MBIG LIMITED

P.O.BOX 732-50200

BUNGOMA

PROPOSED ASPHALT PLANT ON LAND PARCEL NO. EAST BUKUSU/NORTH KANDUYI/11492, AT BUKANANACHI, KIBABII-TUUTI WARD, KANDUYI CONSTITUENCY, BUNGOMA COUNTY

ENVIRONMENTAL IMPACT ASSESSMENT STUDY

Compiled by:-

Kenyanito Tsekou Toure, Expert Reg. No. 0547

Dr.George Were Eshiamwata, Expert Reg .No.1781

Robert Omondi Oswago

Jonnathan Katana Yeri, Expert Reg. No. 7890

Antony Eshamwata, Expert Reg. No. 9054

@2021

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Signed by:

_____

Kenyanito Tsekou Toure
EIA/EA Lead Expert Reg. No. 0547
EIA/EA Team Leader

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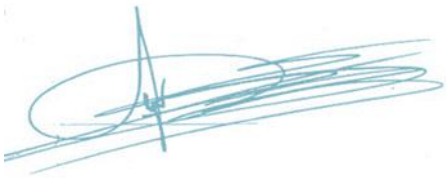
ENVIRONMENTAL IMPACT ASSESSMENT STUDY

Signed and submitted by the Proponent



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Mr. Kenneth Munene Chuaga

FOR MBIG LIMITED

NON-TECHNICAL SUMMARY

Overview

This report presents findings of an Environmental Impact Assessment study for a proposed Asphalt Plant to be developed by MBIG LIMITED. Legal Notice No. 31 of 30th April 2019, that amended the second schedule of the Environmental Management and Coordination Act, 1999 lists processing plants such as the proposed Asphalt plant as high risk projects. Based on this, it is required that an environmental impact assessment study report be submitted for the proposed project. Regulation 11 (1) of the Environmental (Impact Assessment and Audit) Regulations, 2003 require that an environmental impact assessment study be conducted in accordance with the terms of reference developed during the scoping exercise by the proponent and approved by the Authority.

Project Description

The proposed project will involve setting up and operating an Asphalt mixing plant with associated support facilities. The Asphalt mixing plant will consist of

- 4 Feeder bins-for holding the aggregate/ filler mixture (crushed rock and sand as filler). The bins shall be proportioned by cold feed gates.
- Dryer for drying and heating the aggregate/filler mixture
- Dust collectors for removing undesirable amounts of dust from the dryer exhaust
- Plant exhaust stack that eliminates exhaust gases
- Hot elevator that delivers the dried and heated aggregate/filler mixture the hot bins.
- Hot bins for deposition of the heated aggregates
- Hot binder tank where hot binding material (bitumen) is heated and stored

- Mixing chamber/ plug-mill where the heated aggregate/filler mixture and binder are mixed in specified proportions to make asphalt.

Other auxiliary facilities will include;

- Site offices,
- Bitumen storage area,
- Aggregate & dust storage area,
- Guard house, and
- Sanitary facilities

Proposed Project Site

The proposed Project site is located close to Bungoma-Chwele road and on Plot L.R No. East Bukusu/North Kanduyi/11492 in Bukananachi, Kibabii-Tuuti ward, Kanduyi constituency, Bungoma County. The GPS coordinates for the site are Latitude; 0.637985°N and Longitude; 34.522491°E.

Environmental Condition of the proposed project site

The site is in an area that is sparsely populated though rapidly developing due to its strategic location near Mayanja market Centre and Bungoma Town; however, there exists two homesteads; one to the left and one to the right of the proposed site as depicted through the area aerial image in figure 1 of this report.

Environmental Management Plan

The table below highlights a summary of the Environmental Management Plan Developed for the proposed project.

Table 1: A summary of the EMP

Project activity	Potential negative impacts	Proposed mitigation measures
Construction phase		
Vegetation clearance	▪ Loss of vegetation ▪ Destruction of plant habitats ▪ Displacement of fauna from site. ▪ Ground will be left open and hence susceptible to erosion. ▪ Rain water penetration capacity will be reduced. ▪ Increased runoff ▪ Increased soil moisture loss	▪ Limit vegetation removal to actual location where proposed project will take place ▪ Plant trees and other vegetation in any open areas once project is complete
Removal of overburden	▪ Displacement of fauna beneath the soil ▪ Loss of top soil rich in plant and genetic material ▪ Alteration of local soil aggregates	Removed top soil to be kept aside for later use in planting of trees, grasses and other vegetation
Ground levelling and compaction	▪ Reduction of soil porosity ▪ Reduction of soil water absorption rate and capacity ▪ Increase in surface runoff when it rains ▪ Reduction in ground water aquifer recharging capacity	▪ Restrict ground levelling and compaction to area to be occupied by proposed project. ▪ Regularly sprinkle water in open areas without vegetation to encourage vegetation growth. ▪ Re-vegetate all open areas with grasses to trap surface runoff, increase rainwater percolation and reduce soil moisture loss
Assembling of materials and equipment	▪ Vegetation loss especially at the site of location of materials and equipment ▪ Dust disturbance to workers on site and neighbours	▪ Site selected for storage and handling of materials to be one with minimal or no vegetation cover; ▪ Employees involved in

	▪ Injuries to workers involved in offloading of equipment and building material ▪ Noise disturbance to workers involved in material offloading especially offloading of ballast	offloading to be provided with ear protectors; ▪ Material delivery to be limited to day time to avoid unnecessary disturbance to neighbours at night.
Actual construction work	▪ Noise disturbance to workers on site especially noise from equipments like concrete mixers, ▪ Noise disturbance to neighbours and the general public, ▪ Dust disturbance to workers on site, neighbours and general public	▪ Construction work to be limited to day time to avoid unnecessary disturbance to neighbours at night, ▪ Noisy equipment to be fitted with noise reduction devices where applicable ▪ Workers to be provided with dust masks, enforcement on the use of dust masks by all affected workers to be effected; ▪ Entire construction site to be secured with dust fine screens, where applicable ▪ Water to be sprinkled especially on open ground to arrest dust.
Accumulation of construction waste	▪ Inhibition of vegetation growth; ▪ Consumption of available space which could otherwise be used for more useful work; ▪ Blockage of drainage ▪ Poor look of area aesthetic ▪ Inhibition of free movement of persons and machinery	▪ All construction waste to be promptly collected as its being generated and disposed at approved disposal site. ▪ Management to explore possibilities of reuse.
Occupational safety during construction	▪ Falls from working from height ▪ Bruises and Cuts	▪ All employees to be provided with appropriate personal protective equipment which

	▪ Inhalation of dust ▪ Effects of machine vibration ▪ Noise induced hearing loss	includes safety boots, helmet, overalls, hand gloves, dust masks, ear protectors; and safety belts; ▪ Contractor to enforce strict and correct use of all personal protective equipment provided by all affected workers, and visitors to the site during construction; ▪ Contractor to provide workers with appropriate serviceable tools and equipment for the correct type of work; ▪ All tools and equipment to be in required working condition; ▪ Workers to have the required technical knowledge on the proper use of the required equipment before being assigned to use it; ▪ All tools and equipment to be regularly serviced and maintained according to schedule
Operational phase		
Solid waste generation during operational phase of the Asphalt Mixing Plant	• Waste could block storm water drainage channels • Littering and scattering	• Waste bins to be provided at strategic points within the Plant area. • All waste bins to have lids on. • Employees at the plant to be sensitized on good waste management practices. • Engage a licensed waste collection company to collect and dispose of waste from the Plant. • Waste collection company to

		ensure there is no littering and scattering of waste during collection and transportation • A record of waste tracking documents to be kept.
Air Pollution	• May lead to occupational illness (lung infection, itching skin, eye irritation, coughing, to workers and other people exposed to the odours and dust; • Reduced visibility in the case of dust; • Dust may chock plants	• Ensure de-dusting system is always efficient; • Workers to use appropriate PPE; • Strict enforcement on PPE use; • Ventilation at workplace to be sufficient; • The proponent is advised to carry out a baseline Air Quaity monitoring by an accredited laboratory before starting operations, and thereafter quarterly as required in the Environmental Management and Coordination (Air Quality) Regulations 2014. ◎
Air quality and Odours	Handling of Asphalt and bituminous products may lead to toxic gas releases.	• Minimize vapour leaks and loses to reduce the likelihood of air pollution and odours through the asphalt mixing works. • Ensure that housekeeping is of high standard.
High noise level at the workplace	• Noise induced hearing loss • Poor concentration at the workplace • Reduced productivity	• Developing and implementing an effective noise control and hearing conservation program; • Carrying out periodic noise measurements; • Fitting noise machines with noise reduction devices; • Providing suitable hearing protection to all workers

		exposed to noise levels above 85dB(A); • Posting notices and signs in noisy areas; • Carrying out audiometric test by a designated medical practitioner to all workers exposed to noise levels above 85dB(A); • Educating all workers on importance of making correct use of PPE provided to protect them
Occupational injuries such as Bruises, Cuts and Falls.	• Injury to employees and visitors to the workstation	• Employees should be provided with appropriate working gear • There should be a well-equipped First Aid box at the work station.
Disposal of wastewater	• Contamination of soils and ground water resources	• Ensure wastewater is treated to acceptable standards before disposal. • Regular maintenance of the waste water management system.
Storm water and soil contamination	▪ During rainfall events, there will be an increase in storm water flows across and from the site due to change of the surface from soil cover to hard surfaces. During decommissioning phase, soil contamination could occur especially with the use of machinery in demolition of the facility	• The operator shall prepare a hazardous materials and waste management plan. The plan shall include, but not limited to, measures to prevent: (a) contamination of soils; (b) pollution of water. • Contaminated waste water should be captured and kept in the hazardous waste stream. • The Proponent and contractor engaged in the demolition of the facility shall ensure

		machinery and vehicles used during demolition are adequately serviced to prevent any oil leakages. In addition, the Proponent shall undertake a further survey to identify any contaminated areas and remediate them accordingly.
Fires and Explosions	The operation of the asphalt mixing plant facility is a potential source of ignition of fires, which could spread into neighbouring properties.	✓ Use only electrical equipment that is certified to be flame proof and spark proof. ✓ Control static electricity by:- • Use of static wrist band for operators • Use of hands moisturizers for operators • Prohibiting overburdened electrical plugs in the operation areas. ✓ Restrict radioactive items (i.e. cell phones, laptops, etc.) to the office blocks. ✓ Prohibit smoking, open flames and sparks ✓ Prevent activities that can cause spark and friction such as use of metal wheeled equipments, pulling of metal on ground. ✓ Ensure there is adequate firefighting water in the emergency water tanks ✓ Ensure personnel drill on response to emergency fires is carried out. ✓ Compile and implement a fire management plan
Parking	▪ Using road reserves as	▪ Provide for sufficient internal

	parking will inconvenience other road users; ▪ Lack of adequate parking space will result in congestion of vehicles on local roads; ▪ Lack of proper parking facility can result in obstruction of neighbours.	parking to accommodate parking needs of the plant.
Fire safety	▪ Loss of property due to fire; ▪ Injury to workers, neighbours and the general public from fires emanating from the facility; ▪ Death to plants and animals; ▪ Air pollution resulting from smoke emission.	▪ Install sufficient fire-fighting equipment, these should include portable fire extinguishers, fire blankets, horse reel, and fire alarm. ▪ Train workers and employees in fire fighting and fire response; ▪ Develop and document a fire evacuation procedure, the procedure should be available to workers and other users of the facility; ▪ Provide for fire exits; ▪ Ensure all fire exits are clearly marked and not obstructed; ▪ Carry out periodic fire drills; ▪ Ensure all fire- fighting equipment are survivable; ▪ Provide for bulk storage of water for fire- fighting; ▪ Identify and mark a fire assembly point.
Electrical safety	▪ Electrical shocks to workers and users of the Plant; ▪ Possible loss of life; ▪ Loss of property resulting from electrical faults.	▪ All electrical installations to be done by a qualified electrician; ▪ All electrical wires to be properly insulated; ▪ All wiring to be done by qualified and registered

		electrician; ▪ Required loading at electrical outlets to be observed.
Security	▪ Loss to property at the plant; ▪ Damage to the plant; ▪ Vandalism to property.	▪ Management to hire the services of a registered and licensed security firm. ▪ Use of security surveillance system such as Closed Circuit Television (CCTV) ▪ Keep a record of all security concerns and incidences at the plant.
Decommissioning phase		
Decommissioning of the Plant	▪ Dust disturbance to workers on site; ▪ Dust disturbance to neighbours; ▪ Dust disturbance to the general public; ▪ Noise disturbance to workers on site; ▪ Noise disturbance to neighbours; ▪ Noise disturbance to the general public; ▪ Injuries to workers; ▪ Injuries to neighbours, ▪ Injuries to the general public.	▪ Workers on site to be provide with appropriate personal protective clothing such as helmet, dust masks, ear protectors, safety boots, and overalls. ▪ The use of personal protective clothing to be enforced; ▪ Demolition to be limited to day time to avoid disturbance to neighbours at night; ▪ First Aid services to be readily available on site; ▪ Other emergency services such as fire fighting and ambulance to be available by phone call.
Decommissioning waste water infrastructure	▪ Disused waste water infrastructure can be a safety and environmental hazard	Consult Bungoma Water and Sewage Company on the most appropriate and acceptable way of decommissioning disused wastewater infrastructure.
Decommissioning of water reservoirs and	▪ Generation of concrete waste; ▪ Dust disturbance;	▪ Concrete waste generated to handled, managed and disposed according to the

water supply infrastructure	▪ Occupational hazards	EMC (Waste Management) Regulation, 2006; ▪ Workers to be provided with appropriate personal protective clothing such as dust masks, helmets, safety boats, overalls and ear protectors.
Decommissioning of electrical supply lines	▪ Electrical shocks; ▪ Damage to electrical equipment and installations;	All the decommissioning to be done by Kenya Power certified electricians
Site rehabilitation	▪ Soil contamination	▪ Sampling and testing of local soils to be done to ascertain any contamination ▪ Soil treatment and stabilization to be done before any site rehabilitation is done; ▪ Appropriate tree spices to be determined that will be planted on site; ▪ Planted trees to be taken care of until maturity.

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1. BACKGROUND

1.1 Introduction

This report presents findings of an Environmental Impact Assessment study for a proposed Asphalt Plant to be developed by MBIG LIMITED. Legal Notice No. 31 of 30th April 2019, that amended the second schedule of the Environmental Management and Coordination Act, 1999 lists processing plants such as the proposed Asphalt plant as high risk projects. Based on this, it is required that an environmental impact assessment study report be submitted for the proposed project. Regulation 11 (1) of the Environmental (Impact Assessment and Audit) Regulations, 2003 require that an environmental impact assessment study be conducted in accordance with the terms of reference developed during the scoping exercise by the proponent and approved by the Authority.

1.2 Context, Components and Activities of the Project

To provide a comprehensive description of the project and the surrounding environment specifying any information necessary to identify and assess the environmental effects of the project, this report includes project objectives and information on, rationale for the project and background, the nature, location/existing setting, timing, duration, frequency, general layout, pre-construction activities, construction methods, works and duration, and post construction plans. A description of raw material inputs, technology and processes to be used as well as products and by-products generated, is provided. The EIA study includes an assessment of the context, components and activities of the project.

This includes among others:

- *Context*: Description and assessment of the *location* of the land, the *land use characteristics*, including the planned use of the land and description of the existing land use and their patterns within 3-km radius from the boundary of the Project Area and *project characteristic*

- *Activities*: Description and assessment of the specific phases and activities; including timing and location, for:

i. *Pre-construction (planning) phase* (Plan preparation and seeking of the appropriate approvals from the relevant authorities, baseline condition appraisal),

ii. *Construction phase* (base camp establishment, site clearance, acquisition and transportation of building materials, construction of the plant)

iii. *Operation phase* (running and managing the facility as per the laid down rules and procedures; and

iv. Decommissioning/abandonment phase (demolition of facility).

2. PROJECT DESCRIPTION

2.1 Name of the Project

Proposed Asphalt mixing plant located On Plot L.R East Bukusu/North Kanduyi/11492.

2.2 Objective of the Project

The proposed project will be to set up and operate an Asphalt mixing plant with associated support facilities.

2.3. Project Description

2.3.1 Project components

The proposed project has the overall objective of setting up and operating an Asphalt processing plant comprising of:

- 4 Feeder bins-for holding the aggregate/ filler mixture (crushed rock and sand as filler). The bins shall be proportioned by cold feed gates.
- Dryer for drying and heating the aggregate/filler mixture
- Dust collectors for removing undesirable amounts of dust from the dryer exhaust
- Plant exhaust stack that eliminates exhaust gases
- Hot elevator that delivers the dried and heated aggregate/filler mixture to the hot bins.
- Hot bins for deposition of the heated aggregates
- Hot binder tank where hot binding material (bitumen) is heated and stored
- Mixing chamber/ plug-mill where the heated aggregate/filler mixture and binder are mixed in specified proportions to make asphalt.

Other auxiliary facilities will include;

- Site offices,
- Bitumen storage area
- Aggregate & dust storage area
- Guard house
- Sanitary facilities

Major activities shall include:

- Drying and heating of aggregates.
- Weighing of aggregates, bitumen and filler material.
- Mixing aggregates with bitumen and filler material.
- Release of hot mix asphalt.

