ENVIRONMENT IMPACT ASSESSMENT (E.I.A) STUDY REPORT

FOR

THE PROPOSED MINI CEMENT PLANT ON PLOT NO. MGUMOPATSA/MAZERAS/857 &994, KILIFI COUNTY

GPS COORDINATES

3˚56'02.5"S 39˚32'15.5"E
(-3.934017, 39.537626)

2017

PROPONENT

SAFARI CEMENT LTD

P.O. BOX 90081-80100
MOMBASA

CERTIFICATION

CERTIFICATION BY EIA EXPERT

EIA EXPERT

EDGAR AMBAZA	**1916**
EZEKIEL OLUKOHE	**8379**

Signature: _____ Date: _____

CERTIFICATION BY PROPONENT

PROPONENT: SAFARI CEMENT LIMITED

NAME: _____

DESIGNATION: _____ **Signature:** _____

DATE: _____

ACRONYMS

Acronym	Description
BS	British Standard
dB(A)	Decibels on the A-Scale
EA	Environment Audit
EHS	Environment, Health & Safety
EIA	Environment Impact Assessment
EMCA	Environmental Management and Coordination Act
ESM	Environmentally Sound Management
PM_X	Particulate Matter
MSDS	Material Safety Data Sheet
NEMA	National Environment Management Authority
NFPA	National Fire Protection Association – USA
OSHA	Occupational Health and Safety Act
DHP	Designated Health Practitioner
KEBS	Kenya Bureau of Standards
HSEQ	Health Safety Environment and Quality
ISO	International Standards Organization

EXECUTIVE SUMMARY

This report outlines the results of the EIA study process for the proposed installation and commissioning of a mini cement grinding plant to be located on Plot L.R. No. Mgumopatsa/Mazeras/994 & 857, Kokotoni area, Kilifi County in compliance with Section 58 of EMCA, 1999 and Legal Notice No. 101 of 2003. The project site is located along Mombasa - Nairobi road, approximately 25 kilometers' from Mombasa town and about 7 kilometers' to Mariakani on satellite tagging points **-3.934017, 39.537626.** The assessment findings are presented in the format prescribed by Legal Notice No. 101 of 2003.

The EIA study follows approval of Terms of Reference brief report outlining the geological setup of the area which was submitted to NEMA on 8th December 2017 and a letter issued for the proponent to undertake an EIA study.

The proposed site (Plot N0. MGUMOPATSA/MAZERAS/857 & 994) located in Uwanja Ndege location and off Mombasa-Nairobi road is estimated to be about 10.2 hectares in area has been leased by Safari Cement Limited herein referred to as the proponent specifically for the purpose of cement manufacturing plant. The site holds already existing godowns, administrative office buildings, concrete perimeter wall, entry gates a biodigestor is installed to ensure effective management of wastewater. the area is zoned for commercial/industrial use and the subject plots have change of use from agricultural to industrial development.

Project activities

The project activities include;

- ✓ Preparing plant architectural and engineering designs
- ✓ Acquisition of pertinent approvals from relevant government agencies including an EIA licence
- ✓ Site preparation activities
- ✓ Actual construction and installation of the plant and other auxiliary facilities
- ✓ Operation of the plant
- ✓ Possible decommissioning of the project

Description of the plant and grinding process

The proposed installation and commissioning of a mini cement grinding plant producing an average of 600Tonnes per day (TPD). The raw materials for the plant will include clinker,

pozzolana and gypsum. Clinker will be imported, warehoused and transported to the site from the port of Mombasa while Pozzolana and gypsum will be sourced from existing quarries owned by other investors. Upon delivery at the site, the clinker will be stored at a clinker hall while the pozzolana and gypsum will be stored in a designated yard within the project site. The plant will adopt the latest automated tipping technology in conveying raw materials from storage yard to cement mill.

The plant seeks to produce cement which is manufactured by intimately intergrinding clinker, pozzolona and gypsum in recommended ratios by employing use of closed circuit ball mill grinding system. The optimization of this process would yield substantial benefits in terms of energy savings and capacity increase. In addition, it addresses the grinding process, maintenance and product quality. The objective is to achieve a more efficient operation and increase the production rate as well as improve the run factor. Consistent quality and maximum output with lower specific power consumption results in lower operating costs per unit of production. Optimization of this process can also reduce the cost of liners and grinding media. The mill is ventilated by an induction/mill fan. The air required for classification is provided by another fan. The fans pull the gases through independent baghouses which clean the vent air and return the cement dust to the system. .

Clinker, Gypsum and other desired additives are fed to the ball mill in specific proportions based on the quality requirement through material hoppers. Feed material is ground in the ball mill, discharged and fed to a separator/classifier with the help of a bucket elevator for classification of the ground cement into two streams – coarse and fines. The coarse fraction is sent back to the mill and the fines are collected in cyclones and / or a baghouse as finished product and directed to cement silo by aid of compressed air.

