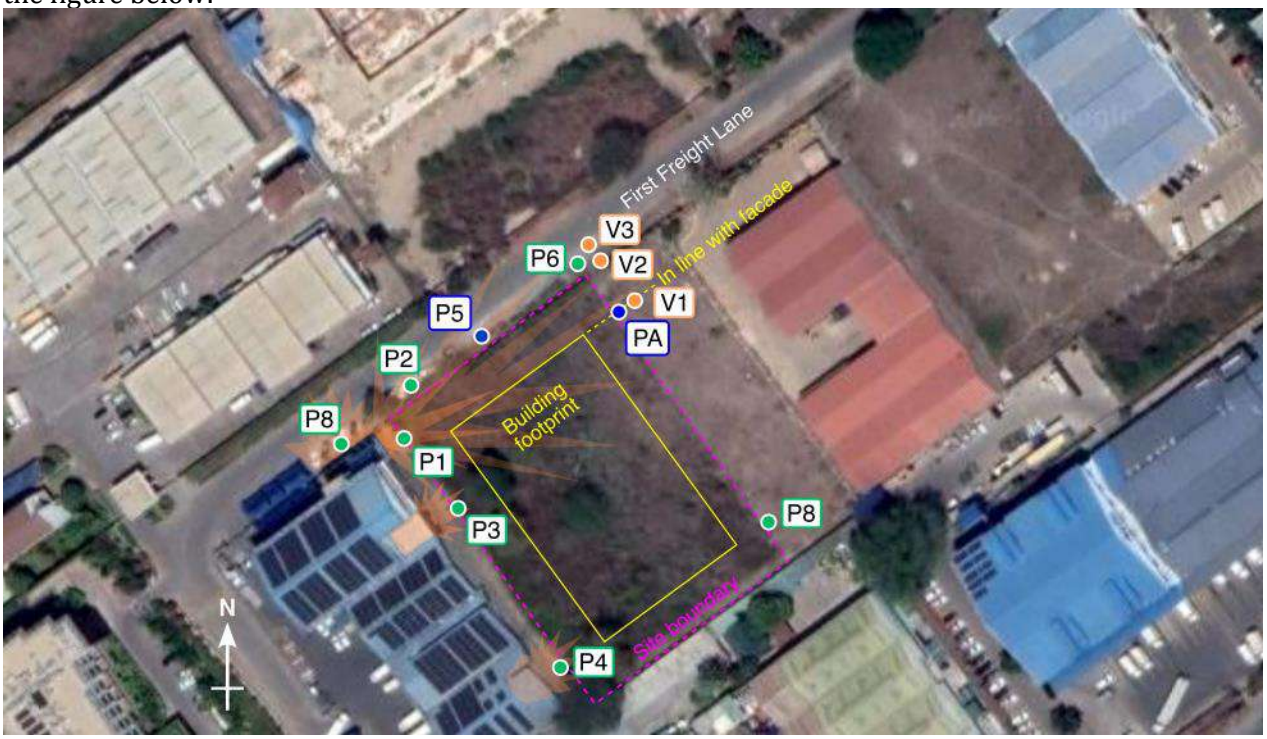

Figure 4-5 Noise and Vibration Measurement Points

Ambient noise levels during the daytime period were taken at positions P1 to P8 where 10-minute hourly measurements were done at P5 between 08:00 and 17:00. Night-time noise was continually measured at location PA between 22:30 and 05:30. This location as well as Vibration measurement location V1 are in line with the façade of the proposed building so would have a near-identical exposure to noise from dollies.

Hotel operators typically include internal noise limits for hotel bedrooms and other noise-sensitive rooms. The intended operator is Radisson. Their Technical Standards document dated September 2021 gives the following noise limits:

- Bedroom night-time: LA10 = 30 dBA,

- Bedroom daytime: LA10 = 35dBA,
- Meeting & events, offices, team members areas: LA10 = 35 dBA,
- Restaurant, reception, bar: LA10 = 40 dBA.

The Environmental Management and Coordination (Noise And Excessive Vibration Pollution) (Control) Regulations, 2009 has made provisions for maximum permissible levels within different operation zones as shown in the figures below

MAXIMUM PERMISSIBLE NOISE LEVELS

Zone		*Sound Level Limits dB(A) (Leq,14 h)*		*Noise Rating Level (NR) (Leq,14 h)*	
		Day	Night	Day	Night
A.	Silent Zone	40	35	30	25
B	Places of worship	40	35	30	25
C.	Residential : Indoor	45	35	35	25
	Outdoor	50	35	40	25
D.	Mixed residential (with some commercial and places of entertainment)	55	35	50	25
E.	Commercial	60	35	55	25

Time Frame

Day: 6.01 a.m. – 8.00 p.m. (Leq, 14 h)
Night: 8.01 p.m. – 6.00 a.m. (Leq, 10h)

Figure 4-6 Maximum Permissible Noise Levels *(Source: EMCA (Noise and Excessive Vibration Pollution Control) Regulations, 2009*

MAXIMUM PERMISSIBLE NOISE LEVELS FOR CONSTRUCTIONS SITES
(Measurement taken within the facility)

Facility		*Maximum Noise Level Permitted (Leq) in dB(A)*	
		Day	Night
(i)	Health facilities, educational institutions, homes for disabled etc.	60	35
(ii)	Residential	60	35
(iii)	Areas other than those prescribed in (i) and (ii)	75	65

Figure 4-7 Maximum Permissible Noise Levels for Construction Sites *(Source: EMCA (Noise and Excessive Vibration Pollution Control) Regulations, 2009*

In addition, the World Health Organisation recommends that maximum noise levels do not regularly exceed LAeq 45 dBA in bedrooms for good sleeping conditions.

Vehicle vibration level were found to be faint at V1 so additional vibration sample measurements were taken at locations closer to the road (V2 and V3) where loaded and empty dollies and other vehicles pass by. Plant noise, in the absence of dollies, was measured and calculated at up to LAeq 62 dBA at the building elevation facing the Kuehne+Nagel.

Dolly noise levels at the façade varied depending on loading, speed, number of dollies. Noisy events exceeded LAeq 80 dBA regularly through the night (10 times on the recorded night) but only exceeded LAeq 85 dBA twice. Vibration recording of passing tractor dollies are well below the threshold for audible ground-borne noise at the nearest building façade. Ground-borne vibration measurements from dollies showed that vibrations from the dollies will not create audible ground-borne noise in the building.

During the night survey, dolly noise levels ranged from approximately 68 dBA to 92 dBA.

Table 4-3Façade noise levels (location PA) for period between 22:30hrs to 05:00hrs

Metric	Level [dBA]	Comment
LAmax	92	Highest recorded noise
LAeq	63	Average noise for the period
LA90	55	Background noise (plant noise)
LA10	60	Noise level exceeded 10% of the time
LA1	73	Noise level exceeded 1% of the time
LA0.1	84	Noise level exceeded 0.1% of the time

The Environmental noise from the surroundings was found to exceed the maximum permissible levels for; Hotel Operators under the Technical Standards document; Environmental Management and Coordination and Coordination (Noise And Excessive Vibration Pollution Control) Regulations, 2009 and World Health Organisation standards. The proponent is aware of the noise levels and has engaged a specialist to work on the hotel design and other robust noise control measures so as to minimize noise levels from the surrounding Environment.

Based on the survey results, the site was found to be suitable for a hotel development. Interventions required to control external noise levels within guestrooms are reasonable and practically feasible. No interventions are required to control external vibration levels.

The proposed project construction works are also likely to emit high noise and vibration levels due to the heavy machinery and material delivery vehicles on site. To be affected mostly are the site workers since noise beyond some level is itself a nuisance if not maintained within acceptable limits (an exposure 85 Db/ 8 hours as per WHO standards). The ESMP Chapter has outlined preventive measures the proponent/contractor needs to put in place to reduce or eliminate noise levels.

4.6 Biological Environment

4.6.1 Flora and Fauna

The landscape around JKIA has undergone extensive transformation as a product of intensive urban and industrial development, alongside the growth of the airport infrastructure itself. This has led to a sharp reduction in natural vegetation cover. Within the airport boundaries and immediate vicinity, there is now a notable absence of indigenous flora apart from occasional small patches of short, withered grass and newly planted exotic tree varieties. The surrounding areas comprise built-up residential suburbs, factories, warehouses, highways, and other sealed surfaces.

This highly modified setting with limited vegetation is favourable from an aviation operational perspective for the airport. The lack of tall buildings, forests or obstacles prevents obstruction to flight paths or aircraft movements. Outside the busier developed zones, some small pockets of indigenous vegetation persist in nearby riparian zones along seasonal streams. Out on the Athi-Kapiti plains southeastwards, the traditional grassland savanna and woodland habitats retain higher biodiversity, although increasing land subdivision threatens this as well.

Overall, the airport's vegetation profile has been transformed into one dominated by infrastructure and managed green spaces concentrated in developed zones rather than natural areas. While favourable for flights, proactive environmental conservation is required to offset habitat losses while supporting social and economic progress for Nairobi. Careful planning can achieve an integrated sustainable balance.

The airport is within a mixture of industrial and commercial area and there is a notable absence of natural vegetation following intensive social and economic-driven land use changes. On the undeveloped land area earmarked for the Airport hotel, there exists vegetation cover, mainly grass and approximately 10 Acacia tree species.

Plate 4-3 Existing trees on the project site

4.7 Socio-Economic Environment

4.7.1 Population

According to the 2019 National Population and Housing Census, the population of Nairobi city is estimated to be 4.397 million. This is projected to rise to about 7.14 million by 2030 (UN DESA, 2016). The population growth rate stands at 4.1 percent per annum. Nairobi's population is notably youthful with 49 percent between 15 and 36 years. The general growth rate of Nairobi city is approximately 4.1% a year, which signifies a steady upward population growth trend into the future. Nairobi has an overall population density of 3,079 people per square kilometre. A growing economy and swelling population numbers from both in-migration and natural growth are continually increasing the city's population size.

The proposed project is timely in its conception and development as it will meet the demand for accommodation facilities within the Airport and Nairobi city at large, for the steadily increasing city's population. In the last census report (2019), the project area sub-county had about 988,808 persons with a population density of 11,458/km^2.

On the other hand, the internal population within JKIA grounds consists of workers working at JKIA and different organizations/ companies located within the Airport, passengers (local and international), transit service providers (mostly transporters) and passenger escorts/receivers (relatives and friends).

4.7.2 Infrastructure and Transport

Due to rapid urban growth, the provision of basic infrastructure for all has become an important concern of development planners in Nairobi. Basic infrastructural services such as Solid Waste Management (SWM) system; Water and Sewerage Systems; Drainage and flood protection; Roads and Rail; Mass transportation; Electric installations; and telecommunications are currently under immense pressure due to ever-increasing population rates within Nairobi. Greater environmental pollution, congestion and problems have been the result of the under-provision of such basic services.

Nairobi city is well served with good telecommunication and transport networks such as air, road, and railway. It is centrally located to serve the Eastern African Countries. Bus and train stations are within an easy walk of the city centre. The newly launched Expressway has toll points in close proximity to the area; JKIA toll Station. The Network facilitates transportation of agricultural products from Western Kenya to the Coast. The city is a hub of road transport connecting other major towns in the country. On air transport, Jomo Kenyatta International Airport makes it easy to transport people and goods from all over the world into the country and vice versa.

Plate 4-4 Well-maintained Road with street lighting next to the project site

4.7.2.1 Energy Access

The main sources of energy in Nairobi County are electricity, solar, LPG, biogas paraffin, charcoal and firewood. Lack of access to clean sources of energy is a major impediment to development through health-related complications such as increased respiratory infections and air pollution. The type of cooking fuel used by households is related to the socio-economic status of households/individuals.

The project area is connected to Kenya's Power grid which serves as the main source of energy for most enterprises in the area. There are also streetlights providing lighting at night within the project area.

4.7.2.2 Road, Rail and Airports

Nairobi County comprises of various infrastructure developments including road and railway networks, water supply, power supply, airports, transport and telecommunication systems, sewerage networks and treatment works. Key infrastructure development that links the County includes; Thika Road Superhighway together with the Eastern and Northern Bypasses, the Standard Gauge Railway (SGR) and the Nairobi Expressway. The most common means of public transport within the county are matatu, buses and train. The proposed facility is strategically located with easy access to the transport network.

4.7.2.3 Water supply

Approximately 94% of the piped water supply in Nairobi comes from rivers and water reserves in the Aberdare Ranges which are north of the city. Portable water in Nairobi County is mostly piped water from Nairobi City Water and Sewerage Company (NCWSC). The source of this water is from rivers and reservoirs which undergo treatment before being distributed to consumers. The project is well served with a water supply from NCWSC. However, several factors compromise the city's water quality, ranging from natural phenomena such as the high fluoride content in groundwater to anthropogenic factors such as poor wastewater treatment and environmental degradation both within the city and in the surrounding countryside. The project area and indeed many areas within Nairobi have a high potential for underground water use by constructing boreholes to supplement the other sources of water supply. It is anticipated that the development will source its water supply from Nairobi City Water and Sewerage Company and supplement with a borehole to be drilled on site.

4.7.2.4 Waste Water Management

Wastewater from homesteads and industries is collected in Nairobi via a system of interconnected channels and flows to Ruai Treatment works where it's treated and effluent is released to the Nairobi River. However, due to the higher population in the slums within Nairobi, most of the wastewater is directly released to the nearby streams and rivers, accounting for the high level of pollution in the rivers. This is currently being addressed by the Rehabilitation and Restoration programme by the Ministry of Environment, Water and Natural Resources. The programme began in 2010 and is aimed at rehabilitation, restoration and sustainable management of the Nairobi River Basin in order to provide improved livelihoods and enhance environmental quality and values through well-regulated economic and recreational ventures.

JKIA has an extensive sewerage and wastewater management system for safe handling of all liquid discharges from airport operations. Sewage from airport terminals and buildings is directed to a 20,000 m3 capacity treatment plant via underground sewer lines. Here it undergoes pre-treatment, primary treatment, secondary biological treatment and disinfection before the treated effluent is discharged as per National Environmental Management Authority guidelines. Regular sampling ensures consistent standards are maintained. The project site area is well served by Nairobi City Water and Sewerage Company sewerage services. It is anticipated that the development will be connected to the sewer line.

4.7.2.5 Solid Waste Management

Out of 1,600 metric tons of solid waste generated daily in the city by 2002, only 40 percent was being collected. Out of this total the Nairobi City Council and Private Companies combined, only managed to dispose only 47.1 percent of the total garbage turnover. The accumulated mess of waste collection over the years has continued to be a bottleneck to Nairobi City administrators. The prevailing waste disposal needs therefore call for the need for waste disposal facilities like incinerators.

Solid waste at JKIA is segregated into biodegradable, recyclable and hazardous streams for responsible disposal. Color-coded bins across the airport guide users appropriately. Waste is transported from collection points to dedicated disposal sites in covered trucks to restrict leaks or spills. Hazardous medical and electronic waste is incinerated via approved handlers. Composting and partnerships with recycling companies give a second life to other waste. Open dumping or burning is prohibited. With growing passenger traffic, JKIA continues to expand its waste handling capacities through advanced treatment infrastructure, latest technologies adoption and process standardization - ensuring both legal compliance and environmental conservation.

The proponent will contract a NEMA Licensed Waste collector to handle all waste within the facility. Waste management during the construction period will be addressed through a clause in the contract between the proponent and the contractor. This clause will stipulate that the contractor must sign an agreement with a NEMA-approved waste collector operating within the airport premises. Compliance with all airport regulations, including Environmental Management and Coordination (Waste Management) Regulations, 2006 and Sustainable Waste Management Act, 2022 will be mandatory for the contractor.

4.7.2.6 Economic Activities

The major economic activities in Nairobi County include businesses in formal and informal lines. Some of the major investments in the city are industries, service providers and office complexes among others. Due to its population, Nairobi provides numerous opportunities for trade at various scales. Because of these characteristics, it is considered the commercial centre for Kenya and even East Africa. Owing to its huge economic potential, Nairobi was once the headquarters of the East African Community (EAC).

In 2020, Nairobi City County accounted for 27.5 percent of the total national economy with gross domestic product (GDP) valued at Ksh 2,669,829 (KNBS 2021). Nairobi's economically active population is 2.23 million. The economic structure of Nairobi city is dual, characterized by shrinking formal employment opportunities and an informal sector that is increasingly expanding and accounts for 83 percent of total employment opportunities (KNBS 2022).

Main economic activities around the project site are business enterprises with a majority being transport and logistics companies. There are also similar hotel developments such as Crown Plaza Airport Hotel and Four Points by Sheraton Airport Hotel located within Jomo Kenyatta International Airport Area and within a range of 100m to 250m from the project site respectively.

4.7.2.7 Tourism Activities

Nairobi City County has major parks and museums that serve as main tourist attractions and activities centres. The main national parks are Nairobi National Park, Nairobi Safari Walk and Nairobi Mini Orphanage. The County also boasts of the Nairobi National Museum which houses a large collection of artifacts portraying Kenya's rich heritage through history, nature, culture, and contemporary art. Nairobi city is also the centre for many tour companies and travel agencies. City hotels range from low-cost budget to luxury and offer good value and excellent service. The proposed Airport hotel is strategically located to provide access to the tourist attraction centres.

4.7.3 JKIA's current initiatives towards greener aviation

As part of its sustainability efforts, JKIA has implemented various green programs to minimize the environmental impact from its operations. A large tree planting drive has seen over 3,000 indigenous trees planted along the airport's periphery. This serves as an additional natural sound barrier supplementing the earth embankments installed for noise attenuation. More greening drives are planned alongside upcoming developments.

An advanced sewage treatment plant allows water recycling for non-potable uses like horticulture and landscaping. Extensive waste segregation and composting also prevent useful materials from reaching landfills. Motion sensor lights, solar heaters and optimized HVAC systems curb energy demands.

As JKIA evolves to meet Nairobi's air transport needs, environmental stewardship remains an integral aspect through tree planting, clean vehicle adoption, water recycling and energy conservation initiatives airport wide. The goal is to become the region's benchmark for eco-friendly airport infrastructure operation.

4.7.4 Traffic Movement

JKIA serves as a crucial hub for international air travel, facilitating the movement of passengers and cargo between Kenya and various global destinations. International traffic flow at JKIA encompasses arrivals, departures, and transit passengers traveling to and from diverse destinations across Africa, Europe, Asia, the Middle East, and America.

4.7.4.1 Passenger Movements

According to recent data from the Kenya Airports Authority (KAA), JKIA handles millions of international passengers each year, with passenger traffic exhibiting steady growth due to increased connectivity, airline route expansions, and tourism initiatives. The airport serves as a gateway to Kenya's renowned wildlife reserves, pristine beaches, and cultural attractions, attracting leisure and business travelers from around the world.

In 2021, JKIA handled approximately 7.5 million passengers, making it one of the busiest airports in Africa (Kenya Airports Authority, 2022). The annual growth rate of passenger traffic at JKIA has been

averaging around 5% over the past five years, indicating consistent demand for air travel services (Kenya Civil Aviation Authority, 2021).

4.7.4.2 Goods Movement

Jomo Kenyatta International Airport serves as a major cargo center for both inbound and outbound goods. Air cargo has emerged as a key driver of activity at the airport. According to Kenya Airport Authority, total air cargo throughput at JKIA reached approximately 550,000 metric tonnes in 2021, up from just over 330,000 tonnes in 2013. This represents an average annual cargo growth rate of 8.5% over the past decade. Analysts predict JKIA air cargo volume could double over the next 10 years. This might be driven by rising global demand for Kenyan exports like fresh produce, flowers, and pharmaceuticals. The proposed project site is located within the freight area. The access road to the proposed project site is also used for freight area activities that include distribution of goods for both national and international transit.

4.7.4.3 Air Traffic

JKIA also recorded approximately 120,000 aircraft movements in 2021, including both passenger and cargo flights (Kenya Airports Authority, 2022). The airport operates as a key transit point for international flights connecting Africa to other regions worldwide.

4.7.4.4 Surface Traffic

Jomo Kenyatta International Airport (JKIA) is Kenya's largest aviation facility and the busiest airport in East and Central Africa. The airport has witnessed substantial growth in passenger traffic over the last decade, resulting in increased vehicular volumes entering and exiting the airport daily. Approximately 12,800 vehicles access the airport per day which is a 51% increase from the 8,500 daily vehicle average reported in the past, (Kenya Airports Parking Services). The 1st freight lane which is used as the access road to the proposed project site experiences traffic congestion caused by buses used to ferry employees to and from neighboring enterprises. Traffic congestion is also caused by tractors and dollies that move cargo.

4.7.4.5 Traffic survey around the Project Site

Traffic surveys were undertaken on the **27th, 28th and 30th March 2024** at the Freight Terminal Rd/Freight Rd Intersection and the Freight Rd/First Freight Lane Intersection, along with vehicle entries and exit from Crown Plaza Hotel and Siginon Logistics Premises. The locations were selected as they represent the most critical location in evaluating the current and future traffic operating conditions

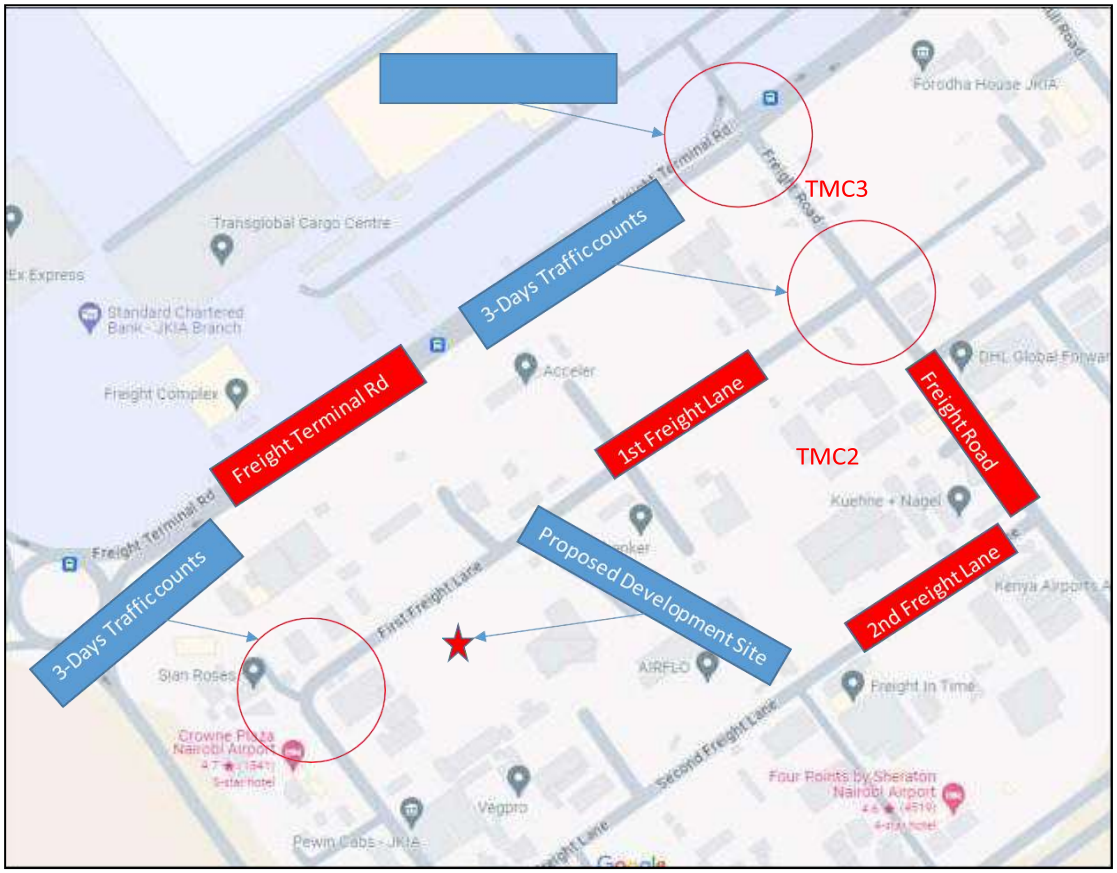

Figure 4-8 Traffic survey location (Source: Traffic Impact Assessment Report, B&L Engineering Services Limited, 2024**)**

The data collection methodology consisted of Manual Classified Counts of all vehicle turning movements. Traffic data was collected using enumerators located at the survey location over three (3) peak periods, i.e., AM Peak (6.00 am – 9.00 am), Midday Peak (12.00 – 2.00 pm) andPM Peak 4.00 pm - 7.00 pm) and, over 3 days. The data was then encoded and analysed using coded Excel sheets and traffic analysis software.

The Levels of Service (LOS) criteria based on the Highway Capacity Manual (HCM, TRB, 2010) was adopted as a basis for determining the performance of the project road sections and major intersections. The LOS is a globally recognized standard used to evaluate the performance of highways and road network facilities.

The traffic was forecast for the year 2031. Generated traffic from the development when it is constructed and fully operational was then added to the 2031 forecast. Trips were generated using the Institution of Traffic Engineers (ITE) Trip Generation Manual. The widely accepted Level of Service (LOS) concept based on the Highway Capacity Manual was used in assessing the capacity at the intersection to determine the existing and future traffic conditions (impacts). In practice, LOS A represents free-flow traffic conditions while LOS F represents congestion; LOS C and below are acceptable conditions, both in Kenya and Internationally.

The results showed that in the future, WITHOUT the proposed development, if the normal traffic growth patterns in Nairobi continue, the traffic conditions will deteriorate, albeit marginally, in the

AM and PM peak hours but still largely maintain the current LOS. Only the Freight Lane East approach will register a shift in LOS from A to B, which is still acceptable.

The results showed that in the future, WITH the proposed development, the Freight Terminal Rd/Freight Rd intersection will operate at LOS A in the future on the Freight Terminal Rd approaches with the effects of the generated traffic from the proposed project considered. Despite the marginal increases in delays at the approach from Freight Rd, this arm will also maintain the acceptable LOS B. Thus, this junction, as does the First Freight Lane/Freight Intersection, does not require any immediate intervention

Access Design Proposal: To improve access in and out of the development, an acceleration/deceleration lane of length 15m (2.75m width), including the taper section was recommended. It shall be provided to allow for safe speed change and entry/exit speed. It also allows for the queuing of vehicles as they are checked outside the gate. A walkway of a minimum width of 0.75m leading up to the junction with the First Freight Lane/Freight Rd intersection should also be improved.

Traffic Management Plan (TMP) (*Annex 16)* was prepared to address the potential traffic effects associated with the construction. It identifies the standards necessary for the management of traffic during the construction of the project roads. The TMP will be updated, with the necessary approval, throughout the construction of the project roads to reflect changes associated with the construction methodology, requirements from the concerned road authorities and the regulatory requirements for the implementation of traffic control during construction

5 RELEVANT POLICY, LEGISLATIVE AND PLANNING FRAMEWORK

5.1 Introduction

This chapter includes a summary of the laws, regulations and institutional setup relevant to environmental and social management in Kenya. A review of the most pertinent regulations and standards governing health and safety has been included. In addition, an analysis for MEAs and their applicability to the proposed project were reviewed and presented to guide the proponent. This section also includes a review of environmental quality standards relevant to the proposed project. Kenya has in place a wide range of policy, institutional and legislative frameworks to address the major causes of environmental degradation and negative impacts on ecosystems emanating from industrial and economic development programmes. The legislative framework is meant to ensure that proposed projects are economically beneficial while being environmentally sustainable. A brief description of how the proposed project will comply with the relevant environmental quality standards has been given for each case.

5.2 Constitution of Kenya

The Constitution of Kenya is the country's supreme legislation and has Environmental provisions in Chapter Four, under 'Rights and Fundamental Freedoms', Chapter Five, under 'Environment and Natural Resources', and Chapter Ten, under 'Judicial Authority and Legal System'. The Fourth Schedule also includes environmental provisions under 'Distribution of functions between National and County Governments' and the Fifth Schedule titled 'Legislation to be enacted by Parliament'. Environmental rights and freedoms are presented in Article 42 of the new constitution, which states: Every person has the right to a clean and healthy environment, which includes the right:

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

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

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

Article 69 (II) states that "Every person has a duty to cooperate with state organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources."

The proposed project is compliant with the provisions of the Kenya Constitution through the undertaking of Integrated Environmental and Social Impact Assessment that incorporates the ethos of sustainable development and efficient use of natural resources

5.3 National Policy Framework

5.3.1 The Vision 2030

Vision 2030 (GOK, 2007) is divided into three fundamental pillars: economic, social and political. The social pillar aims at realizing a just and cohesive society enjoying equitable social development in a clean and secure environment. These pillars are anchored on the following foundations: macroeconomic stability; continuity in governance reforms; enhanced equity and wealth creation opportunities for the poor; infrastructure; energy; science, technology and innovation; land reform; human resources development; security and public sector reforms.

Vision 2030 aims at transforming Kenya into a globally competitive, newly industrialized, middle-income and prosperous country. The growth objectives underpinning Vision 2030 require a sustainable annual economic growth rate of more than 10% supported by industry, agriculture and services. Efficient, accessible and reliable infrastructure has been identified as an enabler for achieving sustained economic growth, development and poverty reduction by lowering cost of doing business and improving the country's global competitiveness.

