ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED RESIDENTIAL APARTMENTS (AMBERTON CARNATION GARDEN ESTATE) ON PLOT B TO BE EXCISED FROM NGONG/NGONG/52926 SITUATED AT RAPASI VILLAGE, ALONG MEMUSI ROAD OFF FOREST LINE ROAD (D523) IN OLKERI LOCATION, MATASIA, NGONG DIVISION, KAJIADO NORTH SUB-COUNTY, KAJIADO COUNTY

GPS coordinates: 1°22'58.0" S, 36°40'58.9" E

LEAD ESIA EXPERTS	PROPONENT
MUNYUA A. MWENGA & FRED ARONYA	AMBERTON INTERNATIONAL HOLDINGS LIMITED P.O BOX 3122-00621, NAIROBI.

JANUARY 2022

PROJECT FACT SHEET

Project Name	Proposed Amberton Carnation Garden Estate
Proponent	Amberton International Holdings Limited KRA PIN P051697756C
Report	Environmental and Social Impact Assessment Study Report
Project components	1. Gated residential community 2. 259 housing units (9 blocks) 3. Green spaces 4. A clubhouse 5. Onsite Wastewater Treatment Plant 6. Photovoltaic street lighting
Project Cost Estimate	Ksh. 593,016,024
Project site & Footprint	Plot B to be excised from L.R. No. Ngong/Ngong/52926, Kajiado County 3.5 acres Built up area 25,663m^2

Front cover photo: artistic rendering of proposed Amberton Carnation Garden Estate concept ©Tectura International

ESIA TEAM

Munyua A. Mwenga	Team Leader
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Martin Mamboleo	Environmental Economist
Mr.Issac Wafula	GIS specialist
Timothy Mutiso	Public Health Expert

DOCUMENT AUTHENTICATION

This ESIA Study Report has been prepared in accordance with the Environmental Management and Coordination Act (EMCA) 1999 (Rev. 2015), and the Environmental (Impact Assessment and Audit) Regulations for submission to the National Environment Management Authority (NEMA). We the ESIA Lead Experts and the proponent certify that the particulars given in this report are correct to the best of our knowledge.

Prepared by:

Signed: _____

Date:_____

Munyua A. Mwenga
LEAD EXPERT NEMA REG.NO 0340

Signed: _____

Date:_____

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PROPONENT

Mr. Edward Nyale
Amberton International Holdings Limited
P.O Box 3122-00621,
Nairobi.

Signed:…… Date: ……

NON – TECHNICAL SUMMARY

Amberton International Holdings Limited proposes to construct residential apartments on plot B measuring approximately 3.5 acres, the plot will be excised from L.R. No. Ngong/Ngong/52926. The plot is situated in Rapasi Village along Memusi Road off Forest Line Road (D523) in Matasia, Ngong Division, Kajiado North Sub-County, Kajiado County. The GPS coordinates for the proposed project site are: 1°22'58.0" S, 36°40'58.9" E. The proposed development will be known as Amberton Carnation Garden Estate.

The project proposal entails site preparation, construction of 259 housing units and one (1) clubhouse with supporting social amenities. The 259 housing units (69 one bedroom units; 168 two bedroom units; and 22 three bedroom units) will be put up in 9 blocks each 6 levels (ground + 5 floors).

The 259 new housing units will be for outright sale to the general public

The general steps followed during the assessment were as follows:

i. Environment screening, in which the project was identified as among those requiring environmental impact assessment under schedule 2 of EMCA, cap387
ii. Environmental scoping that provided the key environmental issues
iii. Desk Stop studies and interviews
iv. Baseline studies
v. Physical inspection of the site and surrounding areas
vi. Holding three (3) EIA Public participation meetings on 29th November, 30th November and 1st December 2022
vii. Holding a consultative meeting with the immediate neighbours (Rapasi Village residents) on 4th December 2022.
viii. Stakeholder consultations
ix. Impact analysis, mitigation & reporting.

The project is envisaged to have the following benefits:

- Creation of direct and indirect employment opportunities during construction phase
- Provision of a market for construction materials
- Creation of modern housing stock
- Improved infrastructure and social amenities
- Increase home ownership
- Improved local infrastructure and security

However, the proposed project will have some negative impacts, some of the anticipated negative impacts (for which we have proposed mitigation measures) are summarised in tables below:

Table 1: Summary of anticipated impacts and mitigation measures for construction phase

Impact	**Mitigation measures**
Commissioning of the construction works	1. Site hand-over & ground breaking 2. Selection of competent NCA approved contractor with staff to implement & monitor environmental and social safeguards
Housing for construction site workers	3. Use of local labour force as far practical to avoid setting up a labour camp

Impact	Mitigation measures
Site security and security of construction material and equipment	4. Construction of perimeter fence and hoarding of the construction site 5. Installation of security lighting 6. Round the clock security manning of the construction site 7. Construction of secure material and equipment stores on the site 8. Construction materials to be delivered in small quantities to minimize storage problems 9. Installation of CCTV on the site
Construction material extraction & use	10. Availability and sustainability of the materials extraction sites as they are non-renewable in the short term 11. Source building materials from certified suppliers
Safety and integrity of building during construction	12. Comply with the National Construction Authority Act, No. 41 of 2011 13. Comply with applicable Labour Laws e,g. the Occupational Safety and Health Act, 2007; the Work Injury Benefits Act, 2007, etc 14. Use of appropriate construction materials and reinforcements as per specifications 15. Ensuring building materials and components are as per design specifications 16. Close supervision of construction works 17. Proper supervision and material testing regime 18. Ensure proper timelines are followed during construction works e.g. curing time
Increased traffic flow and road safety concerns during construction	19. Undertake traffic impact assessment study 20. Formulate a traffic management plan for the proposed development approved by the county government 21. Proper road safety signage 22. Road safety awareness creation 23. Provide adequate parking facilities within the project site
Soil Erosion	24. Create and maintain soil traps and embankments 25. Control of storm water generated from the site 26. Landscaping and planting of vegetation after completion of construction
Site excavation leading to site disturbance	27. A large section of the proposed project site has already been excavated & excavated materials dumped offsite 28. Excavate only areas to be affected by buildings 29. A NEMA certified waste management firm to be commissioned to provide waste collection and disposal services 30. Dumping of excavated materials to sites approved by NEMA and the county government 31. Landscaping and restoration of excavated sites
Noise pollution and excessive vibration	32. Carryout noise survey and regular monitoring of noise levels 33. Comply with EMCA Noise Pollution & Excessive Vibration Regulations, 2009 34. Ensure use of well serviced equipment 35. Avoid idling of engines when not in use. 36. Construction work to be confined to between 8am to 5pm 37. Ensure use of earmuffs and earplugs by machine operators and workers in noisy areas 38. All workers shall be trained and provided with PPEs such as helmets, earmuffs, dust mask, etc. which will always be used when operating within the site area 39. Safety signage shall be erected at the construction site entrance to notify of the construction activities and timings 40. Drivers delivering materials shall avoid unnecessary horning of the trucks/vehicles 41. Equipment installed with noise abatement devices shall be used as much as practicable

Impact	Mitigation measures
	42. Noise shields shall be used on noisy equipment, such as corrugated iron sheet structures, to minimize the exposure to the neighbours and other workers within the site 43. Install portable barriers to shield compressors and other small stationary equipment where necessary 44. Equipment such as drills, graders and cement mixers should also be used when the least number of neighbours can be expected to be affected
Air pollution, particulate matter and dust emission	45. Carryout baseline air quality and monitor the air pollution levels regularly as per the Air Quality regulations,2009 46. Regular spraying of stockpiles of earth and dusty area with water 47. Avoid pouring dust materials to the lower ground from elevated areas 48. Cover all trucks hauling soil, sand and other loose materials 49. Provide dust screen where necessary and sensitize workforce including drivers of construction vehicles on dust suppression / reduction measures 50. Ensure no burning of waste such as paper and plastic containers on the construction site 51. Minimize exposed areas through the schedule of construction activities to enable dust control 52. Minimize the period for idling of machinery and construction vehicles 53. 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 54. All workers at the construction site and visitors exposed to dusty conditions must be provided with dust masks and other PPEs 55. All waste must be transported off-site for processing, not burnt or stored for any longer than is absolutely necessary 56. All raw materials where possible must be sourced as close as possible to the construction site thus reducing the emissions from vehicular traffic 57. Regular and prompt maintenance of construction machinery and equipment to minimize generation of hazardous gases 58. Use environmentally friendly fuels such as low sulphur diesel 59. Buffer area of trees and other vegetation may serve as natural windbreaks 60. Use of dust nets/screens around the construction site to contain and arrest dust. 61. Institute appropriate dust suppression measures such as regular sprinkling of water on dusty access roads; speed limits; etc.
Occupational Safety and Health	62. Register the construction site with Department of Occupational Safety and Health Services (DOSHS) 63. Comply with applicable Labour Laws e,g. the Occupational Safety and Health Act, 2007; the Work Injury Benefits Act, 2007,etc 64. Staff awareness creation on safety and health issues 65. Have trained First Aiders and fully equipped First Aid box on site 66. Provide and ensure proper use of personal protective equipment i.e. safety boots, helmet, goggles, and hand gloves 67. The contractor and management shall adhere to developed environmental health and safety plan (EHS) for the project 68. Protect workers from accidental falls and falling objects e.g use of scaffolding with a safety net (sisal sacking); use of safety harnesses 69. Implement dust suppression measures 70. Enforce speed limits for trucks and vehicles delivering construction materials 71. Provide First Aiders and First Aid Kits on site 72. Ensuring Building Strength and stability 73. Proper supervision of works

Impact	Mitigation measures
Public Safety and Health	74. Comply with applicable Labour Laws e,g. the Occupational Safety and Health Act, 2007; the Work Injury Benefits Act, 2007 75. Hoarding / fencing of the construction site to prevent unauthorized people accessing the site 76. Enforce speed limits for trucks and vehicles delivering construction materials 77. Proper signage and warning to public of heavy vehicle turning 78. Ensuring Building Strength and stability 79. Provide access to clean water and food to the workers and members of public 80. The contractor to abide by ESIA licensing conditions
Solid waste generation	81. Comply with EMCA Waste Management Regulations 2006 82. A NEMA certified waste management firm to be commissioned to provide waste collection and disposal services 83. Ensure waste materials are disposed of on NEMA and County Government approved sites 84. Ensure re-use of materials that can be re-used 85. Use of the 3rs – Reduce, Re-use, Re-cycle 86. Efficient use of building material to reduce waste and recycling/reuse where feasible 87. Provision for waste management receptacles / bins at strategic places within the site 88. Segregation of waste at the source during the project cycle 89. Use of an Integrated Solid Waste Management System (ISWMS); through a hierarchy of options: source reduction, recycling, composting and reuse, will facilitate waste handling during operation/occupation phase 90. A NEMA and County Government certified waste management firm to be commissioned to provide waste collection and disposal services. 91. Ensure waste materials are disposed of on NEMA and County Government approved dumpsites
Sewerage and wastewater management	92. Comply with EMCA Water Quality Regulations, 2006 93. Carry out a sanitation need analysis for the proposed development 94. All drainpipes passing under buildings should be of heavy-duty PVC pipe tube encased in concrete surround 95. All manholes should have heavy-duty covers set and double sealed airtight as approved by specialists 96. Proper decommissioning of the sanitary facilities shall be carried out once construction is complete 97. Provision of adequate and appropriate sanitary facilities for the workers during construction phase and tenants during the operation phase of the facility 98. Sanitary facilities shall be kept clean always through regular cleaning 99. The design of the internal sewerage system shall consider the estimate discharges from individual sources and the cumulative discharge of the entire project, that is, it will have the capacity to consistently handle the loads even during peak volumes 100. Install an onsite WWTP compliant with EMCA Water Quality Regulations 2006 and Comply with NEMA's EIA requirements for onsite wastewater treatment plants for non-sewered developments of 25th June 2020 101. Regular inspection and maintenance of the onsite wastewater disposal systems during the operation phase 102. Sound management of the treated effluent wastewater 103. Oil interceptors to be installed on drainage channels passing through the parking area 104. Servicing of machinery and equipments to be done at a designated places with a paved surface and oil interceptors

Impact	Mitigation measures
	105. Regular inspection and maintenance of the onsite wastewater disposal systems during the construction phase
Increased water demand & consumption	106. Undertake a water needs analysis for the project 107. Verify the legal status and the yield of the existing borehole on the proposed project site 108. Set up water reservoirs to buffer against erratic supplies & reduce competition for resource with other users 109. The contractor to source water for construction from WRA approved sources 110. Drill a legal borehole to provide water for domestic use 111. Prompt detect and repair of all the water fixtures and fittings to reduce water wastage 112. Provide notices and information signs to sensitize on means and needs to conserve water resource i.e., "Keep/Leave the Tap Closed", etc. This will awaken the civic consciousness of the workers and residents with regard to water usage and management 113. The contractor shall use water bowsers and tankers to bring in water for construction activities i.e., during periods of high-water demand (i.e., during slab formation). Water fetching shall however be subject to authorization by the relevant authority 114. Use water efficient appliances and fixtures for conservation of water during the project cycle
Increased energy demand & consumption	115. Carry out energy needs analysis for the project 116. Common areas / exterior lights shall be controlled by a programmable timer 117. Generator should be provided as a full backup energy source throughout the development 118. Install and routine maintenance of energy efficient appliances e.g., LED bulbs etc 119. Monitor energy use during construction and set reasonable limit 120. Put off all lights immediately when not in use or are not needed 121. The water booster set will contain inverter pumps for energy saving and precise control of flow and pressure rate 122. Turn off machinery and equipment when not in use 123. Use of solar energy as an alternative source of energy
Emergence and spread of social vices e,g Increase in Sexual Transmitted Infections & increased local insecurity	124. Installation of security lighting in and around the project site 125. Liaise with local security system to secure the area 126. Use of local labour force as far practical to avoid construction of a labour camp 127. Conduct periodic sensitization forums for employees on ethics, morals, general good behaviour and the need for the project to co-exist with the neighbours 128. Ensure enforcement of relevant legal policy on sexual harassment and abuse of office 129. It is recommended that the contractor employs workers from the immediate area where possible to avoid social conflict 130. Offer awareness, guidance and counselling on HIV/AIDS and other STDs to employees 131. Provide condoms to employees
Loss of privacy for house owners & tenants in the adjacent bungalows and maisonettes	132. Designs of opening s & ventilations on up level floors to maximise privacy of existing housing developments

Impact	Mitigation measures
Increased surface runoff and storm water	133. Rainwater harvesting 134. Provision of enough green spaces for water percolation 135. After completion of construction, the proponent shall embark on comprehensive landscaping 136. Construct gently sloping drains to convey water at non-erosive speed 137. Drainage channels shall be covered; say with gratings, to avoid occurrence of accidents and entry of dirt 138. Semi permeable materials will be used for construction of pavements
Loss of vegetation	139. Landscape the site by planting grass and trees at all disturbed areas 140. Care for the planted trees/plants 141. Retain vegetation screens to reduce the visual effect of this stage of the development 142. Incorporate as much local plants found within the area into the final landscaping of the property
Disruption of existing natural environment and modification of micro-climate	143. Development restricted to follow zoning policy/approved density – building line, plot coverage and plot ratio as approved by the County Government 144. Careful layout and orientation of buildings to respect wind and sun direction 145. Adequate provision of green and open space planted with grass, shrub and tree cover 146. Minimum use of reflective building material and finishes for roof, wall and pavement.

Table 2: Summary of anticipated impacts and mitigation measures for the operation phase

Environment Aspect	Safeguards proposed
Increased energy demand & consumption	1. Carry out energy needs analysis for the project 2. Common areas / exterior lights shall be controlled by a programmable timer 3. Generator should be provided as a full backup energy source throughout the development 4. Install and routine maintenance of energy efficient appliances e.g., LED bulbs etc 5. Monitor energy use during construction and set reasonable limit 6. Put off all lights immediately when not in use or are not needed 7. The water booster set will contain inverter pumps for energy saving and precise control of flow and pressure rate 8. Turn off machinery and equipment when not in use 9. Use of solar energy as an alternative source of energy
Solid waste generation & management	10. Comply with EMCA Waste Management Regulations 2006 11. Regular inspection and maintenance of the waste disposal systems during operation phase 12. Establish a collective waste disposal and management system 13. A NEMA certified waste management firm to be commissioned to provide waste collection and disposal services 14. Provide waste disposal bins to each house well protected from adverse weather and animals
Sewerage & Wastewater management	15. Undertake a sanitation needs analysis for the development 16. Comply with EMCA Water Quality Regulations, 2006 17. Comply with NEMA's EIA requirements for onsite wastewater treatment plants for non-sewered developments of 25th June 2020 18. Regular inspection and maintenance of the onsite wastewater disposal systems during the operation phase 19. Sound management of the treated effluent wastewater

Environment Aspect	Safeguards proposed
Increased loading on existing infrastructure services	20. Carry out an infrastructure impact assessment analysis and implement the findings / recommendations 21. Have paved local access road and walkway system 22. Undertake a comprehensive water needs analysis for the project 23. Verify the legal status & the yield of the existing borehole on the proposed project site 24. Encourage rainwater harvesting 25. Provision of increased water storage capacity 26. Provide adequate storm water drainage system
Increased Traffic	27. Carry out traffic impact assessment study 28. Formulate a traffic management plan for the proposed development approved by the county government 29. Proper signage 30. Awareness creation 31. Provide adequate parking facilities within the project site
Storm water management	32. Rainwater harvesting 33. Provide roof gutters to collect and direct roof water to drains and storage tanks 34. Construct drains to standard specifications 35. Develop a storm water drainage system and linkage to natural drains
Insecurity	36. Ensure secure perimeter wall 37. Manned entry & exit points

This ESIA study recommends that the identified mitigation measures (safeguards) should be closely monitored to ensure that they are being undertaken. All contracts for construction of any of the proposed project components must stipulate the responsibilities of the contractor in implementing the Environmental Management Plan & EIA licensing conditions. In this regard, the Environmental and Social Management Plans (ESMPs) developed in this ESIA report considers the impacts of construction and of the operation phases of the all-housing components. The core responsibilities during the implementation of the ESMP have been allocated.

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ABBREVIATIONS & ACRONYMS

BoQ	Bill of Quantities
CBD	Convention on Biological Diversity
CCTV	Close Circuit Television
COP	Contracting Parties
DOSHS	Department of Occupational Safety & Health Services
EIA	Environmental Impact Assessment
EMCA	Environmental Management Coordination Act
EMP	Environmental Management Plan
ERC	Energy Regulation Commission
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
GIS	Geographical Information System
HIV/AIDs	Human Immunodeficiency Virus/Acquired Immune Deficiency
INLUG	Integrated National Land-use Guidelines
ISWMS	Integrated Solid Waste Management System
KES	Kenya Shilling
KFS	Kenya Forest Service
KPLC	Kenya Power and Lighting Company
LED	Light Emitting Diodes
NCA	National Construction Authority
NEAP	National Environmental Action Plan
NEC	National Environment Council
NECC	National Environment Complaints Committee
NEMA	National Environment Management Authority
NET	National Environmental Tribunal
NLUP	National Land Use Policy
OSH	Occupational Safety and Health
PID	Project Information Document
PIN	Personal Identification Number
PPE	Personal Protective Equipment
SERC	Standards and Enforcement Review Committee
TOR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change
WRA	Water Resources Authority
WWTP	Waste Water Treatment Plant

1 INTRODUCTION OF PROJECT PROPOSAL

This Environmental and Social Impact Assessment Study Report is prepared on behalf of Amberton International Holdings Limited a locally registered firm which proposes to construct 259 housing units and one (1) clubhouse with supporting social amenities on plot B which will be excised from L.R. No. Ngong/Ngong/52926 situated at Rapasi Village along Memusi Road off Forest Line Road (D523) in Matasia, Ngong Division, Kajiado North Sub-County, Kajiado County.