Movement of material in the mill is achieved by rotation effect and ventilation, a draft fan at the end of the mill pulls the material that is they are air swept. Ventilation helps in the cooling of the mill and also prevents the cement from agglomerating. Ambient air will be taken in by fans and heated to 350-450°C and leave the mill at around 85-90°C. The mill will have an outlet diaphragm which has smaller perforations to only allow cement particles of required size to leave the second chamber. Cement leaves the mill with the flowing air. The very fine particles tend to behave fluidized thus they move with air to the mill bag filters where air is filtered out to the atmosphere and the solids drop down due to gravity to the air slides to meet the heavier ones

which had fallen down directly from the mill outlet through to the air slide. The recirculating elevator, in principle a bucket elevator, picks these solids from the air slides and conveys them up to the separation, system of fine cyclones, where the solids are separated by centrifugal means. The coarse cement (rejects) retaken back into the mill to be reduced further through the larger center unit. Fine cement (fines) is then channeled from the four small outer units in separation to screw conveyors to be taken to top of silo by another system of bucket conveyor.

The separator is expected to perform in a way that a minimum of the fines is carried in the coarse reject fraction and sent to the mill for regrinding. The separator's efficiency is determined by drawing a Tromp curve based on particle size distribution analysis. The separator's performance can be improved by changing the adjustments or replacing worn components.

Cement extraction will be done by packing plant operation through compressed air and will be dispatched in two modes namely in bulk and in bag of 50kg capacity.

In compliance to section 58 of Environmental Management and Coordination (Amendment) Act 2015, the proponent has initiated the undertaking of an Environmental Impact Assessment (EIA) study report for submission to National Environment Management Authority (NEMA) for licensing. The project falls under schedule 2-processing and manufacturing industries.

The EIA Report is crucial in environmental management systems. An EIA is an information document, which will inform the proponent, licensing Authority, lead agencies, decision makers and the public of the significant environmental effects of the proposed project; identify possible ways to minimize the significant effects; and describe reasonable alternatives to the project. The purpose of this EIA, therefore, is to focus the discussion on those potential effects on the environment of the proposed project which may be significant. In addition, feasible mitigation measures are recommended, when applicable, that could reduce or avoid significant environmental impacts.

This EIA was carried out between the period of November 2017 and December 2017 through the guidance of the Environmental (Impact Assessment and Audit) Regulation 2003 and other related legislation.

The main purpose was to identify all possible social, economic and environmental impacts that may arise from the construction and operation of this building. This ended up with recommendation of mitigation measures for the significantly negative impacts and finally the

proposed practical Environmental Management Plan (EMP) for implementation by the contractor and the proponent.

The scope of the study included literature review; describing the location, collecting baseline social, physical, economic and environmental information; identifying phase's, processes, understanding designs and lastly developing an EMP.

The outcome of the study was discussed with the proponent's representative before the report was finalized and submitted to NEMA.

Project objectives, activities and alternatives

The proponent proposes to establish and operate a cement factory. In addition to setting up the cement factory with associated facilities, the proponent intends to construct an administration block and residential blocks four in number; a building to house canteen and dispensary within the same project site (Plot L.R. No. Mgumo Patsa/Mazeras/994 & 857).

Pre-construction activities: This involves feasibility studies and location analysis; Conceptualization of development designs and options; Detailed design and seeking for approval from relevant government bodies.

Site preparation: this involves bush clearing; setting up of camp, a site office with store and setting up driveways for construction trucks delivering materials to site.

Construction activities: After meeting all the statutory requirements by obtaining approvals from relevant government agencies, construction activities will start and this will be in phases. It is estimated the construction will take a period of twenty two months.

Operation phase: The Mini cement manufacturing process will involve transportation of raw materials (Clinker, pozzolana and gypsum) to site then grinding of these raw materials in the cement mill to produce cement. Different additives may be added alongside gypsum and pozzolana to give the cement specific properties. The cement is then stored in silos before being shipped in bulk or packaged in bags. The proponent shall ensure compliance with the Kenya Standards KS 1829:2004 – Labelling of products- General requirements

Two project alternatives are available namely the (i) 'no project' alternative and (ii) 'yes project' alternative. Under alternative (i), the proposed project would not be constructed and the project site would remain in its current condition, which is scrub land of no commercial land value; whereas under alternative (ii), the county of Kilifi would get an additional industry that would

create employment, earn the government revenue through taxes and would open up the area for investment.

Foreseeable Environmental impacts

The expected impacts and required mitigations were assessed for different phases of the development. These start with physical planning and detailed design of the cement manufacturing plant, construction phases and the operation phase. Cement production requires intensive use of natural raw materials and energy. It also results in emissions to the atmosphere, the most significant being CO_2 and dust.

Studies were carried out on Physical environment, ecological environment and socio-economic factors. Reference to previous studies was incorporated in the study. Important of all, consultations were carried out by holding a public meeting (baraza) with all affected and interested parties in this project and their inputs have been factored in the ensuing recommendations for the project.

The majorities of impacts are related to the human environment and the business environment. Added to these are biological impacts. The project contributes to long term, cumulatively significant unavoidable adverse impacts to biological resources due to loss of vegetation in the area during construction that leads to soil erosion, loss of habitat, loss of views and aesthetics.

A. Physical Impacts

- ✓ Loss of vacant land: project implementation will require commitment of current vacant land to industrial use and will contribute to the cumulative loss of un-built land in the locality.
- ✓ Change in Topography: The project will slightly alter the physical attributes of the site.
- ✓ Change in Current land use: Once the project is implemented, the land will not be returned to its current condition. Therefore, the project represents an irreversible change to the land uses on the site.
- ✓ Destruction of vegetation: The little vegetation on site will be lost forever to be replaced by concrete and asphalt. However, the area will be fully landscaped.
- ✓ Drainage impacts: Water volumes in excess (run-off) of that which would have been conveyed offsite prior to the development will impact external sites due to hard surface creation.

