ENVIRONMENT AND SOCIAL IMPACT ASSESSMENT STUDY REPORT

FOR THE PROPOSED ASBESTOS DISPOSAL SITE (LAND FILL) ON PLOT NO. KLF/DOLA/10 MIGUJINI AREA, BAMBA KILIFI COUNTY

Project proponent:

SERGENT LOGISTICS LIMITED

P.O BOX 1549-80100

MOMBASA

GPS Coordinates

3º 37´51.67″S & 39º 21´52.15″E

June 2021

DOCUMENT AUTHENTICATION

ESIA EXPERTS

This report has been prepared in accordance with Environmental (Impact assessment and Audit) Regulation, 2003 Legal Notice No. 101. We hereby certify that this study report was prepared on the information provided by the proponent, consulted stakeholders as well as that collected from other primary and secondary sources and on the best understanding and interpretation of the facts by the environmental experts. It is issued without any prejudice.

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For and on behalf of the proponent

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EXECUTIVE SUMMARY

This ESIA report documents the findings of a study of a proposed Asbestos Disposal site at Bamba, Kilifi County by Sergent Logisitcs Limited(the proponent).The proponent has been in the in general waste management and disposal activities for the past 7 years and now to seeks to expand their service offering to include final disposal of Asbestos containing material on plot number KLF/DOLA/10 situated along/off Tsangasini – Munagowa Dola Road in Migujini sub location, Mitangani Location, Bamba Division, Ganze Sub County within Kilifi County. The site measures 17 acres out of which 3 acres is being set aside for the asbestos containing material landfill. The landfill will be excavated up to 10M below the ground, lined with 130mm concrete lining/wall before receiving the asbestos material. Once filled, the pit will be sealed with a concrete slab. The disposal site will also host site office, sanitary facilities perimeter wall and manned entrance.

Positive impacts include availability of state-of-the art asbestos disposal facility which will reduce the exposure of the material to larger public, and that the project will provide avenue for the compliance through safe disposal. The proposed activity can be a sustainable development if all the mitigation measures advanced herein are adhered to.

The key negative impact is the exposure of the asbestos materials to the workers & public. This will be mitigated by proper handling by trained staff and provision of appropriate PPE.

Summary of potential impacts of the proposed project

Environmental concern	Potential impact	Proposed Mitigation measures
Occupational health and safety	Health risk to site workers and general public	1. Inform all the relevant stakeholder and government officials prior to commencement of any work. 2. All employees will wear protective clothing during the exercise. 3. Provision of respirators to all persons entering the asbestos site 4. Fence off the site to avoid unauthorized access 5. Warning & Safety signage will be placed at the strategic areas within the disposal site 6. All personnel involved with the asbestos disposal process will be subjected to medical surveillance 7. Asbestos air sampling will be conducted on the sites for clean-up 8. When there is a visible dust or winds in excess of 20 knots, any asbestos disposal and cleaning process will be stopped 9. Thorough, complete and up to date records should be kept at the site 10. Ensure all asbestos is collected and loaded into a transportation vehicle licensed by NEMA 11. The transporting vessel shall be labelled "**hazardous waste**
Water Quality	Potential impacts on ground and surface water through asbestos contamination	12. The asbestos wastes shall be disposed in underground concrete confinement of 130mm thick 13. The maximum depth of the pit will not exceed a depth of water table in respect to the hydrogeological survey report to be conducted on the proposed site. The pit will be built with the recommendations in the safe asbestos management guidelines 14. The proponent shall install water quality monitoring device 15. Asbestos is insoluble in water and alkali and as such cannot can leach
Screening of asbestos wastes	Contamination of the environment due to the unregulated asbestos waste handling	16. All Asbestos Containing Materials (ACM) will be recoded indicating the origin of the waste for easy tracking 17. All deliveries to the disposal site to be registered in NEMA tracking document 18. Confirmation of material properties prior to disposal 19. Employees at the site to be trained on asbestos handling procedures
Flora and fauna on the proposed site	Destruction of plant and animal species natural habitat on the proposed project site	20. The proposed project site has shrubs and few trees that make the vegetation cover. The site trees have been harvested for charcoal burning since its major economic activity in the area. There are no threatened species within the project site. 21. The proposed site will be rehabilitated through the rehabilitation plan to be developed by the proponent to try and retain the natural flora and fauna during the operation phase. This will entail progressive planting of native trees within the boundary of the site
Noise and Dust control measure	Generation of dust nuisance and noise as a result of	22. Vehicle speeds on the access road will be limited to about 10km/h to minimize the generation of dust 23. Adequate wetting of operation surfaces of the site to reduce dust generation 24. A wash down area will be provided for all trucks and vehicles leaving the site to reduce dust

Environmental concern	Potential impact	Proposed Mitigation measures
	movement of vehicles and trucks accessing the site	particles from the operation site 25. Onsite noise level to be kept to a max of 45dB during operation hours. 26. Installation of speed limits for vehicle will help in reduction of noise emission from and around the site 27. The operations of the site will be advised to strictly obey the working hours
Traffic along the access road to the site	The impact of increased traffic as a result of trucks visiting the site during operations	28. The trucks carrying asbestos materials will be advised to access the site at intervals to reduce traffic congestion along the access road 29. The operations of the site will be on contractual basis hence reducing the potential impacts of heavy traffic
Land degradation	Impact on soil quality through erosion and contamination of ground water	30. Rehabilitation plan will be developed to restore the site to its natural state. This also involve progressive planting of native plant species 31. In the event of decommissioning the project, the site will be covered to a depth of one metre below the ground surface
Seismic impacts on the site	Potentiality of risk as a result of seismic activities within the area	32. The concrete underground wall shall be constructed to withstand the seismic events on the landfill 33. The proposed project site has not recorded any seismic events in the recent past hence reducing the chances of seismic events
Fire Safety at the site	Impacts of fire on the operation of the site and surrounding environment	34. The project proponent shall install firefighting equipment and develop fire response plan within the site 35. Fire safety training and fire drills will be conducted on regular basis on the site 36. Installation of appropriated fire signage in strategic points within the site
Heritage, Cultural and Historical values	The potential loss of heritage cultural and historical significant to the community	37. The site for the proposed project does not possess any cultural and heritage sites

Conclusion

Asbestos is a hazardous material that requires proper handling and safe disposal. The disposal must be handled properly to ensure the safety of the environment as well as workers. The proposed project will be of great importance in ensuring a cleaner and safer environment. Mitigation measures and Environmental Management Plan have been proposed to address the scope of the predicted adverse environmental impacts to the highest degree

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ABBREVIATIONS AND ACRONYMS

ACM	Asbestos Containing Material
CPR	Comprehensive Project Report
EA	Environmental Audit
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
EMP	Environmental Management Plan
EMS	Environmental Management System
NEC	National Environmental Council
NEMA	National Environmental Management Authority
OHS	Occupational Health & Safety
PPE	Personal Protective Equipment

CHAPTER 1: INTRODUCTION

1.1 Background

Solid wastes are classified based on their material content (composition); ability to be reused, recycled, their source (point of generation) among other classifications. The material composition of wastes is central to defining the disposal method/ strategy. Some materials such as asbestos are considered hazardous and require specialized disposal methods, thus asbestos and asbestos containing materials (ACM) are classified as hazardous wastes under the Environment Management and Coordination Act (Waste Management Regulations, 2006). The use of asbestos has been banned in Kenya and the National Environment Management Authority (NEMA) has developed guidelines on the disposal of the same. The guidelines (National Guidelines on Safe Management and Disposal of Asbestos (2015) provides for three methods on safe disposal of asbestos and Asbestos Containing Material (ACM). These include the following:

- *Sites designated by the local authorities and licensed by NEMA;*
- *Privately owned disposal facility licensed by NEMA; and*
- *Designated by the waste generator (on-site disposal).*

In this regard, the proposed project falls under the "Privately Owned Disposal Facility Licensed by NEMA

1.2 Project Location

Proposed asbestos disposal site (landfill) will be located on Plot number KLF/DOLA/10 in Migujini area, Bamba Sub County along/off Mariakani–MunagowaDola Road in Kilifi County. The geo-reference points of the site are Latitude 3º 37′51.67″S & Longitude 39º 21′52.15″E at an elevation of 814ft above sea level. The proposed project land use comprises of communal ranch owned by Dola Group Ranch, the main economic activity being livestock keeping, agriculture & charcoal burning. The proposed site lies on a flat ground covered with natural growing grass, shrubs, and trees.

Figure 1.1: Location Map (Source: Google map 2021)

Figure 1.2: Proposed Project Site (Source: Site survey/photography)

1.3Project objective

The overall objective of the proposed project is to set up & operate an asbestos disposal site (landfill) for purposes of disposal of end-of-life asbestos and ACM in line with the National Guidelines on Safe Management and Disposal of Asbestos

1.4Project Justification

Asbestos is a versatile industrial material with many uses. Asbestos was the material of choice in many industrial uses where heat resistant material was needed in the early and mid-twentieth century. However,

it was realized that its industrial benefits were outweighed by the impacts on public health. This is because asbestos is considered to be a carcinogenic material and therefore a predisposing factor to cancers of the respiratory tract and the skin. It is against this background that many countries/ jurisdictions banned the use of asbestos.

The use of asbestos in Kenya was banned in the year 2006 and NEMA later developed guidelines on the management and disposal of the asbestos. Despite the ban on use of asbestos in Kenya, there has been numerous challenges effecting the ban, largely attributable to lack of disposal facilities especially in the Kenyan Coast region. For this reason, Sergent Logistics Limited herein referred to as the proponent would like to set up and operate a privately owned sanitary landfill in Migujini area, Bamba, Kilifi County.

1.5 Scope and criteria

The study has been conducted to evaluate the environmental impacts of the proposed asbestos landfill. Upon evaluation, recommendations are made on the accentuation of positive impacts and the mitigation of negative ones. The scope for the assessment dwelled on impacts the project will have on the following:

- *Physical environment;*
- *Socio-cultural environment;*
- *Land use;*
- *Socio-economic aspects;*
- *Flora and fauna;*
- *Occupational safety & health issues*

1.6Assessment methodology

The ESIA is based on site visits, literature review, and discussions with the project proponent, hydrogeologists, engineers and consultation with the public (public participation). The project proponent provided all details relevant to the proposed project. While preparing the ESIA report, care has been taken to identify the potential negative impacts and their mitigation measures in terms of:

- *Impacts due to project location;*
- *Impacts from project design and during construction; and*
- *Impacts during the operation of the project*

For the purpose of the assessment and preparation of the Study Report, the following approaches and methodologies were employed:

a) *Desktop studies which involved review and analysis of literature for acquisition of secondary data;*
b) *Environmental screening, in which the project was identified as among those requiring ESIA under schedule two (2) of EMCA, 2015; the proposed project is classified as a High Risk Project.*
c) *Environmental scoping that provided the key environmental issues to be investigated in relation to implementation of the proposed project;*
d) *Physical inspection of the site and surrounding areas;*
e) *Consultation involving key stakeholders for collection of primary data (Public barazas)*
f) *Identification of potential impacts and preparing an ESMP;*
g) *Confirmation and sharing of findings with the project proponent;*
h) *Reporting assessment findings*

1.7Public and Stakeholder participation

Consultation and Public Participation was done at the proposed project site. This promoted open governance whereby everybody is granted equal opportunity to voice their opinion/ views with regard to the proposed project: the opinions/ views given assist in planning of the proposed project. This promotes awareness and provides an opportunity for better planning of the proposed project whereby opinions from various stakeholders are considered.

An extensive public consultation process that involved two public meetings *(barazas)* that were conducted between 20th and 22thof April 2021 to obtain views and concerns of a variety of stakeholders in the development of this project. Kenya has developed EIA/ESIA Regulations, which must be adhered to by proponents of all development projects.

1.8 Terms of reference

The list below highlights the NEMA approved terms of reference for this study report. The terms of reference define the objectives and scope of the ESIA as follows:

- *Assess the baseline environmental conditions in the project area, such as biological, physical and socio-economic environment;*
- *Study the potential positive and negative impacts of implementing the proposed project in the society living within the influence of the project including, but not limited to, sound disposal of asbestos wastes, job creation and improvement in the livelihood within the local community.*
- *Assess the potential environmental and social impacts of the project and suggest suitable mitigation measures for the adverse impacts;*
- *Study the project conditions and requirements in terms of location, implementation and operation requirements;*
- *Study issues negative impacts arising from the proposed project for example livelihood disruption, public safety and health and rehabilitation of the affected environment.*
- *Prepare an Environmental and Social Management Plan (ESMP) for implementation and monitoring of mitigation measures along with budgetary estimates.*

CHAPTER 2: BASELINE INFORMATION ON PROJECT AREA

2.1 Introduction

This section presents a status report on the situation of the proposed project within the context of Kilifi County as a whole. The environmental baseline offers both the present and future states of the environment. It takes into account changes which might be occasioned by natural and anthropogenic activities.Baseline information provides a basis to ascertain the implication of the development process and determine the mitigation measures to be undertaken or suitable to ameliorate the identified impacts.

