PROPOSED INCINERATOR PLANT ON PARCEL NO. NTIMA/NTAKIRA/ 7535, 7404 & 7405 IN GIANTUNE AREA IN IMENTI NORTH SUB-COUNTY MERU COUNTY.

ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT REPORT

Submitted To:

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY
COUNTY DIRECTOR OF ENVIRONMENT
MERU COUNTY
P.O. BOX 67839- 00200 Nairobi

Submitted on behalf of:

SCORPIO SOLUTIONS LIMITED
P.O BOX 9551-60200
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Submitted by:

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NAIROBI

DOCUMENT CERTIFICATION

The Environmental & Social Impact Assessment (ESIA) Project Report was conducted and report compiled by a team led by: Grace Njeri, NEMA Reg No. 7562 associate, James Gituma, NEMA Reg No. 8020 Lead and Eric M. Miriti, NEMA Reg No. 7048. Lead consultant.

I *Eric M. Miriti* on behalf of the team of experts GEM Environmental Consulting & Research Services, hereby confirm that to the best of our knowledge, all information contained in this report is an accurate and truthful representation of all findings as relating to the proposed project as per project information provided by the proponent and information gathered during stakeholder's engagements with the EIA consultants.

Signed in NAIROBI on this ……Signature and stamp: ……

PROPONENT DECLARATION

I, ……....., on behalf of **SCORPIO SOLUTIONS LIMITED** (PROPONENT) submit this Environmental Impact Assessment report (EIA) for the PROPOSED INCINERATION PLANT on Plot No. . NTIMA/NTAKIRA/7535,7404 & 7405 Meru County.

To my knowledge, all information contained in this report is an accurate and truthful representation of all findings as relating to the proposed project and as per the project description provided to the EIA consultant.

Signed in NAIROBI on this …….

Signature and stamp ……

LIST OF ABBREVIATIONS AND ACRONYMS

%	Percentage
Cap.	Refers to 'chapter' in the Laws of Kenya
CBO(s)	Community Based Organization(s)
CGM	County Government of Meru
CO	Carbon-monoxide
CO^2	Carbon dioxide
dBA	Decibels (a unit of measuring sound)
EA	Environmental Audit
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
EMP	Environmental Management and Monitoring Plan
ft	Foot/feet (a unit of measuring length)
GOK	Government of Kenya
hr(s)	Hour(s) (A unit of measuring time)
KEBS	Kenya Bureau of Standard
KEMSA	Kenya Medical Supplies Authority
KFS	Kenya Forest Service
Km	Kilometer(s) (A unit of measuring distance)
Km2	Square kilometer(s) (A unit of measuring area)
KShs.	Kenya shilling(s) (a unit of measuring currency in Kenya)
m	Metre(s) (a unit of measuring length)
m3	Cubic metre(s) (a unit of measuring volume)
mm	Millimeter(s) (A unit of measuring length)
NCA	National Construction Authority
NEAP	National Environment Action Plan
NEC	National Environmental Council
NEMA	National Environment Management Authority
NMK	National Museums of Kenya
No.	Number
o	Degrees (A unit of measuring latitudes and longitudes)
oC	Degrees Celsius (A unit of measuring temperature)
OSHA	Occupational Health and Safety Act
P. O.	Post Office
PPE	Personal Protective Equipment
PVC	Polyvinyl chloride
Reg. No.	Registration number
SHE	Safety Health Environment
spp	Species
TOR	Terms of Reference
TSP	Total Suspended Particulates
UPS	Uninterrupted Power Supply
WRA	Water Resources Authority

OPERATIONAL TERMS

Authority: Refers to the National Environment Management Authority (NEMA) established under section 7 of the Environmental Management and Coordination Act (EMCA) Amendment, 2015.

Decommissioning: This is the permanent withdrawal from a site or close down of a facility for restoration.

Proponent: Means a person proposing or executing a project which is subjected to an Environmental Impact Assessment (EIA) or undertaking an activity specified in the second schedule of EMCA the 1999.

Environment: Physical factors of surroundings of human beings including land, water, atmosphere, climate, sound, Oduor, taste, the biological factors of animals and plants and social factor of aesthetics, culture and includes both the natural and the built environment.

Environmental Audit (EA): The systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing in conservation or preservation of the environment.

Environmental Impact Assessment (EIA): A systematic evaluation of activities and processes of an upcoming project/facility to determine how far these activities and programs conform to the approved environmental management plan of that specific project and sound environmental management practices.

Environmental Management and Monitoring Plan (EMP): Means all details of project activities, impacts, mitigation measure, time, schedule, costs, impact or activities, including monitoring and environmental audit during implementation and decommissioning phase of a project.

Mitigation: Measures which include engineering works, technology improvement management ways and means of minimizing negative aspects, including socio-economic and cultural losses suffered by communities and individuals, whilst enhancing positive aspects of the project.

Project: Means any undertaking that may have an impact on the environment.

Scoping: Is the process of determining the content and extent of the matters which should be covered in the environmental information to be submitted to a competent authority for projects which are subject to EIA.

Screening: It is a coarse analysis of the possible impacts of an action with a view to identifying those impacts which are worthy of detailed study for a project to be considered for an EIA process or not.

Standards: Means the limit of discharge or emission established under the Act or under Regulations.

Waste: Includes any matter whether liquid, solid, gaseous or radioactive, which is discharged, emitted or disposed in the environmental in such a volume composition or manner likely to cause an alteration of the environment.

EXECUTIVE SUMMARY

Industrialization in Kenya and the implementation of Environmental Management and Coordination (Waste Management) Regulations, 2006, has necessitated the need to develop a hazardous waste treatment facility that can cope with the increased demand from industrial waste and at the same time meet the ever-demanding regulatory framework. The proponent is a private Kenyan citizen who intends to install an incinerator to facilitate waste management within Meru County.

The availability of a commercial hazardous waste treatment facility is not only a critical environmental issue, but also an essential economic factor for a country that aspires to grow its industrial base. Most international companies expect a hazardous waste management program to be in place that is both economical and meets international standards, especially ISO 14000 considerations. Besides, without the means to treat and dispose hazardous wastes, it is not possible to enforce the current environmental legislation.

The installation of a new incineration facility at Giantune in Meru County will increase the handling capacity of hazardous waste which will both assist the economic growth of industries and provide a proper treatment and disposal route that is affordable.

The purpose of this EIA report submission to the National Environment Management Authority (NEMA) is to grant the proponent an opportunity to install an incineration plant in the land which is currently left idle. The proposed site is approximately 300m from Meru Eastern Bypass Road in Giantune area. The area is well connected to road that will enable its operators to safely transport wastes by road from across the county for treatment. The incinerator is expected to handle 150 kgs/hr. during its pick operation.

Upon realization of the growing hazardous wastes challenges, the proponent is seeking to install a new facility to be able to provide a hazardous waste handling capacity to cater for the need of such waste disposal by ever increasing industrial establishments in the country.

For this reason, the proponent has identified a parcel of land in Giantune area in Imenti North Sub-county within Meru County approximately 4 km from Meru Town Center to establish a designed yard for the collection, storage and incineration. The site will also take advantage of the existing road for safe delivery of waste from various part of the county and the country at large.

In compliance to the Environmental Management and Coordination Act (EMCA), 1999 as well as the related regulations, the proponent has undertaken this EIA Study through a NEMA registered Lead EIA Expert for review and necessary approval purposes.

Our investigation examined the potential impacts of the project on the immediate surrounding with due regard to all the phases from installation through to completing, operation and decommissioning. It encompasses all aspects pertaining to the physical, socio-cultural, health and safety conditions at the site and its environs during and after installation of the project. During the screening exercise, issues identified as those that may be impacted upon by the project activities include: air quality, health and safety, and other environmental hazards and socio-economic welfare of the surrounding communities. *The estimated project cost is Kenya shillings* ***four million seven hundred thousand only (Kshs.4, 700,000)***.

The proposed plant will be handling hazardous wastes through incineration. It is, therefore, expected that there will be potential emission of various gases and particulate matter into the atmosphere, depositions of particulate matter onto land and vegetation to the west of the plant. This scenario implies potential linkages with the surrounding environment and ecological setting that require to be addressed during the construction and upon commissioning. The following sections outline these linkages as well as proposed corrective measures.

ANTICIPATED IMPACTS Positive Impacts

The plant has an overall positive implication to the country, and especially urban, agricultural and industrial sectors. The major threat to the environment and human health today is risks associated with waste management. Not all waste sources are capable of handling hazardous and toxic materials within the premises without compromising the health of their own workers or the neighboring communities. The result of waste generators disposing wastes without appropriate equipment has been pollution of environmental resources and particularly water sources, air pollution, land contamination and even direct effects to human health. In this regard, therefore, the following are considered main benefits of the proposed plant;

The facility is a blue print of vision 2030 aimed at having a clean and healthy environment for all. It also encourages private investments in environmental conservation within the country.

Cleaning up of hazardous and toxic materials from the agricultural sector and particularly the agro-chemical manufacturers and dealers as well as major users such as to include expired chemicals, packaging materials and obsolete equipment.

Provision for disposal of expired drugs and medicines from hospitals and health centers across the country, most of whom do not have a professional mode of the waste disposal,

The facility will provide a safe point for reducing the volumes of hazardous waste and toxic wastes before disposal into appropriate county's landfills, most of which currently is dumped into public garbage disposal sites with adverse implications to the ecology and human health. The facility will provide a multiple of direct and indirect employment opportunities within the county

Negative Impacts

The project is anticipated to create negative impacts as well. This will emanate from the construction and subsequent operation activities of the facility. They include the following:

- Air pollution: Emissions released to the atmosphere both during the installation and operation,
- Impact to soil (soil erosion and degradation) especially when laying the foundation and other earthworks
- Potential contamination of soil and water; due to oil spills and other leakages/releases.
- The health and safety of workers and immediate residents and neighbors may be compromised due to accidents, pollution and disturbance.
- Impact (constraints/pressure) to the existing infrastructure i.e., water, power, surface drains, roads among others.
- Vegetation clearing
- Increased storm water/run off resulting from the roof catchments and as a result of decreased recharge areas, after pavement of most areas i.e., fore court and drive ways.
- Visual Intrusion; likely to occur during earthworks for the foundation of the project.
- Increased waste generation (both solid and liquid) during construction and operation phases.

Proposed mitigation measures

- To minimize the occurrence and magnitude of the negative impacts, mitigation measures have been proposed against each of the anticipated impact. Some measures have been integrated in the project designs with a view to ensuring compliance with applicable environmental laws and guidelines. The measures include the following:
- Erection of warning /informative signs (bill boards) at the site during the installation/construction phase.
- Suppressors or silencers on equipment or noise shields for instance corrugated iron sheet structures. Management strategies to reduce impacts including truck speed. Sensitize workers on the need to switch off engines whenever possible; ensure that the machineries are well maintained; ensure that the work is carried out during the recommended time.
- Septic system should be properly designed (using approved materials), installed and regularly maintained to effectively drain effluent.
- Workers should be provided with appropriate personal protective equipment (PPE) to beef up their health and safety and they should be sensitized on EHS safety measures.
- The site should be fenced off during installations to keep off animals and the general public.
- Provision of sound waste management systems and procedures. This will involve provision of solid waste collection bins; segregation of waste at source, appointing a reputable garbage collector etc. during operation phase. During the installation phase, the contractor should put in place effective and efficient waste disposal systems. Waste, including excavated soil and debris should be properly disposed of by backfilling or dumping in approved grounds by the County Council.
- An emergency power control switch will be strategically installed in order to facilitate general power cut of the entire workplace in case of emergency.
- An adequately stocked "First Aid Box" will be provided and the employees at the incinerator will be properly trained on how to administer first aid.
- Following the completion of the construction phase, measures will be undertaken to restore the affected biodiversity through landscaping; i.e., planting of trees and grasses to cover unpaved areas.

- The surface drainage system should direct all potentially contaminated surface waters from the incinerator area into waste interceptor. The drainage and interceptor maintenance will be carried out regularly, including cleaning the interceptors of foliage, rubbish and grit.
- Capacity building of the workers and staff; to create awareness towards potential risks and recommended preventive measures through training. This will ensure that health and safety measures are followed. Conduction of regular drills on fire prevention and control will be encouraged to ensure proper preparedness for fire control.
- Formal procedures will be put in place for energy and water saving to optimize their use.
- The staff will be encouraged to turn off unnecessary lights and not to leave water taps running.
- Comprehensive firefighting equipment should be provided after completion of the project. This should be installed or provided at strategic points. The fire extinguishers should be serviced accordingly i.e. after every six months to ensure effective and efficient performance when required.
- The contractor and the proponent will implement the proposed mitigation and monitoring plan in order to protect the environment from any negative impacts.
- During the operation phase, conduct annual environment audit, health/Safety and Fire audits.
- Realization of cordial relations among various community, economic, social and cultural groups as well as between the local community and the contractor,
- Soil compaction and watering of loose soils on all unpaved access areas, construction materials at the construction sites to minimize air pollution and erosion by the agents of soil erosion i.e., water and wind.

Conclusion

The proponent should take note that apart from the positive impacts created, the project has negative impacts which should be closely monitored and evaluated. This will ensure that the environment is always safeguarded. It is important that the proponent conducts regular site assessments to provide early indication of leaks or releases of waste into the ground and other potential risks. Considering the proposed project, mitigation measures that will be put in place and the project's contribution to the environment and economy, its implementation is considered important and beneficial. The key effort should be geared towards safeguarding the environment. This can be effectively overcome through close following and implementation of the recommended Environmental Management Plan (EMP), consequently attaining sustainable development.