It is anticipated that the proposed project will spur economic growth and development both at the construction and operational stages of its implementation through creation of a number of economic opportunities. The ideals of a safe and clean environment will be as well adopted and engraved in all the stages of the proposed project as envisioned in the social pillar of Vision 2030, which identifies Environment, Water and Sanitation as a key priority sector of Kenya's development agenda.

5.3.2 The Big Four Agenda

The Big Four Agenda (GOK, 2017) was launched during the 54th Jamhuri Day Celebrations on 12 December 2017 and elaborates the specific agenda and measures the Jubilee administration will focus on over the period 2018-2022. The areas of focus set out are -food security, affordable housing, manufacturing and universal healthcare.

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

This Policy proposes a broad range of measures and actions responding to key environmental issues and challenges. It seeks to provide the framework for an integrated approach to planning and sustainable management of natural resources in the country. It recognizes the various vulnerable ecosystems and proposes various policy measures not only to mainstream sound environmental management practices in all sectors of society throughout the country but also recommends strong institutional and governance measures to support the achievement of desired objectives and goals.

The broad objectives of the national environmental policy in Kenya are: -

a) To ensure optimal use of natural resources while improving environmental quality.

b) To conserve natural resources such that the resources meet the needs of the present without jeopardizing future generations in enjoying the same.

c) To develop awareness that inculcates environmental stewardship among the citizens of the country.

d) To integrate environmental conservation and socio-economic aspects in the development process.

e) To ensure that national environmental goals contribute to international obligations on environmental management and social integrity.

In line with the above policy statements, this ESIA has been conducted to ensure that potential environmental and social issues are appropriately addressed. Once approved by NEMA, the Project Proponent will also need to conduct periodic Environmental Audits to ensure continuous conformity with the overall goal of this Session Paper.

5.3.4 Sessional Paper No. 6 of 1999 on Environment and Sustainable Development Policy.

The policy defines approaches that will be pursued by the Government in mainstreaming the environment into development. The policy harmonized environmental and developmental objectives with the broad goal of achieving sustainable development.

The key objectives of the Policy include: -

(i) To ensure that from the onset, all development policies, programs, and projects take environmental considerations into account,

(ii) To ensure that an independent Environmental Impact Assessment (EIA) report is prepared for any industrial venture or other development before implementation,

(iii) To come up with effluent treatment standards that will conform to acceptable health guidelines.

The policy recommends the need for enhanced re-use/recycling of residues including wastewater, use of low or non-waste technologies, and increased public awareness-raising and appreciation of a clean environment. It also encourages the participation of stakeholders in the management of waste within their localities. Regarding human settlement, the paper encourages better planning in both rural and urban areas and the provision of basic needs such as water, drainage, and waste disposal facilities among others.

This policy is relevant to the proposed project in view of the potential impacts on the environment.

5.3.5 The National Climate Change Response Strategy (NCCRS), 2010

Climate change remains one of the greatest challenges facing humanity globally in the 21st Century. Locally, some of the effects of the effects of climate change such as temperature increases. Rainfall intensification and irregularity have been continually experienced in increased measure. This policy fast-tracks and rallies nationwide actions towards climate change adaptation and mitigation of GHG's emissions.

The National Climate Change Response Strategy has the following key recommendations: adaptation and mitigation measures in key sectors; necessary policy, legislative and institutional adjustments; enhancing climate change awareness, education and communication in the country; capacity building requirements; enhancing research and development as well as technology development and transfer in areas that respond to climate change, among many others.

It is prudent to ensure that the proposed project infrastructure design is climate-proof over its lifespan, and designing infrastructure that can withstand the prevailing climatic conditions, e.g., structures that can withstand strong winds and high temperatures. Measures that are geared towards offsetting carbon emissions should also be incorporated in the project design.

5.3.6 Sessional Paper No. 1 of 2017 on National Land Policy

The overall goal of the national land use policy is to provide a legal, administrative, institutional and technological framework for optimal utilization and productivity of land-related resources in a sustainable and desirable manner at national, county and community levels. The Policy is premised on the philosophy of economic productivity, social responsibility, environmental sustainability and cultural conservation.

It recognizes and addresses the effects of land mismanagement which are environmental, social, economic and political in nature. Some of these impacts include; are deterioration in land quality, under-utilization of land, land, urban squalor, insecurity and conflict. Other fundamental issues such as compulsory acquisition and development, and security of tenure for all have also been taken into consideration

Amongst the key principles envisioned by the policy include;

- Land use planning, resource allocation and resource management for sustainable development to promote public good and general welfare;
- Environmental management and sustainable production in the utilization of land resources;
- Coordination and integration of institutional linkages in planning at sectoral and cross-sectoral levels to foster collaboration and decision-making among different land users;
- Equitable utilization of land resources to meet governance, social-economic and cultural obligations of the people of Kenya;

The proposed project will need to be consistent with the provisions of this Policy to ensure environmental sustainability.

5.3.7 Sessional Paper No. 02 of 2019 on National Policy on Gender and Development

The Policy spells out a policy approach of gender mainstreaming and empowerment of women and clearly states that it is the right of women, men, girls and boys to participate in and benefit equally from the development process. The NPGD provides a framework for mainstreaming gender in all policies, planning and programming in Kenya and puts in place institutional mechanisms to ensure effective implementation.

The proposed project should hence ensure gender concerns are mainstreamed into the development to ensure that the needs and interests of each gender are addressed.

5.3.8 The National Occupational Health and Safety Policy Of 2012

This policy is intended to protect the safety and health of workers in workplaces. The proposed development project will provide employment opportunities to many workers in various categories. *The contractor will be expected to comply with the requirements of this policy when engaging workers in various construction activities. The preliminary environmental management plan provides mitigation measures that can be undertaken to ensure compliance with the requirements of this policy.*

5.3.9 Government of Kenya Medium Term Plan 2023-2027

The Fourth MTP will implement the fourth and second-last phase of Kenya Vision 2030 and will set the momentum for the transition to the next long-term development agenda for the Country. The Fourth MTP will prioritize the implementation of economic recovery strategies to re-position the economy on a steady and sustainable growth trajectory.

The Core Pillars for the Fourth MTP include, Agriculture, Micro, Small and Medium Enterprise (MSME) economy, Housing and Settlement, Healthcare, Digital Superhighway and Creative Economy

5.4 Legal Framework / Laws and Key Relevant Regulations

There are several legal provisions on environmental protection, which touch on and regulate the development of infrastructure like the proposed project. A brief review of the various legislations relevant to the development is given hereunder.

5.4.1 Environmental Management and Coordination Act (EMCA Cap 387) and its Amendment of 2015

EMCA Cap 387 applies to all policies, plans and programs as specified in part IV, part V and the Second Schedule of the Act. A number of legislations are in place to ensure the provision of a healthy and clean environment but EMCA Cap 387 takes precedence. It is the principal law that governs the use, management and regulation of environmental resources in Kenya. Under the second schedule, **amended vide legal notice number 31 of 2019**, the proposed project is categorized as a **High-Risk Projec**t under urban development projects i.e. "***establishment of hotels with a bed capacity exceeding one hundred and fifty***". The proposed four-star airport hotel will entail 233 guest rooms. This Study Report has been prepared for submission pursuant to Regulation 7 (4) of the Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019. The assessment was conducted following recommendation under sub-regulation 3 (a) stating "Where Authority considers that the proposed project will have a high environmental impact, it shall recommend that the proponent should prepare and submit a study report."

This project is listed under High-Risk Project for which an Integrated Environmental and Social Impact Assessment study report is prepared. Through EMCA, various regulations have also been gazetted which the proponent is expected to abide as discussed below;

5.4.1.1 Environmental Management and Coordination (Environmental Impact Assessment and Audit) Regulations, 2003 and (Amendment) Regulations, 2016 (L.N 149) & 2019 (L.N 32)

Environmental Impact Assessment under the EMCA Cap 387 Act is guided by the Environmental Impact Assessment (Assessment and Auditing) *Regulations of the year 2003, which is given under legal notice no. 101 and (Amendment) Regulations, 2016 (L.N 149) & 2019 (L.N 32)*. Regulation 11(1) provides that Environmental Impacts Assessment be conducted by the proponent in accordance with the terms of reference developed during the scoping exercise and approved by the Authority. The regulations stipulate the ways in which environmental impact assessment and audits should be conducted and categorically assigning a lead expert, qualified in accordance with criteria for listing of experts as outlined under regulation 13(2), with the responsibility for undertaking them. The project falls under the second schedule of EMCA, Cap 387 High Risk Project that requires an Environmental Impact Assessment Study be undertaken to provide baseline information upon which subsequent environmental control audit shall be based. The EMCA, Cap 387 requires that during the EIA process, a proponent shall in consultation with the Authority seek views of persons who may be affected by the project or activity through posters, newspaper, radio and public meetings with the affected parties and communities.

This Report complies with the requirements of the Environmental Regulations in the coverage of environmental issues, project details, impacts, legislation, mitigation measures, management plans and procedures. The Proponent will be required to commit to implementing the environmental management plan laid out in this report and any other conditions laid out by NEMA.

5.4.1.2 Environmental Management and Coordination (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.

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 the discharge of all effluent into the aquatic environment.

Everyone including the proposed project proponent 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) Gazetted in Cap 387

5.4.1.3 Environmental Management and Coordination (Waste Management) Regulations, 2006

The Waste Management Regulations are established in accordance to section 174 of the EMCA, Cap 387. Waste management includes activities, both administrative and operational that are used in handling, packaging, treating, conditioning, reducing recycling, re-using, storage and disposal of waste.

These regulations stipulate how the different types of waste streams should be stored, transported, and disposed of. The type of waste streams described herein include solid waste, industrial waste, hazardous waste, pesticides and toxic substances, biomedical waste and radioactive substances. Cleaner production principles are championed under Regulation 6(1) of these regulations which obligates owners of premises or facilities generating waste to minimize the amounts generated through adoption of best practices such as conservation of raw materials and energy, reduction in toxic emissions and waste, avoidance of using toxic raw materials and adoption of recycle and re-use strategies. The regulations also stipulate the conditions for licensing any person dealing with the transport or waste disposal. *The proponent will undertake all measures to ensure that all waste generated is collected and handled appropriately and disposed of at a designated waste disposal site and in accordance with the waste management regulations.*

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

Regulations 3 (1) prohibits any person from making or causing any loud, unreasonable, unnecessary or unusual noise that annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment. On the other hand, Regulation 4(1) outlaws excessive vibrations and imposes a limit on the maximum permissible vibration levels as 0.5 centimeters per second of a source property boundary or 30 meters from any moving source. It also stipulates the factors to be considered when determining the amount of noise produced from various sources. The regulations further provide the permissible noise levels within different neighborhoods at different times. For a typical construction project, Regulation 14(1) gives powers to the Authority to impose requirements on how the work is to be carried out, machinery that may be used and permitted noise levels. In determining whether noise is loud, unreasonable, unnecessary or unusual, the following factors may be considered:

- Time of the day;
- Proximity to residential area;
- Whether the noise is recurrent, intermittent or constant;
- The level and intensity of the noise;
- Whether the noise has been enhanced in level or range by any type of electronic or mechanical means; and,
- Whether the noise is subject to be controlled without unreasonable effort or expense to the person making the noise.

Machinery and equipment used during the construction phase will be the main source of noise pollution. *The Proponent/contractor is required to implement the provisions of the ESMP to ensure noise reduction. In addition, he shall be required to adhere to the provisions of maximum permissible noise levels for construction sites.*

Table 5-1 Maximum Permissible Noise levels for Construction sites

Maximum Permissible levels for Construction sites (Measurements taken within the facility)			
	Facility	*Day*	*Night*
	Health facilities, educational Institutions, Homes for the disabled and residential areas	*60 dB*	*35 dB*
	Other areas	*75 dB*	*65 dB*
	Day: 6.01am to 6.00pm	***Night: 6.01pm to 6.00am***	

5.4.1.5 Environmental Management and Coordination (Air Quality) Regulations, 2014

These regulations provide for the prevention, control and abatement of air pollution to ensure clean and healthy ambient air. It applies to all internal combustion engines, all premises, places, processes, operations, or works to which the provisions of the Act and Regulations made thereunder apply, and any other appliance or activity that the Cabinet Secretary may by order in the Gazette, specify. Specifically, air pollution within the occupational areas is highlighted in under Regulation 17 which requires owners of controlled facilities to ensure that occupational air pollutants workers are exposed to are monitored and recorded accordingly. Release of particulate matter during construction activities not in excess of the permissible limits is addressed under Regulation 33 of these regulations. They stipulate the measures to prevent air pollution from both stationary and mobile phases. They also provide for the permissible occupational exposure limits.

A baseline ambient Air Quality study to determine the concentration levels of gaseous and particulate matter pollutants of concern within the boundary of the proposed project site premises was conducted on 5th March 2024. The scope of the measurement survey involved air quality sampling at four monitoring stations that collected 60-minute air samples at 1-minute intervals whose results were compared with the Environmental Management and Coordination Act (EMCA) Air Quality Guidelines. Particulate Matter (PM 2.5 & PM10), C Nitrogen Dioxide (NO_2), Carbon Monoxide (CO), and Volatile Organic Compounds (VOCs) were found to be within permissible levels. Sulphur Dioxide (SO_2), levels were, however, found to exceed the permissible levels under the regulations. This could be attributed emission of vehicular gases from the nearby roads.

The proponent and contractor will be guided by provisions of these regulations during the construction, operation and decommissioning phases of the Project. Air quality monitoring will be guided by standards stipulated thereof.

5.4.1.6 Environmental Management and Coordination of Controlled Substances Regulations, 2007 (Legal Notice No.73 of 2007)

The Controlled Substances Regulations define controlled substances and guides on how to handle them. This regulation mandates NEMA to monitor the activities of persons handling controlled substances, in consultation with relevant line ministries and departments, to ensure compliance with the set requirements. The regulations stipulate that controlled substances must be clearly labelled with among other words, "Controlled Substance-Not ozone friendly" to indicate that the substance or product is harmful to the ozone layer. Advertisement of such substances must carry the words, "Warning: Contains chemical materials or substances that deplete or have the potential to deplete

the ozone layer." Producers and/or importers of controlled substances are required to include a material safety data sheet.

Persons are prohibited from storing, distributing, transporting or otherwise handling a controlled substance unless the controlled substance is accompanied by a material safety data sheet. Manufacturers, exporters or importers of controlled substances must be licensed by NEMA. Further, any person wishing to dispose of a controlled substance must be authorized by NEMA. The licensee should ensure that the controlled substance is disposed of in an environmentally sound manner. These regulations also apply to any person transporting such controlled substances through Kenya. Such a person is required to obtain a Prior Informed Consent (PIC) permit from NEMA. *The proponent shall ensure adherence to the regulations during the construction and operational phases of the proposed project.*

5.4.2 Sustainable Waste Management Act, 2022

The objectives of the Act are but not limited to: promotion of sustainable waste management; promotion of effective delivery of waste services; improvement of the health of all Kenyans by ensuring a clean and healthy environment; reduction of air, land, fresh water and marine pollution; and the creation of an enabling environment for employment in the green economy in waste management, recycling and recovery.

The proponent shall comply to this Act throughout its three major phases by carrying out frequent monitoring and auditing of the waste management infrastructure; enhancing waste mapping, segregation, collection and transportation; contracting a NEMA-registered waste handler to handle all waste generated from the site and it's surrounding; and implementing measures set out in the ESMP and EMP of this report.

5.4.3 Kenya Airports Authority Act (Cap. 395)

The Act established the Kenya Airports Authority in 1992. It provides for the powers and functions of the Authority. It mandates KAA to among other things to manage civilian airports and airstrips efficiently and profitably; provide, develop and maintain such services and facilities that are necessary or desirable for the efficient operation of the aircrafts; provide rescue and firefighting equipment and services at the airports and approve the establishment of private airstrips and control the operations thereof

To support the functions of the Authority, other Government agencies are also involved, including;

a) The Kenya Airport Police Unit to provide security for Airport installations, handles incidents of hijacking, carries out detection and disposal of bombs, participates in the prevention and detection of crime, carries out investigation of accidents, takes control of all points of entry into restricted and controlled areas, and maintenance of law and order.
b) Specialized security units including bomb detection and disposal experts.

Section 15 vests powers to the Authority to enter land to prevent accidents. In particular, Part (3) states that where any person erects any building which in any way interferes with the operation of any service provided by the Authority under this Act, the Authority may, unless such person has previously obtained the approval of the managing director to the erection of such building, or has modified it to the satisfaction of the managing director, apply to the High Court for an order for the demolition or modification of such building, or, as the case may require, for the payment to the Authority of the cost incurred in the resetting or replacement necessary to prevent such obstruction or danger and the court at its discretion may grant such order as it may deem fit as to the payment of compensation and costs. Esiway Investments Limited has obtained necessary approval required before commencement of construction works. *A copy of KAA Approval is attached as an Annex 10.*

5.4.4 The Civil Aviation Act No. 21 of 2013

The Civil Aviation Act 2013 (amended in 2016) provides for the control, regulation and orderly development of civil aviation in Kenya and for matters incidental thereto or connected therewith.

The Act establishes the Kenya Civil Aviation Authority KCCA under Section 4 (1) whose role is to plan, develop, manage, regulate and operate a safe, economical, and efficient civil aviation system in Kenya in accordance with the provisions of the Act. Other responsibilities of the Authority as stated under section 7(1) include; licensing of air service; provision of air navigation services; advising the government on civil aviation matters; dealing with incidents of unlawful interference with aviation security and undertaking investigations on general incidents not classified as accidents or serious incidents. The Act empowers the Cabinet Secretary in charge of Transport, under Part V section 56 (1) of the Act to prohibit the erection of buildings or structures above a certain height in declared areas; where he considers it to be necessary in the interests of the safety of air navigation, by order published in the Kenya Gazette.

Part V section 57 gives the Director-General of KCAA powers to Control structures, etc., on or near aerodromes if the Director-General considers that provisions for the safety or efficiency of air navigation ought to be made by lighting or otherwise for giving aircraft warning of the presence of any building, structure, tree or natural growth or formation on or in the vicinity of an aerodrome; or by the removal or reduction in height of any such obstruction. Section 58 of Part V further prohibits persons from trespassing on any land forming part of a government aerodrome or an aerodrome licensed under the regulations established under the Act.

The proponent owns the proposed project area (A copy of the land ownership document is attached). Esiway Investments Limited has also obtained approval to erect a hotel within Jomo Kenyatta International Airport with an Approved height of 25Metres.

5.4.5 Occupational Safety and Health Act (OSHA 2007)

Occupational Safety and Health Act applies to all workplaces where any person is at work, whether temporarily or permanently. The purpose of the Act is to secure the safety, health and welfare of persons at work and protect persons other than persons at work against risks to safety and health arising out of the activities of persons at work. Section 6(1) obligates the occupier or employer to ensure that the safety, health and welfare of all the people at work within the work premises are secured and maintained. Workers also have their part to play by taking all the necessary precautions to ensure their own safety and health and that other people in their workplace or within the environs of their workplaces. The Act protects workers by requiring the use of appropriate safe systems of work, preventive and control measures and full utilization of Personal Protective Equipment and clothing.

Section 19 of the Act provides that an occupier of any premises likely to emit poisonous, harmful, injurious or offensive substances, into the atmosphere shall use the best practicable means to prevent such emissions into the atmosphere and render harmless and inoffensive the substances which may be emitted. Ergonomics aspects of the workplace environment are covered under section 76(1) while section 81 (1) highlights the relevant housekeeping rules of the workplace setup. The employer or occupier is expected to develop a suitable for the safe collection, recycling and disposal of chemical wastes, obsolete chemicals and empty containers of chemicals to eliminate to safety, health of employees and the environment.

Part VII of the Occupational Safety and Health Act (OSHA), 2007 elaborately deals with machinery safety requirements, mainly from the point of view of avoiding accidents and injuries at work. *There will be a need to ensure that all employees and people around the area are protected against any risks*

that could arise from the operations, hence the provisions of this Act will be fully incorporated and adhered to. All plants shall be subjected to periodical examination as provided by law.

5.4.5.1 Factories and Other Places of Work (Fire Risk Reduction) Rules, 2007 (L.N No. 59)

These regulations were made in exercise of the powers conferred on the Minister of labour by section 41 (2) (k) of the Factories and Other Places of Work Act. The rules provide for secure storage of vessels containing dangerous liquids and measures for prevention of fire.

The proponent is required to:

a) Provide firefighting and fire detection appliances at the development and ensure they are regularly inspected.
b) Conduct Fire audits.

5.4.5.2 Factories (First-Aid) Rules, 1977 (L.N No. 160)

These rules stipulate that there shall be provision of well-maintained and readily available and accessible first aid boxes or cupboards.

Section 7 of the rules provide that no person shall be placed in charge of a first aid box or cupboard unless he or she has received adequate training in the application of first-aid to the injured persons and holds a certificate of competence issued by: The St. John Ambulance of the St. John Council of Kenya; or The Kenya Red Cross Society; or such other body or society as may be approved from time to time, by the Labor Commissioner.

The proponent will adhere to the provisions of section 2 (c) and 5 of these rules. Additionally, the proponent will ensure the first aid boxes/cupboards are plainly and clearly marked on the outside with the words "FIRST AID" and contact information of the First Aider on-duty.

5.4.5.3 Factories and Other Places of Work (Medical Examination) Rules, 2005 (L.N No. 24)

These Rules provide for the conducting of medical examination on various occupations including work involving exposure to noise. There should be Pre-employment and annual repeat examinations within two weeks where abnormal examination results are noted. Examinations are to involve clinical examinations, biological monitoring and other necessary tests depending on the type of exposure.

The proponent is required to ensure that all employees undergo pre-employment and periodic medical testing within the course of the project activities to survey on their health

5.4.5.4 Factories and Other Places of Work (Noise Prevention and Control) Rules, 2005 (L.N No. 25)

According to section 5 of the rules, where noise in a workplace exceeds the continuous equivalent of 85 A-weighted decibel (dB (A)) the occupier must develop and implement an effective noise control and hearing conservation programme which must be in writing and should address: Noise measurement; Education & training; Engineering noise control; Hearing protection; Posting of notices in noisy areas; and Annual programme review

Where the noise level will be above 90 dB (A), the proponent will be required to:

a) Post a sign at the entrance to and in every room or conspicuous place, clearly and prominently marked "DANGER HEARING PROTECTION MUST BE WORN".
b) Supply hearing protection to all persons required to enter such an area.
c) Ensure that all workers and any other person entering this area wear hearing protectors.

5.4.6 The Energy Act of 2019

The Energy Act 2019 was approved on 12th March 2019 and commenced on 28th March 2019. The Act establishes an Energy and Petroleum Regulatory Authority mandated to regulate the generation, importation, exportation, transmission, distribution, supply and use of electrical energy except for licensing of nuclear facilities; ensure, in collaboration with the Kenya Bureau of Standards, that only energy efficient and cost-effective appliances and equipment are imported into the country; certify energy managers and license energy auditors amongst other duties. The Act gives provisions for the need to protect the health and safety of users of energy by providing an enabling environment of operation that protects the health and safety of users of the service for which the license or permit is required and other members of the public affected by the undertaking. Section 107(1) of the Act also provides that for energy producing facilities, a Strategic Environment Assessment and Social Impact Assessment will be undertaken among other requirements, before commencement of construction activities. *The provisions of this Act have and will be enforced by the management in consultation with the Environmental experts, planners, mechanical and electrical consultants in ensuring the best practices are adopted for sustainable energy use while attaining public health and safety.*

5.4.7 County Governments Act No.7 of 2012

This is an Act of parliament to give effect to Chapter Eleven of the Kenyan Constitution; to provide for the County government's powers, functions and responsibilities to deliver services. The Act emphasizes on the need for a consultative and participatory approach where the principles of planning and development facilitation in a county serve as a basis for engagement between the county government and the citizens and other stakeholders.

In addition to principles of planning, the Act provides that a planning framework integrates economic, physical, social, environmental and spatial planning as per section of 104(1) of this Act. County Governments are also mandate by section 115(b)of this Act to under Strategic Environmental Assessment (SEA) and Environmental Impact Assessment reports as part of their planning processes.

The proponent will engage Nairobi County in its planning to ensure various licenses and permits are acquired.

5.4.8 Employment Act, 2007 and it's Amendment in 2022

The Act is enacted to consolidate the law relating to trade unions and trade disputes, to provide for the registration, regulation, management and democratization of trade unions and employer organizations and federations. The purpose of the Act is to promote sound labor relations through freedom of association, the encouragement of effective collective bargaining and the promotion of orderly and expeditious dispute for the protection and promotion of settlements conducive to social justice and economic development for connected purposes. This Act is important since it provides for an employer-employee relationship that is important for the execution of the project.

The basic conditions of employees should be observed to avoid unnecessary conflicts during the construction works. The Contractor shall pay the entire amount of the wages earned by or payable to the workers. Payment of such wages should be done at the end of a working day at or near the place of work.

5.4.9 The National Construction Authority Act, 2011

The purpose of the Act is to provide for the establishment, powers and functions of the National Construction Authority and connected purposes (Section 1).

The National Construction Authority oversees the construction industry and coordinates its development (section 5(1)) and is given power for necessary performance (section 6(1)). It also sets

out application requirements and procedures for the registration of persons and firms as construction contractors (Section 17) and punitive measures for contravening by individuals (Section 15(3)). Additionally, the Act gives the Board power to inquire into the conduct of a contractor on its initiatives (Section 22) and sets out suspension conditions for contractors (Section 23).

Furthermore, the Act stipulates the establishment of an Appeals Board and its function to make rules for or concerning the filing, hearing and disposal of appeals etc. (Sections 27 and 28) Finally, Sections 30 and 31 provides for the constituent of the Authority's funds and concerns imposition of levy, which contributes importantly to the income of the Authority*. The proponent will adhere to the requirements of this act and obtain all necessary approvals during the construction period.*

5.4.10 Land Registration Act, 2012

This is an Act of Parliament that revises, consolidates and rationalizes the registration of titles to land, to give effect to the principles and objects of devolved government in land registration, and for connected purposes. The act requires proper marking and maintenance of boundaries.

With regard to the maintenance of boundaries, the Act requires every proprietor of land to maintain in good order the fences, hedges, stones, pillars, beacons, walls and other features that demarcate the boundaries, pursuant to the requirements of any written law.

The proponent has adhered to the provisions of this act by ensuring the project land boundaries are marked.

5.4.11 Penal Code Act (Cap.63)

This Act stipulates the various activities and conduct that are considered to be unlawful or criminal in nature, and the penalties as provided for by the Act. According to section 191, 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 also stipulates 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 neighborhood or passing along a public way, is guilty of a misdemeanor. *The proposed project will be implemented with strict observance of the Penal Code Act.*

5.4.12 Physical and Land Use Planning Act, 2019;

This Physical and Land Use Planning Act, 2019 makes provision for the planning, use, regulation and development of land and connected purposes. Article 5 of the Act under Principles and norms of physical and land use planning, notes that every person engaged in physical and land use planning development activities shall be in a manner that integrates economic, social and environmental needs of present and future generations. Article 4 notes that major developments should be subjected to environmental and social impact assessment. *The proponent and contractors of the proposed development should ensure compliance with the provisions of the act and land use planning. Public participation has been conducted to ensure the involvement of stakeholders in the planning process.*

5.4.13 Water Act, 2016

The Act provides the legal framework for the management, protection, usage and regulation of water resources as well as procurement and control of rights towards usage of water. Regulations provided for in this act are in line with the Constitution of Kenya. It also makes provision for the control and management of the supply of water and the provision of sewerage services. It also addresses issues to do with ownership, management and usage of water resources and protection with regard to water catchment areas

Section 25 (1) of this Act states that a permit shall be required for any of the following purposes:

- any use of water from a water resource, except as provided by Section 26;
- the drainage of any swamp or other land;
- the discharge of a pollutant into any water resource; and

Any purpose, to be carried out in or in relation to a water resource, which is prescribed by rules made under this Act to be a purpose for which a permit is required. Part II, Section 18, of this Act provides for national monitoring and information system on water resources. Following this, Sub-section 3 of the same Section, allows the Water Resources Authority (WRA) to demand from any person or institution, specified information, documents, samples or materials on water resources. Under these rules, specific records may be required to be kept by a facility operator and the information thereof furnished to the Authority. *The proponent will adhere to the requirements of the act.*

5.4.14 The Environment and Land Court Act, 2011

This Act is in place to give effect to Article 162(2) (b) of the Constitution; to establish a superior court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land, and to make provision for its jurisdiction functions and powers, and connected purposes. *This Act shall be of great essence to the proponent, public, interested or affected party that may want to litigate against the development on settlement issues, location of the project or even effects of the project to the public.*

5.4.15 Work Injury Compensation Benefit Act (WIBA) 2007

This is an Act of Parliament to provide compensation to employees for work-related injuries and diseases contracted in the course of their employment and for connected purposes. The Act applies to all employees, including employees employed by the Government, other than the armed forces, in the same way and to the same extent as if the Government were a private employer. It is the duty of all employers to obtain and maintain an insurance policy from an approved insurer in respect of any liability the employer may incur as provided for by the Act. The Act also stipulates that an employee who suffers an accident that leads to disablement or death is subject to the provisions of this Act and is entitled to compensation. *It will be important for the Contractor of the proposed project to ensure that all workers contracted during the project implementation phase are provided with appropriate insurance covers so that they can be compensated in case they get injured while working.*

5.4.16 Public Roads and Roads of Access Act Cap 399, Rev. 2012

The Public Roads and Roads of Access Act Cap.399 Act states that a public road is any road which the public has a right to use immediately before the commencement of this Act, or all proclaimed or reserved roads and thoroughfares being or existing on any land sold or leased or otherwise held under the East Africa Land Regulations, 1897, the Crown Lands Ordinance,1902, or the Government Lands Act at any time before the commencement of this Act and all roads and thoroughfares hereafter reserved for public use. *The proponent will observe the requirements of this act while carrying out their operations.*

5.4.17 Public Health Act (Cap. 242)

This is an Act of Parliament that makes provision for securing and maintaining the health of individuals and the public in general. Section 115 of the Act states that no person shall cause nuisance or cause to exist on any land or premises any condition liable to be injurious or dangerous to human health. Section 116 requires that Local Governments take all lawful, necessary and reasonably practicable measures to maintain their jurisdiction clean and sanitary to prevent the occurrence of nuisance or condition liable to be injurious or dangerous to human health. Section 130 further empowers the Cabinet Secretary to delegate functions to County Governments to enforce rule in respect of define areas to prohibit or regulate erection of dwellings, sanitary convenience, tanks or other works to entail risk of harmful pollution or pollution threatening to sources of water being used by the public.