An increase in the turbidity of the runoff leaving the site could occur if uncontrolled surface water flows onto or over unprotected loose substrates or sediment stockpiles

- ✓ Disturbance to soils: Soils will be disturbed during construction. The top soil will be removed during the construction of the project. However, much will be brought back for landscaping purposes.

B. Human Impacts.

- ✓ Increase in population and employment/socio-economic impacts: The coming on stream of this project will lead to an additional people into the locality (Kokotoni location and wider Mariakani) who will either be employed directly or indirectly on the project. The development will result in the creation of between 900-1000 job opportunities both during and after the construction of the cement plant. In addition, the development will create business for suppliers and professionals/consultants.
- ✓ The country‘s economy will benefit by the injection of foreign exchange through export of cement produced to neighbouring countries. Locally, the operationalisation of the mini cement plant will boost the economy by paying relevant taxes to the national and county government.
- ✓ Increase in resource demand (water and energy): There will also be demand for water during and after construction. Water connections will be made to the current main water trunk that runs through this area. The project will cause greater demand for energy both renewable and non-renewable sources. Oil and other non-renewable energy sources will be used in the construction and subsequent use of the site as a cement processing industry. Electricity connections will be made to the main trunk power line that runs near the site. A sub-station shall be put in place to ensure electricity demand is met.
- ✓ Waste management: there shall be increase in the generation of solid and liquid waste throughout the project cycle.

C. AESTHETICS

Aesthetic impacts come from air pollution, increased traffic flows, noise, aesthetic impacts etc.

- ✓ Air/dust pollution: There will be an incremental increase in air pollution as a result construction activities and vehicular emissions from trucks ferrying materials and emissions

from cement manufacturing operations. Dust may be generated during construction of and in the operation of a cement manufacturing plant.

- ✓ Construction activities are known to contribute to dust pollution. During construction dust most often arises from vehicle movements on unsealed roads and from earth moving operations using construction plant such as excavators.
- ✓ During operation phase, activities known to contribute to fugitive dust emissions include storage and handling of materials and solid fuels, and also from road surfaces; activities in the cement mill and particulate releases from packing and dispatch of clinker/cement can also be significant.
- ✓ Noise pollution: Increased traffic, mechanical, industrial and human activities will result in increased noise in the area.
- ✓ Traffic: The development of this area is bound to raise traffic along Mombasa – Nairobi highway. This will be witnessed by increased number of tipper transporting materials.

D. Occupational Health and safety

- ✓ Workers accidents and hazards during construction and/or installation of equipment;
- ✓ Workers accidents and hazards during operation phase

Proposed Mitigations

These would include:

Drainage Mitigations:

- The use of permeable surfaces for parking, walkway and roadway areas to facilitate ground infiltration.
- The use of ground-based storm water disposal options where the geology of the area will facilitate its use.
- The control of storm water accessing the site from offsite locations.
- The incorporation of all drainage mitigations, along with a back-up surface drainage proposal, within an overall drainage plan for the development, with specific attention being placed on the terminal portion of the surface drainage, which may present a flooding risk within the site and it's neighbourhood.
- The employment of drainage mitigation measures to assist in the reduction of the volume and velocity of run-off from the site.

- The covering and berming of stockpiles of materials during rainfall periods to prevent the washing away of these materials.
- The recycling of sediment-loaded wash-water from batching plants to prevent the discharge of these waters into the environment.

Aesthetic Mitigations:

✓ **Air pollution mitigations**

- Dust generation and air emissions on-site should be controlled through the following activities:

  - The imposition of speed limits for vehicular movement on dust sources.
  - The enclosing of raw material dumping and stockpiling areas to contain generated dust
  - The controlling of wind movement of exposed materials through the use of frequent wetting or the use of dust stabilization products.
  - Regular maintenance of vehicles/trucks to ensure emissions meet air quality regulation standards.
- Preventing fugitive dust from exiting the construction site through the use of containment barriers at the site's periphery. This mitigation would work in tandem with noise mitigation measures to prevent sound releases into the external environment.
- Controlling fugitive dust generation from sources external to the construction site, such as at Concrete Batching plants and from trucks transporting raw materials to the site – using the containment methods.
- To effectively reduce any emissions of dust to a level which will not cause nuisance during operation phase, the plant should incorporate the use of modern electrostatic precipitators and bag filters

✓ **Noise Mitigations**

- The use of the lowest noise-emitting equipment appropriate for the given task should be opted for, since this will result in less noise generated on-site.
- Time limits should be imposed to limit the periods during which construction noises can be generated. The following times are proposed: - Mondays to Fridays 0800hrs to 17hrs. Saturdays 0800hrs to 1300hrs. Sundays and Holidays – no noisy activities are to be permitted.