It is concluded that the project is important for economic development of the county and has a balanced environmental considerations and benefits. This report gives adequate measures to mitigate the negative impacts and a management plan. The proponent is committed the proposed measures during the construction, operation and decommissioning phase of the project. Accordingly, as per part 11 section 10 (2) of the Legal Notice No. 101 on The Environmental Impact Assessment and Audit) Regulations, 2003, we recommend that the project is granted an EIA license.

Project Cost

The project cost will be approximately four million, seven hundred thousand Kenya shillings. This entails land leveling, landscaping and construction of the incinerator housing and installation.

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CHAPTER ONE: BACKGROUND AND RATIONALE FOR THE EIA

1.1. Introduction

The Project Proponent Scorpio Solutions Ltd has a keen interest in investing in waste management sector in the County and Country in general. Upon realization of the growing hazardous wastes challenges, the Proponent is seeking to install a new incineration plant to enable waste handling capacity with enhanced safety and health and without compromising environment and public health. For this reason, the proponent has identified and purchased a parcel of land in Giantune area, in Imenti North Sub- County within Meru County for the sole purpose of establishing a designed work area for the collection, storage and incineration of waste. The project has also included consultation of the public and review of all the necessary documentations to ensure approvals are obtained from the relevant Authorities.

1.2. Project overview and justification

Industrialization in Kenya and the implementation of Environmental Management and Coordination (Waste Management) Regulations, 2006, has necessitated the need to develop a hazardous waste treatment facility that can cope with the increased demand from industry and at the same time meet the ever-demanding regulatory framework. The proponent is a Kenyan citizen and an investor. The installation of the incinerator was conceptualized by the proponent due to the fact that he is an Environment enthusiast. Consequently, the proponent intends to develop the facility to provide local industry and the public sector with the technical infrastructural capacity to manage hazardous wastes.

Meru is coupled with the rapid human development and other agricultural activity in the area means that hazardous waste production is on the great rise. The area is also characterized by various hospitals and industries that account for various chemical wastes and other hazardous wastes. This incineration services are hence a necessity within Meru County.

The availability of a commercial hazardous waste treatment facility is not only a critical environmental issue, but also an essential economic factor for a country that aspires to grow its industrial base. Most international companies expect a hazardous waste management program to be in place that is both economical and meets international standards, especially ISO 14000 considerations. Besides, without the means to treat and dispose hazardous wastes, it is not possible to enforce the current environmental legislation.

The management of hazardous wastes in Kenya is regulated under the Environmental Management and Co-ordination Act (EMCA, 1999), EMCA (Waste Management) Regulations (2006) and other related regulations controlling the disposal of Pesticides, Pharmaceutical wastes and Hazardous and Nuclear wastes. These regulations establish an order of preference for the management of hazardous wastes to be: minimization, recycling, treatment, and land filling. The installation of the incineration plant at Giantune area will both assist the economic growth of industries and provide a proper treatment and disposal route that is affordable.

1.3. Scope, Objective and Criteria of the Environmental Impact Assessment (EIA)

1.3.1. Scope of the Report

The EIA exercise has been conducted to evaluate the impacts of the proposed incinerator installation on the environment and proposals have been given on how to eliminate or minimize any undesirable effects resulting from its implementations (construction, installation and future operations). This report includes an assessment of impacts of the installations and operations on the following:

- Physical environment;
- Flora and fauna;
- Land use;
- Socio-economic aspects;
- Health issues;
- Fire response preparedness;
- Spill/leak containment;

The report has assessed the impacts of the proposed Station on the environment in accordance with the EMCA, 1999 guidelines and EIA/EA regulations. The scope of the EIA study covered:

- A review of the policy, legal and administrative framework
- Description of the proposed project
- Baseline information
- Provisions of the relevant environmental laws
- Assessment of the potential environmental impacts on the project area

- Development of the mitigation measures and future monitoring plans

1.3.2. Project Objectives

The purpose of this EIA is to ensure adequate identification of potentially negative environmental impacts. Secondly to propose workable mitigation measures and thirdly to formulate an environmental management plan (EMP) articulating envisaged impacts.

The overall objective of the study on the other hand is to ensure that all environmental concerns are integrated in all the project development processes with an aim of managing hazardous waste without compromising the natural environment and the ecology of the area.

Specific objectives include:

- To identify possible environmental impacts, both positive and negative
- To assess the significance of the impacts
- To assess the relative importance of the impacts of relative plan designs, and sites
- To propose preventive mitigation and compensative measures for the significant negative impacts of the project on the environment.
- Generate baseline data for monitoring and evaluating how well the mitigation measures are being implemented during the project cycle.
- To present information on impact of alternatives
- To present the results of the EIAS that can guide informed decision making and safe operation of the incineration plant

1.3.3. Terms of Reference (TOR) for the EIA Process

The TOR for the EIA included but not limited to the following:

- The proposed location of the project
- A concise description of the national environmental legislative and regulatory framework, baseline information, and any other relevant information related to the project.
- The objectives of the project.
- The technology, procedures and processes to be used, in the implementation of the project.
- The materials to be used in the installation, construction and implementation of the project.

- The products, by-products and waste to be generated by the project.
- A description of the potentially affected environment.
- The environmental effects of the project including the social and cultural effects and the direct, indirect, cumulative, irreversible, short-term and long-term effects anticipated.
- Recommend a specific environmentally sound and affordable waste management system.
- Analysis of alternatives including project site, design and technologies.
- An environmental management plan proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment, including the cost, timeframe and responsibility to implement the measures.
- Provide an action plan for the prevention and management of the foreseeable accidents and hazardous activities in the cause of carrying out development activities.
- Propose measures to prevent health hazards and to ensure security in the working environment for the employees, residents and for the management in case of emergencies.
- An economic and social analysis of the project.
- Such other matters as the Authority may require.

1.3.4. Data Collection Procedures

First, the Consultants undertook collection of data, which was carried out through public participation meeting/standard interview schedules, use of checklists, observations and photography, site visits, desk top environmental studies and scientific tests, where necessary in the manner specified in Part V (section 31-41) of the Environmental (Impact Assessment and Audit) Regulations, 2003. Then data collected underwent environmental screening and scoping to avoid unnecessary data.

1.3.5. EIA Organization and Structure

The EIA was carried out to full completion within a period of twenty-four (24) days from the date of undertaking. The Consultant (Lead Expert) coordinated the day-to-day functions and any related institutional support matters. The team undertaking the study was charged with responsibilities under the leadership of the team leader for a successful EIA process.

1.3.6. Reporting and Documentation

The Environmental Impacts Assessment Project Report from the findings was compiled in accordance with the guidelines issued by NEMA for such works and was prepared and submitted

for consideration and approval. The Consultant ensured constant briefing of the client during the exercise.

1.3.7. Responsibilities and Undertaking

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

The output from the consultants includes the following:

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

1.3.8. Methodology Outline

Since the proposed site is located within an area with no rich natural resources whose total effect to the surroundings could not be adverse. It also noted that the proposed development and use of facility on completion will greatly promote hazardous waste management which is a big issue of concern not only in Meru County but in the Country at large. The general steps followed during the assessment were as follows:

- Environment screening, in which the project was identified as among those requiring environmental impact assessment under schedule 2 of EMCA, 1999
- Environmental scoping that provided the key environmental issues
- Desk Stop studies and interviews
- Physical inspection of the site and surrounding areas
- Reporting

1.3.8.1 Environmental Screening

This step was applied to determine whether an environmental impact assessment was required and what level of assessment was necessary. This was done in reference to requirements of the EMCA, 1999, and specifically the second schedule. Issues considered included the physical location, sensitive issues and nature of anticipated impacts.

1.3.8.2 Environmental Scoping

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

1.3.8.3 Desktop Study

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

1.3.8.4 Site Assessment

Field visits were meant for physical inspections of the site characteristics and the environmental status of the surrounding areas to determine the anticipated impacts. It also included further interviews with neighbors. First site visit was carried out on 12th October 2022 and 21st October 2022 and 26th October 2022

1.3.8.5 Reporting

In addition to constant briefing of the client, this environmental impact assessment project report was prepared. The contents were presented for submission to NEMA as required by law.

The Terms of Reference was prepared and submitted to the Authority for approval. The ToR was submitted on 28th September 2022 and approved ToR No. 485. The ESIA preparation was commissioned immediately by the proponent.

CHAPTER 2: BASELINE INFORMATION OF THE PROPOSED PROJECT AREA

2.1. Introduction

Here, emphasis is placed on describing proposed project area Giantune area in terms of resources, vegetation, land-use patterns, socio-economic activities, population, topography, climate, geology among others so as to provide information from which the potential impacts of the proposed project can be predicted. Giantune is found in Meru County.

2.2. Development Concerns and Plans

Major environmental concerns in the area are geared to the improvement of the sub-county activities to effectively deal with the problems of:

- Clogged storm water drainage lines and culverts along the roads and in the streets;
- Poor solid waste collection and disposal systems;
- The problems related to the increasing population which poses pressure on the existing resources for example water and energy and facilities such as housing
- Lack of effective public water supply and sewerage systems.

2.3. Population

During the population and housing census in 2019, Meru County had a population of 1,545,714. Within the area of 7006 $Km^{2,}$ the current population density is at 206 persons per Km^2. There is an average of 1.3% population growth rate and thus the population in the county is expected to remain high. The proposed project area in Giantune area, an area that is about 4Km to Meru Town which has a very high population with over 80, 191 people inhabiting the Meru town and its environs.

2.4 Climate

2.4.1 Rainfall

Rainfall pattering in Meru town is similar to that of Meru County at large: it is spread into two wet seasons. The long rains usually begin from March and end in June while the short rains span from August to October. The peaks occur in May and September respectively. Generally, rainfall varies from lows of 250 mm to highs of 2,500 mm per annum. Most rainfall received in the County comes in form of relief rainfall.

2.4.2 Temperature

Meru County has high temperatures all the year round with slight variations in the mean maximum and minimum which range from 8^{o} C to 32^{o} C. The mean maximum is about 24^{0} C and diurnal temperature variations are minimal.

2.4 Altitude and soils

The altitude at the project area is 1520 M above sea level. Soils are deep, well-drained, dark brown, friable sandy loams.

2.5 Water resources

Due to the high rainfall throughout the year, rivers and springs are perennial. Most of the County has a high potential for groundwater. The average depths of striking water vary depending on the geology of an area. The main river flowing through the County is River Kathita. There are numerous springs which form the sources of the various streams in the district. Many households in the County have access to portable water especially in the rural areas while in the municipality people have access to piped water supplied by MEWASS (Meru Water and Sewerage Services). However, the water supply coverage may be declining due to the increasing population, especially in Meru town hence justifying the need for water rationing by the providers.

2.6 Geology

Rocks in the project area range from early Precambrian to Quaternary. Land at the project area is relatively flat. However, the entire district is characterized by undulating pars.

2.7 Agricultural activities

The main crops grown in Meru include maize, potato, beans, sweet potato, banana, nuts and yams, and keeping livestock, and some are also involved in agroforestry. Of the main food crops, maize and beans are the most important staples, followed by the root crops, banana and yams. Other food crops grown in the County are tea, cassava, arrowroots, groundnuts, French beans and soy beans. Among the cash crops, Miraa (Khat) is the most important and is grown mainly in the Meru North. Animals kept include poultry, cow, sheep and goats. There are also sections with horticulture and floriculture developments under controlled climatic conditions.

2.8 Flora

The Municipality has both exotic and indigenous tree species. The trees are used mainly for ornamental, shade, boundary demarcation, fencing and production of fruits.

2.9 Land-use patterns

Within Meru Town and its environs, land is divided into residential, commercial, industrial and the central business district. Hotels, small shops and institutions form the prime land-uses in the municipality. In the rural areas and parts of the municipality, land is used primarily for settlement and agriculture though changes have been cropping due to increased population with many people opting to utilize their parcels as residential zones.

2.10 Business activities

Business entrepreneurs licensed in the formal sector include catering, retail, motor vehicle repairs, wholesale, manufacturing, welding, bar and restaurant, distribution, bakeries and export-import activities. The County has financial institutions like the commercial banks. They enhance economic activities by offering credit facilities to farmers, traders and training in basic business management skills during the plan period, alongside effects to attract other financial institutions. The informal sector is widespread in the County and it contributes considerably to the growth of the County economy. However, the sector requires intensive promotion since it uses affordable and readily available technology and is among the sectors, which offer most of the employment opportunities.

2.11 Physical and social infrastructure

Electricity is supplied by KPLC. However, some institutions have opted to the installation of back-up generators and solar energy systems to supplement KPLC supply especially in times of power black-outs. Water in the area is supplied by the MEWASS. The area is served by traffic on the Meru – Nairobi and Meru – Nanyuki Highways. There are other feeder roads. However, these feeder roads are dry weather roads and most become impassable during the rainy seasons. Communication is excellent for mobile reception from Safaricom, Airtel and Telkom networks.

CHAPTER THREE: METHODOLOGY

3.1 Methodology

The preparation of an Environmental Impact Assessment report is a multi-disciplinary process that requires use of various approaches and data collection methods. In this particular survey, public participation and consultation was widely used and the bottom-top approach of participation applied. Both scientific and social data collection methods were used and they included the following:

3.1.1 Public Participation Meeting

Public participation meetings were held on different times and days with the immediate and close neighbors and interested parties of the parcel where the incinerator plant would be installed. The general feedback was positive with none of the attendees having any reservation towards the proposed project. The minutes of the aforementioned meetings are attached as part of the Report annexes. The public baraza was held on 26th October 2022 at the chief's office. 12th and 21st October stakeholders were also engaged to sensitize them on the upcoming project and how the incinerator works. This was possible through workshops and focus groups.

3.1.2 Observations

Field observations formed an integral part of the report as the experts gathered considerable information through observations. This involved site visits and recording the situation on the ground. Observations were also used as a tool for verifying the facts that were gathered through interviews and questionnaires.

