ENVIRONMENTAL SOCIAL AND IMPACT ASSESSMENT

STUDY REPORT

FOR

THE PROPOSED HOSPITAL DEVELOPMENT ON PLOT LR. NO. KAJIADO/KAPUTIEI NORTH/116481 IN MILIMANI AREA OF KITENGELA TOWNSHIP AND WITHIN KAJIADO COUNTY

PROPONENT	CONSULTANT
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September 2021

LATITUDE -1.485583 LONGITUDE 36.9487

CERTIFICATION

This Environmental Social and Impact Assessment Study Report for **Vicrity Limited** was conducted and prepared by Nduhiu Nyoike who is a registered expert by NEMA. The registration details are as follows:

CONSULTANT

NDUHIU NYOIKE	**LEAD EXPERT**
SIGNATURE ……..	**5006**
DATE ……September / 2021	

PROPONENT

VICRITY LIMITED
JESSE AMBUNDO DIRECTOR
SIGNATURE …….
DATE ……September / 2021 RUBBER STAMP

EXECUTIVE SUMMARY

This ESIA Study Report is for a proposed hospital in the town of Kitengela. The hospital will comprise of the following major salient features:

1. Main and minor theatre, laboratory and pharmacy.
2. Different wards for antenatal, post-natal, paediatric, medical wards for female and male patients, surgical wards for male and female patients. Also have a section with private and semi – private rooms.
3. New-born unit and maternity section with labour rooms.
4. Well baby, dental, eye and well woman clinics.
5. Doctors and nurses' stations.
6. Prayer and CSSD rooms.
7. Admin station with offices and board room.
8. Laundry, sluice, dirty and clean linen rooms.
9. Restaurant space, kitchen area and cold, store and oven area rooms,
10. Large terrace area with drying area section.
11. Toilets, showers and wash basins in every floor,
12. Water storage water tanks,
13. Emergency rooms and areas

The general and facilitating areas include the lift and staircase area in every floor, emergency exits doors, boundary wall with gate, garbage shed, septic tank, parking area and drive ways together with land scrapped area.

Vicrity Limited is the proponent of the proposed project.

This study report was cognizant that Environmental Impact Assessment (EIA) is a systematic process of identifying, predicting and evaluating the environmental effects of proposed actions and projects. It also noted that special emphasis in EIA is given to the practice of preventing, mitigating and offsetting adverse effects of proposed undertakings. Therefore, the purpose of environmental impact assessment is to provide information for decision-making on the environmental consequences of proposed actions; to promote environmentally sound, sustainable development and mitigation measures.

However, the immediate objectives of EIA is to improve the environmental design of the proposed proposal; to ensure that resources are used appropriately and efficiently; to identify appropriate measures for mitigating the potential impacts of the proposal; to facilitate informed decision making including setting the environmental terms and conditions for implementing the proposal.

The proponent engaged a team of experts in order to articulate and prepare the project to its completion. The project architect is Raphael Mono Owoko, the Civil and structural engineer is George Anyanga Odwuor, the quantity surveyor is Michael Achieng, the mechanical engineer is Eng. Kennedy Abielo Odoyo, the electrical engineer is Walter Mhando, the social expert is

Mercy W. Wachira Omondi (Mrs.) while the environmental experts are Nduhiu Nyoike (Lead exper) and Susan Ngare (Associate Expert).

This study report has followed the guidelines contained in the approved Terms of Reference and covers but is not limited to the following considerations:

1. A detailed description of the proposed project and location.
2. A detailed description of the project site and surrounding area.
3. A general description and explanation of the process to be used in implementing the proposed project in its diverse phases.

4. The objectives of the project.
5. The design of the project.
6. The materials to be used in the construction and implementation of the project.
7. The products, by-products and waste generated project.
8. Predicted and anticipated environmental impacts and the proposed mitigation measures for the negative impacts.
9. Project alternatives.
10. Environmental Management Plan for the construction, operation, decommission phases together with the legal framework.
11. An action plan for the prevention and management of foreseeable accidents and hazardous activities.
12. A safety and Health plan for employees and general public.
13. An economic and social analysis of the project.
14. The project cost.

    The scope of the study report covers the following expected works to be undertaken in the implementation of the projects.

In preparing this report, the following legal framework was considered and perused:

1. The Constitution of Kenya
2. The County Governments Act No. 17 of 2012
3. The Persons with Disability Act 2003
4. The Employment Act 2007
5. The Environment and Land Court Act, 2011
6. The Environmental Management and Co-ordination Act Chapter 387
7. The Waste Management Regulations, 2006
8. The Environmental (Impact, Assessment and Audit) Regulation, 2003
9. Noise And Excessive Vibration Pollution) (Control) Regulations, 2009
10. Legal Notice 31 - EMCA - Amendment to the Second Schedule
11. The Factories Act Cap 514
12. The Factories (First-Aid) Rules, 1977 Legal Notice No. 160
13. The Fire Risk Reduction Rules, 2007
14. The Food, Drugs and Chemical Substances Act Chapter 254
15. The Land Registration Act, 2012
16. The National Construction Authority Act NO. 41 OF 2011
17. The National Construction Authority Regulations, 2014
18. The Occupational Health and Safety Act 2007
19. The Physcal and Land Use Planing Act of 2019
20. The Public Health Act Chapter 242
21. Workmen's Compensation (Compulsory Insurance) Order No. 13 OF 2007
22. Annex I: Ministry of Health Guidelines on Covid-19 Management

23. The Building Code – The Local Government (Adoptive By-laws) (Buildings) Order 1968 and The local Government (Adoptive By-Laws) (Grade II Building) Order 1968

The study report was able to extract the following as the expected positive impacts of the proposed project:

IMPACTS	**DESCRIPTION OF IMPACTS**
Employment opportunities.	The proposed project is expected to provide employment opportunities for both skilled and unskilled personnel, in all its three project phases.
Improved business opportunities.	The proposed project will open up a lot of business opportunities to Kenyans from all the major sectors of the economy: industries (supply of construction materials), energy (supply of fuel and electricity), hospital suppliers for medicines among others.
A new hospital.	The proposed project will usher in a new hospital in the area which will greatly boost the hospital industry in the area.
Improved land use.	The proposed project will change the land use of the proposed site from being idle to being income generating.
Improved revenue to government.	The proposed project will attract revenue to the county and central government through the payment of various levies, taxes and rates.

The study report was also able to inform the proponent and NEMA on the expected negative impacts and their proposed mitigation measures which include the following:

Construction phase anticipated impacts and proposed mitigation measures:

IMPACTS	MITIGATION MEASURES
Job creation.	Ensure local people are given priority or preference in employment opportunities. At least 2/3 of all local workforce should be local people.
Loss of trees and vegetation	Demarcation of project site and contractor's site yard.
	Restrict movement of vehicles to the project site and not beyond.
	Adherence to work programme.
Accumulation of material on site.	Order as per the bill of quantities.
	Order from NEMA approved suppliers.
	Order from registered VAT vendors.
	Recycle construction materials.
Minimization of noise and vibration	Apply of a Noise license.
Reduce working hours.	Restrict construction activities to the hours of 8.00 to 5.00 pm.
Night work.	No supplies at night.
Noise at site.	No hooting and gunning of engines.
	Service programme for equipment and machinery.
	Switch off engines on site when not in use.
	Encourage the use of PPE for ear protection.
Minimization of dust generation and emission	The contractor will develop a standard approach to handling all air emission throughout all the different activities in the site
Reduce generation of emissions.	Follow work programme to the letter.
Dust control procedures.	Ensure the construction site is watered when necessary.

	Ensure all supply trucks carry loose materials are covered.
	Encourage the use of electrical equipment and machinery instead of diesel-powered engines.
	Buckets being carried by crane and machine hoist should be enclosed to avoid spill over.
	Ensure hoarding of 2.4 metres is erected around the site boundary.
	During construction activities where scaffolding is used, ensure adequate netting, sheeting or dust screens.
Exhaust fumes control measures	Ensure all diesel-powered machinery and equipment together with supply trucks to have their engines switch off when not in use.
	Discourage gunning of engines on site.
	Encourage engine service and maintenance to the manufactures specification.
Minimization of construction waste.	The ordering of the construction material to be timed to the work programme to avoid having idle material on site.
Ordering of material.	The contractor is encouraged to purchase high value and high-quality construction material which will be able to last long and avoid wastages.
Damaged and reject materials.	To encourage recycling of construction materials to avoid wastages.
Damaged materials.	To encourage the refurbishing of damaged construction materials including doors for sale or use in other construction sites.
Toilets.	Ensure adequate toilet facilities on site.
Waste materials.	Transport waste materials to NEMA certified dumpsites using NEMA certified transporters.
Minimization of insecurity	The contractor to cordon off the construction place and to have one gate for access.
Workers attendance sheet.	The contractor shall have a register of all construction workers on site and shall ensure only those on the register are allowed on site.
Visitor's identification.	The contractor shall capture the details of all visitors and supply trucks into the site.
Security oversight.	The contractor shall hire security guards to ensure no unauthorized people are in the site 24 hrs. a day.
	Contractor to employ personnel with good conduct certificates.
Minimization of water use	Purchase holding tanks.
	Signage for water sensitization.
Safety and health concerns.	Implement the relevant sections of the OSHA.
	Registration of workplace.
Minimizing spread of HIV.	Undertake forums for raising awareness about HIV/Aids by increasing understanding about the disease through dissemination of information and by generating discussion.
	Ensuring the construction site has access to condoms.

Operation phase expected impacts and mitigation measures

IMPACTS	MITIGATION MEASURES
Increase of income opportunities	Preference in employment should be given to persons from the immediate area and county.
Traffic management	Traffic signs to be displayed to direct vehicles to and from the building.
	Traffic marshal to monitor the traffic and to assist where needs be.
Ensure efficient water use	Install water-conserving automatic taps and toilets.
	All hospital staff and patients shall be sensitized on how to use water efficiently.
Minimized Energy consumption	Switch off machinery, equipment and lights when not being used.
	Install energy saving bulbs and fluorescent lights.
Managing storm water drainage	Ensure the design of the building will capture all the storm water and direct the same to the natural drainage system.
	Contract an NEMA certified disposer for pharmaceutical, sharps and infectious wastes.
Ensuring efficient solid waste management	All persons in the hospital will be sensitise on solid wastes disposal procedures through the use of sign boards and information notices posted within the hospital.
	Separation or sorting of wastes shall be undertaken at source through the provision of multiple skips and bins.
	Kitchen foods wastes shall be separated from other wastes and shall be used as animal feeds or manure for the gardens.
	All department of the hospital will have a daily cleaning routine with some department such as the restaurants being swept and mopped more than once a day
	Cleaning crew will direct the wastes to the holding bay where a further sorting and segregation will take place.
	Plastic bottles will be collected separately and sold to waste collectors as an income generating project.
	The county government of Kajiado will organize collection of garbage at least twice a week.
Liquid waste generation	All the effluent and waste water will be directed through piping to the underground septic tank and emptied by NEMA licensed sewerage disposers agents.
	The maintenance crew will ensure that the piping is in good condition and will repair immediately a breakage occurs.
Reducing air emission	Ensure the kitchen hood and the fans in the laundry are serviced and in working condition.
Safety and Health concerns	Register the Hospital as a Workplace under OSHA.
	Constitute a safety and health committee.
	Provide personal protective equipment to all its workers.
Reducing the risk of fire outbreak	Identifying and training a firefighting team of at least five persons and ensure equal distribution in all department and all shifts.
	Ensuring that the hospital has adequate and appropriate firefighting equipment together with ensuring the regular service of the same.
	Ensuring that fire drills are undertaken once a year and identifying a fire assembly point
	Ensuring that all fire accidents are properly investigated and recommend corrective measures are undertaken.

	Develop and implement a firefighting response and evacuation procedures.
Intervention measures for injuries and accidents	Ensuring an adequate supply of fully stocked First Aid Boxes in every department which is easily assessable.
	Ensuring the First Aid Boxes are properly labelled “First Aid’
Reducing security concerns	The management to ensure that all its vehicles and trucks are locked when in parking.
Car theft prevention.	The management to have signage encouraging all owners of vehicles to lock their cars when in parking
Security oversight.	The management to have security guards patrolling the premises and on the lookout for security concerns.
Security information collection.	The management to capture details of guests at the reception.
Security checks.	Guest arriving by car to be checked at the gate for terrorism explosives and details of the car to be captured. On entering the hospital, all people are to go through frisking by security guards.
CCTV installation.	The hospital to install CCTV camera and to have the information backed up off site.
Training.	The security team to undergo security training at least once a year from a qualified security expert.
Alert provision.	At the gate house and reception, contacts of the OCS and Fire department to be displayed so that a quick respond can done by those on the ground.
Siren.	Install a siren for alerting the general public on security emergency.
Covid-19 restrictions	All persons entering the hospital to have face masks properly worn.
	All persons entering the hospital to have wash their hands at the entry points.
	All persons entering the hospital to have their temperature recorded.
	The hospital to prepare and install adequate signage for Covid-19 protocols.

Decommission phase expected impacts and mitigation measures

IMPACTS	MITIGATION MEASURES
Rehabilitation.	The structure shall be demolished and the foundation shall be undone.
	All underground cables, pipes and structures shall be dismantled and uprooted.
	The debris shall be removed from the site and the land shall be backfilled.
	The appropriate topsoil shall be imported to the site and the suitable vegetative cover shall be planted.
Job creation	General and specialized workers will be employed and preference should be given to those from the immediate area.
Efficient waste management	Ensure adequate provision of toilets in the site.
	Cordon of the demolition site.
	To encourage recycling of construction materials to avoid wastages.
	Ensure refurbishing of damaged construction materials including doors for sale or use in other construction sites.

	Separation of wastes into biodegradable and non-biodegradable.
	Use NEMA licensed transporters to cart away wastes to NEMA certified dumpsites.
Dust control	The contractor will develop a standard approach to handling all air emission throughout all the different activities in the site.
	The contractor and the proponent to be extremely strict in following the work program in order to minimize the amount of time air pollution can happen.
	Ensure all supply trucks carry loose materials are covered
	Ensure hoarding of 2.4 metres is erected around the site boundary.
Exhaust emission.	Ensure all diesel-powered machinery and equipment together with supply trucks to have their engines switch off when not in use.
	Discourage gunning of engines on site.
	Encourage engine service and maintenance to the manufacture's specification.
Minimization of noise and machine vibration	Restrict construction activities to the hours of 8.00 to 5.00 pm.
	No hooting and gunning of engines.
	Service programme for equipment and machinery.
	Switch off engines on site when not in use.
	Encourage the use of PPE for ear protection.
Risk reduction at site of accidents and injuries	Implement the relevant sections of the OSHA.
	Ensure personal protective equipment for all construction workers.
Application for permits and disconnection licenses	Apply for demolition permits.
	Apply for disconnection from the utilities company.

Recommendation

The proponent is encouraged to pay close attention to the recommendation outlined below:

1. The recommendation for solid and effluent waste disposal systems to be put in place as the expected volume is quite large.
2. The OSHA requirements on safety health and occupation should be implemented to the letter in order to ensure a safe environment for the workers and general public.
3. The land has a beautiful view and the programme of landscaping should commence immediately with the construction in order to re-establish the beauty of the project site in tandem with the environment.
4. The entire EMP for construction, operation, decommission and legal framework should be implemented to the letter in order to safe guard the environment and to bring out the best hospital in Milimani area for Kitengela.

Conclusion

The proposed project has numerous positive impacts including:

1. The proposed project is expected to provide employment opportunities for both skilled and unskilled personnel, in all its three project phases and will go a long way in alleviating the employment shortage in Kajiado County and Kenya in General.

2. The proposed project will open up a lot of business opportunities to Kenyans from all the major sectors of the economy: industries (supply of construction materials), energy (supply of fuel and electricity) and hospital services among others.
3. The proposed project will usher in a new hospital in the area which will greatly boost the medical service provisions in the area.
4. The proposed project will change the land use of the proposed site from being idle to being income generating.
5. The proposed project will attract revenue to the county and central government through the payment of various levies, taxes and rates.

The proponent is also aware that the project will generate negative environmental impacts and owners of the company are ready to implement the recommendations contained in the EMP to the letter.

We therefore recommend the project for licensing subject to the adherence to the EMP.

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ABBREVIATIONS AND MEANINGS

CSSD	Central Sterile Supply Department
EIA	Environmental Impact Assessment
EMP	Environmental management plan
ESIA	Environmental social and impact assessment
LR. No	Land reference number
NEMA	National Environmental Management Authority
TOR	Terms of reference
HA	Hectares

Lists of Map

CHAPTER ONE

INTRODUCTION

1.1 Background and rationale for an Environmental Impact Assessment (EIA)

Kitengela Town and its environs has experienced a twenty-three (23) fold growth in its population from 6,548 in 1989 to 154,436 in 2019 according to the census of 1989 and 2019. This was made possible by the action of the government that wanted to encourage private land ownership in pastoral systems. At that time, the land was owned by 214 registered members of the Kitengela Group Ranch. Over time, the land was sub-divided and sold to enable persons from Republic of Kenya and beyond to purchase and invest heavily in residential, commercial and industrial enterprises.

The fantastic growth of the town population and development has led to several environmental challenges in the following areas including:

1. Land use – the Kitengela plains was a natural corridor and grazing land for the wildlife as they moved to and from the Nairobi National Park through the southern boundary that is not fenced. The mushrooming population and subdivision of land is interfering with the free movement of wild life.
2. Generation of wastes – The generation of construction wastes from the numerous housing developments (single, multiple, industrial and commercial), waste water generated from the cleaning activities of human settlement and industrial activities, human toilet wastes which all require to be properly disposed.
3. Air pollution arising from vehicles, trucks, machinery, factory and other process that produce air emission. Most of the emission can be harmful to the environment and can cause green house emission which is compromising the atmosphere.
4. Depletion of unground water levels – Kitengela plains does not have adequate surface water and the community is forced to drill boreholes in order to meet its water needs. As more and more boreholes are being drilled, a serious danger of underground water depletion is possible as the rate of abstraction is greater than the rate of refilling.
5. Medical challenges to meeting the needs of the growing population.

The increase of population has resulted in challenges in the medical sector including:

1. The need to ensure disease prevention is undertaken.
2. The need to promote better quality of life.
3. The need to prevent avoidable deaths through better management systems.
4. The need to improve detection, diagnosis and treatment of illness.
5. The need to increase life expectancy.
6. The need to ensure adequate health services to the people.
7. The need to ensure medical health facility are nearer to the people and is affordable.

Vicrity Limited intends to construct and run a hospital in the Milimani area of Kitengela Town on Plot LR. No. Kajiado/Kaputiei North/116481.and the proposed project shall have the following features:

14. Main and minor theatre, laboratory and pharmacy.
15. Different wards for antenatal, post-natal, paediatric, medical wards for female and male patients, surgical wards for male and female patients. Also have a section with private and semi – private rooms.
16. New-born unit and maternity section with labour rooms.
17. Well baby, dental, eye and well woman clinics.
18. Doctors and nurses' stations.