Under section 58 Environment Management and coordination Act (EMCA), 1999 and the Second Schedule (3(g) establishment of new housing estate development exceeding one hundred units, the proposed project is categorized as **a high risk project** which requires an ESIA study before it can start. This report is used for application of an EIA licence for the proposed project.

This ESIA study report has been prepared based on the findings of screening and scoping report, field visits, public participation meetings, designs from the project team and information collected from both primary and secondary sources including the information provided by the Project Proponent.

1.1 Project Proponent

The project proponent is Amberton International Holdings Limited, a locally registered company. Annex 1 (certificate of incorporation and PIN certificate).

1.2 Project Description

The project proposal entails site preparation, construction of 259 housing units and one (1) clubhouse with supporting social amenities. The 259 housing units (69 one bedroom units; 168 two bedroom units; and 22 three bedroom units) will be put up in 9 blocks each 6 levels (ground + 5 floors). These housing units will be developed on a 3.5 acre piece of land. The land is owned by Oleshua Properties Limited (Annex 2).

The breakdown of housing units is a shown in table 1 below:

Table 3 Summary of typology of the proposed housing units

No. of bedroom	No of units	Built up area m^2
1 bedroom	69	38
2 bedrooms	168	67
3 bedrooms	22	85
Total	**259**	**25,663**

The 259 new housing units will be for sale to the general public.

1.3 Project Objectives

The objectives of the proposed housing project:

1. To develop additional housing units for sale;
2. Provide adequate, functional, safe and pleasant living space for the house owners / residents;
3. Improve the utilization of land; and
4. Increase the taxable value of property in the project area.

1.4 Objectives of ESIA the study

1.4.1 General Objective

The general objective of the ESIA study is to carry out a systematic examination of the present environmental situation within the project area to determine likely impacts of the proposed residential housing project with a view of injecting sustainability to the project.

1.4.2 Specific Objectives of the ESIA Study

(i) To highlight environmental issues of the proposed project with a view to guiding policy makers, planners, stakeholders and government agencies to help them in understanding the implications of the proposed project on environmental elements within the project area;
(ii) To review existing legal institutional, and policy framework relevant to the proposed project;
(iii) To predict impacts associated with implementation of the proposed housing project with a view to suggesting mitigation measures for the negative impacts;
(iv) To assess and give recommendations on the various mitigation measures to be taken to reduce possible negative impacts on the proposed piece of land for development;
(v) Analyse public and occupational safety and health issues associated with the proposed project;
(vi) To determine the compatibility of the proposed facility with the neighboring land uses and evaluate local environmental conditions.
(vii) Facilitating public open meetings for the stakeholders to weigh in on the project benefits & concerns.
(viii) Identifying and contacting the project stakeholders to seek their views on the proposed project.
(ix) To assess the relative importance of the impacts of alternative plans, design and sites;
(x) To generate baseline data for monitoring and evaluation of how well the proposed mitigation measures are being implemented during the project operation period;
(xi) To develop an Environmental and Social Management Plan (ESMP) to guide in decision making and for future auditing;
(xii) To raise stakeholder awareness on potential impacts of the project on the environment with a view to making them understand the implication of the project in their environment;
(xiii) To develop an ESIA report in conformity with the EMCA 1999, Environmental (Impact Assessment and Audit) Regulations 2003 and EMCA (amendment) 2015 and legislation under it; and
(xiv) Submission of the final EIA report to NEMA and subsequent follow up to obtain relevant authorization/permit in order for the project to commence.

This ESIA Study Report, therefore, details the positive and negative effects of the development on the project environment and recommends appropriate environmental and social safeguards to minimize potential undesirable effects resulting from the project.

1.5 ESIA process followed

The following ESIA process was followed in development of the study report:
(i) Screening and scoping of project impacts.
(ii) Establishing the suitability of the proposed location for the proposed housing project
(iii) Carrying out literature review.
(iv) Carrying out preliminary fieldwork.
(v) Preparation of the TOR for NEMA`s consideration and approval - a copy of the terms of reference approval letter is attached in **annex 3.**
(vi) Undertaking detailed fieldwork.
(vii) Holding meetings with the project proponent, other project consultants, relevant regulatory government bodies, and stakeholders.
(viii) Holding three (3) public meetings with members of the public.
(ix) Carry out a systematic environmental assessment at the proposed project site and the surrounding area in line with established standards and laws.

(x) Provide a description of the proposed activities throughout the entire implementation process of the project with a special focus on potential impacts to the surrounding environment and facilities.
(xi) Develop an Environmental Management Plan and cost estimates for the proposed housing project.
(xii) Produce an Environmental and Social Impact Assessment report that contain among other issues potential negative and positive impacts and recommendation of appropriate mitigation measures to minimize or prevent adverse impacts.

1.6 Methodology

The methodology used in the ESIA Study included the following.

i. A site reconnaissance and visual survey to determine the baseline information of the project area.
ii. Comparative study of the project with existing land uses in the neighborhood.
iii. Reviewing and analysis of the project documents
iv. Discussion with the proponent and the other consultants
v. Assessment of the site to detail the various existing and likely impacts.
vi. Assessment of health and safety issues
vii. Seeking public views through interviews; questionnaire administration; and holding public meetings
viii. Proposal of mitigation measures to minimize any negative impacts.
ix. Preparation and submission of ESIA study report to NEMA

1.6.1 Screening

Environmental screening was applied at the preliminary stage to determine whether the proposed development required an Environmental Impact Assessment. With reference to the second schedule of EMCA (1999), the proposed project was identified as among those that requires Environmental Impact Assessment so as to ensure that negative impacts from the project are mitigated as the positive ones are amplified.

1.6.2 Approaches to undertaking the ESIA

This ESIA Project Report has been prepared in accordance with the Environmental (Impact Assessment and Audit) Regulations of 2003. It is also guided by the general principles of green buildings. The study methodology also comprised the following activities:

1. Desktop study;
2. Field investigations and assessment.

1.6.2.1 Desktop Study

The desktop study involved:

(i) Initial meetings with project architects and engineers to discuss the proposed project, including activity options under consideration;
(ii) Preparation of a checklist that consisted of a simple catalogue of environmental factors, which were compared with the activities to be performed;
(iii) Collection and review of baseline data, maps, reports and other relevant information on the existing environmental and social conditions of the project area;
(iv) Review of existing legislation, regulation and policies relevant to the proposed project;
(v) Review of proposed project engineering designs and construction inputs, including anticipated technical processes.

1.6.2.2 Field investigations

Field investigations involved:

(i) Site walks within the project area and the neighbouring areas that are within the zone influenced by the project;
(ii) Taking photographs of significant aspects to assist in describing the baseline environmental and social conditions of the project area and its influence zone;
(iii) Taking of the site coordinates and the area elevation;

(iv) Interviews with representatives of relevant key regulatory authorities within the project area and interested and affected parties mainly within the project influence zone;
(v) Obtaining relevant documents from the authorities such as the County Government, and key authorities within the project influence zone.
(vi) Filling in of the questionnaires to facilitate environmental impact data collection
(vii) The aim of the field investigations was to verify information and data collected during the desktop study and to collect any new information that may have been important in the assessment of impacts and design of mitigation measures.

1.6.3 Report Preparation & Outline

The ESIA study report was prepared and compiled and a draft report discussed with the proponent. Thereafter, findings of the assessment were discussed amongst the proponent, the project design & management team and the ESIA experts. This was necessary to appreciate the various responsibilities and modalities of implementing the proposed project. The final report was then prepared and submitted to the proponent for endorsement.

1.7 Potential Positive Impacts

The positive impacts associated with the proposed project include the following among others:

1. Provide additional housing units for sale
2. Enhanced land use; the proposed project will put the land into a more productive use than it is now.
3. Generation of revenue for both the government and developer
4. Improved security in the area
5. Development of social amenities
6. Employment opportunities
7. Development of local infrastructure
8. Enhancement of other businesses

1.8 Potential Negative Impacts

- Increased local population leading to increased pressure on the existing infrastructure and resources
- Socio-economic Impacts
- Increase solid waste generation
- Increased air pollution, particles and dust emission
- Increased generation of effluent & storm water
- Noise pollution and excessive vibrations
- Increased water demand & usage
- Increased energy demand &usage
- Increased local traffic flow
- Public & Occupational Health and Safety threats
- Insecurity and loss of privacy

1.9 Public Consultations

Public consultations are critical in conducting an effective ESIA. The consultation process was backstopped by two social scientist and the ESIA experts, supported by other experts from the consulting team. Public consultations consisted of use of public barazas, interviews and questionnaires administration.

1.10 Constraints and Limitations

The information presented in this report is by and large consistent with the data and information gathered through the various sources and approaches outlined above. However, just as in any studies, the exercise experienced a number of constraints and as a result, there could be some gaps of information in the report as the consultants could not exhaust the collection of all primary data. The findings and issues advanced in this report reflect the general views and perceptions of

some selected people and stakeholders; they may not cover the specific issues from some unique situations, or some individuals affected by the project.

1.11 Project Cost and EIA Processing and Monitoring Fees payable to NEMA

The estimated project cost is Kenya Shillings Five Hundred and Ninety Three Million Sixteen thousand and twenty four (Kshs. 593,016,024). Accordingly, the statutory EIA processing and monitoring fee payable to NEMA is Kenya Shillings Five Hundred and Ninety-Three Thousand Sixteen Shillings (Ksh. 593,016).

A Summary of the Bills of Quantities attached (Annex 4).

1.12 ESIA Study Output

This ESIA study report is prepared for purposes of presenting required information to NEMA for consideration for possible approval and issuance of the EIA licence of the proposed housing project.

2 BASELINE INFORMATION

2.1 Introduction

The following baseline information details on environmental, socio-economic and bio-physical characteristics of the site. This information will provide a benchmark for continued monitoring and assessment of the impact of implementing the proposal on the environment.

2.2 Project Location

The proposed project is located on 'Plot B' to be excised from L.R. No. Ngong/ Ngong/ 52926 situated at Rapasi village along Memusi Road off Forest Line Road (D523) in Olkeri Location, Matasia, Ngong Division, Kajiado North Sub-County, Kajiado County. Namanisho Park Estate Stands on a section of this plot. The GPS coordinates of the proposed project site are 1°22'58.0" S, 36°40'58.9" E.

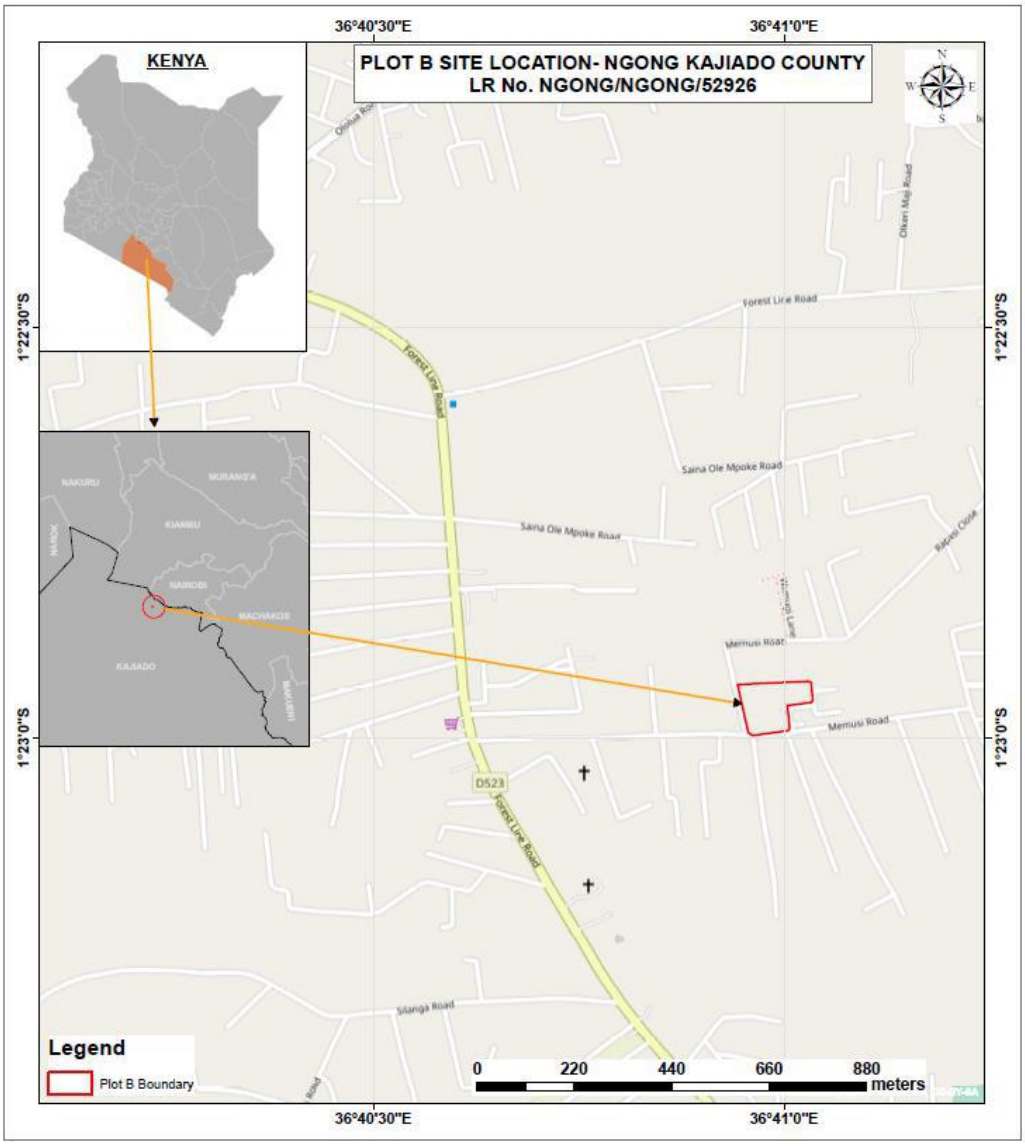

Figure 1 Location map of housing project site

2.3 Land ownership

The proposed residential housing project will be located on plot B measuring approximately 3.5 acres, the plot will be excised from L.R. No. Ngong/Ngong/52926 (measuring approximately 2.4 Ha (5.9304 acres). The land is currently owned by Oleshua Properties Limited. Oleshua Properties Limited has subleased out existing maisonettes (Namanisho Park Estate) to three other entities. A copy of the certificate of lease is annexed in this report.

Amberton International Holdings Limited is at an advanced stage of acquiring a long-term sublease for the undeveloped section of the land measuring approximately 3.5 acres from Oleshua Properties Limited.

2.4 Existing condition of the project site

The project area is located in an already developed environment devoid of any endangered fauna or flora. The site is flat, well drained with scattered vegetation and shrubs /trees. A large section of the plot has already been excavated and the expansive topsoil removed from the site, we were informed that the excavation was done 3 years ago (in 2019) by the former owner of the land.

The site is fenced with a one (1) meter high masonry wall on all sides.

There is electricity (power line), a borehole and an elevated steel water tank on the proposed project site. The borehole and an overhead water tank serve adjacent Namanisho Park Estate. We were not able to verify if the existing borehole on the proposed site is licensed by WRA and it current yield.

Plate 1 Excavated section of the proposed project site

Plate 2 Existing borehole and water tank on the proposed project site

Plate 3 Power line passing on a section the proposed project site & boundary masonry wall

2.4.1 Land use - land cover

The local land use and land cover is presented in the figure below:

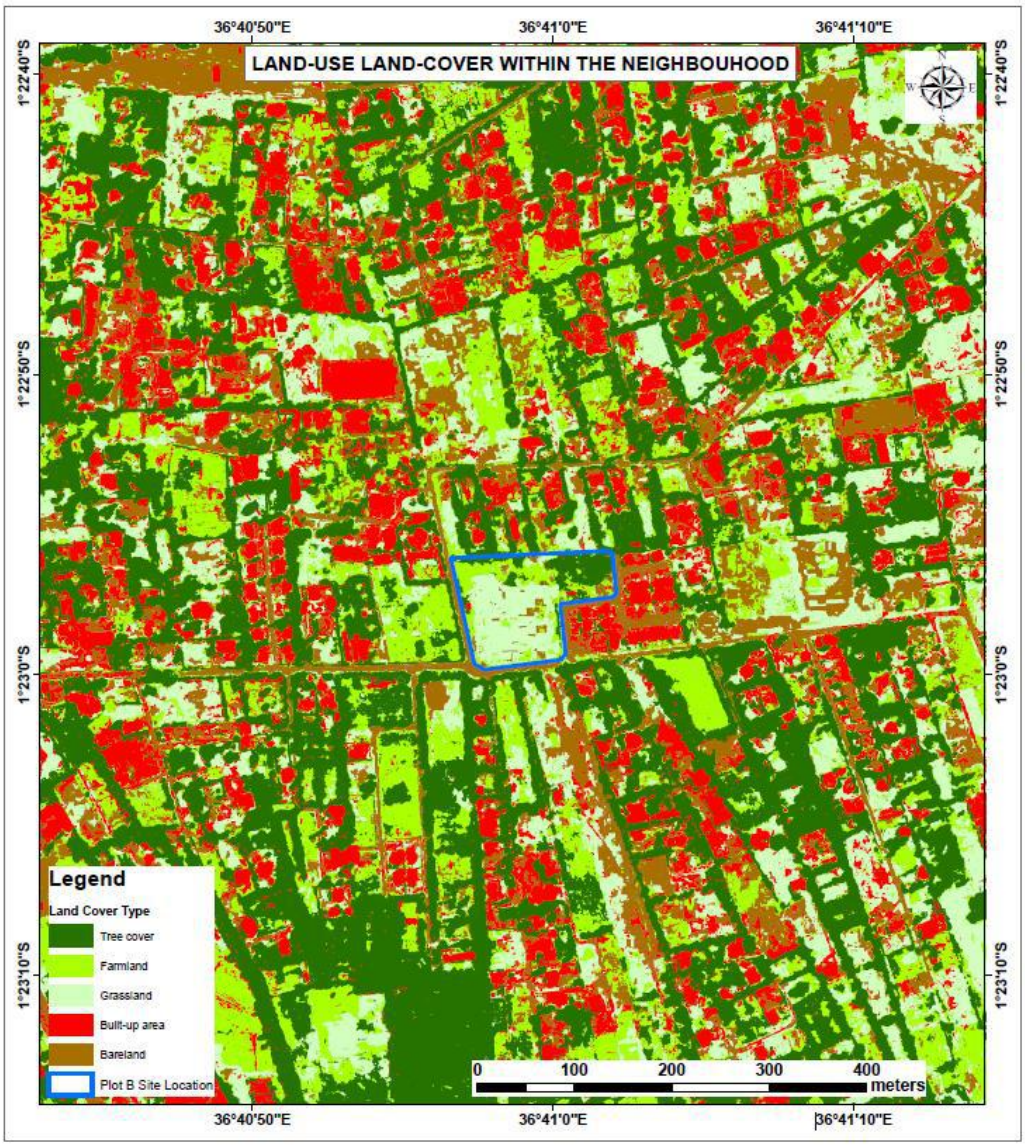

Figure 2 Land use – land cover

2.4.2 Neighbouring developments

Generally, the neighbourhood is a residential area with bungalows and maisonettes. Namanisho Park Estate (21 four bedroom maisonettes - each maisonette with DSQ) is on the northern side of the project sitet. The Institute of applied technology (Matasia Campus) is approximately 30 metres away from the proposed project site. There is also the nearby Okello flats at ground plus 3 floors.