2.3.2 Background to Asphalt

Asphalt is a mixture of aggregates, binder and filler, used for constructing and maintaining all kind of roads, parking areas but also play- and sport areas. Aggregates used for asphalt mixtures could be crushed rock, gravel or slags. Sand or rock dust is as filler. In order to bind the aggregates into a cohesive mixture a binder is used. Most commonly, bitumen is used as a binder.

2.3.3 Asphalt Mixing Plant

An asphalt mixing plant is an assembly of mechanical and electronic equipment where aggregates, recycled materials or other additives are blended, heated, dried and mixed with binder to produce asphalt mixture meeting specified requirements.

2.3.4 Asphalt Production process

Aggregates are removed from storage or in controlled amounts and passed through a dryer to be dried and heated. The heated aggregate is then combined with binder (bitumen), and thoroughly mixed in a batch. The asphalt mixture is then delivered directly via a conveyor belt onto awaiting trucks and heaved to the road construction site upon request by esteemed clienteles/contractor (s).

2.4 Project Location and Justification for the EIA Study

The proposed project will be located in Bungoma County, Kanduyi Constituency, Kibabii-Tuuti Ward at Bukananachi area and on a parcel of land plot No. East Bukusu/North Kanduyi/11492.The GPS coordinates for the site are Latitude; 0.637985°N and Longitude; 34.522491°E. *Appendix 1* gives land sale agreement.

The above site is in an area that is sparsely populated though rapidly developing due to its strategic location near Mayanja market Centre and Bungoma Town;

however, there exists two homesteads; one to the left and one to the right of the proposed site as depicted through the area aerial image on figure 1. Due to the latter scenario and as observed during our site visits /scooping excise; the proposed project is at a slightly sensitive environment and thus is likely to create an impact on this location herein and thus the need for the EIA study which shall entail an analysis of all the anticipated impacts, detailed public participation and preparation of a detailed Environmental and social Management Plan.

2.5 Project Proponent

MBIG LIMITED, a private company incorporated with limited liabilities in the Republic of Kenya is the project proponent. *Appendix 2* is copy of the certificate of incorporation and a copy of personal identification number certificate. Attached therein are also copies of National identification card and KRA pin for the company's founder/Director who is in charge of the company's administrative activities to date.

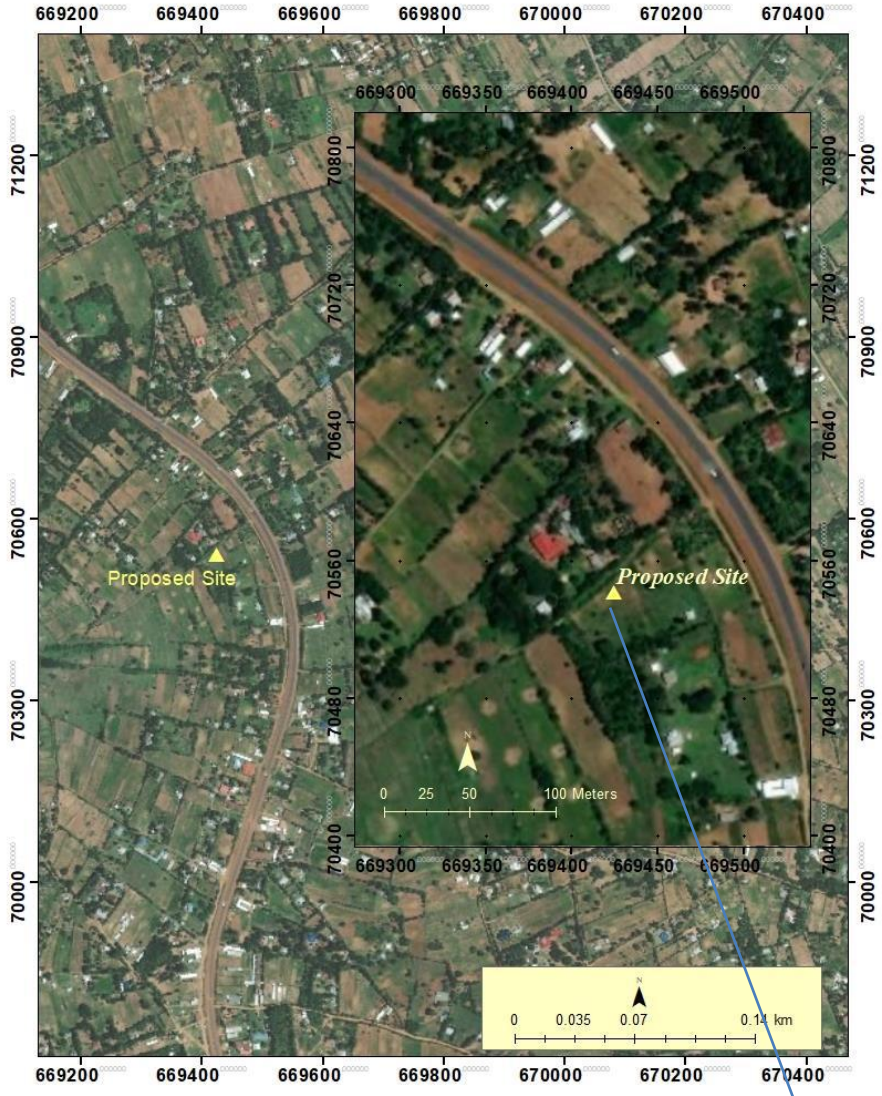
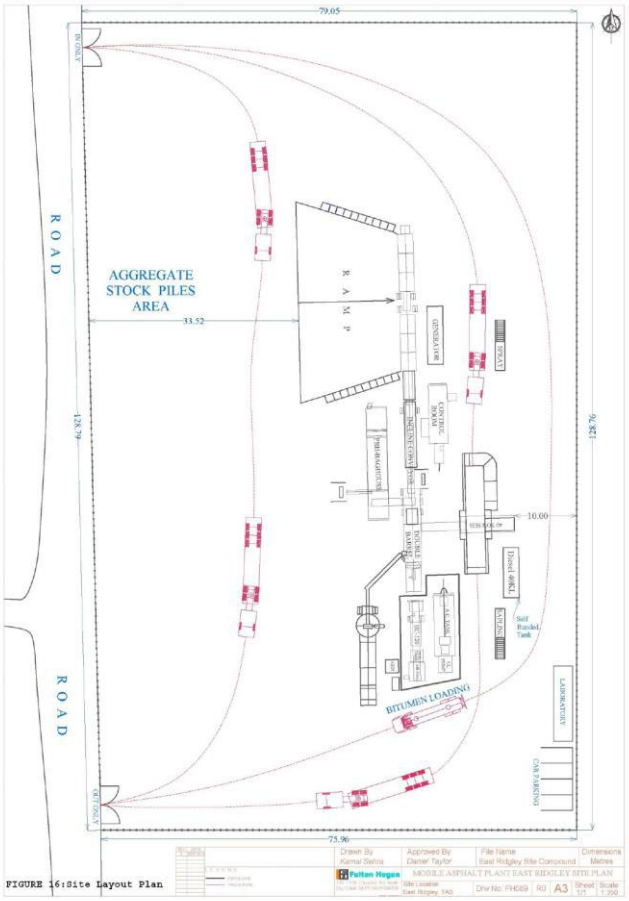


Figure 1: General location of proposed project site



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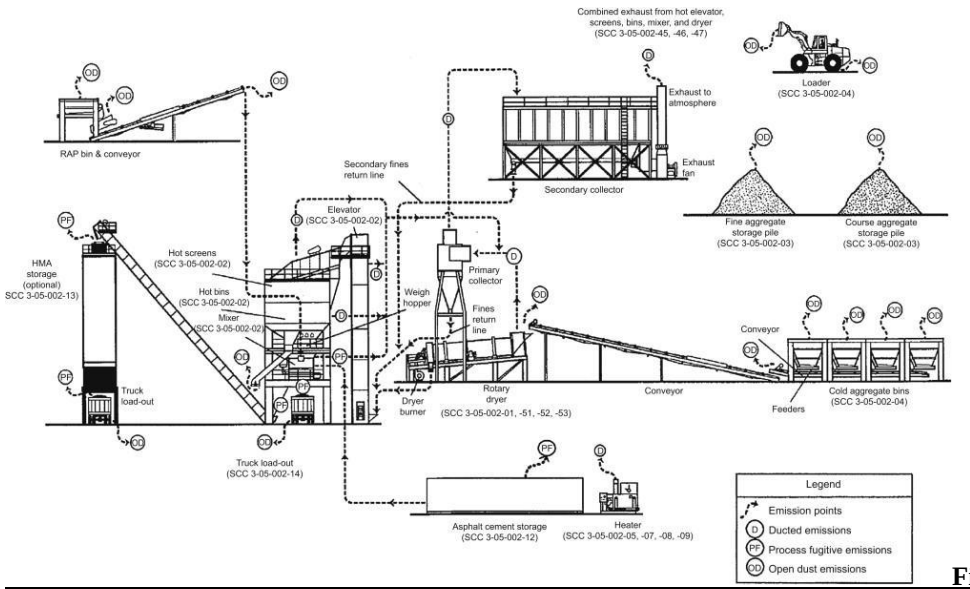


Figure 2: Site layout plan (Typical HotAsphalt mix process diagram)

2.6 Team of Experts

Kenyanito Tsekou Toure, Dr.George Were Eshimwata,registered and licensed EIA/EA Lead Experts registration numbers 0547 and 1781 respectively, Jonnathan Katana Yeri, a registered and licensed EIA/EA Associate Expert registration number Expert Reg. No. 7890 and Antony Eshamwata, a registered and licensed EIA/EA Associate Expert registration number 9054, have been contracted by MBIG LIMITED to carry out the Environmental impact assessment study for the proposed project and prepare an environmental impact assessment study report. Appendix 3 is copy of registration certificates and practicing licenses of the EIA Experts.

Table one below gives details of the team specialists

Table 2: The specialists team of experts

Name	Profession / Designation	Educational Training
Kenyanito Tsekou Toure	▪ Team Leader ▪ EIA/EA Lead Expert	▪ PHD (GIS)-On Going ▪ Masters in Geographic Informati Science ▪ Masters in Environmental Planning Management
Dr.George Were Eshiamwata	▪ Botanist ▪ Ornithologist ▪ Deputy Team Leader ▪ NEMA Lead EIA Expert	▪ PHD. Geographical Information Systems ▪ Master of Science, Conservation Biology ▪ B.Sc Natural Resource Management
Robert Omondi Oswago	▪ Sociologist ▪ Team Member	▪ Master of Arts (Sociology) ▪ Bachelor of Arts (Sociology & Geography
Jonnathan Katana Yeri (BSc. Eng.)	▪ Team Member ▪ EIA/EA Associate ▪ Graduate Engine Engineers Registration Boa (EBK) ▪ Soil, Water &	▪ BSc. Soil, Water & Environmen Engineering, ▪ Certificate in Office Automation ▪ Certificate of Webinar Participatic Fundamentals of oil and gas exploration production, key environmen considerations.

Name	Profession / Designation	Educational Training
	Environmental Engineer	▪ Certificate of Webinar Participation: C Contaminated Site Assessment.
Antony Eshamwata	▪ Team Member ▪ EIA/EA Associate ▪ GIS Analyst	▪ Bachelor of Environmental Planning a Management ▪ Certificate in GIS and Remote Sensing ▪ Honor Certificate in Urban water

2.7 Terms of reference

Terms of reference (ToR) for the environmental impact assessment study were developed and submitted to NEMA. The ToR was approved by NEMA on the 19TH of February 2021. This paved way for data collection and compilation of this environmental impact assessment study report. Appendix 4 is copy of the ToR approval letter from NEMA

3. BACKGROUND TO ENVIRONMENTAL IMPACT ASSESSMENT

3.1 Definition of Environmental Impact Assessment

Broadly environmental impact assessment (EIA) refers to the need 'to identify and predict the impact on the environment and on man's health and wellbeing of legislative proposals, policies, programmes, projects and operational procedures, and to interpret and communicate information about the impacts'(Munn 1979). UNECE (1991) defines EIA as 'an assessment of the impacts of planned activity on the environment', IAIA (2009) on the other hand defines EIA as 'the process of identifying, predicting, evaluating and mitigating the biophysical, social and other relevant effects of proposed development proposals prior to major decision being taken and commitments made'. Glasson *et.al* (2012) defines EIA as 'a systematic process that examines the environmental consequences of development actions in advance'. EIA is thus a vital tool that aid formulation of development actions, decision making, an instrument for sustainable development and vehicle for stakeholder consultation and participation (Glasson *et.al* 2012).

3.2 The purposes of EIA

3.2.1 An aid to decision making

EIA is an aid to decision-making. For the decision maker, for example, a local authority, it provides a systematic examination of the environmental implications of a proposed action, and sometimes alternatives, before a decision is taken. The EIA can be considered by the decision-maker along with other documentation related to the planned activity. EIA is normally wider in scope and less quantitative than other techniques, such as cost-benefit analysis (CBA).It is not a substitute for decision making, but it does help to clarify some of the trade-offs associated with a proposed development action, which should lead to more informed and structured decision-making. The EIA process has a potential, not always taken up, to be a basis for negotiation between the developer, public interest groups and the planning

regulator. This can lead to outcome that balances well the interests of the development action and the environment.

3.2.2 An aid to the formulation of development actions

Developers may see the EIA process as another set of hurdles to jump before they can proceed with their various activities; the process can be seen as yet another costly and time-consuming activity in the development consent process. However, EIA can be of great benefit to them, since it can provide a framework for considering location and design issues and environmental issues in parallel. It can be an aid to the formulation of development actions, indicating areas where a project can be modified to minimize or eliminate all together its adverse impacts on the environment. The consideration of environmental impacts early in the planning life of a development can lead to more environmentally sensitive development; to improved relations between the developer, the planning authority and the local communities; to a smoother development consent process, and sometimes to a worthwhile financial return on the extra expenditure incurred. O'Riordan (1990) links such concepts of negotiation and redesign to the important environmental themes of 'green consumerism' and 'green capitalism'. The growing demand by consumers to goods that do no environmental damage, plus a growing market for clean technologies, is generating a response from developers. EIA can be the signal to the developer of potential conflict; wise developers may use the process to negotiate 'environmental gain' solutions, which may eliminate or offset negative environmental impacts, reduce local opposition and avoid costly public inquiries. This can be seen in the wider and contemporary context of corporate social responsibility (CSR) being increasingly practiced by major businesses (Crane et al.2008)

3.2.3 A vehicle for stakeholder consultation and participation

Development actions may have wide-ranging impacts on the environment, affecting many different groups in society. There is increasing emphasis by government at

many levels on the importance of consultation and participation by key stakeholders in the planning and development of projects. EIA can be a very useful vehicle for engaging with communities and stakeholders, helping those potentially affected by a proposed development to be much better informed and to be more fully involved in the planning and development process.

3.2.4 An instrument for sustainable development

Existing environmentally harmful developments have to be managed as best as they can. In extreme cases, they may be closed down, but they can still leave residual environmental problems for decades to come. It would be much better to mitigate the harmful effects in advance, at the planning stage, or in some cases avoid the particular development together. This of course leads on to the fundamental role of EIA as an instrument for sustainable development-a role some writers have drawn attention to as one often more hidden than it should be when EIA effectiveness is being assessed (Jay et al.2007)

3.3 Origins and development of EIA

The first EIA legislation was formerly established in the United States of America in 1969 (NEPA 1970), in Europe the 1985 European Community directive on EIA (Directive 85/337) introduced broadly uniform requirements for EIA for all member states (CEC, 1985). In Australia, the Commonwealth EIA system was established in 1974 under the Environmental Protection (Impact of Proposal) Act (Wood 2003, Ellott and Thomas, 2009). The United Kingdom enacted a formal legislation on EIA in 1988 (Glasson *et.al* 2012). China formerly enacted its first EIA legislation in 1979 (Moorman and Ge 2007). In Africa and the Middle East, Israel and Algeria pioneered in enactment and implementation of EIA legislations in 1982, 2003 and 1983, 1990 respectively (Economic Commission for Africa, (2005) Almagi *et.al* (2007). In East Africa Uganda pioneered in enacting EIA legislation in 1998, Kenya EIA legislation was enacted in 2000, and implemented in 2003 (Morara *et.al* 2011).

3.4 This Environmental Impact Assessment Study

Detailed environmental impact assessment study for the current proposed project involved, but was not necessarily limited to, the following:

- ✓ Collection of baseline data and information
- ✓ Description of affected environments
- ✓ Participation of stakeholders
- ✓ Identification and assessment of potential impacts (both negative and positive) of the project to the environment
- ✓ Proposal of possible mitigation measures to curb any potential negative impacts, while outlining interventions to enhance the positive impacts
- ✓ Development of an appropriate Environmental Management Plan (EMP).

The role of the stakeholder participation was to:

(a) Establish common stakeholder needs and ensure that the project continues to satisfy these needs or even enhance the needs.

(b) Provide background information which will form an important part of baseline data.

(c) Create awareness amongst the stakeholders and sensitise them on environmental issues related to the project.

3.5 Preparation of the EIA Study Report

EIA Study Report prepared for the proposed project contains detailed information on the project, including the following:-

- ✓ Location of the project
- ✓ The objectives of the project
- ✓ Baseline information such as descriptions of the natural, social and operational environments the current policy and legal framework and the administrative arrangement under which the project will operate.
- ✓ The technology, procedures and processes to be used in implementation of the project.
- ✓ Alternative technologies and processes available and reasons for preferring the chosen technology and processes.
- ✓ The wastes to be generated by the project and ways of handling it.