3.1.3 Photography

Photos were taken to show the actual site of the proposed development, resources on site and neighboring development.

3.1.4 Secondary data

Various literatures were used in aiding the successful completion of the report. They include: The Kenya Gazettes Supplement Acts 2000, Environmental Management and Coordination Act No.8 of 1999. Government printer, Kenya Gazette supplements Acts, Physical Planning Act-Cap 286 of 2009. Government printers, Kenya Gazette supplement No.56, Environmental Impact Assessment Audit regulations 2003. Government printer, Meru County Development plan, Environmental Management and Coordination (Waste Management) regulations, 2006 Legal Notice No.12, the Public Health Act, cap 242, the factories and other places of work Act and water Act 2002, draft of the wetlands policy 2008 among others.

CHAPTER 4: RELEVANT LEGISLATIVE AND REGULATORY FRAMEWORK

4.0. Introduction

The EMCA No. 8 of 1999 was developed to harmonize and co-ordinate environmental management issues in Kenya. Topmost in the administration of EMCA is the National Environmental Council (NEC), which formulates policies, sets goals and promotes environmental protection programs. The implementing institution for EMCA is NEMA.

4.1. Kenyan policy papers and Acts

4.1.1. Environmental Management and Coordination Act (EMCA), No. 8 of 1999

According to sections 58 and 138 of EMCA No. 8 of 1999 and Section 3 of the Environmental (Impact Assessment and Audit) Regulations 2003 (Legal Notice No. 101), residential/commercial urban complexes require an EIA project/study report prepared and submitted to NEMA for review and eventual licensing before the development commences.

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

Section 66 (2) warns that the issuance of an EIA license in respect of a project shall afford no defense to any civil action or to a prosecution that may be brought or preferred against a proponent in respect of the manner in which the project is executed, managed or operated.

4.1.2. National Environment Action Plan (NEAP)

NEAP, Kenya was prepared in 1994 as a deliberate policy to integrate environmental considerations in to the country's social and economic development process. The integration was achieved through multi-sectoral approach to develop a comprehensive framework to ensure that environmental management and conservation of natural resources is an integral part of societal decision-making process.

4.1.3. Sessional Paper No. 6 of 1999 on Environment and Development

Every person in Kenya is entitled to a clean and healthy environment and has a duty to safeguard and enhance the environment. As envisioned in the paper, Kenya should strive to move along the path of sustainable development which aims at meeting the needs of the current generation without compromising the ability of the resource base to meet those of future generations. The overall goal is hence to integrate environmental concerns into the national planning and management processes and provide guidelines for environmentally sustainable development. The policy paper emphasizes that EIA must be undertaken by the developers as an integral part of a project preparation. It also proposes for periodic environmental auditing to investigate if developer is fully mitigating the impacts identified in the assessment report.

4.1.4. Public Health Act (Cap. 242)

Environmental degradation may pose a health hazard to the general public. This is among the factors considered by the Public Health Act. Section 15 (IX) of the Act indicates that any noxious matter, or wastewater discharged from any premise, such as a building constitutes nuisance. Any premise not kept in a clean condition, free from offensive smell such as gases which are injurious to health such as those from commercial establishments shall therefore generate nuisance. The act stresses that no person shall cause a nuisance to exit from any land or premise occupied by him/her. Part X of the act states that where in the opinion of the Medical Officer of Health that food stuffs within a warehouse or a building are insufficiently protected; the owner shall be compelled to observe the required regulations. Otherwise, he/she shall be guilty of an offense.

4.1.5. Way-leaves Act (Cap. 292)

Section 3 of the Act states that the government may carry any sewer, drain or pipeline into, though, over or under any lands whatsoever, but may not in so doing interfere with any existing building.

Section 7, provides that any person in the service of the government and any contractor executing any work for the Government, together with his agents and servants, may at any time enter upon any land for the purpose of surveying, setting out and marking the line of any intended sewer, drain or pipeline, or for the purpose of inspecting, repairing, removing, re-laying or cleansing any sewer, drain or pipeline the property of the Government, or for any other purpose under this Act.

4.1.6. Occupational Safety and Health Act, 2007

This is an Act of Parliament to provide for the safety, health and welfare of workers and all persons lawfully present at workplaces. This Act applies to all workplaces where any person is at work, whether temporarily or permanently. Part II section 6 (1) states that; every occupier shall ensure the safety, health and welfare at work of all persons working in his workplace while part II section 6 (2) (b) provides the duties of an occupier as arrangements for ensuring safety and absence of risks to health in connection with the use, handling, storage and transport of articles and substances.

Part II section 7 (1) (a) provides that except in such cases as may be prescribed, it is the duty of every occupier to prepare and, as often as may be appropriate, revise a written statement of his general policy with respect to the safety and health at work of his employees and the organization and arrangements for the time being in force for carrying out that policy.

The act further states that; every workplace shall be kept in a clean state, and free from effluvia arising from any drain, sanitary convenience or nuisance. An occupier shall ensure that his workplace shall not, while work is carried on, be so overcrowded as to cause risk of injury to workers.

4.1.7. The Physical and Land Planning Use Act No.13 Of 2019

The new Physical and Land Use Planning Act, 2019 (the 2019 Planning Act) came into force on 5 August 2019, repealing the Physical Planning Act of 1996 (the 1996 Act). The 2019 Planning Act shall now govern matters relating to planning, use, regulation and development of land in Kenya.

- The government, at both national and county level, is tasked with the preparation of physical and land use plans. The national, county, inter-county and local plans are required to be integrated, and these plans shall collectively form the basis of how land is to be used in Kenya.
- County governments have retained their role of development control in their respective counties. All applications for development permission shall therefore continue to be made in the relevant county.
- Development permission must be sought prior to undertaking any development. A developer who does not obtain such prior permission risks criminal sanctions and demolition of the unapproved works.

- Increased public participation**:** Members of the public will now be given the opportunity to give their views and raise objections to various matters e.g., the suitability of the national and county plans.

Classification of developments**:** Developments are no longer classified as either Class "A" or Class "B" but rather the 2019 Planning Act lists developments that require development permission. In this regard, developments such as subdivision, amalgamation, change of user, extension of user, extension of lease and approval of building plans will still require development permission to be issued by the relevant county government.

4.1.8. Local Government Act (Cap. 265)

Section 147 (a) provides the miscellaneous powers of every local authority as to require the owner of any premises to remove, lower or trim to the satisfaction of the local authority any tree, shrub or hedge overhanging or interfering in any way with the traffic on any road or street, or with any wires or works of the local authority.

Section 148 (1) (a) provides that a local authority may impose fees and charges for any license or permit issued under this Act or any other written law or in respect of any person or matter, premises or trade, whom or which the local authority is empowered to control or license.

4.1.9. Penal Code (Cap. 63)

The chapter on "Offences against Health and Conveniences" contained in the Penal Code strictly prohibits the release of foul air into the environment, which affects the health of other persons. According to section 192, any person who voluntarily violates the atmosphere at any place, to make it noxious to health of persons in general dwelling or carrying out business in the neighborhood or passing along public ways is guilty of misdemeanor, i.e., imprisonment not exceeding two years with no option of fine.

Section 193 provides that, any person who for the purpose of trade or otherwise makes loud noise or offensive awful smell in such places and circumstances as to annoy any considerable number of persons in the exercise of their rights, commit any offence, and is liable to be punished for a common nuisance.

4.1.10. Environmental Management and Coordination (Waste Management) Regulations, 2006

According to part II of the regulations; on general provisions, a generator of waste should:

Not dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle;

Collect, segregate and dispose or cause to be disposed-off such waste in the manner provided for under these Regulations; and

Ensure that the waste is transferred to a person who is licensed to transport and dispose-off such waste in a designated waste disposal facility.

Under section 4 of part II, there are the provisions for prevention of water pollution and states that:

Every person shall refrain from any act which directly or indirectly causes, or may cause immediate or sub-sequent water pollution, and it shall be immaterial whether or not the water resource was polluted before the enactment of the Act; and

No person shall throw or cause to flow into or near a water resource any liquid, solid or gaseous substance or deposit any such substance in or near it, as to cause pollution.

4.1.11. The Way Leave Act

The areas zoned for communication line, sewer lines, power lines, water pipes etc are known as way leaves. The way leave act prohibits development of any kind in these designated areas. Thus, any developer is bound by this act to see to it that no development takes place in these areas. The proponent has taken into consideration the requirement of the act. The proposed project will not encroach on power line way leave which is close proximity to the site and will leave the required space for such services – the project manager to supervise and ensure compliance is attained.

4.1.12. Occupational Safety and Health Act, 2007)

The Act makes provision for the health, safety and welfare of persons employed in workplaces. The provisions require that all practicable measures be taken to protect persons employed in a workplace from dust, fumes or impurities originating from any process within the facility. The provisions of the Act are also relevant to the management of hazardous and non-hazardous wastes, which may arise at a project site.

For developments such as construction projects, the Act is important as it requires project proponents to have adequate management procedures of occupational safety and health at the work places. In particular the project should be implemented during construction in accordance with the requirements of the Building and Works of Engineering Construction Rules, which is a subsidiary

legislation of the Occupational Safety and Health Act, 2007. For safe construction works, the contractor and project managers should ensure the following:

- Provision of Personal Protective Equipment's (PPEs), fire safety, electrical safety, and other precautions essential for safe construction work.
- Provision of Physical barriers and solid separators (dust barriers, hazard barriers, temporary walkways, among others as explained in the project Environmental Management Plan.)
- Inspection of construction equipment to ensure that they are in good working condition before beginning a job. In addition, the proponent will ensure that regular inspections and maintenance of the equipment are conducted accordingly.
- Provision of a First Aid Kit stocked in accordance with the First Aid Rules, 1977 and also ensures availability of a trained First Aider at all working times.

4.1.13. Policy Guidelines on Environment and Development (Sessional paper No.6 of 1999)

Among the key objectives of the policy paper on Environment and Development (Sessional paper No.6 of 1999) are to ensure that from the onset, all development policies, programs and projects take environmental considerations into account and to ensure that an immediate environmental impact assessment (EIA) report is prepared for all kinds of developments before implementation. Under this paper, broad categories of development issues among them the human settlement sector, have been covered that require sustainable approach. The policy recommends the need for enhanced re-use/recycle of residues including wastewater, use of low non-waste technologies, increased public awareness and appreciation of clean environment. It also encourages participation of stakeholders in the management of wastes within their localities. Regarding human settlement, the paper encourages better planning in both rural and urban areas and provision of basic needs such as water, drainage and waste disposal facilities among others. The proponent intends to adhere to these provisions.

4.1.14. National Policy on Water Resources Management and Development

While the National Policy on Water Resources Management and development (1999) enhances a systematic development of water facilities in all sectors for the promotion of the country's socio-economic progress, it also recognizes the by-products of these processes as waste water. It, therefore, calls for the development of appropriate sanitation systems to protect people's health and water resources from pollution. Projects therefore, should be accompanied by corresponding

waste management systems to handle the waste water and other wastes emanating there from. The same policy requires such projects should undergo comprehensive Environmental Impact Assessment. The proponent has addressed all these and this report forms the basis.

4.1.15. Petroleum Act, Cap. 116

The legislation has noted several challenges that face the sector which include proliferation of substandard Petroleum Products dispensing and storage sites which pose environment health and safety risks; diversion of petroleum products destined for export into the local market by unscrupulous business people to evade tax and a dominance of the market by a few companies among others. The Government noted these challenges in its energy policy contained in Session Paper No. 4 of 2004 on Energy and recommended review of the Petroleum Act Cap 116 and other energy sector statutes and the introduction of a new energy sector legislation to cover petroleum, electricity and renewable energy. It also recommended the formation of a single energy sector regulator to regulate electricity, downstream petroleum, renewable energy and other forms of energy.

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

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

4.1.16. Energy Act, 2006

In 2006, the Energy Act No. 12 of 2006 was enacted. This led to the transformation of the then Electricity Regulatory Board to the Energy Regulatory Commission (ERC) to also regulate petroleum and renewable energy sectors in addition to electricity. The Act states in Section 5(a) (ii)

That the objects and functions of ERC include regulating the importation, exportation, transportation, refining, storage and sale of petroleum and petroleum products. Therefore, one of the functions of the ERC is licensing of petroleum import, export, transport, storage, refining and sale. Construction Permits are also to be issued by ERC for all petroleum related facilities in order to check proliferation of substandard sites. All petroleum operators are required to comply with provisions for Environment Health and Safety. Petroleum products should also meet the relevant Kenya Standards.

The Minister may on the recommendation of the Commission make regulations-

a) Defining the kind of petroleum to which the regulations shall apply, and dividing the petroleum into classes or categories and making different provisions with regard to such classes or categories;

b) Governing the design, construction and operation of pipelines, refineries, bulk liquefied petroleum gas facilities, retail dispensing sites, storage depots and providing for the protection of property and the environment and the safety of the public in the construction and operation thereof.

The proponent shall not contravene any provision of the act in whatever way.

4.1.17. Weights and Measures Act, Cap. 513

The above-named Act mandates the Weights and Measures Department to annually certify the measuring equipment used such as the weighing balance in order to ensure that they are properly calibrated. During the certification exercise, the measuring mechanisms inside the equipment are sealed with a seal-mark of quality assurance. The proponent intends to adhere to the provision of this act by ensuring that all the measuring equipment are effectively calibrated. The proponent will hence have in place certificate of verification issued by Weights and Measures Department for all weighing machines present at the workplace.