2.2 Administrative location and size

Administratively, Kilifi County is divided into nine sub-counties namely; Chonyi, Ganze, Kaloleni, Kauma. Kilifi North, Kilifi South, Mgarini, Malindi and Rabai Sub counties.Kilifi County was formed in 2010 as a result of a merger of Kilifi District and Malindi District. Its capital is Kilifi and its largest town is Malindi. The county has a population of 1,453,787. It covers an area of 12,245.90 km^2. The county is located north and northeast of Mombasa. Kilifi has fewer tourists than Mombasa County, but there are some tourists' beaches in Kikambala, Watamu, Malindi and Kilifi.

2.3 Location

The proponent has proposed to set up a disposal site for asbestos waste/materials on a piece of land of approximately 17 acres to be located on Plot number KLF/DOLA/10. The proposed project area is located along/off Tsangasini - MunagowaDola Road in Migujini sub location, Mitangani Location, Bamba Division, Ganze Sub County within Kilifi County. The geo-reference points of the site are Latitude **3º 37´51.67″S** & Longitude **39º 21´52.15″E** at an elevation of 814ft above sea level.

2.4 Climate

Kilifi County lies within the coastal strip which is a hot tropical region. Local weather is influenced by monsoon winds. The average annual rainfall ranges from 300mm in the hinterland to 1,300mm at the coastal belt. The coastal belt receives an average annual rainfall of about 900mm to 1,100mm with marked decrease in intensity to the hinterland. Areas with highest rainfall include Mtwapa and to the north of the coastal strip around the ArabukoSokoke Forest. Evaporation ranges from 1800mm along the coastal strip to 2200mm in the Nyika plateau in the interior. The highest evaporation rate is experienced during the months of January to March in all parts of the county. The annual temperatures in the county range between 21 degrees Celsius and 30 degrees Celsius in the coastal belt and between 30 degrees Celsius and 34 degrees Celsius in the hinterland. The county experiences relatively low wind speeds ranging between 4.8 km/hr and 12 Km/hr.

2.5 Topography and geology

The hydrogeology of any area is intimately related to the geology; the occurrence of groundwater being a function of recharge, porosity and permeability. This section examines the geology of the investigated area in detail, and is based on researches done by A.O. Thompson, (1951).

The proposed area lies on majiyachumvi beds as observed on the ground. There is no geological map of this area as shown on the geological map below.

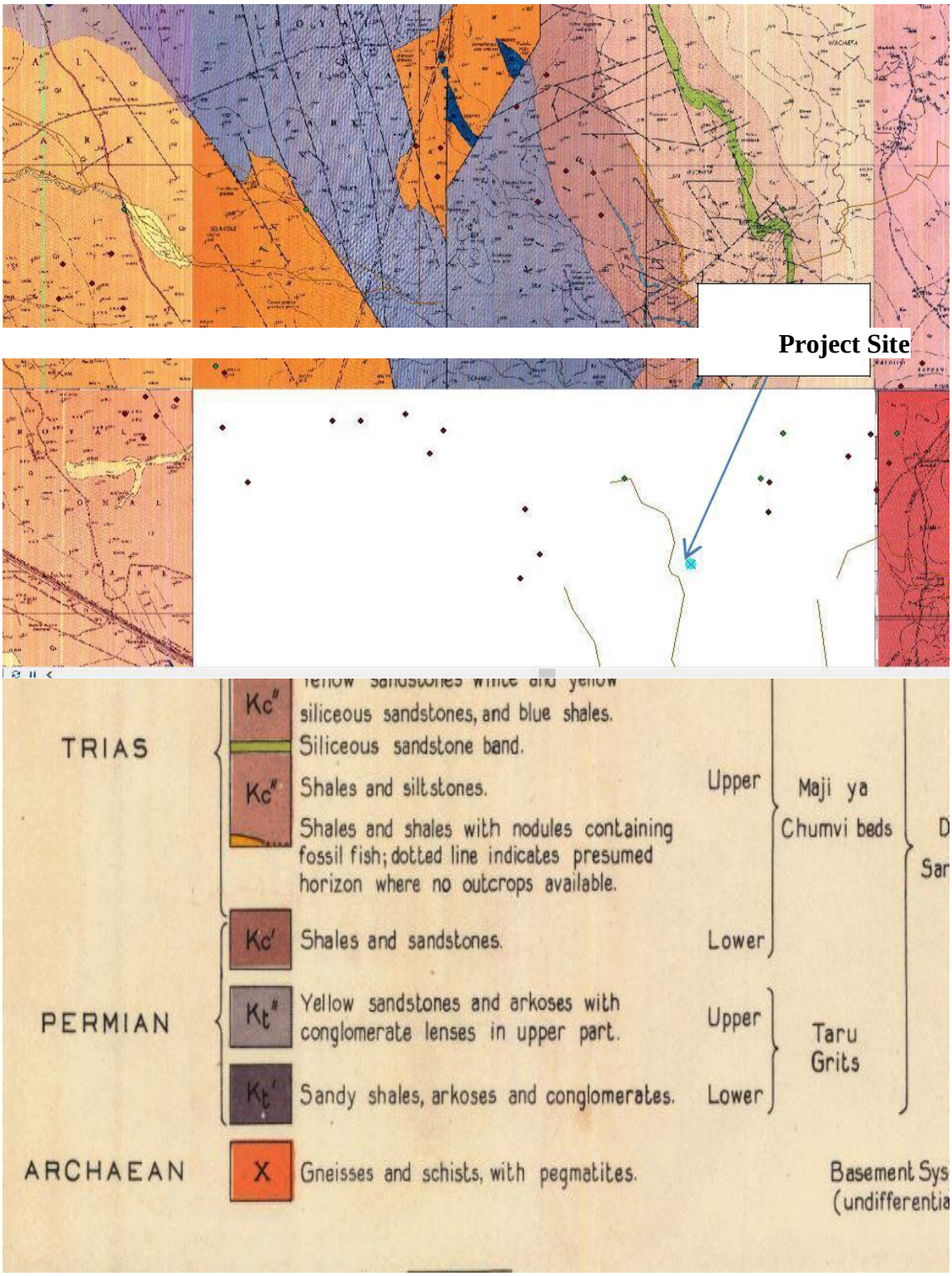

Figure 2.1: Site Geological Map (Source: Hydrogeological survey)

2.6 Water Supply

The area relies on water from dams, ponds and water pans. There is also a stream within the locality which is about 10km from the site.*(see attached copy of the hydrogeological report in appendix 1)*

2.7 Land Use Systems

The proposed project land use comprises of communal ranch owned by Dola Group Ranch, the main economic activity being charcoal burning and forest harvesting. This is coupled by the unavailability of sustainable rainfall in the area to support any other activity that is dependent on rainfall. The nearby land is used as grazing grounds for livestock being within the ranch.

The proposed site lies on a flat ground covered with natural growing grass, shrubs, and trees. Vegetation gives the ground a lot of cover, which prevent rainwater from hitting the ground directly to cause soil erosion. The cover also stops the water from flowing freely to the streams, hence giving the rainwater more time to percolate and recharge the groundwater. The cover in some cases stops evaporation of the soil moisture and leaves the water on the soil for long allowing plants to utilize the same for their growth. During transpiration the water, which evaporates from the plants increases the cloud moisture and cools the clouds causing rain. Trees also hold rain water for a short period before it falls to the ground giving it more time for percolation as to much water on the ground would flow to the rivers.

This area is sparely populated with the population density being below the Kenya's average population density

2.8 Physiography and vegetation

The proposed site lies on a relatively flat land covered with thorny bushes. Cutting down of trees in this area is not common as the population is very scarce. Therefore the land lays undisturbed and vegetation grows naturally. Vegetation gives the ground a lot of cover, which prevent rainwater from hitting the ground directly to cause soil erosion. The cover also stops the water from flowing freely to the streams, hence giving the rainwater more time to percolate and recharge the groundwater. The cover in some cases stops evaporation of the soil moisture and leaves the water on the soil for long allowing plants to utilize the same for their growth. During transpiration the water, which evaporates from the plants increases the cloud moisture and cools the clouds causing rain. Trees also hold rain water for a short period before it falls to the ground giving it more time for percolation as to much water on the ground would flow to the rivers.

Figure 2.2: Project site vegetation cover (Source: Site survey/photography)

2.9 Energy supply

Only 2% of residents in Kilifi County use liquefied petroleum gas (LPG), and 8% use paraffin. 67% use firewood and 21% use charcoal. Firewood is the most common cooking fuel by gender with 65% of male headed house-holds and 73% in female headed households using it.

Ganze constituency has the highest level of firewood use in Kilifi County at 95%.This is twice Malindi constituency, which has the lowest share at 39%. Ganze constituency is about 28 percentage points above the county average. Jaribuni ward has the highest level of firewood use in Kilifi County at 97%.This is six times Malindi Town ward, which has the lowest share at 15%. Jaribuni ward is 30 percentage points above the county average.

2.10Waste Management Practices

The proposed project area (Migujini village) is classified as rural area and the waste production is negligible. There is no formal waste disposal service and each household disposes of its own waste. The most frequently utilized means of waste disposal is through burning of combustible materials or used as manure or buried.

2.11 Demographics

According to the 2019 Population and Housing Census, the population of Kilifi County stood at 1,453,787 of which 704,089 are males, 749,673 females and 25 intersex persons. There are 298,472 household with an average household size of 4.4 persons per household and a population density 116 people per square kilometer.

Table 2.1: Distribution of Population by Sex and Sub-County

Sub County	Male	Female	Intersex	Total
Chonyi	29,527	32,807	1	62,335
Ganze	66,921	76,981	4	143,906
Kaloleni	92,614	101,063	5	193,682
Kauma	10,965	11,673	5	22,638
Kilifi North	86,986	91,836		178,824
Kilifi South	101,852	104,897	2	206,753
Magarini	93,302	98,308	4	191,610
Malindi	163,351	169,866		333,226
Rabai	58,571	62,242	9	120,813
Total	**704,089**	**749,673**	**25**	**1,453,787**

2.12 Settlement Patterns

Within the project area, inhabits are Giriama tribe of the larger Mijikenda Community. The population of the village is sparsely distributed, the average density of Ganze Sub County being 42 persons per square kilometer while the total population of 143,906 for the whole Sub County. The population distribution patterns in the area are skewed towards the availability of social amenities and infrastructural distribution such as access roads and availability of water pans which are the major source of water provision within the area.

2.13 Socio-economic profile

The area where the project will be located relies mostly on charcoal making. Formal employment is very low apart from charcoal making. There are no cultural or historically important sites within the project influence area and therefore the proposed project is bound to have no adverse impacts on the cultural aspects of the neighboring community.

CHAPTER 3: POLICY, INSTITUTIONAL & LEGAL FRAMEWORK

3.1 Introduction

The relevant legislation which the project must comply with is intended to ensure project's sensitivity to environmental concerns, public safety, public health, physical planning regulations. Kenya has a policy, legal and administrative framework for guiding it in environmental management. Under the framework, NEMA is responsible for ensuring that ESIAs are carried out for new projects and EAs/ESAs on existing facilities as per the provisions of EMCA, CAP 387 (Amended 2015). ESAs are carried out in order to identify positive and negative impacts associated with ongoing projects with a view to taking advantage of the positive impacts and developing mitigation measures for the negative ones.

The guidelines on EAs are contained in Sections 58 to 67 of EMCA of 1999. ESIA is a tool for environmental conservation and has been identified as a key requirement for new projects to ensure sustainable operations with respect to environmental resources and socio-economic activities in the neighbourhood of the proposed projects. The government has established regulations to facilitate the process on ESIAs and ESAs. The regulations are contained in the Kenya Gazette Supplement No. 56, legislative supplement No. 31, Legal Notice No. 101 of 2003. In order to ensure that the activities undertaken during implementation of the proposed project conform to existing policies and laws, a number of key statutes and principles geared towards ensuring proper environmental and natural resources management were examined. This enabled the identification of specific provisions of various relevant laws that need to be adhered to. These included the following:

- *Policy Framework*
- *Environmental Management Principles and Guidelines*
- *Institutional Framework*
- *Legal Framework*
- *International Conventions and Treaties*

3.2 Policy Framework

3.2.1 The Constitution of Kenya (2010)

The Constitution of Kenya 2010 is the supreme law of the land. Any other law that is inconsistent with the Constitution is null and void to the extent of its inconsistency. Under Chapter IV, article 42 provides for the right to a clean and healthy environment for all. Further, Chapter V of the Constitution deals with Land and Environment. Specifically Part 2 elaborates on the following components regarding the protection of the environment.

- Enforcement of environmental rights
- Obligations in respect of the environment
- Agreements relating to natural resources
- Legislation relating to the environment

Under the Constitution the proponent is entitled to carry out the project within legal limits and a fair administrative decision making process from NEMA and other State organs. On the other hand, he is required to ensure:

- *That the development is carried out in an ecologically, economically and socially sustainable manner;*
- *That the right to a clean and healthy environment for all is upheld in all phases of the development; &,*
- *That all the applicable provisions of the Constitution are observed at all times.*

3.2.2 National Environmental Action Plan (NEAP, 1994)

According to the Kenya National Environmental Action Plan (NEAP, 1994) the government recognized the negative impacts on ecosystems emanating from industrial, economic and social development programs that disregard environmental sustainability. Following on this, establishment of appropriate policies and legal guidelines as well as harmonization of the existing ones have been accomplished and/or are in the process of development. Under the NEAP, Environmental Impact Assessments and Environmental Audits were introduced targeting the industrialists, business community and local authorities.