- Physical noise barriers should be considered for the property.
- Carry out regular sound level measurements
- Check the performance of the major equipment periodically, in order to troubleshooting ant fix the problem by lubricating, repairing and etc.
- Reduce the noise exposure level of the employees especially machine operators or altering their activity zones between safe and unsafe acoustical zones.
- Provision and ensuring appropriate use of personal protective equipment

Solid Waste Mitigations:

- Operational measures should be designed and put in place to guide the process of waste reduction on-site.
- Waste reduction mechanisms should be employing on-site to reduce the volume of any solid wastes generated.
- The collection and safe storage of solid wastes on-site should be encouraged to facilitate transportation off-site.
- The facilitation of safe transport of solid wastes off-site to authorized solid waste disposal sites should be encouraged. This would discourage accidental waste disposal during transport.

Sewage Mitigations:

- The provision of adequate access to toilet and bathroom facilities that meet both numerical standards (to prevent workers from using the neighbours') and treatment standards.
- The separation of sewage and grey water streams to reduce sewage effluent volumes.
- The employment of on-site treatment of wastewater.

Other Mitigations:

- The careful choosing of heavy vehicular access points to the site to reduce obstructions to traffic movement.
- The limiting of heavy vehicle movement on-site to non-peak daytime traffic periods.
- Segregate motor traffic from pedestrian traffic in the design.
- The use of metal scaffolding and shoring equipment for construction purposes to limit the exploitation of natural resources.

- The limiting of unregularized vending at the perimeter of the development to restrict the generation of uncontrolled solid and liquid wastes.
- Proper landscaping and planting of trees especially along boundary of plot.

The EIA study observes that the proponent is keen on complying with all legal and environmental requirements in order to mitigate against these probable negative impacts and enhance the positive social, economic and environmental impacts.

Summary of the general anticipated Impacts and Mitigation Measures during establishment and operation activities

Possible Impacts	Mitigation Measures
1. Waste Management (solid and liquid)	▪ Provide solid waste collection facilities and segregation during site preparation. ▪ Suitable method of disposal for each kind of waste will apply ▪ Operational measures should be designed and put in place to guide the process of waste reduction on-site. ▪ Waste reduction mechanisms should be employing on-site to reduce the volume of any solid wastes generated. ▪ The collection and safe storage of solid wastes on-site should be encouraged to facilitate transportation off-site. ▪ The facilitation of safe transport of wastes off-site to authorized solid waste disposal sites should be encouraged. This would discourage accidental waste disposal during transport. ▪ The provision of adequate access to toilet and bathroom facilities that meet both numerical standards (to prevent workers from using the neighbours') and treatment standards. ▪ The separation of sewage and grey water streams to reduce sewage effluent volumes. ▪ The employment of on-site treatment of wastewater.
2. Public and Occupational Health and Safety	▪ Provision of appropriate protective clothing and equipment (overalls, head-covers/caps, gloves, ear muffs, nose muffs) and

during establishment and operation	training to workers. ▪ Provide suitable equipment during site preparation to avoid muscular strains. ▪ Ensure that drinking water is safe for workers. ▪ Ensure workers work in shifts whereby duration of each shift has a maximum of 8 hours. ▪ Provide well equipped first aid box on site ▪ Ensure First Aid training to employees and two or three First Aiders be identified within the workers and their mobile numbers placed at strategic points ▪ Ensure compliance with OSHA 2007 ▪ Segregate motor traffic from pedestrian traffic in the design. ▪ The limiting of unregularized vending at the perimeter of the development to restrict the generation of uncontrolled solid and liquid wastes.
3. Surface Run-off	▪ Ensure that no waste water is directed into surface run-off drains. ▪ Put in place roof catchments so as to harvest rain water ▪ The use of permeable surfaces for parking, walkway and roadway areas to facilitate ground infiltration. ▪ The use of ground-based storm water disposal options where the geology of the area will facilitate its use. ▪ The control of storm water accessing the site from offsite locations. ▪ The incorporation of all drainage mitigations, along with a back-up surface drainage proposal, within an overall drainage plan for the development, with specific attention being placed on the terminal portion of the surface drainage, which may present a flooding risk within the site and it's neighbourhood. ▪ The employment of drainage mitigation measures to assist in the reduction of the volume and velocity of run-off from the

	site. ▪ The covering and berming of stockpiles of materials during rainfall periods to prevent the washing away of these materials. ▪ The recycling of sediment-loaded wash-water from batching plants to prevent the discharge of these waters into the environment.
4. Security	▪ 24 hours security measures to be provided including inco-operation of technology ▪ Police emergency numbers to be placed at strategic points
5. Drainage system	▪ Ensure effective waste water management as guided by law. ▪ Avoid as much pollution on the drainage system in the area.
6. Increased resource (water & electricity) demand	▪ Management of water usage. Avoid unnecessary wastage. ▪ Recycling/reuse of water at the establishment time where possible. ▪ Install water-conserving taps that turn off automatically when water is not being used. ▪ Install energy saving electrical appliances to reduce energy consumption ▪ Carry out Energy Audit so as to know areas that need improvement
7. Air, Dust and Noise Pollution (during establishment and opération)	▪ Regular maintenance of operating machines and equipment. ▪ Use of appropriate protective equipment (PPE) such as ear protectors dust masks by workers ▪ Carry out regular sound level (noise) and dust survey ▪ The use of the lowest noise-emitting equipment appropriate for the given task should be opted for, since this will result in less noise generated on-site. ▪ Time limits should be imposed to limit the periods during which construction noises can be generated. The following