4.1.18. Compliance of Solid Waste Management Legal Notice No. 121

The environment management and coordination Legal Notice No. 121 on (Waste Management) provides for the responsibility of waste generation, cleaner production methods, segregation of waste by generator, waste transportation license responsibility of waste transporter, transportation of waste by licensed transporters, license for disposal facility, waste

treatment by operators of disposal sites, requirement of environmental audit and re- use and recycling plant. The legal notice provides mitigation measures to industrial waste and their treatment. The hazardous and toxic wastes have been specified by the legal notice that also provides for various requirements of EIA. Details on how toxic and hazardous waste should be handled, stored, treated, transported and even provision of permits. This has to apply to pesticides and toxic substances, biomedical waste, and radioactive waste whereby collection, transportation, storage, treatment and disposal of them have been specified. The legal notice further specifies offence, penalties and operation of regulation that have to be followed when dealing with any type of waste. The proponent will have to adhere to legal notice No 121 in its project cycle that is from construction, operational and decommissioning of the incinerator.

The proponent is environmental management company characterized by presence of environmental experts. The proponent will fully adhere to the legal notice No. 121 in its project cycle that is from construction, operational and decommissioning of the incinerator. The proponent is also intending to apply for waste transportation license from the Authority.

4.1.19 Noise and Excessive Vibrations Act, 2009

Under this Act, except as otherwise provided in these regulations, no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment.

The proponent will adhere to this provision installing modern machinery which are silenced and environmentally friendly.

4.1.20 Work injury benefits Act-Act No.13 of 2007.

It is an act of Parliament to provide for compensation to workers for injuries suffered in the course of their employment. It outlines the following:

- Employer's liability for compensation for death or incapacity resulting from accident;
- Compensation in fatal cases;
- Compensation in case of permanent partial incapacity;
- Compensation in case of temporary incapacity;
- Persons entitled to compensation and methods of calculating the earnings;

- No compensation shall be payable under this Act in respect of any incapacity or death resulting from a deliberate self-injury;
- Notice of an accident, causing injury to a workman, of such a nature as would entitle him for compensation shall be given in the prescribed form to the director.

The contractor will need to abide by all the provisions of WIBA. During the operation the occupier must also ensure that this legal provision is complied with.

4.1.21. Kenya's Vision 2030.

Efficient waste management infrastructure for transport and treatment of solid waste is imperative for the desired Kenya's socio-economic transformation and has been identified as a central pillar in Vision 2030. Clean environment has likewise been identified as one of the infrastructural enablers of economic, social and political pillars of Kenya's Vision 2030.

Kenya aims to be a nation that has a clean, secure and sustainable environment by 2030. The goals for 2012 are:

(i) to increase forest cover from less than 3% at present to 4%; and

(ii) to lessen by half all environment-related diseases.

Specific strategies will involve promoting environmental conservation in order to provide better support to the economic pillar flagship projects and for the purposes of achieving the Millennium Development Goals (MDGs); improving pollution and waste management through the design and application of economic incentives; and the commissioning of public-private partnerships (PPPs) for improved efficiency in water and sanitation delivery. Kenya will also enhance disaster preparedness in all disaster-prone areas and improve the capacity for adaptation to global climatic change. In addition, the country will harmonize environment- related laws for better environmental planning and governance.

The proponent is hence committed to promoting the vision by installing the proposed incinerator. The proponent's intervention is based on realization that effective and reliable waste management infrastructure is critical in promoting the country's ability to manage solid hazardous wastes produced in different industrial and farm setup.

4.2 The International Framework

This EIA is intended to meet the expectations of international supporters through the government of Kenya. Kenya is a signatory to some international legislation. Some of these are relevant to this project and were reviewed for the purpose of writing this report.

4.2.1 The Rio Declaration on Environment and Development

Agenda 21 – a programme of action for sustainable development worldwide in the Rio Declaration on Environment and Development was adopted by more than 178 governments at the United Nations Conference on Environment and Development (UNICED), known as the Earth Summit, held in Rio de Janeiro, Brazil from 3rd to 14th June 1992. Kenya is a third- world country and therefore its plans fall into the agenda 21 whereby the government, local authorities, donors and other stakeholders have committed large amounts of resources to facilitate sustainable developments. Principle No. 10 of the declaration underscored those environmental issues are best handled with participation of all concerned citizens at all the relevant levels. At the national level, each individual shall have appropriate access to information concerning environment that is held by public authorities. The states shall encourage and facilitate public participation by making information widely available.

4.2.2 The World Commission on Environment and Development

This commission commonly referred to as "the Brundtland Commission" focuses on the environmental aspects of development, with particular, the emphasis on sustainable development that produces no lasting damage to biosphere, and to particular ecosystems. In addition, environmental sustainability is the economic and social sustainability. Economic sustainable development is development for which progress towards environmental and social sustainability occurs within available financial resources. Social sustainable development maintains the cohesion of a society and its ability to help its members work together to achieve common goals, while at the same time meeting individual needs for health and well-being, adequate nutrition, and shelter, cultural expression and political involvement.

CHAPTER 5: PROJECT DESCRIPTION, DESIGN AND CONSTRUCTION

5.1 Nature of the project

The proponent intends to develop a waste handling facility by installing an incineration plant at Meru County located approximately 200 m from Gikumene – Gitoro Eastern Bypass Road in Giantune area in Imenti North Sub- County in Meru County. This is necessitated by the increased demand for proper waste handling facility by the increasing industrialization within the country and the desire for maintenance of a clean environment. The plant has been designed to handle at least 150 KGS/HR of hazardous waste.

When complete, the project will have an incineration plant, waste handling and sorting yard and waste holding point. The specification of the incinerator is listed below;

5.2 Product Description

Product Description

YDF series incinerator is developed by the China Aviation Industry Planning Institute and Henan Yuanda Boiler Co., ltd. From introduction of the Japanese medical waste incinerator technology, and organization of technical experts to solve the key problem, we exert the advantages and discard the disadvantages of the same kind of equipment at domestic and abroad, and developed and unique and international advanced medical waste incineration facilities. The incinerator is small in size, burned with high efficiency, reasonable process, leading technologies and harmless, and its ideal garbage treatment for various hospitals, hotel and station.

Technical sheet and onsite requirements

150 Kg Per Batch Diesel Fired Incinerator		
No	**Item**	**Data**
1	Model	**YDF 150**
2	Rated capacity	150 kg per batch per hour
3	Daily capacity (8 working hours)	1200 kg
4	Incinerator dimension and weight	1.8m×1.4m×3.4m Weight: 6500 Kg
5	Volume of combustion chamber	First combustion chamber: 1500 Liters Secondary combustion chamber: 700 Liters
6	Temperature of combustion chamber	First combustion chamber: 50℃.
7.	Furnace body is made of Q235 steel plate	Secondary combustion chamber: 1300℃
8	The inner lining is refractory insulation material.	(Thickness: 6mm), Manufacturing materials
9	Waste inlet size	760mm×960mm
10	Ash residue	<5%
11	Air blower	0.75 kw
12	Disel burner	Burner 1# Italy Baltur brand BTL-10
	Incineration rate	≥99.9%
	Noise	≤85dBA (at 1 meter)
Onsite		
1	Size and weight	2.1m×1.5m×3.5m ,8500kg
2	Power supply	1.41Kw (220V, 50HZ, Single Phase)
3	Diesel consumption	16-35 Liters/hour

Main characteristics

I. Using gasification incineration technology, it is suitable for incineration of medical equipment such as syringes, drip containers, various paper waste materials, bandages, absorbent cotton, various medical wastes, and various wastes removed from hospitals and medical institutions.

II. Vertical structure, small size, small footprint, compact structure, and low requirements for supporting facilities.

III. Adopt the combustion method of aero engine to make the flue gas enter the high-temperature burnout chamber tangentially and the combustion air tangentially into the combustion-supporting methods, so that the flue gas can be fully burned in the burn-out chamber again, and at the same time, the rotating airflow is used to remove dust from the flue gas.

IV. Adopt gasification incineration method, so that medical waste will not produce frit, sintering and other problems during incineration. The garbage generated every day can be incinerated once.

V. Use gasification incineration, mixed incineration, burn-out treatment and other technologies to make the dioxin content of exhaust smoke and dust lower than the national emission standards.

VI. Adopt fully enclosed operation. The large furnace door is designed to facilitate the disposal of garbage. The furnace door and ash cleaning door of the incinerator are in the form of mother-and-child openings and are fully sealed. They are completely isolated from the outside world during incineration and form negative pressure combustion. It is suitable for treating infectious medical waste and avoiding two Secondary pollution.


Mix burning Chamber
Dust and gas purify chamber
Secondary chamber with
Waste inlet and ash cleaning door
First


Secondary Burner
Oil tank
Electric control
Air Blower
Primary

5.3 Site Location and Ownership

The proposed project site is located about 200M off the Gikumene – Gitoro Meru Eastern Bypass Road at Giantune area in Imenti North Sub-county within Meru County. The site is within Imenti North constituency, Meru County. The parcel of land is on plot Ntima/Ntakira/7404, 7405 & 7535 in Giantune area, Meru County and belongs to Scrpio Solutions Ltd C/o Mr. Anthony Ngera who is the Proponent of the proposed installation. The proposed site is on coordinates 0.065740, 37.601402

The land title deeds are hereby attached as annex.

5.4 Site characteristics and neighborhood

During the site assessment the piece of land was found to be under agricultural activity. Vegetables, bananas, kales spinach and carrots were planted There is a house within the premises that serves as a store. There are very few neighbors. The immediate neighbor on the right is an idle land not occupied while on the left is occupied. The other neighbors are residential houses and the nearest is about 650 meters to the north of the site. This is a sparsely populated area and most of the land has been left idol.

Figure 1: showing the neighbourhood to the site

5.5 Proposed development components

Despite the fact that the general solid wastes management is being addressed through local authorities (direct services, out-sourcing, partnerships and privatizations) handling of hazardous wastes still remains a great challenge to the authorities as well as environmental and public Health fields since this sub-sector of waste management requires specialized handling. Among the options available for the management of hazardous wastes include incineration in accordance to the guidelines in the Environment Management and Coordination Act (Waste Management regulations), Gazette Notice No. 121 of September

2006). The integrated waste management facility is being designed to facilitate handling of hazardous wastes and will accommodate the following basic components;

A Go-down will be constructed at a site. The go-down will be of dimensions 70 feet by 40 feet and will be divided into two – the machine area and the temporary waste storage area. There will be a separate office and sanitary facilities.

5.5.1 Waste Reception

It is intended that waste will be delivered to the site by road from around Meru County and other parts of the Country. Delivery by road will be in compliance with regulations. The waste reception will comprise of;

- The proponent will procure a track and obtain waste transportation license from the National Environment Management Authority.
- A container offloading bay will be provided at the site that will also be installed with safety measures environmental protection provisions. The bay will also receive wastes from delivery trucks

5.5.2 Waste Sorting

Waste sorting will be done before loading into the tracks. Minor sorting bay will therefore, be provided fitted with appropriate quantification facilities, documentation and holding zones. Necessary safety and environmental protection provisions will be provided.

5.5.3 Waste Storage

The proposed go-down will consist of two main areas, the machine area and the temporary storage area. It is uneconomical to start the incineration process without enough waste, because of the heating process. Therefore, the temporary holding area will be enough to hold a day's capacity i.e., approximately 1200 kilograms.

5.5.4 Incineration facility description

The proponent anticipates installing an incinerator at his newly acquired plot in Giantune area area. The design, acquisition and final installation has been done and will be in conformity to the Waste Management Regulation, 2006, guidelines, criteria, procedures for installing/operating incinerators. In addition, it has been proposed that the proponent regularly subject its operation to air quality measurements to ensure sound environmental management in its operation.

The incineration plant will be fitted with constant air emission monitors that will provide a CEM including a draw sample system that will monitor O2, CO, HCl, hydrogen fluoride, Sulphur dioxide, NOx, particulate, and HC. This will eventually regulate particulate matter to the atmosphere reducing air pollution.

The incinerator will be installed and operated by competent persons at all times to ensure efficiency and environmental conservation.

5.5.5 Waste Disposal

The process does not use any water and therefore water will only be used for sanitary and washings within the site. Waste water emanating from operation areas will not be allowed into

the natural drainage system. Due to the potential residuals of hazardous pollutants, the wastewater will be collected and channeled into a septic system designed for used at the premises.

As per the manufacturers guidelines out of 100 kgs of waste, 4kgs of ash will be generated. The ash is considered clean and will be disposed off at the municipal council's dumping site. The management will seek permission from the council for the disposal.

5.5.6 Water supply

There is a surface water source within the vicinity of the proposed site. It is a community water project which could be supplemented by the piped water from MEWASS. The water is then stored in a tank to minimize wastage. The figure below shows one of the tanks to be used

Figure showing one of water storage tanks

5.5.7 Air Quality

As indicated in the report the area is not inhabited and therefore the air quality is normal with the region. However, the site is close to the Gikumene – Gitoro Meru Eastern Bypass Road and therefore the emitants from the lorries and other vehicles could affect the area.

5.5.8 Support services

The site will not be complete until support facilities are put into place. These will include;

(i) Offices,

(ii) Sanitation facilities (toilets, bathrooms, hydrants, wastewater drains,

(iii) Health and safety provisions (fire extinguishers, hydrants, signage, exits, first Aid points etc.,

(iv) Security arrangements.

5.6 Project Approval

The project will be developed on land that the proponent already owns. The development plans are yet to be submitted to the County Government of Meru for approvals.

For full implementation of the project, the following pre-requisites will be met:

1) Approval designs by the County Government of Meru.

2) Appointment of established competent and capable contractors and consultants to undertake the development.

3) Acquisition of NEMA approval.

After the pre-requisites are met the proponent will then commission the development as is planned.