Such nuisance or conditions are defined under section 118 as waste pipes, sewers, drainers or refuse pits in such state, situated or constructed as in the opinion of the medical officer of health to be offensive or injurious to health. Any noxious matter or wastewater flowing or discharged from any premises into the public street or into the gutter or side channel or watercourse, irrigation channel, or bed not approved for discharge is also deemed as a nuisance. Other nuisances are an accumulation of materials or refuse which in the opinion of the medical officer of health is likely to harbor rats or other vermin.

Part XII, Section 136, states that all collections of water, sewage, rubbish, refuse and other fluids which permit or facilitate the breeding or multiplication of pests shall be deemed nuisances under this Act. This part seeks to guard against the breeding of mosquitoes which is key as they cause malaria which is one of the major causes of death in this country. *The proponent will observe all the provisions of this Act*

5.4.18 Urban Areas and Cities Act No. 13 of 2019

This is an Act of Parliament to give effect to Article 184 of the Constitution, to provide for the classification, governance and management of urban areas and cities and to provide for the criteria of establishing urban areas. According to section 5 of the Act, an urban area only qualifies for the status of a city if it possesses infrastructural facilities such as good roads, street lights, markets, fire station, regional infrastructural connectivity and adequate capacity for disaster management. The Act also provide for the principle of governance and participation of residents of towns and cities. Under the Act a town is an urban area with a population of at least ten thousand residents. Also, under the Act the management of a city and municipality is vested in the county governments. The County Governments may impose such fees, levies and charges for the delivery of services by the municipality or the city county. The Act under section 44, provides for collaboration between the County Governments and all relevant stakeholders in provision of infrastructural services including environmental conservation, construction of roads, health facilities and promotion of tourism among others. *The proponent shall comply with the act.*

5.4.19 The Climate Change (Amendment) Act, 2023

On September 1st, 2023, against the backdrop of Kenya hosting the Africa Climate Summit and Africa Climate Week, the Climate Change (Amendment) Act, 2023 ("the Act") was assented to by the President. The Act came into force on 15th September 2023, and builds upon the foundations laid by the Climate Change Act, 2016, in pushing Kenya a step forward towards realizing its obligations under the Paris Agreement. The Act has brought with it a wide array of changes, particularly in relation to effecting Article 6 of the Paris Agreement by introducing provisions on the regulation of and participation in carbon markets.

In an effort to boost accountability and transparency, the Act provides for the establishment of a carbon registry that would be accessible to the public with registers on information relating to carbon credit projects and the amount of carbon credits issued or transferred from Kenya. The carbon registry will boost climate financing activities in the country by reassuring investors in carbon markets. A Designated National Authority as established by the Act will be the custodian of the Registry.

Whilst the importance of climate financing cannot be overemphasized, it is equally important to safeguard the environment from further degradation. In this regard, the Act requires that before commencing a carbon trading project an environmental impact assessment must be carried out in compliance with international obligations. The Act also entrenches the need for carbon projects to specify the anticipated environmental, economic or social benefits of the project which includes the extent to which the project will contribute to the removal of greenhouse gases from the atmosphere in order to contribute to meeting Kenya's greenhouse gas emissions targets.

The proposed project should therefore ensure that infrastructure design is climate-proof over its lifespan and undertaken as per provisions of the act specifically on planning and implementation stages.

5.4.20 Building Code 2009

This by-law recognizes the county governments as the leading planning agencies. It compels potential developers to submit development applications for approval. The county governments are hence empowered to approve or disapprove any plans if they do or don't comply with the law, respectively. Any developer who intends to erect a building must give the respective local authority a notice of inspection before the erection of the structure. On completion of the structure, a notice of completion shall be issued by the local authority to facilitate final inspection and approval. No person therefore shall occupy a building whose certificate of completion has not been issued by the county government.

Section 194 requires that where a sewer exists, the occupants of the nearby premises shall apply to the local authority for a permit to connect to the sewer and all the wastewater must be discharged to the sewers. Section 196 provides that the county government may refuse to admit to sewer any trade waste or any other effluent unless it has been treated in an approved manner. In this regard, the county government may cause the occupier of the premise to construct an approved manhole connected to the pipe conveying such effluent. Finally, this Act requires supply of water for buildings and provisions be made for water shortages. *In the development of the project, the proponent will have to comply with the provisions of this Act by complying to the building code provisions.*

5.4.21 The Traffic Act Cap 403

The Traffic Act, of 2012 gives provisions and guidelines that govern the Kenya roads transport sector. These guidelines are essential to private, public and commercial service vehicles in ensuring safety and sanity on the roads hence ensuring the environment is safeguarded. In section 41 the Act demands for installation and certification of speed governors for the commercial vehicles ferrying goods adjusted to the loading condition of such vehicles to a limit of 80 KPH, registration and competence of drivers. Moreover, the owner of commercial vehicles or trailers shall ensure clear markings on their vehicles in English language on the right side of the vehicle showing ownership details, tare weight of the vehicle and maximum authorized weight. Section 26 and 27 of the same discourages engines that emit exhaust gases into the atmosphere without passing via a silencer or expansion chamber. In ensuring safety of all the persons in transit, section 56 encourages that every public and commercial vehicle be fitted with inspected and first-class first aid box and fire extinguisher. In ensuring compliance to this Act, the contractor and developer shall ensure that all site drivers and all material suppliers to the site satisfy the provisions as stipulated in the Act. *In ensuring compliance to this Act, the contractor and developer shall ensure that all site drivers and all material suppliers to the site satisfy the provisions as stipulated in the Act.*

5.4.22 The Standards Act Cap 496

The Act is meant to promote the standardization of the specification of commodities, and to provide for the standardization of commodities and codes of practice; to establish a Kenya Bureau of Standards, to define its functions and provide for its management and control. 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. KEBS is mandated, according to section 10(7) (a) and (b) of the Act, to issue standardization marks to commodities.

The proponent, contractor and project engineer will enforce the overall safety of the development, by ensuring strict vetting of material to ensure that only construction materials that meet the acceptable quality of standards and which are labeled with a standardization mark are used for construction

process. Thorough scrutiny of these materials and frequent monitoring will also be assisted by the construction supervisory staff on site such as the Resident Engineers.

5.4.23 Food, Drugs and Chemical Substances Act, CAP 254

This Act was enacted by parliament to make provision for the prevention of adulteration of food, drugs and chemical substances. According to the Act food includes any article manufactured, sold or represented for use as food or drink for human consumption including chewing gum or any other ingredient. Food is offered in all hotels and restaurants therefore provisions of this Act are very relevant on that regard.

The Act prohibits the sale of any food which adulterated, unwholesome or unfit for human consumption or which is poisonous. This includes food that consists of in whole or in part of any filthy, putrid, disgusting, rotten, decomposed or deceased substance. It is unlawful to label, package, treat, process, sell or advertise any food in contravention of the regulations set out in this Act or in a manner that is false, misleading or deceptive as regards to its character, nature, value, substance, quality, composition, merit or safety. In the case where a standard has been prescribed for a certain food, it is unlawful for a person to label, package, sell or advertise that food in a manner that is likely to be mistaken for the food of the prescribed standard whereas it does not comply with the standard. Preparing, conveying, storing or displaying any food under insanitary condition is also an offense under section 23 of the Act. *The proponent will observe all the provisions of this Act.*

5.4.24 The Hotels and Restaurants Act, Cap 494

This act was enacted to provide for the licensing of hotels, hotel managers and restaurants. It has provisions for the regulation of hotels and restaurants as well as provisions for imposing levies on persons to be employed in hotels and restaurants.

All hotel and restaurant establishments are managed by this Act. The Act established the Hotels and Restaurants Authority (herein with referred to as the authority) under section 3(1), the body whose powers include issuing licenses, investigating and determining complaints and lastly suspending and cancellation of licenses. The authority is comprised of a chairman appointed by the minister for tourism, the permanent secretary of the ministry of tourism, a member who is knowledgeable in the hotel industry and international tourism and a member who represents the interests of hotel keepers, restaurant keepers and employees. *The proponent is expected to adhere to the requirements of this act*.

5.4.25 Alcoholic Drinks Control Act, 2010.

The Alcoholic Drinks Control Act is an act of Parliament to regulate the production, sale, and consumption of alcoholic drinks, to repeal the Chang'aa Prohibition Act, the Liquor Licensing Act and for connected purposes. The Act seeks to:

- To protect the health of individuals by providing a legal framework to control sale, production & consumption of alcoholic drinks
- To protect consumers of alcohol products from misleading inducements to use alcohol
- To protect young people (those below 18 years) by restricting their access to alcoholic products
- To educate the public on the dangers of alcohol use (economic, social & health)
- To protect the government by dealing with illicit trade
- To promote and provide for treatment & rehab programmes for the addicted
- To promote research and dissemination of information, especially of health risks

The proponent is therefore expected to comply with the provisions of this act in regard to sale of alcohol.

5.4.26 National Gender and Equality Act, 2011

National Gender Equality Commission is a constitutional Commission established by an Act of Parliament in August 2011, as a successor commission to the Kenya National Human Rights and Equality Commission pursuant to Article 59 of the Constitution. NGEC derives its mandate from Articles 27, 43, and Chapter Fifteen of the Constitution; and section 8 of NGEC Act (Cap. 15) of 2011, with the objectives of promoting gender equality and freedom from discrimination.

Gender mainstreaming in developments ensures that the concerns of women and men form an integral dimension of the design, implementation, operation and monitoring and evaluation ensures that women and men benefit equally and that inequality is not perpetuated. *Gender considerations should be made in every stage of the development by the proponent.*

5.5 National institutional framework

There are various national institutions that are important in matters related to environmental

5.5.1 Key Environmental Institutional Framework

At present there are over twenty (20) institutions and departments which deal with environmental issues in Kenya. Some of the key institutions include the National Environmental Council (NEC), National Environmental Management Authority (NEMA), and Water Resources Authority (WRA) among others. There are also local and international NGOs involved in environmental issues in the country. From the above institutions, NEMA plays the regulatory and oversight role in the management of environment in Kenya.

5.5.1.1 Ministry of Water, Sanitation and Irrigation.

In 2013, the government, in line with the Constitution, rationalized the portfolio, responsibilities and functions of all the ministries and other government agencies. Consequently, the Ministries of Environment and Mineral Resources, Forestry and Wildlife, Water and Irrigation and Regional Development were merged to form the Ministry of Environment, Water and Natural Resources (MEWNR). In April 2015 MEWNR was again split to form the current Ministry of water and irrigation, giving recognition to the crucial role played by the irrigation sub-sector in national development. This was further split towards the realization of water security to promote sustainable development in line with the Big Four agenda leading to formation of Ministry of Water and Sanitation.

Mandate of the Ministry

- Water Sector Investment Planning
- Sewer and Non sewer Sanitation Services
- Water Resource Management and Use
- Water Supply Services
- Water Harvesting and Storage

Agencies under the Ministry

- Water Services Regulatory Board
- Water Services Trust Fund
- National Water Harvesting Authority
- National Irrigation Tribunal
- Water Tribunal

5.5.1.2 Water Resources Authority (WRA)

Water Resources Authority (WRA) is a state corporation established under Section 11 of the Water Act, 2016. Pursuant to Section 6 of the Act, the Authority is an Agent of the National Government responsible for regulating the management and use of water resources. The Water Act, 2016 makes extensive provisions on the Authority's role in regulating the use and management of water resources. WRA was operationalized on 21st of April 2017 vide Gazette Notice No. 59. However, the Authority has been in existence for 12 years following its establishment under the Water Act, 2002 as Water Resources Management Authority (WRMA). *WRA will provide the necessary water permits.*

5.5.1.3 Ministry of Labour and Social Protection

The mandate of the ministry is "formulation, review and implementation of employment, national human resource planning and development, national Labour productivity, Facilitating and Tracking Employment creation, Coordination of National employment, Internship and Volunteers for public service, community Development, Protection and advocacy of needs of Persons with Disabilities, and Workplace Inspection and Workman's Compensation.

a) The Labour Department

The Labour Department is the Ministry's focal point agency responsible for implementation of the three major Labour Laws; namely: The Employment Act, 2007 and it's Amendment of 2023; The Labour Institutions Act, 2007; and The Labour Relations Act, 2007.

b) Directorate of Occupational Safety and Health Services (DOSHS)

The Directorate of Occupational Safety and Health Services (DOSHS) is one of the departments within the Ministry of Labour and Social Protection, whose primary objective is to ensure the safety, health and welfare of all workers in all workplaces. Unsafe and unhealthy work environment causes accidents, diseases, disasters and environmental pollution that occasion huge economic and social burdens to individuals and enterprises thereby stifling economic and social growth.

5.5.1.4 Ministry of Environment Climate Change and Forestry

The Ministry was established and mandated to undertake protection, conservation and development of the environment and natural resources to ensure sustainable development. Semi-Autonomous Government Agencies under the Ministry of Environment and Natural Resources include:

i. Kenya Water Towers Agency (KWTA)

ii. Kenya Forest Service (KFS)

iii. Kenya Forestry Research Institute (KEFRI)

iv. Kenya Wildlife Service (KWS)

5.5.2 Institutions under EMCA Cap 387

There are other institutional arrangements provided for within the EMCA Cap 387 and relevant to the development. The roles are reviewed and discussed in detail below:

5.5.2.1 National Environmental Management Authority (NEMA)

NEMA was established to exercise general supervision and coordinate 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 Director General appointed by the president heads NEMA. Any project that falls under the second schedule of EMCA, Cap 387 shall seek an Integrated Environmental Impact Assessment License from NEMA.

5.5.2.2 National Environmental Council

The National Environmental Council performs the following functions

a) Formulate policies and directions for purposes of this Act.

b) Set up national goals, objectives, and determine policies and priorities for the protection of the environment.

c) Promote co-operation among public departments, local authorities, private sector, Non-Governmental Organizations and such other organizations engaged in environmental protection programmes; and

d) Perform such other functions as are assigned under the EMCA Act.

5.5.2.3 National Environmental Tribunal

The National Environment Tribunal (NET) created under Section 125 of EMCA Cap 387 has the following functions:

- To hear and determine appeals from NEMA's decisions and other actions relating to issuance, revocation or denial of (EIA) licenses or the amount of money to be paid under the Act and imposition of restoration orders;
- To give direction to NEMA on any matter of complex nature referred to it by the Director General; and

If the proponent disagrees with NEMA decisions in exercising the above-mentioned functions, then they may lodge a case at the NET to seek to overturn the decision. Should this avenue not lead to a favorable ruling from the NET, an appeal may be lodged in the Environment and Land Court.

5.5.2.4 Public Complaints Committee

The Public 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.

5.5.2.5 The Standards and Enforcement Review Committee (SERC)

NEMA through EMCA has established standards for the various environmental parameters that require management and these include water quality standards, noise and vibration control standards, and waste management standards, amongst others. SERC, through the Compliance and Enforcement Department of NEMA, monitors the compliance level of the project to ensure environmental control standards are implemented. The committee also acts on on complaints reported by the public.

5.5.2.6 National Environment Trust Fund (NETFUND)

The trust fund is vested in NEMA and is 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.

5.5.2.7 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 offense not to implement them.

5.5.2.8 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

5.5.3 Hotel and Restaurants Authority (HRA)

It was established to regulate and standardize hotels and restaurants. New hotel, resort and lodge projects are required to be licensed first before commencing construction. This is aimed at ensuring quality and compliance with relevant laws and regulations and promoting excellence in the hospitality sector. The authority will also embark on a nationwide exercise of grading and classification, using the East African Community regulatory regime for all five member States.

The tourism industry is regulated by two Acts of Parliament -the Hotels and Restaurant Act (Cap 494) and the Tourist Industry Licensing Act (Cap 381). The former was enacted in 1972 to provide for licensing of hotels, hotel managers and restaurants with a view to regulate hotels and restaurants, for the imposition of a levy for training people to be employed in hotels and restaurants. Licensing and regulation under the Act is administered through the Authority, a board constituted by the Minister for Tourism.

Three types of licenses are issued under Cap 494: Annual renewals, classification certificates and entry permits. In considering applications for hotel licenses, the board requires operators to present a title deed or lease agreement for the premises, copies of work permit where applicable, health clearance certificate, tariff (bed and room charges, and menu) and an appropriate license fee according to category, size, bed capacity and extent of services provided.

For restaurant licenses, the following are required: A certificate of incorporation or PIN number, health certificates, copy of tariffs, lease agreement, copies of the manager's professional qualifications, work permit for foreigners, license fee and filled forms HRA 1 and FM 2, Hotel and Restaurants Authority (HRA)

5.5.4 National Construction Authority

The National Construction Authority (NCA), constituted under Act No. 41 of 2011 laws of Kenya, is mandated to register contractors and to prepare a register of contractors and construction workers licensed to work in Kenya. National Construction Authority is the body mandated to register all contractors and companies carrying the following categories of work:

- Building works
- Road works
- Waterworks
- Mechanical works in buildings
- Electrical works

National Construction Authority (NCA) has regional offices in the forty-seven counties. The main head office is located in upper hill area in Nairobi. The body is mandated to regulate the construction industry in Kenya as per the National Construction Act law of Kenya.

National Construction Authority also approves the construction of buildings and related projects, construction works and general contractors in Kenya. For construction to be approved by NCA they must be approved by other regulating bodies in Kenya such as national environmental management authority and county governments. *The proponent will get all the NCA Permits and approval for the project.*

5.5.5 International Civil Aviation Organization (ICAO)

The International Civil Aviation Organization's (ICAO) involvement in aviation environmental protection emphasizes the value of a common, coordinated and global approach to addressing the impact of air transport operations on noise and local air quality around airports, and the much broader challenge of climate change. The environmental programme of ICAO has grown larger in scope since the coming into force of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992. This framework created a mechanism for ICAO to interact and cooperate with other UN bodies on greenhouse gas emissions issues, while continuing to deal with an expanding list of noise and local air quality issues. ICAO has established environmental protection standards and recommended practices (SARPS), policies and guidance for international application.

The key focuses of ICAO guidelines in its Annex 16A & B that require a coordinated approach include aircraft noise and engine emissions. It also pays attention to integrated measures to abate adverse environmental impacts including technological improvements, operating procedures, organization of air traffic, appropriate airport and land use planning, as well as application of available market-based options. Environmental protection is one of the Strategic Objectives of ICAO.

ICAO has three environmental goals for international aviation, which aim to:

a) Limit or reduce the number of people affected by significant aircraft noise;
b) Limit or reduce the impact of aviation emissions on local air quality; and
c) Limit or reduce the impact of aviation greenhouse gas emissions on the global climate.

"In support of these goals and in its role as international aviation's leading environmental body, CAEP has established environmental documents, including reports, guidance material, and/or specific studies that help to ensure that the most up-to-date information on aviation environmental issues is fully available to State authorities and the broader aviation community for future planning and related decisions and actions.

5.6 Multilateral Environmental Agreements / Treaties

Kenya has signed a number of international conventions and treaties on environment and natural resources also known as multi-lateral environmental agreements (MEAs) that obligate the country to promote sustainable environmental and natural resources management and social equity. Conventions are legally binding bilateral, regional or international agreements that binding to the states that are parties thereto. Kenya has ratified some of the most important conventions on the environment as discussed below which apply to the proposed project hence the contractor is bound to comply by the respective provisions.

Table 5-2 Multilateral Environmental Agreements

Multilateral Environmental Agreements	Key areas of application

United Nations Framework Convention on Climate Change (UNFCC)	▪ UNFCCC has near universal membership and is the parent treaty of the 1997 Kyoto Protocol. The Kyoto Protocol has been ratified by 192 of the UNFCCC Parties. ▪ The ultimate objective of both treaties is to stabilize greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system. *The proposed project should ensure all activities and development plans are undertaken in line with the provisions of the Convention aimed at stabilizing greenhouse gas concentrations in the atmosphere.*
Vienna Convention for the Protection of the Ozone Layer	▪ The Vienna Convention for the Protection of the Ozone Layer was adopted in 1985 and entered into force on 22 Sep 1988. In 2009, the Vienna Convention became the first Convention of any kind to achieve universal ratification. ▪ The objectives of the Convention were for Parties to promote cooperation by means of systematic observations, research and information exchange on the effects of human activities on the ozone layer and to adopt legislative or administrative measures against activities likely to have adverse effects on the ozone layer.
Rio Declaration on Environment and Development	▪ The Rio Declaration on Environment and Development, often shortened to Rio Declaration, was a short document produced at the 1992 United Nations "Conference on Environment and Development" (UNCED), informally known as the Earth Summit. ▪ The declaration aimed at establishing a new and equitable global partnership through the creation of new levels of co-operation among States, key sectors of societies and people, working towards international agreements which respect the interests of all and protect the integrity of the global environmental and developmental system, recognizing the integral and interdependent nature of the Earth, our home. ▪ The Rio Declaration consisted of 27 principles intended to guide countries in future sustainable development. It was signed by over 170 countries. ▪ Principle 17 of the Rio Declaration provides key relevance to the proposed project; *the principle denotes that environmental impact assessment as a national instrument shall be undertaken for proposed activities that are likely to have a significant impact on the environment and are subject to a decision of a competent national authority.*
Earth Summit on Sustainable Development Agenda 21	▪ Agenda 21 is a non-binding, voluntarily implemented action plan of the United Nations regarding sustainable development. It is a product of the Earth Summit (UN Conference on Environment and Development) held in Rio de Janeiro, Brazil, in 1992. ▪ It is also regarded as an action agenda for the UN, other multilateral organizations, and individual governments around the world that can be executed at local, national, and global levels. The "21" in Agenda 21 refers to the 21st Century. Agenda 21 Section I on Social and Economic Dimensions is directed toward combating poverty, especially in developing countries, changing consumption patterns, promoting health, achieving a more sustainable population, and sustainable settlement in decision making. ▪ Section II on Conservation and Management of Resources for Development Includes atmospheric protection, combating deforestation, protecting fragile environments, conservation of biological diversity (biodiversity), control of pollution and the management of biotechnology, and radioactive wastes.

	Kenya continues to implement Agenda 21 to support sustainable development through the integration of environmental concerns into the national development policies, plans, and programmes. Also relevant is the implementation of Agenda 17. The proposed project would need to be consistent with the objectives of Agenda 21.
The World Commission on Environment and Development (The Brundtland Commission of 1987)	▪ The Commission in its 1987 report dubbed "Our Common Future" focused on the environmental aspects of development, in particular the emphasis on sustainable development that produces no lasting damage to the biosphere and to particular ecosystems. ▪ In addition to environmental sustainability is economic and social sustainability. Economic sustainable development is development for which progress towards environmental and social sustainability occurs within available financial resources. ▪ While social sustainable development is development that maintains the cohesion of a society and its ability to help its members work together to achieve common goals, while at the same time meeting individual needs for health and well-being, adequate nutrition, and shelter, cultural expression and political involvement. The key aspect of sustainability is the interdependence of generations. *The concept of EIA is embodied in many multilateral environmental agreements. Principle 17 of the Rio Declaration provides that environmental impact assessment as a national instrument shall be undertaken for proposed activities that are likely to have a significant impact on the* environment and are subject to a decision of a competent national authority.
The Paris Agreement	▪ The agreement was adopted on 12th December 2015 at the 21st session of the Conference of the Parties to the United Nations Framework Convention on Climate Change in Paris, it then came into force on 4th November 2016 after meeting the ratification threshold. ▪ The Agreement provides the framework to address climate change for a safer and sustainable future, it has an objective of preventing a global temperature increase above 1.5 degrees Celsius relative to pre-industrial levels by reduction of Greenhouse gas emissions. ▪ Kenya ratified the Paris Agreement and welcomed it into force on 28th December 2016. As at now a total of 171 parties out of 197 have ratified the agreement. *The proposed project should ensure all activities are in-line with the tenets of the Paris Agreement to minimize greenhouse gas emission*.
Sustainable Development Goals (SDGs)	▪ The 17 Sustainable Development Goals (SDGs), are an urgent call for action by all countries - developed and developing - in a global partnership. ▪ They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests. *This project is expected to cut-across the three dimensions of sustainable development - economic, social and environmental—in a balanced and integrated manner, hence making SDGs a key reference point.*
International Labour Organization (ILO)	The International Labour Organization (ILO) is built on the constitutional principle that universal and lasting peace can be established only if it is based upon social justice. The ILO has generated such hallmarks of industrial society as the eight-hour working day, maternity protection, child-labour laws, and a range of policies which promote workplace safety and peaceful industrial relations.

The ILO has four principal strategic objectives:

- To promote and realize standards, and fundamental principles and rights at work.
- To create greater opportunities for women and men to secure decent employment.
- To enhance the coverage and effectiveness of social protection for all.
- To strengthen tri-parties and social dialogue.

6 CONSULTATION AND PUBLIC PARTICIPATION

6.1 Introduction

The Consultation and Public Participation (CPP) and Disclosure Process is a policy requirement by the Government of Kenya, which is enshrined in the Constitution of Kenya and is a mandatory procedure as stipulated by the Environmental (Impact Assessment and Audit) Regulations, 2003 (Part III, section 17), and EMCA (Cap 387) section 59 on ESIA for the purpose of achieving the fundamental principles of sustainable development.

It is an important process through which key stakeholders are given an opportunity to contribute to the overall project design by making recommendations and raising concerns on proposed projects before they are implemented. In addition, the process creates a sense of responsibility, commitment, and ownership for smooth implementation. Public consultation and disclosure requirements have been emphasized in the ESIA study through the developed project frameworks such as Environmental and Social Management Framework (ESMF), which have been prepared in accordance with Kenyan national laws and guidelines.

This chapter describes the process of public participation and consultation that was adopted in order to identify the key issues of the proposed hotel development. Views and concerns from the business enterprises surrounding the project area, government agencies, and institutions, who in one way or another would be affected or have an interest in the proposed project, were sought through public participation interviews, key informant consultations, and Key Stakeholders' meetings.

6.2 Objectives of the Consultation and Public Participation

Consultation and Public Participation is an important process through which stakeholders are given an opportunity to contribute to the overall project design by making recommendations and raising concerns on the project before it is implemented. In addition, the process creates a sense of responsibility and commitment for smooth implementation.

The key objectives of the consultation and public participation for the proposed hotel project were to:

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

In addition, the process enabled the establishment of a communication channel among the stakeholders, the team of consultants, the project proponent and the Government. The consultation and public participation also offered a platform for the concerns of the stakeholders to be known to the decision-making bodies at an early phase of project development.

6.3 Methodology in Consultation and Public Participation

In order to ensure effective stakeholders' consultation and public participation, stakeholders' mapping was conducted, and a database was created consisting of likely interested, affected business enterprises and relevant institutions. Assessment tools were prepared for effective and systematic interviews by the environmental and social consultants assisted by a team of technical field assistants. The tools included; key informant interview schedules, mapping, sampling of the areas to be assessed, field visits and observations; and triangulation of field data which focused specifically on the key stakeholders located within JKIA.

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

a) Administration of Public Consultation Questionnaires
b) Key Informant interviews
c) Key Stakeholders' meeting

6.3.1 Administration of Public Consultation Questionnaires

The exercise of public consultation was conducted in the month of February 2024 by the consultants through the use of questionnaires. These questionnaires were designed to gather the concerns, comments, and issues of stakeholders, neighbouring business people in proximity to the project site. The purpose of administering questionnaires was to identify the positive and negative impacts and subsequently gather proposals on the best practices to be adopted and mitigate the negative impacts respectively.

This also helped in identifying any other miscellaneous issues, which may bring conflicts in case the proposed hotel project implementation proceeds as planned. The information gathered enabled the identification of the specific issues from the respondents, which provided the basis upon which the aspects of the Environmental and Social Impact Assessment was undertaken. Among the stakeholders who were consulted through administration of ESIA questionnaires included the business enterprises neighbouring the proposed project site, relevant associations and relevant government agencies and institutions. A total of Fourty-Three (43) ESIA questionnaires were administered during the consultative public participation exercise (*See Annex 11– ESIA Public Consultation Questionnaires*).