- ✓ A description of potentially affected environments.
- ✓ 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.
- ✓ An EMP proposing measures for eliminating, minimising or mitigating adverse impacts on the environment, while enhancing the positive effects; including the cost, time frame, and responsibility to implement these measures.
- ✓ Provision of an action plan for the prevention and management of foreseeable accidents and hazardous activities.
- ✓ Measures to prevent health hazards and to ensure security in the working environment for the employees and users of the facility, and for management of emergencies.
- ✓ An economic and social analysis of the project.
- ✓ An identification of gaps in knowledge and uncertainties which were encountered in compiling the information.
- ✓ A non-technical summary outlining the key findings, conclusions and recommendations of the study.

4. BASELINE ENVIRONMENT INFORMATION OF THE PROJECT AREA

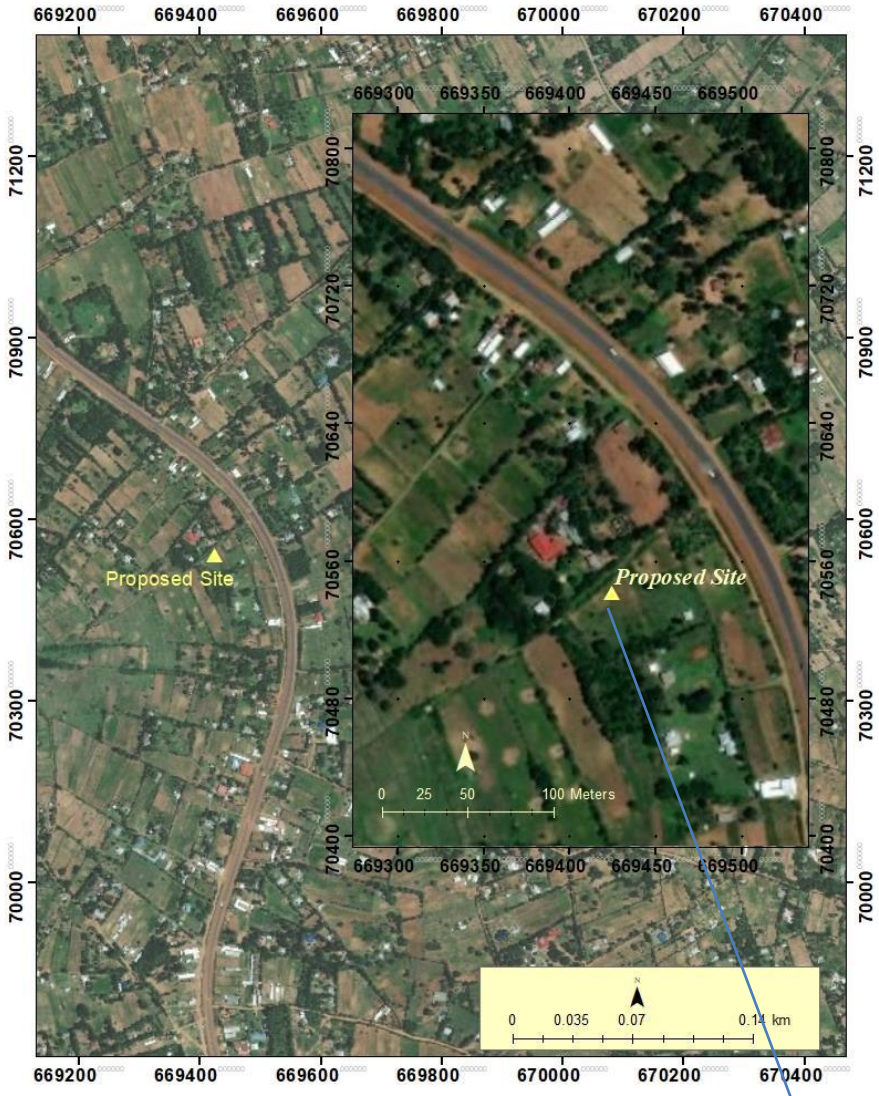
The baseline environmental condition of the proposed project is described in terms of the existing physical, biological, and social environment.

Plate 1: Collection of baseline information

4.1 Project Location

The proposed project will be located in Bungoma County, Kanduyi Constituency, Kibabii-Tuuti Ward at Bukananachi area and on a parcel of land plot No. East Bukusu/North Kanduyi/11492.The GPS coordinates for the site are Latitude; 0.637985°N and Longitude; 34.522491°E.

The site is in an area that is sparsely populated though rapidly developing due to its strategic location near Mayanja market Centre and Bungoma Town; however, there exists two homesteads; one to the left and one to the right of the proposed site as depicted through the area aerial image below.



Proposed Plant Site

Existing Homesteads

Figure 3: *General location of proposed project site*

4.2 Social Economic

4.2.1 Demography

The 2013 projected population for Bungoma County based on the growth rate of 3.1% was 1,557,236 (Male 760,564 Female 796,672). The projections for 2015 gave the County a population of 1,655,281 (Male 808,449, Female 846,832) and by 2017 the population was projected to stand at 1,759,499 (Male 859,350 and Female 900,149). The Male to Female ratio is 1: 1.2. The county has a growing population with varying demographics, which include fertility, mortality, birth rates, migrations, immigrations among others. Understanding population composition by age cohorts helps to plan for delivery of required needs and services.

4.2.3 Transportation and Infrastructure

The bulk of the road network in Bungoma County is composed of earth surface. The road network is poor and lack overhead foot bridges, designated bicycle and pedestrian lanes. The Nairobi – Kampala railway line traverses through the County but is underutilized since many bulk transporters use roads. This contributes to wear and tear of County roads.

4.2.4 Land Tenure and Use

Agriculture is the backbone of Bungoma County and most families rely on crop production and animal rearing. The main crops include maize, beans, finger millet, sweet potatoes, bananas, Irish potatoes and assorted vegetables. These are grown primarily for subsistence with the excess sold to meet other family needs. On the other hand, the main cash crops include sugar cane, cotton, palm oil, coffee, sun flower and tobacco. Most families integrate livestock production with farming. The main livestock kept include cattle, sheep, goats, donkeys, pigs, poultry and bees. Most of this is on a small scale but some farmers also produce milk and poultry products for commercial

use. Milk farmers sell their milk though cooperative societies including Sang'alo, Kikai and Naitiri.

4.3 Bio-Physical Environment

4.3.1 Physical and Topographical Features

The major physical features include; the extinct volcanic Mt Elgon, Mt. Elgon forest reserve, National park and mountain vegetation. The other physiographic features include hills (Chetambe, Sang'alo and Kabuchai), rivers, waterfalls such as Nabuyole and Teremi. Mt. Elgon and Sang'alo hill have attractive caves. The altitude of the County ranges from over 4,321m (Mt. Elgon) to 1200m above sea level. Mount Elgon is a 4,321m high extinct volcano, Kenya's second-highest mountain (after Mount Kenya). The County has only one gazetted forest, the Mt. Elgon forest reserve which measures 618.2Km^2.

4.3.2 Climate

The climate here is tropical. Most months of the year are marked by significant rainfall. The short dry season has little impact. The temperature here averages 21.1 °C. In a year, the average rainfall is 1628 mm. The County experiences two rainy seasons, the long-March to July and short rains-August to October. The annual rainfall in the County ranges from 400mm (lowest) to 1,800mm (highest). The annual temperature in the County vary between 0°c and 32°c due to different levels of attitude, with the highest peak of Mt. Elgon recording slightly less than 0°c. The average wind speed is 6.1 km/hr. February is the warmest month of the year. The temperature in February averages 22.1 °C. The lowest average temperatures in the year occur in July, when it is around 20.0 °C. There is a difference of 189 mm of precipitation between the driest and wettest months. The variation in temperatures throughout the year is 2.1 °C.

4.3.3 Geology

The county is well drained due to the mountainous topography. The drainage pattern is radial to parallel on the upper and mid-slopes respectively. Flooding is not common and limited to the lower parts specifically at the boundaries with Teso. However, drainage infrastructure is poor. Storm water flows freely carrying with it massive soils downstream. Water erosion is the major form of erosion in the county.

5. POLICY AND LEGAL FRAMEWORK

5.1 Introduction

Legislation, laws, policies and regulations specific to environmental management can directly or indirectly affect the implementation of a proposed project. Kenya is a signatory to many international conventions and treaties. Some of the International Treaties and Conventions Binding Kenya include:

- Agenda 21
- The World Commission on Environment and Development (The Brundtland Commission)-signed/ratifies 1987
- Convention on Biological Diversity (CBD)-signed/ratified 1992
- United Nations Framework Convention on Climate Change (UNFCCC)-signed/ratified 1994
- United Nations Framework Convention on Climate Change (UNFCCC)-Kyoto Protocol signed/ratified (1997)
- African Convention on the Conservation of Nature and Natural Resources
- International Union for Conservation of Nature

Kenyan Environmental Legislation are determined and enforced through various levels of statutes, the majority of which are sector specific. The Environment Management and Coordination Act (EMCA) 1999 is the governing law for the Protection and Development of the Environment in the Kenya. It is considered the base for various environmental regulations and guidelines. Some of the legislation that are relevant to this project include

- The Environmental Management and Coordination Act of 1999
- The Environmental Management and Coordination (Water Quality) Regulations, 2006
- The Environmental Management and Coordination (Waste Management) Regulations, 2006

- The Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations 2009
- The Physical planning Act
- The County Government Act 2012
- The Public Health Act
- The Water Act of 2016
- The Employment Act 2007
- The Work Injuries Benefits Act 2007
- The labour Institutions Act 2007
- The Occupational Safety and Health Act 2007
- The Environmental (Impact Assessment and Audit) Regulations 2003
- The Standards Act, Cap 496
- Land Control Act Cap 302
- Land Planning Act (Cap. 303)
- The Land Acquisition Act Cap 295

5.1 Binding multilateral agreements/ conventions

5.1.1 Agenda 21

Kenya continues to implement Agenda 21 to support sustainable development through the integration of environmental concerns into the national development policies, plans, and programmes

5.1.2 The World Commission on Environmental and Development (The Brundtland Commission) -signed/ratifies 1987

The commission focuses on the environmental aspects related to development and requires all development projects to be sustainable economically, socially and environmentally. The principle of the organisation emphasis that development project

should not have permanent negative impact on the biosphere and in particular the ecosystems.

5.1.3 Convention on Biological Diversity (CBD)-signed/ratified 1992

Commonly known as the Bio-diversity Treaty, this is one of the treaties that was open for signature at UNCED, 1992. This convention is a practical tool for translating the principles of Agenda 21 (Rio Earth Summit) into reality. The Convention is dedicated to promoting sustainable development. Parties to the treaty solemnly affirm sovereign rights over their biological sources, while accepting responsibility for conserving biological diversity and using biological resources in a sustainable manner. All developers need to ensure their operation promote national strategies, legislation, plans and programmes and avoid loss of biodiversity within their property.

5.1.4 United Nations Framework Convention on Climate Change (UNFCCC) – signed/ratified 1994

The Convention on Climate Change sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. Kenya and other states gather and share information on greenhouse gas (GHG) emissions, national policies and best practices.

5.1.5 African Convention on the Conservation of Nature and Natural Resources

This convention reaffirms the importance of natural resources both renewable and non-renewable, particularly the soil, water, flora and fauna. The main objective is to facilitate sustainable use of the above resources. The convention was adopted in Algiers on 15th September 1966 and came into force on 16th June 1969.

5.1.6 International Union for Conservation of Nature

International Union for Conservation of Nature (IUCN) helps the world find pragmatic solutions to our most pressing environment and development challenges. IUCN categorises protected areas by management objective and has identified six distinct

categories of protected areas according to their management objectives. The categories are recognised by international bodies such as the United Nations and by many national governments as the global standard for defining and recording protected areas and as such are increasingly being incorporated into government legislation.

5.2 Kenya Environmental legislation

5.2.1 Environmental Management and Co-Ordination Act (EMCA), 1999

The EMCA, 1999 provides the legal framework for management of the environment and other related issues in Kenya. It is the policy of the Government of Kenya that EIA be conducted for planned projects that are likely to cause, or will have, significant impacts on the environment, so that adverse impacts can be foreseen, eliminated or mitigated. It is also policy of the government that the EIA process be interdisciplinary, fully transparent so that the stakeholders have access and can express their views. This is in order that the process serves to provide a balance between environmental, economic, financial, social and cultural values for purposes of sustainable development of the entire country. The policy therefore, through the use and application of EIA, seeks to integrate environmental concerns in all development policies, plans, projects and programs at national, regional, district and local levels with full public participation of all stakeholders.

The undertaking and administration of the EIA process for the proposed project will be in accordance with the Environmental (Impact Assessment and Audit) Regulations, 2003. Some of the administrative procedures of EMCA include:

- The EIA process will be applicable to both public and private sector development projects and programs.
- The projects to be subjected to EIA are specified in the second schedule of the EMCA, 1999. Besides the scheduled activities, the Act empowers the Minister in charge of environment to prescribe for EIA appraisal any other activities, which in his view carries significant environmental impacts.

- NEMA will designate environmental committees to oversee implementation at Provincial and District levels.
- NEMA will initiate public participation through uses of public notices and meetings with regard to proposed EIA studies and review of reports.
- A scheduled activity will not receive the necessary authorisation from NEMA to proceed, until all EIA requirements have been fulfilled and accepted by NEMA and relevant lead agencies.
- EIA License will be granted when NEMA and the Minister are satisfied that an EIA has been satisfactorily conducted and that an Environmental Management Plan of the activity has been sufficiently developed.
- Complains with regard to compliance with EIA licensing requirements and procedures that NEMA may not resolve will be subject to a review by the Environment Tribunal. Under the Act there are general provisions for appeal to high courts and to bring proceedings in a court of law where necessary, for judicial review by third parties including concerned citizens and/or organisations other than the Government.

5.2.2 The Environmental Management and Coordination (Water Quality) Regulations, 2006

The regulations protect all water resources. Relevant features of this regulation as far as this study is concerned include:-

- Every person shall refrain from any act which will directly or indirectly cause pollution and it shall be immaterial whether or not the water resource was polluted before the enactment of these regulations;
- 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 as to cause pollution;

- Discharge of effluent from sewer must be licensed according to the act; and the carry out daily effluent discharge quality and quantity monitoring and shall comply with the standard set in the fifth Schedule of the act.
- Water abstraction must only be done after approval of an Environmental Impact Assessment study;
- The regulations also set out standards to be followed for effluent discharge to the environment.
- No person shall be permitted to use waste water for irrigation purposes unless such water complies with the quality guidelines set out in the 8th Schedule of the Act.
- No person shall use or allow to be used any natural water body for recreational purposes unless the water body meets the quality standards for recreational standards as set out in the tenth schedule of the regulation.

5.2.3 The Environmental Management and Coordination (Waste Management) Regulations, 2006

Relevant parts of this regulation include

- Prohibition of any waste disposal on a public highway, street, road, recreation area or in any public place except in designated waste receptacle;
- All waste generator to collect, segregate and dispose such waste in a manner provided for under these regulations;
- All waste generators to minimize waste generated by adopting cleaner production methods through:
    - improvement of production process;
    - monitoring the product cycle from beginning to the end;
    - incorporating environmental concerns in the design and disposal of products;
- All waste transporters to be licensed according to the act;

- All vehicles used to transport waste to be labelled in such a manner as may be directed by the Authority;
- Collection and transportation of the waste to be done in such a manner no to cause scattering of the waste;
- The vehicle and equipment for waste transportation to be in such a manner not to cause scattering of or flowing out of waste; and
- The vehicles for transportation and other means of conveyance of waste to follow the scheduled routes approved by the authority from the point of collection to the disposal site.
- No person shall engage in any activity likely to generate any hazardous waste without a valid EIA licence issued by Authority
- Every generator of hazardous waste shall ensure that every container or package for storing such waste is labelled in easily legible characters, written in both English and Kiswahili: 'CAUTION', 'WARNING', 'POISON', 'DANGER', 'KEEP AWAY FROM UNAUTHORISED PERSON' and pictogram of skull and crossbones.

The proposed project shall generate solid wastes and liquid wastes which must be subjected to the mentioned parts of the regulations.

5.2.4 The Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations 2009

Part II of the general prohibition of this regulation state that except as otherwise provided for in this 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. Part (2) of the general prohibitions stated that in determining whether noise is loud, unreasonable, unnecessary or unusual the following factors may be considered:-

- Time of the day;

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

Part 2 of section III states that any person wishing to operate or repair any machinery, motor vehicle, construction equipment or other equipment, pump, fan, air-conditioning apparatus or similar mechanical device or engage in any maisonettes or industrial activity which is likely to emit noise or excessive vibrations shall carry out the activity or activities within relevant levels prescribed in the first schedule to these regulations. Part III section 13 (1) states that except for the purpose specified in sub-Regulation (2)… no person shall operate construction equipment (including but not limited to any pile driver, steam shovel, pneumatic hammer, derrick or electric hoist) or perform any outside construction or repair work so as to emit noise in excess of the permissible levels as set out in the second schedule of the regulations.

5.2.5 The Physical Planning Act

The Physical Planning Act governs how development is to be carried out in major towns and urban centres. The Department of Physical Planning, in the Ministry of Lands and Settlement, administers the Act. Under the Act, the Department of Physical Planning first approves all Partial Development Plans (PDPs) of infrastructure and other developments before the projects are implemented.