	times are proposed: - Mondays to Fridays 0800hrs to 17hrs. Saturdays 0800hrs to 1300hrs. Sundays and Holidays – no noisy activities are to be permitted. ▪ Physical noise barriers should be considered for the property. ▪ Check the performance of the major equipment periodically, in order to troubleshooting ant fix the problem by lubricating, repairing and etc. ▪ Reduce the noise exposure level of the employees especially machine operators or altering their activity zones between safe and unsafe acoustical zones. ▪ Installation of pollution control devices most preferably filter bags for dust pollution control ▪ Ensure trucks ferrying raw materials especially clinker to the site are well covered to prevent dust spread ▪ Preventing fugitive dust from exiting the construction site through the use of containment barriers at the site's periphery. This mitigation would work in tandem with noise mitigation measures to prevent sound releases into the external environment. ▪ Controlling fugitive dust generation from sources external to the construction site, such as at Concrete Batching plants and from trucks transporting raw materials to the site – using the containment methods.
8. Increase in traffic	▪ Provision of adequate parking within the compound ▪ Comply with traffic regulations such as speed limits at the site ▪ Provide bill boards at the site/entrance to notify other motorists in the area about the project ▪ Apply from KeNHA for installation of speed bumps 100 meters away from both sides of the main entrance to the facility
9. Fuel leakage	▪ Ensure fuel storage tank is bunded ▪ Designated staff at storage area to be trained on how to

	prevent, contain and clean up spills ▪ Ensure provision of spill kits
10. Resource efficiency	▪ Monitor electricity and water use ▪ Put in place energy and water saving procedures and targets ▪ Install energy saving motors; water saving devices

Conclusion and recommendations

The installation and commissioning of the mini cement plant is expected to translate to high economic returns on investment. The government and the local population will benefit through taxation income and employment opportunities respectively. This proposal therefore considers the plant beneficial.

The Environmental Impact Assessment study carried out for the proposed mini cement manufacturing plant project concludes that the project shall have a number of significant positive values including:

- Enhancing the opportunities of the development of the mini cement plant in Kokotoni area, Kilifi County,
- Increasing the revenue base of Kenya;
- Assist in enhancing the technical capability and skills of personnel involved especially the indigenous staff;

The technology, equipment and facilities that will be employed in by the Proponent Safari Cement Limited factory are within the category of Best Available Technology and are environmentally friendly. It is for this reason that the project will cause very limited significant negative impacts in view of the choice of equipment and facilities.

The communities within the area are in support of the project though raised concerns on dust pollution.

The potential impacts of the project will be minimized to acceptable levels by a number of measures recommended in the Environmental Management Plan.

We therefore recommend that the project be granted environmental clearance to proceed in line with the provisions of the Environmental Management and Coordination Act, 1999.

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1. BACKGROUND OF THE PROJECT

1.1 Introduction

This report outlines the results of the EIA study process for the proposed installation and commissioning of a mini cement grinding plant to be located on Plot L.R. No. Mgumopatsa/Mazeras/994 & 857, Kokotoni area, Kilifi County in compliance with Section 58 of EMCA, 1999 and Legal Notice No. 101 of 2003. The project site is located along Mombasa - Nairobi road, approximately 25 kilometers' from Mombasa town and about 7 kilometers' to Mariakani on satellite tagging points **-3.934017, 39.537626.** The assessment findings are presented in the format prescribed by Legal Notice No. 101 of 2003.

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Cement is a greenish grey colored powder, made of calcined mixtures of clay and limestone that when mixed with water becomes a hard and strong building material. The history of cement goes back into Roman Empire. The modern day cement which is Portland cement was first produced by a British stone mason, Joseph Aspdin in 1824, who cooked cement in his kitchen where he heated a mixture of limestone and clay powder then ground the mixture into powder creating cement that hardens when mixed with water. The name Portland was given by the inventor as it resembles a stone quarried on the Isle of Portland.

The first use of modern day Portland cement was in the tunnel construction in the Thames River in 1828.

1.2 Project Definition

This is an Environmental Impact Assessment Project Report for proposed Development of a Mini Cement manufacturing plant to be developed by Safari Cement Limited. The E.I.A for the project was conducted by Global E.H.S firm of expert is being coordinated by registered lead of Experts. The firm has been appointed by the proponent to carry out the EIA project report in accordance with Legal Notice 101: Environment (Impact Assessment and Audit) Regulations 2003 promulgated under the Environment Management and Coordination (Amendment) Act, 2015. The proposed project is also expected to comply with:

1. Environmental Management and Co-Ordination (Amendment) Act, 2015
2. Environmental Management and Co-Ordination (Air Quality) regulations, 2009
3. Kenya Bureau of Standard (KS), British Standard (BS), International Standards (ISO) and East Africa Standards (EAS)

    i. BS EN 459-1:2015 (KS 1780) Building lime. Definitions, specifications and conformity criteria: Applies to building limes used as binders for preparation of mortar (for masonry, rendering and plastering) and production of other construction products. Defines different types of building limes and gives their classification. Also specifies requirements for their chemical and physical properties, which depend on the type of building lime, and the conformity criteria.

    ii. BS EN 459-3:2015 specifies the scheme for the attestation and verification of constancy of performance (AVCP) of building limes to their corresponding product standard EN 459-1. It provides rules for surveillance, assessment and evaluation of the factory production control and rules for the frequency of inspections.