3.2.3 The National Environmental Policy (NEP)

The Kenya government established its central policy position on the need to conserve natural resources and improvement of environmental quality through Sessional Paper No. 10 of 1965, establishment of the National Environment Secretariat (NES) in 1974 following on the Stockholm conference and a series of four year development plans (1974-1978; 1979-1983; 1984-1988; 1989-1993). The rationale for administrative and legislative approach to the management of the environment was in part as a result of the need for the government to domesticate international instruments aimed at ensuring sustainable development especially the outcomes of the International Convention on Biological Diversity (CBD). A major national challenge however remained on how the country would achieve sustainable development goals without degrading the natural environment on which the country's population is depended on (Okidi, 1992). Land and habitat degradation, environmental pollution and destruction of water catchment areas continued to impact negatively of the country's potential to provide adequate environmental goods and services (GoK and JICA, 1992) in spite of regulations and environmental statutes spread across different government ministries (21 of them at the time).

3.2.4 National Policy on Water Resources Management and Development

While the National Policy on Water resources Management and Development (1999) enhances systematic development of facilities in all sectors for promotion of the country's socio-economic progress, it also recognizes the by-products of this process as wastewater. It therefore calls for development of appropriate sanitation systems to protect people's health and water resources from institutional pollution. Industrial and business development activities therefore should be accompanied by corresponding waste management

systems to handle the wastewater and other waste emanating from their activities. The same section requires that such projects should also undergo comprehensive Environmental Impact Assessment (EIA) that will provide suitable measures to be taken to ensure environmental resources and people's health in the immediate neighborhood and further downstream are not negatively impacted by their emissions.

As a follow-up to this, EMCA 1999 requires annual environmental audits to be conducted in order to ensure that mitigation measures and other improvements identified during EIA studies are implemented. In addition, the policy provides for charging levies on waste on the basis of quantity and quality. The "polluter-pays-principle" applies in which case parties contaminating water are required to meet the appropriate cost of treatment. The policy provides for establishment of standards to protect water bodies receiving waste water, a process that has been accomplished through the gazettement of Legal Notice No. 120 of 2006 (Water Quality Regulations).

3.2.5 Policy Paper on Environment and Development

The key objectives of the Policy on Environment and Development include:

- To comply with and make provisions for effluent treatment standards that will conform to acceptable NEMA guidelines.
- To ensure that an independent environmental impact assessment (EIA) report is prepared for any industrial venture or other development before implementation; &,
- To ensure that from the onset, all development policies, programs and projects take environmental considerations into account.

3.2.6 The National Poverty Eradication Plan, 1999

The NPEP had the objective of reducing the incidence of poverty in both rural and urban areas by 50 percent by the year 2015; as well as strengthening the capabilities of the poor and vulnerable groups to earn income. The proposed project will provide employment opportunities during implementation to casual workers and thereafter will offer employment to various service providers like property managers/ agents, water suppliers and eventually a reward to the proponent. This will go a long way in poverty alleviation.

3.3 Environmental Management Principles & Guidelines

The project proponent and the contractor are expected under law and best practice to consider and exercise all the principles and tenets of environmental management. These principles are as discussed below:

3.3.1 The Principle of Sustainability

The principle of sustainability requires that natural resources should be utilized in a way and at a rate that does not lead to the long-term decline of natural resources, thereby maintaining its potential to meet the needs and aspirations of present and future generations. It strives for equity in the allocation of the benefits of development and decries short-term resource exploitation which does not consider the long-term costs of such exploitation. In the course of implementing the proposed project, the project proponent/manager is

strongly advised to use resources sustainably and source materials from suppliers that have been identified as employing/ practicing sustainable resources use.

3.3.2 The Principle of Intergenerational Equity

The principle of sustainability should be examined together with that of intergenerational equity, which focuses on future generations as a rightful beneficiary of environmental protection. Essentially, the principle of intergenerational equity advocates for fairness, so that present generations do not leave future generations worse off by the choices they make today regarding development. Operations and activities undertaken at all the stages of the proposed project ought to be designed to embrace the rationale of intergeneration equity in resources use both natural and man-made resources. Besides, intra-generation equity should be observed whereby various resources users in the current generation should not have their resources use ability compromised by the proposed project.

3.3.3 The Principle of Prevention

The principle of prevention states that protection of the environment is best achieved by preventing environmental harm in the first place rather than relying on remedies or compensation for such harm after it has occurred. The reasoning behind this principle is that prevention is less costly than allowing environmental damage to occur and then taking mitigation measures. The project proponent is duty bound under EMCA CAP 387 to undertake all the preventive and viable measures to protect the environment in the course of implementing the project, upon commissioning the project through to decommissioning of the project.

3.3.4 The Precautionary Principle

The precautionary principle recognizes the limitations of science, as it is not always able to accurately predict the likely environmental impacts of resource utilization. It calls for precaution in the making of environmental decisions where there is scientific uncertainty. Accordingly, it is closely related to the principle of prevention and can be viewed as the application of the principle of prevention where the scientific understanding of a specific environmental threat is not complete. The precautionary principle thus requires that all reasonable measures must be taken to prevent the possible deleterious environmental consequences of development activities. Further, it demands that scientific uncertainty should not be used as a reason for not taking cost effective measures to prevent environmental harm. The project proponent should undertake all the necessary precautionary measures in the course of implementing the proposed project.

3.3.5 The Polluter Pays Principle

The polluter pays principle requires that polluters of natural resources should bear the full environmental and social costs of their activities. It seeks to internalize environmental externalities by ensuring that the full environmental and social costs of resource utilization are reflected in the ultimate market price for the products of such utilization. Since environmentally harmful products will tend to cost more, this principle

promotes efficient and sustainable resource allocation as consumers are likely to prefer the cheaper less polluting substitutes of such products. This principle dictates that when undertaking a project or running institution, if damage is caused to private properties or even public utilities such as roads or public goods such as water bodies, measures to compensate the affected should be instituted immediately.

3.3.6 The Principle of Public Participation

The principle of public participation seeks to ensure environmental democracy and requires that the public, especially local communities should participate in the environment and development decisions that affect their lives. It requires that the public should have appropriate access to information concerning the environment that is held by public authorities and should be given an opportunity to participate in decision-making processes. This principle calls for public participation in the development of policies, plans and processes for the management of the environment. Public participation ensures that:

- *The process is open and transparent;*
- *Provides valuable sources of information on key impacts, potential mitigation measures and possible alternatives;*
- *Ensures that a project meets the community's needs;*
- *Ensures that a project is legitimate and it is a way of ensuring that conflicts can be addressed before NEMA makes a decision;*
- *Assists in informed decision making*
- *Promotes better implementation of projects once NEMA has made a decision;*
- *Enlightens the community on the opportunities and benefits that could arise from a project;*

In compliance to this principle, two public meetings were conducted at the proposed project site to inform the local community and local leadership.

3.3.7 The Cultural and Social Principle

The Cultural and Social Principle is traditionally applied by many communities in Kenya for the management of the environment or natural resources in so far as the same are relevant and are not repugnant to justice and morality or inconsistent with any written law. Since time immemorial many communities have lived sustainably in various ecosystems in Kenya. It against this setup that existed where resources utilization though devoid of sophisticated/ complicated technologies guaranteed health environment that the current development should borrow leave from. It is therefore important for the proponent to factor in local/ traditional environment management systems in the course of implementing the project.

3.3.8 The Principle of International Co-operation

The Principle of International Co-operation applies in the management of environmental resources shared by two or more states. Environmental impacts do not respect national or international boundaries and as such are trans-boundary. This principle ensures that international relations and understanding are upheld and

therefore management of environmental concerns arising from a project/ action across two jurisdictions can be managed. However, the proposed project does not have far reaching cross boundary impacts.

3.4 Institutional Framework

At present there are over twenty (20) institutions and departments which deal with environmental issues in Kenya. Some of the key institutions include the National Environmental Council (NEC), National Environmental Management Authority (NEMA), the Forestry Department, Kenya Wildlife Services (KWS), Water Resources Management Authority (WRMA) and others. There are also local and international NGOs involved in environmental issues in the country.

3.4.1 The National Environmental Council (NEC)

EMCA 1999 No. 8 part iii section 4 outlines the establishment of the National Environment Council (NEC). NEC is responsible for policy formulation and directions for purposes of EMCA; set national goals and objectives and determines policies and priorities for the protection of the environment and promote co-operation among public departments, local authorities, private sector, nongovernmental organizations and such other organizations engaged in environmental protection programmes. It also performs such other functions as are assigned under EMCA.

3.4.2 The National Environment Management Authority

The object and purpose for which NEMA is established is to exercise general supervision and coordinate over all matters relating to the environment and to be the principal instrument of the government in the implementation of all policies relating to the environment. A Director General appointed by the president heads NEMA. The Authority performs the following functions:

- *Co-ordinate the various environmental management activities being undertaken by the lead agencies and promote the integration of environmental considerations into development policies, plan, programmes*

and projects with a view to ensuring the proper management and rational utilization of the environmental resources on a sustainable yield basis for the improvement of the quality of human life in Kenya.

- *Take stock of the natural resources in Kenya and their utilization and consultation, with the relevant lead agencies, land use guidelines.*
- *Examine land use patterns to determine their impact on the quality and quantity of the natural resources.*
- *Carry out surveys, which will assist in the proper management and conservation of the environment.*
- *Advise the government on legislative and other measures for the management of the environment or the implementation of relevant international conservation treaties and agreements in the field of environment as the case may be.*
- *Advise the government on regional and international environmental convention treaties and agreements to which Kenya should be a party and follow up the implementation of such agreements where Kenya is a party*
- *Undertake and co-ordinate research, investigation and surveys in the field of environment and collect and disseminate information about the findings of such research, investigation or survey.*
- *Mobilize and monitor the use of financial and human resources for environmental management.*
- *Identify projects and programmes or types of projects and programmes, plans and policies for which environmental audit or environmental monitoring must be conducted under EMCA.*
- *Initiate and evolve procedures and safeguards for the prevention of accidents, which may cause environmental degradation and evolve remedial measures where accidents occur.*
- *Monitor and assess activities, including activities being carried out by relevant lead agencies in order to ensure that the environment is not degraded by such activities, environmental management objectives are adhered to and adequate early warning on impeding environmental emergencies is given.*
- *Undertake, in co-operation with relevant lead agencies programmes intended to enhance environmental education and public awareness about the need for sound environmental management as well as for enlisting public support and encouraging the effort made by other entities in that regard.*
- *Publish and disseminate manuals, codes or guidelines relating to environmental management and prevention or abatement of environmental degradation.*
- *Render advice and technical support, where possible to entities engaged in natural resources management and environmental protection so as to enable them to carry out their responsibilities satisfactorily.*
- *Prepare and issue an annual report on the state of the environment in Kenya and in this regard may direct any lead agency to prepare and submit to it a report on the state of the sector of the environment under the administration of that lead agency and,*
- *Perform such other functions as government may assign to the Authority or as are incidental or conducive to the exercise by the authority of any or all of the functions provided under EMCA.*

3.4.3 National Environmental Action Plan

The NEAP for Kenya was prepared in mid 1990s. It was a deliberate policy effort to integrate environmental considerations into the country's economic and social development. The integration process was to be

achieved through a multi-sectoral approach to develop a comprehensive framework to ensure that environmental management and the conservation of natural resources are an integral part of societal decision-making.

3.5 Legal Framework

The key national laws that govern the management of environment resources in the country in relation to the proposed project have been discussed in the following paragraphs. Note that wherever any of the laws contradict each other, the Environmental Management and Coordination Act 1999 prevail.

3.5.1 Environment Management and Co-ordination (Amendment) Act 2015

EMCA is an Act of parliament to provide for the establishment of an appropriate legal and institutional framework for the management of the environment and for related matters. NEMA is a body established under the Act, and has the legal authority to exercise general supervision and co-ordination over all matters relating to the environment, and is the principal arm of the government charged with the implementation of all policies relating to the environment.

Part II of EMCA states that every person is entitled to a clean and healthy environment and has the duty to safeguard the same. It is worth noting that the entitlement to a clean and healthy environment carries a collective duty. Hence, there is not only the entitlement to a clean and healthy environment, but also the duty to ensure that the environment is not degraded in order to facilitate one's own as well as other persons' enjoyment of the environment. All ESIAs reports are submitted to NEMA for review and necessary advice thereafter. The law is based upon the principle that everybody is entitled to a healthy and clean environment. The Act requires that projects acquire approval before their commencement. NEMA approves and issues an environmental license after an Environmental Impact Assessment or a Study Report depending on whether the project assessment and report meets the required threshold. .

3.5.2 The Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019

These Environmental (Impact Assessment and Audit) Regulations 2003 were amended in by deleting regulation 7. The EIA/EA Regulations are meant to ensure the implementation of Sec. 58 of EMCA. It makes it illegal for anyone to undertake developments without an EIA license and stipulates the ways in which environmental experts should conduct the Environment Impact Assessment and Audits reports in conformity to the requirement stated. It is concise in its report content requirements, processes of public participation, licensing procedures, inspections and any possible offences and penalties under the Act.