6.3.2 Key Informant Interviews

Some key respondents were sampled in the project area to give more resourceful information on the environmental and social assessment for the proposed hotel project. The key informant interviews were held with the Kenya Airports Authority (KAA) and Kenya Civil Aviation Authority (KCAA).

6.3.3 Key Stakeholders' Meeting

The key stakeholders' meeting enabled all stakeholders to express their views and perceptions about the proposed four-star hotel. In the meeting, various opinions, other information and recommendations from key stakeholders were captured to be included in the ESIA study as well as to ensure full representation of the key stakeholders in the project. Invitation letters were delivered to respective business enterprises within JKIA, organisations and relevant Government agencies and institutions seven (7) days prior to the key stakeholders' meeting (*See a sample invitation letter in Annex 5)*

The key stakeholders' meeting was convened on ***29th February 2024*** at ***Crowne Plaza Airport Hotel*** in Nairobi County with a total of 29 (twenty-nine) attendees. The meeting was held to:

- Add more input to the ESIA analysis findings;
- Fill information gaps identified during the ESIA study;

- Better understand the proposed project area context; and
- Assist in prioritizing challenges that need to be addressed and communication channels;

Key stakeholders' meeting attendance sheets are attached in the appendices (*Annex 6*)

***Table 6-1** Key Stakeholders' Meeting held during the ESIA study*

S/N	Meeting Venue	Date & Time	Targeted group	Attendance		
				Male	Female	Total
1.	Crowne Plaza Airport Hotel	Thursday 29th February 2024 9:00AM – 11:30AM	Key stakeholders - Government Agencies and Institutions, Associations and Business Enterprises within JKIA	17	12	29

Source – AWEMAC Field Survey

***Plate 6-1:** Key stakeholders' meeting held at Crowne Plaza Hotel in Nairobi County*

The table below categorizes and highlights various stakeholders engaged during the ESIA study exercise.

***Table 6-2** List of stakeholders engaged during the ESIA study*

SN.	Category	Stakeholder
1.	**Government Agencies and Institutions**	1. Kenya Airports Authority (KAA) 2. JKIA Police Station 3. Ministry of Health-Port Health 4. Tourism Regulatory Authority (TRA) 5. Directorate of Occupational Safety and Health (DOSH) 6. Kenya Civil Aviation Authority (KCAA) 7. Kenya Plant Health Inspectorate Service (KEPHIS) 8. Nairobi Water and Sewerage Company
2.	**Business Enterprises within JKIA**	1. Kuehne+Nagel 2. Agronomics 3. JAAV Global Cargo 4. Rapat Freight Kenya 5. Tradewinds Aviation Services Limited 6. True line 7. DB Schenker Limited 8. Siginon 9. Airport Trade Centre 10. Crowne Plaza Airport Hotel 11. SPC Properties Limited 12. United Freight Logistics Limited 13. Freight In Time Limited 14. Freight Solutions Limited 15. Makindu Growers and Packers Limited 16. Shujaa Aviation Limited 17. Atlanta Cargo Limited 18. Brinks Security Limited 19. VegPro Kenya 20. Expolanka Freight 21. Nippon Express 22. Lead Time Cargo Limited 23. Waste Triangle Limited 24. Marugas General Merchants 25. Choma Zone Caterers 26. General shop and Cyber 27. True Line Limited 28. Rosey Cleaning Services 29. Granjee Cargo Limited 30. Zibel Foods 31. Logan, Freight Solution Limited 32. Handy Air Cargo 33. Seven Four Eight Services 34. Air Connection Limited 35. OLA Energy 36. Freight wings

SN.	*Category*	*Stakeholder*
		37. Global Freight Logistics
3.	**Relevant Associations**	1. Kenya Association of Hotelkeepers & Caterers (KAHC)

Table 6-3 Key Issues raised during the Stakeholder's meeting

S/N.	Issues raised by the members	Brief explanation	Response
1.	**High Noise levels**	**Construction Phase:** Stakeholders raised concerns about noise levels on-site, particularly due to the already high noise levels from neighboring companies in the area.	The Lead ESIA Consultant noted that adequate mitigation measures for noise control are captured in the Environmental Management and Social Plan for the contractor to adhere to.
		Operation Phase: Sentiments about high noises levels from the neighbourhood during the operational phase were echoed by several stakeholders. Noise generated from operations such as continuous movement of cargo, operation of dollies, lorries, consolidated freight and equipment**.**	The lead ESIA consultant confirmed plans for a thorough 48-hour noise and vibrations analysis, to be conducted by an expert during peak weekday hours. The client representative acknowledged the existing high noise levels in the project area and stated that the project team is addressing this issue in the hotel designs and material selection to mitigate externall noise.
2.	**Project Location**	Being designated as a specialized freight area that is noisy and very busy, representative from Kuehne and Nagel sought to know why the proponent would consider putting up a hotel the specialized freight area.	The Lead ESIA Consultant noted that the airport land is designated for private investments, allowing for diverse developments, including hotels. However, emphasis will be put on mitigation measures for all the potential impacts.
3.	**Traffic Management**	Concerns regarding traffic management were raised. Traffic management during the construction phase was emphasized as a critical issue due to the already busy road.	The ESIA Consultant noted that provisions have been incorporated into the design.to reduce traffic flow in the area. A traffic Impact Assessment will also be conducted by the proponent. The contractor will be required to implement the traffic management plan and delivery management plan. This plan will outline how the construction activities will be conducted on-site.

S/N.	Issues raised by the members	Brief explanation	Response
4.	**Occupational Health and Safety Risks**	**Ventilation in Basement** Directorate of Occupational Safety and Health representative emphasized on the importance of ventilation in the basement area, highlighting compliance with the Occupational Health and Safety Act of 2007, particularly Section 48, which addresses overcrowding.	The design adheres to ASHRAE standards, ensuring that each room in the basement receives a fresh air supply to meet ventilation requirements.
		First Aid Facilities and Worker Safety: There were expectations of potential injuries or accidents during construction.	The Lead ESIA Consultant noted that there is need for a first aid room hence there would be a qualified nurse and trained first aiders available to handle minor injuries. In case of more serious cases, individuals could be referred to the port health clinic or nearby hospitals.
		Basement Utilization: The Port Health representative sought to know the facilities located in the basement floor and particularly if there was any kitchen located on the floor.	The architect clarified that the basement will primarily house machine rooms, plant rooms, and pump rooms, food preparation area. The Kitchen is located on the ground floor.
		Compliance to Occupational Safety and Health Act (OSHA) 2007: It was recommended that throughout the construction process, focusing on adherence to safety protocols outlined in Occupational Health and Safety Act, 2007 and subsidiary regulations.	The consultant noted that a dedicated section in the report will address management issues, mitigation measures, and insurance requirements related to the health and welfare of workers during both the construction and operation periods. This measure ensures the implementation of all necessary safety protocols and is in compliance with the Occupational Health and Safety Act, 2007. Additionally, he noted that the project will be aligned to the airport's sustainable objectives and ensuring compliance with ISO standards on occupational health and safety.

S/N.	Issues raised by the members	Brief explanation	Response
		Continuous monitoring during the construction phase was advocated to mitigate dust and noise effectively, prioritizing worker safety and health. Attention to the examination of materials, machinery, and plants to be used was emphasized to ensure compliance with occupational safety regulations, including OSHA 2007, noise prevention and control regulations, hazardous substance legal notices, and BOAWEC guidelines.	Regarding monitoring, the Lead ESIA consultant noted that the team will develop an Environmental Health and Safety Monitoring Plan encompassing both the construction and operation stages. This plan will delineate parameters, costing, and timing for effective environmental health and safety oversight throughout the project lifecycle.
		Risk Assessment of Construction activities: Request for risk assessment to be carried out during construction phase in order to identify potential hazards. An emphasis on the need to have a full time **Environment Health and Safety Officer** on site to ensure the contractor complies with the OSHA Act 2007.	The Lead ESIA Consultant noted that the ESIA Team will stipulate as a mandatory requirement in the report that there must be health and safety personnel present at the project site throughout both phases. The Health and Safety Officer will be responsible for conducting the risk Assessments.
5.	**Fire life and safety**	DOSH Representative requested for the incorporation of fire and safety evacuation plan to the building design.	The project has integrated a Fire Life and Safety (FLS) consultant to develop emergency response plans and advise on safety measures throughout the project lifecycle, including design, construction, and operation.
6.	**Waste Water Management**	Waste Water Disposal: The Stakeholders sort to know how the client intends to dispose of waste water generated from the proposed development.	The project has been designed to direct all sewage to the municipal sewer line. The project Architect representative noted that the project has been designed to direct all sewerage into the existing Municipal Sewer Line. Additionally, kitchen waste will pass through grease traps before entering the sewer system.

S/N.	Issues raised by the members	Brief explanation	Response
7.	**Water Use and Management**	A concern was raised on on water use and availability given that there are so many boreholes within the proposed project site which has been necessitated by the water shortage. The introduction of the airport hotel will create a high-water demand for already strained water resources. They sought to know how the proponent will address the water shortage issue.	The Client representative noted that Strategies in place include sourcing water from a borehole to be drilled on site and implementing water-saving sanitary fixtures throughout the premises to promote efficient water usage and conservation.
8.	**Security**	Security concerns were raised emphasizing on the need for enhanced security measures at the airport. Also, importance of controlling access to the premises and ensuring the security of individuals working at the hotel. It was also suggested for the contractor to organise for a mass transport for all workers to and from the site in order enhance security. The contractor should also obtain security passes for all workers.	The Architect representative noted that a security engineer has been engaged to manage security within the property premises, covering security arrangements from parking levels to roof levels. Provision has been made for additional security measures despite the secure nature of the surrounding area. The contractor will also be advised to ensure all workers obtain security passes.
9.	**Solid Waste Management**	**Construction Phase:** a major concern on the significant amount of soil generated during excavation process was raised. Stakeholders sought clarification on the frequency of waste collection, disposal methods for excavated soil, and measures to prevent soil clogging in the sewage system.s Given the project's proximity to the flight path and airspace, Kenya Civil Aviation Authority representative underscored the need for a proper waste management System to prevent	The Lead ESIA Consultant noted that Waste management during the construction period will be addressed through a clause in the contract between the proponent and the contractor. This clause will stipulate that the contractor must sign an agreement with a NEMA-approved waste collector operating within the airport premises. Compliance with all airport regulations, including Environmental Management and Coordination (Waste Management) Regulations, 2006 and Sustainable

S/N.	Issues raised by the members	Brief explanation	Response
		waste from becoming an attraction for birds and wildlife. **Operation Phase:** A concern was also raised about waste generation during the operational phase, He sought to know how the proponent intends to handle that.	Waste Management Act, 2022 will be mandatory for the contractor. He further noted that the proponent will be advised to explore options for disposing of materials within the airport premises or in surrounding areas, such as nearby quarries. The Client representative noted that the NEMA-licensed waste transporter company will be contracted on the basis that they will collect the separated waste in trucks that maintain separation
10.	**Sustainable Energy Management**	Stakeholders issued recommendations for consideration by the developer regarding adoption of sustainable energy practices that are both efficient in energy use and are also cost effective such as use of solar panels and energy efficient equipment during both construction and operational phase	The Lead ESIA Consultant noted that a Mechanical and Electrical Engineer is currently on board and working with the design team to ensure that the project incorporates sustainable energy practices and equipment during both construction and operational phases of the project. Additionally, he noted that the project will be aligned to the airport's sustainable objectives regarding low emissions and environmental systems.

S/N.	Issues raised by the members	Brief explanation	Response
11.	**Dust Emissions**	Concern about dust emissions that will emanate from the proposed development construction activities was raised by Crowne Plaza Hotel representative. In particular, the presence of a rooftop restaurant within the proposed project vicinity. The representative sought clarification on how dust pollution would be mitigated to ensure a pleasant environment for guests. Need for ccontinuous monitoring during the construction phase was advocated to mitigate dust and noise effectively, prioritizing worker safety and health.	The Lead ESIA Consultant noted that; to address concerns regarding air pollution and dust control during the construction phase, standard measures will be implemented. This includes the suppression of dust at its source using water and the spraying of water as an initial step. Additionally, the entire project site will be enclosed with dust control nets throughout the construction period. Furthermore, all workers will be provided with relevant personal protective equipment (PPE) to ensure their safety and well-being during this time.
12.	**Aviation Safety Risks**	Emphasis on the critical consideration of aviation safety risks associated with the project site's proximity to an Aerodrome, situated approximately 1.5 kilometres from the nearest runway threshold. **Building Materials:** The proponent was advised to avoid the use of reflective materials on the proposed development due to the site's proximity to an aerodrome. **Landscaping Guidelines:** importance of selecting plants and trees for landscaping that do not attract wildlife or birds. Specifically, they recommended avoiding fruit-producing trees or those that encourage bird nesting, as these could potentially disrupt airport operations and compromise safety standards.	Discussions have been held with the Kenya Civil Aviation Authority (KCAA), and all requirements pertaining to aviation safety have been meticulously documented and provided to the design team. These requirements cover aspects such as permissible heights, waste management, bird control measures, and the selection of appropriate materials. Investigations have been conducted to address these concerns, and as the design phase progresses, further adjustments will be made to ensure full compliance with aviation safety standards.

S/N.	Issues raised by the members	Brief explanation	Response
		Height Approval for Building and Cranes: the proponent to fully adhere to all regulations set forth in the Civil Aviation Act No. 21 of 2013. Concerns were also raised regarding the use of cranes during construction, particularly those exceeding 25 meters in height, which surpasses approved height limits.	The project team is currently at the design stage and is working with an approved height of 25m. However, the use of cranes will necessitate a height increase of about 4-5m. Therefore, approval from KCAA will be sought for this height variation.

Detailed Minutes of the key stakeholders' meeting are attached in the appendices (*Annex 7*).

6.4 Project impacts raised during the consultative public participation (Questionnaires)

6.4.1 Positive impacts

The feedback gathered during the interviews highlighted several positive impacts of the proposed project:

6.4.1.1 Increased demand for construction materials benefiting nearby businesses:

Interviews revealed that the construction of the proposed 4-star hotel is anticipated to result in a significant rise in the demand for construction materials. This surge not only facilitates the progress of the hotel project but also provides a substantial economic boost to local businesses engaged in supplying these materials.

6.4.1.2 Employment opportunities for locals:

The hotel project will serve as a source of employment for local residents as it will address a crucial need within the community, contributing to job creation and economic stability.

6.4.1.3 Increased revenue for local businesses:

The anticipation of increased patronage due to the hotel's presence suggests a positive economic impact. Local businesses are expected to experience a surge in revenue as they cater to the needs of hotel guests, thereby fostering economic growth in the area.

6.4.1.4 Increased customer base for businesses around the proposed project:

There will be an expanded customer base for businesses surrounding the hotel project giving a positive spillover effect. The influx of guests to the hotel is expected to benefit nearby establishments, creating a more vibrant local economy.

6.4.1.5 Modern building and equipment introduction:

The project will not only ensure the hotel's competitiveness but also contribute to the overall modernization of the local infrastructure.

6.4.1.6 Opportunities for women vendors:

Recognition of opportunities for women vendors underscores a commitment to inclusivity. The project is perceived as providing equal economic opportunities, fostering diversity and social sustainability.

6.4.1.7 Boost in food market supply to workers:

The anticipation of an increased demand for food due to the hotel project will have a positive impact on local restaurants and vendors. This boost in demand will potentially create new opportunities and enhance the viability of food-related businesses.

6.4.1.8 Boost for nearby businesses and services:

The positive impact the project will have on nearby businesses be a catalyst for local economic growth. This could lead to a more thriving and interconnected business community.

6.4.1.9 Increased tourist activities and foreign exchange:

There will be increased tourist activities and foreign exchange making the hotel project a significant contributor to the local tourism industry. This will lead to a more diversified and robust economy.

6.4.1.10 Improvement in the visual aspect of the airport:

The project will improve aesthetics around the airport contributing to enhancing the overall visual appeal of the area. This could have positive effects on the perception of the area as a whole.

6.4.1.11 Provision of food and accommodation services:
The hotel project is aligned with meeting the needs of travellers and will enhance the area's hospitality infrastructure and attractiveness to visitors.

6.4.1.12 More business traffic for hoteliers:
There will be business traffic for local hoteliers. This will have a positive economic impact on existing hotels. This will lead to a more vibrant and competitive hospitality industry in the area.

6.4.1.13 Reduced competition among hotels:
The new hotel will complement rather than compete with existing establishments. This can foster a collaborative and mutually beneficial environment within the hospitality sector.

6.4.1.14 Paving the way for new investors:
The project is likely to pave way for new investors making it a catalyst for attracting additional investments, potentially diversifying the local economy.

6.4.2 Negative Impacts
The following additional negative impacts were highlighted during the interviews:

6.4.2.1 Accidents Caused by Transportation Trucks:
The fear of accidents involving transportation trucks relates to the increased traffic and movement of construction-related vehicles. Respondents are concerned about the potential risks to both pedestrians and drivers, emphasizing the need for safety measures.

6.4.2.2 Potential Insecurity due to Accommodation of Foreigners:
The accommodation of foreigners raises concerns about potential security issues within the community. Respondents express worry about the adequacy of security measures to handle the increased number of visitors, aiming to ensure the safety of both locals and tourists.

6.4.2.3 Escalated Competition with Existing Hotels:
Local hoteliers expressed concerns about intensified competition and potential market share loss due to the introduction of a new 4-star hotel. This apprehension reflects the economic implications and challenges faced by existing businesses in the hospitality sector.

6.4.2.4 Decrease in Foot Traffic at the Food Court:
Concerns about a decrease in foot traffic at the food court stem from the anticipation that the 4-star hotel might draw customers away from local eateries. This apprehension highlights the potential economic impact on small businesses in the food industry.

6.4.2.5 Reduction in Income for Local Businesses:
The worry about a reduction in income for local businesses is linked to the potential decline in customer patronage as a result of the hotel project. Service providers fear economic hardships and seek reassurances for the sustainability of their businesses.

6.4.3 Mitigation Measures from respondents
The following are the proposed mitigation measures from the respondents:

6.4.3.1 Fire Safety:
- Fire extinguishers should be serviced and maintained on-site at all times to address fire hazards, and proper handling and disposal procedures for flammable materials will be strictly adhered to.

6.4.3.2 Renewable Energy:

- The project should prioritize the use of renewable energy sources to minimize emissions and reduce environmental impact. Additionally, the servicing of equipment will be optimized to enhance energy efficiency.

6.4.3.3 Energy Saving Practices:

- Energy-saving practices and the use of energy-efficient equipment should be incorporated into the project design and operations. Harnessing solar energy should be encouraged to further reduce reliance on conventional energy sources and promote sustainability.

6.4.3.4 Adherence to Water Quality Regulations:

- The proponent should comply with Water Quality Regulations of 2006 concerning effluent discharge to prevent pollution and ensure the preservation of water quality in the surrounding area.

6.4.3.5 Area Reclamation and Regreening:

- Efforts should be made to reclaim the project area and promote regreening initiatives to restore natural vegetation and enhance the environmental aesthetics of the compound.

6.4.3.6 Site Investigation and Service Line Identification:

- Thorough site investigations should be conducted to identify underground service lines and infrastructure, with necessary measures taken to relocate affected services in consultation with the Kenya Airports Authority (KAA) to prevent disruptions.

6.4.3.7 Firefighting Systems and Emergency Response:

- Elaborate firefighting systems and emergency response plans should be implemented during the operational phase in compliance with Fire Reduction Rules to ensure prompt and effective response to fire incidents.

6.4.3.8 Enhanced Security Measures:

- Security enhancements should be implemented to safeguard the hotel premises and the airport, enhancing overall security measures to mitigate potential risks and ensure the safety of guests and airport personnel.

6.4.3.9 Diversification of Services and Products:

- Diverse services and products should be offered in the hotel to minimize competition and cater to the varied needs and preferences of guests, enhancing the overall guest experience.

6.4.3.10 Utilization of Modern Technology:

- Modern technology should be utilized during the decommissioning phase to streamline processes, enhance efficiency, and minimize environmental impact during the cessation of operations.

6.5 Suggestions from the Respondents

The following are the suggestions proposed by the respondents during the ESIA study consultative public participation exercise;

- The project should designate a liaison person to KAA during the construction phase to facilitate communication and coordination between the project team and airport authorities.
- The proponent should ensure that backfilling and construction activities are promptly carried out post-excavation as per the scheduled timeline. This measure aims to prevent water ponding, thereby mitigating the potential increase in bird activity within the airport vicinity.

- Preference should be given to companies located around the hotel area when awarding project tenders to foster local economic development and supporting businesses within the immediate vicinity.
- To promote employee well-being and foster community engagement, individuals working within the airport/cargo center should be offered discounted access to amenities such as the gym and swimming pool.
- Preference should be given to local residents during the hiring process for all project phases.
- Instead of outsourcing services from external providers, priority should be given to local businesses within the airport vicinity to fulfill the project's service requirements.
- Any damage to airport facilities resulting from construction activities should be repaired or restored at the proponent's expense.

7 POSSIBLE ALTERNATIVES TO THE PROPOSED PROJECT

7.1 Introduction

This chapter analyses the project alternatives with respect to the site, materials, technology level, solid waste and water waste management options. It also involves studying the design alternatives based on their respective environmental cost The Environmental and social impact assessment seeks to assess the alternatives to the proposed project. The best alternative, usually with the least adverse impacts is chosen. Among the alternatives to be assessed are the "No project" and the relocation options.

7.2 No Action Alternative

The No Action Alternative with respect to the proposed project implies that the status quo is maintained, that is, no construction/redevelopment activity takes place. This option is most suitable alternative from an extreme environmental perspective as it ensures non-interference with the existing conditions. However, the need for such redevelopment is high and the anticipated environmental and social impacts resulting from construction have already been experienced. The land will remain under-utilized or neglected. The No Project Option is the least preferred from the socio-economic and partly environmental perspective since if the project is not done:

- The economic benefits especially during construction i.e. provision of jobs for skilled and non-skilled workers will not be realized.
- There will be no generation of income by the developer and the Government.
- The local skills would remain underutilized.
- No employment opportunities will be created for Kenyans who will work in the project area.
- Discouragement for investors to produce this level of standard and affordable developments in the future.

7.3 Alternative Site

Relocation option to a different site is an option available for the project implementation. At the moment, there are no alternative sites for the proposed development (i.e. the project proponent does not have an alternative site). This means that the proponent has to look for alternative land if relocation is proposed. Looking for the land to accommodate the scale and size of the project and completing official transactions on it may take a long period. In addition, it is not a guarantee that such land would be available. It is also worth noting that the said project is already underway in terms of seeking development approvals in various government departments and conducting of various other essential activities like socio-economic surveys, neighborhood analysis and geotechnical surveys. Therefore, the project proponent would spend another long period of time on the design and approvals of the plans by the relevant government departments. The project design and planning before the stage of implementation would call for costs; already incurred in the proposed development i.e. whatever has been done and paid to date would be counted as a loss to the proponent. In consideration of the above concerns and assessment of the current proposed site, relocation is not a viable option.

The proposed site is ideal for the following reasons:

- Strategic location within Jomo Kenyatta International Airport and Proximity to Wilson Airport and Syokimau Standard Gauge Railway taps into the demand for convenient guest accommodation rooms for both tourists and local businessmen.

- Proximity to Nairobi CBD and major roads such as Mombasa Road and Nairobi Expressway Road enhances the project's visibility and accessibility.

7.4 Schedule Alternative

This option entails carrying out the proposal at a later time thereby offsetting its impacts to that time. The only benefit is if there are improvements in baseline conditions and technologies that may be involved with the proposal. However, these are not guaranteed and it may only lead to delays in development, therefore carrying out the proposed project with mitigation would be a preferred option due to this uncertainty. In addition, carrying out the proposed project at a later time may lead to more operational and logistic costs due to increasing inflation and standards of living

7.5 Alternative Designs

All designs made for this project have been done professionally taking into account the topography, soil types and structure and with all environmental considerations to make sure that the developments do not negatively affect the surrounding environment. The architectural designs, structural engineering of the proposed hotel are specially designed and the construction will use modern technologies that are in accordance to sustainable development and green economy.

Sustainability design principles and construction parameters will be incorporated in the proposed project. Thus, the selection of materials will be informed by sustainable environmental practices. Equipment that saves energy and water consumption and those that minimize hazards will be given first priority without compromising on cost or availability factors. The recruitment of labor and procurement of materials and equipment will be guided by national laws and best practice guidelines.

7.6 Materials

There is a wide range of construction and furnishing materials that can be sourced locally and internationally. In this construction, certified raw materials/equipment and modern technology will be used. Also, electrical appliances that save energy will be given first priority. The concrete pillars and walls will be made using locally sourced stones, cement, sand (washed and clean), metal bars and fittings that meet the Kenya Bureau of Standards (KEBS) requirements.

7.7 Wastewater Management Options

- **Connection to the Sewer System**

Connection to the Nairobi City County sewer line will solve the waste management issue at a very minimal cost and in an environmentally efficient manner. This is the most viable option for the project since the area is already connected to the Nairobi City Water and Sewerage Company sewer line.

- **Use of Septic Tanks**

This involves the construction of underground concrete-made tanks to store the sludge. It is expensive to construct and requires regular emptying. In line with the Vision 2030 goals that aim for a nation where all its citizens have access to a clean, secure and sustainable environment, this alternative is inadequate to supplement wastewater disposal.

The proposed development intends to channel Wastewater to the Nairobi City Water and Sewerage Sanitation Company sewer system.

7.8 Solid Waste Management Options

There will be a lot of solid waste that will be generated from the project during construction. An integrated waste management system will be adopted to ensure that the recyclable and non-recyclable solid waste materials are properly disposed of and in an environmentally friendly approach. The proponent will ensure that waste is minimized at the source, there will be the reuse of waste where applicable and separation of waste; recyclable from non-recyclable. The proponent will also engage a waste handler that is NEMA-certified to help with the removal and disposal of waste. An integrated solid waste management system is recommended which is as follows:

a) First, the proponent should give priority to reduction at source of the materials. This option will demand a solid waste management awareness programme.
b) The proponent should also consider recycling and reusing the waste as a second alternative in priority. This shall call for at-source separation programme to be put in place. The recyclables may be sold to waste buyers locally or directly to any company that recycles waste such as plastic bags.
c) The third priority in the hierarchy of options is landfilling of the waste that is not recyclable or reusable. It is to the interest of the proponent and the community that the waste is effectively managed so as to maintain a safe and healthy environment to the workers and the community at large through appropriate disposal mechanisms.

7.9 The Proposed Development Alternative

Under the proposed development alternative, the developers of the proposed project would be issued with an EIA License. In issuing the license, NEMA would approve the proponent's proposed construction of the hotel, provided all environmental measures and alternative technologies are complied with during the construction period and operational phases. Since the potential negative impacts are relatively insignificant and the benefits accrued from the project will benefit both the proponent and the economy, this is the best alternative.

8 ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

8.1 Introduction

This chapter identifies and predicts the potential effects on various environmental elements arising from the construction, operation, and decommissioning of the proposed project. It comprehensively outlines the potential impacts on both the biophysical and socio-economic aspects of the local environment resulting from the planned activities and sub-activities. The prediction of impacts helps to minimize the adverse impacts and maximize the beneficial impacts on environmental quality.

The proposed project would create impact on the environment in three distinct phases:

- During the construction phase;
- During the operation phase; and
- During the decommissioning phase.

The project characteristics, form the basis for impact identification and evaluation. The impacts that are expected to arise from the project are either positive, negative, direct, indirect, short-term, or temporary. There are no adverse or permanent impacts anticipated in the proposed project.

The consultant used the scale indicated in *table 2.2* to analyze the proposed project impacts and quantified them in a scale of 0 – 5.

8.2 Positive Impacts during the Construction Phase

Positive impacts associated with the proposed project during the construction phase include:

8.2.1 Job Opportunities

Throughout the lifetime of the proposed project, numerous job opportunities shall be created, these being the need for casuals and trained personnel during the construction phase; the operation phase where watchman's accommodation management will be employed, and then further personnel needed for facility decommissioning. The project through the generation of employment will stimulate other economic activities. It will also enhance the casuals' skill levels through intensive and well-structured technology transfer. Several employment opportunities will be created for construction workers during this phase of the project and will employ both skilled and unskilled labour. Most of the construction labour will be sourced locally and this will benefit especially the youth who are the main victims of the high rate of unemployment in the community neighbouring the project area (JKIA). This impact will be **moderate (value of 2).**

8.2.2 Gains in the Local and National Economy

The project construction phase will generate revenue for both the National and County Governments. The National Government will benefit from various taxes (e.g. income tax, Value Added Tax (VAT), etc.) and approval fees (e.g. NCA). The county government will gain revenue in the form of construction plan approvals, local business licenses/permits, etc. All materials will be imported through the existing transport hubs which will earn revenue to the county. This impact will be **Moderate (value of 2).**

8.2.3 Provision of Market for Supply of Building Materials

The project will require supply of large quantities of building materials, most of which will be sourced locally. This provides a ready market for local building materials. This will in turn improve income generation for local materials suppliers, quarrying companies, hardware shops, etc. Surrounding businesses will benefit from increased customer base with the overall effect of increased business

activity and expansion. High influx of customers coming from the project site will also promote publicity and competitiveness of local businesses. This impact will be **High (value of 3).**

8.2.4 Provision of Opportunities for Advancement of Environmental Technologies.

The need to ensure that environmental impacts are mitigated and controlled has fueled the mushrooming of many new technologies that provide sustainable environmental solutions. A good example is the embracing the green building practices during construction. Every new construction project provides numerous opportunities for furtherance of sustainable green building practices and promotion of progressive environmental technological solutions. This impact will be **Moderate (value of 2)**.