5.2.6 The County Government Act

Under the County Government Act Act the Bungoma County assumes a number of roles in its area of jurisdiction, which includes the proposed project area. The roles include issuance of

licenses for businesses, collection of refuse, setting up of adequate lighting, provision of water and sewerage services in the area, among others.

5.2.7 The Public Health Act

The Public Health Act outlines how different aspects of a project have to be undertaken to ensure the safety and health of users and neighbours. The Act gives guidelines on construction, maintenance and inspection of drainage system, septic tanks, cesspool or latrines.

5.2.8 Water Act 2016

This is an Act that replaces the old water Act of 2002. It provides for the regulation, management and development of water resources, water and sewerage services; and for other connected purposes. It is meant to align the water sector with the new Constitution's primary objective of devolution. The Act recognizes that water related functions are a shared responsibility between the national government and the County government.

The Act provides that every person has the right to access water resources, whose administration is the function of the national government as stipulated in the Fourth Schedule to the Constitution. Section 63 thereof also provides that every person in Kenya has the right to clean and safe water in adequate quantities and to reasonable standards of sanitation as stipulated in Article 43 of the Constitution.

In the new Act, the following institutions have been established and their roles and responsibilities defined as follows:

- ✓ **Water Tribunal** (formerly *Water Appeals Board*). This new Water Tribunal now includes more members and is present in more locations to deal with disputes.
- ✓ **Water Sector Trust Fund-WSTF** (formerly *Water Service Trust Fund*). Source of funds for the WSTF mandate have been expanded to include funds from national budget, county government, equalization fund, donations and grants, among others.

- ✓ **National Water Storage Authority-NWSA**. The NWSA is responsible for development and management of national public water works for water resource management and flood control.
- ✓ **Water Resources Authority-WRA** established in section 11(l) of the Act (formerly *Water Resources Management Authority*-WRMA). The objective of the new WRA is to protect, conserve, control and regulate use of water resources through the establishment of a national water resource strategy. In addition, the WRA is responsible for:
    - Formulation and enforcement of standards, procedures and regulation for the management and use of water resources;
    - Policy development;
    - Planning and issuing of water abstraction permits; and
    - Setting and collecting permits and water use fees.
- ✓ **Water Services Regulatory Board-WASREB** established in section 70(1) of the Act. The constitutionally guaranteed right to water and the need to protect consumers provides a strong basis for the national regulation and monitoring of water and sewerage services. This is critical to protect the interests and rights of consumers from exploitation and to set minimum national standards. As such, the functions of WASREB were maintained in the 2016 Act as they were in the 2002 Act. WASREB holds the mandate to approve tariffs, monitor and enforce water services standards and issue licenses to Water Service Providers.
- ✓ **Basin Water Resource Committee-BWRC** provided for in section 25 of the Act (formerly *Catchment Areas Advisory Committees*-CAACs). Catchment Areas Advisory Committees, which previously played a regulatory function at the regional level, have been replaced with BWRCs. The BWRCs will be committees of WRA whose members will be drawn from stakeholders within the basin and aim to achieve wide

stakeholder participation in the management of water resources at the basin level. The new BWRCs will retain the same regional functions as the former CAACs, which is to:

- Manage catchments,
- Facilitate establishment of Water Resource User Associations, and
- Play an advisory role to the WRA.

The County government will have a representative in the BWRC whose water resources rest within the County government's geographical jurisdiction.

Water Works Development Agencies-WWDAs, (formerly *Water Service Boards-WSBs*). The 2016 Water Act defines national public water works as water works whose water resource is: cross county in nature, financed out of the national government share of national revenue and intended to serve a function of the national government. These may include assets such as water storage and water works for the bulk distribution of water services. Furthermore, it specifies that development and management of national public works will be undertaken by the WWDAs while county public works will be a responsibility of the respective County.

The 2016 Water Act provides for handing over of national public works upon commissioning from WWDAs to the County government, joint committee or authority of the County governments if the water works' assets exclusively rest geographically within their jurisdiction.

The national government has the responsibility of supporting County governments to perform their respective duties. As such, upon commissioning of cross County assets, in a case where several County governments collectively want to transfer these assets from WWDA, the Act makes provision for establishment of an authority of County governments or a joint committee. Transfer of the ownership and management of these

assets from the WWDA can then be done to the authority of the County governments or joint committee.

WWDAs are responsible for the:

- Development, maintenance and management of national public works;
- Operation of the national public waterworks and provision of water services as a water service provider, until the responsibility for the operation and management of the waterworks is handed over to the County government, joint committee or CCA.
- Provision of technical services and capacity building to County governments and water service providers within its region.

✓ **Water Resource User Associations-WRUAs**. The act provides for establishment of WRUAs in section 29(l) of the Act, which are community based associations for collective management of water resources and resolution of conflicts concerning the use of water resources. The BWRC may contract WRUAs as agents to perform certain duties in water resource management.

✓ **Water Services Providers (WSPs)**. WSPs are now the responsibility of County governments who have the mandate to provide water services. WSPs are responsible for provision of water services within the area specified in their licenses and development of County assets. Currently, WSBs sign service level agreements with WSPs and the regulator issues licenses to WSB. Under the new Water Act 2016, WSPs must apply again for new licenses to WASREB.

On establishment of protected areas and ground water conservation areas, section 22(l) of the Water Act 2016 provides that where the Authority is satisfied that in order to conserve a vulnerable water resource, special measures are necessary for the protection of a catchment area or a part thereof, it may by Order published in the Gazette declare such catchment area to be a protected area. Section 23(l) of the Water Act provides that

the Authority may declare an area to be a ground water conservation area, where it is satisfied that, in any area, special measures for the conservation of ground water are necessary in the public interest for-the protection of public water or water supplies used for industry, agriculture or other private purposes; the conservation of the water resources of the aquifer of the ground water resources; or ecological reasons. Section 24(l) requires the Water Resources Authority, in consultation with the Cabinet Secretary, may designate a defined area from which rain water flows into a watercourse to be a basin area for the purposes of this Act.

On operational permits, Section 36 of the Water Act 2016 provides that a permit is required for any of the following purposes:-

- Any use of water from a water resource, except as provided by section 37 of the Act;
- The drainage of any swamp or other land;
- The discharge of a pollutant into any water resource; and
- Any other purpose, to be carried out in or in relation to a water resource, which is prescribed by Regulations made under this Act to be a purpose for which a permit is required.

Further, Section 42(1) provides that the conditions on a permit may require that on the issue of the permit and at prescribed intervals thereafter, the permit holder shall pay charges to the Authority for the use of water in accordance with the terms of the permit and the Regulations prescribed by the Authority. The charges are to be determined by reference to a schedule of charges published in the Gazette by the Authority following public consultation.

Section 43(1) provides that in issuing a permit, and in fixing any conditions to be imposed on a permit, the Authority shall take into account such factors as it considers relevant, including:-

- Existing lawful uses of the water;
- Efficient and beneficial use of water in the public interest;
- Any basin area water resources management strategy applicable to the relevant water resource;
- The likely effect of the proposed water use on the water resource and on other water users;
- The classification and the resource quality objectives of the water resource;
- The investments already made and to be made by the water user in respect of the water use in question;
- The strategic importance of the proposed water use;
- The quality of water in the water resource which may be required for the reserve; and
- The probable duration of the activity or undertaking for which a water use is to be authorised.

Section 43(2) of the Water Act provides that the use of water for domestic purposes shall take precedence over the use of water for any other purpose, and the Authority may, in granting any permit, reserve such part of the quantity of water in a water resource as in its opinion is required for domestic purposes.

Section 37(l) provides that a permit is not required:-

- For the abstraction or use of water, without the employment of works, from any water resource for domestic purposes by any person having lawful access to the water resource;
- For the abstraction of water in a spring which is situated wholly within the boundaries of the land owned by any one landholder and does not naturally discharge into a watercourse abutting on or extending beyond the boundaries of that land; or

- For the storage of water in or the abstraction of water from a reservoir constructed for the purpose of such storage and which does not constitute a water course for the purposes of this Act (The Act defines a watercourse as any natural channel or depression in which water flows regularly or intermittently).

5.2.9 Employment Act 2007

General Principal

The Act constitutes minimum terms and conditions of employment of an employee and any agreement to relinquish vary or amend the terms set shall be null and void.

The act stipulates that no person shall use or assist any other person, in using forced labour. Clause 5 of the act states that its shall be the duty of the Minister, Labour officer, the National Labour Court and the subordinate labour courts to; Promote equality of opportunity in employment in order to eliminate discrimination in employment Promote and guarantee equality of opportunity for a person who, is a migrant worker or a member of the family of the migrant worker lawfully within Kenya

No employer shall discriminate directly or indirectly, against an employee or prospective employee or harass an employee or prospective employee on the following grounds; race, colour, sex, language, religion, political or other opinion, nationality, ethnic or social origin, disability, pregnancy, mental status or HIV status. An employer shall pay his employees equal remuneration for work of equal value

Part IV Rights and duties of employment

The provisions of this part and part VI constitute basic minimum and conditions of contract of service. The employer shall regulate the hours of work of each employee in accordance with provisions of this Act and any other written law. Subsection (2) of section 27 states that an employee shall be entitles to at least one rest day in every period of seven days. An employee shall be entitles to not less that twenty-one working days of leave after every twelve consecutive months. Section 29 of the Act stipulates that a female employee shall be entitled

to three months maternity leave with full pay. Subsection 8 of section 29 further states that no female employee shall sacrifice her annual leave entitlement on account of having taken her maternity leave. *Section 37 (conversion of casual employment to term contract)* Where a casual employee works for a period or a number of continuous working days which amount in the aggregate to the equivalent of not less than one month; or performs work which cannot reasonably be expected to be completed within a period, or a number of working days amounting in the aggregate to the equivalent of three months or more. The contract of service of the casual employee shall be deemed to be one where wages are paid monthly. In calculating wages and the continuous working days, a casual employee shall be deemed to be entitled to one paid rest day after a continuous six days working period and such rest day or public holiday which falls during the period under consideration shall be counted as part of continuous working days.

5.2.10 Work Injuries Benefits Act 2007

Obligations of Employers

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

Registration of employer

Every employer carrying on business in Kenya shall within the prescribed period and in the prescribed manner register with the Director of Occupational Health and Safety Services and any other information as the Director may require.

Subsection 4 of section 8 of the Act states that where an employer carries on business in more than one workplace, or carries on more than one class of business, the Director may require the employer to register separately in respect of each place or class of business.

Employer to keep record (Section 9)

Section 9 states that an employer shall; Keep a register or other record of the earnings and other prescribed particulars of all employees and produce the same on demand by the director for inspection. Such records shall be retained for at least six years after the date of last entry.

Right to compensation

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

Reporting of accidents

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

Lapse of right to benefits

A right to benefits in accordance with this Act shall lapse if the accident is not reported to the employer within twelve months after the date of such accident. However, it shall not be bar to compensation if it is proved that the employer had knowledge of the accident from any other source. Section 30 of the Act states that compensation for permanent disablement shall be calculated on the basis of ninety six months earnings subject to the minimum and maximum amounts determined by the minister after consultation with the board. In case of a fatal

accident compensation shall be paid to the dependants of the employee in accordance with the set provisions in the third schedule. The employer shall further be liable to pay reasonable expenses for the funeral of the deceased employee subject to the maximum amount determined by the minister, after consultation with the National council for occupational Health and Safety

The First Schedule of the Act gives the minimum degree of Disablement for various body parts while the second Schedule gives a list of work description and the associated occupational disease.

5.2.11 Labour Institutions Act 2007

The Act establishes the National Labour Board whose functions shall be to advice the minister on;

- All matters concerning employment and labour
- Legislation affecting employment and labour
- Any matter relating to labour relations and trade unionism
- Labour inspection service
- Reported strikes and lockouts
- Labour facility information and indices etc.
- The board shall in consultation with the minister, establish;
- Work permit committee
- National manpower development committee
- Trade dispute committee
- Productivity committee and such other committees or panel as are necessary for the performance of board's functions.

Section 34 of the act stipulates that an authorized officer may either alone or in the presence of another person, enter any premises or place where persons are, or may be employed for the purpose of performing his duties as specified under the Act.

The labour officer may, for the purpose of monitoring or enforcing compliance with any law require the production of wages sheets or other employment records kept by an employer, enter inspect and examine all latrines and other sanitary arrangements or water supply, inspect and examine all food provided or appearing to be provided for employees, and take samples thereof in duplicate, in the presence of the employer or the employers representative which samples shall be sealed and one sample so sealed shall be left with the employer, order that all buildings and premises where employees are housed or employed be kept in a clean and sanitary condition.

Section 37 of the act states that the medical officer shall exercise the powers conferred upon the labour officer and in addition;

- Order an employee who, in his opinion is sick and for whom the conditions prevailing at the place of employment are not conducive to rapid recovery of his health to proceed to hospital and in that case the employer shall at the earliest opportunity and at his own expense send the employee to the place of work or to a hospital, as the case may be.
- Condemn any food provided for employees which, in the opinion of the medical officer, is unfit for human consumption, and all food so condemned shall be destroyed forthwith in the presence of the medical officer.
- Order at the expense of the employer, such variety of food for an employee as he may deem necessary
- Inspect all drugs and medicine provided for the use of employees

5.2.12 The Occupational Safety And Health Act 2007

Part II – General Duties of the Occupiers

In Section 6 (1), it is stated that the occupier shall ensure the safety, health and welfare at work of all persons working in his work place.

Without prejudice to the generality of an occupier's duty under sub section 1 above, the duties of the occupier includes:-

- The provision and maintenance of plant and systems and procedures of work that are safe and without risk to health;
- Arrangements for ensuring safety and absence of risks to health and connection with the use, handling, storage and transport of articles and substances;
- The provision of such information, instruction, training and supervision as is necessary to ensure the safety and health at work of every person employed;
- The maintenance of any workplace under the occupier's control, in a condition that is safe and without risks to health and the provision and maintenance of means of access to and egress from it that are safe and without such risks to health;
- The provision and maintenance of a working environment for every person employed that is, safe, without risks to health, and adequate as regards facilities and arrangements for the employees welfare at work;
- Inform all persons employed of:-
    - Any risks from new technologies; and
    - Imminent danger; and
- Ensuring that every person employed participates in the application and review of safety and health measures.

Every occupier shall carry appropriate risk assessments in relation to the safety and health of persons employed and adopt preventive and protective measures to ensure that under all conditions of their intended use without risk to health and comply with the requirements of safety and health provisions.

The occupier shall send a copy of a report of Risk Assessment carried out under this section to the area occupational safety and health officer and shall take (occupier)

immediate steps to stop any operation or activity where there is an imminent and serious danger to safety and health and to evacuate all persons employed as appropriate.

Duty to prepare a safety and health policy statement

In Section 7 (1) (a) and (b), it is established that except in such cases that 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; and
- To bring the statement and any revision of it to the notice of all of his employees.

Discrimination against employee

Sub section (1) of Section (8) states that the occupier shall not dismiss an employee, injure the employee or discriminate against or disadvantage an employee in respect of the employee's employment, or alter the employee's position to the detriment of the employee by reason only that the employee:-

- Makes a complaint about a matter which employee considers is not safe or is a risk to his health;
- Is a member of a safety and health committee established pursuant to this Act; or
- Exercises any of his functions as a member of the safety and health committee.

Safety and Health Committee

Section (9) (1) Illustrates that an occupier shall establish a safety and health committee at the workplace in accordance with the regulations prescribed by the Minister if:-

- There are twenty or more persons employed at the workplace; or
- The Director directs the establishment of such a committee at any other workplace.

Duty not to charge employees for things done or provided

Section (10) (1) states that an Employer shall not make any deduction from an employee's remuneration or levy, or permit to be levied on any of his employees any charge in respect of anything done or provided in pursuance of this Act or any regulation made there under.

Safety and Health Audits

Section 11 (1) of the Occupational Safety and Health Act 2007 outlines that the occupier of a workplace shall cause a thorough safety and health audit of his workplace to be carried out at least once in every period of twelve months by a safety and health advisor, who shall issue a report of such an audit containing the prescribed particulars to the occupier on payment of a prescribed fee and shall send a copy of the report to the Director. The Audit report referred above shall be preserved and be kept available for inspection by the Occupational Safety and Health Officer.

Duties of Self Employed person

Every self-employed person shall:-

⇒ Take all the necessary precautions to ensure his own safety and health and that of any other person in his workplace or within the environs of his workplace;

⇒ All times use appropriate systems of work, preventive and control measures and where not feasible, use suitable personal protective appliances and clothing required under this Act;

⇒ Comply with any safety and health rules, regulations instructions and procedures issued under this Act;

⇒ Report to the Director:-

- Any situation which he has reason to believe would present imminent danger or hazard and which he cannot correct, and
- Any incident or injury that arises in the course of or in connection with his works, as required under this Act.

Duties of Employee

Every employee shall, while at workplace:-

- Ensure his own safety and health and that of other persons who may be affected by his Acts or omissions;

Co-operate with his employer or any other person in the discharge of any duty or requirement imposed on the employer or that other person by this Act or any regulation made hereunder;

- At all times wear or use any protective equipment or clothing provided by the employer for the purpose of preventing risks to his safety and health;
- Comply with the safety and health procedures, requirements and instructions given by a person having authority over him for his own or any other person's safety;
- Report to the supervisor, any situation which he has reason to believe would present a hazard and which he cannot correct;
- Report to his supervisor any accident or injury that arises in the course of or in connection with his work; and
- With regard to any duty or requirement imposed on his employer or any other relevant statutory provision, co-operate with the employer or other person to enable that or requirement to be performed or compiled with.