Relevance to the proposed project

- *Acquisition of EIA license/approval prior commencement of the project. The operations of the project are similarly licensed since the project report contains an Environmental and Social Management*

Plan which forms the basis for approval of the project by NEMA and imposition of conditions to safeguard the environment. Due to its transparent nature, the EIA process builds neighborhood support and sustainability into the project.

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

Asbestos has been classified as hazardous waste under the Waste Management Regulations, 2006. The regulations further highlights that every person who generates toxic or hazardous waste shall treat or cause to be treated such hazardous waste using the classes of incinerators prescribed in the Third Schedule to these Regulations or any other appropriate technology approved by the Authority. Any leachate or other by-products of such treated waste shall be disposed of or treated in accordance with the conditions laid down in the license or in accordance with guidelines issued by the Authority in consultation with the relevant lead agency. In issuing a license for the disposal of waste, the Authority shall clearly indicate the disposal operation permitted and identified for the particular waste. These regulations will be applied in operation of the proposed project.

Relevance to the proposed project

- *Seek license to operate/own waste disposal site and ensure that vehicles delivering the waste are licensed.*
- *Ensure that tracking documents for the waste are used.*

3.5.4 Waste Management Regulations (Legal Notice No.121 of 2006)

In pursuit of the provisions of EMCA 1999, the Minister for Environment in 2006 gazetted the waste management regulations focusing on management of solid, industrial and hazardous wastes, pesticides, toxic and radioactive substances.

Relevance to the proposed project

- *Ensure there exists proper contractual agreement with licensed solid waste handlers*
- *Ensure hazardous wastes are disposed off in the manner prescribed*
- *The proponent to ensure that all asbestos waste are to be transported in a licensed truck only.*

3.5.5 The Environmental Management and Co-ordination (Excessive Noise and Vibrations Pollution Control) Regulations, 2009

These Regulations were gazetted to manage noise levels to levels that do not cause a disturbance to the public. The proposed construction activities will however have a potential for the production of noise above the acceptable limits. Generally, construction sites generate noise that is above 85 dB (A).

Relevance to the proposed project

- *Ensure compliance with the set noise level limits for the site especially during construction and occupational phases. The proponent should ensure that employees are not exposed to noise levels above 85 dB (A) and in such cases provide suitable personnel protection equipment (ear protective devices).*

3.5.6 Water Quality Regulations (2006)

The Water Quality Regulations (2006) are contained in the Kenya Gazette Supplement No. 68, Legal Notice No. 120. Of relevance to the proposed project and for the purpose of this Study Report is Part II Sections 4-5 as well as Part V Section24. Part II Section IV states that "Every person shall refrain from any act which directly or indirectly causes, or may cause immediate or subsequent water pollution". Part IV Section 24 states that "No person shall discharge or apply any poison, toxic, noxious or obstructing matter, radioactive wastes, or other pollutants or permit any person to dump any such matter into water meant for fisheries, wildlife, recreational purposes or any other uses

Relevance to the proposed project

- *The asbestos to be disposed in underground concrete confinement at a depth of 9M below the ground level*
- *Since the asbestos remains will be disposed onto the ground then a hydro geophysical survey shall be done to ensure there is no underground contamination of water.*
- *Monitoring activities will follow the guide values provided in the asbestos guidelines*

3.5.7 The Occupational Safety and Health Act 2007

The purpose of the Occupational Safety and Health Act (OSHA) is to provide for the safety, health and welfare of workers and all persons lawfully present at workplaces and to provide for the establishment of the National Council for Occupational Safety and Health and for connected purposes.

Of particular importance to the proposed project is the requirement that all work places must be registered with the Department of Occupational Safety and Health Services. Further, there is a requirement that a Safety and Health Committee must be put in place and those employees and members of this committee must be inducted and trained on the provisions of the Act accordingly.

The OSHA stipulates that an employer shall not require or permit his employee to engage in the manual handling or transportation of a load which by reason of its nature is likely to cause the employee to suffer bodily injury. National Guidelines on Safe Management and Disposal of Asbestos, also states that any person supplying, distributing, conveying or holding in chemicals or other toxic substances shall ensure that

they are packaged, conveyed, handled and distributed in a safe manner so as not to cause any ill effect to any person or the immediate environment.

Relevance to the proposed project

- *It also involves the prevention of accidents at the workplace and provision of personal protective equipment (PPE) to all workers and ensuring their use.*
- *Strict provisions will be made for the requirement of supervision and training of inexperienced workers during commissioning period*

3.5.8 The Occupational Safety & Health Act (Hazardous Substances) Rules, 2007

Asbestos has been listed as a hazardous substance and its threshold limit values given, therefore these rules apply to all workplaces where asbestos is present. Asbestos has been listed as a hazardous substance and its threshold limit values given, therefore these rules apply to all workplaces where asbestos is present.

3.5.9 The Factories (Building, Operations and Work of Engineering Construction) Rules, Legal Notice No. 40 of 1984

The Factories (Building, Operations and Work of Engineering Construction) Rules, Legal Notice No 40 of 1984, rules 20 and 21 prohibit any inhalation of dust and fumes. In any building operation or work of engineering construction where dust or fumes likely to be injurious to the health of persons employed are given off, all reasonably practicable measures shall be taken to prevent the inhalation of dust or fumes by the person employed by ensuring adequate ventilation or providing suitable respirators at the place where the operation or work is carried on.

3.5.10 Occupiers Liability Act Cap 34

This is an Act of parliament to amend the law as to liability of occupiers and others for injury or damage resulting to persons or goods lawfully on land or property from dangers due to the state of the property or to things done or omitted to be done there.

Relevance to the proposed project

- *Ensure safety of workers during construction, implementation and possible decommissioning phases of the proposed project*

3.5.11 Public Health Act Cap 242

This is an act of parliament to make provision for securing and maintaining health. Section 13 states that it shall be the duty of every health authority to take all lawful, necessary and under its circumstances reasonably practicable measures for preventing the occurrence or dealing with any outbreak, or prevalence

of any infections, communicable or preventable diseases or conditions to safeguard and promote the public health and to exercise the powers and perform the duties in respect of the public health conferred or imposed on it by this act or by any other law. The Public Health Act Cap 247, Section 3 gives provisions for use of poisonous substances. It refers to regulations for protection of persons against risk of poisoning, imposing restrictions or conditions on the importation, sale, disposal, storage, transportation or use of poisonous substances. This Act also requires persons concerned with importation, sale, disposal storage, transportation or use of poisonous substances to be registered and licensed and provides measures for detecting and investigating cases in which poisoning has occurred. The Public Health Act Sec 126 A, empowers county governments to make by laws for all or any of the following matters with regards to buildings for - controlling the construction of buildings and the materials to be used in the construction of buildings; Preventing the occupation of a new or altered building until a certificate of the fitness thereof for occupation or habitation has been issued by such local authority. To compel owners to repair order to demolish unsafe, dangerous or dilapidated buildings. The Act further gives the county governments power to require removal or alteration of work in certain cases the local authority may by notice to the owner either require him to pull down or remove the work, or if he so elects to comply with any other requirements.

Relevance to the proposed project

- *Applicable during the entire project cycle in ensuring those proper and hygienic methods are used. Maintain the completed structure according to standards, ensure access to safe drinking water and put measures to prevent activities that would be a nuisance to the public.*

3.5.12 Water Act 2016

An act of Parliament to provide for the regulation, management and development of water resources, water and sewerage services; and for other connected purposes. This Act may be cited as the Water Act, 2016 and shall come into operation on such a date as the Cabinet Secretary responsible for matters relating to water May by notice in the Gazette, appoint, and different dates may be appointed for the coming into operation of different provisions. Water in Kenya is owned by the Government, subject to any right of the user, legally acquired. However; this Act regulates conservation and management of all water resources within the republic, and related purposes. In section 3 of part II, it states that every water resource is vested in the State, subject to any rights of user granted by or under this Act or any other written law. The Act also provides for establishment of a Water Resource Authority, whose aim is to manage and coordinate conservation and utilization of water resources at national scale.

Relevance to the proposed project

- *The proponent should ensure that water usage in all phases of the project cycle is in line with the provisions of this Act and obtain a permit from WRMA if a borehole will be considered as a source of water to supply the facility.*
- *The proponent should also ensure that the activities of the site does not cause any leachate that may cause water pollution.*

3.5.13 Work Injuries Benefits Act (2007)

a) Obligations of Employers

Section 7 of the Act stipulates that every employer shall obtain and maintain an insurance policy, with an insurer approved by the Minister in respect of any liability that the employer may incur under this Act to any of his employees.

b) Registration of Employer

Every employer carrying on business in Kenya shall within the prescribed period and in the prescribed manner register with the Director of Occupational Safety and health Services and any other information as the Director may require. Subsection 4 of section 8 of the Act states that where an employer carries on business in more than one workplace, or carries on more than one class of business, the Director may require the employer to register separately in respect of each place or class of business.

c) Employer to Keep Record (Section 9)

Section 9 states that an employer shall keep a register or other record of the earnings and other prescribed particulars of all employees and produce the same on demand by the director for inspection. Such records shall be retained for at least six years after the date of last entry. Thus all records in relation to the operation of the facility shall be well kept and maintained.

d) Right to Compensation

An employee who is involved in an accident resulting in the employee's disablement or death is subject to the provisions of this Act, and entitled to the benefits provided for under the Act. Subsection 3 of section 10 of the Act however states that no employee shall be entitled to compensation if an accident, not resulting in serious disablement or death, is caused by the deliberate and willful misconduct of the employee. Section 12 of the act stipulates if an employee is injured in an occupational accident or contracts an occupational disease while the employee, with the consent of the employer, is engaged in any organized first aid, ambulance or rescue work, or firefighting or other emergency services, the accident or disease is for the purpose of this Act, deemed to have arisen out of an in the course of the employee's employment.

e) Reporting of Accidents

A written or verbal notice of any accident shall be given by or on behalf of the employee concerned to the employer and a copy to the Director of Occupational Safety and health within twenty-four hours of its occurrence in case of fatal accident. In case of any accidents, the rules shall be applied to the latter.

f) Lapse of Right to Benefits

A right to benefits in accordance with this Act shall lapse if the accident is not reported to the employer within twelve months after the date of such accident. However, it shall not be barred to compensation if it is proved that the employer had knowledge of the accident from any other source. Section 30 of the Act states that compensation for permanent disablement shall be calculated on the basis of ninety-six months earnings subject to the minimum and maximum amounts determined by the minister after consultation with the board. In case of a fatal accident compensation shall be paid to the dependants of the employee in accordance with the set provisions in the third schedule. The employer shall further be liable to pay reasonable expenses for the funeral of the deceased employee subject to the maximum amount determined by the minister, after consultation with the National Council for Occupational Safety and health. The First Schedule of the Act gives the minimum degree of disablement for various body parts while the second Schedule gives a list of work description and the associated occupational disease

3.5.14 Employment Act (2007)

a) General Principle

The Act constitutes minimum terms and conditions of employment of an employee and any agreement to relinquish vary or amend the terms set shall be null and void. The Act stipulates that no person shall use or assist any other person, in using forced labour. Clause 5 of the Act states that its shall be the duty of the Minister, Labour officer, the National Labour Court and the subordinate labour courts to; Promote equality of opportunity in employment in order to eliminate discrimination in employment Promote and guarantee equality of opportunity for a person who, is a migrant worker or a member of the family of the migrant worker lawfully within Kenya. No employer shall discriminate directly or indirectly, against an employee or prospective employee or harass an employee or prospective employee on the following grounds; race, colour, sex, language, religion, political or other opinion, nationality, ethnic or social origin, disability, pregnancy, mental status or HIV status. An employer shall pay his employees equal remuneration for work of equal value.

b) Part IV Rights and Duties of Employment

The provisions of this part and part VI constitute basic minimum and conditions of contract of service. The employer shall regulate the hours of work of each employee in accordance with provisions of this Act and any other written law. Subsection (2) of section 27 states that an employee shall be entitled to at least one rest day in every period of seven days. An employee shall be entitled to not less than twenty-one working days of leave after every twelve consecutive months.

c) Maternity Leave

Section 29 of the Act stipulates that a female employee shall be entitled to two months maternity leave with full pay and an employer who has paid a female employee wages for two months during her maternity leave shall be reimbursed by the National Social Security Fund, the equivalent of wages paid by the employer during maternity leave or a lesser amount as may be determined by the minister in rules made by the

minister for that purpose. Subsection 8 of section 29 further states that no female employee shall forfeit her annual leave entitlement on account of having taken her maternity leave.

d) Section 37 (Conversion of Casual Employment to Term Contract)

Where a casual employee works for a period or a number of continuous working days which amount in the aggregate to the equivalent of not less than one month; or performs work which cannot reasonably be expected to be completed within a period, or a number of working days amounting in the aggregate to the equivalent of three months or more. The contract of service of the casual employee shall be deemed to be one where wages are paid monthly. In calculating wages and the continuous working days, a casual employee shall be deemed to be entitled to one paid rest day after a continuous six days working period and such rest day or public holiday which falls during the period under consideration shall be counted as part of continuous working days

3.5.15 TheKilifi County Environment (Control and Regulations) of 2016

The Act which was enacted to give effects to various provision of the constitution of Kenya 2010 has section dealing with Air pollution, Noise pollution and Public nuisance. It prohibits acts or omissions that are likely to cause air pollution, noise pollution and public nuisance.