5.7 Project Specifications

The following are specific descriptions of the project;

a) The project is located about 200M from Meru Eastern Bypass Gikumene- Gitoro Road, occupy Land reference No. plot no. Ntima/Ntakira/7404, 7405 & 7535 in Giantune area, Meru County**.** The proposed site is on coordinates 0.065740, 37.601402

b) The area has no public sewer line hence the residents rely mainly on septic tanks or the pit latrines.

c) A competent architect has made the final design of the project and the constructions will follow details as given by the project consultants.

d) A competent engineer will facilitate the installation and management of the incinerator according to the manufactures specification.

e) The structures will be founded on solid ground using reinforced concrete strips laid on concrete blinding. The laying of the foundation will follow details as given by the structural engineers on site.

f) The solid wastes will be collected by a private companies contracted for their environmentally sound and friendly waste disposal strategy

5.8 Project Construction

The proposed incinerator will comprise of the following:

i) Excavation of the site to a level that will create a platform upon which the structure/building will be constructed.

ii) The incinerator will be installed inside the building constructed.

iii) Sanitation facility including septic system will be constructed for use at the facility.

iii) The proponent will procure and obtained license for covered truck used to transport waste.

5.9 Project Activities

5.9.1 Pre-Construction stage

Project Approvals

The project has been submitted for/ approved by Lead Agencies for implementation.

The pre-construction has also involved getting to collaborative agreements with key stakeholders including project manager, architects, quantity surveyors, engineers / contractors (structural, mechanical, electrical), material suppliers, landscapers, and financiers). A program has been set and an agreement made between the proponent and the project consultants.

5.9.2 Installation and Civil Works Stage

The project will be constructed based on applicable standards of Kenya and any other standards which may be incorporated. The constructions will as well incorporate environmental guidelines, health and safety measures. The project inputs will include the following;

Construction raw materials will include sand, cement, stones, gravel, ballast, metals, among others. All these will be obtained from licensed dealers and especially those that have complied with the environmental management guidelines and policies.

Construction machines will include machinery such as trucks, concrete mixers and other relevant construction equipment. These will be used for the transportation of materials, clearing of the vegetation and resulting construction debris. Most of the machinery will use petroleum products to provide energy.

A construction labor force of both skilled and non-skilled workers will be required.

In addition, the proponent has hired qualified and registered consultants. During the construction phase of the project, the project's sign board must be erected to make the public aware of the proposed development and to keep away intruders, which will indicate the following:

A pictorial impression of the proposed building

The developer's name and address

The County authority approval number

The project architect's details

The project engineers' details

The project's quantity surveyors

NEMA approval number

The project Environmental Consultants

Environment Consulting Company

Other professionals involved in the project.

Construction activities include the following:

A temporary site office and a sanitation facility for use by the construction workers will be put in place. Procurement of construction material from approved dealers

Storage of the construction materials.

Transportation, storage of construction materials and disposal of the resulting construction wastes/debris using light machinery. All debris and excavated materials will be dumped handled by approved council engineer.

All required kinds of works will be done by registered experts such as:

- Masonry, concrete work and related activities,
- Structural steel works,
- Roofing and sheet metal works
- Electrical work and,
- Incinerator installation
- Landscaping e.t.c.

The project begins after the National Environmental Management Authority (NEMA) issues the Environmental Impact Assessment (EIA) license.

5.9.3 Operations

Once the development is completed, the proponent will use the facility to conduct incineration for various clients. Maintenance activities will include facility cleaning, routine checks and other necessary repairs. Workers will be fully employed onsite including the truck drivers who will be transporting the waste for incineration.

Solid waste management;

The project proponent will provide facilities for handling solid waste generated within and around the facility. These will include dustbins/skips for temporarily holding waste within the premises before final disposal at the designated dumping site by NEMA approved solid waste handling company.

Effluent and waste water management;

The area is not served by sewer system. The proponent hence intends to use septic system for efficient effluent management. Inorganic waste generated from the premise such as oil and fuel should however be treated before release to the system.

Cleaning;

The proponent will be responsible for ensuring regular washing and cleaning of the pavement of the entire facility. Cleaning operations will involve the use of substantial amounts of water, disinfectants, detergents etc.

5.9.4 De-commissioning stage

The commissioning of the project will take the duration agreed as per the Conveyance document between the proponent and the concerned authorities. Later on, should there be need for decommissioning the project; the following will have to be considered:

- **Demolition works**

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

- **Dismantling of equipment and fixtures**

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

- **Site restoration**

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

CHAPTER 6: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

6.1 Anticipated Impacts

Impacts can be positive and negative, direct or indirect. Environmental impacts for the project are determined by breaking down the project into its activity components and examining the tasks in each component. Once the environmental impacts have been identified, mitigating measures are then prescribed and subsequently, an Environmental Management Plan (EMP) is formulated for the project. The Environmental Impacts of the project and the mitigation measures of the negative impacts are listed in the below:

6.1.1 Loss of Biodiversity

The site has minimal vegetation cover including the grass and shrubs. The proponent intends to clear part of the land to create room for developing the proposed incineration plant. On completion of the development, it is recommended that the proponent should plant trees on the unoccupied land to attain aesthetic beauty.

Mitigation:

- After completion of the project the proponent should rehabilitate the land by planting trees and ornamental flowers on the disturbed and undisturbed areas.
- Project implementation should disturb as little area as possible in order to minimize potential impacts to biodiversity.

6.1.2 Air Quality/Particulate Matter (Dust)

Vehicular/ equipment engine exhaust emissions will be minor and temporary during construction. Air quality impacts will be temporary during construction. The project will not generate significant vehicle trips to the area. Vehicular and equipment exhaust emissions during project operations will, thus, have a minor incremental/cumulative impact locally and regionally. Particulate matter (dust) would be generated by grading, excavation and the movement of construction vehicles.

During the operations major potential point sources of particulate matter (chemical residuals, smoke and dust) and gaseous emissions in and around the proposed premises are expected to be as follows;

- Holding areas for the hazardous waste materials as received will likely be sources of dust, particularly from the transfer process to the sorting areas and into the incinerator.
- The hazardous wastes are obtained from a wide range of background with varying components and hence quality of related particulate matter discharged into the air. Particulate matter could contain chemical pollutants, organic pollutants, bacterial contaminants all of hazardous/toxic characteristics,
- The incineration will involve burning hazardous at very high temperatures (between $800^{O}C$ –$1,500^{O}C$). Particulate matter will comprise of ashes and flue gases from the burning process and smoke as a combustion product. Other emissions from this point is hydrocarbon residuals, carbon dioxide, carbon oxide, nitrogen oxides and sulphur oxides from fuels and related combustion processes. However, the incinerator is fitted with a scrubber and as seen in the incinerator descriptions these will be reduced to the minimum.

Impacts associated with the above air pollution would include;

- Health effects mainly bronchial infections, skin problems, visibility, etc. are likely effects from uncontrolled air pollution. This could affect the employees and the immediate residents and communities. However, at the moment there are very few inhabitants in the immediate neighborhood and as mentioned above there is very little smoke emanating from the incinerator.
- Soil quality degradation that may result from deposition of pollutants from the plant operations or carried to other areas through surface runoff,
- Pollution of water sources through direct deposition, surface runoff and/or infiltration into groundwater aquifers,
- Emissions of acetylene gas into the air have a potential to cause fire in the premises with far reaching implications on the neighboring land users.

Mitigation:

- Vehicle speeds in the construction area will be limited to minimize dust in the area.
- Discourage idling of vehicles i.e., vehicle and equipment will be turned off when not in direct use to reduce exhaust emissions.
- Regular maintenance of construction plants and equipment.
- The management will sensitize the employees on sound environmental management.

- Provide personal protective equipment such as, nose masks, goggles to the workers on site.
- The construction contractor will water the site with exposed soil surfaces twice each day during dry weather.
- Hazardous wastes holding yards require to be kept moist at all times to prevent dust emission into the atmosphere and the windward side of the site during deliveries, in- house movement or just in storage.
- The kilns should be designed with provisions of flue gas trapping, smoke interception and stacks fitted with scrubbers (for gases) and filters for particulate matter removal,

6.1.3 Effluent disposal

Developers who construct projects without planning on how effluent will be disposed appropriately, channel their waste water (raw sewage) to water bodies, or dispose carelessly to the environment. Lack of maintaining sewer line leads to blockage of pipes. Areas not served with a sewer line use septic tank which also poses greater risks if not well managed. Some are poorly constructed and others have inadequate water supply hence posing a dangerous health risk to the living organism including human.

The project area is not served with a sewer line hence the proponent intends to build and utilize septic system. The proponent should ensure that the septic systems are regularly maintained and kept very clean.

Operation phase.

Discharging wastewater into open drainage system around the premises would subsequently be carried into public water sources through surface runoff. Pollutants in this case include hazardous residuals, heavy metals, suspended solids, oils and lubricant residuals as well as mixture of contaminants brought along the hazardous waste materials. This has potential impacts on people's health and the aquatic life. The proponent will hence be expected to direct the effluent from the facility to the septic system.

The effluent is mainly from sanitary facilities since the process of incineration does not use water as raw material.

Mitigation measures

The following are basic aspects for inclusion in the site design and the wastewater handled in accordance with waste regulations Legal Notice No. 120 of September 2006;

- Construct a concrete slab for holding of the scrap metals coming from the field. The waste slab should also be fitted with surface runoff traps from which the leachate should be handled as hazardous wastewater
- Surface runoff and spills from the galvanizing areas should be collected and channeled into an oil interception chamber, stabilization/ sedimentation tank and a treatment facility before discharge.
- Appropriate design for septic system should be developed and approved for implementation,
- Maintain appropriate records on wastewater quality for compliance evaluation and comparison with NEMA/KEBS recommended standards on a continuous basis,
- Isolate domestic wastewater from process wastewater for containment in septic tanks and regular exhaustion,
- Oil storage areas should be provided with slabs with surrounding bunds to contain any spilt oils.

6.1.4 Occupational Health and safety

During construction, there will be increased dust, noise and air pollution. The immediate neighbors and workforce involved would be more subjected to these environmental hazards. Food for the construction workforce is usually provided by mobile individuals who usually operate without licenses. This can compromise health of the workers especially if foodstuffs are prepared in unhygienic conditions. In the operational phase workers may be in danger of fire due to the use of electricity, paint and welding activities. The company currently has environmental management plan or policy.

Operation phase.

Health risks are found in the management of the hazardous waste holding areas, the transfer routes and preparation procedures. The risks including exposing the workers to a wide range of chemical poisoning, toxicity or long-term health complications. The neighborhood could also be affected

through wind or surface runoff transferring contaminants from the scrap holding areas to the external environment,

Combustion areas are the most critical section in respect of health and safety. The kilns emit fumes and particulate matter originating from the wastes burning exposing the workers directly handling the same as well as others working elsewhere within the same premises. The affected workers are exposed through inhalation, skin and to some extent ingestion. Emissions from the kilns is also likely to reach external recipients through stacks if not well designed and managed,

There are risks of fire outbreaks from kilns, oil storage areas posing potential danger to not only the site, but also the neighboring land users,

Heat is also a serious impact to the employees operating the kilns since they are likely to be open. The general ambient heat around the entire premises is also likely to be relatively high extending the risk to more workers.

Mitigation measure:

- All workers should be provided with protective gear. These include working safety boots, overalls, helmets, goggles, earmuffs, respirators/masks and gloves.
- Construction crew at the site will be sensitized on social issues such as drugs, alcohol, diseases.
- A first aid kit should be provided within the site. This should be fully equipped at all times and should be managed by qualified person.
- The contractor should have workmen's compensation cover. It should comply with workmen's compensation Act, as well as ordinances, regulations and union agreements.
- All moving machine parts and high temperature areas should be fitted with guard rails and restrict access,
- Adequate sanitary facilities should be provided and standard cleanliness maintained.
- Food handlers preparing food for the workers at the site should be controlled and monitored to ensure that food is hygienically prepared
- Regular maintenance of machinery on site.
- Workers should be provided with evacuation procedures in case of fire.

- Safe operation procedures/ clear instruction provided to the workers to ensure that safety is maintained.
- Conducting risk assessments before the work commences to ensure that hazards are identified and eliminated before the work commences.
- Workers operating within the high temperature zones should not exceed 2hrs continuous presence or/as may be directed by the Occupational Health and Safety Experts,

6.1.5 Soil Erosion

In this particular project, soil erosion might be an environmental issue of concern although this will not be more pronounced if on excavation, leveling of the soil to be done. There will be some soil disturbance which would expose and set the soils loose to the agents of soil erosion water.

Mitigation Measures

- Avoid unnecessary movement of soil materials from the site.
- Provide soil conservation structures on the areas prone to soil erosion mostly to reduce impact by the run-off.
- Control construction activities especially during rainy conditions
- Re-surface open areas after completion of the project and introduce appropriate vegetation.
- Provide suitable storm water drainage channels to effectively discharge water to safe areas. Channels need to be regularly maintained and repaired to avoid point discharge in case of breakages or blockages.
- Conduct landscaping after the project completion to maximally control any possible chance of soil movement.

6.1.6 Surface drainage

Good drainage system is used to prevent land near human settlement from becoming saturated with water which collects or accumulate/ flood after a downfall or from other sources. Poor drainage causes dampness to building structures as well as water stagnation. Dampness is influenced by poor drainage, in the presence of warmth and darkness, breeding grounds for malarial and other diseases can be directly traced from it. Drainage of the general property/premise comes in handy to enhance effective flow of the much-anticipated surface run-off emanating from the roof

catchments and other areas within the site. Drainage in the proposed project area is well maintained, however, the Council should make arrangements to improve the drainage system to be commensurate with the increase in population within the area.