    The Standard specifies technical rules for factory production control by the manufacturer, including autocontrol testing of samples. It also provides rules for actions to be followed in the event of non-conformity and requirements for dispatching centres.

iii. KS EAS 148-5:2000 Cements - Test methods - Part 5: Pozzolanicity test for pozzolanic cements. Describes the method of measuring the pozzolanicity of pozzolanic cements conforming to KS EAS 18-1

4. The Energy Act 2006 and its subsidiary legislations.
5. Occupational Safety and Health Act (OSHA 2007)
6. County Government Act, 2013
7. County Government of Kilifi By-laws

Under the classification of projects in the Environmental Management and Coordination (Amendment) Act (EMCA) of 2015, for the purposes of Environmental Impact Assessment/Audit (EIA/EA), the proposed project fall under the second schedule, category 9: Processing and Manufacturing Industries.

1.1.1. Location

The project is located on Plot L.R. No. Mgumo Patsa/Mazeras/994 & 857 along Mombasa-Nairobi highway, Uwanja Ndege sub-location in Mazeras, Kilifi County. The subject parcel of land which is approximately 10.2 hectares has been leased to Safari Cement Limited for implementation of the proposed mini-cement plant. (*See attached lease agreement*).

The proposed site is located in an area that is sparsely populated and of mixed land use where minimal disturbance to neighbours is expected. A change of use approval from Commercial to industrial has already been obtained and is attached on application registration number being CGK/P/186/1.

The neighborhood is characterized by privately secured undeveloped parcel of land, light industries, service stations and few homesteads. Immediate neighour is Danka Service station, Danka waste oil handling yard, undeveloped parcel of land owned by the same land owner and few residential houses. On the opposite (across the road is PN Mashru yard, undeveloped land, Inter Africa Haulage Services. The proposed site is georeferenced 3˚56′02.5″S 39˚32′15.5″E (-3.934017, 39.537626).

1.1.2. Project Proponent

The project proponent is Safari Cement Limited, and was formed in 2017 its core business being production and supply of cement. *See attached copy of Certificate of Incorporation and PIN certificate of the proponent*.

1.1.3. Project Objective and Scope

The objective of the proposed project is to establish and operate a mini cement factory. In addition to setting up the mini cement factory with associated facilities (storage shed; clinker 25,000 MT, Pozzolana 5,000MT, Gypsum 1,000 MT) Cement silo 500 Ton, Cement Mill, Ramp, cabro-paved roads, the proponent intends to construct an administration block and a workshop, weighbridge; a building to house canteen within the same project site (Plot L.R. No. Mgumo Patsa/Mazeras/994 & 857). The proponent intends to drill a borehole to supplement for water supply.

In this regard therefore, the specific objectives of this EIA study are outlined as follows.

- To provide a description of the project cycle activities and the required legislative compliance
- To predict and/or determine the potential impacts of the mini cement plant development in terms of the economic, social and environmental considerations
- To propose appropriate mitigation measures to minimize or eliminate the environmental challenges associated with the installation and commissioning of the cement plant
- To undertake a public consultative process aimed at obtaining the views of project stakeholders so as to mainstream their concerns and impact mitigation proposals into the Environmental Management Plan (EMP) developed for the project cycle

1.1.4. Terms of Reference

Prior to carrying out an EIA Project Study, it is a requirement that the Terms of Reference (TOR) for the Study are developed by the project proponent. For the current project study, this requirement was fulfilled. In summary, the TOR normally covers the following: -

- Brief project background;
- Project definition and project objectives;
- Identification of anticipated environmental impacts;

- Review of relevant policies, legislation and institutional framework;
- Review of set standards in relation to cement manufacturing;
- Neighbours/Public/stakeholder views;
- Laboratory analysis reports carried out for soil and water:
- Desktop review of similar projects
- The EIA process to be followed and experts to carry out the study.

1.1.5. EIA Study

In carrying out this study, various activities were undertaken including detailed field surveys for acquisition of biophysical socio-economic data and public/stakeholder consultation. Other sources of information included existing database, Government Agencies, professionals, and neighbours.

1.2. EIA Process Followed

This Environmental Impact Assessment (EIA) refers to a critical examination of the effects of the proposed project on the environment before its implementation. Impacts describe any negative and positive environmental influence caused by a project. EIA is applied on the basic principle that the effect of a project on the environment needs to be established before it is implemented. The basic assumption is if a proper EIA is carried out then, the safety of the environment can be properly managed during the projects implementation, commissioning, operation and decommissioning. A project is defined as a specific set of human activities in a particular location and time frame and intended to achieve an objective(s).

The term environment is used in its broadest possible sense to embrace not only physical and biological systems but also socio-economic systems and their inter-relationships. The EIA process took into account operational, social, cultural, economic, legal and administrative considerations. The process will include the following:

- Identifying the anticipated environmental impacts of the project and the scale of the impacts;
- Identifying and analysing alternative methods or technologies for implementing the proposed project;
- Proposing mitigation measures to be undertaken during and after the implementation of the project;

- Developing an Environmental Management Plan (EMP), with mechanisms for monitoring and evaluating the compliance and environmental performance, cost for mitigation and time frame of implementing the measures.