Relevance to this project

- *The proponent shall ensure that all activities on the site does not cause air pollution considering that asbestos dust is potential air that not only harmful to environment, but also public health.*

3.5.16 National Guidelines on Safe Management and Disposal of Asbestos

These guidelines will apply to all persons or firms operating in facilities and premises in which asbestos materials may be handled during installation, demolition, renovation, repair or removal for disposal.

3.6 International Conventions & Treaties

Conventions are legally binding contracts that bind all concerned member countries to respect and act according to its provisions. Kenya has ratified several international conventions and should live with regard to the proposed Asbestos disposal site. Treaties can be called by many names including; International Agreements, Protocols, Covenants, Conventions, Exchanges of Letters, Exchanges of Notes, etc. However, all of these are equally treaties and the rules are the same regardless of what the treaty is called. Treaties can be loosely compared to contracts; both are means of willing parties assuming obligations among themselves, and a party to either that fails to live up to their obligations can be held legally liable for that breach. The central principle of treaty law is expressed in the maxim *pactasuntservanda*, translated as "pacts must be respected." Kenya has ratified the following international conventions:

3.6.1 United Nations Framework Convention on Climate Change

The Convention on Climate Change sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. It recognizes that the climate system is a shared resource whose stability can be affected by industrial and other emissions of carbon dioxide and other greenhouse gases. The Convention enjoys near universal membership, with 191 countries having ratified. Under the Convention, governments:

- *Gather & share information on greenhouse gas emissions, national policies and best practices*
- *Launch national strategies for addressing greenhouse gas emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries;*
- *Cooperate in preparing for adaptation to the impacts of climate change.*

The Convention entered into force on 21 March 1994. The landmark United Nations Framework Convention on Climate Change (UNFCCC) was opened for signature at the 1992 United Nations Conference on Environment and Development (UNCED) Conference in Rio de Janeiro (known by its popular title, the Earth Summit). On June 12, 1992, 154 nations signed the UNFCCC that upon ratification committed signatories' governments to a voluntary "non-binding aim" to reduce atmospheric concentrations of greenhouse gases with the goal of "preventing dangerous anthropogenic interference with Earth's climate system."

These actions were aimed primarily at industrialized countries, with the intention of stabilizing their emissions of greenhouse gases at 1990 levels by the year 2000; and other responsibilities would be incumbent upon all UNFCCC parties. The parties agreed in general that they would recognize "common but differentiated responsibilities," with greater responsibility for reducing greenhouse gas emissions in the near term on the part of developed/ industrialized countries, which were listed and identified in Annex I of the UNFCCC and thereafter referred to as "Annex I" countries. Kenya signed the UNFCCC on 12th July 1992, ratified it on 30th August 1994 and started enforcing it on 28th November 1994.

3.7 World Bank Safeguard Policies

The World Bank’s environmental and social safeguard policies are a cornerstone of its support to sustainable poverty reduction. The objective of these policies is to prevent and mitigate undue harm to people and their environment in the development process. These policies provide guidelines for Bank and borrower staffs in the identification, preparation, and implementation of programs and projects. The Safeguard policies also provide a platform for the participation of stakeholders in project design and have been an important instrument for building a sense of ownership among local populations. In essence, the safeguards ensure that environmental and social issues are evaluated in decision making, help reduce and manage the risks associated with a project or program, and provide a mechanism for consultation and disclosure of information.

CHAPTER 4: PROJECT DESIGN & DESCRIPTION

4.1 Project description

The proposed development will comprise of disposal site (land fill) covering approximately one acre of the whole plot, site office, washrooms and enclosing wall of the whole parcel of land. The landfill will be dug in consideration of the hydrological survey comments regarding the water table of the area so as to avoid ground water contamination. This proposed project site will have a capacity of approximately 2500 tons of the asbestos material. The proposed pit will be excavated up to 10M below the ground. After excavation, concrete wall will be constructed on the excavated pit to ensure that the asbestos containing material does not penetrate into the underground water. After lining the pit with concreate, the asbestos material shall be placed on the constructed pit progressively up to one metre below ground level, then covered. The pit shall be marked with visible marks indicating what has been disposed, the source and the words 'danger" on it. The proponent proposes to set up asbestos landfill in line with the National Guidelines on Safe Management and Disposal of Asbestos (2015).

4.2 Project Design

The design of the proposed asbestos disposal site (landfill) will entail:

- *Lining the pit (to engineer's specification guided by asbestos disposal guidelines);*
- *Building compartments where the asbestos will be disposed/buried;*
- *Providing for access road from the main road into the project area*
- *Construction of Site office, washrooms, changing rooms, construction/erection of the perimeter wall/fence around the whole plot with one entry point, storeroom and temporary asbestos holding shed.*

4.3 Project Activities

a) Construction activities

The construction activities shall involve civil and engineering works as here on:

- *Site preparation/clearing the site*
- *Landfill excavation of soil*
- *Laying of concrete foundation slab and walling of the pit and construction of a perimeter wall around the site*
- *Landscaping*
- *Installation of electrical works*
- *Government inspection/occupation certificate and completion of works issued*
- *Commissioning the project*

b) Operational activities

The proponent intends to set up an asbestos disposal site. The site shall be used as a landfill for safe disposal of asbestos from potential clients at a fee. The site shall be fenced off to limit any access to unauthorized persons and animals. The site shall only be commissioned once a license has been granted by the Authority.. This site will not be used as a one-off disposal but a continuous/long-term site that will have the capacity of 2500 tons of asbestos and asbestos containing materials. Once a client approaches Sergent Logistics Limited

on the need to dispose asbestos/ asbestos containing materials, the proponent shall prepare the disposal area as needed where the asbestos shall be placed up to one metre below ground level, then covered. The office shall keep records/tracking documents indicating what has been disposed and the source. The site shall have visible marks and the words 'asbestos danger keeps off' for creating public awareness.

4.4 Asbestos Disposal Methodology & Management

The proponent is committed to disposing asbestos materials/wastes in line with the National Guidelines on Safe Management and Disposal of Asbestos (2015). The proponent has the requisite human resources to implement the guidelines upon commissioning of the landfill not forgetting that all personnel to be involved in running the project will be subject to occupational health surveillance, training in handling of asbestos as well as management of an asbestos disposal site.

Asbestos is classified as hazardous in schedule IV of Legal Notice No. 121 Environmental Management and Co-ordination (Waste Management) Regulations 2006. The project will thus follow the provisions set out in part IV of Legal Notice No. 121 as well as in the national guidelines on safe management and disposal of asbestos as discussed below.

4.4.1 Preparation for Transportation

Material containing asbestos or contaminated with asbestos must be viewed as hazardous and packaged to keep fibres from getting into the air. Containers used for packaging may be hard or flexible and must seal airtight. The following are some of the precautions that should be observed in the packaging.

i. The waste transporting vessel must be lined with a 500-gauge double wrapped plastic sheet with every seam sealed with a tape and covered.
ii. The transportation vessel should be labeled "**Danger - Contains Asbestos Fibres Cancers and Lung Disease Hazard**" and contain the following information:
    - The identity of the hazardous waste
    - The name, physical address and telephone contact of the generator of waste
iii. The bags and stacks should be gently loaded into transportation vessel.
iv. The goose necks should not be used as handles for carrying the bags, because that might unseal the ends or tear the bags. Tossing the bags into a waste transporting vessel must be avoided because of the risk of rupture.
v. The asbestos waste should be transported to a prepared disposal site that is authorized by NEMA.

4.4.2 Transportation

The vehicle transporting the asbestos waste should be licensed as per the EMCA (Waste Management) Regulations 2006 and must be accompanied by a tracking document.

The waste shall be transported to the disposal site in an enclosed vehicle or container, capable of being washed without lodgment of debris and fibres, and secure from escape of fibres to the atmosphere. The contractor should ensure that all persons involved in handling and disposal of asbestos are trained in safe work operating procedures for asbestos handling. These procedures shall include how the waste is to be handled, services to be contacted during such an exposure, and additional personal protective equipment

4.4.3 Disposal site requirements

Disposal of asbestos must be at a site;

- Designated by the local authorities and licensed by NEMA;
- Privately owned disposal facility licensed by NEMA;
- Designated by the waste generator (on-site disposal)

Where a designated site by the local authorities or privately owned facility does not exist the waste generator shall identify an appropriate site, undertake an EIA and be duly licensed.

4.4.4 Disposal site operation

The waste generator shall ensure that the following precautions are observed when disposing asbestos wastes:

i. The waste generator shall notify the Authority on commencement of disposal activities.
ii. Asbestos materials must not be reused or offered for sale.
iii. All asbestos sheets and the debris should be wrapped before it is hauled to the disposal site or transfer station in a covered vehicle.

4.4.5 Post – disposal issues

i. All transportation vessels, re-useable containers or any other similar article which have been in contact with asbestos waste shall be cleaned at the disposal site.
ii. The disposal site should be maintained including the warning signs, the fence, the gate among others to prevent vandalism and interference.
iii. Human activities which might interfere with the buried asbestos waste such as construction and pitting should not be allowed at the disposal site.
iv. The waste generator shall notify the Authority in writing on completion of disposal of asbestos waste

The Project Concept

Environmental Hygiene is the science of anticipation, recognition, evaluation and control of health hazards in the work environment with the objective of protecting the health of workers and citizens of the community. Its role is first, to ensure a healthy work environment through continuous surveillance; second, to protect workers from diseases that can be caused by unhealthy environments; third, to break the vicious cycle of 'unhealthy environment' – occupational disease. The proponent sought the assistance of an environmental consultant to carry out an environmental impact assessment of the disposal site of asbestos from various sources of asbestos within the country.

Project Cost

The project implementation cost is estimated at Kshs. 3, 000, 000.00. (Three Million Shillings)

CHAPTER 5: PUBLIC & STAKEHOLDER CONSULTATION

5.1 Introduction

A public consultation process was engaged in gauging the sentiments of a variety of stakeholders. Besides the fact that this is a regulatory requirement under the Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019, it was an excellent opportunity to offer the public an opportunity to ventilate their concerns and probably give recommendations. The exercise was conducted between 8th& 11th of February 2021 *(see attached questioners and minutes)*

5.2 Public consultation methodology

Two public consultation meetings (*barazas)* were conducted on 20th and 22nd of April 2021 at the project site among the local community and local leadership regarding the proposed project. Administration of open-ended questionnaires was used to key stakeholders such as the local administration leadership (area chief and two assistant chiefs),Dola Group Ranch members (chairperson) were used to obtain their comments about the proposed project within the area. Sample minutes & filled questionnaires have been appended on this report.

Figure 5.1: First consultative meeting on 20th April 2921 at the project site (Source: Site survey/photography)

5.3 Stakeholder comments/concerns

The issues raised by neighbors of the site were thought to be pertinent to the eventual success of the proposed project. Such issues/views included:

- Creation of awareness to the local community about the project
- Safety of those working within the site and neighborhood
- Creation of employment to the local community

5.4 Conclusion on findings

The overwhelming majority of the members of the public and key stakeholders could see enormous benefits accruing to them by the coming into being of the project. The local community and local leadership endorsed and supported the proposed project on condition that the relevant regulations and guidelines will be followed during operations.

Figure 5.2: Second consultative meeting on 22nd April 2921 at the project site (Source: Site survey/photography)

CHAPTER SIX: ANALYSIS OF PROJECT ALTERNATIVES

6.1 Introduction

Investigating the available alternatives to the development proposal is an important aspect of the assessment process that could invariably help in mitigating the impacts of the proposed project. In this analysis, the EIA/EA experts' team considered alternatives on the following basis.

- The project site
- Design alternatives
- Scale and extent
- Waste management alternatives

In most cases, the ESIA process often occurs too late in decision-making to consider a full range of alternatives. This can undermine ESIA goals to encourage more environmentally sound and publicly acceptable solutions. Allowing new alternatives and objectives to evolve in relation to environmental conditions, public preferences and project sustainability may be a solution to most of the environmental and socio-economic problems associated with the implementation of new projects

6.2. Proposed Project Alternatives

6.2.1 The "No Project" Alternative

The No Project option in respect to the proposed project implies that the status quo is maintained. This option is the most suitable alternative from an extreme environmental perspective as it ensures non-interference with the existing conditions. This option will however lead to challenges experienced in sound disposal of asbestos and asbestos containing materials thereby compounding the impacts associated with poor disposal of asbestos materials/wastes. The No Project Option is the least preferred from the public health, socio-economic and environmental perspectives due to the following factors;

- *Asbestos is carcinogenic and the negative impacts associated with asbestos may continue affecting human and animal health;*
- *The social-economic burden of dealing with health impacts associated with asbestos in terms of medical costs is unbearable;*
- *Landfilling is the globally acceptable method of disposing asbestos and as such the No Project Alternative will challenge the capacity of the nation to dispose asbestos in a sound manner.*

From the analysis above, it becomes apparent that the No Project alternative is no alternative to the proponent.