Mitigation

- During construction, the design of the drainage system should ensure that surface flow is drained suitably into the public drains provided to control flooding within the site.
- Drainage channels should be installed in all areas that generate or receive surface water such as car parking, drive ways and along the building block-edges of the roofs.
- Channels should be covered by approved materials to prevent occurrence of accidents and entry of dirt that would compromise flow of run-off.
- Drainage channels should ensure safe disposal of run-off/surface water and should be self-cleaning
- Paving of the sideways, driveways and other open area should be done using pervious materials to encourage recharge and thus reducing water runoff volume.

6.1.7 Solid Waste

Waste collection within the area boundary is the responsibility of the Proponent, and thus the proponent finds ways of collecting the solid waste management and contracting private companies that have come in to offer such services. Developers should comprehensively address the issues of waste in their planning before doing any construction to avoid creating illegal dumping sites within estates which pose a health risk to the residents.

To curb this issue the proponent will engage the services of a registered private garbage company to collect waste from within the compound. Considerable amounts of solid waste will be generated during construction and operational phase. This will include metal cuttings, rejected materials, excavated materials, paper bags, empty cartons, broken glass among other materials.

Operation phase

Disposal of inert solid waste from the premises could become an extended environmental problem that would affect physical environmental quality, biodiversity and public health at points of disposal. Such waste including fry ash, drums, scrap metals and kiln tiles are notable potential waste requiring planned disposal strategy.

Mitigation Measures:

- The contractor or the proponent should work hand in hand with the private refuse handlers and the Meru County Government to facilitate waste handling, and disposal from the site. The resulting debris will be collected, transported and disposed off at suitably approved dumpsites.
- It is recommended that land clearance, excavation and construction waste be recycled or reused to ensure that materials that would be disposed of as waste are diverted for productive use. In this regard the proponent is committed to ensuring that construction materials are left over at the end of construction will be recovered for refurbishing and use in other projects. Such measures will involve the sale or donation of such recyclable/reusable materials to construction companies, local community and residents.
- The waste slab should be provided with compartments for segregation of various categories of waste classified on source and physical nature that should also be handled separately,
- Provide solid waste holding bins at strategic locations around the premises and install transfer stations and modalities of waste removal to approved dumping grounds. Hazardous materials should be handled through incineration,
- Fry ash and other incineration residuals should not be disposed on land but rather be disposed off in landfills or other approved dumping grounds,
- Oils and grease from moving machine parts and other sources should be handled as hazardous wastes in accordance with the waste regulations,

6.1.8 Noise

Like dust emissions, construction hand tools and transport trucks will be a major source of noise to the surrounding areas. It was noted that the immediate land has not been developed and hence effects of noise during construction/installation will not have any significant social implications.

Operation phase

The proposed plant operations are likely to generate considerable noise levels from deliveries of hazardous wastes, movement of hazardous materials from one point to another within the plant and operations of the incineration equipment components. This situation is likely to have occupational health and safety implications as well effects to the workers. Currently, there are no settlements or other businesses in the immediate neighborhood, but any such future land use may imply that noise levels be maintained at the recommended levels of 45dBA at the residential areas during the night and 45dBA during the day with an occupational noise level of 75dBA.

Mitigation Measures:

- Construction works should be carried out only during the specified time of 0800hrs t0 1700hrs.
- Machinery should be maintained regularly to reduce noise resulting from friction
- There should not be unnecessary horning of the involved machinery
- Provision of billboards at the construction site notifying of the construction activity and timings
- Sensitize drivers of construction machinery on effects of noise
- Billboards will be suitably erected on the start of the project to psychologically prepare the people in the vicinity.
- Maintain plant equipment
- Construction activities to be restricted to day time
- Workers in the vicinity of high-level noise to wear safety and protective gears
- Provide barriers such as walls around site boundaries to provide some buffer against noise propagation.

6.1.9 Soil Compaction

The site preparation process will lead to the area at the site and area near the site to undergo some compaction.

Mitigation Measure:

- The proponent at the decommissioning phase will rehabilitate the land by loosening the soil which would be compacted by the project.

- The contractor will always use a predetermined route to the site.
- Unnecessary heavy machines will be avoided
- Use of cheap tools like jembes, forks and shovels will be encouraged to do the ground breaking
- Operations will be timed to take place during the dry season when the soil are dry to reduce the risk of soil compaction

6.2 Summary of the Mitigation Measures

One of the objectives of the environmental assessment has been to identify measures to be taken by the proponent to mitigate environmental impacts. These will include:

- A code of practice to minimize construction noise, vibration dust and disturbance of the site.
- Planting of trees, and wild flowers to supplement the ground cover on the excavated area.
- Application of soil conservation measures to reduce surface runoff during wet seasons and especially during construction phase.
- Recovery of all debris generated and reuse of materials where possible e.g., the stone chippings which can be used as hardcore.
- Recycling and reuse of appropriate materials.
- Provision of security measures to deter intruders and protect them from the risk of injury; and fitting of noise mufflers on generator exhausts.
- Installation of oil/diesel separators on site especially where there is storage of machinery or petroleum products e.t.c to keep oils from storm runoff.
- Predetermined route to the site, oil spillages will be minimized by using right machinery that are regularly serviced and operators who are qualified following the operations instructions strictly.
- The contractor will ensure management of excavation activities, if any- the activities will be controlled especially if construction will take place during rainy season.
- After construction the proponent shall rehabilitate the land by removing any unnecessary materials that shall be covering the land and preventing natural biodiversity.
- To minimize potential impacts to bio diversity, grass cover that does not interfere with the sitting of the project will be left intact,

- Sensitize drivers of construction machinery on effects of noise; billboards will be suitably erected on the start of the project to psychologically prepare the people in the vicinity.
- Signs must indicate and inform the public when the works start and when it will be completed, construction activities to be restricted to daytime to avoid accidents and possible harm to gears provide barriers such as walls around site boundaries to provide some buffer against noise propagation.
- Vehicle speeds in the construction area will be limited to minimize dust in the area, discourage idling of vehicles i.e., vehicle and equipment engines will be turned off when not in direct use to reduce exhaust emissions.
- Regular maintenance of construction plant and equipment, engage sensitive construction workers.
- Provide personal protective Equipment such as nose masks to the workers on site, the construction contractor will water the site with exposed soil surface twice each day during dry weather.
- All residual waste materials to be recycled sold or disposed in an environmentally friendly manner. Wastes will be properly segregated and separated to encourage recycling of some useful wastes; dustbins will be provided at the construction site.
- A first aid kit will be provided within the site and it will be fully equipped at all times.
- Sanitary facilities will be provided, local individuals preparing food for the workers at the site will be controlled to ensure that food is hygienically prepared
- Construction crew at the site will be sensitized on social issues such as drugs, alcohol, diseases, ensuring proper solid waste disposal and collection facilities, ensure effective waste water management.
- Provision of safe drinking water, contractor to take an insurance cover for workers in case of major accidents on site.
- Unauthorized persons will be restricted from construction site, enforce speed limits for construction vehicles especially along roads leading to the site, provide bill boards at the site/entrance to notify motorists about the development, put up warning signs like "speed limit 10kph", "heavy vehicles" etc.
- For the prevention of accidents, the contractor shall adhere to the guidelines under the factories and other places of work act.

CHAPTER 7 ANALYSIS OF PROPOSED PROJECT ALTERNATIVES

7.1. Introduction

The purpose of this section is to examine feasible alternatives to the project and highlight the benefits of and the general rationale for the proposed project that need to be considered against any potential environmental cost. The general principle involved in identifying alternative option(s) to a proposed development is to ensure that the option chosen, which indeed may be the 'non-development/no-action' or 'relocation' or alternative land-use' option would result in optimal social, environmental and capital benefits. In effect the option chosen should bode well not only for the developer, but also for the environment and stakeholders in the area. This section is a requirement by the Authority and is critical in consideration of a development with minimal environmental disturbance. Feasible land-use options are compared in terms of lowest costs and most benefits criteria: environmental impacts, social acceptability, economics (including productivity of land-use) and design feasibility.

7.2. "No-action" alternative

The selection of the "No-action" alternative would mean the discontinuation of the proposed incinerator project. Thus, the site is retained in its existing form. This option based on the premise that the proposed project will have severe implications to the environment if implemented. The physically implication is that the site is unlikely to undergo any major changes from its present condition while biologically, the vegetation present at the site will not be affected.

If this option is selected by the Authority, then:

a) There would be loss of jobs that the project is envisioned to create;
b) The owner would be at a loss in terms of financial commitments already made in designing and planning for the project: professional fees to the project managers, architects, quantity surveyors, land surveyors, EIA lead experts, public health officers and physical planners and application for EIA approval and licensing from NEMA.
c) There will be a gap in solid and medical waste disposal.

7.3. Relocation alternative

This option would mean transfer of the proposed development to another site. It may be based on the criteria that the proposed site is in a zone planned for other developments that are not compatible with the proposed project or the project will be an impediment to future development in the area or it is a hindrance to an existing development or is not compatible with other developments in the area or the site is environmentally sensitive such as: having one or more threatened, rare, endangered, endemic or key stone plant or animal species or any other flora or fauna that is considered for preservation under law or is or is in an archaeological or historical area or is found to have a historically or archaeologically important material. If this option is selected the proponent is required to look for an alternative site either within or outside the zone. There are no physical, biological, cultural and socio-economic features of special concern at the site.

If this option is selected by the authority, then:

- As in the 'no-action' option, the owner would be at a loss in terms of financial commitments already made in designing and planning for the project;
- It might take a very long time looking for and finding another suitable site and completing all official transactions relating to change of land ownership or land use;
- There is also no guarantee that another site would be available; and
- Even if such land is found its cost might be beyond affordable means for the proponent.

7.4. Alternative land-uses

The option allows the developer to explore other alternative land uses for the site other than the proposed incinerator project. This selection is based on the principle that the proposed development is not compatible with the existing land-uses or as in the 'no-development' option, the project has severe implications to the environment if implemented. This option requires application for change or extension of use to allow for the alternative development.

If this option is selected by the authority, then:

a) Change of use of land might take a long time to mature since it requires relevant authorities to approve the change of land-use;

b) Any other commercial or industrial land-use may mean user incompatibility with current neighborhood land-uses;
c) The hotel management may not have an alternative project to implement at the proposed site;
d) The change might also be massively objected by the workers and/or residents in the neighborhood; and
e) With the changing demand and supply at the market, the prices and availability of materials to be used in the new land-use may not be promising to the proponent at the time the proposal is finally approved by the authorities.

By settling on the "relocation" and "alternative land-use" options, the processes of designing and planning will have to be started over again. This means that the proponent will have to undergo an extra expense by: applying again to relevant authorities; re-engaging professionals like project managers, architects, quantity surveyors, land surveyors, EIA lead experts, public health officers and physical planners and applying for EIA approval and licensing from NEMA. In addition, with the changing demand and supply at the market, the prices and availability of materials to be used may not be promising to the proponent at the time the proposal is finally approved by the authorities.

7.5. The Proposed development as described in the EIA report

The impacts and mitigation measures for this alternative are discussed in detail throughout this report. The positive impacts have also been identified. The Merits of this alternative are as follows:

a) The property (land) value will appreciate and the investment made in the property will be productive from the optimal economic and spatial land-use.
b) Visual and aesthetic amenities will be improved in Meru County.
c) The community will have a potential source of income through the supply of locally produced goods and from employment opportunities to be created by the proposed project.
d) Solid wastes will be effectively managed at Specific Hospitals.

CHAPTER 8: ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

8.1 Environmental management

This section is intended to provide a concise structure of actions with specific priority level of action for the management of the environment in all phases of the proposed project. Environmental management is best achieved by preparation and implementation of an Environmental Management and Monitoring Plan (EMP). The plan ensures that environmental impacts are identified and mitigated during all phases of the project. An EMP outlines corresponding management strategies that will be employed to mitigate potential adverse environmental impacts, estimates costs and assigns responsibility for the implementation of the mitigation measures. As the project commences and scheduling plans are developed and changed, components of the EMP might require amending. This is therefore a working document, which can be updated whenever new information is received or site conditions change. The EMP is generally prepared in accordance with rules and requirements of the EMCA to ensure that the components of proposed project are operated in accordance with outlined mitigation measures.

8.2 Proposed development without an EMP

This scenario is based upon the assumption that the proposed development would go on without any environmental management options being provided. The total project impact for the scenario is on the appreciably adverse side and the adverse impacts on the existing environment would be major.

8.3 Proposed development with an EMP

If the environmental management strategies discussed in the EMP are fully implemented, the adverse impact of the project would be reduced, and there will be an overall improvement in physical, chemical, biological and socio-economic environment of the region.

8.4 Environmental monitoring and audits

Environmental monitoring and audits are conducted to establish if project implementation has complied with established environmental management standards. Environmental monitoring and audits will be conducted to ensure that identified potential negative impacts are mitigated. EA will be conducted annually and will be based on the EMP. EA reports will be submitted to the Authority.