Notice of accidents and dangerous occurrences

Section 21(1) Stipulates that; an employer or self-employed person shall notify the area Occupational Safety and Health Officer of any accident, dangerous occurrence, or occupational poisoning which has occurred at the work place.

Where an accident in a workplace, causes the death of a person therein, the employer or self-employed person shall:-

- Inform the area occupational safety and health officer within twenty-four hours of the occurrence of the accident; and

- Send a written notice of the accident in the prescribed form to the area occupational safety and health officer, within seven days of the occurrence of the accident.
- Where an accident in the workplace cause non-fatal injuries to a person therein, the employer shall send to the area occupational safety and health officer, a written notice of the accident in the prescribed form within seven days of the occurrence of the accident; and
- In case of death due to a workplace accident, non-fatal injuries arising from a workplace accident, an occupational disease or a dangerous occurrence at the workplace, involving a self-employed person incapable of submitting notification, such notification shall be submitted to the area occupational safety and health officer.

Health - General Provisions

Under Section 47 (1) It is established that Every workplace shall be kept in a clean state and free from effluvia arising from any drain, sanitary convenience or nuisance, and, without prejudice to the generality of sub section (1):-

- Accumulations of dirt and refuse shall be removed daily by a suitable method from the floors and benches of workrooms, and from a staircases and passages;
- The floor of every workroom shall be cleaned at least once in every week by washing or, if it is effective and suitable, by sweeping or by any other method;
- All inside walls and partitions, and all ceilings or tops of rooms, and all walls, sides and tops of passages and staircase, shall:-
  - ✓ Where they have a smooth impervious surface, at least once in every period of twelve months, be washed with hot water and soap or cleaned other suitable method;
  - ✓ Where they are kept painted with oil paint or varnished, be repainted or varnished at least once in every period of five years, or such other period as the director may

deem necessary, and at least once in every period of twelve months be washed with hot water and soap or cleaned by other suitable method; and

- ✓ In other cases, be kept whitewashed or colour washed and the white washing or colour washing shall be repeated at least once in very period of twelve months.

After the completion of the proposed project so many local people will be absorbed and employed. Foreigners will also visit the place and they will be from different parts of the country and outside the country. As required by the law the employer shall comply with the Occupational Safety and Health Act 2007.

5.2.13 The Environmental (Impact Assessment and Audit) Regulations 2003

The *Environmental Impact Assessment and Audit Regulations, 2003* provide guidelines for conducting an EIA as well as environmental auditing and monitoring. The Regulations state in Regulation 3 that *"the Regulations should apply to all policies, plans, programmes, projects and activities specified in Part III and V of the Regulations"* basically lists the guidelines of undertaking, submission and approval of the EIA/ESIA/SEA Report.

5.2.14 The Standards Act, Cap 496

The Kenya Bureau of Standard is the authority responsible for implementation of this act. The *Standard Act, Cap 496* provides standards on the requirements of Equipment and project materials.

5.2.15 The Land Act 2012

The Land Act 2012 is "an Act of Parliament to give effect to Article 68 of the Constitution, to revise, consolidate and rationalize land laws; to provide for the sustainable administration and management of land and land based resources, and for connected purposes". Part I of the act is preliminary provisions, part II of the act deals with management of public land, part III of the act deals with administration of public land (Leases, Licenses and Agreements), part IV of the act deals with community

land, part V of the act deals with administration and management of private land, part VI of the act deals with general provisions of leases, part VII of the act deals with general provisions of charges, part VIII of the act deals with compulsory acquisition of interests in land, part IX of the act deals with settlement programmes, part X of the act deals with easements and analogous rights, part XI of the act deals with miscellaneous, the schedule lists repealed laws i.e. The Way Leaves Act, Cap. 292 and The Land Acquisition Act, Cap. 295.

5.3 Proponent's knowledge and awareness of and responsibility for the application of relevant legislation

During this environmental impact assessment study, an assessment of the proponent's knowledge and awareness of and responsibility for the application of relevant legislation was conducted. The proponent was found to be fairly knowledgeable and aware of their responsibility for the application of relevant legislation affecting the proposed project.

5.4 Compliance Requirements

A review of the relevant legislation in relation to the proposed project was done to highlight the compliance requirements of the proposed project. The table below gives a summary of the relevant legislation compliance requirements.

Table 3: Legislation compliance requirements

LEGISLATION	COMPPLIANCE REQUIREMENT
The Environmental Management and Coordination Act (EMCA) 1999 (Amended) 2015.	▪ Requires the Proponent to: i. Submit an EIA Study Report to NEMA for a project. ii. Engage NEMA approved experts in conducting the EIA Study
The Environmental (Impact Assessment and Audit) Regulation 2003 (Amended) 2019.	▪ Requires the Proponent to: i. Prepare EIA Study report in accordance with the format specified in Regulations and pay attention to issues specified in the second schedule of the Regulations ii. Acquire a valid EIA license from the

	Authority prior to engaging in any activity of the proposed project iii. Carry out corrective measures in any improvement notices from NEMA
The Environmental Management & Coordination (Water Quality) Regulations, 2006	▪ The Regulation requires the Proponent to: i. Refrain from any activity which might cause water pollution. ii. Not to discharge any liquid, gaseous or solid into water resource as to cause pollution. iii. Acquire a valid effluent discharge license to discharge effluent into the environment. iv. Acquire EIA license prior to abstracting ground water or any activity that is likely to have any adverse impact on the quantity and quality of the water v. Follow the monitoring guide set out in the Third Schedule to the regulation when discharging effluent into the environment
The Environmental Management and Coordination (Waste Management) Regulation 2006	▪ Dispose of waste in an environmentally acceptable manner. ▪ Transport waste using a vehicle that has an approved "Waste Transportation License" issued by the NEMA ▪ Dispose of waste at a licensed disposal facility ▪ Label hazardous wastes containers in accordance with the requirements provided in section18 of the Regulation
The Occupational Safety and Health Act 2007	▪ It requires the Proponent to: i. Undertaking S&H risk assessments, provide notification of accidents, injuries and dangerous occurrences, etc. ii. Provide first aid facilities at the workplace provide PPEs to the employees
Environmental Management & Co-ordination Act (Air Quality) Regulations, 2014	▪ Management of dust emanating from the operations.
Physical Planning Act	▪ If in connection with a development application a local authority is of the opinion that proposals for

	industrial location, dumping sites, sewerage treatment, quarries or any other development activity will have injurious impact on the environment, the applicant shall be required to submit together with the application an environmental impact assessment report.
The Public Health Act	▪ The Act prohibits the Proponent from engaging in activities that cause environmental nuisance or those that cause danger, discomfort or annoyance to inhabitants or is hazardous to human and environmental health and safety.
The Employment Act 2007	▪ The Act constitutes minimum terms and conditions of employment of an employee.
The Labour Institutions Act 2007	▪ The act deals on matters concerning employment and labour
The Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations 2009	▪ The regulations: i. Prohibits the Proponent from making or causing to be made noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety or safety of others and the environment. ii. Prohibits the Proponent from causing noise which exceeds any sound level as set out in the First Schedule to the Regulations iii. Requires the Proponent (if wishing) to operate or repair any machinery, motor vehicle, construction equipment or other equipment, pump, fan air-conditioning apparatus or similar mechanical device or engage in any commercial or industrial activity which is likely to emit noise or excessive vibrations to do so within the relevant levels prescribed in the First Schedule of the Regulations. iv. Prohibits the Proponent from operating a motor vehicle which produces any loud and unusual

	sound and exceeds 84 dB (A) when accelerating. v. Prohibits the Proponent from operating construction equipment or perform any outside construction or repair work so as to emit noise.
Hazardous Substances Rules 2007	▪ This legislation requires the Proponent to: i. Ensure that where chemicals come into contact with employees, the exposure limits set out in the First Schedule of the Regulations are not exceeded. ii. Ensure that all employees exposed to chemicals in the workplace are protected adequately from exposure to hazardous substances that may be present in them using the hierarchy of hazard control methods iii. Have a Hazard Communication program implemented at their workplace
National Construction Authority Act 2011	▪ NCA registered contractor on site ▪ Sign board showing all approvals and the professionals engaged in the project. ▪ Safety signs on site; ▪ Personal protective equipment on site ▪ Sufficient hoarding and fencing ▪ NCA Compliance Certificate ▪ NCA Accredited Construction Workers and Site Supervisors

6. ANALYSIS OF ALTERNATIVES

Analysis of alternatives of the proposed Asphalt mixing plant focused mainly on the project alternative and on alternative project site. Three project alternatives are available namely the 'no project' alternative and 'yes project' alternative and the 'modified project'. Analysis of each alternative is as follows.

6.1. The "no project" alternative

This option will mean that the project will not be undertaken as currently proposed. This implies that the proposed Asphalt mixing plant will not be set up. The implication of this option is that the proponent may not realize their aim of making Asphalt for their numerous road construction projects.

6.2. The 'yes project alternative'

The "yes" project alternative means that the proposed Asphalt Mixing plant will be carried out as currently proposed without modifications. This option if undertaken will enable the proponent implement the project as currently proposed. The implication to the proponent for this option is that the proponent will be able to realize the plan of making asphalt for their numerous road construction projects.

6.3. The modified project alternative

The modified project alternative means that the asphalt mixing plant be implemented but with modifications.

6.4. Location Alternative

The key criteria used in the evaluation of the selected site were as follows:

Economic factors:

- The proximity of access roads and means of transportations;
- The land has already been procured and is free of conflict.

Non-economic factors:

- The site is at a flat topography as a preferable condition for construction and operation.

The proponent owns this particular proposed site for the installation of an asphalt mixing plant. An alternative location would mean the proponent acquires and/or leases another site which would prove costly thus leaving the current proposed site as the best option.

6.5 Technology Alternative

The proposed asphalt plant adopts a modern technology that takes environmental protection measures into consideration. The plant is equipped with dust prevention filters and many other health and safety incorporated tools and equipment's which makes it a suitable option in terms of environmental protection.

7. OCCUPATIONAL SAFETY AND HEALTH

7.1 Introduction

Occupational Health and Safety (OHS) is of importance at project sites. It is important for mechanisms to be put in place to predict potential risks, incidents and hazards in the said working environment. This is because the occupational environment directly affects employees involved in project, the neighbourhood, visitors, contractors, sub-contractors and the general public. Therefore before commissioning of the project, a number of safety measures have to be in place to ensure the safety of employees, neighbours and the general public. Employees and visitors to the project site may be exposed to a variety of personal health and safety risks. The type and level of exposure is generally related to factors controlled by the employer/ developer. Such factors include design, equipment, tools, work procedures, project, and employee training. Occupational health and safety risks that should be considered by the employer arise from normal functions and operations and during unusual circumstances such as accidents and incidents. The employer/ developer are responsible for:

- Implementation of appropriate national and international recognised OHS standards, practices and guidelines.
- Inclusion of meaningful participation of employees in implementation and maintenance of procedures and processes.
- Implementation of a programme to change employee culture and altitudes regarding health and safety.
- Planning, implementing and monitoring programs required to ensure OHS at the workplace.
- Provide and maintain workplaces, equipment, tools and machinery and organise work so as to eliminate or control hazardous ambient work factors.

- Provide appropriate occupational health and safety training for all employees.
- Provide adequate personal protective equipment to all employees at no cost to employees.
- Record and report occupational injuries and illness.
- Ensure contract specifications include demands for service providers, contractors, and sub-contractors to have or establish systems enabling them to meet the OHS requirements of the employer.

7.2. Occupational Health and Safety Management

An Occupational Health and Safety Management system (OHSMS) will be established, managed and operated for the proposed project. The system will contain the following features:

1. Occupational Health and Safety Policy for the company
2. Organizational framework of the OHSMS
    - Staffing of OHSMS
    - Competence requirements
    - Operating procedures
    - Training programs
    - Documentation
    - Communication
3. OHSMS objective (documentation)
4. Hazard prevention
    - Risk assessment
    - Prevention and control measures (active and negative)
    - Management of changes
    - Emergency preparedness and response

- Procurement (tools, equipment, services, contractors)

5. Performance monitoring and measurements
    - Hazard prevention measures
    - Ambient working environment
    - Work related injuries, ill health, disease and injuries
6. Evaluation
    - Feedback
    - Corrective measures
    - Action plan

7.3. Employee safety

In addressing requirements and needs to ensure employee safety, the following will be in place: -

- Provision of adequate personal protective equipment.
- Enforcement and proper use of personal protective equipment by all employees.
- Provision of First Aid and emergency services on site.
- In case of injury of employee during work; management must have a clear policy on treatment of the injured employee.
- In case of permanent disability arising from injury at work place, adequate compensation should be available within the law.
- Appropriate tools and equipment in sound working condition must be provided to employees to enable they work safely.
- All practical measures must be in place to ensure that the work place is free of dust and excessive noise.

7.4. Safety of neighbours and general public

Project sites are associated with incidents and accidents that endanger neighbours and general public. The contractor must ensure the safety of all neighbours and the general public is taken care of by putting the following measures in place: -

- All neighbours to be informed of the date of commencement of project.
- Heavy vehicles and trucks that will be ferrying in project equipment to the project site to observe required minimum speed limit when approaching the site to avoid accidents.
- There should be notices and warning prominently displayed at entry of project site and strategically around the project boundaries informing general public of on-going activity and safety requirements.

7.5 Machine use and Electrical Safety

During project work, it is expected that different machines, tools and equipment will be used. Most of this machine will be powered internally by use of diesel. In regard to electrical safety, the following will have to be undertaken: -

- Installation and fitting of proper electrical appliances to enable supply of electrical energy to utility point.
- All electrical installations and fittings are done according to electrical safety rules.
- All electrical wires must be safely insulated.
- Sockets and other electrical outlets must be securely fitted.
- When not in use all machines should be shut down.
- Qualified and well-experienced electrician should be hired to carry out all electrical work.
- Safety slogans should be strategically posted as a reminder to employees.
- Operating manuals of equipment should be available for use whenever needed.

7.6. Internal Safety

During the entire project implementation and operation cycle, safety of the employees on the site should be taken care of. Some of the things that need to be in place include:-

- Emergency preparedness
- First aid
- Welfare facilities
- Personal protective equipment

7.7. First-Aid

i. Contractor to ensure qualified First Aiders are available to administer First Aid to affected employees at all times.
ii. An appropriately equipped First-Aid station to be easily accessible at the project site.
iii. The First Aid station to be adequately equipped to meet first aid needs at the project site.
iv. A written Emergency Procedure to be in place.

7.8. Welfare facilities

i. Changing rooms for workers to be provided.
ii. Shower rooms and washing facilities to be provided.
iii. Contractor to avail potable drinking water to all employees at site.
iv. Appropriate and adequate Personal Protective Equipment to be provided
v. The enforcement on the consistency of the correct use of PPE provided
vi. The PPE provided are to be maintained clean and replaced when damaged or worn out.

7.9. Ambient factors in the project site

7.9.1 Noise

Management will put in place a comprehensive noise conservation programme which will include the following:-

i) Training of workers in noise prevention, control and management.

ii) Provision of appropriate noise protective devices to workers.

iii) Training of the workers on the importance of making appropriate use of the protective devices provided.

iv) Monitoring of noise levels through periodic noise survey.

v) Use of appropriate noise attenuators.

vi) Audiometric test of workers

7.9.2 Dust

- Exposure to dust to be controlled by ensuring dust accumulation at project site is controlled.
- Equipment to be selected, especially that with in-built dust extraction.
- Employee exposed to dust to be provide with disposable dust masks.

8. STAKEHOLDER CONSULTATION AND PUBLIC PARTICIPATION

Consultation with stakeholders that are likely to be affected and those that are likely to have an interest in the proposed project was conducted as provided for in Regulation 17 of the Environmental (Impact Assessment and Audit) Regulations, 2003. The consultation was vital and served to:-

- Inform local community especially those drawn from within their locality.
- Explain to the local community the nature of the proposed project, its objectives and scope.
- Give local community especially those drawn from the proposed project site an opportunity to present their views, concerns and issues regarding the proposed.
- Obtain suggestions from the local community and other stakeholders on possible ways potential negative impacts can be effectively mitigated and how the local community can be part of the proposed project.

8.1 Steps taken to consult with stakeholders amidst Covid-19 Pandemic

COVID-19 is a serious and rapidly evolving global pandemic. While about the bigger percentage of individuals infected with corona virus recover, a high proportion of cases requires hospitalization, and some mortalities have been recorded especially for people with underlying medical conditions. Overcrowding and unhygienic conditions and lack of medical screening have proven to cause rapid spread of COVID-19.

Due to the prevailing Covid-19 challenges and having to adhere to restrictions on gatherings as issued by the Ministry of Health guidelines on Management of COVID-19 in Kenya, consultation with the public mainly involved one on one interviews guided by a pre-designed interview checklist/ questionnaire.