6.2.3 The "Yes Project" alternative

This option was considered as the most viable because of the following reasons;

- *There will be employment creation,*
- *Proper disposal of asbestos materials*
- *Commitment to environmental performance*
- *The proposal is consistent with the existing national guidelines on asbestos management and disposal*

6.2.4 Alternative project site

Relocating the proposed project to an alternative site is not a viable option. This is because the proposed site was arrived at as a result of hydrogeological survey undertaken and considering the location of the site in relation to the nearest human settlements. The asbestos management guideline by NEMA stipulates that the site for asbestos disposal site should be far from human habitation such as the one in question.

The proposed project was initially planned to situated in MeliKubwa area, Taru within Kwale County but it was not seen as viable or idea project due to its proximity to human settlement in the area as opposed to the current project site.

6.2.4 Project Design Alternatives

a) ***Sustainability and Affordability***

Sustainability of the proposed asbestos landfill would have a bearing on the environment in the area. This is because the operations of the landfill might affect the local environment positively or negatively; the proponent is expected to operate the landfill in line with the set guidelines by NEMA and internationally acceptable standards. This will be assured by developing standard operating procedures (SOPs) for the landfill that will ensure that the landfill is sustainable. Sustainability would mean the ability of the landfill to continuously serve the proponent without adverse impacts within the project area. This would call for designs that would ensure that the cost of operating the landfill is cost effective and does not impact negatively on the environment. Subsequently, this translates to affordability of the proposed project. Sustainability would also translate to the longevity of the asbestos landfill versus intended use. Affordability is greatly determined at the design stage. Asbestos landfill design will employ simple technology that lowers the cost of constructing the landfill based on the prevailing geographical formation.

b) Technological Alternatives and Input Materials

The technology to be used during construction of the landfill will involve the use of reinforced walls to make the pit lining and columns for the perimeter wall/fence. The proposed project will be constructed using environmentally accepted and materials compliant to engineering standards but locally available to achieve public health, safety, security and environmental aesthetic requirements. Equipment that saves energy and water will be given first priority without compromising on cost or availability factors, the project will entail use of locally available materials like sand, cement and ballast or similar approved materials that would not have adverse impacts on the environment. The technology to be used is environmentally friendly.

6.2.5 Waste Management Alternatives

The project might not generate a lot of wastes other than excess excavated top soil that the proponent would use for landscaping purposes. An integrated solid waste management system is recommendable. First, the proponent will give priority to reduction at source of the materials. This option will demand a solid waste management awareness programme in the management and the staff involved in implementing the project. Recycling and reuse options of the waste will be the second alternative in priority. This will call for a source separation programme to be put in place. Asbestos laden wastes shall be disposed on the landfill because this is the most appropriate method of disposing asbestos containing materials.

CHAPTER 7: POTENTIAL ENVIRONMENTAL IMPACTS IDENTIFICATION & MITIGATION MEASURES

This Chapter identifies both positive and negative environmental and social impacts likely to be occasioned by the activities of the proposed asbestos landfill. These impacts are hereby identified in three distinct phases of the project i.e. Planning and designing Phase, Implementation/Construction Phase and Operation Phase. It discusses the nature of impacts, their magnitude, spatial and time extent and significance. The table below shows how these impacts are assessed.

Table 7.1: Scale for evaluation of project impacts

SCORE	**(-1) +1**	**(-2) +2**	**(-3) +3**	**(-4) +4**	**(-5) +5**
PARAMETER					
Magnitude	Impacts occur or are felt on site		Impacts affect more than 3 kilometers radius		Impacts affect the region
Significance	**Low** Small changes which are hardly detectable	**Moderate** Impact measurable but does not alter processes	**High** Many people, animals, plants affected. Disruption to ecosystems and social systems.	**Very high** Loss of biodiversity, property, livelihood systems	**Unknown effects** Insufficient information available. Apply precautionary principle
Probability of occurrence	**Possible** Impacts can occur but are controllable		**Probable** The impact is likely to occur but can be controlled by effective measures.		Definitely will occur
Duration of occurrence	**Short term** During pre-disposal phase only	**Medium term** Impacts will be during operational phase only		**Long term** Impacts will be there for entire operation phase	**Very Long term** For the entire operational phase and afterwards

7.1 Planning and Design Phase

7.1.2 Positive Impacts

7.1.2.1 Creation of Employment opportunities

During the planning and design phase of the proposed project, there will be employment opportunities especially for professionals. Those involved in planning and design include engineers, surveyors, environmentalists, hydrogeologists and sociologists among others. Those employed will improve their living standards from the fees they will be paid for their services.

7.1.2.2 Awareness creation among the local community

During the planning and design phase of the proposed project, a lot of awareness shall be done through consultations on different aspects of the project. Awareness improves civility in project planning, implementation and operations. This is a sure formula for ensuring there is sustainability of the project and acceptability among the local community.

Impacts during this phase of the project are not significant. However, the professional consultants shall take necessary measures to document any concerns and address them on as they occur.

7.2 Implementation/Construction Phase

7.2.1 Positive Impacts

Employment opportunities

The construction works will require several human resources from machine operators to other skilled and unskilled labourers. Machine operators will be engaged for excavation works, site clearance, compaction works and backfilling. Several workers including casual labourers, plumbers and engineers are expected to work on the site for a period of time. Semi-skilled, unskilled and formal employees are expected to obtain gainful employment during the period of construction. With labour intensive construction technologies, the project will provide employment for the locals.

Market for construction inputs

The Project will require materials, most of which will be sourced locally. These include sand, cement, ballast, hard-core, lining materials, steel bars/ rods. This will provide a ready market for suppliers in and outside the project area.

7.2.2 Negative Impacts

Loss of Flora and Fuana

The proposed site lies on a relatively flat land covered with thorny bushes. The project site is a virgin land hence there will be clearing of the bushes to set up the site in preparation of the project implementation. The significance of the vegetation loss and other living organism during the site clearance will be high.

Proposed Mitigation Measures

- The contractor will ensure proper demarcation of the project area to be affected by the construction works; Strict control of construction vehicles to ensure that they operate only within the area to be disturbed by access routes and other works;
- Retention of herbaceous plants and shrubs, where possible on the potential sites for screening of the visual impact;
- Re-planting of plant biodiversity in the disturbed surfaces should be done.

Excavation and loss of top soil

Project construction will involve earthworks and excavation. These activities will generate a lot of top soil that will need to be disposed from the project site. This top soil will also be used during disposal of asbestos and asbestos containing materials. The excavated soil may affect the surrounding environment if not adequately disposed.

Proposed Mitigation Measures

- Maximizing the re-use of excavated materials to ensure that no permanent spoil dumps are created
- Extra loads of excavated soil should be used to make good the access road to the project site
- Properly disposing off the spoil in an area identified by the experts and approved by NEMA

Physical disturbance of the project setting

The proponent is expected to undertake physical works on the project site especially during the clearing of the bush and general vegetation at the project site. These activities will have minimal negative impacts and could result in; Changes in the local topography during excavation and Blockage of natural drainage for rain water

The negative impacts will be temporal because the proponent is expected to mitigate all the negative impacts prior to commissioning of the landfill. The potential negative impacts on the physical environment will be addressed through the environmental management plan.

Proposed Mitigation Measures

- The proponent should ensure that there is minimal disturbance to the topography of the area
- The landfill design shall not interfere with local drainage or change the topography or introduce physical changes that are not in harmony with the physical setting of the project area

- The landfill and associated structures should be aesthetically acceptable to blend in with the surroundings and
- The proponent shall as much as possible complete the works in such a way that natural aesthetics shall be retained at the locations
- Restoration shall be undertaken to ensure that the original setting is as much as possible retained
- The proponent should observe measures stipulated in the ESMP

Noise and Excess Vibrations

Constructions of the proposed project will most likely result in noise disturbance as a result of the machines that will be used e.g. excavation equipment and construction vehicles delivering materials to site. Noise will also be generated by construction workers. Significance of noise impacts depends on whether the project would increase noise levels above the existing ambient levels by introducing new sources of noise. Noise impacts would be considered significant if the project would result in the following:

- *Exposure of persons to noise levels in excess of acceptable and permitted levels*
- *Exposure of persons to excessive ground-borne vibration or ground-borne noise levels*
- *A substantial permanent increase in ambient noise levels (more than 3dBA) in the project vicinity above levels existing before the project*

Proposed Mitigation Measures

- Installation of portable barriers to shield compressors and other small stationary equipment where necessary
- Use of quiet equipment (i.e. equipment designed with noise control elements)
- Limit pickup trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use, and encourage workers to shut off vehicle engines whenever possible
- Provision of appropriate Personnel Protective Equipment (PPE)
- Construct mainly during the day
- Consider labour based construction methodologies; andThe provisions of EMCA on noise and excessive vibrations should be observed
- nstallation of portable barriers to shield compressors and other small stationary equipment where necessary
- Use of quiet equipment (i.e. equipment designed with noise control elements)
- Limit pickup trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use, and encourage workers to shut off vehicle engines whenever possible
- Provision of appropriate Personnel Protective Equipment (PPE)
- Construct mainly during the day
- Consider labour based construction methodologies; and
- The provisions of EMCA on noise and excessive vibrations should be observed

Dust Emissions

Dust will be emitted during excavation and related earthworks. Air-borne particulate matter pollution is likely to occur during the excavation works. This is likely to affect site workers, in extreme situations leading to respiratory problems.

Proposed Mitigation Measures

- Minimizing the number of motorized vehicles on use
- Rehabilitate disturbed areas
- Provide scour checks on over-15% slopes or when working in loose soils
- Wet all active construction areas as and when necessary to reduce dust.

Increased Waste Generation

Solid wastes generated during construction include papers used for packing, plastics, cuttings and trimmings of materials among others. Dumping around the site will interfere with the aesthetic status and has a direct effect on the surrounding community. Disposal of the same solid wastes off-site could also be a social inconvenience if done in the wrong places. The off-site effects could be aesthetic, pest breeding, pollution of physical environment including water resource, invasion of scavengers and informal recycling by communities.

Proposed Mitigation Measures

- Setting up waste collection and segregation area strategically within the site for collection and sorting of slid wastes before disposal.
- Construction waste should be recycled or reused as much as possible to ensure that materials that would otherwise be disposed as waste are diverted for productive uses
- The Proponent shall put in place measures to ensure that construction materials requirements are carefully budgeted and to ensure that the amount of construction materials left on site after construction is kept minimal
- Minimization of solid waste during construction of the proposed project through use of durable, long-lasting materials that will not need to be replaced often, thereby reducing the amount of construction waste generated over time
- Measures to ensure that waste materials from the project are disposed at suitable sites will be taken. These will include engaging only reputable truckers and conducting appropriate spot checks to verify that disposals are done in accordance with the requirements of NEMA, hence the ultimate fate of the wastes should be monitored so that they are not illegally disposed
- Provision of portable sanitary conveniences for the construction workers for control of sewage waste

Increased Water Demand

During the construction phase of the proposed project, both the construction workers and the construction works will create demand for water in addition to the existing demand. Water will mostly be used during construction for wetting surfaces or cleaning/curing completed structures. It will also be used by the construction workers to wash and drink.

Proposed Mitigation Measures

- The proponent through the contractor shall ensure that water is used efficiently at the site by sensitizing construction staff to avoid irresponsible water use
- Any water handling equipment, facility and systems shall be appropriate for the intended usage. Water used on the construction shall reflect the level of conservation achieved by the contractors. Documentation of amounts of water used will be helpful in minimizing wastage

Occupational hazards at workplace

Construction workers are likely to have injuries and hazards as the construction works unavoidably expose workers to occupational safety and health risks. The workers are also likely to be exposed to risk of accidents and injuries resulting from accidental falls and injuries from hand tools and construction equipment.

There will also be an increased risk of traffic accidents where delays and diversions are imposed or altered without adequate warning.

Proposed Mitigation Measures

- To reduce on the workers accidents and hazards, the proponent will develop and commit the contractors to Site Occupational Safety and health rules and regulations as stipulated in the Occupational Safety and Health Act, 2007
- All construction workers should be advised of the dangers associated with construction work
- Workers should be provided with suitable PPE
- Provision of adequate sanitary facilities to workers
- Train all workers on Safety Health and Environment (SHE) with an aim of improving awareness
- Install safety signage along the work areas
- Where construction activities interfere with the movement of traffic, the site should be signed and controlled by trained flagmen/flag women and lit by night
- Task based risk assessment should be done on daily basis to assess the risks and hazards thereby prescribing the appropriate prevention measures

Loss of Heritage, Cultural and Historical values

The proposed project has the potential to cause loss of heritage cultural and historical significant to the community during its implementation. The site for the proposed project does not possess any cultural and heritage sites. From the field studies, there are no known impacts on archaeologically protected monuments and cultural properties in the proposed project area. Should any archaeological or culturally important artefact be discovered during the construction process, the contractor should develop and implement a chance find procedure that should be approved by the relevant government agency.

High Prevalence of Infectious and Communicable diseases

During the construction phase there is a risk of spread of communicable diseases such as tuberculosis and pulmonary infections. Aspects of the physical environment that promote transmission of diseases include: disposal of wastes and ventilation which are likely to occur during the construction phase of the project. With the influx of people during construction, there will be a likelihood of increase in diseases such as typhoid, tuberculosis, diarrheal diseases, respiratory diseases, dysentery and cholera.