Plate 4 Okello Flats about 300 meters from project site

Some of the learning and health facilities in the neighbourhood are summarised in the map below:

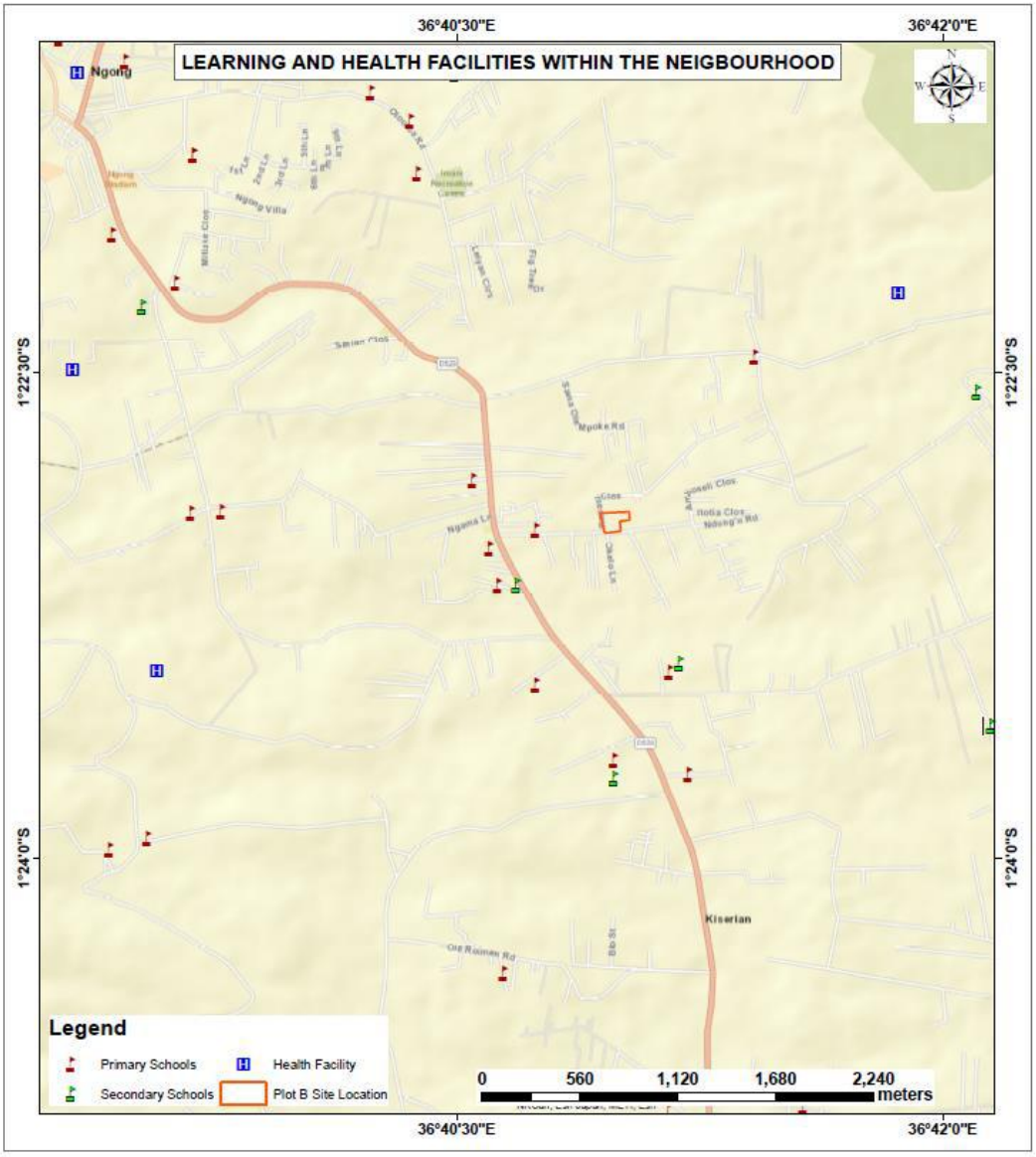

Figure 3 Learning & Health facilities in vicinity of project area

Plate 5 Institute of Applied Technology (Matasia Campus) in the neighbourhood of the proposed project site

2.5 Physical Environment

2.5.1 Climatic Characteristics

The proposed project area is located in Kajiado County. Rainfall in Kajiado is bimodal, with precipitation generally occurring in the months of March to May and October to December. Low altitude in the plains gives rise to low rainfall, high temperature and potentially high evaporation rates, while areas lying at the high altitudes. Annual average rainfall in project site is 600mm.

Average annual temperatures range from 16 ° C to 18º C, with average minima and maxima of 10-12º and 22-24º C, respectively. The warmest period occurs from January to March.

2.5.2 Physiography

Kajiado County, which is located at the southern tip of the Rift Valley province, has a total area of 22,106 sq km, which represents 3.5% of the total area of Kenya. Topographically, Kajiado County can be divided into four distinct areas:

- The Rift Valley-this is a low depression on the western side of the County, which runs from north to south.
- Athi Kapiti plains-, which consists mostly of open, rolling land.
- Central Broken Ground - which comprises a 20-70 kilometres wide stretch along the north eastern border stretching across the County to the southwest
- The Amboseli plain which are characterized by gently undulating plains with deep reddish brown clay-loams, and flat sedimentary plains with poorly drained cotton soils.

2.5.3 Hydrogeology

The occurrence of groundwater in Kajiado County is mainly influenced by climate and topography as well as origin of underlying parent material. Groundwater occurrence in the County is based on four hydro-geological formations, which include: volcanic, volcanic over basement, basement and sediment over basement.

2.6 Solid waste management

It is the responsibility of the County Government to collect solid waste. However, the capacity of the County Government to effectively manage the solid waste is limited, heaps of uncollected waste is a common occurrence.

2.7 Socio-Economic Environment

2.7.1 Population & Demographics

According to the 2019 Census, Kajiado North sub-county had a population of 306,596. There was an average of 101,378 households in Kajiado North sub-county according to the 2019 Census. The proposed project site is in Olkeri Ward / Location, the population of Olkeri Ward is 34,809 people. Below, is a ward population size map for the wards neighbouring Olkeri Ward.

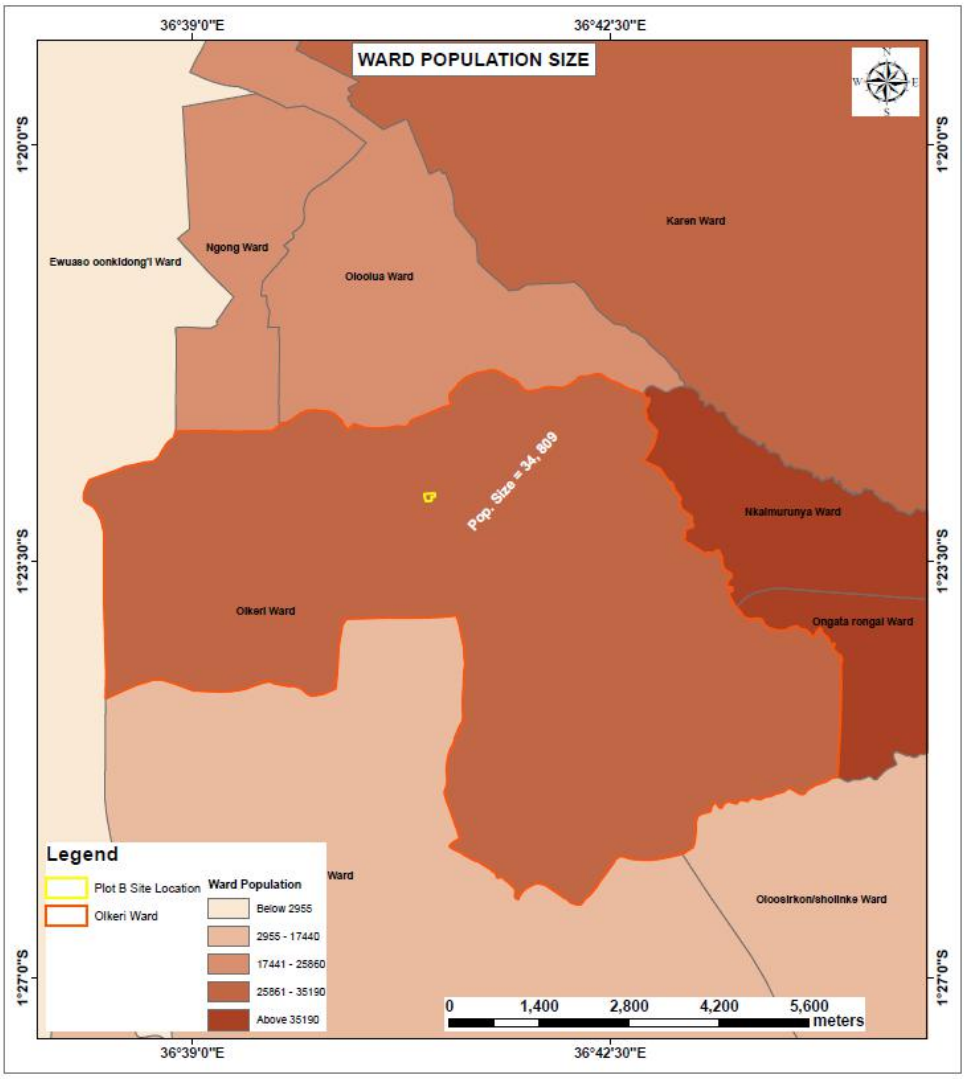

Figure 4 Ward Population size

2.7.2 Economic development

There are small-scale agricultural activities, big and small-scale businesses within the sub-county.

2.7.3 Water Supply

All water in the area is sourced from boreholes. There is rationed water supply from Oloolaiser Water and Sewerage Company, boreholes and private-owned boreholes. The area has no public water supply system; borehole water is the major source of water in the area.

The developer proposes to drill a borehole to provide water for the proposed development.

It is a recommendation that the proponents undertake tests on yields and analysis of the water quality to determine capacity to meet the demand and conformity to Schedule 1 of the Water Quality Regulations, 2006. The proponent has undertaken hydrologeological survey to establish the viability of ground water for the project **annex 5**.

There are several legal boreholes in the neighbourhood, information / details of the boreholes is summarised in the table below.

Table 4 Information on legal boreholes in the neighbourhood

FID	Latitude	Longitude	Average Total Depth (Feet)	Average Water struck level (Feet)	Average Water rest level (Feet)	Average yield in m^3/month
0	-1.3698	36.6521	114	78	63.7	3.96
1	-1.3836	36.6522	160	74	112.5	6.6
2	-1.3556	36.6542	252	152	21	8.22
3	-1.3819	36.6556	89	88	76	6.06
4	-1.3509	36.6603	260	225	3	35.7
5	-1.3825	36.6622	161	141	80.1	5.76
6	-1.3415	36.6657	120	66	34	3.3
7	-1.3667	36.6666	174	128	117	4.98
8	-1.3833	36.6667	198	117	7	20.46
9	-1.4	36.6667	265	145	145	2.7
10	-1.3389	36.6667	30	16	10.1	1.2
11	-1.3925	36.6667	110	74	23.3	8.76
12	-1.3387	36.6781	0	0	0	0
13	-1.3398	36.6793	120	30	33	12
14	-1.3871	36.6796	100	20	7	7.5
15	-1.35	36.6833	79	56	53	9.06
16	-1.3667	36.6833	91	55	39	8.46
17	-1.35	36.6833	124	124	89	1.56
18	-1.35	36.6833	143	136	24	2.88

FID	Latitude	Longitude	Average Total Depth (Feet)	Average Water struck level (Feet)	Average Water rest level (Feet)	Average yield in m^3/month
19	**-1.3833**	**36.6833**	**155**	**104**	**16**	**32.7**
20	-1.3833	36.6833	100	46	42	3
21	-1.3889	36.6873	152	141	4.9	6.1
22	-1.3915	36.6892	226	224	7	3
23	-1.3913	36.6894	230	216	72	21.96
24	-1.35	36.7	83	83	20	1.14
25	-1.35	36.7	153	140	66	2.28
26	-1.35	36.7	153	137	87	8.88
27	-1.35	36.7	155	131	77	8.52
28	-1.35	36.7	148	146	58	1.8
29	-1.35	36.7	138	130	82	4.08
30	-1.35	36.7	230	210	33	3.12
31	-1.35	36.7	137	80	52	13.5
32	-1.3667	36.7	150	90	19	6.48
33	-1.367	36.7	150	104	19	3.42
34	-1.4	36.7	150	43	24.8	9
35	-1.4	36.7	113	52	23	10.5
36	-1.3678	36.7	177	172	97.9	4.98
37	-1.3986	36.7028	100	58	14.9	4.8
38	-1.3514	36.7044	270	98	69	8.4
39	-1.3964	36.7072	94	56	16.2	12.6
40	-1.4131	36.7081	82	68	35	5.1
41	-1.3667	36.7167	255	229	52	1.92
42	-1.3667	36.7167	153	146	93	0
43	-1.3667	36.7167	155	68	49	3

NOTE:

- Borehole with FID 19 is located adjacent to the proposed project site
- The existing borehole on the project site is missing from the above list

There are several water features in the neighbourhood as presented in the figure below:

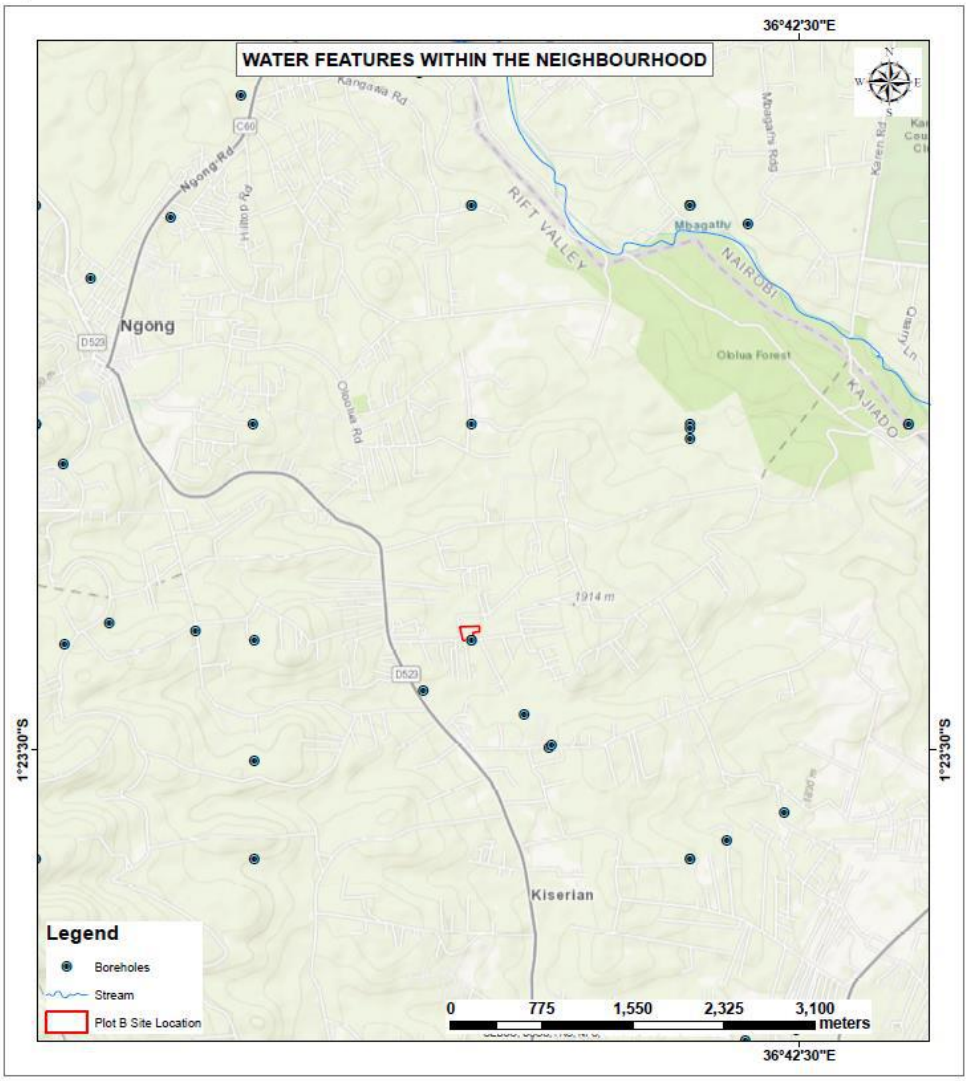

Figure 5 Water features in the neighbourhood

2.7.4 Sewer System

There is no public sewer line in the area. The developer proposed to setup an onsite waste water treatment plant as shown in the drawings attached in **annex 6**.

2.7.5 Existing Infrastructure

A summary of the existing infrastructure of the site is summarized in the table below:

Table 5: Summary of existing infrastructure

Road	By vehicle, the project site is easily accessed by Memusi Road off the Forest Line Road (Ngong-Kiserian Road). However, Memusi Road is narrow. There is need for the proponent to carry out traffic impact assessment and develop a traffic management plan for the project
Water	The area is served majorly by borehole. The proponent proposes to drill one (1) borehole for domestic water use.
Sewerage	The area has no public sewer line; the proponent proposes to install an onsite wastewater treatment plant.

Electricity	The project environment generally enjoys good supply of electricity and the proponent of this project is expected to connect to the existing power lines. However, there is need to establish if the current electricity supply infrastructure will be able to cater for the anticipated increased local population.
Communication infrastructure	Communication network in this area is excellent, courtesy of several mobile phone service providers in the country. Postal services are available.
Refuse disposal	The County Government of Kajiado is responsible for waste disposal. However, the county government has a poor waste management system. The proponent / residents will engage the services of licensed garbage collector to handle the solid waste generated from the site.
Security	Matasia Police post is located approximately 2 km from the site. The developer will engage the services of a private security to enhance the institution students and workers' security.
Storm water drainage	Drainage has been planned along the roads and the perimeter fence in light of the area's poor soil drainage and to re-direct the storm water to the road drainage.