19. Prayer and CSSD rooms.
20. Admin station with offices and board room.
21. Laundry, sluice, dirty and clean linen rooms.
22. Restaurant space, kitchen area and cold, store and oven area rooms,
23. Large terrace area with drying area section.
24. Toilets, showers and wash basins in every floor,
25. Water storage water tanks,
26. Emergency rooms and areas

The general and facilitating areas include the lift and staircase area in every floor , emergency exits doors, boundary wall with gate, garbage shed, septic tank, parking area and drive ways together with land scrapped area.

The project land is ¼ acre and is adequate for the proposed project. The site has been cleared of all native vegetation and is fenced with wood posts tied with barbed wire. The surrounding area of Milimani has been subdivided into plots which are predominantly used for residential purposes. A few commercial enterprises are located in the area including Bio – Security Company, Kauti Academy, Kenya Police Service Milimani Police Post and churches. The majority of people in the area are land/home owners who work in Kitengela, Kajiado and Nairobi County. The others are engaged in informal employment and business.

Under the legal framework operating in Kenya, all new projects and undertakings are required to undergo environmental impact assessment studies to ensure the protection and preservation of the environment both for the current generation and the future ones. Section 58(1) of The Environmental Management and Co-ordination Act Chapter 387, requires all new projects to undergo EIA before financing and commencement while section II and III of the Environmental (Impact, Assessment and Audit) Regulations of 2003 also requires environmental impact assessment studies on new projects or undertakings. Once the studies are undertaken, they are to be submitted to NEMA for review, appraisal and licensing.

1.2 Terms of Reference (TOR)

The Terms of Reference (TOR) for conducting this EIA Study are based on the General Guidelines for Conducting EIAs in Kenya as per Environment (Impact Assessment and Audit) Regulations, 2003, which operationalizes The Environmental Management and Coordination Act Chapter 387. The TOR was prepared and approved by NEMA on 17th August 2021 and the expected output of the study will be the ESIA Study Report which will contain on the minimum the following information as per the requirement in The Environmental (Impact, Assessment and Audit) Regulations of 2003:

1. A detailed description of the proposed project and location.
2. A detailed description of the project site and surrounding area.
3. A general description and explanation of the process to be used in implementing the proposed project in its diverse phases.
4. The objectives of the project.
5. The design of the project.
6. The materials to be used in the construction and implementation of the project.
7. The products, by-products and waste generated project.
8. Predicted and anticipated environmental impacts and the proposed mitigation measures for the negative impacts.
9. Project alternatives.
10. Environmental Management Plan for the construction, operation, decommission phases together with the legal framework.

11. An action plan for the prevention and management of foreseeable accidents and hazardous activities.
12. A safety and Health plan for employees and general public.
13. An economic and social analysis of the project.
14. The project cost.

1.3 Objectives of the project

The objectives of the project are as follow:

1. To obtain a NEMA License for the proposed project.
2. To obtain the best design of the project.

1.4 Scope of the proposed project

The scope of this EIA Study report will cover the following areas:

1. A description of the project.
2. An adequate description of the baseline conditions of the area
3. A detailed and adequate description of the relevant and significant legal framework which will affect the proposed project.
4. A summary of project alternatives
5. A summary of expected environment impacts and their effects on the environment.
6. A comprehensive EMP to cover all phases of the project together with legal framework.

1.5 Process used in preparing this ESIA Study Report

1.5.1 Information gathering procedures

The consultant has undertaken the following procedures and activities:

1. Screening

The architectural drawings and project brief show that the proposed project falls within the high-risk category of the Legal Notice 31 which amended the second schedule of EMCA Chapter 387.'

2. Scoping

A site was studied to gather information on the vegetation, plant and insect life on the land. The surrounding area was studied to understand the affected area, provision of public infrastructure, status of public waste disposal systems, existence of rivers and water bodies, provision of water and electricity, roads, other health centres and economic activities in the area. This information was used to predict the anticipated environmental impacts likely to arise if the project is implemented and the same was presented as part of the TOR submitted for approval. This information will now be investigated further and studied at a greater depth.

3. Impact analysis

In this chapter an in-depth evaluation of the environmental and social impacts of the planned projects will be undertaken and an exploration of the project alternatives will be undertaken in comparison with environment. The evaluation will involve further classification as high, medium and low impacts together with those that are reversible and non-reversible.

Under impact analysis, a review of the desktop and legal framework was undertaken. Previous and other similar studies that have been undertaken in the area were considered and the legal requirements as stated in various statures, codes, legal notices, acts of parliament, government and international policies were reviewed.

4. Mitigation

In this section the key emphasis is on avoidance and minimisation of negative and adverse impacts. Avoidance is the preferred option as it completely removes the potential impacts all together. The next option is to minimise the severity and duration of the impacts. Finally, an analysis of possible compensation matters for any affected parties or persons will be considered.

1.5.2 Consultative meetings

1. The local administrative chief was consulted and interviewed.
2. Neigbours, county government officials in the physical planning department and others stakeholders were invited for a public baraza to get their comments and views.
3. Preparation and distribution of questionnaires during public participation.
4. Consultative meetings with the project consultants in order to describe and understand the project.
5. Interviews of various stakeholders including the proponent.
6. Use of checklists, observations and photography.

1.5.3 Reporting

In addition to constantly briefing of the client, this environmental social and impact assessment study report was prepared and presented for submission to NEMA as required by law.

1.5.4 Format of ESIA Study Report

This report has followed the following format:

Chapter one	Introduction
Chapter two	Project description and design
Chapter three	Baseline information of the study area
Chapter four	Relevant legislative and regulatory framework
Chapter five	Stakeholder and Public participation
Chapter six	Analysis of project alternatives
Chapter seven	Potential impacts to the environment
Chapter eight	Proposed mitigation measures and monitoring
Chapter nine	Environmental management plan
Chapter ten	Recommendation and Conclusion
	References
	Annexes

CHAPTER TWO

2.0 PROJECT DESCRIPTION AND DESIGN

Vicrity Limited intends to construct and run a hospital in the Milimani area of Kitengela Town on Plot LR. No. Kajiado/Kaputiei North/116481.and the proposed project shall have the following features:

27. Main and minor theatre, laboratory and pharmacy.
28. Different wards for antenatal, post-natal, paediatric, medical wards for female and male patients, surgical wards for male and female patients. Also have a section with private and semi – private rooms.
29. New-born unit and maternity section with labour rooms.
30. Well baby, dental, eye and well woman clinics.
31. Doctors and nurses' stations.
32. Prayer and CSSD rooms.
33. Admin station with offices and board room.
34. Laundry, sluice, dirty and clean linen rooms.
35. Restaurant space, kitchen area and cold, store and oven area rooms,
36. Large terrace area with drying area section.
37. Toilets, showers and wash basins in every floor,
38. Water storage water tanks,
39. Emergency rooms and areas

The general and facilitating areas include the lift and staircase area in every floor , emergency exits doors, boundary wall with gate, garbage shed, septic tank, parking area and drive ways together with land scrapped area.

2.1 Site location and particulars

The proposed hospital location is 2 km from Nairobi-Kajiado Highway in Kitengela Town and specifically along the Old Namanga Road. The Plot is 0.164 ha or .0405 acres and is registered in the name of Vicrity Limited. The geographical co-ordinates of the plot are as follows: Latitude -1.485583 and Longitude 36.9487.

Map of proposed site

2.2. Project details

The project will be summarised in three ways: overview, actual hospital plan and the major concern issues.

2.2.1 Overview

PROPONENT	VICRITY LIMITED
Project Description	Proposed Hospital
Plot No.	LR. No. Kajiado/Kaputiei North/116481
Plot Size	0.164 ha or .0405 acres
Access Road	Old Namanga Road
GPS Co – ordinates	Latitude -1.485583 and Longitude 36.9487
Neighbours	Bio – Security Company, Kauti Academy, Kenya Police Service Milimani Police Post, churches and residential homes.
Land use	Plot is empty.
Vegetation on site	None. Site has been cleared and fenced.

2.2.2 Hospital design

The following is the description of what will be present in each floor when the building is completed:

A. Ground floor

The following will be available in the ground floor:

1. Minor theatre room with scrab area with two wash hand basins. Also has an entry to an observation room with toilet and wash basin. An area for stretcher exchange is provided.
2. Laboratory room which is quite large with a separate room for storing blood sample. This room has two wash hand basins.
3. Pharmacy room which is also a large room with one hand basin.
4. Lift section with security desk, lobby area with reception counter.
5. Triage room serving as an entrance to 3 consultation rooms and one injection room.

B. First floor plan

The following will be available in the first floor:

1. Entrance is through the staircase or lift.
2. Well baby clinic.
3. 1st stage of labour room with shower, toilet and sink.
4. 2nd stage of labour room with shower, toilet and sink.
5. Lift section with security desks and lobby.
6. Newborn unit -large room with a changing room section.
7. Doctors on duty office located at the end of the corridor that divides the floor in half.
8. Antenatal ward with 3 toilets, 3 bathrooms and two wash sinks.
9. Well woman clinic with one toilet and wash basin.
10. Nurses station.
11. Post-natal labour ward with a double volume room connected to 3 toilets, 2 wash basins and 3 bathrooms.

12. Sluice room with 2 wash basins connected to an emergency room.

C. Second floor plan

The following will be available in the second floor:

1. Paediatric ward with 4 toilets and 4 showers.
2. Nurses station with entrance to:
    - Isolation room with shower, toilet and wash basin.
3. Dental clinic with toilet, shower and wash basin.
4. Lift, security desks and lobby.
5. Female medical ward with 3 toilets, 3 showers and two wash basins.
6. Prayer room.
7. Sluice room with dhobi sinks (2). Entrance to
    - Emergency room.
8. Nurses station with entrance to
    - Female surgical ward.
    - Units with 3 toilets and 3 showers.
9. CSSD room.

D. Third floor plan

The following will be available in the third floor:

1. Male medical ward with 4 toilets and 4 showers.
2. Sluice section with 2 dhobi sinks.
3. CSSD room.
4. Nurses station room with entrance to
    - Male surgical ward with 2 wash basins.
    - 3 toilets,3 bathrooms and 2 wash basins.
5. Staff ladies changing room.
6. Staff gents changing room.
7. Emergency room.
8. Male general ward with 3 toilets, 3 showers and 2 wash basins.
9. Lobby, lift and security desks.
10. Eye clinic room.
11. Receiving room with scrub area. Entrance to the following:
    - Main theatre with 2 wash basins.
    - Observation room with toilet, sink and bathroom.

E. Fourth floor plan – private and semi-private

The following will be available in the fourth floor:

1. Private room no. 3 with lounge/tv area together with shower, toilet and wash hand basin.
2. Waiting area leading to
    - Room 2 that has toilet, shower and wash hand basin.
    - Room 1 that has toilet, shower and wash hand basin.
3. Office large room.
4. Lift, security desk and lobby area.
5. Shared semi-private room with toilet, shower and wash hand basin.
6. Section which has -
    - 3 private rooms each with toilet, shower and hand wash basin.

- Emergency exit.

7. Nurse station leading to –
    - 5 people semi-private ward with 3 showers, 3 toilets and 2 wash hand basins.
8. Shared semi-private room with toilet and shower.
9. Linen store area at one end of the corridor.
10. 4-5 people semi- private ward with 3 showers and 3 toilets.

F. Attic Floor plan

The following will be available in this floor:

1. Board room.
2. Management office.
3. Security desk, lift and lobby area.
4. Laundry room with provision for dryer, washing machine, concrete work-top, sorting table and the room also serves as an entrance to
    - Dirty linen room.
    - Clean linen room.
    - Terrace drying yard area.
    - Bulky store room.
    - Unit with 2 toilets/showers.
    - Emergency exit.
5. Kitchen room with cooking island in the middle, work top area, granite tops work tables (2). The room also serves as an entrance to
    - Cold room.
    - Store room.
    - Oven area room.
6. Restaurant space.
7. Management office with toilet, wash basins and shower.
8. Unit with -
    - Gents section having 2 toilets and wash basins.
    - Ladies section having 1 toilet and wash basin.
9. Large terrace area.

G. Concrete roof and tank floor plan

`The following will be located in this floor:

1. Three large area for water storage tanks.
2. One large store room.
3. Lift section.
4. Drying yard area.
5. Bulky store room for fuel.
6. Emergency exit.

H. Plan of the grounds

Several features will be located on the grounds apart from the building:

a) Boundary wall

The boundary wall will encompass the entire plot and will be made of masonry stones to a height of 2.1 m and interlaced with coloums at an interval of 3metres.

b) Gate house floor and gate plan

This will consist of a large room with three sections:

- First section is the area for the guards which will have a concrete work top.
- Second section is a cubicle for the hand washing basin.
- Third section is a cubicle having a toilet and shower.

The gate will be 6 metres sliding mechanism.

c) Garbage shed

The area will be a room with protection from rain and animals.

d) Septic tank details

Diagrams and table showing the details of the proposed septic tank.

e) Parking area and drive ways

An area is reserved for parking and is accessible through a drive way.

f) Landscaped area

The is a resting area where grass will be planted and watered.

g) Building

This has been described above but the salient features are the ambulance exit/entrance and the main entrance for patients.

2.2.3 Other major components

1. Construction materials - The proponent intends to use local materials for construction including sanitary ware.
2. Solar Water – the project is design to use solar for water heating and external lighting.
3. The design allows for maximum utilization of sunshine through provision of windows and has considered the location of the Sun and wind to reduce energy expenses from the use of Heating, Ventilation, & Air Conditioning Equipment.
4. Storm Water drainage – the design allows for guttering to capture storm water from the roof and direct the same down using drainage pipe. This water will be captured by storm water drainage works internally and connect to the county government storm water drainage.
5. Water supply – the water supply from the county government is not reliable and neighbours have drilled boreholes for supplementing the water supply. The design includes the use of pumps to ensure the supply of water to all floors and also adequate holding tanks.
6. Security concerns – the design requires the building of a perimeter wall during construction with a gate in order to prevent the public from entering the site.
7. The design also includes the use of security lights both in construction and in operations. The security personnel will be engaged during construction and operation in order to augment the security at the project site. Other measures for capturing details of people and vehicles / trucks coming into and out of the project site will be put in place. The design also includes the use of closed circuit television system.

8. Electrical System - Kenya Power & Lighting Company has provided electricity to the project area and the proponent will apply for connection once the project is ready. A fire safety plan is to be put in action to ensure safety in the construction and operations phases.
9. Safety and health concerns - the design of the building will include the staircase which will provide an emergency escape route in the event of fire or earthquake. The staircase will be fitted with balustrade and will have strategic signage placed strategically. All major doors will open outwards and other safety measures will include the use of firefighting equipment and procedures during all phases of project cycle. Training of construction crew and hospital staff will be ongoing.
10. Sewerage and waste water disposal – all wastes will be directed to the septic tank.

2.3 Works to be undertaken during construction phase

2.3.1 Site investigations

The consultants will investigate to determine the past land users and their activities on the land in order to uncover all environmental issues which can affect the proposed project and help improve the design of the project. This investigation will cover but not be limited to the following:

1. The consultants and especially the civil engineer will undertake investigation to determine depth of the base rock where construction will begin.
2. The elevation and contours of the project site and area will need to be investigated to help inform on storm water and sewerage disposal system.

2.3.2 Site occupation by contractor

The activities will involve the clearing of the site to enable the setting up of the contractor's site office and work area. Other activities will involve the fencing of the project site and construction of gate.

2.3.3 White ant - Insecticide Treatment

The Contractor must destroy any white ants' nests found within the perimeter of the proposed building site and within a distance of 20 metres externally; take out and destroy the queen ants, impregnate holes and tunnels with approved insecticide and back-fill with hard material well rammed and consolidated.

2.3.4 Substructure works

Excavation

This refers to the works undertaken to prepare the foundation of the building to be built. The building site will need to be marked and delineated. Then excavations will be undertaken until the ground level is reached. This will involve the removal of top soil, the removal of underlying loose murram and stones until the hard rock surface are reached. The surface will need to be leveled and smoothed to prepare for construction.

This process will involve the use of tippers and shovel.

Blasting

No blasting will be allowed at the construction site and all rocks requiring blasting shall be broken down using wedges, picks and air compressor drills driven by wagon drill.

Hardcore filling

This will involve the identification of good hard stone, ballast or quarry waste which will be used to back fill the excavation together with compacting and application of a concrete layer on top.

Protection of pipes, cables etc.

A determination of all existing underground cabling and piping from the K P & L Co Ltd, Kenya Pipeline Company Ltd, Engineer's Department (Water and Sewers section) and all other public bodies together with companies shall be made before works are undertaken.

2.3.5 Construction of foundations and structural works

This section will involve an array of activities from:

1. The ordering and importation of construction materials to the work area.
2. The marking and laying out of the foundation lines and columns.
3. The concrete and full construction of the foundations, the retaining walls and drainage systems.
4. The concrete mixing, plastering, slab construction, construction of the building, walling and curing of concrete mixes.
5. All manner of general masonry and the usage of tower hoists, pavers and concrete vibrators.
6. All concrete works will be reinforced with steel and the steel works will involve steel cutting, welding and erection on site.
7. Piping for electrical, mechanical and other services will be installed before concreting.

2.3.6 Electrical works

All electrical installation including all electrical gadgets, transformers, generators, meters, electrical cables, lighting apparatus and sockets shall be fitted.

2.3.7 Mechanical works

The plumbing works will include installation pipes for the water supply system and distribution, the piping for sewerage and waste water system and the storm water drainage capturing and disposal system.

2.3.8 Other general works

The other general works will including flooring with tiles and other finishes, plastering, painting and other finishes. Installation of internet, CCTV cabling and other finishes.

2.3.9 Drainage works

1. All drainage works shall be done by a registered plumber and drain layer.
2. The materials which will be used shall include precast concrete pipes, flexible spigots, rubber gaskets, cast iron pipes, precast concreter invert and side blocks together with precast concrete gullies.
3. Trench excavation shall be undertaken to the required depth and the bed shall be refilled and compacted with suitable material.

4. Before laying of pipes, scrutiny will take place to insure quality of pipes and the defects pipes are removed from the site.

2.3.10 Road works

The internal road is not developed and the following activities are expected to be undertaken by the contractor:

1. Marking out the road as per the architects drawing.
2. The excavation of the top soil shall then take place to the required depth.
3. The excavated soil shall be stored outside the limits of the proposed road.
4. Murram shall be imported to the site and applied to the road together with compacting to for both the sub- base and the base construction.
5. Compaction shall be done with a smooth faced three wheel.
6. After construction of base is completed, bitumen or gabbro shall be applied to the road.

2.3.11 Landscaping

This will involve the planting of trees, loan grasses and flower gardens in order to improve the visual quality of the site.

2.3.12 Contractor existing site

This will involve the dismantling of all temporary building structures and the removal of all construction materials both used and unused from the site. All excavated materials and other solid wastes will also be cleared from the site. All machinery and equipment will be removed from site.

2.4 Activities to be undertaken during operations phase

2.4.1 Hospital activities

The main activity of the hospital is attend to patient both inpatient and out patient together with the myriad of activities that support the same.

2.4.2 General repairs and maintenance

The building will requires general maintenance including repairs during the activities of the operational phase.

Electrical gadgets and equipment will need to be repaired and maintained on regular basis. The building will require fresh coat of paint every two years and general repairs on building walls and floors will require to be undertaken regularly. The water and sewerage piping system will require periodic inspection and repair. The garden will need planting, weeding and general upkeep.