The infection rate of HIV/AIDS and other STI's is expected to rise during the construction phase of the proposed project. This is due to the fact that the contractors, traders and workers will have money to attract women/men from the project area in a bid to solicit for sex, thereby creating avenues for spread of HIV/AIDS and other STIs. The most vulnerable members of the community are women as they don't have access to resources necessary for production and wealth creation.

Proposed Mitigation Measures

- Selecting appropriate locations away from concentration of human settlements for construction camps
- Education and sensitization of workers and the local communities on STIs including provision of condoms to the project team and the public

- The contractor has to institute HIV/AIDS awareness and prevention campaign amongst workers for the duration of the contract e.g. erect and maintain HIV/AIDS information posters at strategic locations within the site.
- The contractor has to ensure that staff are made aware of the risks of contracting or spreading sexually transmitted diseases
- The contractor should ensure that the project workers are sensitized on the local culture

7.3 Operation Phase

7.3.1 Impacts on Health and Safety at Workplace

Environmental Contamination

During the operation of the proposed asbestos landfill and associated activities, there are bound to be breakages that will generate dust therefore inhalation will occur. Due to the fibrous nature of the asbestos, airborne dust is likely to be present in the environment close to the premises where asbestos is handled. All people within that vicinity are likely to be exposed to the dust in the air.

Fibres embedded in lung tissue over time may cause serious lung diseases including asbestosis, lung cancer or mesothelioma. The major health effects associated with asbestos exposure includes:

Asbestosis -- Asbestosis is a serious, progressive, long-term non-cancer disease of the lungs. Symptoms of asbestosis include shortness of breath and a dry, crackling sound in the lungs while inhaling. There is no effective treatment for asbestosis.

Lung Cancer -- People who work in the mining, milling, manufacturing of asbestos, and those who use asbestos and its products are more likely to develop lung cancer than the general population. The most common symptoms of lung cancer are coughing and a change in breathing. Other symptoms include shortness of breath, persistent chest pains, hoarseness, and anemia.

Mesothelioma --this is a rare form of cancer that is found in the lung, chest, abdomen, and heart and almost all cases are linked to exposure to asbestos. This disease may not show up until many years after asbestos exposure.

Health and Safety hazards to the Employess at the Disposal Site

Asbestos containing dust is a complex mixture of fibrous structures. Not only do single fibres vary in dimensions but also such fibres may be found combined with other fibres in the form of bundles, clusters, or matrices. These are known as asbestos structures that can be inhaled. The relationship between soil and air levels of asbestos fibres is therefore considered complex. The potential for asbestos fibres to become airborne depends on the type of work activities as well as natural activities such as wind, i.e. the potential for mechanical disruption of the soil by human and/or natural activities.

The removal/disposal of asbestos and asbestos containing materials, including soil, is anticipated to be high risk work. Suitable precautionary measures must be implemented during asbestos sheet removal or even the

disturbance of asbestos contaminated soil in order to minimize the potential for the release of the fibres into the air. Mitigation measures are essential to avoid exposure of the asbestos workers, employees who operate at the temporary site and the final disposal site and members of the public who may use the sites or reside in close proximity of the sites, when the asbestos is being lifted.

In the absence of mitigation measures, and if people (mainly employees conducting the disposal) inhale or ingest asbestos fibres while the asbestos clean-up is underway, the following negative human health effects may occur in the long term (note that it takes years before these effects could materialize and would be related to the level of exposure): Asbestosis (note that asbestosis is incurable). Lung Cancer (can be treated but however can also result in death), Mesothelioma (can be treated but however can also result in death). Cancer of bronchus, Cancer of intestines (can be treated but however can also result in death), Warts or corns (Dermal) (can be treated). A potential public health risk exists within the areas of the asbestos disposal, unless the recommended mitigation measures are implemented.

Proposed Mitigation Measures

All employees will wear the appropriate Personal Protective Equipment and Clothing (PPE & C) during the exercise.

Wire fencing will be used for high risk areas

Warning & Safety signage will be placed at the areas within the disposal site.

No member of the public to be allowed near of the works area.

All personnel involved with the asbestos disposal process will be subjected to medical surveillance.

All machinery involved in an asbestos disposal process will be jet-washed prior to leaving site.

Asbestos air sampling will be conducted on the site

The employer must not allow anybody to work in or to enter an environment in which they may be exposed to asbestos that will exceed the exposure limit for asbestos.

When there is a visible dust or winds in excess of 20 knots, any asbestos disposal activity will be stopped.

Sergent Logistics Limited Safety Health and Environmental (SHE) policy will apply to the asbestos workers.

If more than 20 employees are involved, the employer must have a Safety and health representative

The asbestos site manager shall establish a safety and health committee.

There must be a safety and health plan that is kept onsite which must contain appropriate safety measures. Employees must be trained on the contents of the safety and health plan

The premises first aiders must be available to the asbestos workers

A first aid kit must be kept onsite.

Personal Protective Equipment (PPE)

Refers to clothing and respiratory apparatus designed to shield or protect individuals from chemical, physical or biological hazards. PPE assists in providing preventive measures when used correctly. All PPE must be suitable for the person using it and provide effective protection for its intended purpose
The following are some of the protective equipment that can be used during asbestos handling activities;:

- *Respirators - half-face, dual-cartridge respirators, each equipped with a pair of High Efficiency Particulate Air (HEPA) filters.*
- *Overalls – should be with built-in booties and disposed off properly in sealed asbestos disposal bags after use.*
- *Rubber boots - These are highly recommended so that coverall booties do not wear through. Rubber boots can be washed off later or disposed of as contaminate debris.*
- *Eye protection - Each person removing asbestos materials should wear non-fogging goggles or safety glasses*

7.3.2 Impacts on Natural/Physical Resources

Impacts on Ground Water Level

A hydrogeological survey conducted by MankenGeohydrotechon the proposed project site. The report indicated that the site would be suitable for the proposed use since the water table was established to be at the depth of over 100M below (Appendix 1) the ground, the project proponent is expected to undertake all the necessary measures that will prevent occurrence of leachate penetrating to the underground water resources. This could occur in the event of poor lining of the disposal pit. This could have longterm adverse effects on groundwater quality, well water quality, and surface water quality stemming from discharge of the groundwater to the surface water. There is no water resource in the immediate vicinity of the proposed disposal site.

Proposed Mitigation Measures

The best mitigation practice in landfill operations is to provide a liner in the entire landfill; the liner could either be natural or synthetic. The proponent stands guided by the national asbestos disposal guidelines on the design of the landfill.

The landfill will not be used to dispose biodegradable wastes that are associated with harmful leachate and emissions. Well packaged asbestos harnessed by proper lining of landfill facility will provide zero chances of asbestos fibres mixing with underground water

Impacts on Flora and Fauna

The proposed site lies on a relatively flat land covered with thorny bushes. The development of a proper landfill site entails clearing of the existing bushes and excavations which will see massive loss of habitat for wildlife and natural vegetation. The area for the proposed project is a virgin land covered by natural bushes. Few trees have been cut for the purposed of charcoal burning.

Proposed Mitigation Measures

Minimal disturbance to the undisturbed sections of the project site where the landfill activities will not affect

Landscaping of the entire project site to create favorable environment for plant growth, plants will in return provide habitat for animals mainly insects

Impacts on Soil

During the clean-up activities, the contaminated soil will be removed and disposed of at the disposal site– this will result in a loss of soil, which will be replaced with either clean soil or stone at relevant areas where asbestos remediation is required. The loss of soil can be completely reversed by the addition of clean soil. However, remediation of the contaminated soils may lead to open excavated areas. The extent of soil removal coupled with the already impacted nature of the area does not warrant the implementation of mitigation measures. To cover these areas with soil would entail removal of soil from some other (probably not impacted) area and may therefore constitute loss of valuable soil resources. Soil erosion is a minimum in the area owing to the nature of the soils and the extent of the area development. Areas that require a substantial amount of excavation, and pose a safety hazard as a result, can be backfilled with stones or soil.

Impacts on Geology and seimic activities

The proposed project will have potentiality to cause risk as a result of seismic activities within the area. This will be caused by the excavations of the landfill and movement of the underground earth materials.

Proposed Mitigation Measures

- The concrete underground wall shall be constructed to withstand the seismic events on the landfill
- The proposed project site has not recorded any seismic events in the recent past hence reducing the chances of seismic events

Impacts on Air Quality

The proposed landfill will strictly be used for disposing asbestos materials only. Therefore, landfill gases associated with municipal wastes such as biodegradable wastes are not expected from the proposed landfill. Bedsides asbestos is odorless and therefore there will no incidences of foul smell emanating from the proposed landfill during operations.

7.3.3 Impacts on Increased Solid Waste Generation

Apart from the asbestos waste and asbestos containing materials, other waste may be generated by the asbestos clean-up activities, including the following:

Hazardous waste

Asbestos contaminated PPE that will be discarded will become hazardous waste, and if disposed incorrectly on the site or surrounding areas may pose health risk to people who come into contact with the waste.

Wastewater will be generated from the decontamination facility where asbestos workers will shower (on a daily basis, until the clean-up is complete). This water will not go into the municipal system and will be

collected in receptacles - drums) and will be treated as hazardous waste, and disposed to a hazardous landfill.

General waste (non-hazardous)

These type of wastes includes; food wrappers, eating utensils, paper wastes, office wastes and used equipment General waste can be disposed to a general landfill by the asbestos workers to avoid cross contamination with general waste from the daily operations at the active landfills. If general waste is dumped in the surrounding area, it may impact the environment and people around there, by creating a breeding ground for pests and disease.

If hazardous waste is incorrectly disposed of into the surrounding environment (onto uncontaminated soil, which then can result in the release of asbestos fibres into the air), this will create an exposure route for asbestos related disease and could pose health risks to people in the vicinity of the waste. With proper general and hazardous waste disposal, the impacts of the general and hazardous waste that is generated by the disposal and clean-up can be avoided**.**

Proposed Mitigation Measures

The asbestos contaminated soil, materials and other hazardous waste (such as used PPE and wastewater) from the asbestos hazardous landfill by the asbestos workers or contractor will be treated as hazardous waste, and disposed to a hazardous landfill.

General waste will be handled by a NEMA licensed waste handler

Littering on the site (general waste) is prohibited.

Waste receptacles for general waste should be placed at designated areas within the site

Ablution facilities must be provided for the asbestos disposal and clean-up workers. These should be located in a designated area.

Should any spillage of the asbestos waste occur, it must be cleaned-up immediately and the affected areas appropriately remediated.

7.3.4 Impacts on Traffic and Site accessibility

The operations of the proposed asbestos disposal site are likely impact on the traffic in the area through the access road to the site. This will be as a result of trucks visiting the site in delivering the asbestos wastes. The proposed site area does not exhibit traffic jams since the site is within the village setting.

Proposed Mitigation Measures

- The trucks carrying asbestos materials will be advised to access the site at intervals to reduce traffic congestion along the access road
- The operations of the site will be on contractual basis hence reducing the potential impacts of heavy traffic

7.3.5 Impacts on Heritage, Cultural and Historical Values

The site for the proposed project does not possess any cultural and heritage sites. Therefore, the proposed protect will not have any impact on the cultural and heritage values of the community.

7.3.6 General Positive Impacts of the Proposed Project

The landfill will provide employment opportunities directly and indirectly; there will be staff employed to run the operations of the facility, transporters of asbestos materials to the facility, contracted asbestos roof replacers and other persons who will be indirectly engaged in the entire process of asbestos disposal that solely depends on the availability of the disposal facility

The facility will lessen the challenge that is currently prevailing with regards to disposal of asbestos especially during the Coast Region; this is largely due to the fact that there are few asbestos disposal facilities and incidences of illegal dumping of asbestos are on the rise

The landfill will provide a facility for sound and safe disposal of asbestos materials thereby protecting the environment from potential/ real negative impacts of poor disposal

By providing sound asbestos disposal services, there will reduce predisposing of human and wildlife population to asbestos hence reducing the medical costs associated with exposure to asbestos

The facility will provide a return on investment to the proponent while at the same time ensuring that the proponent pays the requisite taxes to the government for annual operations

The facility will contribute in ensuring that monitoring of sound disposal of asbestos wastes can be done by undertaking the necessary monitoring exercises

7.3.7 General Negative Impacts

Exposure to human and wildlife population to asbestos by not observing the set guidelines on: handling, temporary storage, packaging, transporting, disposing and post-disposal procedures

Pollution of ground water in the event of poor lining of the pit

Pollution of surface water in the event of interfering with local drainage and topology thereby exposing the landfill to the elements of weather such as water runoff and erosion

Air pollution by poor packaging of asbestos thereby exposing the friable asbestos to the elements of weather

Social-economic impacts associated with unbearable medical costs and eventual loss of life resulting from exposure to human and wildlife population to asbestos as result of poor operating procedures in the landfill.

CHAPTER 8: ENVIRONMENTAL MANAGEMENT PLAN

8.1 Introduction

The objectives of the Environmental Management Plan are:

- To guide the project implementers in project planning,
- To guide the Project implementers on the likely impacts of the project and when they are likely to occur.
- To give an assessment of the capacity requirements for the implementation of the EMP,
- To guide the project implementers to allocate adequate resources for the implementation of the mitigating measures.