8.2. Stakeholders consulted

A detailed questionnaire survey was carried out that targeted to reach out to primary stakeholders at the grass root. The following are some of the stakeholders consulted

8.2.1. Institutions and Government Agencies Consulted

1. St. Marys' Madona Namikelo Primary School.
2. Kibabii Vicational Training Centre.
3. Kibabii Girls Primary School.
4. Nabuala Hospital.
5. Bukananachi Secondary.
6. Kenya Rural Roads Authority.
7. Office of The Member Of Parliament Kanduyi.
8. Office of The Ward Assembly Tuuti-Ward.
9. Munyoti Primary School.
10. Office of The County Commissioner Bungoma South.
11. Marel Junior Academy.
12. Cardinal Otunga Girls High School.
13. Kibabi University.
14. St Mary's Kibabi Boys High School.
15. Kibabii Diploma Teachers Training Institute.
16. Bukananachi Primary School.
17. Manoa Filling Station.
18. Chief's Office Kibabii Location.
19. Zuri Resort Kanduyi.
20. Masinde Muliro University Of Science And Technology-Bungoma Campus.
21. Safa Oil Bungoma.
22. King Jesus Ministry International-Kibabii Church.
23. St. Anthony Medical Clinic.
24. St. Mary's Kibabii Boys Primary School.
25. Deliverance Church Kibabii.

8.2.2. Individuals Consulted

1. Geoffrey Wafula
2. Ambrose Malanga Matanda
3. Fred Wekesa Sikonga
4. Brian Wafula.
5. Christine N. Simiyu.
6. Rebecca Wabomba.
7. Veronica Masika
8. Elizabeth N. Wamalwa
9. Sheila Kisongochi.
10. Jemimah Naliaka.
11. Jacintah Mukhwana
12. Arnold Wekesa Simiyu.
13. Elizabeth Simiyu.
14. Isaac Ngoni.
15. Anthony Kelas Simiyu.
16. Stephen Tabani Ngichabe
17. Wamoto John
18. Patrick Macheso
19. Mary Wekesa
20. Florence Wasilwa.
21. Augustine Macheso
22. Pauline Wafula.
23. Salvation Army Church
24. Wafulah N Brenda.
25. Fwamba Caleb Juma.

26. Ruth Nafula Mulumet.
27. Jane N. Wasike.
28. Bukananachi Primary School.
29. Namikelo R.C Primary
30. Buyeti Medical Centre.
31. Catherine Wanjala.
32. Mary Tabani Nekesa.
33. Salome Osyanju.

8.3. Views from stakeholders consulted

The following is a summary of the views as captured from stakeholders consulted

i. The proposed project will create job for the area residents.
ii. It will contribute to improving infrastructure in the area
iii. Opportunities arising from the proposed project should be given to area youth and women as a priority.
iv. The proposed project may lead to contamination of food crops by the gases emitted during production.
v. The proposed project may lead to sound pollution to residents.
vi. The proposed project may lead to water/air/soil pollution.
vii. It may lead to increased risk of chronic diseases to the people leaving within the neighbourhood of the proposed project site.
viii. The proposed project will contribute to improved business in the area and therefor boost the economy of the area.
ix. The proposed project, if not managed well, may pollute water points.
x. The proposed project will help improve security in the area
xi. Lead to easy access to construction materials.
xii. Improve land value.

xiii. Contribute to the country's revenue.

xiv. May contribute to moral decay and increase in social evils

xv. May contribute to child labor and school drop outs

8.4. Recommendations as given by stakeholders consulted

i. The proposed plant should be moved to the furthest end of the same parcel of land, away from settlements.

ii. Have measures in place to manage emission of gases for a cleaner environment.

iii. Put measures in place to manage sound pollution.

iv. Job opportunities arising from the proposed project should be given to the locals as a priority.

v. Undertake tree planting at the periphery of the proposed project site to act as a buffer.

vi. Workers at the proposed plant should be provided with the appropriate protective equipments.

vii. Waste arising from the propose plant should be handled in an environmentally sound manner.

viii. A committee from the members of the community should be set up to oversee the environmental performance of the proposed plant.

Appendix 4 gives the detailed stakeholder questionnaire responses.

9. POTENTIAL IMPACTS AND MITIGATION MEASURES

9.1. Introduction

During the implementation of the proposed Asphalt mixing plant, it is likely that the project will result in both positive and negative impacts to the environment. All possible practical measures should be put in place to ensure that:-

- ✓ Any likely negative impacts are mitigated;
- ✓ Positive impacts are enhanced and maximized; and
- ✓ Local people from neighborhood benefit positively from the project.

9.2. Impact determination

Four key factors determine the magnitude of the impacts likely to result: -

- ✓ Project size;
- ✓ Local environment condition;
- ✓ Duration of implementation; and
- ✓ Nature and type of technology to be used.

9.2.1. Project size

The size of a project has a direct relationship with the possible environmental impacts likely to result when implemented. Large projects will require large quantities of inputs, labor and longer duration to implement. Positive and negative impacts that are likely to result from such project will thus be of a higher significance as opposed to small project.

9.2.2. Local environmental condition

The baseline environmental condition of a proposed project site will determine the impacts and significance of impacts that are likely to result during project implementation. If a proposed site is a fragile environment rich in biodiversity, there is a likelihood of such a site experiencing severe negative impacts when the proposed project is implemented. On the other hand if a proposed site has significant human

activity and more so disturbed, negative impacts likely to results due to implementation of a project may be less since the said environment would already be disturbed.

9.2.3. Duration of implementation

Time taken to implement a project will determine its impacts. Projects implemented in piecemeal will take long to be completed thus have potential negative impacts spread out over a longer duration. Cumulatively, such impacts may at the long run be of more severity as opposed to if implementation was once.

9.2.4. Technology to be used

The type of technology to be used will also have a bearing on environmental impacts that will likely result. If a project employs outdated technology, then the magnitude of environmental pollution that is likely to occur will be high as opposed to a case where the latest technology is used. Further, labour intensive projects are likely to have more negative impacts to the environment than projects that are highly mechanized. Whereas creation of employment to local people is a vital component in any development project, a balance must be struck between how intensive the labour can be without necessarily resulting to environmental degradation. Total replacement of human labour by intensive mechanization of the entire project may deny local people the much needed job opportunities.

9.3 Identification and Assessment/Analysis of Potential Impacts

Identification and examination of the major potential environmental and public health issues of concern was done and the relative importance to the development project indicated. This included the occupational exposure, health and safety measures and population exposure in the appropriate study area(s) and changes and/or enhancement in emergency response plan. Identified potential impacts related to, (but are not restricted by) the following:

- Air pollution

- Noise and vibration
- Solid waste disposal
- Socio-economic and cultural impacts
- Change in drainage patterns
- Loss of species and natural features
- Habitat loss and/or fragmentation
- Pollution of potable, surface or ground water
- Risk assessment
- Soil
- Change in land use
- Visual impacts – aesthetics
- Impact on traffic and the transportation of heavy equipment to the site

A distinction between significant positive and negative impacts, direct and indirect, long term and immediate impacts were done to inform site restoration, residual impacts and the proposed mitigation measures. Identification of avoidable as well as irreversible impacts was done.

9.4 Anticipated positive impacts

Potential positive impacts that were considered include economic impacts, livelihoods improvement, social impacts, and technological transfers. Measures to enhance positive impacts were proposed.

- ✓ Economic impacts
  - Increased employment
  - Business spill-offs
  - Tax revenue
- ✓ Contribution to development of local public infrastructure/ facilities
- ✓ Skill development and technology transfer

- ✓ Development of the nearby Mayanja Township

9.4.1 Economic impact

9.4.1.1 Employment impact

The proposed Asphalt mixing Plant will require labour. This will translate to creation of employment to local community hence improvement of local economic empowerment.

9.4.1.2 Business spill-offs

Numerous business opportunities are anticipated around the site to serve the increased number of people visiting the site. The work force at the Asphalt Plant will also require more service providers hence increased business. The result will be more business opportunities will be created within the local economy through the multiplier effect which local people will be expected to tap into to improve their livelihoods.

9.4.1.3 Tax revenue

Tax revenue to government will be realised from implementation of the proposed project through licences fees, permits and other statutory deductions.

9.4.2 Contribution to development of local public infrastructure/facilities

It is anticipated that once MBIG Limited implements their proposed project, the company will realise more income some of which the company will plough back into the local community in the form of corporate social responsibility. The company may contribute to development and maintenance of local access road among others.

9.4.3 Skill development and technology transfer

People from the local community who will have the opportunity to work in the Asphalt Mixing Plant will have their skills developed and learn the technologies used in Asphalt making through on job training.

9.4.4 Development of the nearby Mayanja Township

It is anticipated that the proposed Asphalt plant if implemented will contribute directly to further development of the neighbouring Mayanja Township. The development will be as a result of proposed development attracting new investments from both local and outside the region investing in Mayanja to provide facilities and services that will cater for the needs of increased population of people who will move into the area to render their services either directly to the Asphalt Plant or indirectly to people working at the Plant. Modern hotels, accommodation areas, schools, hospitals, recreation facilities may be some of the investments areas such investors may invest in to cater for the needs of the population.

9.5. Potential negative impacts

Potential negative impacts that may result from the implementation of the proposed Asphalt Mixing plant may include: -

- Dust emission
- Noise disturbance
- Occupational injuries and accidents
- Increase in traffic in the area
- Waste generation

9.5.1. Potential Air Quality Impacts Assessment

This section evaluates the likely air quality impacts associated with the construction/operation of the proposed Asphalt mixing plant. The key issues will be dust and odours impacts arising from the works at the plant.

9.5.1.1. Assessment Criteria

The criteria and guideline for air quality assessment are laid out in the Environmental Management and Coordination Act (Air Quality) Regulations, 2014.

The Environmental Management and Coordination Act (Air Quality) Regulations, 2014 provides the guidelines for controlling air pollutants from a variety of sources. The regulations encompass a number of air quality objectives which stipulate maximum concentrations for a range of pollutants. Table 1 of the First Schedule of the Environmental Management and Coordination Act (Air Quality) Regulations, 2014, gives Ambient Air Quality Tolerance Limits for various types of pollutants within an industrial setting such as the proposed Asphalt Mixing Plant. Any ambient air quality monitoring for such a setting should therefore be done against these limits. Table 2 of the First Schedule of the Environmental Management and Coordination Act (Air Quality) Regulations, 2014 gives the Ambient Air Quality at the Property Boundary of an industrial setting. Any ambient air quality monitoring at the property boundary for such a setting should therefore be done against these limits. The second schedule of the regulations, lists the priority pollutants to be monitored. The third schedule of the regulations gives the emission limits of air pollutants for controlled and non-controlled facilities in various industrial settings. The fourth schedule of these regulations gives a guideline on air pollution monitoring parameters from stationary sources for various industry facilities.

The frequency of monitoring is dependent on the parameter and should be reported on a quarterly basis.

Part 1 of the fifth schedule of the Environmental Management and Coordination Act (Air Quality) Regulations, 2014, gives a list of Exempted Equipment and Activities. Those relevant to the proposed Asphalt Mixing Plant are:

- Maintenance, repair, or replacement in kind of equipment for which a permit to operate has been issued.

9.5.1.2. Air Quality pollution sources

Dust pollution will result from the construction of the Asphalt Mixing plant and from its operation. Air emissions are likely to emanate from operation of the equipment, hot molten asphalt fumes and exhaust of vehicles.

9.5.1.2.1. Construction of Asphalt Plant

Major construction works are formation of foundation, erection of steel supports, metal works including welding and assembly of fabricated metal sheets. The material to be excavated is small and thus, the amounts of dust that will be generated from such works are relatively minor. However, during construction, the requirements of the Environmental Management and Coordination Act (Air Quality) Regulations, 2014 should be strictly followed.

9.5.1.2.2. Operation of the Asphalt Plant

During the operation of the proposed Asphalt plant, dust emission sources can be identified in the plant. They involve:

- Emissions for unloading of materials to receiving hopper;
- Emissions from aggregate stockpile; and
- Emissions from access road

9.5.1.3. Dust Monitoring

The proponent is advised to carry out a baseline dust monitoring by an accredited laboratory before starting operations, and thereafter quarterly as required in the Environmental Management and Coordination (Air Quality) Regulations 2014.

9.5.1.4 Air Quality Emissions Management

- Well-designed sprinklers to be located at all points to contain dust pollution, using preferably collected rain water
- Use of water to wet all processes and sources from which dust emanates
- The premises and access roads should be kept clean and free of dust at all times

- Odour controlling equipment such as scrubbers and filters to be incorporated.

9.5.2. Potential Noise disturbance

Noise can be defined as any undesirable sound that is intrinsically objectionable or that may cause adverse effects on human health or the environment {EMC (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009}. Noise can be either intermitted or intrusive. Intermitted noise is noise whose level suddenly drops to several times the level of background noise, on the other hand; intrusive noise is external or noise from another part of the building which penetrates the structural defences of a room or building. Noise can also be defined as unwanted or undesirable sound derived from sources such as industrial set up and operations, road traffic or construction works that interferes with normal activities such as conversation, sleep or recreation.

Noise from the asphalt plant may arise from:-

- Use of mechanical equipment and electric motors, including conveyor belt motors, dryer and mixer drum.
- Movement of loaders within the site
- Lorry traffic within site

As such, necessary precautions shall be taken to ensure noise emitted from the plant is within permissible limits as per the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations 2009

Noise monitoring using calibrated noise meter should be carried out on a regular basis.

Wastewater generated on-site arises from both domestic and industrial sources.

- Domestic wastewater may be generated by staff employed at the plant
- Industrial wastewater comprises effluents from washing, sprinkling of water for dust abatement and runoff.

9.5.2.1. Proposed Noise Mitigation Measures

- Developing and implementing an effective noise control and hearing conservation program;
- Carrying out periodic noise measurements;
- Fitting noise machines with noise reduction devices;
- Providing suitable hearing protection to all workers exposed to noise levels above 85dB(A);
- Posting notices and signs in noisy areas;
- Carrying out audiometric test by a designated medical practitioner to all workers exposed to noise levels above 85dB(A);
- Educating all workers on importance of marking correct use of PPE provided to protect them against high noise levels.

9.5.3. Increase in traffic in the area

Increase in both vehicular and human traffic in the area is likely to be experienced during the operational phase of the Asphalt Mixing plant. Vehicular and human traffic in the area is likely to be as a result of:-

- ✓ People working at the plant
- ✓ People and vehicles ferrying cement, sand and aggregates to the site
- ✓ People and vehicles ferrying concrete from the site
- ✓ Service provision vehicles such as garbage collection trucks
- ✓ Emergency service vehicles such as fire engines

9.5.3.1. Potential negative environmental impacts likely to result from increased traffic in the area

- ✓ Increase in traffic along access road
- ✓ Possibility of occasional experience of delays on the said local road;

- ✓ Increased number of vehicles on local road will result in increased wear and tear of local roads thus reducing lifespan of affected roads;
- ✓ Cost of maintaining local roads will increase;
- ✓ Pedestrians and cyclists using local roads will have to exercise more care with increase of vehicular traffic on the said roads; and
- ✓ There will be an increase of exhaust emission from vehicles which will pollute local atmospheric air.

9.5.3.2. Proposed mitigation measures to mitigate increase in vehicular traffic in the area

The following measures can be put in place to mitigate possible negative impacts likely to result from increase in vehicular traffic in the area.

- ✓ Vehicles moving to and from the site to observe the set speed limits to avoid accidents;
- ✓ All users of local roads to always observe traffic rules, this will give pedestrians and cyclist their space and safety while using the road.
- ✓ Proponent to provide for parking of the vehicles within the confines of the project area.

9.5.4. Solid waste generation

Solid waste is likely to be generated during the operation phase of the Asphalt Mixing plant.

9.5.4.1. Proposed mitigation measures

- ✓ Solid waste to be handled managed and disposed according to the EMC (Waste Management) Regulations 2006.
- ✓ The project proponent to contract a licensed waste collection company to be collecting all solid waste from the plant

- ✓ Waste handling bins to be provided, each waste receptacle bin should have a lid which should always be covered;
- ✓ Color-code to be used to distinguish waste bins of different waste;
- ✓ Waste to be sorted at source;
- ✓ There should be no scattering of waste during transportation to disposal site;
- ✓ Solid waste to be disposed only at licensed disposal sites.

9.5.5. Occupational Injuries

Injuries during operations will mainly affect employees. The injuries can include cuts and bruises, and collisions.

9.5.5.1. Proposed mitigation measures of occupational injuries

Injuries during operation phase can be mitigated in the following ways:-

- Employees to be provided with appropriate personal protective clothing equipments.
- Employees to be provided with appropriate working equipments. The equipments to be in sound working condition
- Employees working at height to be provided with appropriate tools such as ladder.
- First aid services to be readily available onsite.

9.5.5 Wastewater Management and disposal

- Provision of appropriate wastewater treatment and disposal facility to the satisfaction of NEMA .
- Installation of grease traps or oil water separators for removal of floatable solids from wash water.
- Wash water should be channeled into a sedimentation tank. The effluent from the sedimentation tank should be treated and reused for dust abatement and the settled solids be reused.

9.5.6 Other proposed mitigating measures are as follows:

- Necessary precautions should be taken to avoid disturbance to the neighbourhood by way of dust, mud, traffic or other nuisances during construction and operation phase.
- Precautionary measures should be taken for safe haulage of the materials such that there is no spillover during transportation on the road networks.
- Provision to be made for adequate parking, loading and unloading facilities.
- Safe storage of materials on site and stored materials not unduly visible or intrusive in the street scene.
- Provision for a proper drainage scheme for evacuation of stormwater to avoid any risks of flooding/water-logging of site and adjoining areas to the satisfaction of the Local Authority.
- The premises should be kept clean at all times with good housekeeping.
- Installation of bait stations / traps to control pests and rodents.
- Domestic solid wastes to be regularly collected in bins or waste handling receptacles and disposed of to the satisfaction of the Local Authority.
- No waste of any type to be disposed of in any watercourse including drains, canals and the surrounding environment.