2.4.3 Housekeeping

Regular cleaning (sweeping, mopping, vacuuming, polishing etc) of the buildings floors, staircases, pavements and general compound is expected to be carried out during the operational phase of the project.

2.4.4 Staff improvement

The hospital will need to constantly improve its service by taking their staff through continuous trainings.

2.4.5 Procurement

The hospital supplies will need to be purchased and restocked on a continuous bases.

2.4.6 Disposal of dead bodies and medical wastes

It is that expected that patients will die and the hospital must be prepared to temporally hold the dead bodies.

Hospital wastes both hazardous and non- hazardous will need to be properly disposed off.

2.5 Description of the project's decommissioning activities

2.5.1 Demolition works

All structures in the proposed site will be demolished and removed from the premise including the perimeter fence, parking areas, drainage system and the building.

2.5.2 Site rehabilitation

All demolitions wastes and materials will be sorted and separated in different categories: degradable from no degradable. Electrical installations, underground piping will be sorted out to usable and non- usable materials. All usable wastes and materials will be moved to different sites while non-usable wastes and materials will be carted away to disposable wastes site.

2.6 Description of the potentially affected environment

The project site is located about 2km from Kitengela Town along the old Namanga Road.

2.6.1 North of the proposed site

The land opposite the site is not heavily developed. The commercial enterprises located therein are Kitengela Magereza Mixed Secondary School, Beauty World cosmetic stores and Sopa Fashion Clothing Store. The rest of the land is idle.

2.6.2 South and east of the Project site

The land south of the project site is divided into plots and developed as homestead while some plots are not developed.

2.6.3 West of the project site

The properties west of the project site are mainly homestead with Maisonnettes or bungalows. The only commercial centre is Vekaria Construction Company and Kauti Academy.

2.6.4 Current land use of the proposed site

The project site is fenced and the middle part has been cleared. Some parts have shrubs and others have trees. One side is a permanent pit latrine and two iron sheet structures.

2.6.5 Infrastructure development

1. Water - the county government has not provided piped water and residents depend on boreholes and imported water.
2. Sewerage – the county government has not provided sewer lines to the area and residents use alternate means such as bio-digestors and septic tanks.
3. Telephone and data – all the network work providers are available in the area.
4. Roads – the main road is Old Namanga Road and other smaller feeder roads. All are developed as all-weather murram road.
5. Electricity – Kenya Power has provided electricity to the area.

CHAPTER THREE

3.0 BASELINE INFORMATION

3.1 Kajiado County

3.1.1 Population and area

Kajiado County has a population of 687,312 as per the 2009 census and an area of 21,292.7km^2.

3.1.2 Constituencies

The following constituencies are located within its borders; Kajiado North, Kajiado Central and Kajiado South Constituencies.

3.1.3 Economic activity

Main economic activities include pastoralist livestock herding, tourism, agriculture and urban-life activities like cattle trading.

Pastoralism plays a major role in contributing to the economy of Kajiado County. Livestock production has been on an increase because of the growing commercialization of the pastoral economy. Further efforts to develop the processing capacity for dairy and beef products coupled with improvements in livestock marketing boards would see this industry take the county to greater levels.

Agriculture is practiced in some parts of the county as more and more of the indigenous people of the county move from relying solely on livestock for their incomes to substituting this with subsistence agriculture. Efforts to develop irrigation projects in the region would see this agricultural production increase and enable the county to be food secure.

The county also has mining of gypsum and limestone among other minerals in the Kajiado district.

Some notable resources in the county includes the Amboseli National Park a popular tourist destination rich with wildlife and diverse ecosystem of flora and fauna and mineral resources particularly Soda ash from Lake Magadi. Natural resources as wildlife, open grasslands, wooded bush lands, open bushes, woodlands and forests are also found within the county borders.

3.1.4 Location

The county is bordered by Tanzania to the southwest and the County of Taita Taveta (to the south east), Machakos County (to the east), Nairobi County (to the north east), Kiambu County (to the north) and Narok County (to the west)

3.1.5 Hotel Industry

Kajiado County is one of the preferred tourist destination areas. The county is endowed with a variety of wildlife and tourist attraction geographical cultural and historical features. As a result, the hotel industry has taken advantage of this opportunity. Various hotels are established in the district including Ostrich Farm Hotel.

3.1.6 Flower Industry

The flower industry has grown significantly in the last few years. This is attributed to availability of vast land and labour that is drawn from the county. The industry is largely concentrated in Isinya and Central divisions.

3.2 Economic activities in Kitengela

3.2.1 Quarrying

Quarrying of building stones is carried out all over the sub-county. The major areas are Ngong, Kitengela and Ongata Rongai. The demand for this material is high due to the immigration of people from Nairobi to these dormitory townships.

3.2.2 Industrial

The town is home to many light and heavy industries including Prime Steel Mills, stone crushers, flowers farms, Kitengela Hot Glass Limited and Carnation Plants Limited. Other supporting economic activities are transport services, tanneries and pastoralism.

3.2.3 Residential

This is characterized by rising multi storied units, single units and shanties.

3.2.4 Commercial

The town is characterized by a number of wholesale and retail businesses, small and medium scale enterprises and commercial service providers. It is an organized form of trade where various goods are sold through established outlets such as kiosks, shops, restaurants, bars, hotels, pharmacies and supermarkets.

3.2.5 Tourism

Kitengela Town is close to Nairobi National Park and the Kitengela Game Conservation Area, populated with buffalo, Maasai giraffe, black rhino, eland, impala, Grant's and Thomson's gazelle, common and Defassa waterbuck, hippopotamus, warthog, Olive Baboon, monkeys and the attendant carnivores - lion, Spotted Hyena, cheetah, jackals, Bat-eared Fox and smaller carnivores. Near Kitengela Town is the Maasai Ostrich Park, a fairly popular tourist destination 7 km off the Nairobi - Arusha road. It is also a place where Jockeys train for Ostrich racing.

3.3 Infrastructure in Sub County

Boreholes and shallow wells are the most widespread methods of Water Supply in the sub county due to uneven distribution of rain which results in large fluctuations in river flows. Surface water in the district is very low. The major sources of water in the proposed area are boreholes and shallow wells. The site is well being connected to the electricity, health, educational facilities and security as evidenced by a police post. The main tarmac road transecting the town is the Athi River-Kajiado Road. There is also Isinya - Kiserian Road; other interior parts of the town have murram roads.

3.4 Hydrology

3.4.1 Ground water recharge

Kitengela Town depends on ground water reserves. The record of the boreholes in the area suggests that the layer of the volcanic rock is not deep and they overly the basement rocks. There is no difficulty in finding adequate water as there is ample recharge from the high ground to the west formed by the Ngong Hills while several rivers also flow through the area. There is no possibility of depletion of ground water with the present low density of boreholes in the area. This project area lies at the edge of the volcanic rocks that originated from the rift valley eruptions at Ngong and the basement system. It was formed by erosion followed by deposition of weathered material from the volcanism. The quality of ground water in any given area depends on the recharge potential of the aquifers. The mechanism of ground water recharge and the rate of

replenishment will depend on the soil structure, vegetation cover and the erosion state of the parent rock. The movement of ground water is controlled by the sub surface morphology of the rocks. Weathered or fractured zones as well as buried valleys old surfaces within the lavas fault zones and open joints are preferred media for ground water improvement.

3.5 Geology and soils

Tertiary volcanic is found around Ngong, Magadi and Kajiado town. Rock developments include Olivine basalts, phonolites, pyroclastics, volcanic ash, tuffs and trachytes. The soils developed include Leptosols, Luvisols, Andosols, Nitisols, Vertisols, Cambisols and phaeozems. The soils are generally fertile and of medium to high productivity potential for crops and livestock. The proposed site has black cotton fine grained soils derived from weathering of volcanic rocks which are well drained, porous, high moisture and stable structure.

3.6 Water resources

Kitengela Town entirely depends on groundwater reserves due to limited number of permanent rivers and reliable rainfall regimes. Limited surface water resources exist for livestock and domestic use. The major river which transects the town is Athi River. In this case construction of water dams and pans, boreholes and shallow wells are important means of accessing water, the proposed site depends entirely on water from boreholes.

3.7 Flora and fauna

The main vegetation type in the county is determined by altitude, soil type and rainfall received in the different parts of the district. However, anthropogenic and animal causes have modified the status significantly. Overgrazing, charcoal burning, extraction of fuel wood, forest fires and quarrying activities are some of the leading causes of this trend.

The main vegetation types in the town comprise wooded grassland, open grassland, wooded bush land, bushed grassland and forest. Woody species include; Acacia Tortilis, Acacia Xanthopholea, Acacia Mellifera, Commifora Schemperi, Balnites Aegyptiaca, Balanites Gabra, and Salvadora Persica. Grasses include; Pennisetum Mezianum, Pennisetum Stramineum, Chroris Roxburghiana and Sporobulus Angustifolia, Chloris Guyana And Cenchrusciliaris. Pennisetum Mezianum is good grazing grass when young but becomes steamy and unpalatable as it grows.

Within the sub county, native animal and insect life is still rampant but the human settlement is driving the wildlife further away.

3.8 Topography

The general topography of the sub county is characterized by plains and occasional volcanic hills such as Lukenya and Mua hills. The land rises from about 500 meters above sea level around Lake Magadi to about 2,500 meters above sea level in the Ngong Hills area. The proposed site in Kitengela Town consists mostly of open rolling land. The area also includes the Ngong Hills with an altitude of 2,460 meters above the sea level and is the source of Athi River. The river is fed by its major tributaries Mbagathi and Kiserian both of which are permanent rivers.

3.9 Climate and rainfall

The sub county has a bimodal rainfall pattern. The short rains fall between October and December while the long rains fall between March and May. Heavy rains occur around Ngong Hills due to the strong influence because of altitude. The temperatures in the district also vary

according to altitude. Mean maximum of 34ºC around Lake Magadi and a mean minimum of 10ºC on the foothills of Kilimanjaro have been recorded. Moisture deficit is also observed in the greater part of the year. This gives the sub-county a dry season of between 7-9 months. The climate scenario in the district indicates that the bulk of the area (with annual rainfall of 700-850mm), is suitable for ranching.

3.10 Project site

3.10.1 Current land usage

The land has not been interfered with and is in its natural conditioned. The land is fenced.

3.10.2 Surrounding area

The Milimani area has been subdivided into plots which are developed as residential units comprising of Marionettes and Bungalows. The area has some plots that are not built and a small percentage has churches, police post and schools.

3.10.3 Infrastructure development

The Old Namanga Road is the main assess to the area and the road is an all-weather murram road. The feed road roads are also upgraded into all-weather murram roads. The area is connected to Kenya Power and Lighting but the area does not have sewerage services. The residents use septic tanks and pit latrines. The county government has not provided water services to the area and the residents depend on connections from private boreholes in the area.

3.10.4 Fauna and Flora

The wildlife and insect life native to the region has totally disappeared due to the human settlement in the area. The plot has the native savannah grasses and shrubs.

CHAPTER FOUR

4.0 RELEVANT LEGISLATIVE AND REGULATORY FRAMEWORK

4.1 Introduction

In Kenya, the country has a legal framework which governs and regulates all aspect of life, activities and enterprises. This legal framework anticipates the existence and impacts of those activities and enterprises on the lives of the people and also on the environment. In this section, we shall seek to peruse and review the legal framework that touches on the proposed project.

4.2 Environmental Policy Framework

"environmental impact assessment" means a systematic examination conducted to determine whether or not a programme, activity or project will have any adverse impacts on the environment (EMCA – Chapter 387). This study should cover all aspects of the project cycle from planning, implementation, operating and decommissioning phases for public as well as private enterprises. The aim is to protect the environment and to ensure sustainability for future generations.

The relevant regulations (EIA) provide the format and processes for undertaking the studies and also allows the licensing authority to approve those projects which are environmentally sustainable.

4.3 Institutional Framework

Environmental matters and issues are dealt with by different departments and institutions in Kenya such as the Public Administration, the Police, County Government departments like Physical Planning and Health, the Public Works departments that approve government projects, Kenya Wildlife Services (KWS) and the Forest Departments. Other interested parties and institution such as NGO and political interest also have a say and influence on how the environmental interest are taken care of. Ministry of Environment has National Environmental Council (NEC) and the National Environmental Management Authority (NEMA) which deals primarily with environmental matters. The role of NEMA is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of Government in the implementation of all policies relating to the environment while the role of NEC for policy formation, setting national goals and objectives among others.

4.4 The Constitution of Kenya

The constitution guarantees under section 42 the right of every person to have a clean and healthy environment and also to have that environment protected for the benefit of the present and future generations.

The constitution shall encourage the use of public participation in the management and protection of the environment as required in section 69 (d). The state is also mandated to establish systems of EIA and EA together with eliminating process and activities that are likely to endanger the environment as required under section 69(d, f and g).

Relevance

The project design and methodology of construction together with operations of the hospital must be geared to not only protect the environment but to promote the same. The Lead Agencies have a duty to ensure protection of the environment through systems.

4.5 The Building Code – The Local Government (Adoptive By-laws) (Buildings) Order 1968 and The local Government (Adoptive By-Laws) (Grade II Building) Order 1968

Under section 1-4

Section 1-4 of the First Schedule spells out how drawing will be produced, who will sign them for submission, number of copies to be produced and the duty of the municipal to retain copies whether approved or not.

Section 15 requires that all construction sites to have sufficient temporary latrine accommodation.

Section 16 requires the contractor/proponent to provide a detailed work plan and to deposit the same with the council. The work plan shall show who is supervising the construction, frequency and evidence of material testing if required, date of intended completion and other matters that may be required.

Section 20 requires all building to have a secondary means of access while 34 gives the power to the council to request for testing of materials and to cause the removal of any materials that do not meet the required standards.

Section 42 mandates all constructors to ensure that they identify the beacons or boundaries of the land before commencement of works.

Under section 124;

This section specifies that only a qualified architect and structural engineer will be engaged and they shall prepare the required drawings in the prescribed manner.

Section 137 provides the requirement for installing lifts and requires mandatory testing every six months under section 138.

Section 139 requires every building to be provided with approved means of refuse disposal.

Section 148 requires the design for buildings to have storage tanks for the purposes of fire-fighting purposes.

158. All common stairs and common passages shall be adequately cross ventilated, and for common stairs sufficient natural and artificial lighting shall be provided.

Under section 170;

This section specifies how the harvesting of rainwater from the roof tops will be carried out and the materials to be used.

Section 214 list the following firefighting equipment to be incorporated in whole or in part when designing and constructing a building:

(a) hydrants, hose, hose reels and fire appliance external connexions;

(b) portable fire appliance;

(c) sprinkler, drencher and water spray projector system;

(d) water storage tanks; and

(e) dry risers.

The general construction activities from building of foundations, walling, plumbing roofing and all other steps in construction shall be carried out in accordance with the First to Twelfth Schedule of the building code.

Relevance

The consultants will be required to incorporate the above requirement in the design of the project while the contractor is mandated to implement the same during construction.

4.6 The County Governments Act No. 17 of 2012

Under section 134 of the act, The Local Government Act was repealed and this ushered in the authority of the County Government over all matters within its jurisdiction.

Relevance

This act enables the County Governments to enforce the other acts of parliament that have now been repealed but are still being used as the reference laws.

4.7 The Persons with Disability Act 2003

Public buildings

22.(1) A proprietor of a public building shall adapt it to suit persons with disabilities in such manner as may be specified by the Council. (2) All proprietors of public buildings shall comply with subsection (1) within five years after this section comes into operation.

Compliance

The architect shall ensure that the design of the building has either a ramp or lift.

4.8 The Employment Act 2007

The proponent shall give equal employment opportunities to both sexes, shall not discriminate or deny employment, nor employ children and shall pay equal remuneration for work done under section 4, 5 and 5(3) of the act.

Relevance

The proponent is required to ensure that the staff and worker in the hospital and construction site are engaged within the parameters of this law.

4.9 The Environment and Land Court Act, 2011

This Act is in place to give effect to Article 162(2) (b) of the Constitution; to establish a superior court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land, and to make provision for its jurisdiction functions and powers, and for connected purposes.

Relevance

In the event of a need for judicial assistance in adjudicating matters that may arise from environmental issues, this court is available.

4.10 The Environmental Management and Co-ordination Act Chapter 387

Section 58 of the Act requires all proponents to undertake an environmental impact assessment study before implementation or financing of any project and also to have the same studies submitted to the relevant authority for approval.

The second schedule provides a list of the projects that are required to undergo an environmental impact assessment and specifically in no. 1 it specifies that any activity that is out of character with its surrounding or any structure of a scale not in keeping with its surrounding and finally any major changes in land use will be subjected to an EIA process. The proposed hospital will change the nature of the project site permanently and qualifies for an EIA under item I of the Second Schedule.

Third Schedule - List the relevant representatives of Government Ministries that should be consulted when dealing with environmental matters. The Public Administration shall be consulted when undertaking the public participation and stakeholder's consultative meetings.

Compliance

The proponent is required to undertake and submit an ESIA and the Lead agency is to approve, amend or reject the project.

4.10.1 The Waste Management Regulations, 2006

4. Responsibility of Waste Generator

(1) No person shall dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle.

(2) Any person whose activities generate waste shall collect, segregate and dispose or cause to be disposed off such waste in the manner provided for under these Regulations.

(3) Without prejudice to the foregoing, any person whose activities generates waste has an obligation to ensure that such waste is transferred to a person who is licensed to transport and dispose off such waste in a designated waste disposal facility.

38. Any person who generates biomedical waste shall at the point of generation and at all stages thereafter segregate the waste in accordance with the categories provided under the Seventh Schedule to these Regulations.

43. (1) No person shall transport biomedical waste without a valid permit issued by the Authority in consultation with the relevant lead agency.

Compliance

The proponent shall ensure that all wastes generated within the proposed site shall be properly disposed off. Also the proponent shall engage a register bio-medical waste handler to dispose of all the medical wastes generated in the hospital.

4.10.2 The Environmental (Impact, Assessment and Audit) Regulation, 2003

Section 4 requires all projects that are likely to have a negative environmental impact to undertake an EIA before commencement of works.

The proponent shall apply and obtain a Terms of Reference approval for undertaking an ESIA full study before commence of the project as required under section 11 (5).

Section 31 requires all ongoing projects and new undertakings that to undertake annual environmental audits and to submit the same to the authority for perusal and action.

Compliance

The proponent will undertake ESIA before commencement of the project and shall undertake annual audits every year therein.

4.10.3 Noise And Excessive Vibration Pollution) (Control) Regulations, 2009

"action plan" means a plan designed for the purpose of managing noise or excessive vibrations and their effects, including reduction of noise or excessive vibrations;

Section 2 list the factors that are used in determining whether noise is loud, unreasonable, unnecessary or unusual including time of day and proximity to residential area.

Section 4 specifically prohibits noise from vibration beyond stated amounts.

Section 11 prohibits the use of Machinery activity which is to emit noise or excessive vibrations that shall exceed the noise levels listed in the First Schedule.

Section 13 prohibits construction noise at night if the activity shall exceed the noise levels listed in the Second Schedule of these regulations.