Area of concern	Recommended measures	Responsible party	Time frame	Approximate cost (KShs.)
Solid wastes				
Soils, ground water and surface water contamination and creation of breeding grounds for vectors and rodents	Use of an integrated solid waste management system through a choice of options such as recycling, reuse, combustion and sanitary land filling	Contractor	Throughout the construction period	20,000
	Comprehensive biological organic matter management	Contractor		
	Ensure that construction materials left over at the end of construction are used in other projects rather than being disposed off	Project Manager and Contractor	One-off Throughout the construction period	-
	Ensure that damaged or wasted construction materials including timber are recovered for refurbishing and use in other projects	Project Manager and Contractor		-
	Provide facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements	Project Manager and Contractor	One-off	-
	Purchase of delicate construction materials such as cement incrementally to ensure reduced spoilage of unused materials	Project Manager and Contractor	Throughout the construction period	-
	Use construction materials that have minimal or no packaging to avoid the generation of excessive packaging waste	Project Manager	During the operation period	-
Noise and vibration				

• Hearing problems and damage to the ears • Cracking of walls of buildings	Sensitize construction vehicle drivers and machinery operators to switch off engines of vehicles or machinery not being used, to avoid gunning of vehicle engines or hooting especially when passing through sensitive areas such as churches, schools, residential areas and hospitals	Project Manager and Contractor	Throughout construction period	-
	Ensure that construction machinery is kept in good condition to reduce noise generation	Project Manager and Contractor	Throughout construction period	5,000
	Ensure that all generators and heavy-duty equipment are in sound proof rooms or placed in enclosures to minimize ambient noise levels	Project Manager and Contractor	Throughout construction period	5,000
	The noisy construction works will entirely be planned to be during day time when most of the neighbours will be at work	Project Manager and all site foreman	Throughout construction period	-
	Use machines that are equipped with noise reduction devices such as mufflers	Contractor		
	Provide workers with ear muffs especially those working in high noise concentration areas	Contractor	Throughout construction period	5,000
Adverse construction activities				
• Removal and destruction of	Provide for a landscaping programme	Project Manager and Contractor	After construction but	5,000

flora and fauna • Soil erosion and compaction • Construction wastes and pollution • Overuse of construction materials	Ensure construction activities are confined to an actual demarcated area to avoid spillover effects	Contractor	before operation	-
	Remove and dispose properly excess excavated soil and other wastes	Contractor		1,000
	Rip off all compacted areas	Contractor		1,000
	Valuation of the project to ensure that the design optimizes the use of construction materials	Contractor	Before construction	-
	Proper supervision of construction personnel	Contractor	Throughout construction period	-

Table 8.1: Proposed EMP during the construction phase of the proposed project

Table 8.2: Proposed EMP during the operation phase of the proposed project

Area of concern	Environmental impact	Standards and guidelines	Management and mitigation	Monitoring requirements	Responsibilities	Priority/ action level	Approximate cost (Kshs.)
Solid wastes	A health hazard may arise from pathogen carriers such as pests and rodents	EMCA, 1999	• The refuse areas should be secured and enclosed • Hand over stubborn wastes to authorized solid waste handlers • Use cleaner	Periodic checks and regular maintenance should be carried out on the functioning of the waste	Facility Management and Local Authority	Medium	5,000

Area of concern	Environmental impact	Standards and guidelines	Management and mitigation	Monitoring requirements	Responsibilities	Priority/ action level	Approximate cost (Kshs.)
			technologies/ production • Provide solid waste bins • Ensure separation of wastes at the source • Ensure regular collection of the wastes including ash • Reusing and recycling of some wastes • Waste collection bins to be provided at designated points	management (collection and disposal) system			
Fuel consumption	Excessive consumption of fuel	Energy Act	• Fit a rain cap on top of the stack • Fit the fuel tank with an on/off valve or	Keep and strive to maintain low fuel consumption	All workers	High	10, 000

Area of concern	Environmental impact	Standards and guidelines	Management and mitigation	Monitoring requirements	Responsibilities	Priority/ action level	Approximate cost (Kshs.)
			tap or a simple push button valve with a spring return				
Air quality	Dust pollution from housekeeping practices such as sweeping	EMCA, 1999	• Sorting and incineration of wastes should be done regularly and appropriately • The stack of the incinerator will be raised above 4 M high	Full time monitoring and supervision during operation by senior workers	Project Management and Public Health Inspectors	High	5,000
Record keeping and documentation	Environmental Degradation	NEMA Regulations, Public Health Act	Develop procedures for documentation of records keeping of all environmental and health concerns	Routine recording	Project Management, District Environment Officers and Public Health Officers	Medium	10, 000

Area of concern	Environmental impact	Standards and guidelines	Management and mitigation	Monitoring requirements	Responsibilities	Priority/ action level	Approximate cost (Kshs.)
Environmental policy	Lack of commitment to environmental concerns	EMCA, 1999	• Develop an environmental policy as a guiding principle for corporate environmental management • Encompass an elaborate environment plan as a framework for monitoring mitigation	Routine adherence	Project Management	High	15, 000

Table 8.3: Proposed EMP during the decommissioning phase of the proposed project

Expected negative impacts	Recommended mitigation measures	Responsible party	Time frame
Solid wastes	Use of an integrated solid waste management system through a hierarchy of options: source reduction, recycling, composting, re-use, combustion and sanitary land filling	Resident Project Manager and Contractor	One-off
	All buildings, machinery, equipment, structures and partitions that will not be used up must be removed and recycled/reused	Resident Project Manager and Contractor	One-off
	All foundations must be removed and recycled, reused or disposed of at a licensed disposal site	Resident Project Manager and Contractor	One-off
	Where recycling/reuse of the machinery, equipment, implements, structures, partitions and other demolition waste is not possible, the materials should be taken to a licensed waste disposal site	Resident Project Manager and Contractor	One-off
	Donate reusable demolition waste to charitable organizations, individuals and institutions	Resident Project Manager and Contractor	One-off
Vegetation and animal disturbance	Implement an appropriate re-vegetation program to restore the site to its original status	Resident Project Manager and Contractor	One-off
	Consider use of indigenous plant species in re-vegetation	Resident Project Manager and Contractor	One-off
	Trees should be planted at suitable locations so as to interrupt slight lines (screen planting) between the adjacent area and the development	Resident Project Manager and Contractor	Once-off

Table 8.4: Proposed occupational health and safety EMP for the proposed project

Area of concern	Management	Responsibility	Time frame	Approximate cost (Kshs.)
Approval of plans	Ensure that all incinerator plans are approved by the Local Authority and the Occupational Health and Safety Office	Proponent	One-off	-
General register	A general register should be kept within the facility as stipulated in Sec 62 (1) of the OSHA	Project Manager and Contractor	One-off	1,000
Incidents, accidents and dangerous occurrences.	Ensure that provisions for reporting incidents, accidents and dangerous occurrences using prescribed forms obtainable from the local Occupational Health and Safety Office are in place	Project Manager, Developer and Contractor	Continuous	500/month
	Enforcing adherence to safety procedures and preparing contingency plan for accident response in addition safety education and training be emphasized	The Contractor, Project Manager and Site Safety Officer	Continuous	50,000
Insurance	Ensure that the premises are insured as per statutory requirements (third party and workman's compensation)	Project proponent	Annually	–
Safety healthy environment (SHE) policy	Develop, document and display prominently an appropriate Safety and Healthy Environment policy	Project Manager	One-off	1,000
Machinery/equipment safety	Ensure that machinery, equipment, personal protective equipment, appliances and hand tools to be used do comply with the prescribed safety and health standards and be appropriately installed maintained and safeguarded	Project Manager,	One-off	–

Area of concern	Management	Responsibility	Time frame	Approximate cost (Kshs.)
Storage of materials	Ensure that materials are stored or stacked in such manner as to ensure their stability and prevent any fall or collapse	Project Manager	Continuous	10,000
Emergency preparedness and evacuation procedures	Design suitable documented emergency preparedness and evacuation procedures to be used during any emergency	Contractor	One-off	1,000
First aid	Well stocked first aid box which is easily available and accessible should be provided within the premises	Contractor	One-off	5,000
	Provision must be made for persons to be trained in first aid with a certificate issued by a recognized body	Contractor	One-off	10,000
Ventilation	Enough space must be provided within the premises to allow for adequate natural ventilation through circulation of fresh air	Contractor	One-off	–
Vector-borne and water-borne disease incidences	Complete refuse collection and handling service to be provided	Contractor	Continuous	5,000
Operator safety	When opening the loading door, the operator should always wear eye protection and a face mask	Operator	When operating	-
	Particular care should be taken when using kerosene as atomized vaporized fuel may be present at the top of the combustion chamber which could ignite vigorously	Operator	When operating	-
	The operator should wait a few moments to allow any blow-back to die down before loading waste materials into the incinerator.	Operator	When operating	–

CHAPTER 9: RECOMMENDATIONS AND CONCLUSION

9.1. Recommendations

a) Use of quality construction material alongside high standards of construction and regular maintenance practices are strongly recommended in order to increase resistance to high temperatures.
b) The stack should be raised high (4 M or higher) in order to prevent smoke dispersion lower in the atmosphere.
c) Ensure proper management of wastes as outlined in this report.
d) Ensure record keeping and documentation are appropriately carried out to assist in building of self-auditing capacity.
e) The management is to comprehensively implement the recommendations as given in the EMP to improve on their level of compliance. These mitigations will not only be of benefit to the proposed development, but will also assist other stakeholders in understanding and managing the environment.

9.2. Conclusion

The proposed incinerator will have numerous positive impacts as has been outlined in this report. The negative environmental impacts that will result from establishment of the project will be mitigated with the options provided for in this report. The report concludes that if all the suggested mitigation measures and the above recommendations are put in place and if the proposed EMP is followed, the proposed project will not adversely impact on the environment.

REFERENCES

Reference was made from the following plans and acts:

Architectural and structural plans for the proposed incinerator obtained from the proponent

Republic of Kenya (2005); Kenya Gazette Supplement Acts 2000, *Environmental Management and Coordination Act (EMCA) No. 8 of 1999, Government Printer, Nairobi*

Republic of Kenya (2005); Kenya Gazette Supplement Acts, *Environmental (Impact Assessment and Audit) Regulations 2003,* Government Printer, Nairobi

Republic of Kenya (2005); Kenya Gazette Supplement Acts, *Kakamega District Strategic Plan (2005 – 2010),* Government Printer, Nairobi

Republic of Kenya (2005); Kenya Gazette Supplement Acts, *Local Authority Act (Cap. 265),* Government Printer, Nairobi

Republic of Kenya (2005); Kenya Gazette Supplement Acts, *Occupational Health and Safety Act, 2007,* Government Printer, Nairobi

Republic of Kenya (2005); Kenya Gazette Supplement Acts, *Penal Code Act (Cap.63),* Government Printer, Nairobi

Republic of Kenya (2005); Kenya Gazette Supplement Acts, *Physical Planning Act, 1999,* Government Printer, Nairobi

Republic of Kenya (2005); Kenya Gazette Supplement Acts, *Public Health Act (Cap. 242),* Government Printer, Nairobi

Republic of Kenya (2005); Kenya Gazette Supplement Acts, *Sessional Paper No. 6 of 1999 on Environment and Development,* Government Printer, Nairobi

Republic of Kenya (2005); Kenya Gazette Supplement Acts, *Way Leaves Act, (Cap 292),* Government Printer, Nairobi

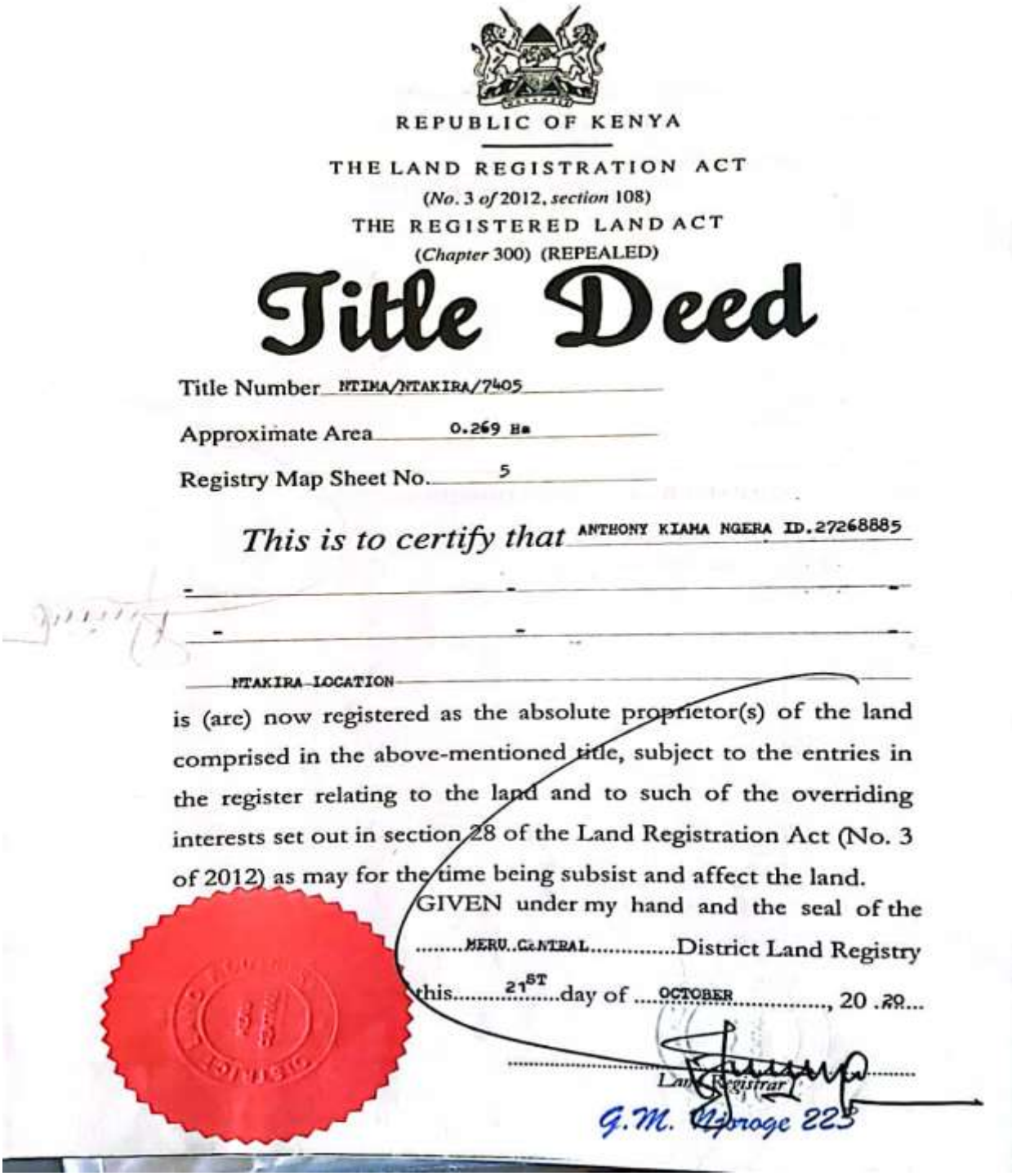
Republic of Kenya (2006); Kenya Gazette Supplement Acts, *Environmental Management and Coordination (Waste Management) Regulations, 2006,* Government Printer, Nairobi

Republic of Kenya (2008); Kenya Gazette Supplement Acts, *Environmental Management and Coordination (Noise and Excessive Vibration Pollution Control) Regulations,* 2008, Government Printer, Nairobi

Republic of Kenya (2009); Kenya Population Census 2009*,* Government Printer, Nairobi

United Nations (1996); *The Rio Declaration on Environment and Development United* Nations (1996); *The World Commission on Environment and Development*

TITLE DEED 1



REPUBLIC OF KENYA

THE LAND REGISTRATION ACT

(*No.* 3 *of* 2012, *section* 108)

THE REGISTERED LAND ACT

(*Chapter* 300) (REPEALED)

Title Deed

Title Number NTIMA/NTAKIRA/7405

Approximate Area 0.269 Ha

Registry Map Sheet No. 5

This is to certify that ANTHONY KIAMA NGERA ID.27268885

NTAKIRA LOCATION

is (are) now registered as the absolute proprietor(s) of the land comprised in the above-mentioned title, subject to the entries in the register relating to the land and to such of the overriding interests set out in section 28 of the Land Registration Act (No. 3 of 2012) as may for the time being subsist and affect the land.