10. ENVIRONMENTAL MANAGEMENT PLAN

10.1. Installation and operation of the proposed Asphalt Mixing Plant

Environmental Management Plan (EMP) for developing projects is usually to provide a framework within which identified negative environmental impacts can be mitigated and monitored. In addition the EMP assigns responsibilities of actions to various actors and provides a timeframe within which mitigation measures and monitoring can be done. The EMP is a vital output of an Environmental Impact Assessment as it provides a checklist for project monitoring and evaluation for sound environmental planning at entire life of the project. There will be a need to entrench within the working operations of the proposed project a sound Environmental Management Plan (EMP) that will ensure no significant environmental pollution occurs as a result of the proposed development. To achieve this, the following will need to be done: -

- ✓ Proponent to develop and document Environmental Management Procedures that will guide the installation and operational phases of the Asphalt Mixing Plant. The procedures should address environmental conservation measures to be put in place, occupational and safety matters of the employees, and management of waste.
- ✓ The project proponent to avail necessary finance for implementation of EMP.
- ✓ Management to ensure employees carries out their work within Environmental and Occupational, Health and Safety requirements.

10.1.1 Objective

The objective of this EMP is to ensure that during implementation of the proposed project no adverse environmental pollution and/or disturbance occurs. This will be achieved by continuous monitoring of all proposed project activities, implementation of recommendations and mitigation measures made in this

report in respect to each of the project activities and ensuring that conditions subjected to license approval with respect to all project activities are adhered to.

10.1.2 Enforcement

The EMP will be enforced by relevant Government Departments and Lead Agencies by continuous monitoring, consultation and feedback from the proponent, neighbours and the general public and improvement on environmental performance. To ensure adherence to the set conditions, The Bungoma County Government, Public Health Officer and County Environment Officer, Bungoma will be enjoined in actions taken.

10.1.3. Management plan

This EMP covers the following management plans which will need to be implemented during the implementation phase of the proposed Asphalt Mixing Plant, the operation phase and the decommission phase. The Management Plan covers the following: -

- Vegetation clearance
- Removal of overburden
- Ground levelling and compaction
- Assembly of construction material and equipment
- Actual construction work
- Accumulation of construction waste
- Occupational safety during construction
- Solid waste management
- Liquid waste management
- Air Quality Management
- Vehicle Parking needs
- Fire safety

- Electrical safety
- Security
- Decommissioning of the plant and allied infrastructure
- Site rehabilitation.

Table 4: Environmental Management Plan, Action Plan

Project activity	Potential negative impacts	Proposed mitigation measures	Monitoring	Responsibility	Timeframe	Cost estimate (KSh)
Construction phase						
Vegetation clearance	▪ Loss of vegetation ▪ Destruction of plant habitats ▪ Displacement of fauna from site. ▪ Ground will be left open and hence susceptible to erosion. ▪ Rain water penetration capacity will be reduced. ▪ Increased runoff ▪ Increased soil moisture loss	▪ Limit vegetation removal to actual location where proposed project will take place ▪ Plant trees and other vegetation in any open areas once project is complete	▪ Constant checking of success of tree planting programme	Project proponent	▪ All these are to be carried out alongside implementation of the project and throughout the project life.	100,000 per year
Removal of overburden	▪ Displacement of fauna beneath the soil	▪ Removed top soil to be kept aside for later use in	▪ Regular checking of	▪ Project proponent	▪ Once construction is complete	50,000

	▪ Loss of top soil rich in plant and genetic material ▪ Alteration of local soil aggregates	planting of trees, grasses and other vegetation	proper use of top soil in tree planting programme		and site rehabilitation begins.	
Ground levelling and compaction	▪ Reduction of soil porosity ▪ Reduction of soil water absorption rate and capacity ▪ Increase in surface runoff when it rains ▪ Reduction in ground water aquifer recharging capacity	▪ Restrict ground levelling and compaction to area to be occupied by proposed project. ▪ Regularly sprinkle water in open areas without vegetation to encourage vegetation growth. ▪ Re-vegetate all open areas with grasses to trap surface runoff, increase rainwater	▪ Vegetation development and growth at all affected sites.	▪ Project proponent	▪ Vegetation programme and other proposed mitigation measures to be carried out alongside project implementation. Ground maintenance to be continuous throughout the project cycle.	50,000 per year

		percolation and reduce soil moisture loss				
Assembling of materials and equipment	▪ Vegetation loss especially at the site of location of materials and equipment ▪ Dust disturbance to workers on site and neighbours ▪ Injuries to workers involved in offloading of equipment and building material ▪ Noise disturbance to workers involved in material offloading especially	▪ Site selected for storage and handling of materials to be one with minimal or no vegetation cover; ▪ Employees involved in offloading to be provided with ear protectors; ▪ Material delivery to be limited to day time to avoid unnecessary disturbance to neighbours at night.	▪ Monitoring of particulate matter in the air where dust particles visible particulate matter sampling and analysis to be done to ensure dust disturb	▪ Project proponent, neighbours, employees and the general public	▪ Noise disturbance control measures to be put in place from the onset of project implementation then throughout project cycle.	50,000

	offloading of ballast		ance is checked. ▪ Noise disturbance to be monitored by listening to and addressing complaints and feedback from neighbours in regard to noise disturbance, employ			

			ees and affected parties. Where complaints are serious site noise survey to be carried out.			
Actual construction work	▪ Noise disturbance to workers on site especially noise from equipments like concrete mixers, ▪ Noise disturbance to neighbours and the general public,	▪ Construction work to be limited to day time to avoid unnecessary disturbance to neighbours at night, ▪ Noisy equipment to be fitted with noise reduction devices where applicable	▪ Carrying out noise survey on site wherever complains arise; ▪ Carrying out	▪ Project proponent, workers on site, neighbours and general public	▪ All noise and dust control/reduction/minimization measures to be put in place from the beginning of project implementat	100,000

	▪ Dust disturbance to workers on site, neighbours and general public	▪ Workers to be provided with dust masks, enforcement on the use of dust masks by all affected workers to be effected; ▪ Entire construction site to be secured with dust fine screens, where applicable ▪ Water to be sprinkled especially on open ground to arrest dust.	suspended matter survey on site whenever complains arise		ion.	
Accumulation of construction waste	▪ Inhibition of vegetation growth; ▪ Consumption of available space which could otherwise be used for more	▪ All construction waste to be promptly collected as its being generated and disposed at approved disposal site.	▪ Regular site checking to ensure no unnecessary	▪ Project proponent, contractor, workers on site, neighbours and general public	▪ Waste collection and disposal to be done on a continuous basis as long as it is	60,000

	useful work; ▪ Blockage of drainage ▪ Poor look of area aesthetic ▪ Inhibition of free movement of persons and machinery	▪ Management to explore possibilities of reuse.	accumulation of construction waste on site beyond manageable levels ▪ Ensure transportation, handling and disposal of waste is done according to the EMC (Waste Manag		generated.	

			ement) Regulations, 2006			
Occupational safety during construction	▪ Falls from working from height ▪ Bruises and Cuts ▪ Inhalation of dust ▪ Effects of machine vibration ▪ Noise induced hearing loss	▪ All employees to be provided with appropriate personal protective equipment which includes safety boots, helmet, overalls, hand gloves, dust masks, ear protectors; and safety belts; ▪ Contractor to enforce strict and correct use of all personal protective equipment provided by all affected workers, and visitors to the	▪ Servicing schedule of tools and equipment being used; ▪ Record of incidences and accidents.	▪ Project proponent, project contractor, site supervisors, workers and general public.	▪ Provision of personal protective equipment and putting in place of all the other mitigation measures to be done from the beginning of project implementation and be maintained throughout project life.	100,000

		site during construction; ▪ Contractor to provide workers with appropriate serviceable tools and equipment for the correct type of work; ▪ All tools and equipment to be in required working condition; ▪ Workers to have the required technical knowledge on the proper use of the required equipment before being assigned to use it; ▪ All tools and equipment to be regularly serviced				

		and maintained according to schedule				
Operational phase						
Solid waste generation during operational phase of the Asphalt Mixing Plant	• Waste could block storm water drainage channels • Littering and scattering	• Waste bins to be provided at strategic points within the Plant area. • All waste bins to have lids on. • Employees at the plant to be sensitized on good waste management practices. • Engage a licensed waste collection company to collect and dispose of waste from the Plant. • Waste collection company to ensure there is no	• Monitor records of waste collection from the plant and disposal by the licensed company • Monitor frequency and consist	• Management of the Plant • Bungoma County Government Public Health Officer, and • County Environmental Officer	• From the onset of operations of the Asphalt Mixing Plant and throughout its full operational life.	60, 000 p.a

		littering and scattering of waste during collection and transportation • A record of waste tracking documents to be kept.	ency of collection of waste from the plant • Provision of appropriate waste bins with lids			
Air Pollution	• May lead to occupational illness (lung infection, itching skin, eye irritation, coughing, to workers and other people exposed to the	• Ensure de-dusting system is always efficient; • Workers to use appropriate PPE; • Strict enforcement on PPE use; • Ventilation at workplace to be sufficient;	• Periodic air quality surveys within the plant, and the neighborhood	• Project proponent. • Environmental Officer. • County Public Health Officer	From the onset of operations of the Asphalt Mixing Plant throughout its full operational life.	150, 000

	odours and dust; • Reduced visibility in the case of dust; • Dust may chock plants	• The proponent is advised to carry out a baseline Air Quality monitoring by an accredited laboratory before starting operations, and thereafter quarterly as required in the Environmental Management and Coordination (Air Quality) Regulations 2014.	of the plant to determine dust levels • Undertake a pre-employment medical examination of workers and thereafter annually.			
Air quality and Odours	Handling of Asphalt and bituminous products may lead to toxic gas releases.	• Minimize vapour leaks and loses to reduce the likelihood of air pollution and odours through the asphalt mixing	Monitor vapour leaks	Operator	Throughout the project life	Ksh. 10,000

		works. • Ensure that housekeeping is of high standard.				
High noise level at the workplace	• Noise induced hearing loss • Poor concentration at the workplace • Reduced productivity	• Developing and implementing an effective noise control and hearing conservation program; • Carrying out periodic noise measurements; • Fitting noise machines with noise reduction devices; • Providing suitable hearing protection to all workers exposed to noise levels above 85dB(A); • Posting notices and signs in noisy	• Reduction of noise levels at the workplace to the stipulated legal limits	• Company Management • Staff	From the onset of operations of the asphalt mixing plant throughout its full life.	150, 000

		areas; • Carrying out audiometric test by a designated medical practitioner to all workers exposed to noise levels above 85dB(A); • Educating all workers on importance of making correct use of PPE provided to protect them				
Occupational injuries such as Bruises, Cuts and Falls.	• Injury to employees and visitors to the workstation	• Employees should be provided with appropriate working gear • There should be a well-equipped First Aid box at the work station.	Constant site inspections to ensure that required workplace conditions are followed	Project proponent, Occupational Health and Safety Officer and County Environmental Officer	From onset of the project and then throughout the project life.	20,000 p.a

			to the later.			
Disposal of wastewater	Contamination of soils and ground water resources	▪ Ensure wastewater is treated to acceptable standards before disposal. ▪ Regular maintenance of the waste water management system.	▪ Regularly monitoring of the contents of the soak ▪ Monitoring of quality of ground water resources in the neighbourhood.	▪ Project proponent. ▪ Bungoma Water and Sewage Company, ▪ County Environmental Officer. ▪ County Public Health Officer	Throughout the occupation life of the project	60, 000 p.a
Storm water and soil contamination	During rainfall events, there will be an increase in storm water flows across and from the site	• The operator shall prepare a hazardous materials and waste	Soil condition	Operator	Throughout of the project cycle	Ksh. 50,000 per monitoring

	due to change of the surface from soil cover to hard surfaces. During decommissioning phase, soil contamination could occur especially with the use of machinery in demolition of the facility	management plan. The plan shall include, but not limited to, measures to prevent: (a) contamination of soils; (b) pollution of water. • Contaminated waste water should be captured and kept in the hazardous waste stream. • The Proponent and contractor engaged in the demolition of the facility shall ensure machinery and vehicles used during demolition are adequately serviced to prevent any oil				

		leakages. In addition, the Proponent shall undertake a further survey to identify any contaminated areas and remediate them accordingly.				
Fires and Explosions	The operation of the asphalt mixing plant facility is a potential source of ignition of fires, which could spread into neighbouring properties.	✓ Use only electrical equipment that is certified to be flame proof and spark proof. ✓ Control static electricity by:- • Use of static wrist band for operators • Use of hands moisturizers for operators • Prohibiting overburdened electrical plugs	✓ Firefighting systems	Operator	Throughout the project life	Ksh. 100,000

		in the operation areas. ✓ Restrict radioactive items (i.e. cell phones, laptops, etc.) to the office blocks. ✓ Prohibit smoking, open flames and sparks ✓ Prevent activities that can cause spark and friction such as use of metal wheeled equipments, pulling of metal on ground. ✓ Ensure there is adequate firefighting water in the emergency water tanks ✓ Ensure personnel drill on response				

		to emergency fires is carried out. ✓ Compile and implement a fire management plan				
Parking	▪ Using road reserves as parking will inconvenience other road users; ▪ Lack of adequate parking space will result in congestion of vehicles on local roads; ▪ Lack of proper parking facility can result in obstruction of neighbours.	▪ Provide for sufficient internal parking to accommodate parking needs of the plant.	▪ Availability of internal parking	Project proponent	Parking to be provided for from the beginning of construction. The project design should include sufficient parking.	100,000
Fire safety	▪ Loss of property due to fire; ▪ Injury to workers, neighbours and	▪ Install sufficient fire-fighting equipment, these should include portable fire	▪ Availability of fire-fighting	▪ Project proponent, and the County Occupation	▪ Installation of all required fire fighting equipment	300,000

	the general public from fires emanating from the facility; ▪ Death to plants and animals; ▪ Air pollution resulting from smoke emission.	extinguishers, fire blankets, horse reel, and fire alarm. ▪ Train workers and employees in fire fighting and fire response; ▪ Develop and document a fire evacuation procedure, the procedure should be available to workers and other users of the facility; ▪ Provide for fire exits; ▪ Ensure all fire exits are clearly marked and not obstructed; ▪ Carry out periodic fire drills; ▪ Ensure all fire-	equipment; ▪ Evidence of training in fire fighting.	al Health and Safety Officer Bungoma	to be done before operation of the plant, Annual training of occupants in fire safety to be done, servicing of fire fighting equipment to be done quarterlly.	

		fighting equipment are survivable; ▪ Provide for bulk storage of water for fire- fighting; ▪ Identify and mark a fire assembly point.				
Electrical safety	▪ Electrical shocks to workers and users of the Plant; ▪ Possible loss of life; ▪ Loss of property resulting from electrical faults.	▪ All electrical installations to be done by a qualified electrician; ▪ All electrical wires to be properly insulated; ▪ All wiring to be done by qualified and registered electrician; ▪ Required loading at electrical outlets to be observed.	▪ Certification of successful completion of all installations	▪ Project proponent; Kenya Power and Lighting Company.	Before the Plant is operational	500,000
Security	▪ Loss to property	▪ Management to	▪ Record	▪ Project	▪ From the	20,000

	at the plant; ▪ Damage to the plant; ▪ Vandalism to property.	hire the services of a registered and licensed security firm. ▪ Use of security surveillance system such as Closed Circuit Television (CCTV) ▪ Keep a record of all security concerns and incidences at the plant.	of security incidences	proponent	time construction work on site begins then throughout lifecycle of the project.	p.m.
Decommissioning phase						
Decommissioning of the Plant	▪ Dust disturbance to workers on site; ▪ Dust disturbance to neighbours; ▪ Dust disturbance to the general public; ▪ Noise disturbance to workers on site;	▪ Workers on site to be provide with appropriate personal protective clothing such as helmet, dust masks, ear protectors, safety boots, and overalls.	▪ Records of incidences during demolition work ▪ Records on how	▪ Project proponent and the contractor involved in demolition work.	▪ All required measures of mitigating possible dust pollution to be put in place before demolition of the plant begin.	20,000

	▪ Noise disturbance to neighbours; ▪ Noise disturbance to the general public; ▪ Injuries to workers; ▪ Injuries to neighbours, ▪ Injuries to the general public.	▪ The use of personal protective clothing to be enforced; ▪ Demolition to be limited to day time to avoid disturbance to neighbours at night; ▪ First Aid services to be readily available on site; ▪ Other emergency services such as fire fighting and ambulance to be available by phone call.	each incidence and arising emergency cases are handled.			
Decommissioning waste water infrastructure	▪ Disused waste water infrastructure can be a safety and environmental	▪ Consult BungomaWater and Sewage Company on the most appropriate and acceptable	Report from Bungoma Water and Sewage Company	Project proponent, Bungoma Water and Sewage Company;	All required measures of mitigating likely negative impacts to result from	100,000

	hazard	way of decommissioning disused wastewater infrastructure.	on progress of decommissioning	County Environmental Officer Bungomaand neighbours.	decommissioning exercise of waste water infrastructure to be put in place.	
Decommissioning of water reservoirs and water supply infrastructure	▪ Generation of concrete waste; ▪ Dust disturbance; ▪ Occupational hazards	▪ Concrete waste generated to handled, managed and disposed according to the EMC (Waste Management) Regulation, 2006; ▪ Workers to be provided with appropriate personal protective clothing such as dust masks, helmets, safety boats, overalls and ear protectors.	▪ Report from local Environment Office and local Safety and Health office; ▪ Feedback from workers; ▪ Feedback from the general public.	Project proponent, Local Water Authority; County Environmental Officer Bungoma, Occupational Safety and Health Officer, workers, neighbours and the general public.	All required measures of mitigating likely negative impacts to be put in place before the decommissioning exercise begin.	100,000

Decommissioning of electrical supply lines	▪ Electrical shocks; ▪ Damage to electrical equipment and installations;	▪ All the decommissioning to be done by Kenya Power certified electricians	▪ Report of satisfactory completion from Kenya Power and Lighting Company.	▪ Project proponent; Kenya Power,	▪ All required measures of mitigating likely negative impacts to be put in place before the decommissioning exercise begin.	300,000
Site rehabilitation	▪ Soil contamination	▪ Sampling and testing of local soils to be done to ascertain any contamination ▪ Soil treatment and stabilization to be done before any site rehabilitation is done; ▪ Appropriate tree spices to be	▪ Progress of site rehabilitation	Project proponent,	Site rehabilitation to begin immediate decommissioning is completed	500,000

		determined that will be planted on site; ▪ Planted trees to be taken care of until maturity.				