The following table 1 shows the noise levels permissible under these regulations:

MAXIMUM PERMISSIBLE NOISE LEVELS					
Zone		Sound Level Limits dB(A) (Leq,14 h)		Noise Rating Level (NR)	
		Day	Night	Day	Night
A	Silent Zone	40	35	30	25
B	Places of worship	40	35	30	25
C	Residential : Indoor Outdoor	45 50	35 25	35 40	25
D	Mixed residential (with some commercial and places of entertainment)	55	35	50	25
E	Commercial	65	35	55	25

4.10.4 Legal Notice 31 - EMCA - Amendment to the Second Schedule

The establishment of hospitals is classified as high risks project under section Urban developments 3(e).

Relevance

The proposed project qualifies for a full ESIA study report.

4.11 The Factories Act Cap 514

Section 29 requires all employers to provide training and supervision to inexperienced and new workers.

Section 30 requires all hoists and lifts to be in good mechanical condition before work and also requires them to be examined and certified in writing every six months by a person approved to undertake such a task.

Section 32 requires all cranes and other lifting machines to be of good mechanical condition and to be serviced and examined by a qualified person every 14 months.

Section 62 requires all proponent to keep a registered where all pertinent information required under the act will be contained.

Compliance

The contractor shall ensure all machinery, hoists, lifts and lifting machines in the site are in good working condition and shall have certificate as evidence of the same.

4.11.1 The Factories (First-Aid) Rules, 1977 Legal Notice No. 160

Section 2 and 3 requires not only the provision of a first aid box in the premises but also what should be contained in it.

Section 4 requires the name 'First Aid' to be clearly marked on the container and to be displayed where it can be easily seen.

Compliance

The contractor during the construction phase and the proponent during the operation phase shall comply to the above requirement.

4.11.2 The Fire Risk Reduction Rules, 2007

20. (1) Every occupier shall establish a fire fighting team that shall consist of–

(a) At least two persons, where the number of workers is not more than ten;

(b) At least three persons, where the number of workers is between eleven and twenty five;

(c) At least five persons, where the number of workers is more than twenty five.

22. A fire fighting team shall carry out the following functions–

(a) ensure that all fire fighting appliances, fire detection systems, fire alarm and any other facility for fire safety are in place and are regularly serviced;

(b) Conduct fire drills at the workplace;

(c) Investigate fire incidences at the workplace and recommend corrective measures;

(d) Regularly inspect the workplace for purposes of identifying potential fire risks and recommend remedial measures;

(e) Train other workers in the safe use of fire fighting appliances;

(f) Co-ordinate the evacuation of other workers in the event of a fire; and

(g) Undertake any other functions as may be directed by the occupier.

23. (1) Every occupier shall ensure that fire-drills are conducted at least once in every period of twelve months and a record of such drills kept available for inspection.

24. (1) Every occupier shall identify a location in the workplace where every worker shall assemble in the event of a fire.

26. (1) Every occupier shall provide suitable means of alerting persons in the workplace, in the event of a fire, and such means shall be made known to all workers.

29. (1) Every occupier shall provide means of extinguishing fire at the work place.

30. (1) Every occupier shall ensure that all means of extinguishing fire are properly maintained.

Compliance

The contractor during construction and the proponent during operation shall develop a fire fighting plan which shall cover all aspects of fire fighting procedures and equipment together with their implementation.

4.12 The Food, Drugs and Chemical Substances Act Chapter 254

Section 3 requires all premises which are to be used for the purposes of selling, preparing, packaging, storing or displaying food to be licensed.

Section 11(B and C) requires all employers to provide adequate sanitary conveniences for all their workers and also to have running water at all points where processing of food and cleaning is taking place.

Section 15 requires all workers who handle food to have a medical examination carried out by a government medical institution periodically.

Second Schedule Part B

The following requirement shall be complied with as regards the cleanliness of all persons working in direct contact with food

A They shall wear clean outer garments and conform to hygienic practises while on duty

B They shall wash their hands thoroughly, remove all jewellery, and take any necessary precaution to prevent contamination of food with micro- organisms or foreign substances

E as is necessary for the work, on which the employee is engaged, he shall wear effective head – dress, such as hair net, head – band or cap and

F all employee shall refrain from storing their clothing or any other personal belonging or from eating or drinking beverages in areas where food is or food ingredient are exposed or areas used for washing equipment or utensils.

Compliance

The proposed hospital must ensure that the restaurant will be fully licensed, the sanitary conveniences to be enough for all guest and workers, that the food handlers have all undergone medical examination, that all employees have the appropriate PPE and the facilities has adequate lockers for storing personal effects while at work.

4.13 The Land Registration Act, 2012

This act specifies how the land will be registered and the title deed produced.

Compliance

The proponent is to ensure that the proposed site land has a title deed in the name of the hospital.

4.14 The National Construction Authority Act NO. 41 OF 2011

Requirement for registration

15. (1) A person shall not carry on the business of a contractor unless the person is registered by the Board under this4Act.

(2) A person seeking registration under subsection (1) shall, in the case of a firm, be eligible for registration if at least one of the partners or directors of the firm possesses such technical qualifications, skills or experience as the Board may from time to time prescribe.

17. (1) A person or firm may apply to the Board for registration as a contractor for purposes of this Act.

Relevance

The proponent is required contract persons, firms or company to be contractors of the proposed project who are registered under this act.

4.14.1 The National Construction Authority Regulations, 2014

The owners of all construction works are required to register construction works and the BQ with the authority as soon as possible as required under section 17 (1) and (2).

The Authority shall accredit and certify all construction workers and site supervisors in accordance with this act as specified under sections 19, 20 and 21.

Compliance

The contractor will register the tender contract with the authority and the proponent will provide the name of the contact person.

4.15 The Occupational Health and Safety Act 2007

6. (1) Every occupier shall ensure the safety, health and welfare at work of all persons working in his workplace.

(6) It is the duty of every occupier to register his workplace unless such workplace is exempted from registration under this Act.

Part vii— Machinery Safety

77. (4) Necessary precautions including warning signs, shall be taken to prevent injury to employees and other persons at a workplace from mobile plants falling objects and objects ejected from machines and work processes.

89.(1)In every workplace in which, in connexion with any process carried on, there is given off any dust or fume or other impurity of such a character and to such extent as to be likely to be injurious or offensive to the persons employed, or any substantial quantity of dust of any kind, all practicable measures shall be taken to protect the persons employed against inhalation of the dust or fume or other impurity and to prevent its accumulating in any workroom, and in particular, where the nature of the process makes it practicable, exhaust appliances shall be provided and maintained, as near as possible to the point of origin of the dust or fume or other impurity, so as to prevent it entering the air of any workroom and the dust, fumes or impurity shall not be allowed to enter into the atmosphere without undergoing appropriate treatment to prevent air pollution or other ill-effect to life and property.

Part X Welfare – General Provision

91 (1) Every Occupier shall provide and maintain an adequate supply of wholesome drinking water at suitable points conveniently accessible to all persons employed.

93 Every occupier shall provide and maintain for use of a person employed, adequate and suitable accommodation for clothing not worn during working hours.

Part XI Health, Safety and Welfare- Special Provisions

101 1 Every employer shall provide and maintain for the use of employees in any workplace where employees are employed in any process involving exposure to wet or to any injurious or offensive substance, adequate, effective and suitable protective clothing and appliances, including ,where necessary, suitable gloves, footwear, goggles and head coverings.

Compliance

The proponent and contractor are required to put measures into place to ensure that the safety health and welfare all workers and public is secured.

Both the contractor and the proponent are required to register the construction site and hospital as a workplace.

The proponent is to ensure that all service and safety procedures are undertaken for the gas cylinders .

The proponent, constructor and the consultants are to ensure safety and health concerns are incorporated into the design of the project.

4.16 The Physcal and Land Use Planing Act of 2019

Under section 56 and 57, the proponent shall ensure that he has applied and obtained developmental approval for construction and change of use of the land before commencement.

Compliance

The proponent is to apply and obtain a change of user together with architectural approval.

4.17 The Public Health Act Chapter 242

115. Nuisances prohibited

No person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.

116. Local authorities to maintain cleanliness and prevent nuisances

It shall be the duty of every local authority to take all lawful, necessary and reasonably practicable measures for maintaining its district at all times in clean and sanitary condition, and for preventing the occurrence therein of, or for remedying or causing to be remedied, any nuisance or condition liable to be injurious or dangerous to health, and to take proceedings at law against any person causing or responsible for the continuance of any such nuisance or condition.

117. Health authorities to prevent or remedy danger to health from unsuitable dwellings

It shall be the duty of every health authority to take all lawful, necessary and reasonably practicable measures for preventing or causing to be prevented or remedied all conditions liable to be injurious or dangerous to health arising from the erection or occupation of unhealthy dwellings or premises, or the erection of dwellings or premises on unhealthy sites or on sites of insufficient extent, or from overcrowding, or from the construction, condition or manner of use of any factory or trade premises, and to take proceedings against.

Compliance

The Proponent and the Contractor will take measures to ensure that all sewer, waste and storm water together with solid wastes generated at the site are discharged correctly, safety and promptly to ensure safety, health and welfare of all persons on site.

4.18 Workmen's Compensation (Compulsory Insurance) Order No. 13 OF 2007

2. Application

This Order shall apply to any employer in any undertaking or part of any undertaking which consists in the carrying on, for gain or reward, of one or more of the following activities, that is to say—

(a) the construction, structural alteration, maintenance or repair of any building the demolition of any building and the preparation for, and laying the foundation of, any intended building;

(b) the construction of any railway line or siding, and the construction, structural alteration or repair or the demolition of any airfield, dock, harbour, wharf, quay, pier,

in-land navigation works, road tunnel, bridge, viaduct, waterworks, dam, reservoir, pipeline, aqueduct, sewer, sewage works or latticework structure designed solely for the support of electric lines;

(c) the carriage of passengers and goods, or either of them, by any motor vehicle whether or not required to be licensed as a public service vehicle under theTraffic Act (Cap. 403) or a road service licence, or public carriers licence or a limited carriers licence, under the Transport Licensing Act (Cap. 404):

Provided that this Order shall not apply to—

(i) the Government of Kenya;

(ii) any employer who provides and maintains in force a security consisting of an undertaking by a surety, approved by the Minister, to make good, subject to any conditions specified in such undertaking and up to an amount approved by the Minister, any failure by the employer to discharge any liability which he may incur under the Act to any workmen employed by him.

Compliance

The contractor shall undertake liability insurance for all construction workers and visitors on site.

The proponent will also take liability insurance for all the hospital workers during operations.

4.19 Annex I: Ministry of Health Guidelines on Covid-19 Management

Considering that the COVID-19 disease has now been classified as a pandemic we are taking precautionary measures. All Kenyans should observe the following:

Annex I: Ministry of Health Guidelines on Covid-19 Management

Considering that the COVID-19 disease has now been classified as a pandemic we are taking precautionary measures. All Kenyans should observe the following:

1. Regularly and thoroughly wash your hands with soap and water or use alcohol-based hand sanitizer.

2. Maintain a distance of at least 1 meter (5 feet) between yourself and anyone who is coughing or sneezing.

4. Maintain good respiratory hygiene by covering your mouth and nose while coughing and sneezing with a handkerchief, tissue, or into flexed elbow.

7. Suspend all inter – school events but keep schools open.

12. All persons visiting public places such as supermarkets, open air markets, public transport should at all times wear a face mask to reduce the chances of transmission of the virus.

13. Utilize the call line facility number 719 to report on any cases regarding the disease and *719# to receive the correct messages.

CHAPTER FIVE

5.0 STAKEHOLDER AND PUBLIC PARTICIPATION

5.1 Introduction

Public consultation and participation process is a policy requirement by the Government of Kenya and a mandatory procedure as stipulated by EMCA CAP 387 section 58, on Environmental Impact Assessment for the purpose of achieving the fundamental principles of sustainable development.

Therefore, this section describes the process of the public consultation and public participation followed to identify the key issues and impacts of The Proposed Hospital Development on Plot LR. No. Kajiado/Kaputiei North/116481 in Milimani area of Kitengela Township and within Kajiado County. The objective of the consultation and public participation was to:

- Disseminate and inform the stakeholders about the project with Special reference to its key components and location.
- Gather comments, suggestions and concerns of the interested and affected parties about the project.
- Incorporate the information collected in the ESIA study.

In addition, the process enabled:

1) The establishment of a communication channel between the general public and the team of consultants, the project proponents and the Government.

2) The concerns of the stakeholders be known to the decision-making bodies at an early phase of project development

5.2 Methodology used in Public consultation

The exercise was conducted by a team of experienced registered environmental experts and social expert. The following process in carrying out the entire process involved:

- Key informant interviews and discussions
- Field surveys, photography and observations
- Completion of the pre-designed questionnaires which captured all the phases of the proposed development

The purpose for such interviews was to identify the positive and negative impacts and subsequently promote proposals on the best practices to be adopted and mitigate the negative impacts respectively. It also helped in identifying any other miscellaneous issues, which may bring conflicts in case project implementation proceeds as planned. The information gathered enabled the identification of the specific issues from the stakeholders' response, which provided the basis upon which the aspects of the Environmental Impact Assessment was undertaken.

5.3 Sources of information

The exercise of public consultation will be conducted in September 2021. The exercise will be conducted via a public baraza and interviews under the guidance of questionnaires developed to capture the concerns, comments and issues that the stakeholders, neighbours and business people around the project site have regarding the proposed hospital. The completion of such questionnaires will allow for the participants views to be synthesised and analysis of issues that will arise.

CHAPTER SIX

6.0 ANALYSIS OF PROJECT ALTERNATIVES

6.1 Introduction

The proponent purchased the property in Mlimani area for the sole purposes of running a hospital in the area.

Under the environmental framework and regulation whose interest is to safe guard the environment today so that future generations shall have a suitable environment in which they can generate both a livelihood and a habitant in which to live; alternatives to the project in alternative plot, no project alternative, proposed development alternative, alternatives to disposal of effluent and waste water together with alternatives in solid waste management will be considered.

6.2 Alternative plot

Under this alternative, the proposed project would be relocated from the proposed site to another site. This would involve several factors that would need to be considered:

a) Sourcing for the alternate plot -The proposed concept is for a hospital and requires a location with a sufficient customer base to be able to make the project viable. The proposed new site would also have to have the necessary infrastructure and also the land would have to be in a place that allows a change of user. This two options are a tall order for the proponent.
b) Extra costs involved in a new site involve purchasing a new plot and the proponent is not in a position to undertake such expenditure. The current land was purchased at an great sum of money and to be able to put the same in the market in order to get a buyer would take an indefinite amount of time and the money realised would be no guarantee that it would be enough for the new site. The proponent has already expended a lot of money on consultation fees to the team of consultants who have designed the concept and a change of the location would be a loss of the concept already designed and a further cost of designing a new concept based on the new site.

This alternative is not attractive or cost friendly and the proponent is not financially able to undertake this option.

6.3 No Project – alternative

This alternative envisages that the current status quo remains and the proposed development does not take place. In practical terms, this would involve the following:

1. The land would continue to remain idle.
2. The proponent would continue paying land rent to the Ministry of Lands and land rate to the county government of Kitengela without adequate income.
3. The economic status of the local community which would have benefitted with employment would remain the same.
4. The business opportunity to supplies of construction materials and consulting services would not be realised.
5. The proponent would suffer a big blow due to his dreams not being realised and also other investors would be discouraged to know that their projects would be disapproved under similar circumstances.

From the above analysis, it becomes apparent that the no-project alternative is a **no alternative** to the local people, proponent, Kenyans and the Governments of the Kajiado County and Kenya.

6.4 The proposed Development Alternative

Under the proposed Development Alternative, the developer of the proposed project would be issued with an EIA License. In issuing the license; NEMA would approve the proponent's proposed development of the hospital, provided all environmental measures are complied with during the three phases of the project cycle. This alternative consists of the applicant's final proposal with the inclusion of the NEMA regulations and procedures as stipulated in the environmental impacts to the maximum extent practicable.

Under the proposed Development Alternative Option in respect to the proposed project, implies that the project achievements will proceed as discussed before hence the local people, Kenyans, and the government of Kenya will all benefit immensely.

6.5 Alternatives to disposal of effluent and waste water

During the occupation of the hospital, a lot of waste water and effluent will be generated and will need to be properly disposed off.

6.5.1 Current option

The area does not have sewer line facilities and the architect has planned for the use of septic tanks to collect the sewerage generated in the hospital.

Under this option, all the waste water and effluent will be properly disposed off and the only concerns would be to ensure that licensed sewerage transportors are engaged.

6.5.2 Use of a waste treatment plant

Under this option, the proponent would design and install a waste treatment plant which would collect all waste water and effluent and treat the same before discharge into the environment. The result waste water would be used to water the grounds.

This option is viable as it would properly dispose of the wastes. However, the cost implications verse the option of using a septic tank makes the option unattractive.

6.5.3 Use of bio-digesters

Biodigestors work on the principle by which microorganisms break down organic materials without the use of oxygen. The facility is usually a closed system to allow the breakdown to occur naturally. The raw material used is any organic material and in this case will be the toilets wastes from the hospital together with the waste water generated therein. The end product of the process is recycled water which can be used to water the ground or can be discharged back into the river. The process also produces fertilizers and biogas.

This is a viable option which can be used in the project.

Three of the four options are all viable except for the use of septic tanks which will result in ground water contamination. However, the option that is least expensive and will not require much further input to implement is the connection to the public sewer system.

6.6 Alternatives in solid waste management

During operation phase, a lot of solid wastes will be generated in the different departments of the hospital. The following measures can be used:

1. Plastic bottles can be collected and sold for recycling..
2. Kitchen food can be separated and recycled as animal feed.

3. Great care should be taken at ordering of materials to ensure only required amount are ordered which will minimize wastes.
4. Medical wastes will be segrated and separated at source. A licensed wastes disposer will collected and dispose in licensed facilities.

CHAPTER SEVEN

7.0 POTENTIAL IMPACTS TO THE ENVIRONMENT

7.1 Introduction

The purpose of environmental impact assessment study is to identify and predict potential impact to the environment that the proposed project will generate and to propose mitigation measures to counteract the negative impacts.

In this chapter, we shall explore at greater length the direct and indirect impacts together with those that are cumulative and those that are irreversible. We shall also be sensitive to the short-term impacts against those that are long term.

7.2 Positive impacts from construction activities

7.2.1 Job creation

Excavation, marking and clearing of the foundation/perimeter wall area, construction and completion of all construction works will require an assortment of labour including general and specialized labour, electricians, plumbers, masons, specialist artisans and consultants.

The previous government policy was to create 500,000 jobs every year and this project will contribute heavily to meeting this end.

7.2.2 Procurement of building materials

The project will require building materials such as stones, sand, ballast, cement, steel, paint, wood and others. These materials will be sourced from shops, hardware, quarries and factories in Namanga, Kitengela and Nairobi Towns.

7.2.3 Creation of supporting businesses

The project will attract other secondary businesses which complement the main project activities.

7.3 Negative impacts arising from construction activities

7.3.1 Loss of vegetation and trees

The contractor shall identify and demarcate the area where the building will be constructed. Clearing of this site will also involve cutting the trees together with shrubs and other vegetative life.