8.2.5 Provision of a ready food supply market

The inception of project's construction activities will create a demand for food required by the large number of workers and other related staffs. The increased food demand in turn, will increase more business opportunities and revenues for food vendors mostly belonging to the low-income cadre of society comprising women and youths, directly improving their livelihoods. This impact will be **Moderate (value of 2).**

8.2.6 Improvement of the High-End status of Airport's accommodation facilities

The project will be situated in an airport environment comprising a variety of business, factories, companies and other private organizations. By virtue of the proposed project involving the development of a four-star hotel, this will improve the image status and reputation of the airport premises. Neighboring business will also benefit from the luxury and the pomp associated with being in close proximity to a world class hotel and its affiliate amenities through increased clientele and accompanying publicity. This impact will be **Moderate (value of 2).**

8.2.7 Introduction of a state-of-art building, amenities and equipment

Any new project of such magnitude as the propose project provides an opportunity for developers and contractors to embrace and make use of the most advanced technologies and best practices in the construction industry. The proposed project is no exception, as it will incorporate start of art building technologies and designs with installation of modern amenities, equipment and facilities for use by ever evolving clients with a taste for new and better varieties of hotel services. This impact will be **Moderate (value of 2)**.

8.3 Negative Impacts during the Construction Phase

8.3.1 Vegetation clearing

Vegetation has a great effect on the general and localized environment and normally can modify microclimate. Usually, the flora creates a good environment for habitats thus the two may go together more often than not. In consequence, de-vegetation during construction may result to negative effects on the fauna by creating a disturbance

Most of the vegetation within the project site will be cleared as part of the site preparation for construction. The topsoil will be stripped as part of site preparation. Site clearance activities are associated with loss of biodiversity, soil erosion and increased runoff. The loss of vegetation also has a great effect on the general and localized environment and normally can modify microclimate. With regards to flora, there are no known red-list species or significant indigenous vegetation on-site or within the project area. The only areas of concern with regard to biodiversity are 10 acacia trees, bushes and grass vegetation. This impact will be **moderate (value of 2).**

Potential mitigation measures

- Landscape and plant vegetation in all open areas after the completion of the project;

- Ensure fruit-producing trees and plants that attract wildlife or birds and encourage nesting are avoided in landscaping as these could potentially disrupt airport operations and compromise safety standards.
- Restriction of construction activities to defined project areas;
- Back-filling of all excavated areas with the overburden or soil stockpiles immediately after completion of earthworks.
- Used soil stockpiles shall be used in levelling of rugged earth roads sections, filling quarries or borrow pits.
- Provide drainage channels to minimize erosion;
- After completion of earthworks, grasses should be planted on all open areas to minimize soil erosion;
- Stockpiles shall not be allowed to become contaminated with oil, diesel, petrol, garbage or any other material, which may inhibit the later growth of vegetation;
- Soil conservation measures should be taken to the stockpiles to prevent erosion;
- Liaise with county government to ensure safe removal of underground fiber or electric cables at the proposed project site during excavation works.
- Soil stockpiles shall not be higher than 2.5 m or stored for a period longer than 2 months.
- Stabilize the excavated areas to prevent caving in of soil.

8.3.2 Increased Noise and vibration generation

Major source of noise at the airport area are the aircrafts whose effects are also felt outside the airport grounds to the adjacent areas. The noise so generated is intermittent, that it occurs only when a flight event is taking place (a take-off or a landing). Other sources at the terminal areas include stationary and taxiing aircrafts, ground support equipment, surface transport vehicles, cargo operations and power back-up generators (when in use). The proposed project site is located within a specialized freight area surrounded by light industrial companies dealing with Cargo operations that are noisy especially at night with the peak hours being 8 pm to 4 pm. The potential sources within the project area include: Vacuum Pump Chillers from nearby cargo operating company Kuhne & Nagel, Air Compressors, Aircrafts, Dollies used in transporting Cargo Trucks and Lorries.

A noise and vibration survey exercise was conducted on **26th and 27th March 2024.** The loudest and most intrusive noise source was found to be road noise from tractor-drawn dollies. Unloaded dollies were noticeably noisier than loaded dollies. In the absence of vehicular noise, the predominant noise source is plant noise from the neighbouring Kuehne+Nagel site to the west. Noisy events exceeded LAeq 80 dBA regularly through the night (10 times on the recorded night) but only exceeded LAeq 85 dBA twice.

Vibration recordings of passing tractor dollies were found to be well below the threshold for audible ground-borne noise at the nearest building façade. Ground-borne vibration measurements from dollies showed that vibrations from the dollies will not create audible ground-borne noise in the building.

The construction activities within the project site are not likely to result in a significant increase in noise and vibration levels internally or externally but may result to increased background noise levels within the airport. The main sources of noise expected will be from moving machines, material delivery vehicles and communicating workers. To be affected mostly are the site workers since noise beyond some level is itself a nuisance if not maintained within acceptable limits (an exposure 85 Db/ 8 hours as WHO standards). Exposure of workers beyond the specified limits will lead to hearing complications such as tinnitus, and partial or even complete hearing loss. The impact is anticipated to be high and has been **given a score of 3.**

Potential mitigation measures

The following noise-suppression techniques will be employed to minimize the impact of temporary construction noise and vibrations at the project site.

- Provide appropriate protective gear including ear corks and ear muffs to all construction workers working in noisy sections and enforce application at all times during the construction works,;
- Sensitization of drivers handling construction vehicles and machinery to switch off engines or machinery that are not being used;
- Consult and inform the immediate stakeholders before undertaking a blast. Any blasting should be supervised and within the established regulations from the Geology and Mines Department;
- Ensure that all vehicles and construction machinery are well maintained and regularly serviced to avoid excessive noise generation;
- Deploy compact machinery and fit them with mufflers and vibration dampers;
- The contractor will endeavour to comply with the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009.
- Install portable barriers to shield compressors and other small stationary equipment where necessary;
- Install sound barriers for pile driving activity;
- Ensure sound insulation technologies employed during the construction phase work effectively towards minimising high noise levels from external environment in the vicinity.
- Limit pickup trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use;
- The delivery of construction materials and noisy activities should be done preferably at off-peak hours to minimize high level noise impacts;
- Construction activities will be done during daytime to minimize noise disturbances to neighboring community at night.

8.3.3 Increased Solid Waste Generation

Solid waste will consist of construction debris, cement bags, wood, broken glasses, containers, metal, sharp objects such as nails, organic waste, paper, and plastic among others during the development's construction phase. Transportation of construction materials or solid waste to and/or from the project site can also cause littering along the airport roads and nearby facilities if the transportation trucks are not appropriately covered. This impact will be **High**, hence a **value of 3.**

Potential mitigation measure

- Efficient use of building material to reduce waste and recycling/reuse where feasible;
- Develop a comprehensive waste management plan for the construction period guided by the ESMP and the NEMA Waste Management Guidelines;
- Ensure daily removal of solid waste materials from the construction sites to avoid unnecessary accumulation at the locations;
- Engage the services of registered waste handlers to collect and transport waste to designated disposal sites;
- Management of all paint materials confirmed of containing lead as a hazardous waste;
- Choose building materials that are least polluting and environmentally sustainable;
- Provide a central Waste receptacle;
- Provide mechanisms to segregate waste at source to enable recycling;
- Consider reselling reusable or recyclable waste materials such as paper, cardboard, plastic etc. to local waste recyclers;

- Use of an Integrated Solid Waste Management System (ISWMS); through a hierarchy of options including source reduction, recycling, composting and reuse;
- Manage all waste in line with the requirements of the Environmental Management and Co-ordination (Waste Management) Regulations, 2006.

8.3.4 Increased generation of Waste Water

During construction, a large number of workers will be employed who will require adequate sanitation facilities. Wastewater will also be generated during construction activities such as concrete curing. This will be a concern that the contractor has to address as he engages in the construction of the proposed hotel. This impact will be **moderate**, hence a **value of 2**.

Potential mitigation measures

- The contractor should install mobile toilets separate for males and females that are well-maintained and with adequate hand washing facilities;
- Water containing pollutants such as cement, concrete, lime, chemicals, and fuels should be discharged into a conservancy tank for removal from the site.
- Ensure that the proposed project does not delay after the commencement of construction activities and it is built in record time to avert potential aviation control risks through bird attraction sites brought about by stagnant pools of rainwater.
- Control of water usage during construction activities to minimize wastage;
- Potential Pollutants of any kind should be contained to ensure the water table is not endangered.
- Promote recycling of wastewater and stormwater.
- Install water meters to monitor consumption rates
- Comply with the EMCA (Water Quality regulations, 2006)

8.3.5 Air Pollution, Particles and Dust Emission

Construction equipment and vehicles associated with the construction of the proposed hotel will generate additional emissions into the atmosphere within the airport grounds. While previous measurements show low concentrations due to the dispersal conditions, the overall actual emissions (CO, CO2, NOx, Sox and VOCs etc.) will be dependent on the additional number of fossil fuel-driven equipment including earthmovers, pavers, batching plants and material movement trucks.

Dust emissions (particulate matter PM) will also increase proportionately with the additional magnitudes of earthworks, materials mobilization and batching as well as additional movements of trucks into and out of the airport grounds.

The existing air quality conditions in the proposed project site have been documented to provide baseline data that form a basis for monitoring. CO, NO_2 and VOCs levels were found to be within permissible levels as per EMCA Air Quality Regulations, 2014. SO2 levels were however found to be higher due to the vehicular traffic along the surrounding roads. *Refer to Annex 14 for the detailed report*. This impact will be **Moderate**, hence a **value of 2**.

Potential mitigation measures

- To the extent possible, undertake earthworks in dump conditions to reduce dust emissions.
- Regular Sprinkling of water on dry and dusty surfaces on access roads within the airport used by the construction trucks to keep dust low,
- Materials management and batching plants associated with the project should be designed for low dust and emissions.
- Ensure no burning of waste such as paper and plastic containers on site;

- Minimize exposed areas through schedule of construction activities to enable dust control;
- Onsite dirt piles or other stockpiled material should be covered, windbreaks installed, water and/or soil stabilizers employed to reduce wind-blown dust emissions;
- All staff employed at the construction site and visitors must be provided with dust masks;
- Slow speed of traffic by using clearly marked road signs to reduce dust levels
- Erection of dust screens around the construction site;
- Fueled construction equipment shall be used where feasible with environmentally friendly fuels such as low-sulphur diesel;
- All raw materials where possible must be sourced as close as possible to the construction site thus reducing the emissions from vehicular traffic;
- Regular and prompt maintenance of construction machinery and equipment to minimize the generation of hazardous gases;
- Restricting heights from which materials are to be dropped, as far as practicable to minimize the fugitive dust arising from unloading/loading;
- Monitor the air pollution levels regularly to ensure compliance to EMCA Air Quality regulations, 2014;
- Embrace modern technology in the use more efficient construction equipment and machinery to suppress emission levels of hydrocarbons.

8.3.6 High Demand of Raw Materials

The proponent will source building materials such as sand, ballast and hardcore from a registered quarry and sand mining firms, whose projects have undergone satisfactory environmental impact assessment/audit and received NEMA approval. Since such firms are expected to apply acceptable environmental performance standards, the negative impacts of their activities at the extraction sites are considerably well mitigated. This impact will be **moderate**, hence a **value of 2**.

Mitigation measures

- Source building materials from local suppliers who use environmentally friendly processes in their operations
- Ensure accurate budgeting and estimation of actual construction material requirements to ensure that the least amount of material necessary is ordered.
- Ensure that damage or loss of materials at the construction site is kept minimal through proper storage.

8.3.7 Oil Leaks and Spills

During the construction phase, some of the site's construction equipment will require diesel and/or oil. It is also 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. 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. There is therefore the risk of leaks or spills and the potential for contaminating the site's soil. The impacts of improperly stored fuel and other chemicals could prove detrimental if these fluids infiltrate the surface waters or groundwater systems. Management guidelines should be implemented in order to regulate and document the use of explosives, chemicals and fuels within the project site. Operators should express due caution when it comes to the re-fueling of equipment on site, as an accidental oil spill is more likely to occur during these activities. This impact will be **minimal**, hence a **value of 1**.

Potential mitigation measures

- Train personnel on the risks of oil spills and leakages;
- Refueling and maintenance of large vehicles will only take place at a designated garage;
- All hazardous materials will be stored in appropriately banded containers and placed on concrete floors as where applicable;
- Maintaining spill response kits at the construction site at all times;
- Prepare and display on-site spill response procedures and training of workers on spill response and management;
- The site design should incorporate oil sumps at the parking areas to isolate oil spills from parked vehicles that might spill into the storm drains;
- No solid waste, fuels, or oils shall be discharged on the land surface or into drains.
- All oil products and materials should be stored in site stores;
- Any wash-off from the oil/grease handling area or workshop shall be drained through impervious drains;
- Regularly check for leaks from paint containers;
- Unwanted paint will not be disposed of by pouring it on soil or stormwater drains;
- All machinery must be keenly monitored to prevent oil leaks on the ground. This can be affected through regular maintenance of the machinery;
- Maintenance must be carried out in a designated area (protected service bays) and where oils are completely restrained from reaching the ground. Such areas should be covered to prevent storms from carrying away oils into the soil or water systems.

8.3.8 Occupational Health and Safety Risks

Construction workers will be susceptible to health and safety hazards during the construction phase of the project. Inherent occupational risks include muscular-skeletal injuries, cuts and bruises, falls into unmarked/ uncovered trenches, and falls from height. This impact will be **moderate** hence a **value of 2.**

Potential mitigation measures

- Send a notification to DOSHs two weeks prior to the commencement of construction.
- Appoint a site Safety Officer to monitor compliance to OSHA, 2007.
- Keep a well-stocked first aid kit of the prescribed standard and have trained first aiders amongst the project employees.
- Training of workers in safety issues related to their activities, such as the hazards of working at height, use of high-visibility safety apparel and safe manual lifting.
- The area around which elevated work is taking place should be barricaded to prevent unauthorized access. Working under personnel on elevated structures should be avoided.
- Ladders should be used according to pre-established safety procedures for proper placement, climbing, standing, as well as the use of extensions.
- Implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers, among others.
- Provide appropriate PPE to workers.
- Ensure that electrical fittings are done by qualified contractors and regular inspections of the facility's electrical system is done by qualified personnel to avert electrical faults.
- Ensure proper installation of staircases and lifts that could serve as alternative escape routes during emergencies.
- Ensure proper ventilation of the basement of the building.
- Ensure that scaffolds are constructed as the requisite standards with safe means of access
- Comply with the provisions of OSHA, 2007.

- Ensure all Lifting Plant Equipment are examined by an Authorized Plant Examiner
- Carry out Occupational Medical Examinations for all workers.
- Train workers on Occupational Safety and Health and Construction Safety
- Ensure provisions for reporting incidents, accidents and dangerous occurrences, during construction use prescribed forms from the Directorate of Occupational Safety and Health.
- Ensure Compliance to the Occupational Safety and Health Act, 2007.

8.3.9 Increased water abstraction and consumption

Construction projects utilize significant quantities of water for concrete mixing laying and curing. Water will also be required for human use including drinking and sanitary needs. This could lead to strain on the available water resources. This impact will be **high** hence a **value of 3.**

Potential mitigation measures

- Water will be recycled where possible without compromising on quality and health.
- Ensure good use of water resources during construction by installing taps on all outlets and minimizing wastage by ensuring regular repair and replacement of broken or worn-out pipes and fittings.
- Identify activities and areas that cause high consumption and implement conservation practices.
- Install gutters on the roof for site offices to harvest rainwater and Construct an underground reservoir for storage of harvested water.
- Install water-saving devices in appropriate places such as flow regulators, self-closing taps
- Drilling of a borehole to supplement supply from Nairobi Water and Sewerage company;
- Ensure Compliance to the Water Act 2016, and EMCA Water Quality regulations, 2006.

8.3.10 Traffic Impact

The site can be accessed through the first freight lane at JKIA. Since most of the business enterprises located along the lane are logistical in nature, there will be increased human and vehicular traffic in the area. This will occur as vehicles bring in deliveries at the site and as workers leave or come to the site. Heavy traffic is normally experienced along the first freight lane, especially during staff arrival and departure times. Vegpro, a neighboring business, contributes to this traffic with a large workforce and fleet of buses. The site will generate higher traffic than normally experienced within the airport.

Additional vehicles serving the project will definitely be a significant number. This has the potential to cause an increase in road accidents. Precautions must be put in place to reduce traffic accidents and incidents. This impact will be **high** hence a **value of 3.**

Potential mitigation measures

The proponent has conducted a Traffic Impact Assessment study (*Report is attached as Annex 16*) for the proposed project site to address traffic concerns during both the construction and post-construction phases, with the aim of optimizing available space. However, the project contractor should put in place the following measures to reduce traffic:

- Adopt a Traffic Management plan and delivery management plan to enhance traffic movement within the site and along first freight lane.
- Heavy Commercial Vehicles (HCVs) delivering construction materials should observe designated speed limits for the area.
- Proper signage and warnings shall be placed at appropriate places along the site road to forewarn other motorists of HCVs turning and transportation of abnormal loads.
- Minimize haulage and transportation of construction material during peak hours.

- Flagmen/traffic marshals shall be deployed at the entrance to control traffic.
- Construct acceleration and deceleration lanes to channel delivery trucks to the site without creating a backlog of traffic behind them as they navigate turns of entry.
- Proper signage and warnings shall be placed at strategic locations to direct traffic to minimize inconveniences to motorists and forewarn other motorists of HCVs turning and transportation of abnormal loads.
- Ensure the construction doesn't occupy road reserves and complies with the Traffic and land demarcation obligations.
- All materials will be offloaded on the site and adequate space for that will be provided.
- Enough parking spaces will be created for the vehicles transporting workers and heavy tracks offloading the construction materials.
- The selection of construction areas shall be based on the existing road layout and the location of access to the various commercial and residential properties.
- Any change in the normal programming of activities that will significantly disrupt normalcy along the abutting project roads should be timely communicated

8.3.11 Traffic Accidents

Due to increased human and vehicular traffic in the area, the proposed project might lead to increased number of Accidents. This impact will be **minimal** hence a **value of 1.**

Potential Mitigation Measures

- Employ traffic marshals to control the movement of vehicles during the construction phase of the project.
- Implement the annexed Traffic Management Plan to enhance the traffic movement within the site and the public road.
- Use of signs for diversion and to warn motorists against dangers at or near construction site.
- Use of reflective jackets among other PPEs to avoid accidents.
- Work closely with the traffic police to ensure that any incident on the detours is quickly cleared to ensure the continual operation of the detours

8.3.12 Increased energy demand

Construction activities will use engine-driven machinery such as transportation vehicles, concrete mixers and vibrators, compressors and power generators that require fossil fuel inputs such as diesel and petrol. Their continual application will increase the demand for energy. This impact will be **moderate** hence a **value of 2.**

Potential mitigation measures

- Switch off engines when not in use.
- Use well-serviced construction machinery that is efficient in fuel consumption.
- Maximize the use of natural lighting by limiting construction works to daytime.
- Repair or replace any faulty equipment with more efficient and economical alternatives.
- Utilize electricity meters to monitor energy consumption within all work sections and identify areas which cost most energy in order to forestall appropriate energy conservation measures.
- Create awareness among workers on the importance of conservation of energy resources.
- Employ technologies that demand less energy consumption.
- Use energy-saving lighting systems.

8.3.13 Insecurity

Construction sites in Kenya attract all manner of people not directly engaged in the work. These will include people hoping to secure some form of casual work, outside caterers and idlers. This introduces an element of insecurity at the construction site. There has been past cases on the risk of fuel pilferage for some other project within the project site area due to lack of security personnel manning the site. This impact will be **moderate** hence a **value of 2.**

Potential mitigation measures

- The contractor should contact due diligence while recruiting workers to ensure only people of good conduct access the site.
- The Airport being a sensitive area clear security protocols should be established and followed.
- The contractor should obtain gate passes for all workers from KAA and provide for their transportation from JKIA entrance gate and from the site back to the exit gate.
- Secure the site and have security personnel manning the site.
- The contractor to give out information of suspecting conduct within the site to the local administration.
- Hire services of a security firm to monitor personnel or visitor movement within and close to the site.
- Formulate and instill a place of work conduct.
- Ensure every construction staff biodata is well captured
- The contractor will work closely with the JKIA Airport Security to ensure the government provides security during construction.

8.3.14 Interference with stormwater Drainage Systems and Surface Hydrology

As drainage areas become increasingly impervious due to urban development, stormwater runoff volumes, flows, and velocities increase, while base groundwater flows decrease. Small annual storm events that would be captured by the plants and soils of an undeveloped landscape are delivered quickly and efficiently to the receiving pipe network and streams. Human activities in the city also generate increased pollutant loads, ranging from heavy automobile traffic to the use of various chemicals. These pollutants, as well as the deposition of atmospheric pollution from outside of the city, build up on impervious surfaces during dry weather, and rain and snow events wash these pollutants into the city's drainage channels, streams, and rivers.

Excavation of soils to construct foundations may result in loose soil which may be washed alongside any poorly disposed waste on site to clog storm drains. The loose soil is also likely to increase sediment load in stormwater. Together with the loss of flora, changing the characteristics of the project site from its present state to a more built state and changing the soil's characteristics, the proposed project will lead to a change in the water regime at the project site. This is because the built areas will increase run-off while reducing the percolation of water into the ground and thereby also changing the sub-surface hydrology.

By overloading the capacity of storm sewers, unmanaged stormwater runoff is responsible for increased combined sewer overflow events and adverse downstream impacts such as flash flooding, channel erosion, surface and groundwater pollution, and habitat degradation. With the recent ongoing heavy rains in the country, Jomo Kenyatta International Airport area is one of the areas in the city that has experienced flooding. This impact will be **moderate** hence a **value of 2.**

Mitigation Measures

- **Adopt Green Roofing Technology:** These refer to Practices that capture and store rainfall in an engineered growing media that is designed to support plant growth. A portion of the captured rainfall evaporates or is taken up by plants, which helps reduce runoff volumes, peak runoff rates, and pollutant loads on development sites. The roofs are designed so that water drains vertically through the media and then horizontally along a waterproofing layer towards the outlet. Plant species are selected so that the roof does not need supplemental irrigation or fertilization after vegetation is initially established.
- **Practice rainwater harvesting:** Rainwater that falls on a rooftop or other impervious surface is collected and conveyed into an above- or belowground storage tank where it can be used for landscape irrigation, cleaning, flushing of toilets and urinals, fire suppression (sprinkler systems) and replenishment of water fountains. In many instances, rainwater harvesting can be combined with a secondary (down-gradient) stormwater practice to enhance stormwater retention and/or provide treatment of overflow from the rainwater harvesting system.
- **Impervious Surface Disconnection:** This strategy involves managing runoff close to its source by intercepting, infiltrating, filtering, treating or reusing it as it moves from the impervious surface to the drainage system. Disconnection practices can be used to reduce the volume of runoff that enters the combined or separate sewer systems.
- **Adopting permeable Pavement Systems:** Alternative paving surfaces that capture and temporarily store the Stormwater Retention Volume by filtering runoff through voids in the pavement surface into an underlying stone reservoir. Filtered runoff may be collected and returned to the conveyance system or allowed to partially infiltrate into the soil.
- **Detention vaults:** Detention vaults are box-shaped underground stormwater storage facilities typically constructed with reinforced concrete. Detention tanks are underground storage facilities typically constructed with large diameter metal or plastic pipe.
- **Tree Planting and Preservation:** Existing trees can be preserved, or new trees can be planted to reduce stormwater runoff. Tree canopy can intercept a significant amount of rainfall before it becomes runoff, particularly if the tree canopy covers impervious surface, such as in the case of street trees. Through the processes of evapotranspiration and nutrient uptake, trees located on a development site have the capacity to reduce stormwater runoff volumes and improve water quality. Further, through root growth, trees can improve the infiltration capacity of the soils in which they grow. Both tree planting and tree preservation can contribute to stormwater management on a site.
- The drainage system should ensure that surface flow is drained suitably into the public drains provided to control flooding within the site.
- Installing cascades to break the impact of water flowing into the drains. Controlling the earthworks and ensuring the management of excavation activities.
- The drainage channels should be installed in all areas that generate or receive surface water such as car parking, driveways and along the building block edges of the roofs.
- The channels should be covered with gratings or other suitable and approved materials to prevent the occurrence of accidents and entry dirt that would compromise the flow of run-off.
- The channels should be designed with regards to the peak volumes such as periods or seasons when there is a high intensity of rainfall.
- The drainage channels should ensure the safe final disposal of run-off /surface water and should be self-cleaning which means it should have a suitable gradient.

8.3.15 Visual Impact

The proposed development will have an impact to the JKIA Project area natural environment thus changing the appearance of the area. This impact will be **moderate** hence a **value of 2.**

The proponent is advised to:

Restore active works areas through backfilling, landscaping by planting of indigenous trees, shrubs, and grass on the open spaces to re-introduce visual barriers.

8.3.16 Aviation Safety

Height Approval for Building and Cranes: As per the Civil Aviation Act No. 21 of 2013, property developers must seek approval from the authority before putting up a storey building next to or within an airport. The main reason behind the move is the need to regulate the height of buildings due to an airport's safety and operation concerns. Most importantly, the height of buildings is regulated to ensure that there is no obstacle hindering landing planes, given the specific procedures conducted before the exercise. KCAA approval should also be obtained for cranes to be used during the construction phase.

Additionally, airport traffic management relies on radar signals to control traffic. Large buildings are likely to block inbound and outbound signals hence affecting communication between the command centre and pilots.

Building Materials: The use of reflective building materials on any development within the aerodrome or vicinity poses a serious threat to aircraft operational safety.

Landscaping Guidelines: KCAA highlighted the importance of selecting plants and trees for landscaping that do not attract wildlife or birds. Specifically, they recommended avoiding fruit-producing trees or those that encourage bird nesting, as these could potentially disrupt airport operations and compromise safety standards.

Mitigation Measures:

- The proponent should fully adhere to all regulations set forth in the Civil Aviation Act No. 21 of 2013 regarding compliance with height regulations, due to the project's proximity to the runway. KCAA has the authority to determine the allowable height for the construction of the hotel. *The proponent has obtained a building height approval of 25M from KCAA. Refer to Annex 9.*
- The proponent should also apply and obtain a change of use for the proposed piece of land to be developed from use light industrial to hotel establishment. *Change of use has been obtained and is annexed to the report as Annex 8.*
- Approval from KCAA is necessary for crane usage, considering the specific location's obstacles and limitation. If the proponent intends to use cranes exceeding 25 meters in height during construction, approval for the same should be obtained from KCAA. Height approval must be obtained before construction commences to ensure compliance with aviation safety regulations.
- The proponent should avoid the use of reflective materials on the proposed development due to the site's proximity to an aerodrome. *This has been integrated in the project designs on the type of material to be used.*
- The proponent should select plants and trees that do not attract wildlife or birds for landscaping. It is advisable to avoid fruit-producing trees or those that encourage bird

nesting, as these could potentially disrupt airport operations and compromise safety standards.

8.4 Positive Impacts during the Operation Phase

8.4.1 Employment creation

The proposed project will create employment in three tiers, with the first being the staff that will be primarily involved in its implementation, supervision and maintenance. The second tier will be staff for the other support facilities such as the Gym and recreational areas. The third type of employment creation will be for the people who will take the opportunities presented to service the increased population and the population's amenities. Some of the employment opportunities include: managers, security personnel, solid waste management staff, chefs, cleaners, waiters, and repair and maintenance technicians. This impact will be **moderate** hence a **value of 2.**

8.4.2 Optimal use of land

Being state of the art hotel, the project will see optimal use of land. Land is a scarce resource in Kenya and through implementation of the proposed project will ensure optimal use of land to the great benefit of the country and its people. This impact will be **moderate** hence a **value of 2.**

8.4.3 Increased Commercial Viability

The establishment of the project in the area will increase the economic viability of the area and will consequently increase the land values in the surrounding area due to the potential high returns after development. This will attract more high-income investors into the region as well as more middle-income groups as settlers. This impact will be **moderate** hence a **value of 2.**

8.4.4 Provision of Affordable, Modern and Easily Accessible Accommodation

Jomo Kenyatta International Airport being Kenya's largest aviation facility, and the busiest airport in East Africa, is bound to receive many international visitors. The proposed project aims to provide affordable, modern and easily accessible accommodation to both local and international guests. This impact will be **moderate** hence a **value of 2.**

8.4.5 Tourism Promotion

A four-star hotel at an international airport can attract tourists and business travelers, promoting the destination as a viable and luxurious stopover or stay. This can positively impact the tourism industry, bringing in more visitors and revenue to the region. This impact will be **moderate** hence a **value of 2.**

8.4.6 Improvement in revenues and expansion of local businesses.

Some of local companies likely to benefit from the presence of the proposed project comprise; clearing and forwarding companies providing logistics services, private waste collection and disposal companies, foodstuff supplying companies, professional cleaners companies, Freight services companies among several others. One essential trickle down benefit of the project is an increased number of walk-in customers for local businesses. A hike in demand for the provision of support services created by the project will provide a wider market for local businesses, this directly translates in a surge in revenues of local businesses, thus boosting both local and national economy.