8.1.1 Plan Period

The EMP provided here is to cover the entire timeframe of the proposed asbestos disposal site (landfill)) operations. It is then expected that several internal/ external surveys will be undertaken at the end of the project to evaluate conformity to the EMP as well as identify any gaps and recommend corrective adjustments to the plan. This will then be addressed through a loop mechanism from pre-disposal phase to disposal phase to identify the success of the project versus the failures. This should be analyzed through the environmental management criteria of impact and mitigation.

8.1.2 EMP Outline

The table below outlines the environmental management plans for the proposed cycle. The plan considers the following;

- *Predicted environmental impact*
- *Proposed mitigation measures*
- *Responsible party / parties*
- *Timeframe*
- *Estimated costs*

8.2 EMP for the Proposed Asbestos Disposal Landfill

Anticipated Impacts/environmental aspect	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
Occupational Health and Safety Hazards	Inform all the relevant stakeholder and government officials prior to commencement of any work. All employees will wear protective clothing during the exercise. Provision of respirators to all persons entering the asbestos site Fence off the site to avoid unauthorized access Warning & Safety signage will be placed at the strategic areas within the disposal site All personnel involved with the asbestos disposal process will be subjected to medical surveillance Asbestos air sampling will be conducted on the sites for clean-up When there is a visible dust or winds in excess of 20 knots, any asbestos disposal and cleaning process will be stopped Thorough, complete and up to date records should be kept at the site Ensure all asbestos is collected and loaded into a transportation vehicle licensed by NEMA The transporting vessel shall be labelled “hazardous waste” The workers should be trained on asbestos handling and management	Project Manager/Contractor	Thought the project cycle	50,000.00
Screening of asbestos wastes	All Asbestos Containing Materials (ACM) will be recoded indicating the origin of the waste for easy tracking	Proponent/ site manager	During disposal	-

Anticipated Impacts/environmental aspect	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
	All deliveries to the disposal site to be registered in NEMA tracking document Confirmation of material properties prior to disposal Employees at the site to be trained on asbestos handling procedures			
Water Quality and underground contamination	The asbestos wastes shall be disposed in underground concrete confinement of 130mm thick The maximum depth of the pit will be 10M not exceeding a depth of water table that is over 100M in respect to the hydrogeological survey conducted on the proposed site. The pit will be built with the recommendations in the safe asbestos management guidelines The proponent shall install water quality monitoring device Asbestos is insoluble in water and alkali and as such cannot can leach	Site Manager/proponent	During Construction and operation	50,000 per month
Air Quality	Establish air quality monitoring systems and implement operational management plans to ensure that the system is being maintained properly and that the outputs of the monitoring system are providing suitable data on air quality Appoint a dust monitoring system to monitor and analyze dust and air quality Air monitoring should be done continuously in areas related to asbestos removal and disposal works	Proponent	During operation/quarterly	80,000
Generation of dust nuisance and noise as a result of movement of vehicles and trucks	Vehicle speeds on the access road will be limited to about 10km/h to minimize the generation of dust Adequate wetting of operation surfaces of the site to reduce dust generation	Site Manager	During operation	50,000 per month

Anticipated Impacts/environmental aspect	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
accessing the site	A wash down area will be provided for all trucks and vehicles leaving the site to reduce dust particles from the operation site Onsite noise level to be kept to a max of 45dB during operation hours Installation of speed limits for vehicle will help in reduction of noise emission from and around the site The operations of the site will be advised to strictly obey the working hours (8am to 5pm daily)			
Increased traffic and road safety	Signposting, warning signs, barriers and traffic diversions, site should be clearly visible and the workers warned of all potential hazards Provision of safe passages and crossings for pedestrians be made Active management by trained and visible staff at the site, if required for safe and convenient passage for the workers The trucks carrying asbestos materials will be advised to access the site at intervals to reduce traffic congestion along the access road The operations of the site will be on contractual basis hence reducing the potential impacts of heavy traffic	Site manager/supervisor	During construction and operation	30,000
Asbestos and Asbestos Containing Material (ACM) Management	Asbestos disposal site shall be marked clearly as handling hazardous material The asbestos will be appropriately contained and sealed to minimize exposure The asbestos prior to removal should be treated with a wetting agent to minimize asbestos dust Asbestos should be handled and disposed by skilled & experienced	Proponent and site supervisor	Pre-disposal and During operation	100,000

Anticipated Impacts/environmental aspect	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
	professionals If asbestos material is being stored temporarily, the wastes should be securely enclosed inside closed containments and marked appropriately. Security measures will be taken against unauthorized removal from the site. The removed asbestos will not be reused			
Risk of Asbestos Exposure	The proponent shall not permit any person to work in an environment in which he or she would be exposed to asbestos in excess of the prescribed occupational exposure limit. Provision of appropriate PPE to all employees within the site at all times All the workers at the site to be subjected to regular medical surveillance	Site supervisor	During operation	60,000
Waste Management Systems	Use of an integrated solid waste management system i.e. through a hierarchy of options: 1. Source reduction 2. Recycling 3. Reuse 4. Disposal Ensure that all waste removal workers comply with the Waste Regulations of 2006 Adequate dust bins and waste segregation facilities should be strategically placed within the site Contract a NEMA licensed waste handler to dispose of non-hazardous wastes at designated dumping sites	Proponent and site supervisor	During operation	10,000 per month
Loss of biodiversity in the project area	The proposed site will be rehabilitated through the rehabilitation plan to be developed by the proponent to try and retain the natural flora and fauna during the operation phase. This will entail progressive planting of native trees within the boundary of the site	Proponent	During operation	50,000
Land /soil degradation	Rehabilitation plan will be developed to restore the site to its natural state.	Proponent	During opeartion	50,000

Anticipated Impacts/environmental aspect	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (Ksh)
	This also involve progressive planting of native plant species In the event of decommissioning the project, the site will be covered to a depth of one metre below the ground surface			
Storm water Management	Ensure that all the storm water from the proposed project site is channeled into the storm drains	Proponent	During operation	30,000
General Conditions for operations at the site	Notify workers about the upcoming activity if any Prepare appropriate PPE complying with international good practices Post appropriate signpost of the site that will inform the workers of key rules and regulations to follow	Site Supervisor	Pre-disposal and during operations	50,000
Fire Safety at the site	The project proponent shall install firefighting equipment and develop fire response plan within the site Fire safety training and fire drills will be conducted on regular basis on the site Installation of appropriated fire signage in strategic points within the site	The Proponent	During operation	30,000
Social Concerns Security of the site Community conflicts	 Contracting a security personnel and fencing the facility to enhance the security Make sure all stakeholders and the local population is comfortable with project implementation. Comprehensive public consultation was conducted with the local	 The proponent The proponent and	 During operation Continuous	 10,000 per month

Anticipated Impacts/environmental aspect	**Recommended Mitigation Measures**	**Responsible Party**	**Time Frame**	**Cost (Ksh)**
Heritage, Cultural and Historical values	community and leadership to create awareness among the locals Prevention and restoration of cultural and heritage values of the community in the proposed project site The site for the proposed project does not possess any cultural and heritage sites	the locals Proponent	engagement	- -

8.3 Project Decommissionng

In the event that the proposed disposal site lifetime is limited as a result of any unforeseen factors, then at some point, the asbestos disposal site must be decommissioned or redeveloped to keep up with changes in land use and legislation on environmental impact. An initial site assessment will have to be undertaken before an acquisition is made and a change of site usage is proposed. Environmental assessment is a key part of the due diligence process and ensuring that all surveys and assessments identify potential decommissioning hazards and risks and how to conserve resources and reduce the instances of environmental liability.

In extreme situations, the decommissioning process may involve the safe handling and disposal of hazardous asbestos, material and waste and the cleanup of a site that has been contaminated by previous disposal operations. Exposure to asbestos may be fatal: the fibres can lodge in the lungs, thus causing the onset of a number of types of lung cancer. This may be prevented if suitable protective clothing is worn. The site may carry more risks through the decommissioning process. The cost of the decommissioning process may be high, but the safety implications of contamination are so severe that each step of the process needs to be planned and executed to perfection.

The purpose of decommissioning of the site will be to reclaim the land, making it safe for people and vegetation. The introduction of vegetation to the site is less likely to have any severe impact. Environmental impact assessment will ensure that environmentally responsible decommissioning and redevelopment is a priority and that introduction of right biodiversity species offsets any damage that may have been previously caused. The regeneration of this site will aim at protecting the health of the people that work on or are near the site and provide protection for the land for any other future developments with minimal negative impact

CHAPTER 9: ENVIRONMENTAL MONITORING PROGRAM

9.1 Overview of monitoring program

Throughout the operation phase, regular monitoring intended for proper safety and protection of the environment will be undertaken. The monitoring system will assist in observation, evaluation, assessment and reporting on the performance of different/various variables with regard to the environment.

9.2 Environmental Management System

An environmental management system (EMS) is a comprehensive approach to managing environmental issues, integrating environment-oriented thinking into every aspect of development management. An EMS ensures environmental considerations are a priority with other concerns such as costs, product quality, investments, productivity and strategic planning.

The proposed development will require that a comprehensive safety, occupational and public health and environmental system be formulated and maintained in accordance with the relevant legislative and regulatory requirements.

9.3 Environmental Institutional Framework

The project proponent will work with EIA/EA experts' team in identifying ways to improve environmental performance of the disposal setting objectives and targets, monitoring and evaluating implementation.

9.4 Monitoring schedule

The proponent will follow the monitoring schedule that will assist in observation, evaluation assessment and reporting on the performance of different/various variables. The following table summarizes the suggested monitoring schedule of the disposal site.

Table 9.1: Summary of monitoring schedule

Description of parameter	**Method of monitoring**	**Monitoring schedule and duration**
Compliance by contractor and contractor staff to HSE requirements	Visual inspections against checklists containing requirements	Review daily to determine impact on quality
Public health and safety	Visual inspection and complaints from neighbors/workers	Daily

9.5 Waste tracking

As per the Waste Management Regulations of 2006 and the National guidelines on Management and Disposal of asbestos, the proponent must ensure that tracking documents are in place and that necessary notifications to the authority are done.

CHAPTER 10: CONCLUSIONS & RECOMMENDATIONS

10.1 Conclusion

Asbestos is a hazardous material that requires proper handling and safe disposal. The proposed project will therefore be significant and will play a big role in enhancing the environmental and occupational safety and health benefits of an asbestos free environment. Mitigation measures and Environmental Management Plan have been proposed to address the scope of the predicted adverse environmental impacts to the highest degree. The findings of the ESIA carried out for this project indicate that possible environmental impacts generated can be addressed effectively by the proponent through the mitigation measures proposed.

10.2 Recommendations

This report recommends issuance of a license/approval subject to the conditions that NEMA may impose during the decision making process. The following recommendations should however be considered:

- *The project does not pose any serious environmental concerns, other than those of a minor scale that accompany similar projects*
- *The positive impacts of the project outweigh the negative ones, which will be adequately contained by following the prescribed environmental and social impact management plans*
- *As such, the project could be allowed to commence, and activities be managed within the provided EMP and sound environmental management practices that are locally and internationally recognized.*

REFERENCE

1) Government of Kenya (GoK), Energy Act, 2006.
2) Environmental (Impact Assessment & Audit) (Amendments) Regulations, 2019.
3) Government of Kenya (GoK). National Development Plan, 2002-2008, Government Printer.
4) Government of the Republic of Kenya, 1994. The Kenya National Environment Action Plan (NEAP). Report. Ministry of Environment and Natural Resources, Nairobi, Kenya.
5) Government of the Republic of Kenya, 1996. Environmental Impact Assessment (EIA) (Guidelines and Administrative Procedures). Draft Report, National Environment Action Plan (NEAP) Secretariat. Ministry of Environment and Natural Resources, Nairobi, Kenya.
6) Government of the Republic of Kenya. National Policy on water Resources Management and Development.
7) Government of the Republic of Kenya: Policy Paper on Environment and Development
8) Government of Kenya (GoK) Physical Planning Act, 1999 .
9) Legal Notice No. 120: EMCA (Water Quality) Regulations, 2006
10) Legal Notice No. 121: EMCA (Waste Management) Regulations, 2006
11) Legal Notice No. 61 EMCA (Noise and Excessive Vibration Pollution Control) Regulations, 2009
12) NEMA Kenya (2013), National Guidelines on safe Management and Disposal of Asbestos
13) Government of Kenya (GoK), Occupational Safety and Health Safety (OSHA) Act No. 15 of 2007
14) The County Government Acts(2012)
15) Constitution of the republic of Kenya, 2010
16) Government of Kenya (GoK),The Public Health Act
17) Government of Kenya (GoK),The Water Act (2016))

APPENDICES

Appendix 1: Hydrogeological Survey Report

Appendix 2: Company Certificate of Incorporation

Appendix 3: Copy of KRA PIN certificate

Appendix 4: County Business Permit

Appendix 5: Copy of land sale agreement

Appendix 6: Public participation questionnaires/public *baraza*minutes

Appendix 7: Approval of TOR

Appendix 8: Copy of EIA /EA experts' practising licenses