7.3.2 Extraction and use of building materials

Among the materials which will be used are stones, hard core, cement and sand harvesting. These materials are obtained from quarries and factories which mine from the ground. These materials are of limited quantities and are not renewable. This causes permanent degradation of the environment. In the process of extraction, the landscape changes, displacement of animals and vegetation occurs.

7.3.3 Generation of noise and vibration

Construction noise is expected to be generated at the construction site. The activities that are earmarked to generate noise are loaders, excavators, cranes, concrete mixers trucks, concrete pumps, and concrete vibrators among others.

However, noise is only an issue depending on the context where it occurs. Factors such as:

1. Time of the day.
2. Distances to nearest neighbour to be affected.
3. Nature of the noise generated (continuous or intermittent).
4. Those closest to the source of the noise.

The effects of the noise include:

1. Loss or impairment of hearing.
2. Structural damage to foundation, walls and swimming pools.
3. Interference with learning in schools.

The general construction works, delivery of building materials, metal grinding and vibrators all contribute to increasing the level of noise at the construction site.

7.3.4 Generation of dust and exhaust fumes

The following activities in the construction site are expected to generate air pollutions:

1. Movement of trucks, vehicles and motorcycles will generate exhaust fumes from engines and dust from the ground.
2. The operation of machinery and construction equipment is also likely to generate fumes from engines. Exhaust fumes from diesel and other engines generate:
    a) Carbon monoxide can lead to severe tissue damage, dull headache, weakness, nausea, vomiting, confusion, dizziness and difficulty in breathing.
    b) Metallic abrasion particles, sulfates and silicates all of which are harmful to health.
3. Construction activities involving site clearance, excavations and general building will generate dust emission into the air. Dust emissions contain tiny solid and liquid particles that can float in the air. The large particles tend to be trapped in the nose and mouth when you in hale them but the smaller particles will penetrate to the lungs and others will be absorbed directly into the lungs. Prolonged and or intensify exposure to dust and exhaust fumes can adversely affect one's health.

7.3.5 Solid waste generations

Solid wastes are those useless or unwanted products produced during the activities of the construction site. These wastes include rejected materials, packages from used materials, metal cuttings, paper bags, empty cartons, empty paint and solvent containers, broken glass, broken tiles, sand, concrete, gravel, stones, bricks, plastics, paper, wood and cleared biomass among others.

Effects of undisposed solid wastes include:

1. Rubbish heaps can easily become a breeding ground of rodent and flies which will become vectors of disease to the community.
2. Uncollected materials can easily find their way to the open drainage and cause blockages.
3. Some wastes materials such as plastic are not biodegradable and will permanently ground contamination if not properly disposed off.
4. Undisposed human excreta will cause health problems and illness.

7.3.6 Increase water demand

Water is a key component of most of the building activities from concreting, cementing, walling and plastering. Other activities such as cleaning and water for construction workers (drinking and washing) will lead to an increase on the demand of water.

7.3.7 Increase insecurity

Construction materials will be brought to the construction site and will become a target of persons who may wish to benefit from stealing the same.

The presence of large number of people at the site is both a blessing and a curse:

1. Some of the people will be looking for employment opportunities while others will be part of the construction crew.
2. Some of the people will come to scout for information on the type and location of construction materials so that they can plan on how to steal the same.
3. Some of the people are terrorists who come to survey how they can unleash terror to Kenyans.

7.3.8 Risks of accidents and injuries

Several of the construction phase activities can pose serious threat of accidents and injuries to the construction crew and general public:

1. Deep excavations can lead to accidental falls resulting in injuries and also damage to equipment and machinery.
2. Constant movement of trucks, vehicles, cranes and other equipment in the site poses a risk of accidents and injuries through collisions.
3. Construction materials falling from above can cause injuries and accidents to those below while general handling of equipment poses a risk of injuries to the handlers.
4. The other activities which include erection, fastening of roofing materials, metal grinding/cutting, concrete work, steel erection and wielding exposes construction workers to the risks of accidents and injuries. Such injuries can result from accidental falls from high elevations, injuries from hand tools and construction equipment's, cuts from sharp edges of metal sheets and collapse of building sections.

7.3.9 Health concerns

From March 2020, Kenya has been experiencing the spread of Covid-19 into the county and has caused many people to be infected and others have dead. The construction crew, supplies and other concerned parties are in danger of affecting each due to close contact during the construction activities.

7.4 Positive impacts from operational activities

7.4.1 Availability of a hospital

When the project is complete, the proponent will have a full medical facility. This will also provide the proponent with a chance to recover the capital investment. The community will benefit from the services of the hospital.

7.4.2 Optimization of land

The land will no be longer idle and will become income generating.

7.4.3 Job creation

The proponent will employ personnel to run the hospital; will engage different consultants and service providers to augment the service delivery of the hospital.

7.4.4 Medical and general staff recruitment

The hospital will require workers to man the establishment; both general and specialized.

7.4.5 Increased revenue to government

Proponent shall pay income, withholding and VAT to the central government, land rent to Ministry of Land, rates and other relevant fees to the County Government.

7.5 Negative impacts arising from operational activities

7.5.1 Increased traffic

The number of vehicles, motorbikes and trucks that shall be bringing supplies and patients to the hospital is expected to be quite high.

7.5.2 Increased Water use

The cleaning activities of the hospital and the operations of the kitchen will require large amounts of water and this will be a big drain on the underground reservoir. Use of unsafe drinking water can bring about illness to workers and patients. This usage will bring an additional drain on the limited water source in the area.

7.5.3 Increased Energy consumption

The wards, the machines to be used in the dental and lab, the machines that will operate the theatre will all increase the general electricity consumption of the hospital. Since electricity generation involves utilizations of natural resources, excessive electricity consumption will drain the same and negatively impact on the environment.

On the other hand, the procedures of the hospital including theater and storage facilities require uninterrupted services to avoid the loss of life and medicines including vaccines.

Since electricity generation involves utilizations of natural resources, excessive electricity consumption will drain the same and negatively impact on the environment.

7.5.4 Increased storm water flow

The building roofs and pavements will lead to increased volume and velocity of storm water or runoff flowing across the area covered by the project. This water can be very destructive to existing structures including comprising foundation of buildings, soil erosion and destruction of walls.

7.5.5 Solid waste generation

The solid waste expected to be generated in the hospital floors includes pharmaceutical wastes (drugs and their containers, vials, gloves and syringes), infectious wastes (cotton wool, swabs and gauze), chemical wastes (disinfectant), and pathological wastes (blood and blood products) and sharps (needles and blades). Other general wastes will include waste from office and dirt.

The above solid waste requires to be disposed off or will pose a danger to the health of the staff and patients if they accumulate.

7.5.6 Liquid waste generation

The liquid waste generated from the use of bathrooms, toilet and cleaning activities of hospital will need to be properly disposed or else it will pose a risk of ground contamination.

7.5.7 Increased air emission

The cooking process in the Kitchen and the cleaning activities in the laundry room will produce unclean and unwanted fumes into the environment which are harmful.

7.5.8 Safety and Health concerns

Some of the hospital activities are likely to cause a risk of injuries, accidents and infection to patients, medical and general staff together with the general public.

7.5.9 Increased risk of fire out-break

Faulty wiring and sockets can cause accidental fire to the premises. Other activities of the kitchen and human error can lead to a fire outbreak.

7.5.10 Increased risks of accidents and injuries

The hospital procedures pose a risk to the medical personnel from accidental pricking of needles and risks of contracting disease from the patients.

All persons are at increased risks of accidents and injuries from activities such as cleaning and repairs where persons can fall and be injured.

7.5.11 Security concerns

Security challenges in the hospital are multifaceted and can cause serious loss and threats of insecurity:

1. Loss of vehicles through theft in the parking lot is a real issue.
2. Loss of patients personal items either in wards or in the common area is another concern.
3. Loss of life through terrorism threats is another concern.

7.5.12 Covid-19 restrictions

From March 2020, Kenya has been experiencing the spread of Covid-19 into the county and has caused many people to be infected and others have dead. The proposed hospital will be in danger of causing people to be infected either from staff or patients.

7.6 Positive impacts from decommissioning activities

7.6.1 Rehabilitation

Upon decommissioning the project, the land will be restored to its original status. This will include replacement of topsoil and re-planting vegetation that will lead to improved virtual quality of the area.

7.6.2 Creation of employment opportunities

The demolition exercise will involve the use of electricians to dismantle electrical installations, plumbers, masons and general workers. Variety of equipment will be used. All this activities will provide opportunities for monetary engagement.

7.6.3 Creation of secondary business

Contractors may or may not sublet some demolitions works and other supportive business such as NEMA licensed transport to cart away solid wastes materials will be engaged.
Food business will mushroom to cater for eating needs of the staff at site.

7.7 Negative impacts of decommission activities

7.7.1 Solid waste generation

Demolition of the project buildings and related infrastructure will result in large quantities of solid waste. The waste will comprise of the materials used in construction including concrete, metal, wood, glass, paints, adhesives and fasteners.

Although demolition waste is generally considered as less harmful to the environment since they are composed of inert materials, there is growing evidence that large quantities of such waste may lead to release of certain hazardous chemicals into the environment. In addition, even the generally non-toxic chemicals such a chloride, sodium, sulphate and ammonia which may be released as a result of leaching of demolition waste, are known to lead to degradation of ground water quality.

7.7.2 Dust generation and exhaust fumes

The following activities in the demolition site are expected to generate air pollutions:

1. Movement of trucks, vehicles and motorcycles will generate exhaust fumes from engines and dust from the ground.
2. The operation of machinery and construction equipment is also likely to generate fumes from engines.
3. Exhaust fumes from diesel and other engines generate:
   a) Carbon monoxide can lead to severe tissue damage, dull headache, weakness, nausea, vomiting, confusion, dizziness and difficulty in breathing.
   b) Metallic abrasion particles, sulfates and silicates all of which are harmful to health.
4. Dust emissions contain tiny solid and liquid particles that can float in the air. The large particles tend to be trapped in the nose and mouth when you in hale them but the smaller particles will penetrate to the lungs and others will be absorbed directly into the lungs. Prolonged and or intensify exposure to dust and exhaust fumes can adversely affect one’s health.

7.7.3 Generation of noise and vibration

A similar analysis will be undertaken like that for construction phase impacts. Construction noise is expected to be generated at the demolition site. The activities that are earmarked to generate noise are loaders, excavators and cranes among others.

However, noise is only an issue depending on the context where it occurs. Factors such as:

1. Time of the day.
2. Distances to nearest neighbour to be affected.
3. Nature of the noise generated (continuous or intermittent).
4. Those closest to the source of the noise.

The effects of the noise include:

1. Loss or impairment of hearing.
2. Structural damage to foundation, walls and swimming pools.
3. Interference with learning in schools.

7.7.4 Risks of injuries and accidents

Some of the expected demolition activities pose a risk of accidents on site and of injuries which can occur. The following are some of the expected activities which can results in injuries and accidents:

1. Demolitions will cause debris to fall down from upper floors and this poses a risk of injuries and accidents to those on the ground.
2. Constant movement of trucks, vehicles, cranes and other equipment in the site poses a risk of accidents and injuries through collisions.
3. General handling of equipment poses a risk of injuries to the handlers.

7.7.5 Licensing requirements

Various regulation exists that spell out procedures to be followed when carryout demolitions exercises as means of protecting the environment and the general public.

CHAPTER EIGHT

8.0 PROPOSED MITIGATION MEASURES AND MONITORING

8.1 Introduction

In the previous chapter we analyzed the positive and negative environmental impacts which are potentially significant that will arise from the activities of the construction, operation and decommission phase of the project.

In this chapter, we go to the next phase in EIA process which is Mitigation where we identify measures which will avoid, minimize or remedy impacts. This will then be incorporated in the impact management system in order to ensure that practical measures to protect the environment will be carried out during all phases of the project cycle.

8.2 Proposed mitigation measures for construction activities

8.2.1 Increasing employment opportunities

The contractor is to ensure that local people from the town and county of Kajiado are given first priority and preference in employment.

8.2.2 Reduce the loss of trees and vegetation

In order to reduce the loss of trees and vegetation on site the contractor and proponent shall do the following:

1. The area for the contractor site office and holding together with the building site shall be demarcated with the architect and surveyor. The aim is to reduce unnecessary loss of trees and vegetation.
2. Movement of vehicles and trucks in the proposed site to be restricted so as not to disturb flora.
3. The landscaping programme of the project site to commence immediately and in tandem with the constructions works ensuring restoration of vegetation to completed areas.

8.2.3 Efficient sourcing and use of raw material

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

To reduce the negative impacts on availability and sustainability of the materials, the proponent has been advised to only order for what will be required through accurate budgeting and estimation of actual construction requirements. This will ensure that materials are not extracted or purchased in excess quantities. Moreover, the proponent will ensure that wastages, damages or loss (through run-off, wind etc.) of materials at the site is kept minimal, as these would lead to additional demand for and purchase of materials. The proponent is recommended to ensure that bulk purchases are carried out in order to minimize the number of trips done thus saving on fuel and transport costs.

The proponent is to purchase supplies from vendors who are registered with VAT and to deal with quarries that are NEMA compliant in order to earn revenue for the government and to protect the environment.

8.2.4 Minimization of noise and vibration

The contractor and proponent will implement the relevant sections of the EMCA (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009. In this regard they shall undertake as follows:

1. Shall apply for a license under this regulation for those operations which are expected to exceed recommended noise levels:
2. Restrict construction activities to the hours of 8.00 to 5.00 pm.
3. Avoid having supply trucks bringing supplies at night.
4. Encourage supply trucks drivers to avoid hooting and gunning engines on site in order to reduce the noise level.
5. Ensure all contractors machinery, equipment, vehicles and trucks are well serviced and maintained.
6. Encourage all trucks and machinery to switch off the engines when not in use.
7. Encourage the use of PPE for ear protection.

8.2.5 Minimization of dust generation and emission

The programme to reduce dust and exhaust fumes emission into the air will be dealt with in three approaches:

General procedures

1. The contractor will develop a standard approach to handling all air emission throughout all the different activities in the site.
2. The project manager, the contractor and the proponent are to be extremely strict in following the work program in order to minimize the amount of time air pollution can happen.

Dust control procedures

1. Ensure the construction site is watered when necessary.
2. Ensure all supply trucks carry loose materials are covered.
3. Encourage the use of electrical equipment and machinery instead of diesel powered engines.
4. Buckets being carried by crane and machine hoist should be enclosed to avoid spill over.
5. Ensure hoarding of 2.4 metres is erected around the site boundary.
6. During construction activities where scaffolding is used, ensure adequate netting, sheeting or dust screens.

Exhaust fumes control measures

1. Ensure all diesel-powered machinery and equipment together with supply trucks to have their engines switch off when not in use.
2. Discourage gunning of engines on site.
3. Encourage engine service and maintenance to the manufactures specification.

8.2.6 Minimization of construction waste

In order to minimize construction waste, the following measures will need to be put in place:

1. The ordering of the construction material to be timed to the work programme to avoid having idle material on site.
2. The contractor is encouraged to purchase high value and high-quality construction material which will be able to last long and avoid wastages.
3. To encourage recycling of construction materials to avoid wastages.
4. To encourage the refurbishing of damaged construction materials including doors for sale or use in other construction sites.
5. Promptly carting away to NEMA certified dumpsites using NEMA certified transporters.
6. Build toilets for the construction crew.

8.2.7 Minimization of insecurity

The following measures shall be put into place:

1. The contractor to cordon off the construction place and to have one gate for access.
2. The contractor shall have a register of all construction workers on site and shall ensure only those on the register are allowed on site.
3. The contractor shall capture the details of all visitors and supply trucks into the site.
4. The contractor shall hire security guards to ensure no unauthorized people are in the site 24 hrs a day.
5. The contractor to insist on back ground checks of employees.

8.2.8 Minimization of water use

The contractor will purchase holding tanks for storing water for construction and shall be careful to minimize the use of water for only essential services. Signage for water controlling measures will be put in place to ensure no wastages are experience.

8.2.9 Minimization of risks of accidents and injuries to workers

The proponent and contractor to:

1. Implement the relevant sections of the OSHA.
2. Contractor will register the site as a workplace.
3. Ensure personal protective equipment for all construction workers.

8.2.10 Creation of HIV awareness

The contract shall undertake the following measures in order to reduce the impacts of HIV spread and infection:

1. Undertake forums for raising awareness about HIV/Aids by increasing understanding about the disease through dissemination of information and by generating discussion.
2. Ensuring the construction site has access to condoms.

8.3 Proposed mitigation measures for operation activities

8.3.1 Increase of income opportunities

The hospital shall employ general staff and medical personnel to run the hospital. Preference in employment should be given to persons from the immediate area and county.

8.3.2 Traffic management

The hospital management will ensure the following measures are put in place:

1. Traffic signs to be displayed to direct vehicles to and from the building.
2. Traffic marshal to monitor the traffic and to assist where needs be.

8.3.3 Ensure efficient water use

The proponent will do the following:

1. Install water-conserving automatic taps and toilets.
2. All hospital staff and patients shall be sensitized on how to use water efficiently.

8.3.4 Minimized Energy consumption

The proponent will install energy saving electrical devices in the hospital and will augment solar power which shall have a huge economic saving. Other measures will include:

1. Staff shall be sensitized to switch off machinery, equipment and lights when not being used.
2. Install energy saving bulbs and fluorescent lights.

8.3.5 Managing storm water drainage

The proponent will ensure the design of the building will capture all the storm water and direct the same to the natural drainage system.

8.3.6 Ensuring efficient solid waste management

The hospital management will undertake the following measures in order to handle solid wastes:

1. The proponent shall ensure that pharmaceutical, sharpes and infectious wastes are disposed off through collection by a NEMA certified disposer.
2. All persons in the hospital will be sensitized on solid wastes disposal procedures through the use of sign boards and information notices posted within the hospital.
3. Separation or sorting of wastes shall be undertaken at source through the provision of multiple skips and bins. This shall be placed in all offices and rooms in each floor.
4. Kitchen foods wastes shall be separated from other wastes and shall be used as animal feeds or as manure for garden.
5. All department of the hospital will have a daily cleaning routine with some department.
6. Cleaning crew will direct the wastes to the holding bay where a further sorting and segregation will take place.
7. Plastic bottles will be collected separately and sold to waste collector as an income generating project.
8. The county government of Kajiado will organize collection of garbage at least twice a week.

8.3.7 Liquid waste generation

All the effluent and waste water will be directed through piping to the underground septic tank. The maintenance crew will ensure that the piping is in good condition and will repair immediately a breakage occurs.

8.3.8 Reducing air emission

The design of the kitchen has a kitchen hood for capturing and directing the kitchen fumes to the air and the proponent will ensure the regular service and maintenance of the same. The design of the laundry allows for cross ventilation in the room to enable the presence of fresh air. The laundry will also have fans to extract bad air and to help in air circulation.

8.3.9 Safety and Health concerns

The hospital management has committed to implementing the OSHA regulations on all matters pertinent to the hospital operations.

1. The hospital management will constitute a safety and health committee and will empower the committee to undertake its mandate.
2. The hospital management will provide personal protective equipment to all its workers.