3 ENVIRONMENTAL POLICY, LEGAL & INSTITUTIONAL FRAMEWORK

3.1 National Environmental Policies

	National Environmental Policies	Relevance to the project/license or permit required/ or activity requiring regulation
1.	National Environmental Action Plan (NEAP): The purpose of the National Environmental Action Plan (NEAP) is to promote and facilitate the coordination of strategies and measures to protect and manage the environment into plans and programmes for the social and economic development of Kenya. The Environmental Management and Coordination Act, 1999, established the NEAP to address the protection and management of the environment at district, provincial and national levels.	The proponent should comply with the NEAP policies and legislative with regards to preventing, controlling or mitigating specific as well as general adverse impacts on the environment. The project activities will interact with the various elements and components of the physical, social and economic environments in ways that could lead to negative impacts. Stakeholders in the project will therefore ensure that projects covered under consideration should be implemented in ways that ensure environmental integrity. Issues of environmental integrity will be addressed through project level Environmental Impact Assessments (EIAs).
2.	Kenya's Vision 2030: The Kenya Vision 2030 is the national long-term development policy that aims to transform Kenya into a newly residential, middle-income country providing a high quality of life to all its citizens by 2030 in a clean and secure environment.	Amongst others, Vison 2030 is to facilitate production of housing units and to improve the lives of slum dwellers. The proposed development is a timely project in line with this vision. Each activity or project carried out in the republic must comply with the state vision of the national environment, as well as respect the right of everyone to a clean and healthy environment. The project provides for various types of development activities that use sensitive components of the physical and natural environment, and stakeholders involved in the implementation of the program must ensure that the principle of sustainable development is respected at all stages of projects related to the programs.
3.	National Environment Policy, 2012 Revised Draft #4: The major objective of the policy is to provide a framework for an integrated approach to planning and sustainable management of Kenya's environment and its natural resources. The policy further ensures that the environment is integrated in all government policies in order to facilitate and realize sustainable development at all levels. This would help promote green economy, enhance social inclusion, improve human welfare and create opportunities for employment and maintenance of a healthy ecosystem.	ESIA study has developed an environment and social management and monitoring plan to mitigate the impacts that may result during the construction and operation phases of the project. This tool is aimed at promoting coordination of environmental management of the project such that sensitive ecosystems are not destabilized by project activities The developer should ensure that the provisions of this policy are followed to ensure the protection of the environment.

	National Environmental Policies	Relevance to the project/license or permit required/ or activity requiring regulation
4.	Environmental and Development Policy (Session Paper No. 6 1999): The goal of this Policy is a better quality of life for present and future generations through sustainable management and use of the environment and natural resources	The main objective of this Policy is a better quality of life for present and future generations through sustainable management and use of the environment and natural resources. The proposed project once complete will provide additional residential housing units for sale.

3.2 Environmental Institutional Framework

	Environmental Institutional Framework	Relevance to the project/license or permit required/ or activity requiring regulation
1.	**National Environment Management Authority (NEMA):** The objective and purpose for which NEMA is established is to exercise general supervision and co-ordinate over all matters relating to the environment and to be the principal instrument of the government in the implementation of all policies relating to the environment. NEMA is responsible for general supervision and, co-ordination of all matters relating to the environment and is the principal instrument of government in the implementation of all policies relating to the environment. The authority is also responsible for monitoring compliance with all the NEMA regulations	The Project proponent is required to contract services of a NEMA licensed EIA expert, submit an ESIA report to NEMA and acquire an EIA licence before commencing any construction works.
2.	**County Environment Committee:** The County Environment Committee shall- (a) Be responsible for the proper management of the environment within the county for which it is appointed; (b) Develop a county strategic environmental action plan every five years for consideration and adoption by the County Assembly. These committees contribute to decentralization of activities undertaken by NEMA and thus enable local communities to have access to environmental management information. The committees also conduct site visits and review environment related reports of the projects and on occasions could attend site meetings.	The project is in Kajiado County and will be subject to discussion and site visits by the County Environmental Committee. The committees will review environment related reports of the project.
3.	**National Environment Complaints Committee, NECC** (Public Complaints Committee): The committee is an environmental ombudsman that was established under section 31 to 36 of Environmental Management and Coordination Act, Cap 387 with mandate to investigate allegations or complaints regarding the condition of environment in Kenya. It is an important institution in the assessment of the condition of the environment in Kenya	If any disputes will arise in regards to this project, the NECC will also play an important role in the facilitation of alternative dispute resolution mechanisms relating to environmental matters.

	Environmental Institutional Framework	Relevance to the project/license or permit required/ or activity requiring regulation
4.	**Standards and Enforcement Review Committee:** NEMA through EMCA has established standards for the various environmental parameters that require management, and these include the water quality standards, noise and vibration control standards, and the waste management standards, amongst other. 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 follows on complaints reported by the public. This is a technical Committee responsible for environmental standards formulation, methods of analysis, inspection, monitoring and technical advice on necessary mitigation measures. The members of the Standards and Enforcement Review Committee are set out in the third schedule of the principal Environmental Management and Co-ordination Act, Cap 387.	The committee gives advice on how to establish criteria and procedures for the measurement of water quality and recommends the minimum water quality standards, analyzes conditions for discharge of effluents into the environment, and also carry out investigations of actual or suspected water pollution
5.	**National Environmental Tribunal (NET):** The tribunal is formed under section 125 of the EMCA, Cap 387 and handles all cases related to environmental offences in the Republic of Kenya. The tribunal's principal function is to receive, hear and determine appeals arising from decisions of the National Environment Management Authority (NEMA) on issuance, denial or revocation of environmental impact assessment (EIA) licenses, among other decisions.	If disputes with respect to the proposed development arise, the NET will function very much like a court of law.
6.	**Environment and Land Court (ELC):** The ELC is formed under Part 11 section 4 of Environment and Land Court Act, No. 19 of 2011 and section 150 of the EMCA, Cap 387. Any person aggrieved by a decision or order of the Tribunal may, within thirty days of such decision or order, appeal against such decision or order to the Environment and Land Court.	Anybody aggrieved by the decision of NET may seek redress at the ELC.

3.3 National Environment Legislative Framework

	National Environment Legislative Framework	Relevance to the project/license or permit required/ or activity requiring regulation
1.	The Constitution of Kenya 2010: Article 42 of the Constitution states that 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 proponent has a right to carry out the project within legal limits. The proponent must ensure that the project is carried out in an ecologically, economically and socially sustainable manner. The proponent is entitled to a fair administrative decision-making process from NEMA and other State organs.

	National Environment Legislative Framework	Relevance to the project/license or permit required/ or activity requiring regulation
	Article 69(2) 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 project proponent will be required to comply fully with the above stated articles of the Constitution.
2.	County Government Act 2012: This Act vests responsibility upon the County Governments in planning of development projects within their areas of jurisdiction on projects of importance to the local County Government or those of national importance. Section 102 of the Act provides the principles of planning and development facilitation which include integration of national values in county planning, protect the right to self-fulfillment within the county communities and with responsibility to future generations, protection of rights of minorities and marginalized groups and communities, promotion of equity resource allocation, among others.	The project proponent should initiate the process of County Government engagement in the initial project planning through application of essential development approvals from Kajiado County Government. The proponent will comply fully with the Act.
3.	Environment Management and Coordination Act (EMCA) 1999 Revised in 2015: The Environmental Management and Coordination Act, Cap 387 provides for the establishment of appropriate legal and institutional framework for the management and protection of the environment.	EMCA provide a legal and institutional framework for the management of the environment-related matters. Environmental quality conservation aspects of the project in consideration will be realized through the implementation of the Environmental Management & Social Monitoring Plan aimed at mitigating the potentially negative impacts and enhancing the potentially positive impacts predicted through project level EIAs.

3.4 International Environmental Management Agreements/ Conventions and Protocols

	International Environmental Management Agreements/ Conventions and Protocols	Relevance to the project/license or permit required/ or activity requiring regulation
1.	The United Nations Declaration on the Rights of Indigenous Communities: The Declaration is the most comprehensive international instrument on the rights of Indigenous peoples. It establishes a universal framework of minimum standards for the survival, dignity and well-being of the Indigenous peoples of the world and it elaborates on existing human rights standards and fundamental freedoms as they apply to Indigenous peoples.	The provisions of The United Nations Declaration on the Rights of Indigenous Communities should be put into consideration by the developer, in that the developer should engage the indigenous communities throughout the project cycle.

	International Environmental Management Agreements/ Conventions and Protocols	Relevance to the project/license or permit required/ or activity requiring regulation
2.	The Rio Declaration- Agenda 21: Principle 4 of the Rio Declaration provides that in order to achieve sustainable development environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it. Principle 25 accentuates this by stating that peace, development and environmental protection are interdependent and indivisible.	The provisions of Rio Declaration should be put into consideration by the developer, in that protect the environment while still sustainably developing.
3.	World Commission on Environment and Development of 1987: The mission of the Brundtland Commission is to unite countries to pursue sustainable development together. The Brundtland Commission insists upon the environment being something beyond physicality, going beyond that traditional school of thought to include social and political atmospheres and circumstances. It also insists that development is not just about how poor countries can ameliorate their situation, but what the entire world, including developed countries, can do to ameliorate our common situation.	The provisions of this convention should be taken into consideration by the developer.
4.	The Ramsar Convention on Convention on Wetlands of International Importance especially as Waterfowl Habitat: The Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat is an international treaty for the conservation and sustainable use of wetlands. It is also known as the Convention on Wetlands. It is named after the city of Ramsar in Iran, where the Convention was signed in 1971. Every three years, representatives of the Contracting Parties meet as the Conference of the Contracting Parties (COP), the policy-making organ of the Convention which adopts decisions (Resolutions and Recommendations) to administer the work of the Convention and improve the way in which the Parties are able to implement its objectives.	The developer should ensure the proposed project doesn't have any impacts on wetlands. Wastes should properly be disposed and not directed into water bodies.
5.	Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal (Basel Convention): Is an international treaty that was designed to reduce the movements of hazardous waste between nations, and specifically to prevent transfer of hazardous waste from developed to less developed countries (LDCs). The Convention is also intended to minimize the amount and toxicity of wastes generated, to ensure their environmentally sound management as closely as possible to the source of generation, and to assist LDCs in environmentally sound management of the hazardous and other wastes they generate.	The developer should minimize the amount and toxicity of wastes generated, to ensure their environmentally sound management as close as possible to the source of generation
6.	Convention on Biological Diversity (CBD) of 1992:	The provisions of this convention should be taken into account in the conservation of various species of plants, animals and the variety of ecosystems in the project area.

	International Environmental Management Agreements/ Conventions and Protocols	Relevance to the project/license or permit required/ or activity requiring regulation
	The CBD establishes a global legally binding framework for the conservation of biodiversity, the sustainable use of its components and the fair and equitable sharing of benefits arising out of utilization of genetic resources.	The proposed project is in line with the CBD and NBSAP, including the Aichi target with regards to promoting local communities appreciating and valuing biodiversity so as to conserve and use it sustainably.
7.	United Nations Framework Convention on Climate Change UNFCCC (1993): The UNFCCC objective is to "stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". The framework sets non-binding limits on greenhouse gas emissions for individual countries and contains no enforcement mechanisms. Instead, the framework outlines how specific international treaties (called "protocols" or "Agreements") may be negotiated to specify further action towards the objective of the UNFCCC.	The proposed project will endeavour to be in line with this convention and ensure that atmospheric pollution through greenhouse gases is minimised as is practically possible.
8.	Rotterdam (PIC) Convention on Prior Informed Consent: The Rotterdam Convention (formally, the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade) is a multilateral treaty to promote shared responsibilities in relation to importation of hazardous chemicals. The convention promotes open exchange of information and calls on exporters of hazardous chemicals to use proper labeling, include directions on safe handling, and inform purchasers of any known restrictions or bans.	The Convention creates legally binding obligations for the implementation of the Prior Informed Consent (PIC) procedure. It built on the voluntary PIC procedure, initiated by UNEP and FAO in 1989 and ceased on 24 February 2006. The Convention covers pesticides and industrial chemicals that have been banned or severely restricted for health or environmental reasons by Parties and which have been notified by Parties for inclusion in the PIC procedure.
9.	Stockholm Convention on Persistent Organic Pollutants (POPs) (2002): The Stockholm Convention on Persistent Organic Pollutants is a multilateral treaty to protect human health and the environment from chemicals, known as POPs. POPs have harmful impacts on human health or on the environment. They remain intact in the environment for long periods, become widely distributed geographically and accumulate in the fatty tissue of humans and wildlife.	The developer should ensure that all POPs are properly disposed in order to protect the environment.
10.	UNCCD: Convention on Desertification, of January 1995: The United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa (UNCCD) is a Convention to combat desertification and mitigate the effects of drought through national action programs that incorporate long-term strategies supported by international cooperation and partnership arrangements.	Soil conservation measures should be put in place throughout project implementation period.
11.	World Heritage Convention: Convention concerning the protection of the world cultural and natural heritage: For the purpose of this Convention, international protection of the world cultural and natural heritage shall be understood to mean the establishment of a system of international co-operation and	The Convention Concerning the Protection of the World Cultural and Natural Heritage (the World Heritage Convention) is a successful global instrument for the protection of cultural and natural heritage.

	International Environmental Management Agreements/ Conventions and Protocols	Relevance to the project/license or permit required/ or activity requiring regulation
	assistance designed to support States Parties to the Convention in their efforts to conserve and identify that heritage.	
12.	Montreal Protocol: Protocol for the Protection of the Ozone Layer January 1990: The Montreal Protocol is an international treaty designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion.	The developer is required to use only materials and substances that are safe and won't lead to the depletion of the Ozone layer.
13.	Sofia Protocol to LRTAP concerning the Control of Emissions of Nitrogen Oxides or their Trans-boundary Fluxes (NOx Protocol): Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution Concerning the Control of Emissions of Nitrogen Oxides or Their Transboundary Fluxes, opened for signature on 31 October 1988 and entered into force on 14 February 1991, was to provide for the control or reduction of nitrogen oxides and their transboundary fluxes.	The proponent is requested to introduce pollution control measures based on best available technologies that are economically feasible.

3.5 Institutional Structure of the Housing Sector in Kenya

	Institutional Structure of the Housing Sector in Kenya	Relevance to the project/license or permit required/ or activity requiring regulation
1.	National Housing Corporation (NHC): The National Housing Corporation is established and constituted by the Housing Act Chapter 117 (3) The Corporation consists of— (a) a chairperson appointed by the President; (b) the Principal Secretary responsible for housing in the Ministry; (c) a person appointed by the Cabinet Secretary for the time being responsible for finance; and (d) six persons appointed by the Cabinet Secretary for the time being responsible for housing, being persons who in his or her opinion possess knowledge of housing development or housing finance. The corporation is charged with: (a) undertake and encourage research and experiment in housing related matters, and undertake and encourage the collection and dissemination of information concerning housing and related matters; (b) take part in housing exhibitions and other forms of publicity;	NHC endeavours to make Kenya a "decently housed nation". To achieve this vision, the corporation plays a leading role in providing affordable housing and related services to Kenyans. The proposed project is a timely project in line with this vision. This is a project that will provide additional residential housing units for sale.

	Institutional Structure of the Housing Sector in Kenya	Relevance to the project/license or permit required/ or activity requiring regulation
	(c) undertake and encourage the provisions of training in furtherance of the purposes of this Act and provide training for members of its staff; (d) perform such other duties connected with housing as the Minister may direct; (e) to operate a housing finance institution with powers to borrow funds from the Government, overseas agencies, pension and trust funds and any other institution or persons, as well as to collect deposits and savings from the public to be applied to the financing of residential housing development and related matters; and (f) to establish, promote or aid in establishing or promoting, constitute, form or organise companies' syndicates or partnerships alone or in conjunction with any other person or institutions for the carrying on of any such functions as the Corporation is empowered to carry on under this Act.	
2.	National Housing Development Fund, 2020: Housing Act Chapter 117 (7) Establishes the Housing Fund which is under the control of the National Housing Corporation, consisting of such securities and money and applicable to such purposes as are provided for by this Act. The Finance Act 2018 was enacted by adding the following on Section 86, thus technically amending employment act, 2007 by inserting this text after section 31. 31A. (1) An employer shall pay to the National Housing Development Fund in respect of each employee— (a) the employer's contribution at one point five per centum (1.5%) of the employee's monthly basic salary; and (b) the employee's contribution at one point five per centum (1.5%) of the monthly basic employee's salary: Provided that the sum of the employer and employee contributions shall not exceed five thousand shillings (Kshs.5,000) a month.	Housing remains one of the key growth pillars for promoting long-term economic development. To achieve the goals outlined in this pillar, the Government of Kenya established the National Housing Development Fund (NHDF). Public-private partnership framework will enable fast-tracking of the approval processes of housing projects and to accommodate new approaches. The proposed project will help the Kenyan Government to achieve this goal.

3.6 Ministerial and County Institutional Integration

	Ministerial and County Institutional Integration	Relevance to the project/license or permit required/ or activity requiring regulation
1.	The Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2016 It deletes and substitutes the Fifth Schedule (fees) of Environmental (Impact Assessment and Audit) Regulations, 2003 as summarized below: i. Specify fees payable for application for registration as an Environmental Impact Assessment / Audit expert; ii. Specify fees payable for annual license to practice as an Environmental Impact Assessment / Audit; iii. Specify fees payable for Environmental Impact Assessment license for low risk projects – which is 0.1% of the total cost of the project subject to a minimum of Kenya Shillings Ten Thousand (Ksh.10,000) and a maximum of Kenya Shillings Three Million (Ksh.3,000,000); iv. Specify fees payable for Environmental Impact Assessment license for medium risk projects – which is 0.1% of the total cost of the project subject to a minimum of Kenya Shillings Twenty Thousand (Ksh.20,000) and a maximum of Kenya Shillings Ten Million (Ksh.10,000,000); v. Specify fees payable for Environmental Impact Assessment license for high risk projects – which is 0.1% of the total cost of the project subject to a minimum of Kenya Shillings Fifty Thousand (Ksh.50,000) and a maximum of Kenya Shillings Ten Million (Ksh.10,000,000).	The developer will fully comply; the proposed project being a high risk project, the developer will pay required fee of Ksh. 593,016 being 0.1% of the total project cost (Ksh. 593,016,024).
2.	Environmental Management & Co-ordination (Waste Management) Regulations 2006: Provides standards for handling, transportation & disposal of various types of waste including hazardous waste. Requirements to ensure waste minimization or cleaner production, waste segregation, recycling or composting Provides for licensing of vehicle transporting waste Provides for licensing of waste disposal facilities	Disposal of generated waste from operations under the project. Generation of hazardous wastes such as used oi & oily parts from servicing of equipment & vehicles. Ensure there exists proper contractual agreement with NEMA licensed solid waste handlers and that solid wastes are collected in a timely manner and disposed responsibly.
3.	Air Quality Regulations, (Legal Notice No. 34 of 2014): These regulations are aimed at controlling, preventing and abating air pollution to ensure clean and healthy ambient air.	The proponent will ensure that operations at the site do not generate dust, particulates and other emissions beyond allowable limits especially during construction by deploying efficient dust screens, PPE and other dust suppression measures.