8.4.7 Contributing to the appealing scenery of the Airport.

The addition of another four-star hotel within the airport provides potential clients, travellers, tourists, and visitors with a wider pool of options for their preferred hotel to choose from. An additional advantage of the proposed project is the improved visual landscape perception of the Airport in terms of its scenery values, which psychologically has the positive effect of attracting more visitors. Being persuaded by the availability of world-class airport support facilities, the visitors will

be more willing to travel to the country and even spend more days within the airport accommodation facilities, boosting the country's economy through more foreign exchange.

8.5 Negative Impacts during the Operation Phase

8.5.1 Solid Waste Generation

The hotel is expected to generate enormous amounts of solid waste during its operation phase. These will include waste papers, plastics, broken glass, kitchen waste, etc. The waste may accumulate to undesirable volumes if not segregated and disposed of regularly, thereby becoming a nuisance. This impact will be **moderate** hence a **value of 2.**

Potential mitigation measures

- Use of an integrated solid waste management system (i.e. through a hierarchy of options: Reduce, Reuse, Recycling and Dispose) is recommended.
- Provide a central waste receptacle.
- Transportation of wastes from the development to be done by a NEMA-registered solid waste handler.
- Manage all waste in line with the requirements of the Environmental Management and Co-ordination (Waste Management) Regulations, 2006.
- Ensure timely disposal of solid waste from the hotel premises and where feasible adopting daily emptying of waste bins and waste collection for disposal by certified waste collectors.
- Institute recycling programs for materials like paper, cardboard, aluminum cans and glass.
- Compost organic waste to reduce the amount of materials that are disposed of.
- Adopt waste reduction strategies such as using bulk dispensers for toiletries in addition to promoting reuse of textile materials.
- Transportation of wastes from the development to be done by a NEMA-registered solid waste handler.
- Undertake regular employee training programs to raise awareness about waste reduction and recycling practices.
- Perform regular waste audits to identify gaps in waste management and implement more efficient and cost-saving practices.
- Track waste generated, recycling rates and landfill diversion rates.
- Perform frequent removal of solid waste from waste receptacles to prevent bad odors and attraction of birds.

8.5.2 Wastewater Generation

Large volumes of wastewater will be generated from kitchens, laundry activities, ablution, toilets etc. This has the potential to infiltrate and contaminate both ground and surface water sources if not well managed. This may pose a health risk for both humans and animals when they consume polluted water through diseases and poisoning. This impact will be **moderate** hence a **value of 2.**

Mitigation Measures

- Channel all wastewater to Nairobi City Water & Sewerage Company sewer system;
- Regular inspection and maintenance of internal sewer system;
- Consider recycling of grey-water and reuse it for toilet flushing, landscaping and other non-portable purposes.
- Adopt more efficient use of water resources in order to reduce of overall amount of waste water generated by the facility
- Comply with the provisions of EMCA Water Quality regulations, 2006.

8.5.3 Air pollution from emissions.

Potential emissions from the proposed project will include hydrocarbon emissions from fuels-based machinery such as generators, lawn mowers among others and kitchen fumes that release particulate matter into the environment.

Mitigation Measures

- Installation of ducted kitchen extractors.
- Use of unleaded premium petroleum products that release less harmful substances into the atmosphere.
- Secure the proposed project site with a proper fence to minimize air pollution effects.
- Adhere to all the provisions of EMCA (Air Quality) Regulations 2014 regarding management of air emissions by abiding within permissible levels and standards.

8.5.4 Increased pressure on the existing infrastructure

The expected increase in population and the needs of this population would place more pressure on infrastructure, utilities and social amenities in the area during the operational phase of the project. The operations of the project are projected to create a strain on existing already inadequate utility resource i.e. water. According to information from credible sources, cites the airport facilities to be grappling with challenges of inadequate or even sometimes absence of water resources. The establishment of the project will result in a foreseeable competition for the scarce water resource among the neighboring businesses and companies. An increased demand for energy is also anticipated during the operational phase of the proposed project. This can potentially cause a strain in electricity supply within the airport premises resulting in disruption of hotel services.

The proposed development will likely increase pressure on existing energy and water infrastructure. This impact will be **moderate** hence a **value of 2.**

Potential mitigation measures

The Proponent will put in place the following Waste Management, Energy and Water conservation technologies to ensure sustainability of the hotel:

a) **Water Conservation System**; The development will make use of low flow water saving Water Conditioning System and brassware. Photocells shall be used for wash hand basin mixers and urinal flushing; Install dual flash toilets and sensor taps.

b) **Waste Recycling and Recovery System;** In terms of operational waste, spaces will be provided on site for separation of waste; and recycling bins will be clearly labelled for use by the staff and guests. Paper and cardboard, plastic, metal and cans, glass bottles, and food waste will all be separated during operations. The appointed waste collection company will be awarded a contract on the basis that they collect the separated waste in trucks that maintain separation, and have an extensive sorting site.

c) **Energy Conservation:** The proponent will put in place the following measures in a bid to reduce energy consumption:

- Solar panels and variable refrigerant flow systems with heat recovery will be used for domestic hot water production.
- LED lighting and lighting controls will be installed for low energy consumption.
- A building Management System for Mechanical, Electrical and Plumping systems monitoring and operation optimization will be installed.

d) Use of Renewable Materials: The proposed development will incorporate the use of the following renewable materials: Organic fabrics, bamboo, sustainable wood, cork, reclaimed materials and stone.

e) The proponent intends to drill a borehole to supplement the Nairobi Water and Sewerage Company Water Supply.

Further, the proponent should:

- Liaise closely with other development partners and Government/Council Departments, to upgrade the existing shared facilities including roads, water distribution systems etc.
- Identify a holding area for vehicular traffic during the conduction of security searches at the entrance gate to the facility.
- Incorporate adequate water storage tanks for a sustainable and consistent supply of water within the project premises.
- Embrace water harvesting technologies to supplement the existing water supply.
- Identify activities and departmental areas that cause high consumption of both water and electricity and take appropriate corrective measures to reduce overall consumption levels of the project
- Prompt Detection and repair of water pipe and Tank Leaks
- Install a discharge Metre at Water outlets to monitor water use.

8.5.5 Micro-Climate Modification

Though the project area is quite small to cause any considerable microclimate change it bears the potential of adding to the cumulative effects of other infrastructural development that together emit GHGs. Change in land surface from natural vegetation to manmade built landscape will have an effect on the area microclimate by reducing the amount of evapotranspiration from the vegetation in the area which are also a GHG sink.

The microclimate will also be modified by the project activities that produce waste heat (emitted heat) and this will result in the area producing more heat than originally emitted without the project. Waste heat will be produced from vehicles, electronics, generators, water pumps, air conditioning etc. This impact will be **minimal** hence a **value of 1.**

Mitigation Measures

- Landscaping the site with indigenous species/trees and ornamentals of plants.
- Using sustainable drainage systems that mimic the natural percolation of water into the soil, and green roofs where possible using efficient equipment that emit little or no waste heat.
- Make use of Photo catalytic materials containing titanium dioxide in the designing of pavements surfaces of the hotel in order to reduce air pollution created by traffic.

8.5.6 Oil Depot Risk

The Kenya Pipeline Company, Embakasi Depot is located approximately 1.5 Km from the proposed project site. Oil terminals store large amounts of hazardous substances and so can pose a serious threat to people and the environment, especially in the case of improper design, construction, management, operation or maintenance. An accident at an oil terminal may result in uncontrolled spills, fires and explosions, potentially leading to the loss of human life or to a major environmental catastrophe. In oil terminals, the products are highly flammable, and the presence of any ignition source such as open flames and any non-insulated electrical equipment can cause an explosion and loss on a major level.

Once in operation, the proponent is advised to put in place the following measures to mitigate the proposed hotel from any risks associated with the nearby oil depot owned by Kenya Pipeline Company.

- The facility should be properly equipped with automated fire detection systems and fire suppression equipment.
- The fire fighting equipment should be strategically placed within the building.
- There should be provision for periodic training programs on Fire Safety, Occupational Health and Safety and First Aid. A register should be kept of all personnel who attend the courses, and bi-annual refresher sessions should be scheduled for staff.
- Mock drill should be conducted once in six months. Exercises or drills have two basic functions, namely training and testing. While exercises do provide an effective means of training in response procedures, their primary purpose is to test the adequacy of the emergency management system and to ensure that all response elements are fully capable of managing a likely emergency situation.
- Develop an Emergency Response and Disaster Management Plan. Anticipating and planning for various contingencies is crucial for ensuring the success of any emergency response actions in an actual Emergency Situation. Hence, periodic review of an Emergency Response Plan is essential. The emergency Response Plan should also be updated based on findings of mock drills.
- Marking and checking to ensure all fire escape routes are available and clear at all times.
- Having a marked Fire Assembly Point at the Facility.

8.5.7 Occupational Health and Safety (OSH) Risks

Several OHS risks will also be created by either the activities, equipment and materials of the operational phase of the project, and these have been listed below alongside their sources.

Table 8-1 Operational phase OHS risks

	OHS Risk	Sources
1	Injuries or injurious substances and equipment	• Slippery floors from washing with soaps and detergents, oil spills (both fuel and kitchen oil). • Parking barriers – can hit people passing below them. • Moving parts of machines • Working at heights during maintenance works.
2	Fire	LPG Explosions, fuel, electricity and electrical equipment that cause heat such as kettles, cookers.

A plan to manage the OHS risks during this stage will also be important and necessary. This plan may simply be an extension of the one developed for the construction phase and can be further extended to the decommissioning phase. This impact will be **moderate** hence a **value of 2.**

Mitigation measures

- Provision of PPES to all personnel working in potentially hazardous areas or with potentially hazardous equipment, and replacing the PPES on wear and tear.
- Placing readable signs alerting people of hazards such as slippery floors.
- Servicing equipment and machines to ensure efficiency.
- Providing firefighting equipment and maintaining them to ensure they are fully functional.
- Delineating fire and emergency assembly points and creating awareness to ensure all people at the hotel are aware of them, e.g. through the use of maps on elevators, staircases etc.
- Putting in place and Emergency Response Plan and ensuring all people in the project area are aware of it and the procedures to follow commensurate to the level of emergency.
- Providing adequate storage for hazardous and flammable substances and controlling access to them.
- Performing emergency drills on a frequent basis, setting benchmarks for response and evaluating performance to ensure continuous improvement of response and preparedness.

8.5.8 Generation of Noise

The activities of this phase of the project are expected to generate noise and these will be from various point sources such as if diesel generators without silencers are used and also any repair works that may be carried as necessitated by the project's operations. Mobile sources of noise will mainly include cars and trucks that will be ferrying goods to the hotel. Although the noise levels emitted during this stage will be less than during the construction the impact will have more receptors since there will be more people in the area as a direct result of the project being operational.

The proposed project is also located within a specialized freight area that is busy and noisy with operations running 24/7, throughout the year. The noisy environment is majorly caused by continuous movement of cargo, operation of dollies, lorries and trucks delivering materials, Air compressors, vacuum pumps and landing of aircraft. These activities will highly impact the operation of the hotel by causing disturbance to guests seeking accommodation at the facility.

During the Noise and Vibrations Survey conducted on 26th and 27th March 2024, vehicle vibration level were assessed along the First Freight lane where loaded and empty dollies and other vehicles pass by. Plant noise, in the absence of dollies, was also measured and calculated at up to LAeq 62 dBA at the building elevation facing the Kuehne+Nagel.

Dolly noise levels at the proposed project façade varied depending on loading, speed, and number of dollies. Noisy events exceeded LAeq 80 dBA regularly through the night (10 times on the recorded night) but only exceeded LAeq 85 dBA twice. Vibration recordings of passing tractor dollies are well below the threshold for audible ground-borne noise at the nearest building façade. Ground-borne vibration measurements from dollies showed that vibrations from the dollies will not create audible ground-borne noise in the building. During the night survey, dolly noise levels ranged from approximately **68 dBA to 92 dBA.**

This impact will be high hence a value of 3.

Mitigation measures

- Ensure sound insulation technologies employed during the construction phase work effectively towards minimizing high noise levels from the external environment in the vicinity.
- Erecting signs and notifying other users of noisy activities. Conducting all noisy activities during the day when permissible levels are higher.

- Provision of PPES such as ear plugs for employees working in noisy conditions or with noisy equipment.
- Using equipment with low noise ratings or noise reduction technologies such as silencers for the generators

8.5.9 Social and Cultural Disruptions

An influx of tourists will potentially lead to shifts in the local culture; this might be seen when local businesses adapt practices to cater for tourist preferences which will potentially dilute traditional habits. Cultural conflicts may be experienced due to the difference in cultural norms between local residents and tourists these issues might involve issues related to dress code noise levels or public behavior. The impact is anticipated to be **moderate** and given a score of **2.**

The proponent shall use a thoughtful approach that will balance economic development with community well-being. The following are the measures to be taken:

I. Community engagement; establishing a regular dialogue with the local community to understand their concerns and needs and create an avenue for community members to provide feedback and suggestions throughout the project cycle.
II. Sustainable tourism practices; educate hotel staff and guests about local customs, cultural norms and responsible behavior to ensure respectful interactions.
III. Establish a crisis response plan: development of a comprehensive response plan to address any unexpected social or cultural disruptions promptly and effectively, ensuring the safety and well-being of both guests and residents.

8.5.10 Security threats

The project will attract both local and international clientele from all walk of life. This will come with related social issues such as insecurity challenges i.e. terrorism, posed by malicious visitors residing in the project. This negative impact has grave implications on the national security of the country considering the critical role of airports nationally and in the region as a key player in the aviation industry. This impact is expected to be **moderate** and hence given a score of **2**.

Mitigation measures

- Install adequate security measures at the project consisting of CCTV devices, Security alarms systems, electric fenced perimeter wall.
- Employ well trained and adequately equipped security guards with ability to man the hotel premises and respond to any existential security threats.
- Ensure proper screening of all visitors, their details are well captured and archived, and each visitor is well known to the management before being accommodated by the facility.
- Collaborate with all security apparatus within the airport including Kenya police and other private security organizations, in ensuring that security at the hotel and airport is enhanced at all times.

8.5.11 Traffic Congestion

The operational stage of the project has the potential effect of causing traffic snarl-up, especially at the Hotel's entrance gate and the connecting main road interception, when there is a maximum amount of vehicular traffic coming in and out of the hotel premises. This could slow down vehicular traffic and even accident events. This impact is anticipated to be **moderate** therefore is given a score of **2.**

Mitigation measures

- Ensure fast screening and access of all vehicles entering the hotel premises to prevent traffic snarl-up at the entry point.
- Ensure that appropriate road signage is positioned strategically at the entry point alerting oncoming drivers of route diversion into the Hotel premises.
- Ensure that all drivers making use of the hotel parking adhere to all traffic rules to minimize incidences of accidents.

8.5.12 Hiked competition with similar existing projects

The entrance of a new player in the Hotel Accommodation Industry will definitely create competition among the existing Four-Star Hotels that will be competing for a share of the existing portfolio of clients. Unhealthy competition will be detrimental to the provision of quality accommodation services to clients, especially in the event some players resort to employing cut-throat strategies to beat competition. Smaller businesses could also lose their loyal clients going for more impressive and better-quality catering/accommodation services now offered by the proposed project. This impact is expected to be **moderate** thus is given a score of **2**.

Mitigation measures

- Encourage diversification of services offered by the proposed project in order to reduce competition among related businesses targeting similar clients.
- Promote good customer service in the provision of accommodation services and other amenities to improve customer satisfaction and retention rates.
- Embrace continual improvement of services through research and consistent implementation of corrective measures for all recurrent impacts.

8.5.13 Wildlife strikes

The presence of wildlife (birds and animals) on and in the aerodrome, vicinity poses a serious threat to aircraft operational safety. Wildlife is attracted to aerodromes because they provide; food, water habitat and security. Wildlife strikes can cause accidents and serious incidents, costing the aviation industry billions in losses due to aircraft damage, flight delays and other operational impacts. ICAO has been undertaking various initiatives to help countries reduce wildlife strike hazard to aviation. KCAA has developed effective strategies in preventing and mitigating the risk of wildlife strikes to aircraft. This impact is expected to be **moderate** thus is given a score of **2**.

Mitigation Measures

Given the project's proximity to the flight path and airspace there is need to put in place preventive measures to avoid attracting wildlife from the aerodrome:

- Regular collection and disposal of waste to avoid accumulation of waste which can attract birds and wildlife.
- The proponent should avoid the use of fruit-producing fruits for landscaping purposes. The trees and flowers used should not attract birds within the vicinity.
- Securely seal open water points, to deter wildlife from seeking hydration in these areas.

8.6 Positive Impacts during the Decommissioning Phase

8.6.1 Rehabilitation

Upon decommissioning the project, rehabilitation of the project site will be carried out to improve the site. This will include the replacement of topsoil and vegetation, which will lead to improved visual quality of the area. Alternatively, a new different structure may be put up. This impact will be **moderate** hence a **value of 2.**

8.6.2 Employment Opportunities

Employment opportunities will be created for the demolition staff as well as those involved in loading, transportation and unloading of the demolished materials. This impact will be **minimal** hence a **value of 1.**

8.6.3 Recycling of usable materials

Not all the demolished materials will go to waste as some may be recycled for alternative uses. This impact will be **moderate** hence a **value of 2.**

8.6.4 Reduced competition within hotel accommodation providers

The exit of project through decommissioning with create a room for existing hoteliers to now access more clients who were previous served by the facility. Hence, this will remarkably lower the competition levels among existing hotel accommodation players. This impact will be moderate hence a value of 2.

8.6.5 Relief for utility resources such as water and electricity and land

The absence of the project operating at the airport precincts will consequentially cause a noticeable reduction in the amount of water and energy consumption. This effect will positively result in conservation of utility resources that are otherwise scarce in supply, hence facilitating their sustainable use. The decommissioned project will also create a vacant land that is usable for other development needs. This impact will be minimal hence a **value of 1.**

8.6.6 Leeway to establish new development projects

The decommissioned project will created available land that is convertible to other beneficial uses. This will in the long run enable sustainable development of natural resources such and land. This impact is minimal hence the **value of 1.**

8.7 Negative Impacts during the Decommissioning Phase

8.7.1 Generation of demolition waste

Demolition of the project's buildings and related infrastructure will result in large quantities of solid waste. The waste will contain materials such as blocks of 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 the 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 the leaching of demolition waste, are known to lead to the degradation of groundwater quality. This impact will be **minimal (value of 1).**

Mitigation measures

- Manage all waste in line with the requirements of the Environmental Management and Co-ordination (Waste Management) Regulations, 2006.
- Conduct a thorough environmental audit of to ensure proper disposal of decommissioning waste.
- Engage in community outreach programmed to address post-decommissioning impacts on local communities.

8.7.2 Air Pollution

The processes, material and equipment involved in this stage of the project and their wastes will also emit air pollutants either: as gases such as oxides of Carbon, Nitrogen and Sulphur from the burning of fossil fuels in engines, or particulate matter from cuttings and breakages of steel, glass, shavings, bricks and movement of soil. These pollutants will pose risks to both human and environmental health such as air pollution, water pollution, soil contamination, respiratory diseases, skin disorders

and irritations. Large quantities of dust will be generated during demolition works. This will affect demolition staff as well as the neighbouring enterprises. This impact will be **minimal (value of 1)**.

Mitigation measures

- Truck drivers will maintain low speeds to avoid raising dust.
- Employees will be provided with dust masks and goggles.
- Install dust trappers around the site to prevent dust from spreading in the neighbourhood.
- Sprinkle dusty areas with water to suppress dust levels.
- Trucks involved in the demolition and transportation activities of soil and other solid materials from the site should be covered to prevent the spreading of dust into the surrounding areas.

8.7.3 Noise and Vibration

There will be a considerable increase in noise owing to the demolition process. This will be a short-term impact and will be felt throughout the demolition process. The main sources of noise will include cars and trucks; the civil works of pulling down the project structures and mechanized equipment that will be used in the processes involved in this project phase.

This impact will be **minimal (value of 1).**

Mitigation measures

- Workers should be provided with appropriate Personal Protective Equipment (PPE).

8.7.4 Occupational Safety and Health Risks

Demolition work involves many of the same hazards that are common during construction activities, but demolition may also introduce additional hazards like sharp objects. This impact will be **minimal (value of 1).**

Mitigation measures

- Ensure workers have proper instruction and supervision.
- Establish a Health and Safety Plan (HASP) for both the demolition works.
- Appoint a trained health and safety team for the duration of the construction work.
- Provide workers with adequate and appropriate PPEs.
- Provide workers with adequate drinking water and breaks.
- Train workers on safety procedures and emergency response.
- Provide workers with adequate drinking water and breaks.
- Train workers on safety procedures and emergency response.
- Embrace modern technology in selection of appropriate equipment, machinery and tools in order to minimize health and safety hazards.
- Ensure all other applicable safety standards according to the provisions of OSHA 2007, during to this phase are adhered to in order to minimize impacts.

8.7.5 Loss of Jobs.

The decommissioning phase may result in the termination of jobs that were created during the construction and operational phases of the hotel project. This can have adverse effects on the livelihoods of workers and their families. This impact will be **high (value of 3)**.

Mitigation measures

- Implement a responsible and transparent communication strategy to inform workers well in advance about the decommissioning phase and potential job implications.

- Work closely with local employment agencies to assist affected workers in finding alternative employment opportunities, potentially in other local projects or industries.
- Consider providing training programs or skills development initiatives to enhance the employability of affected workers in different sectors.
- Engage with local community leaders and authorities to explore alternative economic opportunities that can absorb the workforce affected by the decommissioning.

8.7.6 Loss of Business opportunities

The exit of the project from the airport operations stage will result in loss of numerous opportunities that local businesses benefited from, thus considerably shrinking their revenues This impact will be **moderate (value of 2)**.

Mitigation measures

- Issuance of prior notices of decommissioning the project to dependent local businesses
- Maintain ties with local businesses and socio-economic community and provide important information on the availability of new opportunities for business collaborations.

8.7.7 Loss of revenue for the developer

The demolition works of the proposed project have a huge financial implication on the developer leading to loss of a great fortune. The developer and operational owner of the hotel will no longer get a return on investment from the development project. This impact will be **high (value of 3).**

Mitigation measures

- The Hotel operator to find a niche market they can grow with in the long-term period.
- Seek advice on potentially lucrative business ideas from the established business community and individuals that are part of the developer's business network.

8.7.8 Potential theft of reusable decommissioned materials

The decommissioning phase will generate a huge pile of unusable and reusable materials. If left those reusable materials and equipment could quickly attract petty thieves focused on quick gains resulting from the sale of scrap metals and other recyclable waste. This impact will be **minimal (value of 1).**

Mitigation measures

- Ensure that the decommissioned site is secured on a continuous basis until the end of the decommissioning stage.
- Sort out all reusable waste materials and equipment and sell them off or donate them before disposing of the rest of the demolition waste debris.
- Discourage idling and prohibit authorized access to the decommissioned site during the demolition and rehabilitation phase.

9 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

9.1 Introduction

Environmental and Social Management Plan (ESMP) for developing projects is given to provide a logical framework within which identified negative environmental impacts can be mitigated and monitored. In addition, the ESMP assigns responsibilities of actions to various actors and provides a timeframe within which mitigation measures and monitoring can be done and their budgetary element.

9.2 The Environmental and Social Management Plan (ESMP)

Based on the policy outlined in the preceding sections, this ESMP has been developed to provide a basis of evaluation of the project with reference to Environmental Management regulations both locally and internationally for the life of the proposed project. Since key factors and processes may require change, considerable provisions have been made for dynamism and flexibility of these plans. As such the ESMP will be subject to a regular regime of periodic review.

The table below forms the basis of the ESMP for the construction and operational phases of the proposed project. In general, the ESMP outlines the potential safety, health and environmental risks associated with the project and details all the necessary mitigation measures as well as the person(s) responsible and the budgetary element for implementing and monitoring such measures. The ESMP will be used as a reference point in annual environmental audits.

9.3 Construction Phase Environmental and Social Management Plan

The purpose of the Environmental and social management plan is to ensure the proponent has a predetermined set of compliance guidelines to ensure that the project is carried out safely and; that environmental concerns and laid down guidelines are observed. It also ensures that social and environmental impacts and risks identified during the ESIA process are effectively managed during the construction phase of the Project. The ESMP specifies the mitigation and management measures to which the proponent is committed to and shows how the project will mobilize organizational capacity and resources to implement these measures

Table 9-1: ESMP for the Construction phase

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) (3 Years)
Vegetation clearing	▪ Landscape and plant vegetation in all open areas after the completion of the project; ▪ Restriction of construction activities to defined project areas; ▪ Ensure fruit producing trees and plants that attract wildlife or birds and encourage nesting are avoided in landscaping. ▪ Undertake appropriate soil erosion control measures to manage siltation and clogging of drains during construction phase; ▪ Ensure proper demarcation and delineation of the project area to be affected by construction works; ▪ Stockpiles shall not be allowed to become contaminated with oil, diesel, petrol, garbage or any other material, which may inhibit the later growth of vegetation; ▪ Soil conservation measures should be taken to the stockpiles to prevent erosion; ▪ Soil stockpiles shall not be higher than 2.5 m or stored for a period longer than 2 months	Contractor	Throughout the Construction Phase	500,000
Increased Noise and vibration generation	▪ Serviceable machines will be used for excavation to ensure vibrations are kept at below risk levels; ▪ Employees using equipment that produce peak sounds shall be provided with earmuffs; ▪ The contractor will deploy compact machinery and fit them with mufflers and vibration dampers; ▪ The contractor will endeavour to comply with the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009. ▪ Install portable barriers to shield compressors and other small stationary equipment where necessary; ▪ Install sound barriers for pile driving activity;	Contractor	Throughout the Construction Phase	2,520,000

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) (3 Years)
	▪ 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; ▪ Conduct continuous noise monitoring of construction activities at the site.			
Increased Solid Waste Generation	▪ Efficient use of building material to reduce waste and recycling/reuse where feasible; ▪ Engage the services of NEMA License waste handlers to collect and transport waste to designated disposal sites; ▪ Provision for waste management rooms at strategic places within the development facility; ▪ Segregation of waste at the source during the project cycle; ▪ Use of an Integrated Solid Waste Management System (ISWMS); through a hierarchy of options including source reduction, recycling, composting and reuse; ▪ Track all waste generated and disposed; ▪ Ensure frequent collection of piled up waste for disposal ▪ Manage all waste in line with the requirements of the Environmental Management and Co-ordination (Waste Management) Regulations, 2006	Contractor	Throughout the Construction Phase	1,440,000
Increased Waste water Generation	▪ The contractor will install portable toilets that will be maintained clean and ensure adequate water supply; ▪ Control of water usage during construction activities to minimize on wastage.	Contractor	Throughout the Construction Phase	5,400,000
Air Pollution, Particles and Dust Emission	▪ Ensure no burning of waste such as paper and plastic containers on sites/non-designated areas; ▪ Minimize exposed areas through the schedule of construction activities to enable dust control; ▪ Minimize the period for idling of machinery and construction vehicles; ▪ Onsite dirt piles or other stockpiled material should be covered, wind breaks installed, water and/or soil stabilizers employed to reduce wind-blown dust emissions;	Contractor	Throughout the Construction Phase	2,880,000

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) (3 Years)
	▪ All staff employed at the construction site and visitors must be provided with dust masks and other PPEs; ▪ All waste must be transported off-site for processing, not burnt or stored for any longer than is absolutely necessary; ▪ Machines must not be left idling for unnecessary periods of time; ▪ Fuelled construction equipment shall be used where feasible; ▪ All raw materials where possible must be sourced as close as possible to the construction site thus reducing the emissions from vehicular traffic; ▪ Regular and prompt maintenance of construction machinery and equipment to minimize generation of hazardous gases; ▪ Regular sprinkling of water on work areas to prevent fugitive dust violations; ▪ Restricting heights from which materials are to be dropped, as far as practicable to minimize the fugitive dust arising from unloading/loading; ▪ Use environmentally friendly fuels such as low sulphur diesel; ▪ Buffer area of trees and other vegetation will serve as natural windbreaks; ▪ Use of dust nets/screens around the construction site to contain and arrest dust; ▪ Where a vehicle leaving a construction site is carrying load composed of dusty materials, the load shall be covered entirely by clean impervious sheeting to ensure that the dusty materials will not leak from the vehicle; ▪ Monitor the air pollution levels regularly as per the EMCA (Air Quality regulations, 2014); ▪ Workers should be issued with the correct PPE such as dust masks.			