8.3.10 Reducing the risk of fire outbreak

The hospital management will implement the regulations contained in The Fire Risk Reduction Rules, 2007 including:

1. Ensure the formation of a firefighting team.
2. Ensuring that the hospital has adequate and appropriate firefighting equipment together with ensuring the regular service of the same.
3. Ensuring that fire drills are undertaken once a year and identifying a fire assembly point.
4. Ensuring that all fire accidents are properly investigated and recommend corrective measures are undertaken.
5. Develop and implement a firefighting response and evacuation procedures.

8.3.11 Intervention measures for injuries and accidents

The hospital management will implement the regulations contained in The Factories (First-Aid) Rules, 1977 including:

1. Ensuring an adequate supply of fully stocked First Aid Boxes in every department which is easily assessable.
2. Ensuring the First Aid Boxes are properly labeled “First Aid’.
3. Ensuring the identification and training of first aid team according to department and to shifts at the hospital.

8.3.12 Reducing security concerns

The issue of security including the acts of terrorist is a major concern today and the hospital management undertakes to carry out the following actions:

1. The management to have signage encouraging all owners of vehicles to lock their cars when in parking.
2. The management to have security guards patrolling the premises and on the lookout for security concerns.
3. Guest arriving by car to be checked at the gate for terrorism explosives and details of the car to be captured. On entering the hospital, all people are to go through frisking by security guards.
4. The hospital to install CCTV camera and to have the information backed up off site.
5. The security team to undergo security training at least once a year from a qualified security expert.
6. At the gate house and reception, contacts of the OCS and Fire department to be displayed so that a quick respond can done by those on the ground.
7. Install a siren for alerting the general public on security emergency.

8.3.13 Covid-19 restrictions

Hospital is to ensure the following:

1. All persons entering the hospital to have face masks properly worn.
2. All persons entering the hospital to have wash their hands at the entry points.
3. All persons entering the hospital to have their temperature recorded.
4. The hospital to prepare and install adequate signage for Covid-19 protocols.

8.4 Proposed mitigation measures for decommission activities

8.4.1 Rehabilitation

The structure shall be demolished and the foundation shall be undone. All underground cables, pipes and structures shall be dismantled and uprooted. The debris shall be removed from the site and the land shall be backfilled.

The appropriate topsoil shall be imported to the site and the suitable vegetative cover shall be planted.

8.4.2 Job creation

General and specialized workers will be employed and preference should be given to those from the immediate area.

8.4.3 Efficient waste management

In order to manage waste, the following measures will need to be put in place:

1. Ensure adequate provision of toilets in the site.
2. Cordon of the demolition site.
3. To encourage recycling of construction materials to avoid wastages.
4. To encourage the refurbishing of damaged construction materials including doors for sale or use in other construction sites.
5. Separation of wastes into biodegradable and non-biodegradable.

6. Use NEMA licensed transporters to cart away wastes to NEMA certified dumpsites.

8.4.4 Minimization of dust generation and emission

The programme to reduce dust and exhaust fumes emission will be similar to those in the construction phases:

General procedures

1. The contractor will develop a standard approach to handling all air emission throughout all the different activities in the site.
2. The contractor and the proponent to be extremely strict in following the work program in order to minimize the amount of time air pollution can happen.

Dust control procedures

1. Ensure all supply trucks carry loose materials are covered.
2. Ensure hoarding of 2.4 metres is erected around the site boundary.

Exhaust fumes control measures

1. Ensure all diesel-powered machinery and equipment together with supply trucks to have their engines switch off when not in use.
2. Discourage gunning of engines on site.
3. Encourage engine service and maintenance to the manufactures specification.

8.4.5 Minimization of noise and machine vibration

The programme to reduce noise and machine vibration will be similar to those in the construction phases:

The contractor and proponent will implement the relevant sections of the EMCA (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009. In this regard they shall undertake as follows:

1. Restrict construction activities to the hours of 8.00 to 5.00 pm.
2. Encourage supply trucks drivers to avoid hooting and gunning engines on site in order to reduce the noise level.
3. Ensure all contractors machinery, equipment, vehicles and trucks are well serviced and maintained.
4. Encourage all trucks and machinery to switch off the engines when not in use.
5. Encourage the use of PPE for ear protection for areas and activities where noise levels are expected to exceed the recommended levels.

8.4.6 Risk reduction at site of accidents and injuries

The demolition exercise is expected to be short but very vigorous and dangerous. The proponent and the contractor agreed to undertake the following:

1. Implement the relevant sections of the OSHA.
2. Ensure personal protective equipment for all construction workers.

8.4.7 Application for permits and disconnection licenses

The proponent is to apply for demolition permits and to apply for disconnection from the utilities company.

8.5 Anticipated impacts and mitigation measures in construction phase (table form)

NO.	ACTIVITY	IMPACTS	MITIGATION MEASURES	RESPONSIBLE	INDICATORS
1.	Employment.	Job creation.	Ensure local people are given priority or preference in employment opportunities. At least 2/3 of all local workforce should be local people.	Project manager and contractor.	Employment records.
2.	Clearing of construction and building site.	Loss of trees and vegetation	Demarcation of project site and contractor's site yard.	Architect, contractor and Project manager.	Survey pegs on the ground.
			Restrict movement of vehicles to the project site and not beyond.	Contractor and project manager.	Signage on ground.
			Adherence to work programme.	Contractor and project manager.	Work programme.
3.	Efficient sourcing and use of raw material	Accumulation of material on site.	Order as per the bill of quantities.	Contractor and project manager.	Records of purchases.
			Order from NEMA approved suppliers.	Contractor and project manager.	Bill of Quantities.
			Order from registered VAT vendors.	Contractor and project manager.	Check for VAT receipts.
			Recycle construction materials.	Contractor and project manager.	Bill of quantities.
4.	Construction activities.	Minimization of noise and vibration	Apply of a Noise license.	Contractor and proponent.	Application form and payment fees.
		Reduce working hours.	Restrict construction activities to the hours of 8.00 to 5.00 pm.	Project manager and contractor.	Work schedule.
		Night work.	No supplies at night.	Project manager and contractor.	Security book records.

		Noise at site.	No hooting and gunning of engines.	Project manager and contractor.	Visual inspections.
		Noise at site.	Service programme for equipment and machinery.	Project manager and contractor.	Service records.
		Noise at site.	Switch off engines on site when not in use.	Project manager and contractor.	Visual inspections and signage
		Noise at site	Encourage the use of PPE for ear protection.	Project manager and contractor	Workers uniform record book.
5.	Construction activities.	Minimization of dust generation and emission	The contractor will develop a standard approach to handling all air emission throughout all the different activities in the site.	Project manager and contractor.	Published programme.
		Reduce generation of emissions.	Follow work programme to the letter.	Project manager and contractor.	Work programme.
		Dust control procedures.	Ensure the construction site is watered when necessary.	Contractor.	Visual inspections.
			Ensure all supply trucks carry loose materials are covered.	Contractor, supplier and project manager.	Visual inspections.
			Encourage the use of electrical equipment and machinery instead of diesel-powered engines.	Project manager and contractor.	Visual inspections.
			Buckets being carried by crane and machine hoist should be enclosed to avoid spill over.	Project manager and contractor.	Visual inspections.
			Ensure hoarding of 2.4 metres is erected around the site boundary.	Project manager and contractor.	Material purchase records.
			Ensure adequate netting, sheeting or dust screens.	Project manager and contractor.	BQ quantities and purchase records.

		Exhaust fumes control measures	Switch engines off when not in use.	Project manager and contractor.	Visual inspections.
			Discourage gunning of engines on site.	Project manager and contractor.	Visual inspections.
			Encourage engine service and maintenance to the manufactures specification.	Project manager and contractor.	Service records.
6.	Material control procedures and process.	Minimization of construction waste.	The ordering of the construction material to be timed to the work programme to avoid having idle material on site.	Project manager and contractor.	Purchase records.
		Ordering of material.	Purchase high value and high-quality construction material which will be able to last long and avoid wastages.	Project manager and contractor.	Purchase records.
		Damaged and reject materials.	Ensure recycling of construction materials to avoid wastages.	Project manager and contractor.	Visual inspections.
		Damaged materials.	To encourage the refurbishing of damaged construction materials including doors for sale or use in other construction sites.	Project manager and contractor.	Sale estimates.
		Toilets.	Ensure adequate toilet facilities on site.	Project manager and contractor.	BQ estimates.
		Waste materials.	Transport waste materials to NEMA certified dumpsites using NEMA certified transporters.	Project manager and contractor.	Visual inspections.
7.	Construction activities.	Minimization of insecurity	The contractor to cordon off the construction place and to have one gate for access.	Contractor.	Design drawings.
		Workers attendance sheet.	The contractor shall have a register of all construction workers on site and shall ensure only those on the register are allowed on site.	Contractor.	Security records.
		Visitor's identification.	The contractor shall capture the details of all visitors and supply trucks into the site.	Contractor.	Security records.
		Security oversight.	Hire security guards 24 hrs. a day.	Contractor.	Engagement records.

			Contractor to employ personnel with good conduct certificates.	Contractor.	Employment records.
8.	Water use in site.	Minimization of water use	Purchase holding tanks.	Project manager and contractor.	Purchase records.
			Signage for water sensitization.	Project manager and contractor.	Visual inspections.
9.	Minimization of risks of accidents and injuries to workers	Safety and health concerns.	Implement the relevant sections of the OSHA.	Contractor.	Safety and health committee minutes.
		Registration of workplace.	Contractor will register the site as a workplace.	Contractor.	Application form and payment receipt.
10.	Fraternalization at work.	Minimizing spread of HIV.	Undertake forums for raising awareness about HIV/Aids by increasing understanding about the disease through dissemination of information and by generating discussion. Ensuring the construction site has access to condoms.	Health providers and contractor.	Training programs. Free.

8.6 Anticipated impacts and mitigation measures in operation phase (table form)

NO.	ACTIVITY	IMPACTS	MITIGATION MEASURES	RESPONSIBLE	INDICATORS
1.	Operations.	Increase of income opportunities	Preference in employment should be given to persons from the immediate area and county.	Hospital management.	Employment records.
2.	Operations	Traffic management	Traffic signs to be displayed to direct vehicles to and from the building.	HR.	Signage.
			Traffic marshal to monitor the traffic and to assist where needs be.	Security supervisor and traffic marshal.	Visual inspections.
3.	Provision of water during operations.	Ensure efficient water use	Install water-conserving automatic taps and toilets.	Proponent.	BQ for mechanical works.
			All hospital staff and patients shall be sensitized on how to use water efficiently.	Hospital management.	Signage.
4.	Energy provision.	Minimized Energy consumption	Switch off machinery, equipment and lights when not being used.	Hospital management.	Signage.
			Install energy saving bulbs and fluorescent lights.	Hospital management.	Purchase records.
5.	Rain damage.	Managing storm water drainage	Ensure the design of the building will capture all the storm water and direct the same to the natural drainage system.	Proponent.	Design drawings for mechanical works.
6.	Waste disposal	Ensuring efficient solid waste management.	Ensure that pharmaceutical, sharpes and infectious wastes are disposed off through collection by a NEMA certified disposer.	Licensed medical waste disposer.	Contract engagement and copy of NEMA license.

			Sensitized staff on solid wastes disposal procedures through the use of sign boards and information notices posted within the hospital.	Hospital management.	Signage.
			Separation or sorting of wastes shall be undertaken at source through the provision of multiple skips and bins.	Maintenance manager.	Visual inspections.
			Kitchen foods wastes shall be separated from other wastes and shall be used as animal feeds or manure for the gardens.	Kitchen crew, marketing team and grounds keeping crew.	Separate bins.
			All departments of the hospital will have a daily cleaning routine with some department such as the bar and restaurants being swept and mopped more than once a day	Cleaning crew.	Cleaning rooster.
			Cleaning crew will direct the wastes to the holding bay where a further sorting and segregation will take place.	Cleaning crew.	Yard inspections.
			Plastic bottles will be collected separately and sold to waste collector as an income generating project.	Cleaning crew.	Yard inspections.
			The county government of Kajiado will organize collection of garbage at least twice a week.	Yard manager.	Visual inspections.
7.	Effluent discharge.	Liquid waste generation.	All the effluent and waste water will be directed through piping to the underground septic tank and emptied by NEMA licensed sewerage disposers agents.	Proponent.	Drainage system drawings and specification.
			The maintenance crew will ensure that the piping is in good condition and will repair immediately a breakage occurs.	Maintenance manager.	Visual inspections.
8.	Air pollution	Reducing air emission	Ensure the kitchen hood and the fans in the laundry are serviced and in working condition.	Maintenance manager.	Visual inspections and service maintenance program.

9.	Safety issues	Safety and Health concerns	Register the Hospital as a Workplace under OSHA.	Hospital management.	Application form and payment receipts.
			Constitute a safety and health committee.	Hospital manage-ment.	Safety and health minutes.
			Provide personal protective equipment to all its workers.	Hospital management.	Workers uniform records.
10.	Fire issues	Reducing the risk of fire outbreak	Identifying and training a firefighting team of at least five persons and ensure equal distribution in all department and all shifts.	Safety and health committee.	Safety and health minutes.
			Ensure adequate and appropriate firefighting equipment together with ensuring the regular service of the same.	Hospital management.	Purchase records and visual inspections.
			Undertake fire drills at least once a year and identifying a fire assembly point	Safety and health committee.	Safety and health minutes.
			Ensuring that all fire accidents are properly investigated and recommend corrective measures are undertaken.	Hospital management.	General register, medical reports.
			Develop and implement a firefighting response and evacuation procedures.	Hospital management.	Safety and health minutes.
11.	Injuries and accidents.	Intervention measures for injuries and accidents	Ensuring an adequate supply of fully stocked First Aid Boxes in every department which is easily assessable.	HR.	Procurement records.
			Ensuring the First Aid Boxes are properly labelled “First Aid’	HR.	Signage.
12.	Oversight of security concerns.	Reducing security concerns	Ensure that all its vehicles and trucks are locked when in parking.	Security and transport manager.	Visual inspections.
		Car theft prevention.	The management to have signage encouraging all owners of vehicles to lock their cars when in parking	Hospital management.	Signage.

		Security oversight.	The management to have security guards patrolling the premises and on the lookout for security concerns.	Security manager.	Duty rooster.
		Security information collection.	The management to capture details of guests at the reception.	Hospital management.	Guest check-in record book,
		Security checks.	Guest arriving by car to be checked at the gate for terrorism explosives and details of the car to be captured. On entering the hospital, all people are to go through frisking by security guards.	Security manager.	Barrier at gate and radar detection equipment at entrance.
		CCTV installation.	The hospital to install CCTV camera and to have the information backed up off site.	Hospital management.	Pro-forma invoice.
		Training.	The security team to undergo security training at least once a year from a qualified security expert.	Hospital management.	Training records.
		Alert provision.	At the gate house and reception, contacts of the OCS and Fire department to be displayed so that a quick respond can done by those on the ground.	Hospital management.	Signage.
		Siren.	Install a siren for alerting the general public on security emergency.	Hospital management.	Visual inspections.
13.	Patients and public coming to hospital.	Covid-19 restrictions	All persons entering the hospital to have face masks properly worn.	Public and staff.	Visual observation.
			All persons entering the hospital to have wash their hands at the entry points.	Public and staff.	Wash hand basins with soaps.
			All persons entering the hospital to have their temperature recorded.	Public and staff.	Temperature guns.
			The hospital to prepare and install adequate signage for Covid-19 protocols.	Management.	Signage displayed.

8.7 Anticipated impacts and mitigation measures in decommission phase (table form)

NO.	ACTIVITY	IMPACTS	MITIGATION MEASURES	RESPONSIBLE	INDICATORS
1.	Demolition works.	Rehabilitation	The structure shall be demolished and the foundation shall be undone.	Contractor and proponent.	Contract tender.
			All underground cables, pipes and structures shall be dismantled and uprooted.	Mechanical and electrical engineer together with Contractor.	Underground designs and installation maps.
			The debris shall be removed from the site and the land shall be backfilled.	Contractor and NEMA approved transporter.	Visual inspections.
			The appropriate topsoil shall be imported to the site and the suitable vegetative cover shall be planted.	Botanist, geologist, contractor and proponent.	Quotations.
2.	Employment opportunities.	Job creation	General and specialized workers will be employed and preference should be given to those from the immediate area.	Contractor and proponent.	Employment records.
3.	Demolition activities.	Efficient waste management.	Provide toilets in the site.	Contractor.	BQ.
			Cordon of the demolition site.	Contractor.	Visual inspection.
			To encourage recycling of construction materials to avoid wastages.	Proponent and Contractor.	Visual inspections.
			Ensure refurbishing of damaged construction materials including doors for sale or use in other construction sites.	Proponent and Contractor.	Workshop charges.
			Separation of wastes into biodegradable and non-biodegradable.	Contractor.	Visual inspections.
			Use NEMA licensed transporters to cart away wastes to NEMA certified dumpsites.	Contractor and transporters.	Transport quotations.

4.	Air pollutions during demolitions.	Dust control	The contractor will develop a standard approach to handling all air emission throughout all the different activities in the site.	Contractor and proponent.	Dust control procedures guidelines.
			The contractor and the proponent to be extremely strict in following the work program in order to minimize the amount of time air pollution can happen.	Contractor and proponent.	Work programme.
			Ensure all supply trucks carry loose materials are covered	Contractor and proponent.	Purchase records.
			Ensure hoarding of 2.4 metres is erected around the site boundary.	Contractor and proponent.	BQ.
	Air pollutions during demolitions.	Exhaust emission.	Ensure all diesel powered machinery and equipment together with supply trucks to have their engines switch off when not in use.	Contractor and proponent.	Signage.
			Discourage gunning of engines on site.	Contractor and proponent.	Visual inspections.
			Encourage engine service and maintenance to the manufactures specification.	Contractor and proponent.	Service records.
5.	Noise at the demolition site.	Minimization of noise and machine vibration	Restrict construction activities to the hours of 8.00 to 5.00 pm.	Contractor and proponent.	Work programme.
			Encourage supply trucks drivers to avoid hooting and gunning engines on site in order to reduce the noise level.	Contractor.	Signage.
			Ensure all contractors machinery, equipment, vehicles and trucks are well serviced and maintained.	Contractor.	Service register.
			Encourage all trucks and machinery to switch off the engines when not in use.	Contractor.	Visual inspections.
			Encourage the use of PPE for ear protection for areas and activities where noise levels are expected to exceed the recommended levels.	Contractor.	Workers uniform record book.

6.	Demolition activities.	Risk reduction at site of accidents and injuries	Implement the relevant sections of the OSHA.	Contractor and proponent.	Bq.
			Ensure personal protective equipment for all construction workers.	Contractor.	Workers uniform record book.
7.	Public utility companies	Application for permits and disconnection licenses	Apply for demolition permits.	Contractor and proponent.	Application form and payment fees.
			Apply for disconnection from the utilities company.	Contractor and proponent.	Application form and payment fees.

CHAPTER NINE

9.0 ENVIRONMENTAL MANAGEMENT PLAN

9.1 Introduction

Environmental Impact Assessment (EIA) is a systematic process of identifying, predicting and evaluating the environmental effects of proposed actions and projects. Special emphasis in EIA is given to the practice of preventing, mitigating and offsetting adverse effects of proposed undertakings. In this section, an environmental management plan is developed which will translate recommended mitigation and monitoring measures into specific actions that will be carried out by the proponent.