	Ministerial and County Institutional Integration	Relevance to the project/license or permit required/ or activity requiring regulation
4.	Legal Notice No. 120, Environmental Management & Co-ordination (Water Quality) Regulations 2006: Provides for the protection of ground & surface water resources Provides for the parameters in the quality of wastewater discharged from any facility/activity into the environment or sewer.	Any discharges to the surface water courses during operation phases to be monitored for conformance with the standards. The project proponent will fully comply with the Regulations. The contractor/proponent will handle hazardous substances in a manner that is not likely to cause water pollution. The proponent should ensure that effluent meets the standards set out under Schedule III of Legal Notice No. 120 of 2006.
5.	The Environmental Management and Co-ordination (Controlled Substances) Regulations, 2007: The regulations regulate the importation and use of Ozone Depleting Substances. Regulations No. 3 gives a classification of Controlled Substances.	The proponent will comply fully with the Regulations by not using Ozone Depleting Substances
6.	The Environmental Management and Co-ordination (Wetlands, Riverbanks, Lake Shore and Sea Shore management) Regulations, 2009: Section 14 of the Regulations states: Duty of landowners, users and occupiers. (1) Every owner, occupier or user of land which is adjacent or contiguous to a wetland shall, with advice from the Authority, have a duty to prevent the degradation or destruction of the wetland, and shall maintain the ecological and other functions of the wetland.	The project proponent will be required to comply fully with the Regulations. It will be the duty of the developer to ensure no wastes from this development end up into water bodies.
7.	The Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006 Legal Notice No. 160: The regulations provide for a) detailed processes and rules for the conservation of biological diversity in Kenya; b) mechanisms to protect and prevent exploitation of endangered and threatened plant and animal species; c) access to and the fair and equitable sharing of benefits arising from the utilization of genetic resources; d) the consultation of local communities in the process of accessing genetic resources for research, commercial and other purposes; e) Ensure recognition of specific knowledge held by and role of local communities in conservation of biological resources; f) Regulate the process and terms by which genetic resources can be taken out of the republic of Kenya and, g) Sustainable use of biodiversity and genetic resources.	The developer should adhere to these regulations in order to conserve the biological diversity in of the area

	Ministerial and County Institutional Integration	**Relevance to the project/license or permit required/ or activity requiring regulation**
8.	Environmental Management & Co-ordination (Noise & Excessive Vibration Pollution control) Regulations 2009: Prohibits the generation of unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others & the environment. Provides for the maximum noise levels permissible in various environmental set ups such as residential areas, places of worship, commercial areas & mixed residential Provides that a sound source creates or is likely to emit noise or excessive vibrations or otherwise fail to comply with the provision of these regulations, a license is required.	Sound level limits of 60dB(day) and 35dB (night) to be observed during operations License to emit noise/vibrations in excess of permissible levels to be acquired if necessary. The proponent will be required to comply fully with the Regulations.
9.	Legal Notice No. 31, Environmental Management and Coordination, (Noise and Excessive Vibration Pollution) Regulations 2009: These Regulations require that no person or activity shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise that annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment.	The contractor shall be required to implement these measures, ensure that all machineries are in good working condition to reduce noise. Also, construction activities shall be restricted between 0800Hrs-1700Hrs to ensure that the neighbours are not disturbed.
10.	Environmental (Impact Assessment & Audit) Regulations, 2003 Amended 2019: Provides for the procedure for carrying out the ESIA Provides for the contents of an ESIA study report	The ESIA to be carried out in accordance to the regulations
11.	EMCA (Fossil Fuel Emission Control) Regulation, 2006: NEMA is mandated under this regulation to approve any substance to be used as a fuel catalyst if the substance improves fuel economy, enhances combustion and reduces harmful emissions that adversely affect human, animal and plant health and degrade the environment. Furthermore, NEMA has to issue a catalyst license of an approved fuel catalyst and may impose such conditions as it may deem appropriate.	Only approved substances are to be used as a fuel catalyst if the substance improves fuel economy, enhances combustion and reduces harmful emissions that adversely affect human, animal and plant health and degrade the environment
12.	Use of Poisonous Substances Act Cap 247: An Act of Parliament to provide for the protection of persons against risks of poisoning by certain substances, and for matters incidental thereto and connected therewith	Section 3 of the Act casts a duty of all employers of protecting their employees against the risk of poisoning by poisonous substances.
13.	The Water Act (Act No.8 of 2002) revised in 2016: Provides that a permit shall be required for any use of water from a resource, especially where there is abstraction and use of water with the employment of works. The legislation provides for the management of water resources at national and county level. Article 40(4) provides an application for a permit to which shall be subject to public consultation and, where applicable EIA in accordance with the requirements of the EMCA. 108(1) sewage & effluent management to avoid environmental pollution.	Use of water abstracted from borehole requires an abstraction permit. A permit will be required from WRA for any water borehole construction works and an abstraction licence The proponent will comply fully with the Act.
14.	Water Resources Management Rules 2007: Provides for application by all those intending to abstract ground water	Depending on the proposed source of water for construction activities, permits may be required

	Ministerial and County Institutional Integration	**Relevance to the project/license or permit required/ or activity requiring regulation**
	Provides that where any borehole or well is intended to be equipped with a motorized pump the application shall be accompanied by a hydrogeological assessment report.	
15.	The Forests Act (Chapter 375): The Forest Act, Cap 385 of 1962 (revised 1982, 1992 and 2005) addresses the reservation, protection, management, enforcement and utilization of forests and forest resources on Government land. The Forest Act is applicable to gazetted forest areas (Forest Reserves) and specifically covers: Gazettement, alteration of boundaries and de-gazettement of Forest Reserves (Section 4); Declaration of Nature Reserves within Forest Reserves and regulation of activities within Nature Reserves (Section 5); Issuance of licenses for activities within Forest Reserves (Section 7); Prohibition of activities in Forest Reserves (removal of forest produce, grazing, cultivation, hunting, etc.) and on unalienated Government land (removal of trees, collection of honey, lighting of fires) except under license from the Director of Forest Services (Section 8); Power of the Minister to make rules with respect to sale and disposal of forest products, use and occupation of land, licensing and entry into forests (Section 15). This prerogative has been taken with the Forests (General) Rules, which sets forth rules for sale of forest produce and specifies royalty rates for these products.	The project area is not located in a forest zone. However, the developer will need KFS permit in order to cut down existing trees. It is advisable that the developer should plant more trees on the site after completion of the project.
16.	The Physical and Land Use Planning Act, No. 13 of 2019 An Act of Parliament to provide for the preparation and implementation of physical development plans and for connected purposes. Provides for zoning areas	The proposed project requires approval by the county government. Provisions of the Act regarding development control shall be strictly adhered to. All developers within the project area must strictly adhered to requirement of the Act regarding plot coverage and reservation of land for public utilities
17.	Public Health Act (Cap. 242): The act makes it the duty of every local authority (in the capacity of "health" authority) to take all lawful, necessary and reasonably practicable measures to safeguard and promote public health (s.13). Part IX of the act deals with sanitation and housing and is of most significance for the control of polluting discharges. S.116 imposes a duty on every local authority to maintain its district in a clean and sanitary condition, to prevent nuisances and prosecute those responsible for nuisances. Nuisances include drains and sewers for the discharge of pollutants into watercourses and lakes. The Public Health (Drainage and Latrine) Rules made under s.126 of the Act, makes more specific provision for drainage. The Rules require the drainage of new buildings; • Prohibit the drainage of surface water into foul water sewers;	Health issues will be integrated into the project to ensure environmental health is appropriately addressed. All stakeholders must undertake to comply with provisions of the regulations by ensuring that the necessary plans to achieve requirements of the regulations are put in place. Measures to mitigate all forms of nuisance in compliance with Part IX Sections 115 and 118 of the Act will be put in place throughout the phases of projects under the programmes Contractors will also manage solid waste arising from programme related activities in compliance with provisions of this Act.

	Ministerial and County Institutional Integration	Relevance to the project/license or permit required/ or activity requiring regulation
	• Prohibit the discharge into sewers of matter which may interface with the free flow of the sewage or injure the sewer; • Empower the local authority to prohibit the discharge of injurious matter into sewers; Impose a requirement for permits to be obtained from the local authority before the making of sewer connections or the construction of sewage treatment works.	
18.	Penal Code Act (Cap. 63): Chapter XVII on "Nuisances and offences against health and convenience" contained in the penal code strictly prohibits the release of foul air into the environment which affects the health of the persons. It states "Any person who voluntarily vitiates the atmosphere in any place so as to make it noxious to the health of persons in general dwelling or carrying on business in the neighbourhood or passing along a public way is guilty of a misdemeanour"	Waste disposal and other project related activities shall be carried out in such a manner as to conform to the provisions of the code. It is the responsibility of the contracted licensed waste handler to ensure that all kinds of wastes are disposed appropriately as per the legal provisions. The proponent will comply fully with the Act.
19.	The Workmen's Injury and Benefits Act, 2007: This Act provides for compensation to employees for work-related injuries and diseases contracted in the course of their employment and for connected purposes. Key sections of the Act include the obligations of employers; right to compensation; reporting of accidents; compensation; occupational diseases; medical aid; appeals; and miscellaneous provisions. Schedules provided in the Act outline the degree of disablement; occupational diseases; and dependant's compensation. In case of any accidents or incidents during the project cycle, this Act will guide the course of action to be taken.	The proponent will comply fully with the Act.
20.	The Employment Act, 2007: This Act declares and defines the fundamental rights of employees; minimum terms and conditions of employment; to provide basic conditions of employment of employees; and to regulate the employment of children, among other rights. Key sections of the Act elaborate on the employment relationship; protection of wages; rights and duties in employment; termination and dismissal and protection of children, among others.	Contractor to be strictly advised not to engage any underage persons (under 18 years of age) to perform any form of work at the site during construction. The proponent shall also ensure that the contractor is conversant and adheres to all the provisions of the Employment Act
21.	The Traffic Act, Cap 203: This Act consolidates the law relating to traffic on roads. Key sections include registration and licensing of vehicles; driving licenses; driving and other offences relating to the use of vehicles on roads; regulation of traffic; accidents; offences by drivers of vehicles other than motor vehicles and other road users; and miscellaneous provisions as to roads, among others.	Vehicles will be used to transport humans and equipment during the entire project life, and their registration and licensing will be required to follow the above Act.
22.	The Standards Act Cap 496: This Act promotes the standardisation of the specification of commodities, and provides for the standardisation of commodities and codes of practice to ensure public health and safety.	This means the Proponent has to ensure all materials and equipment in use during construction as well as operation of the

	Ministerial and County Institutional Integration	Relevance to the project/license or permit required/ or activity requiring regulation
		facility adheres to the highest standards and do not pose any human health and safety risk. The proponent will comply fully with the Act.
23.	Occupiers Liability Act Cap 34: An act of parliament to amend the law as to liability of occupiers and others for injury or damage resulting to persons or goods lawfully on land or property from dangers due to the state of the property or to things done or omitted to be done there.	Ensure safety of workers during construction and possible decommissioning phases and occupants upon occupation of the office block.
24.	Occupational Safety and Health Act 2007 (CAP 15): This Act promotes and guarantees the protection and wellbeing of workers in the workplace. • Provides that every occupier shall ensure the safety, health & welfare at work of all persons working in this workplace. • Provides for registration of premises prior to use as a workplace • Provides that workplace shall be of sufficiently size for work to be carried out with ease & an adequate amount of air for each employee, the minimum permissible being 10m3 per person. • Provides that an occupier shall ensure that effective & suitable provision is made for securing & maintaining by circulation of fresh air in each workroom, the adequate ventilation of the room. • Provides that an occupier ensure effective provision is made for securing & maintaining sufficient & suitable lighting, whether natural or artificial, in every part of this workplace in which persons are working or passing. • Provides that sufficient & suitable sanitary conveniences for the persons employed in the workplace shall be provided, maintained & kept clean, and effective provision shall be made for lighting; and where persons of both sexes are or are intended to be employed (except in the case of workplaces where the only persons employed are member of the same family dwelling there) such conveniences shall afford proper separate accommodation for persons of each sex. Provides that all plant, machinery & equipment whether fixed or mobile for use either at workplace or as a workplace, shall only be used for work which they are designed for & be operated by a competent person.	Work at the proposed site may involve hazards such as accidental falls, working at heights, exposure to energized circuits and heavy equipment etc. Other potential sources of occupational injuries include entry into confined spaces, including manholes and dust generation associated with construction activities among others. The contractor will continuously improve the safety and health standards at the construction site making safety concern everyone's responsibility. Emergency response plan, warning signs, machinery safety and construction safety provisions of the Act which are aimed at managing occupational accidents, incidents and injuries at the workplace will be put in place. All requisite trainings, approval and permits including Workplace Registration Certificate shall be procured by the proponent / contractor
25.	Factories & Other Places of Work (Noise Prevention & control rules,2005: Rules provide for the maximum noise exposure levels for workers in places of work & for the provision of protective equipment for those exposed to high noise levels.	Noise emitted during the operation of the Housing units. requires provision of PPE to workers & minimization of noise exposure to the public

	Ministerial and County Institutional Integration	**Relevance to the project/license or permit required/ or activity requiring regulation**
	Provides that and occupier shall institute noise reduction measures at the source of the noise in the workplace	
26.	Electricity Power Act No. 11 of 1997: The Act establishes the Energy Regulatory Commission (ERC) with a mandate for the management of energy issues in Kenya. Part III of this Act is dedicated to Electricity energy. Section 30 of this part stipulates that any electrical installation work should be conducted by such a person as one licensed by the ERC as an electrician or an electrical contractor.	Electricity power installation and usage should be done in a manner that seeks to protect the health and safety of the project employees; the local and other potentially affected communities as well as the environment. Electrical installation to service the proposed project should be done by a licensed electrician under ERC. Liaison with relevant agencies such as KPLC should be sought where necessary. Proponent should adhere to provisions of this Act in all phases of the project.
27.	The Energy Act 2019: The Act consolidates the laws the relating to energy & provides for National & county government functions in relation to energy. Provides for promotion of renewable energy; exploration, recovery & commercial utilisation of geothermal energy; regulation of midstream & downstream petroleum & coal activities; regulation, production, supply & use of electricity & other energy forms; Enforcement & review of environmental, health, safety & quality standards. Provision for construction permit request to be accompanied by ESIA study.	The project proponent will comply with Legal Notices 43 & 102 to ensure conformity with the Energy Act provisions. The proponent will be required to address provisions raised in the Energy (solar water heating) regulations 2012.
28.	The Surveys Act Cap 299 Laws of Kenya: This is an Act of parliament that make provisions in relation to surveys and geographical names and the licensing of land surveyors.	Surveyors shall carry out surveying in a manner as to ensure that surveys accord in all respect with the provisions of this Act and regulations made there under and shall be responsible for correctness and completeness of every survey carried out by them or under their supervision. Boundaries and benchmarks for any land or holding should be shown on the map.
29.	Legal Notice No. 60: Hazardous Substances Rules, 2007: The Rules state that the Proponent shall ensure that where chemicals come into contact with employees, the exposure limits set out in the First Schedule of the Regulations are not exceeded. Where employees may be exposed to two or more chemicals in the workplace the Proponent shall work out the combined exposure using the narrative given in the Second Schedule of the Regulations.	The proponent will comply fully with the Regulations.
30.	Land Act, 2012 (Act no.6 of 2012):	The proposed project site is registered & has a title deed

	Ministerial and County Institutional Integration	Relevance to the project/license or permit required/ or activity requiring regulation
	Provides for the sustainable administration & management of land & land-based resources & connected purposes. The Act also provides for the repeal of the Way leaves Act (Cap 292) and the Land Acquisition Act(Cap 295)	
31.	The Land Act, 2012: The Land Planning Act (Cap 303) Section 9 of the subsidiary legislation (the development and use of land Regulations 1961) under which it require that before the local Authority to submit any plans to then minister for approval, steps should be taken as may be necessary to acquire the owners of any land affected by such plans. Particulars of comments and objections made by the landowners should be submitted, which intends to reduce conflict of interest with other socio-economic activities. Land Titles Act, Cap 282 This Act makes provision for the removal of doubts that have arisen in regard to titles to land and to establish a Land Registration Court. Specific provisions include guidelines on adjudication of claims, and registration of documents after certificate of ownership is granted. Registration of Titles Act, Cap 281 This Act provides for the transfer of land by registration of titles. Parts within the Act elaborate on mechanisms of bringing lands under the Act, grants, transfers and transmissions of land, registration of titles, and mode and effect of registration, transfers, leases, charges, powers of Attorney, and rectification of titles, among others. Registered Land Act, Cap 300 The Act provides for the registration of title to land and provides for the regulation of dealings in land so registered, and for purposes connected therewith. The Act elaborates on the organization and administration of the Act, the effect of registration, title deeds, certificates of lease and searches, instruments and agents, transmissions and trusts, restraints on disposition, rectification and indemnity, and decisions of registrars and appeals.	The proponent will be required to comply fully with these Acts
32.	Land Registration Act 2012 (Act no.3 of 2012: Provides for 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 proposed site is registered and has a title deed.
33.	The National Land Commission Act, 2012: Pursuant to Article 67 (2) of the constitution, the functions of the commission are outlined in section 5 of the act as follows; i). To manage public land on behalf of the national and county governments;	The proponent will be required to comply fully with this Act. The planning principles outlined in this Act should guide the process of implementation of the projects within the Programmes under study and public participation, a major component

	Ministerial and County Institutional Integration	Relevance to the project/license or permit required/ or activity requiring regulation
	ii). To recommend a national land policy to the national government; iii). To advise the national government on a comprehensive programme for the registration of title in land throughout Kenya; iv). To conduct research related to land and the use of natural resources, and make recommendations to appropriate authorities; v). To initiate investigations, on its own initiative or on a complaint, into present or historical land injustices, and recommend appropriate redress vi). To encourage the application of traditional dispute resolution mechanisms in land conflicts; vii). To assess tax on land and premiums on immovable property in any area designated by law; viii). To monitor and have oversight responsibilities over land use planning throughout the country.	environmental assessment and audits should always be carried out to ensure that all stakeholders are aware of planned activities.
34.	The Environment and Land Court Act, 2011: The Act establishes 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 for connected purposes. The act states that it's an offence for any person who refuses, fails or neglects to obey an order or direction of the Court given under this Act, commits an offence, and shall, on conviction, be liable to a fine not exceeding twenty million shillings or to imprisonment for a term not exceeding two years, or to both	The project proponent should abide to all the provisions of this Act
35.	Land Acquisition Act (Chapter 295): It is an Act of Parliament to make provision for the compulsory acquisition of land for the public benefit. The Act also provides a procedure of acquiring these lands for public use.	The proponent to ensure that only the legal procedure is used to acquire any additional piece of land if needed.
36.	National Construction Authority Act No. 41 of 2011: An Act of Parliament to provide for the registration of contractors operating or willing to undertake construction operations in Kenya as by law through the National Construction Authority (NCA), which is constituted under Act No. 41 of 2011 Laws of Kenya. Section 15 of this Act demands registration of contractors with NCA while section 17 and 18 outlines the procedure of registration of contractors.	The proponent will comply with the Act by ensuring that the site and project contractors are registered and certified by NCA.
37.	The Environment and Land Court Act, 2011: This is an Act of Parliament 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 for connected purposes	The project proponent should abide to all the provisions of this Act

	Ministerial and County Institutional Integration	**Relevance to the project/license or permit required/ or activity requiring regulation**
	The act states that it's an offence for any person who refuses, fails or neglects to obey an order or direction of the Court given under this Act, commits an offence, and shall, on conviction, be liable to a fine not exceeding twenty million shillings or to imprisonment for a term not exceeding two years, or to both. The Act repeals The Land Disputes Tribunal Act (No.18 of 1990).	
38.	The Valuers Act Chapter 532: An Act of Parliament to provide for the registration of valuers and for connected purposes. 3 (1) of the Act establishes the Valuers Registration Board, whose responsibility is to regulate the activities and conduct of registered valuers in accordance with the provisions of this Act.	The project proponent will be required by law to engage the services of only registered valuer.
39.	Sessional Paper, No. 1 of 2017 on National Land Use Policy: The principle objective of the NLUP is to provide legal, administrative, institutional and technological framework for optimal utilization and productivity of land and land related resources in a sustainable and desirable manner at National, County and Sub-county and other local levels. The Policy offers a framework of recommendations and principles designed to ensure the maintenance of a land use system that will provide for: i. Land use planning, resource allocation and resource management for sustainable development to promote public good and general welfare; ii. Environmental management and sustainable production in the utilization of land resources; iii. Coordination and integration of institutional linkages in planning at sectoral and cross-sectoral levels to foster collaboration and decision making among different land users; iv. Equitable utilization of land resources to meet governance, social economic and cultural obligations of the people of Kenya; v. Anchoring land development initiatives that will respond positively to the market demands; vi. A comprehensive and efficient GIS-based national land use information management system; vii. An appropriate, independent, accountable and democratic institution for land use conflict resolution; and Mitigating problems associated with poor land use.	This Policy incorporates measures and principles to guide all activities, whether proposed or on-going, that may have direct or indirect impact on the use of land and its resources. The Policy takes cognizance of the benefits of planned use of land and its resources; and builds in measures for integrated, equitable and sustainable utilization for optimal production. This Policy upholds the values of economic productivity, environmental sustainability and the conservation of culture; and seeks to facilitate their protection and optimal use.
40.	Integrated National Land-use Guidelines, NEMA 2011: The INLUG supports and promotes the implementation of the general goals laid down in the EMCA,1999; as well as support the implementation of the New Constitution as envisioned in Chapter Five (Sections 60 – 72) on Land and Environment.	The guidelines promote the implementation of sustainable development and a good living environment which is the goal of the proposed project.
41.	Housing Act Chapter 117:	Through this Act, loans and grant are available to the developer of the proposed project.