1.2.1. E.I.A Team

The EIA team was coordinated by a registered qualified Environmental Impact Assessment/Environmental Audit Lead Expert in collecting data and information and prepare the EIA Study Report as provided for in the Environmental (Impact Assessment and Audit) Regulations of June 2003. The E.I.A team consisted of the following:-

- ✓ Edgar Ambaza – EIA/EA Lead Expert
- ✓ Edgar Eredi – EIA/EA Lead Expert
- ✓ Steve Amunga Akwabi – EIA/EA Expert
- ✓ Ezekiel Olukohe – Environmental Expert
- ✓ Hastings Sifuma – Environmentalist and specialist in Occupational Health and Safety
- ✓ Nelly Wanjiku – Bsc. Public Health
- ✓ Josephine Kanyeria – Associate expert (BSc. Environmental Science with I.T.
- ✓ Evans Totona-Occupation Health and Safety adviser
- ✓ Purity Kariuki - Associate Expert (BSc. Environmental Studies (Community Development)

1.2.2. Detailed EIA study

This involved, but was not 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; and
- 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; and

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

1.2.3. Preparation of the EIA Study Report

This EIA Study Report prepared for the project contains detailed information on the project, including on 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;
- 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 the 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; and
- A non-technical summary outlining the key findings, conclusions and recommendations of the study.

2. BASELINE INFORMATION ON THE PROJECT AREA

2.1. Introduction

Kilifi County, one of the six counties in coast region was formed by merging two districts i.e. Malindi and Kilifi District. The county is located north and northeast of Mombasa and it covers an area of 12,609.74 square kilometers. The County shares it borders with four other counties; Mombasa and Kwale to the south, Tana River to the north, and Taita Taveta to the west.

Kilifi County constitutes **seven constituencies**: Kilifi North, Kilifi South, Kaloleni, Rabai, Ganze, Malindi and Magarini.

The county's main urban centres are Kilifi, Malindi, Mtwapa, Kaloleni, Mazeras, Mariakani, Watamu, Marafa, Marereni, and Majengo.

2.2. Physiographic and Natural Conditions

2.2.1. Physical and Topographic Features

Kilifi County has four major topographical features. The first one is the narrow belt, which forms the coastal plain and varies in width of 3km to 20km. The coastal plain lies below 30m above sea level with a few prominent peaks on the western boundary including hills such as Mwembetungu. Across this plain run several creeks resulting in excellent marine swamps that are endowed with mangrove forests and present potential for marine culture. This zone is composed of marine sediments, including coral, limestone, marble, clay stones and alluvial deposits that support agriculture.

To the west of the coastal plain lies the foot plateau characterized by slightly undulating terrain. The plateau falls between 60m and 150m altitude and slopes towards the sea. A number of dry watercourses traverse the surface with underlying Jurassic sediments consisting of shells, sandstones and clays. In this zone, grassland and stunted vegetation prevail.

The coastal range falls beyond the foot plateau and has distinct low range of sandstone hills and ranges between 150m to 450m high. These hills include Simba, Kiwava, Daka, Wacha, Gaabo, Jibana, Mazeras and Mwangea. The Nyika plateau that rises from 100m to 340m above sea level

and occupies about two thirds of the county area covers the lower lying ground along the western side of the county. The plateau is less populated with a thin vegetation cover, shallow depressions and gently undulating terrain. This is an arid and semiarid zone, which is suitable for ranching.

The drainage pattern for the county is formed by a permanent river (Sabaki) and seasonal rivers, which drain into Indian Ocean through the various creeks along the coastline. The seasonal rivers are Nzovuni, Rare, Goshi and Kombeni. There are also streams which include Wimbi, Muhomkulu and Mleji

2.2.2. Ecological Conditions

The county is divided into a five Agro- Ecological Zones (AEZ). They define areas that have similar characteristics such as annual mean temperatures, vegetation and humidity. These zones include the following;

Coconut-Cassava Zone: This zone has the highest potential for crop production in the county spreading along the coastal uplands and low-level coastal plains. Major farming activities include tree cropping (mango, citrus, cashew nuts, and coconuts), vegetables (chilli, brinjals, okra etc.), food crops (maize, bananas, cowpeas, green grams etc.) and upland rice. Dairy farming also does well in this zone. It has an average precipitation of 1,300mm per annum and mean annual temperature of 24˚C.

Cashew nut - Cassava Zone: This zone stretches northwards along the coastal plain up to Sokoke Forest. It has an average precipitation of 900mm and mean annual temperature of 24˚C. It has agricultural potential with the same crop types as in Coconut-Cassava zone, but with less production.

Livestock-Millet Zone: The zone is of lower agriculture potential with precipitation of 700 – 900mm. The area is suitable for dry land farming especially drought tolerant crops and livestock ranching.

Lowland Ranching: It varies in altitude of 90-300m with mean annual temperature of 27˚C and annual precipitation of 350-700mm. Major activities within this zone include ranching and wildlife.

Coconut Cashew nut-Cassava Zone: This zone is mainly found in Kilifi South and North Constituencies and is the smallest of all the zones. It varies in altitude from 30-310m above sea level with mean temperature of 27˚C and annual precipitation of 900mm per annum. The area has potential for those crops grown in the coconut-cassava zones and cashew nut-cassava zones.