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) (3 Years)
High Demand of Raw materials	▪ Source building materials from local suppliers who use environmentally friendly processes in their operations ▪ Ensure accurate budgeting and estimation of actual construction material requirements to ensure that the least amount of material necessary is ordered. ▪ Ensure that damage or loss of materials at the construction site is kept minimal through proper storage. ▪ Use at least 5% - 10% recycled, refurbished or salvaged materials as much as possible to reduce the use of raw materials and divert material from landfills.	Project manager & Contractor	Throughout the Construction Phase	No additional costs. Costs will be within the construction budget
Oil Leaks and Spills	▪ Train personnel on the risks of oil spills and leakages; ▪ All hazardous materials will be stored in appropriately banded containers and placed on concrete floor as where applicable; ▪ Maintaining spill response kits at the construction site at all times; ▪ Prepare and display on site spill response procedures and training of workers on spill response and management; ▪ The site design should incorporate oil sumps at the parking areas to isolate oil spills from parked vehicles that might spill to the storm drains; ▪ No solid waste, fuels or oils shall be discharged on land surface or into drains. ▪ All oil products and materials should be stored in site stores; ▪ Any wash off from the oil/grease handling area or workshop shall be drained through impervious drains; ▪ Regularly check for leaks from paint containers; ▪ Unwanted paint will not be disposed by pouring it on soil or storm water drains; ▪ All machinery must be keenly monitored to prevent oil leaks on the ground. This can be affected through regular maintenance of the machinery; ▪ Refueling and Maintenance must be carried out in a designated area (protected service bays) and where oils	Contractor	Throughout the Construction Phase	540,000

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) (3 Years)
	are completely restrained from reaching the ground. Such areas should be covered to avoid storm from carrying away oils into the soil or water systems.			
Increased water demand and consumption	▪ The contractor will ensure that there is water conservation in all activities. ▪ Water will be recycled where possible without compromising on quality and health. ▪ Ensure good use of water resources during construction by installing taps on all outlets and minimize wastage by ensuring regular repair and replacement of broken or worn-out pipes and fittings. ▪ The contractor will put in place sound sufficient water storage reservoirs that are leak proof. ▪ The contractor will consider strategies that include construction of borehole as a source of water for construction activities ▪ The contractor will instil water use discipline among employees.	Contractor	Throughout the Construction Phase	Covered under Construction budget
Visual Impacts	▪ Restore active works areas through backfilling, landscaping by planting of indigenous trees, shrubs, and grass on the open spaces to re-introduce visual barriers.	Contractor	Throughout the construction phase	Covered under Construction budget
Traffic Impacts	▪ Implement the Traffic Management Plan. ▪ Heavy Commercial Vehicles (HCVs) delivering construction materials should observe designated speed limits for the area. ▪ Construct acceleration and deceleration lanes to channel delivery trucks to the site without creating a backlog of traffic behind them as they navigate turns of entry ▪ Proper signage and warnings shall be placed at strategic locations to direct traffic to minimise inconveniences to motorists and forewarn other motorists of HCVs turning and transportation of abnormal loads. ▪ Delivery of material for the construction shall be undertaken during off-peak hours.	Contractor	Throughout the construction phase	Covered under Construction budget

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) (3 Years)
	▪ All materials will be offloaded on the site and adequate space for that will be provided. ▪ Well trained Flagmen / traffic marshals shall be deployed at the entrance to guide traffic ▪ Enough parking spaces will be created for the vehicles transporting workers and heavy tracks offloading the construction materials. ▪ Selection of construction areas shall be based on the existing road layout and the location of access to the various commercial and residential properties. ▪ Any change in the normal programming of activities that will significantly disrupt normalcy along the abutting project roads should be timely communicated			
Traffic Accidents	▪ Employ traffic marshals to control the movement of vehicles during the construction phase of the project. ▪ Implement the annexed Traffic Management Plan to enhance the traffic movement within the site and the public road. ▪ Use of signs for diversion and to warn motorists against dangers at or near construction site. ▪ Use of reflective jackets among other PPEs to avoid accidents. ▪ Work closely with the traffic police to ensure that any incident on the detours is quickly cleared to ensure the continual operation of the detours	Contractor	Throughout the construction phase	Covered under Construction budget
Increased energy demand	▪ Switch off engines when not in use. ▪ Use well serviced construction machinery that is efficient in fuel consumption. ▪ Maximize the use of natural lighting by limiting construction works to day time. ▪ Create awareness among workers on the importance of conservation of energy resources. ▪ Employ technologies that demand less energy consumption. ▪ Use energy saving lighting systems	Contractor	Throughout the construction phase	Covered under Construction budget

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) (3 Years)
Security of the project site	▪ The contractor to give out information of suspecting conduct within the site to the local administration. ▪ Hire services of security firm to monitor personnel or visitor movement within and close to the site. ▪ Formulate and instil place of work conduct; ▪ Develop security rules and procedures to be followed by the contractor and suppliers during construction; ▪ Conduct thorough vetting for all workers to avoid criminal elements infiltrating the project site; ▪ Conduct random and regular security patrols around the construction site. ▪ State of the art security systems will be installed to safeguard the premise. ▪ The contractor to process gate passes to all workers that will be accessing the construction site. ▪ The construction site access should be controlled and restricted to only the authorised personnel. ▪ Ensure thorough screening of workers, suppliers and distributors to ensure security enhancement. ▪ All workers will be required to have certificates of good conduct from the Directorate of Criminal Investigations before they are allowed to work. ▪ Ensure thorough screening of workers, suppliers and distributors to ensure security enhancement. ▪ All workers will be required to have certificates of good conduct from the Directorate of Criminal Investigations before they are allowed to work.	Contractor	Throughout the construction phase	5,400,000
Interference with storm water Drainage Systems and Surface Hydrology	▪ Install cascades to break the impact of water flowing into the drains. ▪ The drainage channels should be installed in all areas that generate or receive surface water such as car parking, driveways and along the building block-edges of the roofs. ▪ The channels should be covered with gratings or other suitable and approved materials to prevent occurrence of	Contractor	Throughout the construction phase	Covered under Construction budget

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) (3 Years)
	accidents and entry dirt that would compromise flow of run-off. ▪ The drainage channels should ensure the safe final disposal of run-off. ▪ The contractor will ensure that the volume of wastewater do not obstruct drainage systems; ▪ During the rainy seasons, vigilant drainage monitoring will be crucial to prevent blockages and potential property. ▪ Minimise damage to existing storm water drainage systems. ▪ Proper waste management especially the excavated material to prevent drainage blockages.			
Labour Management	▪ Make necessary arrangement for mass transportation of workers to and from site on daily basis. The employees will be hired from within the locality hence limited movement or very short distances from their homes. ▪ Ensure that all food vendors that will be supplying food to the construction workers are licensed before they are allowed to sell the food to the workers. ▪ Develop a Human Resource policy for all unskilled labour / casual labourers ▪ Develop an adequate and effective employee grievance system. ▪ Comply with the Employment Act 2007 and its amendment Act of 2022, to ensure there is no forced labour, discrimination in employment and sexual harassment ▪ Ensure non-discrimination of Vulnerable Individuals (if any) such as PLWD, and widows.	Contractor	Throughout the construction phase	Covered under Construction budget
Aviation Safety	▪ Adhere to all regulations set forth in the Civil Aviation Act No. 21 of 2013 regarding compliance with height regulations, due to the project's proximity to the runway. ▪ Obtain a change of use for the proposed piece of land to be developed from use light industrial to hotel establishment.	Proponent/ Contractor	Throughout the construction phase	Covered under Construction budget

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) (3 Years)
	▪ Obtain approval from KCAA for cranes to be used during the construction phase, if exceeding 25 meters in height. ▪ Avoid the use of reflective materials on the proposed development due to the site's proximity to an aerodrome. ▪ Selection of non-fruit producing plants and trees that do not attract wildlife or birds for landscaping. ▪ Ensure regular collection of waste from the construction site to avoid waste accumulation that may attract wildlife and birds.			
Occupational Health and Safety risks				
Approval of building plans	▪ Ensure that all building plans are approved by the Local Authority and the local Occupational Health and Safety Office.	Proponent	One-off	As per DOSH county office invoice.
Registration of the premises	▪ Registration of the premises as a workplace under the Occupational Safety and Health Act, 2007 Laws of Kenya is mandatory.	Proponent	One-off	6,050
General register	▪ A general register should be kept within the facility as stipulated in Section 122 & 123 of the Occupational Safety and Health Act, 2007.	Project Manager & Contractor	One-off	2,500
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	1,500
Approval of building plans	▪ Ensure that all building plans are approved by the Local Authority and the local Occupational Health and Safety Office.	Proponent	One-off	As per DOSH county office invoice.
Fire Safety	▪ Install Appropriate firefighting Equipment. ▪ Designate a Fire Assembly point within the premises. ▪ Train workers on Fire Safety. ▪ Conduct regular fire drills.	The Contractor, Project Manager& Site Safety Officer	Continuous	Covered under Construction budget
Incidents, accidents and dangerous occurrences	▪ Ensure that provisions for reporting incidents, accidents and dangerous occurrences during construction using prescribed forms obtainable from the local Occupational Health and Safety Office (OHSO) are in place.	Project Manager, Developer & Contractor	Continuous	Covered under Construction budget

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) (3 Years)
	▪ 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	Covered under Construction budget
Insurance	▪ Ensure that the premises are insured as per statutory requirements (third party and workman's compensation)	Proponent	Annually	Covered under Construction budget
Safety, health and environment (SHE) policy	▪ Develop, document and display prominently an appropriate SHE policy for construction works	Project Manager & Contractor	One-off	5,000
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	Covered under Construction budget
Welfare of Workers	▪ Provide wholesome drinking water for employees	Project Manager & contractor	Continuous	
	▪ Provision of appropriate PPES to all workers.			
	▪ Provide Suitable, efficient, clean, well-lit and adequate sanitary conveniences should be provided for construction workers.	Project Manager & contractor	One-off	
Medical examination	▪ Arrangements must be in place for the medical examination of workers working in hazardous areas before and after the project.	Project Manager, Developer & Contractor	Continuous	1,500 per examination for each worker
Machinery/equipment safety	▪ Ensure that machinery, equipment, personal protective equipment, 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	Covered under Construction budget
	▪ Ensure that equipment and work tasks are adapted to fit workers and their ability including protection against mental strain.	Project Manager, Developer & Contractor	Continuous	
	▪ All machines and other moving parts of equipment must be enclosed or guarded to protect all workers from injury.	Project Manager & contractor	One-off	

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) (3 Years)
	▪ Arrangements must be in place to train and supervise inexperienced workers regarding construction machinery use and other procedures.	Project Manager & contractor	Continuous	
	▪ 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 & Contractor	Continuous	
	▪ Reports of such examinations must be presented in prescribed forms, signed by the examiner and attached to the general register	Project Manager	Continuous	
Storage of materials	▪ Ensure that materials are stored or stacked against safe walls and partitions in such manner as to ensure their stability and prevent any fall or collapse	Project Manager& contractor	Continuous	Covered under Construction budget
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	Covered under Construction budget
	▪ Securely fence or cover all openings in floors	Project Manager & Contractor	One-off	
	▪ Ensure that construction workers are not locked up such that they would not escape in case of an emergency	Project Manager & Contractor	Continuous	
	▪ All working in height platforms used in construction works must be of good construction and sound material of adequate strength and be properly maintained.	Project Manager & Contractor	One-off	
Emergency preparedness and evacuation procedures	▪ Design suitable documented emergency preparedness and evacuation procedures to be used during any emergency.	Project Manager & Contractor	One-off	
	▪ Such procedures must be tested at regular intervals.	Project Manager & Contractor	Every 3 months	20,000
	▪ Develop & publicize an emergency response plan	Project Manager & Contractor	One-off	Covered under Construction budget
	▪ Ensure that adequate provisions are in place to immediately stop any operations where there is an imminent and serious danger to health and safety and to evacuate workers	Project Manager & Contractor	One-off	Covered under Construction budget

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) (3 Years)
	▪ Ensure that current emergency telephone contact numbers are prominently and strategically displayed on posters within the construction site.	Project Manager & Contractor	One-off	5,000
	▪ Provide measures to deal with emergencies and accidents including adequate first aid arrangements.	Project Manager & Contractor	Continuous	Covered under Construction budget
	▪ Design suitable documented emergency preparedness and evacuation procedures to be used during any emergency.	Project Manager & Contractor	One-off	
First Aid	▪ Provide well-stocked first aid boxes which is easily available and accessible within the premises.	Project Manager & Contractor	One-off	10,000
	▪ Provision of first aid room or emergency room with a trained and qualified nurse within the premises.	Project Manager and Contractor	Throughout construction phase	2,160,000
Environmental monitoring of the project	▪ Due to the magnitude of the project the proponent will liaise with the environmental, health and safety consultants throughout the construction phase and ensure that the conditions of approval are adhered to.	Proponent, Contractor and EHS consultant	Throughout construction phase	5,400,000
Mandatory Site Assessments	▪ Conduct Occupational Safety and Health Risk Assessment ▪ Conduct Occupational Safety and Health Audit ▪ Conduct Fire Safety Audit	Proponent, Contractor and EHS consultant	Annually	500,000

9.4 Operational Phase Environmental and Social Management Plan

The necessary objectives, activities, mitigation measures, and allocation of costs and responsibilities pertaining to the prevention, minimization and monitoring of significant negative impacts and maximization of positive impacts associated with the operational phase of the project are outlined in the table below;

Table 9-2 ESMP for the Operational Phase

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) Per Annum
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 landfilling.	Proponent	Continuous	0
	• Provide solid waste handling facilities such as waste bins and skips	Proponent	One-off	500,000
	• Ensure that solid waste generated is regularly disposed of appropriately at authorized dumping sites	Proponent	Continuous	600,000
	• Donate redundant but serviceable equipment to charities and institutions.	Proponent	Continuous	0
	• Comply with the Airport regulations of solid waste management;	Proponent	Continuous	0
	• Comply with the provisions of Environmental Management and Co-ordination (Solid Waste) Regulations 2006	Proponent	Continuous	0
Wastewater release into the environment.	• Channel all wastewater to Nairobi City Water and Sewerage Company sewer system	Proponent	One-off	0
	• Conduct regular inspections for pipe blockages or damages and fix them appropriately.	Proponent	Continuous	15,000 per inspection
	• Comply with the provisions of Environmental Management and Co-ordination (Water Quality) Regulations 2006.	Proponent	Continuous	0
Energy Use	• Switch off electrical equipment, appliances and lights when not being used.	Proponent	Continuous	0
	• Display information reminding users to switch off lights when not in use.	Proponent	One-off	10-40 % higher than ordinary lighting

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) Per Annum
	• Install energy saving fluorescent tubes at all lighting points within the building instead of bulbs which consume higher electric energy.	Proponent	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	Continuous	0
	• Sensitise workers and the hotel guests to use energy efficiently through posters	Proponent	Continuous	100,000
Water management	• Promptly detect and repair of water pipe and tank leaks	Proponent	Continuous	100,000
	• Occupants to conserve water e.g. by avoiding unnecessary toilet flushing.	Proponent	Continuous	0
	• Ensure taps are not running when not in use.	Proponent	Continuous	0
	• Install water conserving taps that turn-off automatically when water is not being used.	Proponent	One-off	10-40 % higher than ordinary taps
	• Install a discharge meter at water outlets to determine and monitor total water usage.	Proponent	One-off	20,000
Noise Pollution	• Ensure sound insulation technologies employed during the construction phase work effectively towards minimizing high noise levels from external environment in the vicinity. • Using equipment with low noise ratings or noise reduction technologies such as silencers for the generators.	Proponent	One-off	0
	• Erecting signs and notifying other users of noisy activities. Conducting all noisy activities during the day when permissible levels are higher.	Proponent	One-off	20,000
	• Provision of PPES such as ear plugs for employees working in noisy conditions or with noisy equipment.	Proponent	One-off	50,000

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) Per Annum
Air pollution from emissions.	• Installation of ducted kitchen extractors. • Use of unleaded premium petroleum products that release less harmful substances into the atmosphere. • Secure the proposed project site with a proper fence to minimize air pollution effects.	Proponent	One-Off	0
	• Adhere to all the provisions of EMCA (Air Quality) Regulations 2014 regarding management of air emissions by abiding within permissible levels and standards.	Proponent	Continuous	0
Traffic Congestion	• Ensure fast screening and access of the all vehicles entering the hotel premises to prevent traffic snarl-up at the entry point. • Ensure that appropriate road signage is positioned strategically at the entry point alerting oncoming drivers of route diversion into the Hotel premises. • Ensure that all drivers making use of the hotel parking adhere to all traffic rules to minimize incidences of accidents.	Proponent	Continuous	0
Minimization of health and safety impacts	• Implement all necessary measures to ensure health and safety of guest during operation of the project as stipulated in the Occupational Safety and Health Act, 2007	Proponent	Continuous	1,200,000
Ensure the general safety and security of the premises and surrounding areas	• 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	Continuous	2,400,000
	• Ensure installation of CCTV cameras and other security systems to safeguard areas that are unlikely to be manned by security guards within and outside the premises.	Proponent	Once-Off	Covered under Construction budget
Fire Safety	• Provision of fire extinguishers on every floor. • Proper signage on fire alarm as well as a fire evacuation response plan.	Proponent	Once-Off	700,000

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) Per Annum
	• Installation of smoke alarms, fire sprinkler systems and emergency exit doors. • Training hotel personnel on fire safety and evacuation			
Micro-Climate Modification	• Landscaping the site with indigenous species/trees and ornamentals of plants. • Using sustainable drainage systems that mimic the natural percolation of water into the soil, and green roofs where possible using efficient equipment that emit little or no waste heat.	Proponent	One - Off	Covered under Construction budget
Oil depot risk	• The facility should be properly equipped with automated fire detection systems and fire suppression equipment. • The firefighting equipment should be strategically placed within the building. • There should be provision for periodic training programs on Fire Safety, Occupational Health and Safety and First Aid. A register should be kept of all personnel who attend the courses, and bi-annual refresher sessions should be scheduled for staff. • Mock drill should be conducted once in six months. Exercises or drills have two basic functions, namely training and testing. While exercises do provide an effective means of training in response procedures, their primary purpose is to test the adequacy of the emergency management system and to ensure that all response elements are fully capable of managing a likely emergency situation. • Develop an Emergency Response and Disaster Management Plan. Anticipating and planning for various contingencies is crucial for ensuring the success of any emergency response actions in an actual Emergency Situation. Hence, periodic review of an Emergency Response Plan is essential. The emergency Response Plan should also be updated based on findings of mock drills.	Proponent	Continuous	Covered under Fires safety Impact

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh) Per Annum
	• Marking and checking to ensure all fire escape routes are available and clear at all times. • Having a marked Fire Assembly Point at the Facility.			
Increased pressure on existing infrastructure	• Upgrade existing infrastructure and services such as sewerage services if and where feasible	Proponent	One - Off	Covered under Construction budget
Control social and cultural disruption	• Conduct community engagement talks with the local community/business enterprises to address their concerns and grievances. • Achieve sustainable tourism practices by educating and sensitizing staff and guests on local customs, social and cultural norms	Proponent/ Local Authority/ General Manager	Continuous	100,000
Ensure Environmental, Health and Safety compliance	• Undertake an environmental audit within 12 months after operation commences as required by law. • Conduct Occupational Safety and Health Risk Assessment • Conduct Occupational Safety and Health Audit • Conduct Fire Safety Audit	Environmental/ Occupational Health and Safety Consultants	Annually	250,000

9.5 Decommissioning Phase ESMP

In addition to the mitigation measures provided in **Tables 9-1** and **9-2**, 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 the table below

Table 9-3 ESMP for the Decommissioning Phase

Potential Negative Impact	▪ Proposed mitigation measures	Responsibility for Mitigation	Timelines	Cost (Kshs)
9.6 Decommissioning Phase				
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. ▪ 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 of at a licensed disposal site. ▪ 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. ▪ Donate reusable demolition waste to charitable organizations, individuals and institutions. ▪ Manage all waste in line with the requirements of the Environmental Management and Co-ordination (Waste Management) Regulations, 2006.	Demolition Contractor	Throughout the decommissioning phase	No additional costs. Expenditure covered under demolition costs
Air pollution	▪ Truck drivers will maintain low speeds to avoid raising dust. ▪ Employees will be provided with dust masks and goggles. ▪ Install dust trappers/nets around the site to prevent dust from spreading in the neighbourhood. ▪ Sprinkle dusty areas with water to keep dust level low. ▪ Trucks involved in demolition and transportation activities of soil and other solid materials from the site should be covered to prevent spreading of dust into the surrounding areas.	Demolition Contractor	Throughout the decommissioning phase	No additional costs

Noise and Vibration	▪ Workers should be provided with appropriate Personal Protective Equipment (PPE). ▪ Ensure compliance with the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009	Demolition Contractor	Throughout the decommissioning phase	No additional costs. Expenditure covered under demolition costs
Occupational Safety and Health Risks	▪ Ensure workers have proper instruction and supervision. ▪ Establish a Health and Safety Plan (HASP) for both the demolition works. ▪ Appoint a trained health and safety team for the duration of the construction work. ▪ Provide workers with adequate and appropriate PPEs. ▪ Provide workers with adequate drinking water and breaks. ▪ Train workers on safety procedures and emergency response.	Demolition Contractor	Throughout the decommissioning phase	No additional costs. Expenditure covered under demolition costs
Rehabilitation of project site	▪ Implement an appropriate re-vegetation programme to restore the site to its original status ▪ Consider use of indigenous plant species in re-vegetation	Demolition Contractor	Throughout the decommissioning phase	No additional costs. Expenditure covered under demolition costs
Loss of Jobs	▪ Implement a responsible and transparent communication strategy to inform workers well in advance about the decommissioning phase and potential job implications. ▪ Work closely with local employment agencies to assist affected workers in finding alternative employment opportunities, potentially in other local projects or industries. ▪ Consider providing training programs or skills development initiatives to enhance the employability of affected workers in different sectors. ▪ Engage with local community leaders and authorities to explore alternative economic opportunities that can absorb the workforce affected by the decommissioning. ▪ Workers should be encouraged to diversify economic activities and skills to protect their income bases.	Proponent	Throughout the decommissioning phase	No additional costs. Expenditure covered under demolition costs
Interference with Surface drainage	▪ Proper handling of demolition waste to avoid blockage of existing drainages.	Proponent	Throughout the decommissioning phase	. Expenditure covered under demolition costs

10 Environmental and Social Monitoring Plan

Table 10-1 Environmental Monitoring Plan for the proposed project

Component	Action	Standards / Targets	Location	Frequency	Responsibilities	Annual Cost (Kshs)	Supervision
Construction Phase							
Ambient Air Quality	Conduct regular visual inspection of construction site and access roads.	Avoid significant degradation of baseline conditions associated with dust production	Work sites	Continuous during construction activities	Contractor	No additional costs	Construction Management Team
Ambient Noise	Inspect construction site and measure dB levels, at locations where noisy activities are realized close to sensitive receptors and following reception of specific noise-related grievances.	Respect the noise levels set in the EIA Licence conditions	Work sites and neighboring property boundaries.	Continuous during construction activities	Contractor	No additional costs	Construction Management Team
Traffic Congestion	Conduct visual inspection of traffic snarl ups along First freight lane and neighboring roads.	Avoid traffic snarl-ups along First Freight Lane and neighbouring roads.	Roads neighbouring the project site	Continuous during construction activities	Contractor	No additional costs	Construction Management Team
Worker Health and Safety	Provide all workers with Health and Safety sensitisation	100% of workers sensitized on Safety	Entire construction workforce	Continuous during construction activities.	Contractor	No additional costs	Construction Management Team
	Assess proportion of work accidents duly reported.	0 accidents	Entire construction workforce	Continuous during construction activities.	Contractor	No additional costs	Construction Management Team
Operation Phase							

Wastewater	Effluent monitoring	Effluent standards for discharge into the environment	Discharge point	Quarterly	Proponent	Costs covered under the project's operational costs	Hotel Management
Hotel Monitoring	Self-Environment Audit	Comply with all Environmental legal requirements	Entire hotel	Annual	Proponent	Costs covered under project's operational costs	Hotel Management
Decommissioning Phase							
Worker Health and Safety	Provide all workers with Health and Safety sensitisation	100% of workers sensitized on Safety	Entire construction workforce	Continuous during demolition activities.	Contractor	No additional costs	Proponent
	Assess proportion of work accidents duly reported.	Number of accidents	Entire construction workforce	Continuous during demolition activities.	Contractor	No additional costs	Proponent

11 ENVIRONMENT, HEALTH AND SAFETY ACTION PLAN

11.1 Introduction

In today's highly competitive industry, the advancement of technology and processes has brought about an increased concern for environmental, health and safety issues facing the business community. Because of these issues, there is need for the Main Contractor for the proposed project to commit to move from compliance driven by reactionary concerns to the development of a central strategic management plan. At the heart of the environmental, health and safety strategy lies the ability to measure performance and relate EHS programs to financial success. The contractor must therefore integrate the management of environmental, health and safety issues as early as possible in the business and financial planning cycle.

It is vital for the contractor to understand that competitive advantages can be derived from such programs and that the greatest opportunities exist in providing environmentally sound and safe products to differentiate themselves from competitors. In order to facilitate the integration of environmental, health and safety issues into the business activities, the contractor should implement this Environmental, Health and Safety (EHS) action Plan which has been designed by the Consultant.

This will enable the contractor to deal with any EHS challenges that may emerge during the construction phase and to proactively manage environmental, health and safety issues and obligations. The EHS action Plan encompasses the combined areas of environmental, health, safety and transportation of hazardous materials due to the often-overlapping activities and agency regulations. This plan identifies the important issues that may arise during the implementation of the project, establishes goals designed to actively address these issues, sets forth a framework in which to operate and establishes a mechanism to monitor progress and assure continual improvement.

11.2 Mission

This Health and Safety Action Plan will guide the Main Contractor to:

- Manage all activities in a manner that meets or exceeds compliance with all applicable regulations.
- Protect and enhance the environment and assure the health and safety of workers, associates, customers and our communities.
- Manage and minimize potential liability exposure in environmental, health and safety areas.
- Develop team players who share a positive global view with the skills and willingness to perform all necessary tasks and who assume responsibility for their actions regarding EHS matters.

11.3 Policies

It is important for the Main Contractor to reaffirm their commitment to Directives and policies regarding environmental, health and safety issues. They are expected to:

- Maintain a copy of and adhere to the Directives and policies regarding environmental, health and safety issues at the site.
- Maintain a copy of the EHS Management Plan at the site and ensure the communication of and adherence to the plan.
- Identify a responsible, qualified person (professional or manager) and equip that person with the authority, tools and support necessary to coordinate and implement the environmental, health and safety program.
- Measure performance against the Environmental, Health and Safety Management Plan.

- Provide necessary training programs to associates to equip them with the skills and knowledge required to support the Environmental, Health and Safety Management Plan.
- Update the Environmental, Health and Safety Management Plan on an annual basis.

11.4 Roles and Responsibilities

11.4.1 Main Contractor

The Main Contractor in charge of the project will be responsible for:

- Preparing, updating, and implementing this Environmental Health and Safety Action Plan (EHS), including all associated procedures and local regulations such as the Occupational Safety and Health Act, 2007.
- Identifying and observing all legal health and safety requirements;
- Ensuring that all works are conducted in a safe manner without posing any risks to workers and the neighbouring community;
- Planning to do all work safely;
- Participating in the planning and design stages of trade activities;
- Employing a full-time qualified and experienced EHS Supervisor and staff;
- Identifying health and safety training required for an activity;
- Ensuring workers undertake identified H&S trainings;
- Communicating and consulting with workers through general/ project meetings and daily toolbox meetings;
- Investigating identified hazards and other safety breaches reported and ensuring that corrective actions are undertaken;
- Assisting with rehabilitation and return to work initiatives;
- Dispute resolution.

11.4.2 Sub-Contractors

The Sub-Contractors and other contractors who are engaged in the proposed project are responsible for:

- Fulfilling the duties of as per the contract required for their own operations;
- Identifying all high-risk construction work associated with their activities and ensuring safe work method statements are developed and implemented;
- Following all safety policies and procedures and site rules;
- Complying with this H&S Management Plan;
- Complying with any directives given to them by Client;
- Undertake site-specific induction and participate in any client-related briefings;
- Employ a qualified and experienced EHS Supervisor and support staff (e.g. trained staff in First Aid and Fire Fighting);
- Ensuring the workers undergo the site-specific induction;
- Ensuring they have the correct tools and equipment that are in a serviceable condition for the task.

11.4.3 Workers

All workers on the project (including those employed by contractors) will be responsible for:

- Tacing reasonable care of their own health and safety;
- Taking reasonable care that their conduct does not adversely affect others;
- Complying with instructions, so far as they are reasonably able;
- Cooperating with reasonable notified policies or procedures.