	Ministerial and County Institutional Integration	**Relevance to the project/license or permit required/ or activity requiring regulation**
	An Act of Parliament to provide for loans and grants of public moneys for the construction of dwellings; to establish the National Housing Development Fund and a housing board for these purposes; and for connected purposes. The Act also lists out the various duties of the National Housing Corporation.	
42.	County Government by-laws: Prescribes the necessary easements required for the establishment of any project within the County.	Ensure adherence to the by-laws provisions and acquire the necessary approvals and permits

4 PROJECT DESCRIPTION

4.1 Introduction

The proposed residential housing project will entail excavation, transportation of excavated soils and building materials from the site and to the site respectively; and construction of the new housing units.

The project proposal entails site preparation, construction of 259 housing units and one (1) clubhouse with supporting social amenities. The 259 housing units (69 one bedroom units; 168 two bedroom units; and 22 three bedroom units) will be housed in 9 building blocks; each building block will be 6 levels (ground + 5 floors).

The master plan of the proposed housing development is presented below:

Figure 6 Master plan of project showing layout of the housing blocks & support infrastructure

To support this housing development the following support facilities are also planned:

- A club house
- waste water treatment unit
- A boreholes
- Backup generator
- Internal access roads
- Solar street lighting

Details of the master plan development are given in **annex 7** drawings.

4.2 Typology of housing units

Table 6 Summary of typology of housing units proposed

No. of bedroom	No of units	Built up area m^2
1 bedroom	69	43
2 bedrooms	168	78
3 bedrooms	22	96
Total	**259**	**25,663**

4.3 Sustainability

The proposed housing design proposes to incorporate the following component to promote sustainability in the housing project:

- Design to use solar energy
- Design of harvesting and of rainwater
- Design to provide natural ventilation
- Installation of energy efficient fixtures

The proposed housing development will also be fitted, connected and served with the existing infrastructural facilities such as power and electricity connectivity service from the power grid and solar panels, solid waste management and disposal collection point, etc. The following services, infrastructures and facilities were considered and integrated during the plans, designs and implementation process of the project development as discussed below;

4.3.1 Solid Waste Management

Solid waste management will consist of color-coded bins for each type of waste in the blocks and along the corridors at designated points. A NEMA registered garbage Collection Company will be contracted for collection and disposal of waste at a designated dumpsite.

4.3.2 Water Use and Waste Water Management

The proposed site proposes to drill a borehole to provide water to the proposed development. Underground, roof and overhead water storage tanks will be installed. All wastewater from the proposed housing development will be channeled to the WWTP to be put up within the housing estate while storm water will be channeled by gravity to the drainage channel & harvested for none-domestic uses.

4.3.3 Transport Network Infrastructure

The proposed site will have access roads that will connect the various functions within the area. There will be common pathways and roads around the development buildings. The site can easily been accessed from Memusi Road off Forest Line Road.

4.3.4 Electricity Power and Energy

Kenya Power will serve the facility for provision of electricity services. Power distributions will be done in a sustainable manner by employing the use of energy saving gadgets such as bulbs within the facility. Solar panels and generators will be installed within the facility to supplement the national grid supply.

4.3.5 Lighting Systems

All functions within the facility will be fitted using the latest energy saving lighting equipment. Lighting will be dimmable and be under daylight and occupancy controls. To save on energy, provision is made for lighting controls with; daylight linked dimming, occupancy controls in spaces that are not continuously occupied. Solar panels will also be installed to provide renewable energy for lighting where necessary.

4.4 Construction Inputs

The project inputs will include the following:

i) The materials that shall be used will include stones, cement, sand, crushed rock (gravel/ballast), ceramic fixtures, reinforcement bars, wood/timber, glass, painting materials, plastic, electrical and mechanical fixtures. All these materials shall be obtained from licensed dealers who have complied with the environmental management guidelines and policies and approved by Kenya Bureau of Standards (KEBS).

ii) Several machines shall be used which will include earth moving equipment (excavators, loaders, wheel loading shovels and backhoe), material handling equipment (cranes and hoists), construction equipment (concrete mixers and vibrators) and engineering vehicles (trailers, tippers and dumpers).

iii) The project will also require a labour force of both skilled and non-skilled workers. The skilled personnel will include the project consultants (architects, engineers, quantity surveyors and environmental experts) and a contractor with a team of foreman, masons, plasterers, carpenters, plumbers, welders, electricians, glaziers, painters and casual labourers.

Other construction inputs will include wastewater and sewer disposal, water services, power and electricity connectivity and supply from the main power grid or provided by generators.

4.5 Construction Phase

4.5.1 Mobilization of Building Materials

The proponent plans to source several building materials locally and expressed the confidence that the materials can be procured locally. The great emphasis laid on procurement of building materials from within the local area makes both economic and environmental senses since it reduces negative impacts of transportation of the materials to the project site through reduced distance of travel by the materials transport vehicles. Building materials are transported to the project site from their extraction, manufacture, or storage sites using transport trucks. There is adequate road linkage for the purpose of smooth transport of building materials into the project site.

4.5.2 Storage Materials

Building materials will be stored on site according to their need. Bulky materials such as rough stones, ballast, sand and steel will be carefully piled and covered on site. Materials such as cement, paints and glasses among others are to be stored in temporary storage rooms conveniently within the project site for this purpose

4.5.3 Masonry, Concrete Work and Related Activities

The construction of the proposed houses will involve a lot of masonry work and related activities. General masonry and related activities will include stone shaping, concrete mixing, plastering, slab construction, construction of foundations, and erection of building walls and curing of fresh concrete surfaces. These activities are known to be labour intensive and will supplement by machinery such as concrete mixers.

4.5.4 Structural Steel Works

All the beams and floors shall be reinforced with steel metals to enhance the stability of the proposed building. Structural steel works will involve steel cutting, welding and erection.

4.5.5 Roofing and Sheet Metal Works

Roofing activities will include iron sheet cutting, raising the roofing materials such as structural timber to the roof and fastening the roofing materials to the roof. Proper planning and measuring must be done before procurement of the sheets to ensure not much solid waste is generated after roofing is completed.

4.5.6 Electrical Work

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

4.5.7 Plumbing

Installation of pipe work for water supply and distribution will be carried out from the existing supply and then to associated facilities. In addition, pipes will be installed to connect sanitary facilities with the existing Nairobi County sewerage system serving the area, and for drainage of storm water from the rooftop into the peripheral drainage system. Plumbing activities will include metal and plastic cutting, the use of adhesives, metal grinding and wall drilling among others.

4.5.8 Landscaping

To improve the aesthetic value or visual quality of the site once construction is complete, the proponent will carry out extensive landscaping especially at the front and rear parts of the buildings that shall involve establishment of small and attractive flower gardens. It is noteworthy that the proponent will use plant species that are available locally and fast growing for the landscaping.

4.6 Description of the Project's Operational Activities

4.6.1 Solid Waste and Waste Water Management

The developer has proposed to contract a licensed company responsible for solid waste handling for the defect period of the operational phase of the housing units. Solid waste generated within the premises during its operation phase, where it will be occupied by residents who generate household wastes in their day-to-day activities. These household wastes will be disposed off to a designated area within the development, from where licensed contracted company will be responsible for collecting and disposing off these wastes to a designated dumpsite approved by the relevant authority.

4.6.2 Cleaning

Once the proposed development is complete a management company operated by the housing unit owners will be responsible for regular washing and cleaning of the common roads and way leaves, however, the residential tenants/owners will be responsible for cleaning their own houses. Cleaning operations will involve the use of substantial amounts of water, disinfectants and detergents.

4.6.3 General Repairs and Maintenance

Throughout the operational phase of the development project, general repairs will be carried out to ensure normal functioning of the buildings infrastructures, components and avoid any hazard, injury or accident to the occupants. Such activities will include repair of floors, repairs and maintenance of electrical gadgets and equipment, repairs of leaking water pipes, painting, maintenance of flower garden and replacement of worn-out materials among others.

5 ANTICIPATED ENVIRONMENTAL IMPACTS

5.1 Positive impacts

Potential positive impacts from the proposed redevelopment will be both short term and long term. This will include but not limited to the following:

5.1.1 Additional residential housing units

An additional 259 housing units be available for sale / rent.

5.1.2 Employment opportunities

During the construction phase, job opportunities to both skilled and casual workers will be available. Several workers including casual labourers, masons, carpenters, joiners, electricians and plumbers are expected to work on the project site from the project start period to its completion date. Apart from casual labour, semi-skilled and unskilled labour and formal employees are equally expected to obtain gainful employment opportunities during the project construction phase. Employment opportunities are one of the long-term major impacts of the proposed residential development that will be realized after the construction phase and during the operation and maintenance of the facility.

5.1.3 Development of local infrastructure

The implementation of the proposed project will lead to opening up the area by adding more residential space that ensures optimal land use as compared to the current use or any perceived future use of the said plot.

5.1.4 Revenue to government

There will be gains in the local and national economy. Through consumption of locally available building materials including concrete tiles, timber and cement. The consumption of these materials, fuel oil and others will attract taxes including VAT which will be payable to the government.

5.1.5 Enhancement of other businesses

The proposed project will improve income/economic status of people within the project neighbourhood. There will be gains in the local and national economy. Through consumption of locally available building materials including concrete tiles, timber and cement. The cost of the materials will be payable directly to the producers.

5.1.6 Improved security in the area

This is going to be realised through employment of security guards both during construction and operational stages of the proposed project. Lighting of the project area and its environs will also help boost the security of the area during night hours.

5.1.7 Optimal use of land

By building the affordable housing units the design has incorporated an optimal use of the available land..

5.2 Negative Impacts and Potential Mitigation Measures

5.2.1 Site security and security of construction materials and equipment

On a construction site, the security of the site and the security of the building materials and equipment is a major concern.

Potential mitigation measures include:

1. Construction of perimeter fence and hoarding of the construction site
2. Installation of security lighting

3. Round the clock security manning of the construction site
4. Construction of secure material and equipment stores on the site
5. Construction materials to be delivered in small quantities to minimize storage problems
6. Installation of CCTV

5.2.2 Construction material extraction & use

Construction material extraction and use can have negative impacts.

Potential mitigation measures include:

1. Availability and sustainability of the materials extraction sites as they are non-renewable in the short term
2. Source building materials from certified suppliers

5.2.3 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 construction phase.

Potential mitigation measures include:

1. Comply with EMCA Waste Management Regulations 2006
2. Ensure waste materials are disposed of on NEMA and County Government approved sites
3. Ensure re-use of materials that can be re-used
4. Use of the 3rs – Reduce, Re-use, Re-cycle
5. Efficient use of building material to reduce waste and recycling/reuse where feasible
6. Provision for waste management receptacles / bins at strategic places within the site
7. Segregation of waste at the source during the project cycle.
8. Use of an Integrated Solid Waste Management System (ISWMS); through a hierarchy of options: source reduction, recycling, composting and reuse, will facilitate waste handling during operation/occupation phase.
9. A NEMA and County Government certified waste management firm to be commissioned to provide waste collection and disposal services.
10. Ensure waste materials are disposed of on NEMA and County Government approved dumpsites.
11. Ensure re-use of materials that can be re-used – where feasible implement se of the 3rs – Reduce, Re-use, Re-cycle

5.2.4 Air pollution, particulate matter and dust emission

Air pollution will be among the major negative impact during the site preparation and construction phase as a result of increase in amounts of dust emanating from the demolition, excavation, construction activities and stockpiled earth materials. Air pollution may also be as a result of emission of fumes and particles or combustion of fossil fuels from the construction machinery.

The expected air pollutants from the proposed project will include dust, particulate matter and gaseous emissions from construction materials and equipment. Dust will be generated from the excavations and materials delivery. Particulate matter will be generated from dry materials including sand, cement, gravel, etc. Smoke, hydrocarbons and nitrogenous gases will be emitted from machinery exhausts. These will be expected to increase slightly and will be localized hence expected to be experienced within 30m radius of the project. Air pollution is expected to be experienced during construction period.

Potential mitigation measures include:

1. Carry out baseline air quality
2. Regular spraying of stockpiles of earth and dusty area with water

3. Avoid pouring dust materials from elevated areas to ground
4. Cover all trucks hauling soil, sand and other loose materials
5. Provide dust screen where necessary Sensitize workforce including drivers of construction vehicles
6. Ensure no burning of waste such as paper and plastic containers on sites/non-designated areas.
7. Minimize exposed areas through the schedule of construction activities to enable dust control.
8. Minimize the period for idling of machinery and construction vehicles.
9. Monitor the air pollution levels regularly as per the Air Quality regulations.
10. 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.
11. All staff employed at the construction site and visitors must be provided with dust masks and other PPEs.
12. All waste must be transported off-site for processing, not burnt or stored for any longer than is absolutely necessary.
13. Machines must not be left idling for unnecessary periods of time.
14. Alternatively, fuelled construction equipment shall be used where feasible
15. All raw materials where possible must be sourced as close as possible to the construction site thus reducing the emissions from vehicular traffic.
16. Regular and prompt maintenance of construction machinery and equipment to minimize generation of hazardous gases.
17. Regular sprinkling of water on work areas to prevent fugitive dust violations.
18. Restricting heights from which materials are to be dropped, as far as practicable to minimize the fugitive dust arising from unloading/loading.
19. Use environmentally friendly fuels such as low sulphur diesel.
20. Buffer area of trees and other vegetation will serve as natural windbreaks.
21. Use of dust nets/screens around the construction site to contain and arrest dust.
22. Where a vehicle leaving a construction site is carrying a load 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.

5.2.5 Sewerage and wastewater management

There will be increase generation in liquid waste as a result of increase in population within the project site both during construction and operation phases of the development.

Potential mitigation measures include:

1. Comply with EMCA Water Quality Regulations, 2006
2. Carry out a sanitation need analysis for the proposed development
3. All drainpipes passing under buildings should be of heavy-duty PVC pipe tube encased in concrete surround.
4. All manholes should have heavy-duty covers set and double sealed airtight as approved by specialists.
5. Proper decommissioning of the sanitary facilities shall be carried out once construction is complete.
6. Provision of adequate and appropriate sanitary facilities for the workers during construction phase and tenants during the operation phase of the facility.
7. Sanitary facilities shall be kept clean always through regular cleaning.
8. The design of the internal sewerage system shall consider the estimate discharges from individual sources and the cumulative discharge of the entire project, that is, it will have the capacity to consistently handle the loads even during peak volumes
9. Install an onsite WWTP compliant with EMCA Water Quality Regulations 2006 and Comply with NEMA's EIA requirements for onsite wastewater treatment plants for non-sewered developments of 25th June 2020
10. Regular inspection and maintenance of the onsite wastewater disposal systems during the operation phase
11. Sound management of the treated effluent wastewater
12. Oil interceptors to be installed on drainage channels passing through the parking area
13. Servicing of machinery and equipments to be done at a designated places with a paved surface and oil interceptors

5.2.6 Site excavation leading to site disturbance

Site excavation to pave way for the construction of the proposed building will lead to the disturbance of the site.

Potential mitigation measures include:

1. A large section of the proposed project site has already been excavated & excavated materials dumped offsite
2. Excavate only areas to be affected by buildings
3. A NEMA certified waste management firm to be commissioned to provide waste collection and disposal services
4. Dumping of excavated materials to sites approved by NEMA and the county government
5. Landscaping and restoration of excavated sites

5.2.7 Socio-economic impacts potential mitigation measures

The proposed development may have negative socio-economic impacts to the local residents / people, these may include public safety and health effects; air and noise pollution, etc

Potential mitigation measures include:

1. Persons from the nearby communities should be employed to work on the construction site.
2. Designate the roles and responsibilities of workers, which will enable a clear chain of command in the event of an accident and allows persons to be aware of their responsibilities in the event of such occurrences.
3. Place several fully equipped first aid kits on the project sites-.
4. Ensure that some workers are trained in basic first aid practices.
5. Signs must also be placed around the construction site displaying the numbers of the person responsible for handling emergencies on the site
6. Develop and implement a Health and Safety Training Manual for employees;
7. Identify a specific area on the project site for vending type activities
8. Purchase goods and supplies from suppliers within the area

5.2.8 Increased traffic and road safety concerns

Increased road traffic in and out of project site will be experience during all the phase of the project. Traffic increase is anticipated both from vehicular & non-motorised sources.

Potential mitigation measures include:

1. Enforce speed limits for construction vehicles
2. Carry out traffic impact assessment study.
3. Formulate a traffic management plan for the proposed development approved by the county government.
4. Erect additional bus stops close to the proposed access points of the project to encourage use of public transport.
5. Proper road safety signage.
6. Road safety awareness creation.
7. Provide adequate parking facilities within the project site.

5.2.9 Noise pollution & excessive vibrations

Noise pollution during construction will be as a result of use of heavy machinery and vehicles during transportation of materials to and from the site. Vibrations will be experienced during the concrete vibration during concreting of the structural elements and hacking of the walls and building elements during plastering of the structure.

Potential mitigation measures include:

1. Carryout baseline noise survey and regular monitoring of noise levels.

2. Comply with EMCA Noise Pollution & Excessive Vibration Regulations, 2009.
3. Ensure use of well serviced equipment.
4. Avoid idling of engines and machines when not in use.
5. Construction work to be confined to between 8am to 5pm
6. Ensure use of earmuffs and earplugs by machine operators and workers in noisy areas
7. All machines and equipment shall be maintained regularly to reduce frictional noise.
8. All noisy activities shall be scheduled concurrently during the construction period to reduce the exposure period to the PAPs.
9. All workers shall be trained and provided with PPEs such as helmets, earmuffs, dust mask, etc. which will always be used when operating within the site area.
10. Billboard shall be erected at the construction site entrance to notify of the construction activities and timings.
11. Drivers delivering materials shall avoid unnecessary horning of the trucks/vehicles.
12. Equipment installed with noise abatement devices shall be used as much as practicable.
13. Noise shields shall be used on noisy equipment, such as corrugated iron sheet structures, to minimize the exposure to the neighbours and other workers within the site
14. Regular monitoring of noise levels at the site as per the regulations.
15. The construction vehicles and machinery shall be switched off when not in use to reduce idling time.
16. Install portable barriers to shield compressors and other small stationary equipment where necessary
17. Silenced machinery and instruments should be employed to reduce the impact of noise on the existing neighbours and workers.
18. Equipment such as drills, graders and cement mixers should also be used when the least number of neighbours can be expected to be affected
19. Those working with machinery, vehicles and instruments that emit high levels of noise should be provided with ear plugs and earmuffs

5.2.10 Increased water demand & consumption

The demand and usage for water will increase during the project cycle. During construction, water will be required for activities such as cement mixing, curing of concrete, sprinkling of water on dusty areas to suppress dust and drinking water for workers. During operation phase, water will be needed for bathing, washing, cleaning, drinking and cooking. This will place strain on the existing water supply.