The main components included in the EMP are;

- Summary of potential impacts of the proposal.
- Description of the recommended mitigation measures.
- Statement of compliance with relevant standards.
- Allocation of resources and responsibilities.

9.2 Table 1 Environmental Management Plan for construction phase.

9.3 Table 2 Environmental Management Plan for operation phase.

9.4 Table 3 Environmental Management Plan for decommission phase.

9.5 Table 3 Environmental Management Plan for compliance with environmental legislation and regulations.

9.2 EMP impact mitigation measures for construction phase

NO.	IMPACTS	MITIGATION MEASURES	TIME FRAME	RESPONSIBLE	COST ALLOCATION
1.	Job creation.	Ensure local people are given priority or preference in employment opportunities. At least 2/3 of all local workforce should be local people.	From onset until the end.	Contractor.	Wage bill.
2.	Loss of trees and vegetation	Demarcation of project site and contractor's site yard.	Onset of constructions.	Architect, contractor and Proponent.	BQ.
		Restrict movement of vehicles to the project site and not beyond.	Throughout construction cycle.	Contractor and proponent.	1,000.00 for signage.
		Adherence to work programme.	Throughout construction cycle.	Contractor and proponent.	Nil.
3.	Accumulation of material on site.	Order as per the bill of quantities.	Throughout construction cycle.	Contractor and proponent.	Nil.
		Order from NEMA approved suppliers.	Throughout construction cycle.	Contractor and proponent.	Nil.
		Order from registered VAT vendors.	Throughout construction cycle.	Contractor and proponent.	Nil.
		Recycle construction materials.	Throughout construction cycle.	Contractor and proponent.	Repair and restoration charges.
4.	Minimization of noise and vibration	Apply of a Noise license.	At onset of building works.	Contractor and proponent.	Gazetted charges.
	Reduce working hours.	Restrict construction activities to the hours of 8.00 to 5.00 pm.	Throughout construction cycle.	Proponent and contractor.	Nil.

	Night work.	No supplies at night.	Throughout construction cycle.	Proponent and contractor.	Nil.
	Noise at site.	No hooting and gunning of engines.	Throughout construction cycle.	Proponent and contractor.	Nil.
	Noise at site.	Service programme for equipment and machinery.	When time is due.	Proponent and contractor.	50,000.00 every three months.
	Noise at site.	Switch off engines on site when not in use.	During delivery.	Proponent and contractor.	Nil.
	Noise at site	Encourage the use of PPE for ear protection.	Throughout construction cycle.	Proponent and contractor	1,500.00 for sensitization.
5.	Minimization of dust generation and emission	The contractor will develop a standard approach to handling all air emission throughout all the different activities in the site.	From onset.	Proponent and contractor.	3,000.00 to develop guidelines.
	Reduce generation of emissions.	Follow work programme to the letter.	Throughout construction cycle.	Proponent and contractor.	Nil.
	Dust control procedures.	Ensure the construction site is watered when necessary.	Throughout construction cycle.	Contractor.	Wage bill.
		Ensure all supply trucks carry loose materials are covered.	Throughout construction cycle.	Contractor, supplier and proponent.	4,200.00 for a canvass for each truck.
		Encourage the use of electrical equipment and machinery instead of diesel-powered engines.	Throughout construction cycle.	Proponent and contractor.	Nil.
		Buckets being carried by crane and machine hoist should be enclosed to avoid spill over.	Throughout construction cycle.	Proponent and contractor.	25,000.00 for renovation.
		Ensure hoarding of 2.4 metres is erected around the site boundary.	At beginning of construction.	Proponent and contractor.	BQ.
		During construction activities where scaffolding is used, ensure adequate netting, sheeting or dust screens.	Throughout construction cycle.	Proponent and contractor.	12,500.00 for a roll of netting.

	Exhaust fumes control measures	Ensure all diesel-powered machinery and equipment together with supply trucks to have their engines switch off when not in use.	Throughout construction cycle.	Proponent and contractor.	1,000.00 for signage.
		Discourage gunning of engines on site.	Throughout construction cycle.	Proponent and contractor.	Nil.
		Encourage engine service and maintenance to the manufactures specification.	When the time comes.	Proponent and contractor.	Service charges.
6.	Minimization of construction waste.	The ordering of the construction material to be timed to the work programme to avoid having idle material on site.	Throughout construction cycle.	Proponent and contractor.	Nil.
	Ordering of material.	The contractor is encouraged to purchase high value and high-quality construction material which will be able to last long and avoid wastages.	Throughout construction cycle.	Proponent and contractor.	Nil.
	Damaged and reject materials.	To encourage recycling of construction materials to avoid wastages.	Throughout construction cycle.	Proponent and contractor.	Nil.
	Damaged materials.	To encourage the refurbishing of damaged construction materials including doors for sale or use in other construction sites.	Throughout construction cycle.	Proponent and contractor.	Repair and refurnishing quotations.
	Toilets.	Ensure adequate toilet facilities on site.	From onset.	Proponent and contractor.	15,000.00
	Waste materials.	Transport waste materials to NEMA certified dumpsites using NEMA certified transporters.	On needs basis.	Proponent and contractor.	4,000.00-12,000.00 depending on distance.
7.	Minimization of insecurity	The contractor to cordon off the construction place and to have one gate for access.	From onset and within one month.	Proponent and contractor.	BQ..
	Workers attendance sheet.	The contractor shall have a register of all construction workers on site and shall ensure only those on the register are allowed on site.	From onset.	Proponent and contractor.	1,000.00 for employment cards.

	Visitor's identification.	The contractor shall capture the details of all visitors and supply trucks into the site.	Throughout construction cycle.	Proponent and contractor.	500.00 for record books.
	Security oversight.	The contractor shall hire security guards to ensure no unauthorized people are in the site 24 hrs. a day.	Throughout construction cycle.	Proponent and contractor.	16,000.00 per guard.
		Contractor to employ personnel with good conduct certificates.	Throughout construction cycle.	Contractor.	Nil.
8.	Minimization of water use	Purchase holding tanks.	At onset of operations.	Proponent and contractor.	75,000.00 for 10,000litre tank.
		Signage for water sensitization.	Throughout construction cycle.	Proponent and contractor.	1,000.00
9.	Safety and health concerns.	Implement the relevant sections of the OSHA.	Throughout construction cycle.	Proponent and contractor.	Wage bill.
		Registration of workplace.	Contractor will register the site as a workplace.	Contractor.	20,000.00
10.	Minimizing spread of HIV.	Undertake forums for raising awareness about HIV/Aids by increasing understanding about the disease through dissemination of information and by generating discussion.	Throughout construction cycle.	Health providers and contractor.	Training programs.
		Ensuring the construction site has access to condoms.	Throughout construction cycle.	Health providers.	Free.

9.3 Environmental management plan for operation phase

NO.	IMPACTS	MITIGATION MEASURES	TIME FRAME	RESPONSIBLE	COST ALLOCATION
1.	Increase of income opportunities	Preference in employment should be given to persons from the immediate area and county.	From onset.	Hospital management.	Employment records.
2.	Traffic management	Traffic signs to be displayed to direct vehicles to and from the building.	From onset.	HR.	1,000.00 for signage.
		Traffic marshal to monitor the traffic and to assist where needs be.	From onset.	Security supervisor and traffic marshal.	Wage bill.
3.	Ensure efficient water use	Install water-conserving automatic taps and toilets.	From onset and on replacement.	Proponent.	Purchase quotations and BQ. estimates.
		All hospital staff and patients shall be sensitized on how to use water efficiently.	Throughout cycle.	Hospital management.	Wage bill and 1,000.00 for written guidelines.
4.	Minimized Energy consumption	Switch off machinery, equipment and lights when not being used.	Throughout cycle.	Hospital management.	1,000.00 for signage.
		Install energy saving bulbs and fluorescent lights.	From onset and on replacement.	Hospital management.	BQ..
5.	Managing storm water drainage	Ensure the design of the building will capture all the storm water and direct the same to the natural drainage system.	Planning stage.	Proponent and mechanical engineer.	BQ..
		Contract an NEMA certified disposer for pharmaceutical, sharps and infectious wastes.	During hospital activities.	Proponent and NEMA disposers.	As per contract sum with the NEMA certified disposer.

6.	Ensuring efficient solid waste management	All persons in the hospital will be sensitise on solid wastes disposal procedures through the use of sign boards and information notices posted within the hospital.	Throughout cycle.	Hospital management.	5,000.00 for signage.
		Separation or sorting of wastes shall be undertaken at source through the provision of multiple skips and bins.	Throughout cycle.	Maintenance manager.	25,000.00
		Kitchen foods wastes shall be separated from other wastes and shall be used as animal feeds or manure for the gardens.	Throughout cycle.	Kitchen crew, marketing team and grounds keeping crew.	Wage bill.
		All department of the hospital will have a daily cleaning routine with some department such as the restaurants being swept and mopped more than once a day	Throughout cycle.	Cleaning crew.	Wage bill.
		Cleaning crew will direct the wastes to the holding bay where a further sorting and segregation will take place.	Once per day.	Cleaning crew.	Wage bill.
		Plastic bottles will be collected separately and sold to waste collectors as an income generating project.	Collection daily and selling every two weeks when they have accumulated.	Cleaning crew and marketing team.	Wage bill.
		The county government of Kajiado will organize collection of garbage at least twice a week.	Twice per week.	Yard manager.	Free or 50,000.00 per month for private collector.
7.	Liquid waste generation	All the effluent and waste water will be directed through piping to the underground septic tank and emptied by NEMA licensed sewerage disposers agents.	Throughout cycle.	Maintenance manager.	Wage bill.

		The maintenance crew will ensure that the piping is in good condition and will repair immediately a breakage occurs.	Weekly.	Maintenance manager.	Wage bill and repair cost estimates.
8.	Reducing air emission	Ensure the kitchen hood and the fans in the laundry are serviced and in working condition.	Weekly.	Maintenance manager.	30,000.00 per half year.
9.	Safety and Health concerns	Register the Hospital as a Workplace under OSHA.	From onset.	Proponent.	20,000.00
		Constitute a safety and health committee.	Two months.	Proponent and HR.	Wage bill.
		Provide personal protective equipment to all its workers.	From onset.	Hospital management.	120,000.00 initial cost plus replacement costs as they occur.
10.	Reducing the risk of fire outbreak	Identifying and training a firefighting team of at least five persons and ensure equal distribution in all department and all shifts.	Three months and every six months.	Safety and health committee.	2,500.00 per person.
		Ensuring that the hospital has adequate and appropriate firefighting equipment together with ensuring the regular service of the same.	Every six months.	Hospital management.	80,000.00 as a start-up cost estimate.
		Ensuring that fire drills are undertaken once a year and identifying a fire assembly point	After 6 months and 12 months thereafter.	Safety and health committee.	Wage bill.
		Ensuring that all fire accidents are properly investigated and recommend corrective measures are undertaken.	After every incident.	Hospital management and fire Marshalls.	Wage bill.
		Develop and implement a firefighting response and evacuation procedures.	After 6 months.	Hospital management and safety and health committee.	15,000.00
11.	Intervention measures for	Ensuring an adequate supply of fully stocked First Aid Boxes in every department which is easily assessable.	Throughout cycle.	HR. and safety and health committee.	5,000.00 for each.

	injuries and accidents	Ensuring the First Aid Boxes are properly labelled "First Aid'	On purchase of First Aid Box.	HR.	Nil.
12.	Reducing security concerns	The management to ensure that all its vehicles and trucks are locked when in parking.	Daily.	Security and transport manager.	Wage bill.
	Car theft prevention.	The management to have signage encouraging all owners of vehicles to lock their cars when in parking	After one week.	Hospital management.	1,000.00 for signage.
	Security oversight.	The management to have security guards patrolling the premises and on the lookout for security concerns.	Daily.	Security manager.	Wage bill.
	Security information collection.	The management to capture details of guests at the reception.	Daily.	Hospital management.	500.00 for hardcover book.
	Security checks.	Guest arriving by car to be checked at the gate for terrorism explosives and details of the car to be captured. On entering the hospital, all people are to go through frisking by security guards.	Throughout cycle.	Security manager.	Wage bill + 3,500 for each frisky gadget.
	CCTV installation.	The hospital to install CCTV camera and to have the information backed up off site.	From onset.	Hospital management.	750,000.00 for entire hospital.
	Training.	The security team to undergo security training at least once a year from a qualified security expert.	Two months and after every six months thereafter.	Hospital management.	20,000.00
	Alert provision.	At the gate house and reception, contacts of the OCS and Fire department to be displayed so that a quick respond can done by those on the ground.	Immediately.	Hospital management.	500.00 for display signage.
	Siren.	Install a siren for alerting the general public on security emergency.	From onset.	Hospital management.	25,000.00 for industrial siren.
13.	Covid-19 restrictions	All persons entering the hospital to have face masks properly worn.	From onset.	Security team	Nil.
		All persons entering the hospital to have wash their hands at the entry points.	From onset.	Security team	(1,500 for hand washing unit +

					500 renewal for soap) per unit.
		All persons entering the hospital to have their temperature recorded.	From onset.	Security team	6,000 per thermal gun.
		The hospital to prepare and install adequate signage for Covid-19 protocols.	From onset.	Security team	500.00, per sign.

9.4 Environmental Management Plan for decommission phase

NO.	IMPACTS	MITIGATION MEASURES	TIME FRAME	RESPONSIBLE	COST ALLOCATION
1.	Rehabilitation.	The structure shall be demolished and the foundation shall be undone.	From onset.	Contractor and proponent.	BQ.
		All underground cables, pipes and structures shall be dismantled and uprooted.	After demolition and clearing of debris.	Mechanical and electrical engineer together with Contractor.	BQ.
		The debris shall be removed from the site and the land shall be backfilled.	After demolition.	Contractor and NEMA approved transporter.	BQ.
		The appropriate topsoil shall be imported to the site and the suitable vegetative cover shall be planted.	After clearing of site and backfilling.	Botanist, geologist, contractor and proponent.	BQ.
2.	Job creation	General and specialized workers will be employed and preference should be given to those from the immediate area.	Throughout cycle.	Contractor and proponent.	Nil.
3.	Efficient waste management	Ensure adequate provision of toilets in the site.	From onset.	Proponent and Contractor.	15,000.00 per each.
		Cordon of the demolition site.	From onset.	Proponent and Contractor.	BQ.
		To encourage recycling of construction materials to avoid wastages.	During clearing and demolition.	Proponent and Contractor.	Nil.
		Ensure refurbishing of damaged construction materials including doors for sale or use in other construction sites.	During clearing.	Proponent and Contractor.	Repair and refurbishing cost.
		Separation of wastes into biodegradable and non-biodegradable.	Throughout cycle.	Contractor.	Wage bill.

		Use NEMA licensed transporters to cart away wastes to NEMA certified dumpsites.	Throughout cycle.	Contractor and transporters.	4,000.00-12,000.00 per trip depending on distance.
4.	Dust control	The contractor will develop a standard approach to handling all air emission throughout all the different activities in the site.	From onset.	Contractor and proponent.	3,000.00 to develop guidelines.
		The contractor and the proponent to be extremely strict in following the work program in order to minimize the amount of time air pollution can happen.	Throughout cycle.	Contractor and proponent.	Nil.
		Ensure all supply trucks carry loose materials are covered	Throughout cycle.	Contractor and proponent.	4,200.00 for a canvass for each truck.
		Ensure hoarding of 2.4 metres is erected around the site boundary.	First one month.	Contractor and proponent.	BQ.
	Exhaust emission.	Ensure all diesel-powered machinery and equipment together with supply trucks to have their engines switch off when not in use.	Throughout cycle.	Contractor and proponent.	1,000.00 for signage.
		Discourage gunning of engines on site.	Throughout cycle.	Contractor and proponent.	Nil.
		Encourage engine service and maintenance to the manufacture's specification.	On need basis.	Contractor and proponent.	Service charge.
5.	Minimization of noise and machine vibration	Restrict construction activities to the hours of 8.00 to 5.00 pm.	Throughout cycle.	Contractor and proponent.	Wage bill.
		No hooting and gunning of engines.	Throughout cycle.	Contractor and proponent.	Nil.
		Service programme for equipment and machinery.	Throughout cycle.	Contractor and proponent.	50,000.00 every three months.
		Switch off engines on site when not in use.	Throughout cycle.	Contractor and proponent.	Nil.

		Encourage the use of PPE for ear protection.	Throughout cycle.	Contractor and proponent.	1,500.00 for sensitization.
6.	Risk reduction at site of accidents and injuries	Implement the relevant sections of the OSHA.	From onset.	Contractor and proponent.	Bq.
		Ensure personal protective equipment for all construction workers.	Throughout cycle.	Contractor and proponent.	50,000.00
7.	Application for permits and disconnection licenses	Apply for demolition permits.	Before demolition.	Contractor and proponent.	Gazetted charges.
		Apply for disconnection from the utilities company.	Before demolition.	Contractor and proponent.	Gazetted charges.

9.5 EMP for compliance with environmental legislation and regulations

NO.	REGULATION/ACT	COMPLIANCE	TIME FRAME	RESPONSIBLE.	COST ALLOCATION
1.	**The Constitution of Kenya** The constitution guarantees under section 42 the right of every person to have a clean and healthy environment and also to have that environment protected for the benefit of the present and future generations.	The EMP chapters will ensure that the proponent protects the environment.	Planning.	Proponent.	Consultant's charges.
	The constitution shall encourage the use of public participation in the management and protection of the environment as required in section 69 (d). The state is also mandated to establish systems of EIA and EA together with eliminating process and activities that are likely to endanger the environment as required under section 69(d, f and g).	NEMA demands that every proponent undertakes EIA commencement and EA after operations have begun.	Planning.	Proponent.	Consultant's charges.
2.	**The Building Code 1968** Section 1-4 of the First Schedule spells out how drawing will be produced, who will sign them for submission, number of copies to be produced and the duty of the municipal to retain copies whether approved or not.	Arch. Jackson Mutua has drawn, submitted and obtained approval for the architectural drawings.	Planning.	Proponent and project team.	Already done.
	Section 15 requires that all construction sites to have sufficient temporary latrine accommodation.	Contractor to build toilets at site.	Construction and decommission.	Proponent and contractor.	EMP construction and decommission.