GIVEN under my hand and the seal of the

.....MERU CENTRAL.....District Land Registry

this.....21ST.....day of .....OCTOBER....., 20 .20...

.....

Land Registrar

G.M. Njoroge 225

TITLE DEED 2

REPUBLIC OF KENYA

THE LAND REGISTRATION ACT

(*No.* 3 *of* 2012, *section* 108)

THE REGISTERED LAND ACT

(*Chapter* 300) (REPEALED)

Title Deed

Title Number NTIMA/NTAKIRA/7404

Approximate Area 0.269 Ha

Registry Map Sheet No. 5

This is to certify that ANTHONY KIAMA NGERA ID.27268885

NTAKIRA LOCATION

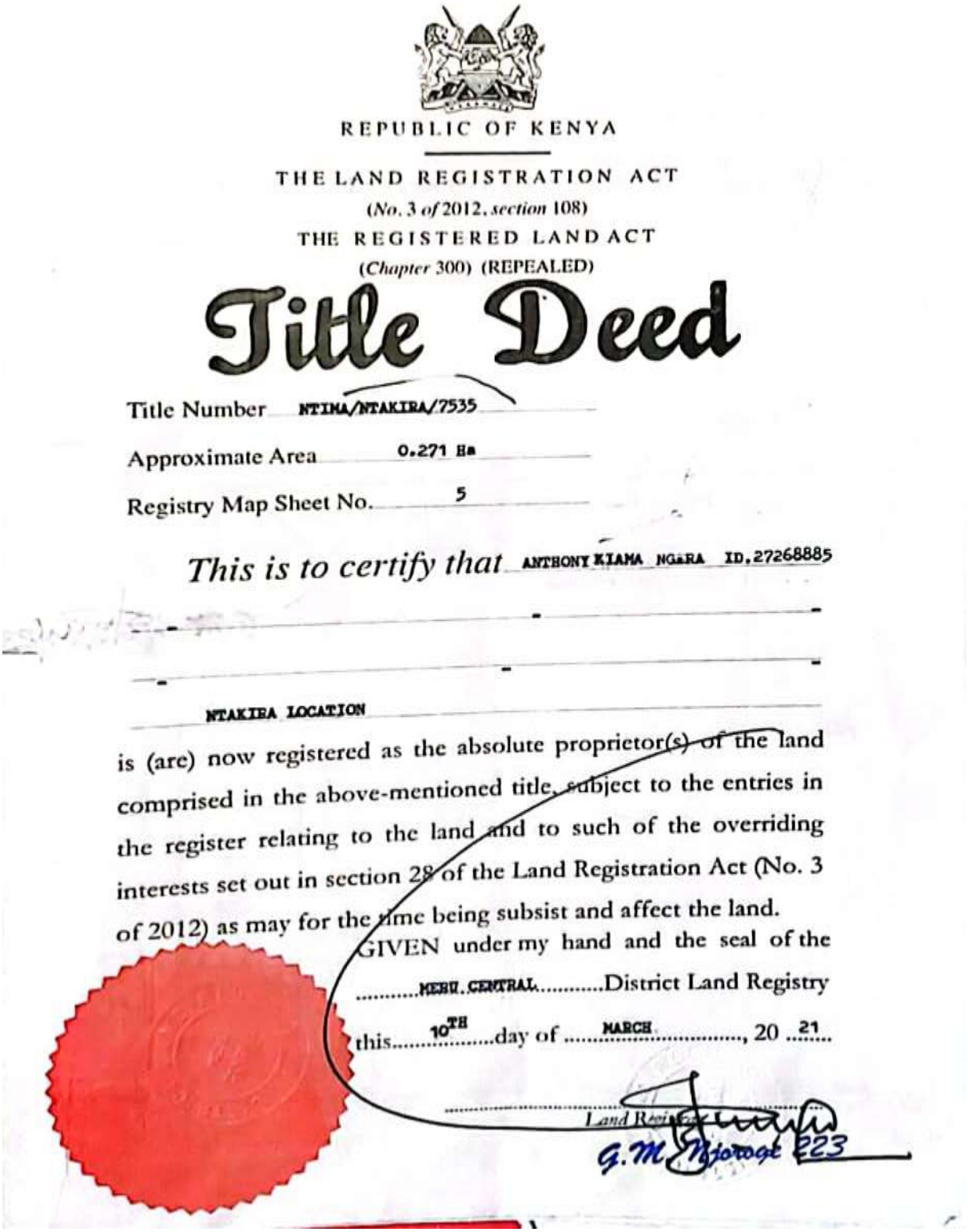
is (are) now registered as the absolute proprietor(s) of the land comprised in the above-mentioned title, subject to the entries in the register relating to the land and to such of the overriding interests set out in section 28 of the Land Registration Act (No. 3 of 2012) as may for the time being subsist and affect the land.

GIVEN under my hand and the seal of the MERU CENTRAL District Land Registry this 21ST day of OCTOBER, 20 20

Land Registrar

G.M Nyaoge 223

TITLE DEED 3



REPUBLIC OF KENYA

THE LAND REGISTRATION ACT

(*No.* 3 *of* 2012, *section* 108)

THE REGISTERED LAND ACT

(*Chapter* 300) (REPEALED)

Title Deed

Title Number NTIMA/NTAKIRA/7535

Approximate Area 0.271 Ha

Registry Map Sheet No. 5

This is to certify that ANTHONY KIAMA NGaRA ID.27268885

NTAKIRA LOCATION

is (are) now registered as the absolute proprietor(s) of the land comprised in the above-mentioned title, subject to the entries in the register relating to the land and to such of the overriding interests set out in section 28 of the Land Registration Act (No. 3 of 2012) as may for the time being subsist and affect the land.

GIVEN under my hand and the seal of the

.....MERU CENTRAL.....District Land Registry

this.....10TH.....day of .....MARCH....., 20 ..21.....

.....

Land Registrar

G.M Njoroge 223

THE CHANGE OF USER PPA 2 APPROVAL:

COUNTY GOVERNMENT OF MERU

DEPARTMENT OF LANDS, PHYSICAL PLANNING, URBAN DEVELOPMENT, HOUSING & PUBLIC WORKS

Meru County Headquarters
P.O Box 120-60200
MERU

Email: meru.county@yahoo.com
When replying please quote

CGM/CU/1/77

FIFTH SCHEDULE
[Section 33(1), (a).]

Form P.P.A. 2 Reg.No. of Application: **000123/2022**

NOTIFICATION OF APPROVAL/REFUSAL/DEFERMENT OF DEVELOPMENT PERMISSION

To: **ANTHONY KIAMA NGERA**
P.O Box
Meru

Your **Development application**, submitted on 5th **March, 2022** for permission to **Extend User to include Light Industrial Use (Incinerator)** on P/No. **Ntima/Ntakira/7404,7405 & 7535** situated in **Ntakira** has been **approved** on (date) **23rd March, 2022** by the **County Government of Meru** subject to the following conditions:

a) Payment of all statutory fees to the **County Government of Meru** as per the demand notice/invoice (s)

b) Proposed Development on the plot to be approved by County Government of Meru

c) Development should not constitute part of Public Land

d) Compliance to the conditions set on approval.

COUNTY GOVERNMENT OF MERU
23 MAR 2022
DIRECTORATE OF PHYSICAL PLANNING AND URBAN DEVELOPMENT

Dated: **23rd March 2022**

S. K MWONGO
FOR: COUNTY DIRECTOR PHYSICAL PLANNING & URBAN DEVELOPMENT

C.C CEC Member for Lands, Housing, Public Works, Physical Planning & Urban Development
Co-ordinator, National Land Commission – Meru
County Land Administrative Officer – Meru
County Land Registrar - Meru

Scanned with CamScanner

PROPONENT'S KRA PIN

KENYA REVENUE AUTHORITY

www.kra.go.ke

PIN Certificate

For General Tax Questions
Contact KRA Call Centre
Tel: +254 (020) 4999 999
Cell: +254(0711)099 999
Email: callcentre@kra.go.ke

Certificate Date 19/03/2019
Personal Identification Number
A004622774A

This is to certify that taxpayer shown herein has been registered with Revenue Authority

Taxpayer Information

Taxpayer Name	ANTHONY KIAMA NGERA
Email Address	DRANTHONYKIAMA@GMAIL.COM

Registered Address

L.R. Number :	**Building** Rental
Street/Road Makutano	**City/Town :** meru
County : Meru	**District** Imenti North District
Tax Area Imenti North	**Station** Meru
P. O. Box 9551	**Postal Code** 60200

Tax Obligation(s) Registration Details

Sr. No.	Tax Obligation(s)	Effective From Date	Effective Till	Status
1	Income Tax - Resident Individual	01/08/2008	N.A.	Active

The above PIN must appear on all your tax invoices and correspondences with Kenya Revenue Authority. Your accounting end date is 31st December as per the provisions stated in the Income Tax Act unless a change has been approved by the Commissioner-Domestic Taxes Department.The status of Tax Obligation(s) with 'Dormant' status will automatically change to 'Active' on date mentioned in "Effective Till Date" or any transaction done during the period. This certificate

Disclaimer : This is a system generated certificate and does not require signature.

THE PROPONENT'S ID

REPORT'S SUBMISSION FORM

Form 2 r. 19))

Application Reference No……………………

For official use

THE ENVIRONMENT MANAGEMENT AND CO-ORDINATION ACT SUBMISSION OF ENVIRONMENTAL IMPACT ASSESSMENT STUDY REPORT

PART A: DETAILS OF PROPONENT

A1	Name of proponent (Person or Firm) Anthony Kiama Ngera
A2	PIN No. A004 622774A
A3	Address P.O Box 9551-60200
A4	Name of contact person Edwin Mwiti
A5	Telephone No. 0707-844-629
A7	E-mail mwitithuranira1@gmail.com

PART B: DETAILS OF THE ENVIRONMENTAL IMPACT ASSESSMENT STUDY REPORT

B1	Title of the proposed project EIA FOR A PROPOSED INCINERATOR PLANT
B2	Objectives and scope of the project Installation of a incinerator plant to deal with collection and disposal of medical waste and hazardous waste for commercial purposes.
B3	Description of the activities Planning, Construction, Installation, Operation and Monitoring.
B4	Location of the proposed project The parcel Nos Ntima/Ntakira/7355, 7404 & 7405 in Giontune area - Imenti North subcounty in Meru County (0.065740, 37.601402)

PART C: DECLATION BY THE PROPONENT

I hereby certify that the particulars given above are correct and true to the best of my knowledge.

Anthony Kiama Ngera (Name) Owner (Position) AKNgera (Signature)

On behalf of ..... Date.....
(Firm name and seal)

PART D: DETAILS OF ENVIRONMETAL IMPACT ASSESSMENT EXPERT

Name(individual/Firm): JAMES GITUMA MWIRIGI

Certificate of registration No: 8040

Address: P.O BOX 212 – 60200

PHONE NO: 0724 692786

EMAIL.: jamesgitum@gmail.com

PART E: OFFICIAL USE

Approved/ not Approved.....

Comments.....

.....

.....

.....

Officer.....Sign.....Date.....

Important Notes: Please submit the following:

(a) Three copies of this form
(b) 10 copies of the project study report
(c) The prescribed fees, to:

Director-General,
The National Environment Management Authority,
Popo Road, South C,
P.O. Box 47146,
NAIROBI.

Tel. 254-02-6009013/27/79 or 6008999 Fax. 254-02-6008997 E-mail dgnema@nema.go.ke

Sub

mission Page 2

LEAD EXPERT'S PRACTICING LICENCE

FORM 7 (r.15(2))

nema

EIA for a proposed incinerator installation.

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/16320

Application Reference No: NEMA/EIA/EL/21176

M/S **James Gituma Mwirigi**
(individual or firm) of address

P.O. Box 212 - 60200, MERU

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**
registration number **8040**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **1/13/2022** Expiry Date: **12/31/2022**

JAMES GITUMA MWIRIGI
14 APR 2022
LEAD EXPERT NO. 8040

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001: 2015 Certified