11. ENVIRONMENTAL MONITORING AND AUDITING

The location of the proposed asphalt mixing plant will require that regular monitoring of possible change in environmental parameters to be undertaken during the operational life of the plant. It is paramount that a program is put in place to monitor such type of projects with the aim of striking a balance between development and local ecological needs.

There will be a need to put in place elaborate and sound environmental management systems and mechanisms of monitoring on a continuous basis the environmental performance of the plant. Undertaking monitoring and auditing of key environmental parameters and putting in place of all approved recommendation of the environmental management plan and conditions of the license will achieve this. Monitoring to be undertaken will be for the entire plant and it will be both active and reactive.

11.1. Monitoring of the proposed asphalt mixing plant

11.1.1. Active monitoring

Active monitoring of the proposed asphalt mixing plant will include:

- Monitoring of the achievements of specific plans of the EMP, performance criteria and fulfillment of objectives;
- Systematic inspection of work place;
- Surveillance and monitoring of the work environment, including the organization of work and activities involved;
- Monitoring of workers' health; and
- Monitoring of compliance with laws, regulations and other requirements.

11.1.2 Reactive monitoring

This would include:

- Work related injuries, ill health (including record keeping and monitoring of sickness/absence), diseases and accidents;

- Losses such as damage to property;
- Deficient safety and health performance including OHSMS failures;
- Workers rehabilitation and health restoration programs.

Parameters monitoring for the proposed asphalt mxixng plant will involve measuring, observing, recording and evaluation of physical, socio-economic and ecological variables within the project area and the neighborhood. This may include the following: -

- ✓ Air quality monitoring
- ✓ Noise survey
- ✓ Solid waste disposal monitoring

Table 5: Environmental Monitoring schedule

Description of parameter	Monitoring schedule and duration
Air quality monitoring	Quarterly
Solid waste	Daily throughout project life
Noise Survey	Yearly and no need-basis

11.2. Environmental Auditing

Annual Environmental Audits should be carried out as provided for in the Environmental (Impact Assessment and Audit) Regulations of 2003. The Audits will serve to confirm the efficacy and adequacy of the proposed Environmental Management Plan. The audits should include but not limited to the following;

- ✓ Waste generation, management and disposal
- ✓ Air Quality assessments
- ✓ Views and comments from neighbors
- ✓ Progress in implementation of Environmental Management Plan.

12. DECOMMISSIONING PLAN

12.1. Introduction

Decommissioning is the last phase of project life. It involves terminating project activities and operations and rehabilitating site to or close to its original state.

12.2. Components

This decommissioning plan presents a conceptual framework on how the proposed asphalt mixing plant can be decommissioned if need arises and how the site can be rehabilitated to its original state or close to original state.

12.3. Decommissioning of the plant

Decommissioning of the asphalt mixing plant and allied infrastructure will involve terminating the batching processes, dismantling of all allied infrastructure and rehabilitating the site to the original status. Before decommissioning is done, the proponent will write to the National Environmental Management Authority stating his intention to decommission and provide a detailed decommissioning plan for approval.

12.4. Considerations

- ✓ All workers involved in the demolition exercises must have proper protective gear throughout.
- ✓ Demolition should be done during day time only unless it's an emergency.
- ✓ Waste resulting must be disposed at designated waste disposal sites.
- ✓ All relevant arms of government must be involved in the exercise.
- ✓ Emergency services such as first Aid and ambulance services must be on standby in case of any eventualities.

12.5. Support infrastructure on site

Support infrastructures such as water reservoirs should be handled with care. The following should be taken into consideration: -

- ✓ If water reservoirs contain water, empty them first before demolition;

12.6. Disposal of land

The site on which the asphalt mixing plant is to be set up is owned by the proponent and therefore once decommissioning of the project has been done, the landowner will decide what to do with the land in accordance with the law.

13. REFERENCES

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5. Government of Kenya Environmental Management and Co-ordination (Water Quality) Regulations, 2006, *Government Printer Nairobi*, 2006.
6. Government of Kenya Environmental Management and Co-ordination (Water Quality) Regulations, 2006, *Government Printer Nairobi*, 2006.
7. Government of Kenya Environmental Management and Co-ordination ((Noise and Excessive Vibration Pollution) (Control) Regulations 2009. *Government Printer Nairobi*, 2009.
8. Government of Kenya, the Water Act, 2016, *Government Printer,* Nairobi, 2016.
9. Government of Kenya, The Employment Act 2007; *Government Printer,* Nairobi 2007
10. Government of Kenya, The Labour Institutions Act 2007 *Government Printer,* Nairobi 2007
11. Government of Kenya, Work Injuries Benefits Act 2007. *Government Printer,* Nairobi 2007
12. Government of Kenya, the Occupational Safety Act 2007 *Government Printer,* Nairobi 2007.
13. Government of Kenya; the Physical Planning Act. *Government Printer,* Nairobi.
14. Government of Kenya, the Public Health Act. *Government Printer,* Nairobi.

14. LIST OF APPENDICES

Appendix 1: Land documents

Appendix 2: Certificate of incorporation and KRA PIN for the Proponent

Appendix 3: Registration certificates and practicing licenses of the EIA Experts

Appendix 4: Stakeholder consultation questionnaires

FORM 7 (r.15(2))

nema
mazingira yetu | ubai wetu | wajibu wetu

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/13895

Application Reference No: NEMA/EIA/EL/18274

M/S **JONNATHAN KATANA YERI**
(individual or firm) of address

P.O. Box 569-80100, MOMBASA

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Associate Expert**
registration number **7890**

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

Issued Date: **2/4/2021** Expiry Date: **12/31/2021**

Signature…..

(Seal)

Director General
The National Environment Management Authority

P.T.O.

ISO 9001: 2008 Certified

Appendix 4: Copy of the ToR approval letter from NEMA

nema

ATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

ile Lines: 0724-253 398, 0723-363 010, 0735-013 046
om Wireless: 020-2101370, 020-2183718
dent Lines: 0786-101100, 0741-101100

P.O. Box 67839, 00200
Popo Road, Nairobi, Kenya
E-mail: dgnema@nema.go.ke
Website: www.nema.go.ke

NEMA/TOR/5/2/209

19th February 2021

Mbig Limited
P.O Box 732-50200,
BUNGOMA

RE: ACKNOWLEDGEMENT AND APPROVAL OF TERMS OF REFERENCE (TOR) FOR ENVIROMENTAL IMPACT ASSESSMENT

We acknowledge the receipt of TOR for the above subject.

Pursuant to the Environmental Management and Coordination Act, 1999 the second schedule and the Environmental (Impact Assessment and Audit) Regulations 31 and 35, your terms of reference for the Environmental Impact Assessment (EIA) for the proposed **ASPHALT PLANT ON LAND PARCEL NO EAST BUKUSU/NORTH KANDUYI/11492, AT BBUKANANACHI, KIBABII-TUUTI WARD, KANDUYI CONSTITUENCY, BUNGOMA COUNTY,** has been approved.

You shall submit ten (10) copies, a soft copy summarised version of the ESMP in **WORD** form and one electronic copy of your report prepared by a registered expert to the Authority.

MARRIAN KIOKO
FOR: DIRECTOR GENERAL

Environment, Our Life, Our Responsibility

ISO 9001:2015 Cert

Appendix 5: Stakeholder consultation

VIEWS FROM THE STAKEHOLDERS

1) GEOFFREY WAFULA

The project will;

a) Create job for the area residents.
b) Improve area infrastructure.
c) Give stipends to area youths/women projects (Anticipation).
d) Nurture the area culture (Anticipation) values.
e) Fruits contamination by the gases emitted during production.
f) Sound pollution to residents.

RECOMMENDATIONS

1) Move the plant to the furthest end of the same parcel of land (near the river).
2) Have measures in place to dissolve/consume emitted gases for a cleaner environment and fruits around the residents.
3) Use sound proof system (costly for a massive plant like this one) to reduce sound pollution to the residents.
4) The plant should be in place to improve/provide job opportunities for residents around and improve infrastructure.

5) AMBROSE MALANGA MATANDA

The project will;

i. Help self-oriented business for specific people.
ii. Maximize employment due to job related effects.
iii. Emission of toxic elements from the site.
iv. Lead to water/Air/Soil pollution.
v. Leads to increased risk of chronic diseases to the people leaving around.

RECOMMENDATIONS

i. Move the project to a sparsely populated area.

6) FRED WEKESA SIKONGA

The project will;

- ✓ Create job opportunities.
- ✓ Building access roads.
- ✓ Lead to noise pollution.

RECOMMANDATIONS

i. Move people around to the other areas.
ii. Install machines with less noise.
iii. To continue with the construction.

BRIAN WAFULA.

The project will;

i. Create employment.
ii. Lead to sound pollution.

RECOMMANDATIONS

i. Reduce sound pollution.
ii. Continue with the project.

CHRISTINE N. SIMIYU.

The project will;

i. Bring employment to the youth.

RECOMMENDATIONS

i. Continue with the construction.

REBECCA WABOMBA.

The project will;

i. Create job opportunities.
ii. Improve business activities.

iii. Development of infrastructure e.g., roads.

RECOMMENDATIONS

i. Continue with the construction.

VERONICA MASIKA

The project will;

i. Boost the economy in our area.

RECOMMADATIONS.

i. It is a nice project

ELIZABETH N. WAMALWA

The project will;

i. Create employment
ii. Improve business in an area.

RECOMMANDATIONS

i. Continue with the operations

SHEILA KISONGOCHI.

The project will;

i. Create job opportunities to the youth.
ii. Improve the economy.

RECOMMANDATIONS

i. The project to continue.

JEMIMAH NALIAKA.

The project will;

i. Create employment opportunities.
ii. Improve business opportunities.

RECOMMANDATIONS

i. Implement this project to continue.

JACINTAH MUKHWANA

The project will;

i. Create employment.
ii. Pollute water points.
iii. Produce bad smell and smoke.

RECOMMENDATIONS

i. Stop the construction

.

ARNOLD WEKESA SIMIYU.

The project will;

i. Create employment to the youths.
ii. Bring security
iii. Lead to easy access to construction materials.
iv. Air pollution causing health problems.

RECOMMENDATIONS

i. Make sure the gas released has less effects on the environment.
ii. Plant enough trees around the plant.
iii. Must equip the workers as protection measures.
iv. Waste disposal should be safe and in good place.
v. The plant should be of the purpose purported to do NOT later to use chemicals that has not been maintained here.
vi. Develop a committee from the community so that to oversee the surrounding in case of any effect to waste brow before late.

ELIZABETH SIMIYU.

The project will;

i. Create employment
ii. Boost the economy in our area.
iii. Pollutes the Environment.
iv. Health hazards.

RECOMMENDATIONS

i. Install the machines that are non-hazardous to human health.
ii. Install the machines that are environmentally friendly.
iii. Continue with the project that it can create job opportunities.

ISAAC NGONI.

The project will;

i. Create job opportunities to the youth.
ii. Improve the economy.
iii. Pollutes the Environment.
iv. Lead to noise pollution.
v. Health hazards.

RECOMMENDATIONS

i. Ensure all smoke affecting residents by building long chimneys upward.
ii. No leakages of waste products to our near by rivers and surrounding environment regular maintenance of our roads.
iii. I have no problem with the projects as long as our health and safety are guaranteed.

ANTHONY KELAS SIMIYU.

The project will;

i. Create employment.
ii. Pollute water points.

iii. Building access roads.

iv. Produce bad smell and smoke.

RECOMMENDATIONS

i. Treat contaminated water

ii. Install non-contaminated machines.

iii. Install longer chimneys to ‘’dump’’ smoke far away.

iv. Continue with building the plant

STEPHEN TABANI NGICHABE

The project will;

i. Create employment

ii. Lift the level of the living capacity.

iii. Pollution of the environment by the machines used.

RECOMMANDATIONS

i. Installation of non-dangerous gaseous machines

ii. It is good because it will create jobs and also our people will earn a living from it.

34. WAMOTO JOHN

The project will;

i. Youths are likely to get employment.

ii. Emission of the hydrocarbons under high pressure and temperature will produce a number of gases that are toxic for human respiratory system

RECOMMANDATIONS

Recycle gaseous by-products.

Proper disposal of by-products.

The plant be relocated to another location where it is less populated.

PATRICK MACHESO

The project will;

i. Create job opportunity.
ii. Improvement of the roads and infrastructure.
iii. Improve the living standards.

RECOMMANDATIONS

i. Company should employ enough workers for the job to be well done.
ii. Always workers should be committed for work to be well.
iii. For the project to be effective the company should have enough money.
iv. Company should ensure machines are well maintained and equipped and of high quality

MARY WEKESA

The project will;

i. Improve our lives through employing us to work.
ii. Lead to Noise pollution.

RECOMMANDATIONS.

i. Install healthy and friendly machines.
ii. It should be migrated far away from homesteads.

FLORENCE WASILWA.

The project will;

i. Lead to air pollution
ii. Leads to soil pollution.
iii. Leads to chronic diseases.

RECOMMANDATIONS.

i. Move the site away.
ii. It is very dangerous to the environment and human health.

AUGUSTINE MACHESO

i. The project will;

ii. Employment creation

iii. Improvement of the infrastructure.

RECOMMANDATIONS.

i. Let the company proceed to the next level.

PAULINE WAFULA.

The project will;

i. Create employment opportunities in the villages.

ii. Improve the living standards of people.

RECOMMANDATIONS.

i. Install environmentally friendly machines.

ii. Move to a sparsely populated area.

SALVATION ARMY CHURCH

The project will;

i. Improve Security of an area.

ii. Create employment opportunities.

iii. Lead to Environmental pollution.

RECOMMMANDATIONS.

i. Relocate the plant to a less congested area.

ii. Relocate residents to a safe place.

WAFULAH N BRENDA.

The project will;

i. Create employment opportunities

ii. Health hazards.

RECOMMANDATIONS

i. Install health friendly machines
ii. Let the project continue.

FWAMBA CALEB JUMA.

The project will;

i. Create employment opportunities in the villages.
ii. Health hazards due to carbon emission.
iii. Soil pollution

RECOMMANDATIONS

i. The plant is so close to the residents therefore the side effects will be much pronounced.
ii. Let the project continue

RUTH NAFULA MULUMET.

The project will;

i. Create employment opportunities.
ii. Bring land value.
iii. Contribute to the country's revenue.
iv. Growth of the area.
v. Air pollution
vi. Noise Pollution.

RECOMMANDATIONS.

i. Relocation of some locals who are near to the site.
ii. Make the substance environmentally Friendly especially to the locals.
iii. The project should be implemented.

JANE N. WASIKE.

The project will;

i. Create employment opportunities

ii. Growth of the area.
iii. Lead to Environmental pollution.

RECOMMANDATIONS.

i. Ensure proper disposal of the waste products.
ii. Proper accommodation for the workers.
iii. The developer should ensure that the project benefits the community so that it is embraced.

BUKANANACHI PRIMARY SCHOOL.

The project will;

i. Job creation
ii. Improved infrastructure.
iii. Security enhancement.
iv. Pollution.
v. Moral decay.
vi. Child labor.

RECOMMANDATIONS.

i. Employ locals.
ii. Sensitize the locals over the effects of the project.
iii. The project can go ahead having put in the welfare of the local.

NAMIKELO R.C PRIMARY

The project will;

i. Provide labor to the locals
ii. Cause pollution.

RECOMMANDATIONS.

i. Control pollution in the area.
ii. The project will have a positive impact to the locals if negative impacts are mitigated.

BUYETI MEDICAL CENTRE.

The project will;

i. Create employment to the locals.
ii. Spur Development in the country.
iii. Improve business.
iv. Lead to air pollution and environmental pollution in general
v. Social immorality.

RECOMMANDATIONS

i. Put the necessary measures to combat air pollution.
ii. It should be implemented

CATHERINE WANJALA.

The project will;

i. Lead to pollution of the environment.
ii. Lead to respiratory problems.

RECOMMANDATIONS.

i. It should be put away from the residents.

MARY TABANI NEKESA.

The project will;

i. Expand the businesses.
ii. Improve security.
iii. Create employment.
iv. Environmental pollution.

RECOMANDATIONS.

i. Continue constructing.

SALOME OSYANJU.

The project will;

i. Lead to environmental pollution.

RECOMMANDATIONS.

i. Move to different location where residents are few.