Potential mitigation measures include:

1. Undertake water needs analysis for the project.
2. Verify the legal status and the yield of the existing borehole on the proposed project site.
3. Set up water reservoirs to buffer against erratic supplies & reduce competition for resource with other users
4. The contractor to source water for construction from WRA approved sources
5. Drill a legal borehole to provide water for domestic use.
6. Prompt detect and repair of all the water fixtures and fittings to reduce water wastage.
7. Provide notices and information signs to sensitize on means and needs to conserve water resource i.e., “Keep/Leave the Tap Closed”, etc. This will awaken the civic consciousness of the workers and residents with regard to water usage and management.
8. Provision of adequate underground and roof tanks for water storage that covers two days’ water demand.
9. The contractor shall use water bowsers and tankers to bring in water for construction activities i.e., during periods of high-water demand (i.e., during slab formation). Water fetching shall however be subject to authorization by the relevant authority.
10. Use water efficient appliances and fixtures for conservation of water during the project cycle.

5.2.11 Increased energy demand & consumption

The proposed project will lead to increased demand and use of energy during the construction stage (fuel for running machinery and other equipment) and during operation phase (electricity used by the occupants of the units).

Potential mitigation measures include:

1. Carry out energy needs analysis for the project
2. Exterior lights shall be controlled by a programmable timer.
3. Generator should be provided as a full backup energy source throughout the development.
4. Install and routine maintenance of energy efficient appliances e.g., LED bulbs etc.
5. Monitor energy use during construction and set reasonable limit.
6. Put off all lights immediately when not in use or are not needed.
7. Turn off machinery and equipment when not in use.
8. Use of solar energy as an alternative source of energy.

5.2.12 Increased surface run-off & storm water

The proposed project construction phase will lead to increased release of sediments into the drainage systems. The building roofs and pavements may lead to increased volume and velocity of storm water or run-off flowing across the area covered by the building. This can lead to increased amounts of storm water entering the drainage systems, resulting in overflow and damage to such systems.

Potential mitigation measures include:

1. Rainwater harvesting
2. Provision of enough green spaces for water percolation
3. After completion of construction, the proponent shall embark on comprehensive landscaping.
4. Construct gently sloping drains to convey water at non-erosive speed.
5. Drainage channels shall be covered; say with gratings, to avoid occurrence of accidents and entry of dirt.
6. Semi permeable materials will be used for construction of pavements.

5.2.13 Emergence & spread of social vices

The proposed development will lead to potential for employment opportunities and access to new services which will draw people to the area more specifically the project site. This factor will further lead to a temporary increase in economic activities and employment of skills for the development. This will lead to population influx which might lead to changes in or unwanted behaviours in the area. This unwanted or change in behaviour may be in the form of loose morality, an increase in school drop-out due to cheap labour, child labour, drug use and abuse, theft/robbery and increased incidences of HIV/AIDS and related infections/diseases and other communicable diseases.

Potential mitigation measures include: in order to minimize project effects on local social set up, the proponent will;

1. Installation of security lighting in and around the project site
2. Liaise with local security system to secure the area
3. Conduct periodic sensitization forums for employees on ethics, morals, general good behaviour and the need for the project to co-exist with the neighbours.
4. Ensure enforcement of relevant legal policy on sexual harassment and abuse of office.
5. It is recommended that the contractor employs workers from the immediate area where possible to avoid social conflict
6. Offer awareness, guidance and counselling on HIV/AIDS and other STDs to employees;
7. Provide sexual awareness and provide condoms to employees

5.2.14 Public Safety & Health

During construction phase, there will be increased safety and health hazards to members of the public.

Potential mitigation measures include:

1. Comply with applicable Labour Laws e,g. the Occupational Safety and Health Act, 2007; the Work Injury Benefits Act, 2007
2. Ensuring building safety and integrity /stability
3. Provide access to clean water and food to the workers and members of public
4. The contractor to abide by EIA licensing conditions
5. Hoarding / fencing of the construction site to prevent unauthorized people accessing the site
6. Staff awareness creation on safety and health issues
7. The contractor and management shall adhere to the provisions of environmental health and safety plan (EHS) for the project
8. Implement dust suppression measures
9. Enforce speed limits for trucks delivery construction materials
10. Safety signage displayed
11. Dust suppression measures
12. Deployment of traffic marshals to control movement of vehicles to and from the construction site
13. Construction works restricted between 8am and 5pm on weekdays, 8am and 2pm on Saturday.

5.2.15 Occupational Safety & Health

Waste material such as pieces of glass and nails left lying on the ground may cause injuries/accidents to the workers on site. Food for the construction workforce is usually provided by mobile individuals most of which operates without licenses. This can compromise health of the workers especially if such foodstuffs are prepared in unhygienic conditions. During construction phase, there will be increased air and noise pollution which are considered harmful to human health. The neighbours and workforce involved shall be subjected to this noise.

Potential mitigation measures include:

1. Register the construction site with Department of Occupational Safety and Health Services (DOSHS).
2. Comply with applicable Labour Laws e,g. the Occupational Safety and Health Act, 2007; the Work Injury Benefits Act, 2007,etc.
3. Staff awareness creation on safety and health issues'
4. Have trained First Aiders and fully equipped First Aid box on site.
5. Provide and ensure proper use of personal protective equipment i.e. safety boots, helmet, goggles, and hand gloves.
6. The contractor and management shall adhere to developed environmental health and safety plan (EHS) for the project.
7. Protect workers from accidental falls and falling objects e.g use of scaffolding with a safety net (sisal sacking); use of safety harnesses.
8. Implement dust suppression measures.
9. Enforce speed limits for trucks and vehicles delivering construction materials.
10. Ensuring buildings under construction are safe and meet all safety standards.
11. Proper supervision of works.
12. All workers shall use properly fitting PPEs to avoid injuries and illness which include working boots, overalls, helmets, goggles, earmuffs, masks, gloves etc.
13. Ensure proper solid waste disposal and collection facilities
14. Ensure dustbin cubicles are protected from animals, rains and are well covered
15. Proper management and treatment of wastewater
16. Construction activities must therefore be limited to the hours of 8:00 a.m. and 6:00 p.m.
17. Local individuals preparing food for the workers at the site shall be controlled, monitored and evaluated to ensure that food is hygienically prepared.
18. Provide adequate and functional sanitary facilities for the workers.
19. Provide appropriate signage and warnings in work areas to avoid injuries to the workers and occupants.
20. Safety awareness may be gained through regular safety meetings, safety training or personal interest in safety and health.
21. The contractor shall adapt a suitable emergence response plan to manage occurrence of anticipated hazards during construction phase.

22. Workers shall always be sensitized on social issues such as drugs, alcohol, diseases such as HIV/AIDS and STIs etc.

5.2.16 Loss of privacy for house owners & tenants in the adjacent bungalows and maisonettes

Construction of 6 – level blocks of apartments will lead to loss of privacy to the owners and tenants of the adjacent low rise bungalows and maisonettes.

Potential mitigation measures include:

1. Reorient windows, balconies & other opening to face away from the bungalows & maisonettes
2. Plant screening vegetation on the plot boundary to screen the neighbouring developments.

5.2.17 Loss of vegetation

Construction activities will lead to loss of some of the existing vegetation.

Potential mitigation measures include:

3. Landscape the site by planting grass and trees at all disturbed areas
4. Care for the trees/plants
5. Retain vegetation screens to reduce the visual effect of this stage of the development.
6. Maintain all mature trees (trees > 25 cm) within the development where possible;
7. Incorporate as much local plants found within the area into the final landscaping of the property;
8. The developer should incorporate trees that are used by bird species for foraging to attract bird species to the area.

6 PUBLIC & STAKEHOLDERS' ENGAGEMENT

Consultation with various stakeholders and public participation was done throughout the Environmental Impact Assessment study. This was in line with the requirements of the Environmental (Impact assessment and Audit) Regulations, 2003. Consultations and public participation were encompassing, interactive and intensive, so as to ensure that as many stakeholders as possible and the public were reached. Special attention was paid to general public especially those drawn from the proposed project site and the immediate neighbourhood. Views, comments, concerns and opinions of stakeholders concerning the proposed project were sought.

The public and stakeholders consultation was vital as it served to:

i. Inform all stakeholders of the proposed development within their locality.
ii. Explain to the stakeholders the nature of the proposed project, its objectives and scope.
iii. Give stakeholders a forum to present their views, concerns and issues regarding the proposed development.
iv. Obtain suggestion from stakeholders on possible ways that potential negative impacts can be effectively mitigated.

The consultation was in the form of site visits, questionnaire administration, public baraza and a meeting with residents of Rapasi village.

6.1 Public Consultation schedule

Public consultation barazas where organised through the office of the Deputy County commissioner (DCC) Kajiado North Sub-County. The public barazas were held on the proposed project site on 29th and 30th November and 1st December 2022.

Once the dates and venues of the meetings were confirmed, public notices and invitation letters were sent out 7 days before the 1st day of the meetings, public notices on A2 sizes where printed and put up at strategic places in the project area. The public meetings announcements were also aired on Nation radio station.

A copy of the public notice was shared on the various Olkeri Location / Wards's Whatsapp groups.

Table 7 Schedule of ESIA public barazas

Meeting Venue	Date	Chairman	Secretary
Proposed project site	29th November 2022	DCC	Ms. Margaret Gathoni
Proposed project site	30th November 2022	Assistant Chief	Ms. Margaret Gathoni
Proposed project site	1st December 2022	Senior Chief	Ms. Margaret Gathoni

A summary of fears / concerns / suggestions raised during the public consultation meetings is summarised in the table below:

Table 8 Summary of fears/concerns/suggestions that arose during the public barazas

1. Increased population leading to increased pressure to existing local infrastructure e,g, water; road; electricity supply
2. Lack of public sewer line in the area and management of wastewater
3. Solid waste management
4. Insecurity and increased social vices
5. Disruption of local traffic flows
6. Proposed building not in harmony with locality
7. Loss of privacy to neighbouring bungalows and maisonettes
8. Corporate social responsibility
9. Uncertainty for employment opportunities for the local youths in the proposed project

10. Water scarcity in area
11. Affordability of the proposed housing units to local residents
12. Public and Occupational Safety and Health concerns
13. The sizes to the proposed units

6.2 Responses to issues raised from the consultation process

The responses to issues raised are summarized in the table below

Table 9 Responses to issues raised during the public barazas

Issue	Response / proposals/ aspirations
Increased population leading to increased pressure to existing local infrastructure e,g, water; road; electricity supply	• An infrastructure impact assessment will be carried out
Lack of public sewer line in the area and management of wastewater	• A modern WWTP will be installed in the proposed housing development
Solid waste management	• A sound solid waste management system will be put in place • Waste receptacles / bins will be placed at strategic points • A NEMA and County Government certified firm will be hired to offer solid waste collection and disposal services • Waste segregation will be done at source
Insecurity and increased social vices	• Priority in employment will be given to local people • No labour camp will be established
Disruption of local traffic flows	• Traffic impact assessment will be carried out • Appropriate traffic management plan will be developed and shared with the residents
Proposed building not in harmony with locality	• Building plans approval will be sought from the county government
Loss of privacy to neighbouring low-rise bungalows and maisonettes	• The issue will be considered / addressed in the final project design
Corporate social responsibility	• The developer will further consult the local community on the issue
Uncertainty for employment opportunities for the local youths in the proposed project	• The local people will be given first priority during employment
Water scarcity in area	• A hydrogeological survey has been undertaken • A water needs assessment for the project will be carried out
Affordability of the proposed housing units to local residents	• The proposed housing project does not fall under the affordable housing project • Developer will partner with mortgage service providers to ensure financing access to those interested.

Issue	Response / proposals/ aspirations
Public and Occupational Safety and Health concerns	• The project will comply with all applicable public safety & health and occupation safety and health laws

The certified minutes of the 3 days deliberations and resolutions are attached in annex 8 of this report.

The EIA expert also attended a follow up meeting on the 4th of December 2022 with the Rapasi residents. It emerged that the residents wanted direct engagement with the project proponent on the project concerns.

6.3 Consultations beyond ESIA Process

In order to ensure that the development runs smoothly, consultations should be structured to aid the completion of the project implementation. These consultations should therefore be preceded by further engagement of various stakeholders under the following stages:

- Construction phase and reported through the Initial Environmental Audit; and
- Operation phases and reported through the Statutory Environmental Audit of the project.

The consultation should address pertinent issues including the sustainability and suitability of the operation and maintenance to ensure acceptable standards

6.4 Grievance redress mechanism

A grievance redress mechanism will be required as a measure to ensure that social concerns related to the project are addressed in a timely fashion. The specific objectives of a grievance mechanism will include:

1. Establishing a timely, consistent, structured, and trusted procedure for receiving and addressing community concerns and complaints;
2. Ensure that complainants are treated with respect;
3. Ensure proper documentation and disclosure of complaints and any resulting corrective actions; and
4. Contribute to continuous improvement in the proponent's decision-making processes by analyzing trends and learning from complaints received.

7 PROJECT NEED & ANALYSIS OF ALTERNATIVES

Analysis of project alternatives of the proposed residential housing project considered three possible alternatives / options namely:

Alternative 1: NO Project" Option
Alternative 2: the "YES" alternative s
Alternative 3: Alternative project Option

7.1 The "no project" alternative

This option will mean that the project will not be undertaken. This implies that the proposed housing project will not be undertaken. This implies that all potential home owners would have to seek home ownership in alternative developments. The project site will remain undeveloped

.

In analysing this option, the following was considered;

- ✓ **Technology transfer**: implementation of the proposed housing development will see transfer of various technologies locally. This includes design technologies for waste water treatment and renewable energy incorporation in buildings. Therefore, the 'no project' alternative will not be favourable to this realization.
- ✓ **Contribution to local housing needs;** it is the government policy to enable home ownership for its citizens. One way of achieving this is by encourage private sector involvement in contribution in meeting rising housing demand in the country. The proposed project if implemented will contribute to meeting housing needs in Nairobi & Kajiado counties. The no project alternative will negate this potential gain from the proposed project if implemented.
- ✓ **Employment creation**; - the current government policy on employment and wealth creation aims at creating as many jobs as possible to meeting the ever-increasing employment demand in the country. If the 'no option project' was to be considered, then this government target may not be realized.
- ✓ **Investor attraction; -** if the no option is considered it will not be consistent with the government aim of attracting investments in the country and especially encourage local private investment in the housing sectors to contribute to addressing rising demand for housing.
- ✓ **Financial investment:** -The 'no' option will mean that the County government will not be paid any taxes / fees charged for development permits.

Therefore, if the no option will be pursued it is likely that we may lose more than what is to be gained if the proposed project is to be implemented.

7.2 The 'yes' project alternative

This was considered to be a viable option. This option was considered viable as opposed to the 'no option' because the yes project alternative implies that the project be implemented and once implemented there will be a number of gains that will be realised including the following;

- ✓ Employment creation at the local level
- ✓ Increased quality housing stock
- ✓ Boost on investor confidence in the housing sector.
- ✓ Development and improvement of local infrastructure.
- ✓ Increased revenue in the form of taxes to the government.

7.3 Alternative project options

Design alternatives for the proposed affordable housing units covers alternative building design and alternative designs of water use & wastewater management systems and solid waste management systems.

7.4 Preferred building design

The proposed development intends to put up 6 level (ground and 5 floors) buildings per housing block to increase the occupancy density. This design is preferred because of the following: -

- Optimum occupancy density is achieved.
- More ground space will be available for gardening and parking & social amenities.

7.5 Waste Water Management Alternatives

The area has no public sewer system. Consequently, septic tanks and soak pits systems are ubiquitous in the handling of wastewater. For the proposed project the following waste water management technologies where considered as discussed below.

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7.5.1 Stabilization Ponds/Lagoons

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

7.5.2 Constructed/Artificial Wetland

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

7.5.3 Waste Water Treatment Plant

This involves the construction of a plant that will enable the recycling of the waste water from the project activities to reusable standards and utilised within the site in activities such as irrigating the flower gardens and flushing of the toilets. It is usually expensive to construct and maintain, but it is the most reliable, efficient and cost-effective in the long term. Consequently, the project proponent has proposed onsite-wastewater treatment plants (WWTP) using *Moving Bed Bio Reactor technology* to treat approximately 225m^3 of black & grey water daily from the entire housing development. The layout of the in-situ WWTP and the design calculations report are attached in **annex 6**

7.6 Solid Waste Management Alternatives

A lot of solid wastes will be generated from the proposed project throughout its three phases (construction, operational and decommissioning) and an Integrated Solid Waste Management System (ISWMS) is recommended for its management. The following shall be given preference in its descending order:

1. The developer shall give priority to waste reduction at source of the materials. This option will demand a solid waste management awareness programme in the management and the residents.

2. Secondly, Reducing, Recycling, Reuse and composting of the waste. This calls for a source separation programme to be put in place.
3. The third priority in the hierarchy of options is combustion of the wastes that are not recyclable.
4. Finally, sanitary land filling will be the last option for the developer to consider.

8 ENVIRONMENT, SOCIAL MANAGEMENT & MONITORING PLAN

8.1 Introduction

The EMP is the key outcome of the Environmental and Social Impact Assessment (ESIA) process for the proposed residential housing project. In real meaning, the ESMP is a mechanism to meet the recommended environmental and social mitigation measures. The ESMP is an instrument that will allow the proponent, developers and other key stakeholders to integrate environmental components during implementation, operation and decommissioning phases of the project.

8.1.1 Scope and Objectives of the ESMP

The Environmental Management Plan will focus on mitigating the impacts identified during the environmental and social assessment. It is an instrument that will allow developers, beneficiary communities and other key stakeholders to integrate environmental components during the various phases of the project. This plan is meant to establish measures and procedures to control the analysed impacts and monitor their progress. It will achieve the following in the long run:

(i) Provide the National Environment Management Authority (NEMA) with a tool to make ease the evaluation of the objectives at different phases of the project, taking into account the Kenyan environmental legislation;
(ii) Provide clear and mandatory instructions to the proponent, tenants / house owners and other key stakeholders with regard to their environmental responsibilities in all phases of project;
(iii) Ensure continuous compliance of proposed development, beneficiary communities and other key stakeholders with Kenyan legislation and policies regarding the environment;
(iv) Assure the regulators and interested and affected parties the satisfaction of their demands in relation to environmental and social performance.

8.1.2 Applicable Legislation

The developed ESMP will be in line with legislation applicable to the project. International normative instruments concerning the environment, as well as international best practice have also been considered.