11.4.4 EHS Supervisor

The Environmental Health and Safety supervisor for the Project will be responsible for:

- Preparing Personal Protective Equipment (PPE) requirements for the project and conduct Regular Monitoring and Supervision of all workers to ensure use of PPE to minimize accidents at workplaces.
- Identifying health and safety training required for an activity.
- Undertake weekly and monthly internal EHS Audits on all project activities and recommend improvements for implementation to the contractor through monthly reports.
- Provide EHS related services between the contractor and all relevant government agencies only in relevant/applicable areas.
- Regular Monitoring and Supervision of the implementation of the NEMA-approved Environmental Management Plan in the ESIA report & NEMA EIA License conditions and provide technical advice to the contractor for the implementation to reduce the level of impacts of the project to the environment and local communities.
- Regular Monitoring and Supervision of the implementation of the Occupational Health and Safety (noise, dust, accidents, working at heights safety, etc) legal requirements as per OSHA, 2007.
- Attend all project site meetings and respond to all emerging issues on Environment, Health and Safety.
- Conduct regular Risk Assessment to identify potential hazards and propose preventive/mitigation measures.

11.5 Emergency and Incident Response

11.5.1 Emergency Preparedness

To ensure adequate preparation in case of an emergency during project works, the contractor is expected to:

- show all workers and subcontractors the emergency exit points and assembly area as part of their induction (this shall be included in the induction checklist);
- display emergency procedures in the site office or other visible locations;
- cause inspection and testing of all firefighting appliances in the workplace to be carried out by a competent person at least once every three months.
- conduct emergency drills in order to evaluate the effectiveness of evacuation procedures and determine the necessary changes or adjustments to procedures to improve performance.

11.5.2 Emergency procedure

The Main Contractor is expected to have procedures in place. In the event of a fire or similar emergency evacuation, dedicated and trained fire marshals should ensure that:

- the workers stop work immediately and vacate the site prior to start up.
- they assist anyone in the workplace who may not be familiar with the evacuation procedures.
- emergency services are called from a mobile phone. Other emergency numbers should be made available and displayed in the numerous locations at site.
- the site office is notified of the occurrence via an incident report.
- workers assemble at the nominated assembly points until all the workers receive further instructions from the site manager or emergency services personnel.

11.5.3 Emergency meeting point

The Main Contractor should ensure that there is a designated meeting point at the entrance and exit of the site. Safe zones will be made accessible by the emergency response team to allow ease of evacuation of injured persons to designated health facilities.

11.5.4 Emergency contact list for the site

The Main Contractor shall display a list of emergency contacts in numerous locations at the site. The Main Contractor shall also maintain emergency contact details for all workers at site.

11.5.5 Incident procedure

The Main Contractor shall put in place incident and accident reporting procedures at the site. In case of an incident, the procedure guide should:

- require workers to immediately notify the site EHS supervisor.
- require workers to avoid interfering with the scene of the incident or accident.
- depending on the nature and severity of the injury, require the EHS supervisor to notify the Directorate of Occupational Safety and Health (DOSH) of the incident.
- require the preparation of an incident/accident investigative report.

The EHS supervisor should record details of the incident and ensure any remedial action is taken.

11.5.6 Notifiable incidents and dangerous occurrences

The Main Contractor should notify the Directorate of Occupational Safety and Health Services of the following incidents and dangerous occurrences:

- the death of a person at site.
- an incident requiring hospitalisation.
- a serious injury or illness of a person.
- bursting of a revolving vessel, wheel, grindstone or grinding heel moved by mechanical power.
- explosion of a receiver or container used for the storage at a pressure greater than atmospheric pressure of any gas or gases (including air) or any liquid of solid resulting from the compression of gas.

In the event of such an occurrence, the site manager through the EHS supervisor shall notify the Nairobi area Occupational Safety and Health officer of any accident, dangerous occurrence, or occupational poisoning which has occurred at the workplace. Where an accident in a workplace causes the death of a person therein, the management shall:

i. inform the area Occupational Safety and Health officer within twenty-four hours of the occurrence of the accident; and

ii. send a written notice of the accident in the prescribed form to the area Occupational Safety and Health officer within seven days of the occurrence of the accident.

iii. where an accident in a workplace causes non-fatal injuries to a person therein, the construction site office shall send to the area Occupational Safety and Health officer, a written notice of the accident in the prescribed form within seven days of the occurrence of the accident.

iv. cause all workplace injuries to be entered in the general register specified in section 122 of OSHA 2007.

v. fulfill any other requirement of OSHA 2007, Sec 21.

11.5.7 First aid

- The Main Contractor shall supply adequate first aid equipment, which should be available at the site. The contents of the first aid kit shall be replenished to ensure that the requirements of the OSHA (First Aid) Rules, 1977 are adhered to.
- The Main Contractor shall ensure that workers are trained in first aid in accordance with the OSHA (First-Aid) Rules, 1977.
- The Contractor shall provide space for a first aid room, fully stocked first aid kit and hire a full-time qualified nurse to handle any injuries at the site.

11.6 Accident/Incident Reporting and Investigation

11.6.1 Reporting

The Main Contractor shall ensure that all work-related accidents, injuries, and diseases are reported to the site safety office. An accident/incident register shall be kept on-site and shall be kept up to date.

11.7 Investigation

The main contractor shall ensure that the following accidents/incidents are investigated immediately after the occurrence, and a written report is issued:

- accident-causing death or injury requiring medical aid by a registered doctor.
- failure of the hoisting device.
- structural failure of a permanent or temporary structure.
- contact with overhead or underground power lines.
- contact with underground pipelines causing breakage or release of contents.
- inadvertent exposure to harmful concentrations of hazardous materials.
- failure of a confined space entry procedure.
- failure of a lockout/ /tagout procedure.
- property damage in excess of one million Kenya shillings.
- a near miss that had the potential to cause serious injury or property damage.

Where corrective action is recommended in the investigation report, a follow-up report shall be issued, within 7 days, detailing the steps taken to prevent a recurrence. A copy of all reports shall be submitted to the area DOSHS.

11.8 Induction and Training

11.8.1 Worker induction

The Main Contractor shall work with other contractors to ensure a site-specific induction is provided for all workers and visitors before starting work or accessing the site. This induction shall outline:

- the expectations outlined in this health and safety Management Action Plan, including all policies and procedures.
- the emergency meeting point.
- the site rules.
- the facilities.
- any site-specific hazards.
- high-risk work activities.
- Safe operation and use of any machinery on site.

11.8.2 Statutory training

The Main Contractor shall ensure that the following training is carried out among the workers:

- First aid training in accordance with the OSHA (First Aid) Rules 1977.
- Occupational Health and Safety training in accordance with the OSHA (Safety and Health-Committee)-Rules 2004.
- Fire Safety training in accordance with the OSHA (Fire Risk Reduction) Rules 2007.

The Main Contractor shall establish a Safety and Health committee. The establishment and operations of the committee shall be guided by the OSHA (Safety and Health-Committee)-Rules 2004.

11.8.3 Worker training

The Main Contractor shall:

- ensure workers are trained and competent for the work to be undertaken.
- ensure workers are trained to deal with any risks associated with the work and understand the control measures in place.
- ensure all workers have had relevant training (first aid, firefighting among others)
- ensure on-site training and supervision is provided.
- organise external training for specific tasks where required.
- seek high-risk licenses for all high-risk work and maintain a register of licenses.
- communicate with other contractors to ensure their workers are appropriately trained and competent.

11.9 Consultation and Communication

11.9.1 Consultation

The Main Contractor shall ensure that there is adequate consultation with all workers and contractors on H&S issues for the project. This shall be done:

- at toolbox meetings where anyone can raise issues for discussion.
- informally during the planning of activities or the development of Safe Work Method Statements.
- when changes to workplace arrangements could affect the health and safety of workers.
- during investigations into any incident to establish details of the incident or to formulate corrective action to prevent the incident from re-occurring.

The Main Contractor shall also consult with contractors and suppliers on health and safety issues associated with any products or services provided for the contract:

- during the negotiation phase before agreeing on the work requirements.
- before starting any contractor operations.
- when any changes to workplace arrangements occur that could affect the health and safety of the contractors or affect their work procedures.

11.9.2 Communication

The Main Contractor shall ensure that workers and other contractors are aware of health and safety requirements by providing them with their Safety Management Plan before commencing any project works. Contractors shall be expected to make their workers aware of all safety requirements.

Further, the Main Contractor is expected to communicate relevant safety information to everyone involved in the project through:

- safety induction
- pre-work meetings

- toolbox meetings
- incident reports and outcomes
- distribution of safety alerts or guidance material about industry-specific hazards/incidents

11.9.3 Disciplinary procedures

The Main Contractor shall put in place a disciplinary procedure for errant persons. The procedure shall include:

i. **First violation**: verbal warning.

ii. **Second violation**: written notification.

iii. **Third violation**: Worker dismissal/suspension from the project.

For serious breaches of safety rules, workers shall be immediately dismissed or removed from the site without notice.

11.10Site Safety Procedures

11.10.1 Site rules

1. Incidents/accidents, regardless of their nature, shall be promptly reported to supervisors.
2. Approved hard hats/helmets shall be worn on the job by all personnel.
3. Clothing shall be appropriate to the duties being performed. Long trousers, shirt, reflector jackets and sturdy work shoes are the minimum requirements.
4. Smoking is permitted only in designated areas. “Strike anywhere” matches are prohibited.
5. Running is not permitted anywhere, except in the case of extreme emergency.
6. Safety glasses, goggles or face shields shall be worn when concrete breaking, metal chopping, welding, grinding and for other operations require eye protection.
7. Hand tools shall not be used for any purpose other than that intended. All damaged or worn parts shall be promptly or replaced.
8. Power tools shall be operated only by authorized personnel, with guards furnished by the manufacturer “in place”.
9. All electrical hand tools shall be grounded or double-insulated.
10. Explosive/powder-actuated tools shall be used only by persons who have been instructed and trained in their safe use.
11. Compressed gas cylinders shall be secured in an upright position.
12. Riding on any hook, hoist or other material-handling equipment which is used strictly for handling material and not specifically designed to carry riders is prohibited.
13. Welding and burning operations shall be carried out only by authorized personnel with appropriate individual protective equipment.
14. Fighting and possession of firearms are strictly forbidden on the job and constitute grounds for dismissal.

15. Possession or use on the job of intoxicating beverages or unauthorized drugs is strictly forbidden and constitutes grounds for dismissal. A copy of the site rules is displayed in the site office.

11.10.2 Site amenities

The Main Contractor shall provide the following amenities on site.

- Toilets/sanitary conveniences in accordance with rule 139 of the OSH (Building Operations and Works of Engineering Construction) Rules 1984. The toilets should be private, adequate in number and with separate male and female facilities. Sanitary bins shall be provided in female facilities.
- Washing facilities/handwashing facilities as per the requirements of rule 138 of the OSH (Building Operations and Works of Engineering Construction) Rules 1984
- Clean and safe drinking water.
- Accommodation for clothing/Changing rooms.
- Shelters for taking meals.

All workers are to observe good hygiene standards and clean up after themselves.

11.10.3 Site Security

The Main Contractor shall, so far as reasonably practicable, secure the site by:

- Securing the construction sites with danger/warning tapes or erecting a fence around the construction site to prevent unauthorised access.
- maintaining a security office where all persons with the intention of going to the construction site must be vetted and checked for appropriate PPE before being allowed in.
- keeping the entry and exits from the project site secure by installing security cameras during the project construction period.
- locking gates to the site outside normal hours of operation.

11.10.4 Site signage

At a minimum, the Main Contractor shall ensure the following signs are displayed at the entrance to the project site:

- the principal contractor's name, contact details and emergency telephone numbers.
- the location of the site office.
- the appropriate PPE.
- abstract of the health and safety policy.
- abstract of emergency response plan.
- abstract of the OSHA 2007.

All signage shall be clearly visible from outside and also from within the buildings. Sufficient lighting/illumination must be provided where the signs may be invisible.

11.10.5 Personal protective equipment

The Main Contractor shall provide personal protective equipment (PPE) to workers at the site, unless the PPE has been provided by another contractor.

The Main Contractor shall ensure that the PPE issued is:

- suitable for the nature of the work and any hazard associated with the work.

- a suitable size and fit and reasonably comfortable for the worker who is to use or wear it.
- maintained, repaired or replaced so that it continues to minimise risk to the worker who uses it, including by:
    - ensuring it is clean and hygienic.
    - ensuring it is in good working order.
    - ensuring it is used or worn by the same worker, so far as is reasonably practicable.

When issuing PPE, the Main Contractor should:

- provide workers with information, training and instruction in the proper use, wearing, storage and maintenance of PPE.
- ensure that any other person at the workplace (such as visitors, clients or inspectors) is appropriately provided with PPE to wear as required.

The main contractor shall ensure that workers are made aware of their responsibility to:

- follow all instructions to wear and use PPE.
- take reasonable care of PPE.

11.11Managing Building Health and Safety Hazards

11.11.1 General Lighting

During construction, the Main Contractor shall ensure the following:

- provision of adequate artificial lighting on the site.
- suitable colour/material will be used to prevent glare or unnecessary reflection from walls and roof.
- maintenance of light fittings in clean and in good repair.
- ensuring that the emergency lighting is operable at all times.
- the installed lighting system will be steady.

11.11.2 Air Quality

Construction may generate emission of fugitive dust caused by a combination of on-site excavation and movement of earth materials, contact of construction machinery with bare soil, and exposure of bare soil and soil piles to wind. A secondary source of emissions may include exhaust from diesel engines of earth-moving equipment. To reduce and control air emissions from the site, the Main Contractor shall:

- minimizing dust from material handling sources by using covers and/or control equipment (water suppression, bag house, or cyclone).
- minimizing dust from open area sources, including storage piles, by using control measures such as installing enclosures and covers, and increasing the moisture content.
- implement dust suppression techniques, such as applying water or non-toxic chemicals to minimize dust from vehicle movements.

The Main Contractor shall put in place a monitoring program to ensure dust and fumes do not affect employees and the neighbouring establishments/offices. This shall include periodic measurements of both indoor (on site) and ambient air qualities. The values shall then be compared with the standards outlined in the OSH (Hazardous substances) rules, 2007 for indoor (on site) exposure and the EMCA (Air quality) regulations, 2014 for ambient air quality.

The Main Contractor shall use the results of the measurements to evaluate the effectiveness of the dust & emissions control measures on site.

11.11.3 Noise

The Main Contractor is expected to put in place measures that shall ensure noise reduction. These include:

- selecting equipment with lower sound power levels.
- installing suitable mufflers on engine exhausts and compressor components.
- installing acoustic enclosures for equipment casing radiating noise.
- improving the acoustic performance of constructed buildings, apply sound insulation.
- installing vibration isolation for mechanical equipment.
- limiting the hours of operation for specific pieces of equipment or operations, especially mobile sources operating through community areas.
- developing a mechanism to record and respond to complaints.

Noise from construction activities may have effects on both workers and persons in the vicinity of the project. As such, the Main Contractor shall put in place a noise monitoring program to establish the levels of noise that the workers (occupational noise measurements) and neighbours (environmental noise measurements) are exposed to. The values shall be compared to the standards set out in the OSHA (Noise Prevention & Control) Rules 2005 and the EMCA (Noise & Excessive vibration pollution control) Regulations 2009.

The results of the measurements shall be used to evaluate the effectiveness of the noise control measures on site.

11.11.4 Ventilation System

The Main Contractor shall ensure that workspaces are adequately ventilated. Where natural ventilation is not available, an operable ventilation system capable of supplying clean and good quality air shall be provided by the Main Contractor. The Main Contractor shall ensure that the installed system is:

- capable of withstanding high temperatures.
- in good working condition.
- capable of evacuating any noxious gases, ground gases, dust, heat or fumes present in the buildings.

11.11.5 Transport and materials safety

The Main Contractor shall ensure high standards of both material and transport safety during construction. At a minimum, the Main Contractor is expected to:

- ensure that all containers of hazardous substances are adequately labelled.

- obtain all safety data sheets (SDS) for all hazardous substances in use.
- have in place a robust traffic surveillance system including audible alarm warning systems and signaling for traffic monitoring.

11.11.6 Fire and Emergency Response

The Main Contractor shall put in place the following measures to ensure minimal risk of fire-related hazards:

- monitoring atmospheric conditions such as wind direction.
- ensuring that appropriate fire extinguishers are installed in place and periodically serviced.
- provision of adequate directions towards fire exits.
- ensuring that the catwalks and ladders are clear.
- having a trained firefighting team on standby who can take responsibility in an emergency.
- conducting fire drills to ensure that the emergency response and evacuation plan is well understood.

11.12Managing construction hazards

11.12.1 Falls from heights.

The Main Contractor shall manage the risks associated with falls from heights by:

- ensuring that where practicable, any work involving the risk of a fall is undertaken on the ground or on a solid construction (such as an elevated work platform).
- where this is not practicable, providing a fall prevention device such as secure fencing, edge protection, working platforms and/or covers.
- where this is not practicable, providing a work positioning system such as plant or a structure (other than a temporary work platform) that enables a person to be positioned and safely supported.
- where this is not practicable, providing a fall arrest system such as a safety harness system. Workers will be trained in emergency procedures for fall arrest systems.
- use of control zones and safety monitoring systems to warn workers of their proximity to fall hazard zones, as well as securing, marking, and labelling covers for openings in floors, roofs, or walking surfaces.

When undertaking work involving the risk of a fall from height, the Main Contractor shall ensure workers must:

- follow all instructions.
- work with a colleague when using a ladder.
- only use approved work platforms.

11.12.2 Struck by Objects

Construction and demolition activities may pose significant hazards related to the potential fall of materials or tools, as well as ejection of solid particles from abrasive or other types of power tools which can result in injury to the head, eyes, and extremities.

Where such risks are present, the Main Contractor shall ensure that the following control measures are put in place:

- Conducting sawing, cutting, grinding, sanding, chipping, or chiseling with proper guards and anchoring as applicable.
- Maintaining clear traffic ways to avoid driving of heavy equipment over loose scrap.
- Use of temporary fall protection measures in scaffolds and out edges of elevated work surfaces, such as handrails and toe boards to prevent materials from being dislodged.
- Wearing appropriate PPE, such as safety glasses with side shields, face shields, hard hats, and safety shoes

11.12.3 Excavation work/trenching

The Main Contractor shall put in place the following measures before any excavation works are conducted:

- Ensure all necessary measures have been put in place to avoid cave-ins and failure of earth walls.
- Find out about any underground services that may be affected by their works, before starting work.
- Implement control measures to avoid direct or inadvertent contact with underground services.
- Potholes be dug (by hand) to expose existing services before any mechanical excavation near the services.
- Provide safe means of access and egress from excavations.
- Each employee at the edge of an excavation 6 feet (1.8 m) or more in depth shall be protected from falling by guardrail systems, fences, or barricades when the excavations are not readily seen because of plant growth or other visual barrier; the contractor shall ensure that proper assessments are done based on the condition of the area such as non-existent vegetation.
- Avoid the operation of combustion equipment for prolonged periods inside excavations areas where other workers are required to enter unless the area is actively ventilated.

11.12.4 Work near overhead or underground essential services

The Main Contractor shall ensure, where reasonably practical, that no one comes within an unsafe distance of an overhead or underground power line.

If maintaining a safe distance is not reasonably practical, the Main Contractor shall:

- assess the risk associated with the proposed work.
- implement control measures consistent with the risk assessment.
- contact and consult with the local essential service providers.

11.12.5 Electrical

The Main Contractor shall ensure electrical safety through the following:

- Power supplied to the site shall only come from:

- an electricity distributer main.
- an existing switchboard permanently installed at the premises.
- a compliant low-voltage generator.
- a compliant inverter.

- Switchboards and distribution boards used on site shall:
  - be of robust construction and materials capable of withstanding damage from the weather and other environmental and site influences
  - be securely attached to a post, pole, wall or other structure unless it is of a stable freestanding design able to withstand external forces likely to be present.
  - incorporate suitable support and protection for flexible cords and cables and prevent mechanical strain to the cable connections inside the board.
  - protect all live parts at all times.
  - be individually distinguished by numbers, letters or a combination of both (where multiple boards are present).
  - Flexible cords used on construction sites must be rated heavy-duty.
  - Ensure hazard-reducing devices like cut-outs, earth leakage and isolating devices are in place.
  - Flexible cords must be either protected by a suitable enclosure or barrier (flexible or rigid conduit) or located where they are not subjected to mechanical damage, damage by liquids or high temperature (elevated on stands or hung from nonconductive support brackets).
  - The Main Contractor shall maintain an in-service inspection and test regime for all portable electrical leads, tools and earth leakage devices.
  - The main shall ensure that after the equipment has been inspected and tested, it shall be fitted with a durable, non-reusable, non-metallic tag. The tag shall include the name of the person or company who performed the test and the test and re-test date.
  - Records of all inspections, tests, repairs and faults related to all electrical equipment shall be recorded in a testing and tagging register.
  - Workers shall report any damaged electrical equipment to the site manager. It will be removed from service and either repaired or replaced and subsequently inspected and tested as required.

11.12.6 Plant, machinery, and equipment

To ensure all plant, equipment and machinery used complies with the requirements of the OSHA 2007 *Sec 55*, the Main Contractor shall:

- only use plant for the purpose for which it was designed.
- use all health and safety features and warning devices on plant.
- follow all information, training and instruction provided.

- ensure guarding is permanently fixed and is not permitted to be removed.
- ensure that no person other than the operator may ride on the plant unless the person is provided with a level of protection that is equivalent to that provided to the operator.

Further, the Main Contractor shall ensure that:

- all plant is regularly maintained, inspected, and tested by a relevant competent person.
- the plant has a warning device that will warn persons who may be at risk from the movement of the plant.
- all plant that lifts or suspends loads is specifically designed to lift or suspend that load.
- there is segregation of the location of vehicle traffic, machine operation, and walking areas, and controlling vehicle traffic through the use of one-way traffic routes, establishment of speed limits, and on-site trained flag-people wearing high-visibility vests or outer clothing covering to direct traffic.
- there is visibility of personnel through their use of high visibility vests when working in or walking through heavy equipment operating areas, and training of workers to verify eye contact with equipment operators before approaching the operating vehicle.
- moving equipment is outfitted with audible backup alarms.

11.12.7 Scaffolds

The Main Contractor shall ensure:

- that the scaffold is erected by a competent person
- that before we use the scaffold, the competent person has advised that it is safe.
- that scaffolding is inspected by a competent person:
    - before use of the scaffold is resumed after an incident occurs that may reasonably be expected to affect the stability of the scaffold
    - before use of the scaffold is resumed after repairs
    - at least every 30 days.
- that, if an inspection indicates that any scaffold or its supporting structure creates a risk to health or safety:
    - any necessary repairs, alterations and additions will be made or carried out.
    - the scaffold and its supporting structure will be inspected again by a competent person before use of the scaffold is resumed.
- that scaffolds are provided with safe means of access, such as stairs, ladders, or ramps.
- that every part of a working platform, gangway or stairway of a scaffold from which a person is liable to fall a distance of 2 m is provided with guard-rails and toe-boards.
- that platforms on scaffolds are of adequate dimension, especially in width, for the tasks performed from the scaffold.

The Main Contractor shall ensure that workers:

- do not use incomplete scaffolding.
- report any scaffolding issues to the safety manager/site manager.
- comply with the directions of any tags attached to the scaffold.

11.12.8 Ladder safety

The Main Contractor shall manage hazards associated with ladders by:

- using ladders according to the manufacturer's instructions.
- only allowing one person at a time on a ladder.
- performing all work from a ladder while facing the ladder.
- ensuring the ladder stands on a firm and level footing except in the case of a suspended ladder.
- ensuring the ladder is equally and properly supported on each stile or side.
- fulfill all other requirements as per OSHA 2007, *Sec 75.*

11.12.9 Manual handling

The Main Contractor shall manage hazards associated with manual handling by:

- ensuring all users follow good manual handling practices.
- assessing risk assessments.
- providing mechanical lifting aids where applicable.
- Not permitting any worker to engage in the manual handling or transportation of a load which by reason of its weight is likely to cause the employee to suffer bodily injury (OSHA, 2007 sec 76 (4).

11.12.10 Slips, trips, and falls

The Main Contractor shall manage hazards associated with slips, trips and falls by:

- Implementing good housekeeping practices, such as sorting and placing loose construction materials or demolition debris in established areas away from footpaths.
- Locating electrical cords and ropes in common areas and marked corridors.
- ensuring that walking areas are slip-resistant.
- using slips, trips and falls checklist as required.
- checking for hazards that could cause someone to slip, trip or fall by doing a visual check.
- ensuring workers keep the site tidy as part of the written site rules.
- use of slip-retardant footwear.

11.12.11 Hand-operated and power tool use

The Main Contractor shall manage hazards associated with hand-operated and power tool use by ensuring that:

- all tools conform to provisions of OSHA 2007 *sec 76 (1).*

- tools are used only for work for which they have been designed.
- tools are operated only by workers who have been authorised and given appropriate training.
- power tools are provided with protective guards and shields.
- safe operating procedures are established and used for all power tools.
- every power-driven tool is provided with adequate means, immediately accessible and readily identifiable to the operator, of stopping it quickly and preventing it from being started again inadvertently.
- there is regular checking of all tools to ensure they are in a safe working order.
- all electrical tools are recorded in a tag and testing register.
- electrical tools are tested and tagged every 3 months.

any issues identified with power tools are communicated to workers through a toolbox meeting.

Before using power tools, the Main Contractor must ensure that:

- electrical connections are secure.
- electricity supply is through an RCD.
- safety guards are in position.
- the machine is switched off before activating the electricity supply.
- appropriate PPE is used as required by the manufacturer's guidelines or as guided by the safety manager.

The Main Contractor shall require workers to report any issues with power tools to the safety officer/manager. Unsafe tools shall be tagged and removed from service.

11.12.12 Traffic Safety

The Main Contractor shall ensure prevention and control of traffic-related injuries and fatalities through:

- Designing and implementing a concise traffic management plan.
- Emphasizing safety aspects among drivers.
- Improving driving skills and requiring licensing of drivers.
- 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.
- Minimizing pedestrian interaction with construction vehicles.
- Collaboration with local communities and responsible authorities to improve signage, visibility, and overall safety of roads.
- Employing safe traffic control measures, including road signs and flag persons to warn of dangerous conditions.

11.12.13 Waste Management

The Contractor should implement measures to minimize waste and therefore develop a waste management plan which should include but not be limited to the following: -

- Contractor to develop and implement a Waste Management Plan (outlining the waste generation activities, waste types and volumes expected, storage, collection, transportation, recovery and disposal programme) before start of the project
- Collecting litter and managing it accordingly/as per waste management and recovery plan. Construction site should be kept clean, neat and always tidy.
- No burying or dumping of any waste materials, metallic waste, litter or refuse should be permitted.
- Incorporating recyclable materials to reduce the volume and cost of new materials.
- Provision of bottle and can trash disposal receptacles at parking lots designated as hoarding sites for the project to avoid littering.
- Managing sediment and sludge removed from storm drainage systems maintenance activities as a hazardous or non-hazardous waste based on an assessment of its characteristics.
- Sub-contract a NEMA licensed waste handling firm to collect solid wastes (that cannot be reused or recycled) on regular basis and dispose of in a NEMA approved disposal site or recycling facility.

11.12.14 Disease Prevention

A. Occupational diseases

To mitigate the risk of occupational diseases, the Main Contractor shall cause pre-employment and periodic medical examinations to be carried out among workers by a Designated Health Practitioner as outlined in the OSH (Medical Examination) Rules, 2005.

B. Communicable diseases such as HIV/AIDS

The Main Contractor shall launch a HIV/AIDS control program that will provide awareness and education to workers. In partnership with government and non-governmental organizations, voluntary counselling, testing and distribution of condoms among workers shall be achieved.

C. Vector-Borne diseases

The Main Contractor shall put in place a pest and vermin control program to ensure insects and rodents are eliminated within the construction site.

12 CONCLUSION AND RECOMMENDATION

The ESIA study has established that the proposed hotel development by Esiway Investments Limited is a worthwhile investment; it will contribute significantly to the provision of guest accommodation rooms with close proximity to Jomo Kenyatta International Airport and by extension spur economic development. This will be achieved through the previously discussed positive impacts namely; growth of the economy, boosting of the informal sector during the construction phase, provision of market for the supply of building materials, employment generation, increase in government revenue, optimal use of land and provision of modern and affordable guest Accommodation rooms.

The proponent shall be committed to putting in place several measures to mitigate the potential 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 the establishment and operation of such projects. It is expected that the potential positive impacts arising from the proposed development shall be maximized as much as possible. These measures will go a long way in ensuring the best possible environmental compliance and performance standards.

It is our recommendation that the project be allowed to proceed provided the mitigation measures outlined in the report are adhered to, the Environmental Management Plan and Environmental Monitoring Plan is implemented and the developer adheres to the conditions of approval of the project that will be given by NEMA.

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14 ANNEXES

Annex 1. Certificate Of Incorporation
Annex 2. KRA PIN Certificate
Annex 3. Copy of Land Ownership Document
Annex 4. Architectural Drawings
Annex 5. Invitation letter to the Key Stakeholders' meeting invitation letter
Annex 6. List of attendance for the public meeting
Annex 7. Minutes of the Public Meetings
Annex 8. Change of Use
Annex 9. Copy of KCAA Approval document
Annex 10. Copy of KAA Approval document
Annex 11. Public Participation Questionnaires
Annex 12. Labor Management Plan
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Annex 16. Traffic Impact Assessment Study
Annex 17. AWEMAC NEMA Practicing License
Annex 18. Lead Expert NEMA Practicing License