	Section 16 requires the contractor/proponent to provide a detailed work plan and to deposit the same with the council. The work plan shall show who is supervising the construction, frequency and evidence of material testing if required, date of intended completion and other matters that may be required.	Contractor to prepare work plan.	Planning and start of construction.	Contractor.	BQ.
	Section 20 requires all buildings to have a secondary means of access while 34 gives the power to the council to request for testing of materials and to cause the removal of any materials that do not meet the required standards.	Design of building to have secondary means of access – staircase and lift.	Planning and construction.	Architect and contractor.	Architects' drawing – architects fees. Testing of materials – lumpsum of 50,000.00 for full project.
	Section 42 mandates all constructors to ensure that they identify the beacons or boundaries of the land before commencement of works.	Contractor and architect to conform boundary beacons.	Planning and start of construction.	Proponent, architect and contractor.	Bq.
	Section 124 requires that only registered architect and structural engineer can supervise the erection of construction building. Architect and civil engineer to supervisor the compliance to the design.	Architect will supervise all construction works.	Construction.	Proponent and architect.	Consultant's fees.
	Section 137 provides the requirement for installing lifts and requires mandatory testing every six months under section 138.	Contractor to tests lifts on installation and proponent to maintain lifts.	Construction and operations.	Contractor and proponent.	BQ and 25,000.00 for service during operations.
	Section 139 requires every building to be provided with approved means of refuse disposal.	Design of the building.	Planning.	Architect and mechanical engineer.	BQ.
	Section 148 requires the design for buildings to have storage tanks for the purposes of fire-fighting purposes.	Design of the building.	Planning.	Architect and	BQ.

				structural engineer.	
	158. All common stairs and common passages shall be adequately cross ventilated, and for common stairs sufficient natural and artificial lighting shall be provided.	Design of the building to ensure adequate ventilation and natural lighting.	Planning.	Architect and structural engineer.	BQ and consultants fees.
	Under section 170; This section specifies how the harvesting of rainwater from the roof tops will be carried out and the materials to be used.	Design of the building to incorporate storm water capture and disposal.	Planning.	Architect and mechanical engineer.	BQ and consultants fees.
	Section 214 list the following firefighting equipment to be incorporated in whole or in part when designing and constructing a building: (a) hydrants, hose, hose reels and fire appliance external connexions; (b) portable fire appliance; (c) sprinkler, drencher and water spray projector system; (d) water storage tanks; and (e) dry risers.	Firefighting provision and requirement to be in the design.	Planning.	Electrical, structural engineers and architect.	BQ and consultants charges.
	First to Twelfth Schedule spells out how construction is to be carried out.	Proponent and contractor to use right quality of materials and to adhere to correct building practices.	Construction.	Contractor.	BQ.
3.	**The County Governments Act No. 17 of 2012** Under section 134 of the act, The Local Government Act was repealed and this ushered in the authority of the County Government over all matters within its jurisdiction.	Proponent to obtain an occupational permit upon completion of the hospital.	At the end of construction.	Contractor.	Gazetted charges.

4.	**Persons with Disability Act 2003** Public buildings 22.(1) A proprietor of a public building shall adapt it to suit persons with disabilities in such manner as may be specified by the Council. (2) All proprietors of public buildings shall comply with subsection (1) within five years after this section comes into operation.	The design of the building to have either a ramp or lifts.	Planning.	Architect.	Architects fees.
5.	**The Employment Act 2007** Section 4 guarantees payment of wages should be commensurate with work done.	Proponent to pay market wages for work done and on time.	All phases.	Proponent and contractor.	BQ and wage bill.
	Requires no discrimination in employment under section 5.	Contractor to give women an equal chance for employment.	All phases.	Proponent and contractor.	Nil.
	5 (3) discrimination of employment based on race tribe, gender or HIV status.	Employ qualified people	All phases.	Proponent and contractor.	Nil.
6.	**The Environment and Land Court Act, 2011** This court will arbitrate on environmental matters when a case arise.	Proponent to go to court if an issue arises.	On need basis.	Proponent.	Court and lawyer charges.
7.	**The Environmental Management and Co-ordination Act Chapter 387** Requires proponents to prepare and submit EIA before commencement of projects under section 58, second schedule and the third schedule list persons who act as representative of the government. Third Schedule - List the relevant representatives of Government Ministries that should be consulted when	Proponent has undertaken an EIA project report.	Planning.	Proponent.	Consultant charges.

	dealing with environmental matters. The Public Administration shall be consulted when undertaking the public participation and stakeholder's consultative meetings.	Proponent to hold a baraza with the senior chief.	Planning.	Consultant of NEMA.	Budget for public participation.
8.	**The Waste Management Regulations, 2006** 4. Responsibility of Waste Generator (1) No person shall dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle.	All solid wastes will be collected and stored in the yard awaiting collection.	Operation.	Proponent and contractor.	Nil.
	(2) Any person whose activities generate waste shall collect, segregate and dispose or cause to be disposed off such waste in the manner provided for under these Regulations.	Proponent shall engage the county government disposal trucks to collect all garbage. Contractor shall dispose construction wastes to NEMA approved dumpsites.	Operation. Construction and decommission.	Proponent. Contractor.	Free. Bq.
	(3) Without prejudice to the foregoing, any person whose activities generates waste has an obligation to ensure that such waste is transferred to a person who is licensed to transport and dispose off such waste in a designated waste disposal facility.	Proponent shall engage the county government disposal trucks to collect all garbage.	Operations.	Proponent.	Nil.
	38. Any person who generates biomedical waste shall at the point of generation and at all stages thereafter segregate the waste in accordance with the categories provided under the Seventh Schedule to these Regulations.	Contractor and hospital management to separate waste at source.	Throughout the project three cycles.	Proponent and contractor.	Bq and wage bill.

	43. (1) No person shall transport biomedical waste without a valid permit issued by the Authority in consultation with the relevant lead agency.	Disposal of hospital wastes.	Operation.	Licensed waste disposers.	Contract engagement.
9.	**The Environmental (Impact, Assessment and Audit) Regulation, 2003** Section 4 requires all projects that are likely to have a negative environmental impact to undertake an EIA before commencement of works.	Proponent shall undertake an ESIA after completion of project.	Planning.	Proponent.	Consultant charges.
	The proponent shall apply and obtain a Terms of Reference approval for undertaking an EIA full study before commence of the project as required under section 11 (5).	Proponent to apply for approval of TOR.	Planning.	Proponent.	Consultant charges.
	Section 31 requires all ongoing projects and new undertakings that to undertake annual environmental audits and to submit the same to the authority for perusal and action.	Proponent to undertake EA after completion of construction.	Operation.	Proponent.	Consultant charges.
10.	**The Noise And Excessive Vibration Pollution) (Control) Regulations, 2009** Section 2 lists the factors that are used in determining whether noise is loud, unreasonable, unnecessary or unusual including time of day and proximity to residential area.	Proponent to restrict construction to 8.00am to 5.00pm daily.	Construction and decommission.	Contractor.	Nil.
	Section 4 specifically prohibits noise from vibration beyond stated amounts.	Proponent to encourage the use of ear protection.	Construction.	Contractor.	300 per piece.
	Section 11 prohibits the use of Machinery activity which is to emit noise or excessive vibrations that shall exceed the noise levels listed in the First Schedule.	Proponent to service engines and trucks to ensure they are working at optimum levels hence producing little noise.	Construction.	Contractor.	Service charges.

	Section 13 prohibits construction noise at night if the activity shall exceed the noise levels listed in the Second Schedule of these regulations.	No work at night.	Construction.	Contractor.	Nil.
	Legal Notice 31 - EMCA - Amendment to the Second Schedule The establishment of hospitals is classified as high risks project under section Urban Development's 3(e).	Undertake screening.	Planning.	Lead expert.	Consultant charges.
11.	**The Factories Act Cap 514** Section 29 requires all employers to provide training and supervision to inexperienced and new workers.	Proponent to train new workers and to place them under supervision.	All phases.	Proponent.	Wage bill.
	Section 30 requires all hoists and lifts to be in good mechanical condition before work and also requires them to be examined and certified in writing every six months by a person approved to undertake such a task.	Proponent and contractor to have all hoist and lifts serviced.	Construction.	Proponent and contractor.	25,000.00
	Section 32 requires all cranes and other lifting machines to be of good mechanical condition and to be serviced and examined by a qualified person every 14 months.	Proponent and contractor to have all cranes to be serviced every 14 months.	Construction.	Proponent and contractor.	50,000.00
	Section 62 requires all proponents to keep a registered where all pertinent information required under the act will be contained.	Proponent and contractor to maintain a general register.	All phases.	Proponent and contractor.	500.00
12.	**The Factories (First-Aid) Rules, 1977 Legal Notice No. 160** Section 2&3 requires not only the provision of a first aid box in the premises but also what should be contained in it.	Proponent to purchase First Aid for the necessary department.	All phases.	Proponent.	5,000.00 for each.

	Section 4 requires the name 'First Aid' to be clearly marked on the container and to be displayed where it can be easily seen.	Proponent to ensure first aid box are purchase which are already labeled.	All phases.	Proponent.	Nil.
13.	**The Fire Risk Reduction Rules, 2007** Section 20 requires proponent to establish firefighting team and specifies the number.	Proponent will establish a firefighting team.	Operations.	Proponent.	Wage bill.
	Section 22 spells out the duties of a firefighting team.	Firefighting team will ensure fighting equipment are serviced, conduct fire drills, investigate fire accidents and train other workers on firefighting procedures.	Operations.	Safety and health committee.	Wage bill.
	23. (1) Every occupier shall ensure that fire-drills are conducted at least once in every period of twelve months and a record of such drills kept available for inspection.	Proponent to undertaken a fire drill once a year.	Operations.	Safety and health committee.	Free.
	24. (1) Every occupier shall identify a location in the workplace where every worker shall assemble in the event of a fire.	Proponent to identify fire-assembly points.	Operations.	Safety and health committee.	Free.
	26. (1) Every occupier shall provide suitable means of alerting persons in the workplace, in the event of a fire, and such means shall be made known to all workers.	Proponent to have a siren at the place of work.	Operations.	Proponent.	25,000.00
	Section 29 requires the proponent to provide firefighting equipment.	Proponent to purchase fire extinguishers, fire blanket and horse reel.	All phases.	Proponent.	100,000.00

	Section 30 requires all firefighting to be properly maintained and records kept.	Proponent will service all firefighting equipment every six months.	All phases.	Proponent.	Service charges.
14.	**The Food, Drugs and Chemical Substances Act Chapter 254** Section 3 requires all premises which are to be used for the purposes of selling, preparing, packaging, storing or displaying food to be licensed.	Proponent to apply for license to run a restaurant.	Operations.	Proponent.	Gazetted charges.
	Section 11(B and C) requires all employers to provide adequate sanitary conveniences for all their workers and also to have running water at all points where processing of food and cleaning is taking place.	Proponent and architect to ensure enough sanitary conveniences in the design of the hospital	Planning.	Proponent and project manager.	Bq.
	Section 15 requires all workers who handle food to have a medical examination carried out by a government medical institution periodically.	All food handlers to undergo medical examination every six months.	Operations and every six months.	Proponent and HR.	1,000.00 per examination.
	Second Schedule Part B The following requirement shall be complied with as regards the cleanliness of all persons working in direct contact with food A They shall wear clean outer garments and conform to hygienic practises while on duty	Proponent to purchase and ensure to staff PPE.	Operations.	Chief.	Quotation price.
	B They shall wash their hands thoroughly, remove all jewellery, and take any necessary precaution to prevent contamination of food with micro- organisms or foreign substances	Proponent to ensure reliable and clean water is available for all staff.	Operations.	Supervisor kitchen.	Nil.

	E as is necessary for the work, on which the employee is engaged, he shall wear effective head – dress, such as hair net, head – band or cap and F all employee shall refrain from storing their clothing or any other personal belonging or from eating or drinking beverages in areas where food is or food ingredient are exposed or areas used for washing equipment or utensils.	Food handlers to wear headdress. Proponent and architect to ensure availability of lockers for all workers.	Operations. Planning and operations.	Kitchen supervisor. Proponent.	Above A. Nil.
16.	**The Land Registration Act** This act spells out how the title is produced, which registry it is registered in and the nature of the land.	The proponent will apply to the Ministry of Lands for a tittle deed.	Planning.	Proponent.	Already done.
17.	**The National Construction Authority Act NO. 41 OF 2011** 15. (1) A person shall not carry on the business of a contractor unless the person is registered by the Board under this Act.	The proponent to identify and to contract a registered contractor.	Planning.	Contractor.	Nil.
	17. (1) A person or firm may apply to the Board for registration as a contractor for purposes of this Act.	Contractor to undertake construction works.	Planning.	Contractor.	Nil.
18.	**The National Construction Authority Regulations, 2014** The owners of all construction works are required to register construction works and the BQ with the authority as soon as possible as required under section 17 (1) and (2).	Contractor to register construction works with the Authority.	Planning and construction.	Contractor and proponent.	Nil.

	The Authority shall accredit and certify all construction workers and site supervisors in accordance with this act as specified under sections 19, 20 and 21.	All workers and supervisors to register with authority.	Planning and construction.	Workers and supervisors .	Nil.
19.	**The Occupational Safety and Health Act** Under section 6 requires the proponent to safe guard the safety, health and welfare of all workers at this site and hospital (6) It is the duty of every occupier to register his workplace unless such workplace is excepted from registration under this Act.	Proponent to provide protective gear for all workers at the site and hospital Proponent to apply for registration as a workplace.	All phases. Construction and operations.	Contractor and proponent. Contractor and proponent.	150,000.00 initial cost. 20,000.00
	Under section 77(4) the act requires warning signs to be put in order to prevent injuries from falling objects and work process.	Proponent to provide warning signs at site.	All phases.	Proponent and contractor.	EMP construction and decommission.
	Section 89 requires adequate measures to be put in place to prevent dust, fumes, vibration and noise pollution..	Proponent to purchase ear mask, to water the site at least once a day and to limit work to between 8.00am and 5.00pm.	Construction and demolitions.	Proponent and contractor.	EMP construction and decommission.
	91 (1) Every Occupier shall provide and maintain an adequate supply of wholesome drinking water at suitable points conveniently accessible to all persons employed.	Proponent to provide drinkable water for all staff.	All phases.	Proponent.	4,500/- for 5,000 litres of water.

	93 Every occupier shall provide and maintain for use of a person employed, adequate and suitable accommodation for clothing not worn during working hours.	Proponent to provide lockers for each employee.	Operations and planning.	Proponent.	125,000.00
	Part XI Health, Safety and Welfare- Special Provisions 101 1 Every employer shall provide and maintain for the use of employees in any workplace where employees are employed in any process involving exposure to wet or to any injurious or offensive substance, adequate, effective and suitable protective clothing and appliances, including ,where necessary, suitable gloves, footwear, goggles and head coverings.	Proponent to keep in working order the kitchen hoods. Proponent to ensure extraction fans are working in the laundry room.	Planning and operations. Operations and planning.	Proponent and engineers. Proponent and engineers.	BQ. BQ.
20.	**The Physical and Land Use Planning Act of 2019** Under section 56 and 57, the proponent shall ensure that he has applied and obtained developmental approval for construction and change of use of the land before commencement.	Proponent has applied for developmental approval.	Planning.	Proponent.	Already done.
21.	**The Public Health Act** Section 115 and 116 prohibits nuisance in the building. The building must be kept in clean and sanitary conditions.	Contractor to ensure the site is cleared from all dangerous metal cuttings and other objects that can cause injuries to workers. Cleaning crew to keep the hospital clean.	Construction. Operations.	Contractor. Hospital management.	BQ. Wage bill.

	Section 117 requires the proponent to ensure that no pests or rodents are found in the premises.	Proponent to maintain a rodent control measure.	Construction and operation.	Proponent.	35,000.00 rodent control measures every six months.
22.	**Workmen's Compensation (Compulsory Insurance) Order No. 13 OF 2007** Section 2 of the regulation makes it compulsory for all employers who undertake the listed activities to contract an insurance company to provide liability insurance.	The contractor shall undertake liability insurance for all construction workers and visitors on site. The proponent will also take liability insurance for all the hospital workers during operations.	Construction. Operations.	Contractor. Proponent.	Insurance quote. Insurance quote.
23.	**Annex I: Ministry of Health Guidelines on Covid-19 Management** 1. Regularly and thoroughly wash your hands with soap and water or use alcohol-based hand sanitizer. 2. Maintain a distance of at least 1 meter (5 feet) between yourself and anyone who is coughing or sneezing. 4. Maintain good respiratory hygiene by covering your mouth and nose while coughing and sneezing with a handkerchief, tissue, or into flexed elbow. 12. All persons visiting public places such as supermarkets, open air markets, public transport should	Provide hand washing units. Arrange seating to have 1 metre spacing. Provide signage for mask and sneezing.	All phases.	Proponent and contractor.	35,000.00

	at all times wear a face mask to reduce the chances of transmission of the virus.	Allow only people wearing a mask into the hospital.			

CHAPTER TEN

10.0 RECOMMENDATION

The proponent is encouraged to pay close attention to the recommendation outlined in this document and summarized here below:

5. The recommendation for solid and effluent waste disposal systems to be put in place as the expected volume is quite large.
6. The OSHA requirements on safety health and occupation should be implemented to the letter in order to ensure a safe environment for the workers and general public.
7. The land has a beautiful view and the programme of landscaping should commence immediately with the construction in order to re-establish the beauty of the project site in tandem with the environment.
8. The entire EMP for construction, operation, decommission and legal framework should be implemented to the letter in order to safe guard the environment and to bring out the best hospital in Milimani area for Kitengela.

10.1 Conclusion

The proposed project has numerous positive impacts including:

6. The proposed project is expected to provide employment opportunities for both skilled and unskilled personnel, in all its three project phases and will go a long way in alleviating the employment shortage in Kajiado County and Kenya in General.
7. The proposed project will open up a lot of business opportunities to Kenyans from all the major sectors of the economy: industries (supply of construction materials), energy (supply of fuel and electricity) and hospital services among others.
8. The proposed project will usher in a new hospital in the area which will greatly boost the medical service provisions in the area.
9. The proposed project will change the land use of the proposed site from being idle to being income generating.
10. The proposed project will attract revenue to the county and central government through the payment of various levies, taxes and rates.

The proponent is also aware that the project will generate negative environmental impacts and owners of the company are ready to implement the recommendations contained in the EMP to the letter.

We therefore recommend the project for licensing subject to the adherence to the EMP.

References

1. The Constitution of Kenya
2. The County Governments Act No. 17 of 2012
3. The Persons with Disability Act 2003
4. The Employment Act 2007
5. The Environment and Land Court Act, 2011
6. The Environmental Management and Co-ordination Act Chapter 387
7. The Waste Management Regulations, 2006
8. The Environmental (Impact, Assessment and Audit) Regulation, 2003
9. Noise And Excessive Vibration Pollution) (Control) Regulations, 2009
10. Legal Notice 31 - EMCA - Amendment to the Second Schedule
11. The Factories Act Cap 514
12. The Factories (First-Aid) Rules, 1977 Legal Notice No. 160
13. The Fire Risk Reduction Rules, 2007
14. The Food, Drugs and Chemical Substances Act Chapter 254
15. The Land Registration Act, 2012
16. The National Construction Authority Act NO. 41 OF 2011
17. The National Construction Authority Regulations, 2014
18. The Occupational Health and Safety Act 2007
19. The Physcal and Land Use Planing Act of 2019
20. The Public Health Act Chapter 242
21. Workmen's Compensation (Compulsory Insurance) Order No. 13 OF 2007
22. Annex I: Ministry of Health Guidelines on Covid-19 Management
23. The Building Code – The Local Government (Adoptive By-laws) (Buildings) Order 1968 and The local Government (Adoptive By-Laws) (Grade II Building) Order 1968

Annexes

1. Certificate of registration
2. Architectural drawings
3. Copy of Title Deed
4. Copy of PP2
5. Expert license

PHOTOS

Figure 1-2 Drive way to project site and the immediate neigbour

Figure 3-4 Old Namanga Road and electricity pole on the project site

Figure 5-6 Boundary fence abutting the Old Namanga Road

DIRECTION TO THE SITE