8.1.3 Principles of Environmental Management Plan

The project should be implemented taking into account the need to minimize potential negative impacts and maximize its potential positive impacts on the biophysical and socio-economic environment as well as health and safety of workers and the public. This commitment must be made at various levels, from the senior management level of the proponent to the levels of all parties involved in the implementation of the project.

8.2 Recommendations/Commitments of the ESIA

The ESIA document contains a series of recommendations related to mitigation measures, monitoring and management. A key role of the ESMP is to put them all in a single framework. For each identified impact in the ESIA, the ESMP provides in a tabular format the following:

(i) A list of mitigation measures (activities) that the developer and other key stakeholders will implement in accordance with each phase and activity of the project, to ensure that the mitigation objectives are met in full;
(ii) The role and responsibility of each of the stakeholders to ensure full implementation of mitigation measures; and
(i) The timetable of implementation/monitoring activities.

8.3 Responsibility

The proponent assumes full responsibility for implementing and monitoring the required measures to mitigate or enhance the environmental impacts. The effectiveness of mitigation measures should be evaluated by the proponent and the contractor.

8.4 Environmental Awareness

The proponent will be sensitive to the needs of the environment so as not to degrade (or degrade to a minimum) the existing environmental conditions. It is the proponent's primary responsibility to ensure that all parties that are directly involved in the construction and operation phases of the project, including managers and employees are aware about the need to prevent or minimize environmental degradation. The awareness activities will be guided by the following issues:

(i) Prevention of pollution of surface water and groundwater;
(ii) Prevention of air quality degradation;
(iii) Prevention of increased noise levels;
(iv) Prevention/reduction of social and economic disruptions;
(v) Prevention of risks to health and safety of workers and the general public.

8.5 Mitigation

All activities related to the lifecycle of the project will be subjected to appropriate mitigation measures to ensure that negative impacts are properly mitigated and managed. Mitigation involves identifying the best options to be adopted to minimize or eliminate negative impacts, highlighting the benefits associated with the proposed project and the protection of public and individual rights.
Practical measures are therefore sought to reduce adverse impacts or enhance beneficial impacts of the project.

8.6 Monitoring

The key objectives of monitoring are:
(i) To ensure that the EMP is implemented;
(ii) To evaluate the effectiveness of the mitigation measures;
(iii) To verify predicted impacts;
(iv) To provide feedback to licensing authorities.

Table 10 ESMP for the pre and construction phase

REF No.	Potential -ve Impact	Mitigation Measures	Responsibility	Timeframe	Estimated Cost (KES)
1.	Air pollution, particles and dust emission	1. Carryout baseline air quality and monitor the air pollution levels regularly as per the Air Quality regulations,2009 2. Regular spraying of stockpiles of earth and dusty area with water 3. Avoid pouring dust materials to the lower ground from elevated areas 4. Cover all trucks hauling soil, sand and other loose materials 5. Provide dust screen where necessary and sensitize workforce including drivers of construction vehicles on dust suppression / reduction measures 6. Ensure no burning of waste such as paper and plastic containers on the construction site 7. minimize exposed areas through the schedule of construction activities to enable dust control 8. Minimize the period for idling of machinery and construction vehicles 9. 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 10. All workers at the construction site and visitors exposed to dusty conditions must be provided with dust masks and other PPEs 11. All waste must be transported off-site for processing, not burnt or stored for any longer than is absolutely necessary 12. All raw materials where possible must be sourced as close as possible to the construction site thus reducing the emissions from vehicular traffic 13. Regular and prompt maintenance of construction machinery and equipment to minimize generation of hazardous gases 14. Use environmentally friendly fuels such as low sulphur diesel 15. Buffer area of trees and other vegetation may serve as natural windbreaks 16. Use of dust nets/screens around the construction site to contain and arrest dust 17. Institute appropriate dust suppression measures such as regular sprinkling of water on dusty access roads; speed limits; etc.	Developer and Contractor	Pre and construction phase	300,000 quarterly
2.	Site security and security of construction material and equipment	18. Construction of perimeter fence and hoarding of the construction site 19. Installation of security lighting 20. Round the clock security manning of the construction site 21. Construction of secure material and equipment stores on the site 22. Construction materials to be delivered in small quantities to minimize storage problems	Contractor	Construction phase	1,000,000

REF No.	Potential -ve Impact	Mitigation Measures	Responsibility	Timeframe	Estimated Cost (KES)
		23. Installation of CCTV on the site			
3.	Construction material extraction & use	24. Availability and sustainability of the materials extraction sites as they are non-renewable in the short term 25. Source building materials from certified suppliers	Contractor	Construction phase	No value attached
4.	Safety and integrity of building during construction	26. Comply with the National Construction Authority Act, No. 41 of 2011 27. Comply with applicable Labour Laws e,g. the Occupational Safety and Health Act, 2007; the Work Injury Benefits Act, 2007, etc 28. Use of appropriate construction materials and reinforcements as per specifications 29. Ensuring building materials and components are as per design specifications 30. Close supervision of construction works 31. Proper supervision and material testing regime 32. Ensure proper timelines are followed during construction works e.g. curing time	Contractor	Construction phase	BOQ
5.	Increased traffic flow and road safety concerns during construction	33. Undertake traffic impact assessment study 34. Formulate a traffic management plan for the proposed development approved by the county government 35. Proper road safety signage 36. Road safety awareness creation 37. Provide adequate parking facilities within the project site	Developer and Contractor	Pre and construction phase	300,000
6.	Soil Erosion	38. Create and maintain soil traps and embankments 39. Landscaping and planting of vegetation after completion of construction	Contractor	Construction	250,000
7.	Site excavation leading to site disturbance	40. A large section of the proposed project site has already been excavated & excavated materials dumped offsite 41. Excavate only areas to be affected by buildings 42. A NEMA certified waste management firm to be commissioned to provide waste collection and disposal services 43. Dumping of excavated materials to sites approved by NEMA and the county government 44. Landscaping and restoration of excavated sites	Contractor	Construction	300,000

REF No.	Potential -ve Impact	Mitigation Measures	Responsibility	Timeframe	Estimated Cost (KES)
8.	Noise pollution and excessive vibration	45. Carryout noise survey and regular monitoring of noise levels 46. Comply with EMCA Noise Pollution & Excessive Vibration Regulations, 2009 47. Ensure use of well serviced equipment 48. Avoid idling of engines when not in use 49. Construction work to be confined to between 8am to 5pm 50. Ensure use of earmuffs and earplugs by machine operators and workers in noisy areas 51. All workers shall be trained and provided with PPEs such as helmets, earmuffs, dust mask, etc. which will always be used when operating within the site area 52. Safety signage shall be erected at the construction site entrance to notify of the construction activities and timings 53. Drivers delivering and removing materials to and from the site shall avoid unnecessary horning of the trucks/vehicles 54. Equipment installed with noise abatement devices shall be used as much as practicable 55. Noise shields shall be used on noisy equipment, such as corrugated iron sheet structures, to minimize the exposure to the neighbours and other workers within the site 56. Install portable barriers to shield compressors and other small stationary equipment where necessary 57. Equipment such as drills, graders and cement mixers should also be used when the least number of neighbours can be expected to be affected	Developer and Contractor	Pre and construction phase	400,000
9.	Occupational Safety and Health	58. Register the construction site with Department of Occupational Safety and Health Services (DOSHS) 59. Comply with applicable Labour Laws e,g. the Occupational Safety and Health Act, 2007; the Work Injury Benefits Act, 2007,etc 60. Staff awareness creation on safety and health issues 61. Have trained First Aiders and fully equipped First Aid box on site 62. Provide and ensure proper use of personal protective equipment i.e. safety boots, helmet, goggles, and hand gloves 63. The contractor and management shall adhere to developed environmental health and safety plan (EHS) for the project 64. Protect workers from accidental falls and falling objects e.g use of scaffolding with a safety net (sisal sacking); use of safety harnesses 65. Implement dust suppression measures 66. Enforce speed limits for trucks and vehicles delivering construction materials	Contractor	Construction phase	250,000

REF No.	Potential -ve Impact	Mitigation Measures	Responsibility	Timeframe	Estimated Cost (KES)
		67. Provide First Aiders and First Aid Kits on site 68. Ensuring Building Strength and stability 69. Proper supervision of works			
10.	Public Safety and Health	70. Comply with applicable Labour Laws e,g. the Occupational Safety and Health Act, 2007; the Work Injury Benefits Act, 2007 71. Hoarding / fencing of the construction site to prevent unauthorized people accessing the site 72. Enforce speed limits for trucks and vehicles delivering construction materials 73. Proper signage and warning to public of heavy vehicle turning 74. Ensuring Building Strength and stability 75. Provide access to clean water and food to the workers and members of public 76. The contractor to abide by EIA licensing conditions	Contractor	Construction phase	100,000
11.	Solid waste generation	77. Comply with EMCA Waste Management Regulations 2006 78. A NEMA certified waste management firm to be commissioned to provide waste collection and disposal services 79. Ensure waste materials are disposed of on NEMA and County Government approved sites 80. Ensure re-use of materials that can be re-used 81. Use of the 3rs – Reduce, Re-use, Re-cycle 82. Efficient use of building material to reduce waste and recycling/reuse where feasible 83. Provision for waste management receptacles / bins at strategic places within the site 84. Segregation of waste at the source during the project cycle 147. Use of an Integrated Solid Waste Management System (ISWMS); through a hierarchy of options: source reduction, recycling, composting and reuse 148. A NEMA and County Government certified waste management firm to be commissioned to provide waste collection and disposal services. 85. Ensure waste materials are disposed of on NEMA and County Government approved dumpsites	Contactor/ Estate management	Construction & Operational phase	TBD

REF No.	Potential -ve Impact	Mitigation Measures	Responsibility	Timeframe	Estimated Cost (KES)
12.	Sewerage and wastewater management	86. Comply with EMCA Water Quality Regulations, 2006 87. Carry out a sanitation need analysis for the proposed development 88. Provide temporary adequate and clean sanitary facilities for the workers	Contractor	Construction phase	100,000
13.	Increased water demand & usage	89. Undertake a water needs analysis for the project 90. Verify the legal status and the yield of the existing borehole on the proposed project site 91. Set up water reservoirs to buffer against erratic supplies & reduce competition for resource with other users 92. The contractor to source water for construction from WRA approved sources 93. Use water efficient appliances and fixtures for conservation of water during the project cycle.	Developer and Contractor	Pre & construction phase	500,000
14.	Increased energy demand and consumption	94. Carry out energy needs analysis for the project 95. Generator should be provided as a full backup energy source throughout the development 96. Install and routine maintenance of energy efficient appliances e.g., LED bulbs etc 97. Monitor energy use during construction and set reasonable limit 98. Put off all lights immediately when not in use or are not needed 99. The water booster set will contain inverter pumps for energy saving and precise control of flow and pressure rate 100. Turn off machinery and equipment when not in use 101. Use of solar energy as an alternative source of energy	Developer and Contractor	Pre & construction phases	700,000
15.	Loss of privacy for house owners & tenants in the adjacent bungalows and maisonettes	102. Reorient windows & openings to minimize direct line of site to the nighbouring properties 103. Establishment of screening vegetation on the boundary of the property.	Developer	Pre construction phase	No value attached
16.	Increased surface runoff and storm water	104. Rainwater harvesting 105. Provision of enough green spaces for water percolation 106. After completion of construction, the proponent shall embark on comprehensive landscaping 107. Construct gently sloping drains to convey water at non-erosive speed.	Contractor / Landscape architect	Construction phase	BOQ

REF No.	Potential -ve Impact	Mitigation Measures	Responsibility	Timeframe	Estimated Cost (KES)
		108. Drainage channels shall be covered; say with gratings, to avoid occurrence of accidents and entry of dirt. 109. Semi permeable materials will be used for construction of pavements.			
17.	Loss of vegetation	110. Landscape the site by planting grass and trees at all disturbed areas 111. Care for the planted trees/plants 112. Retain some of mature trees (trees > 25 cm) within the development where possible 113. Incorporate as much local plants found within the area into the final landscaping of the property	Contractor	During construction	Contractor cost BOQ
18.	Emergence and spread of social vices e,g Increase in Sexual Transmitted Infections & increased local insecurity	114. Installation of security lighting in and around the project site 115. Liaise with local security system to secure the area 116. Use of local labour force as far practical to avoid construction of a labour camp 117. Conduct periodic sensitization forums for employees on ethics, morals, general good behaviour and the need for the project to co-exist with the neighbours 118. Ensure enforcement of relevant legal policy on sexual harassment and abuse of office 119. It is recommended that the contractor employs workers from the immediate area where possible to avoid social conflict 120. Offer awareness, guidance and counselling on HIV/AIDS and other STDs to employees 121. Provide condoms to employees	Contactor	During construction	100,000
19.	Occupational Health and Safety	122. All workers shall use properly fitting PPEs to avoid injuries and illness which include working boots, overalls, helmets, goggles, earmuffs, masks, gloves etc. 123. Comply with OSHA 2007 and all other relevant regulations governing health and safety of workplaces. 124. Ensure proper solid waste disposal and collection facilities 125. Ensure dustbin cubicles are protected from animals, rains and are well covered 126. Proper handling and disposal of solid waste 127. Proper treatment of wastewater 128. Construction activities must therefore be limited to the hours of 8:00 a.m. and 5:00 p.m. 129. Local individuals preparing food for the workers at the site shall be controlled, monitored and evaluated to ensure that food is hygienically prepared. 130. Provide adequate and functional sanitary facilities for the workers. 131. Provide appropriate signage and warnings in work areas to avoid injuries to the workers and occupants.	Contractor, DOSSH	Construction phase	1,000,000

REF No.	Potential -ve Impact	Mitigation Measures	Responsibility	Timeframe	Estimated Cost (KES)
		132. Provide first aid facilities and ensure that workers are trained on emergency response such as first aid skills. 133. Safety awareness may be gained through regular safety meetings, safety training or personal interest in safety and health. 134. The contractor shall adapt a suitable emergence response plan to manage occurrence of anticipated hazards during construction phase. 135. Workers shall always be sensitized on social issues such as drugs, alcohol, diseases such as HIV/AIDS and STIs etc.			
12	Loss of vegetation	136. Landscape the site by planting grass and trees at all disturbed areas 137. Care for the trees/plants 138. Retain vegetation screens to reduce the visual effect of this stage of the development. 139. Ensure that local building materials and muted colors are used to reduce the visual impacts of the development and the landscaping to hide it or blend in with the local environment. 140. Maintain all mature trees (trees > 25 cm) within the development where possible; 141. Incorporate as much local plants found within the area into the final landscaping of the property; 142. The developer should incorporate trees that are used by bird species for foraging to attract beneficial bird species to the area.	Contractor/ Project design team Kenya Forest Service	Prior to commencement of demolitions	Contractor cost

Table 11 ESMP for the operational phase

REF No.	Potential -ve Impact	Mitigation Measures	Responsibility	Timeframe	Estimated Cost (KES)
1.	Increased energy demand & consumption	1. Carry out energy needs analysis for the project 2. Common areas / exterior lights shall be controlled by a programmable timer 3. Generator should be provided as a full backup energy source throughout the development 4. Install and routine maintenance of energy efficient appliances e.g., LED bulbs etc 5. Monitor energy use and set reasonable limits 6. Put off all lights immediately when not in use or are not needed 7. The water booster set will contain inverter pumps for energy saving and precise control of flow and pressure rate 8. Turn off machinery and equipment when not in use 9. Use of solar energy as an alternative source of energy	Developer and house owners / tenants	During operation phase	1,000,000
2.	Solid waste generation & management	10. Comply with EMCA Waste Management Regulations 2006 11. Regular inspection and maintenance of the waste disposal systems during operation phase 12. Establish a collective waste disposal and management system 13. A NEMA certified waste management firm to be commissioned to provide waste collection and disposal services 14. Provide waste disposal bins to each house well protected from adverse weather and animals	Developer and house owners / tenants	During operation phase	200,000 annually
3.	Sewerage & Wastewater management	15. Undertake a sanitation needs analysis for the development 16. Comply with EMCA Water Quality Regulations, 2006 17. Comply with NEMA's EIA requirements for onsite wastewater treatment plants for non-sewered developments of 25th June 2020 18. Install an onsite WWTP 19. Regular inspection and maintenance of the onsite wastewater disposal systems during the operation phase 20. Sound management of the treated effluent wastewater	Developer and house owners / tenants	During operation phase	500,000 annually
4.	Increased loading on existing	21. Carry out an infrastructure impact assessment analysis and implement the findings / recommendations 22. Have paved local access road and walkway system 23. Undertake a comprehensive water and energy needs analysis for the project	Developer and house owners / tenants	During operation phase	1,000,000 annually

REF No.	Potential -ve Impact	Mitigation Measures	Responsibility	Timeframe	Estimated Cost (KES)
	infrastructure services	24. Carry out traffic impact assessment and implement the findings / recommendations 25. Verify the legal status and the yield of the existing borehole on the proposed project site 26. Rainwater harvesting 27. Provision of increased water storage capacity 28. Provide adequate storm water drainage system			
5.	Increased Traffic	29. Carry out traffic impact assessment study 30. Formulate a traffic management plan for the proposed development approved by the county government 31. Proper signage 32. Awareness creation 33. Provide adequate parking facilities within the project site	Developer and house owners / tenants	During operation phase	200,000 annually
6.	Storm water management	34. Rainwater harvesting 35. Provide roof gutters to collect and direct roof water to drains and storage tanks 36. Construct drains to standard specifications 37. Green spaces for percolation of water 38. Develop a storm water drainage system and linkage to natural drains	Developer and house owners / tenants	During operation phase	100,000 annually
7.	Insecurity	39. Guarding of sites/estates by a reputable security firm 40. Constant site patrols 41. Adequate screening of visitors to the site 42. Collaboration with the existing national and county government security machinery 43. Partnership with neighbours and police in community policing 44. The contractor shall ensure that there is adequate street lighting and a security guard within the site to help curb with issues that may arise from theft. Also installing 24hr operating CCTV surveillance, which will be monitored regularly	Proponent/ Estate management company	Operational phase	Contract sum

9 CONCLUSION & RECOMMENDATIONS

9.1 Conclusion

The proposed residential development is a timely project and may be environmentally and socially viable if the proposed mitigation measures outlined in the ESMP are implemented fully.

9.2 Recommendations

i. Fully implement the developed ESMP
ii. Ensure that worker's occupational health and safety standards are maintained through capacity building, proper training, providing protective clothing and equipment.
iii. Annual environmental audits should be carried out on the project in order to ensure compliance of the project with the mitigation measures outlined in the Environmental Management Plan (EMP),
iv. All activities concerning construction and maintenance such as, work execution and site inspection shall be strictly monitored by an engineer or a designated official. Engineers and/or designated official shall be trained and experienced enough to judge the appropriateness of the work executed in order to carry out the monitoring properly.
v. There is need for community and workers' awareness creation on the environmental management issues, and the need for all project-affected populations to cooperate in the projects construction, operation and maintenance.
vi. Upon completion and occupation, the developer / house owners / tenants should engage services of waste handling companies registered by NEMA in compliance with Environment Management and Coordination (Solid Waste) Regulations 2006.

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11 APPENDICES

Annex 1 Certificate of Incorporation & PIN certificate
Annex 2 Copy of Land document for the project site
Annex 3 ESIA terms of reference approval letter
Annex 4 Summary Bill of Quantities
Annex 5 Hydrogeological report
Annex 6 Onsite- Waste water treatment systems design
Annex 7 Technical drawings for the housing units
Annex 8 Minutes of public meetings
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