2.2.3. Climate

The average annual rainfall ranges from 300mm in the hinterland to 1,300mm at the coastal belt. The coastal belt receives an average annual rainfall of about 900mm to 1,100mm with marked decrease in intensity to the hinterland. Areas with highest rainfall include Mtwapa and to the north of the coastal strip around the Arabuko Sokoke Forest. Evaporation ranges from 1800mm along the coastal strip to 2200mm in the Nyika plateau in the interior. The highest evaporation rate is experienced during the months of January to March in all parts of the county.

The annual temperature ranges between 21˚C and 30˚C in the coastal belt and between 30˚C and 34˚C in the hinterland. The county experiences relatively low wind speeds ranging between 4.8 km/hr and 12 Km/hr.

2.2.4. Soils

The soil types are broadly associated with the geological formations along the physiographic zones in the district.

Along the coastal lowlands four soil types predominate namely:

- On the raised reefs along the shore well-drained, shallow (< 10 cm) to moderately deep, loamy to sandy soils predominate;
- On unconsolidated deposits in the quaternary sands zone (also referred to as Kilindini sands) are well drained moderately deep to deep, sandy clay loams to sandy clay, underlying 20 to 40 cm loamy medium sand;
- On the Kilindini sands are also found areas with very deep soils of varying drainage conditions and colour, variable consistency, texture and salinity; and
- Also found on the Kilindini sands are well-drained very deep, dark red to strong brown, firm, sandy clay loam to sandy clay, underlying 30 to 60 cm medium sand to loamy sand soils.

2.2.5. Geology

The geology of the site and its immediate environment is composed primarily of a dissected and eroded coastal belt consisting of Jurassic shale overlain in places by residual sandy plateau. Part of the project site is a loosely filled-up area with gravel material overlying the native clay and shale. This stratum softens with depth as the water content increases to a state where the clay becomes muddy at depths below 10m.

2.2.6. Water Resources, hydrology and drainage

Water in the county remains a problem for domestic use, livestock and Irrigation. The County has 1205 shallow wells, 135 water pans, 90 small earth dams and 50 boreholes. The proportion of households with access to piped water is 48.1 per cent while proportion of households with access to potable water is 63.3 per cent.

Baricho water works and Mzima springs are the only water supply schemes in the county.

Water sources in the county are as follows; permanent rivers such as Sabaki, shallow wells, protected springs, unprotected springs, water pans, dams and boreholes. The average distance to the nearest water point is 5 km.

The Indian Ocean is the largest water mass in the Coast. There are no rivers found in the immediate neighborhood.

2.3. Biological Environment

The marine and coastal zone is rich in biodiversity which is the mainstay of both the fishery and tourism industry. The management of the inland, marine and coastal biodiversity is in the hands of a wide range of institutions including Kenya Wildlife Services (KWS), Fisheries Department, local authorities and regional development authorities.

The government has recently formulated an elaborate national wetland policy which will guide the management and conservation of inland, marine and coastal biodiversity.

2.4. Population and demographics

The population of the county was estimated to be 1,217,892 in 2012 as projected in the Kenya Population and Housing Census 2009, composed of 587,719 males and 630,172 females. The population is projected to rise to 1,336,590 and 1,466,856 in 2015 and 2017 respectively at growth rate of 3.05 percent per annum.

According to the 2009 census report, the county urban population stood at 243,364 people, which represents 36.8 per cent of the total population. The urban population is expected to increase to 267,082 in 2012, further to 293,113 in 2015 and 321,680 in 2017. This represents 21.9 percent of the total population and is expected to grow rapidly once the Kilifi resort city is fully developed. The expansion of the urban population calls for proper planning to ensure sustainable development in the urban areas. There is also need to invest in those sectors and economic activities that create jobs for the rapidly increasing urban population.

2.5. Economic Activities

Agriculture, tourism and fishing are major economic activities in Kilifi. Cash crops grown in the county include cashew nuts, sisal, coconut palms, pineapples and mangoes. Staples like banana, cassava, maize, green grams, cow peas are also cultivated. Along the coastal plains, farmers grow horticultural crops and vegetables such as tomatoes, chillis, onions, brinjals and okra.

Dairy and beef farming is also practised, accounting to a significant quantity of beef and milk consumed in the county and beyond. Small-scale farmers also keep sheep, goats, rabbits, pigs and bees.

Visitors to Kilifi often visit attraction sites such as Gede Ruins, Mnarani Ruins and the Vasco da Gama Pillar - which in combination attract thousands of tourists creating employment for the local communities.

Fishing is widely practiced because of the high demand for fish in Kilifi's hotel industry. Sand harvesting and extraction of gypsum, limestone, rubies and barites have been carried out over the years. The discovery of rare minerals in Kilifi, including titanium and niobium, is expected to

generate alot of revenue from the county's mining industry. Coral blocks quarrying is practiced especially in Bofa and Roka areas.

2.6. Land use

It is estimated that 11.3 percent of the households in the county are landless according to the data available in the Lands offices. Many of these people are squatters on private land. In an effort to address the situation, the Government has put in place several schemes, although the number of people settled in these schemes is below target. This has led to an emergence of informal and unorganized settlements in Malindi, Kilifi and Mtwapa Towns. Many people in the rural parts of the county have no title deeds and they own the land communally. Absence of title deeds has discouraged long term investments on the land.

The proposed site is located in an area zoned for commercial/industrial use.

2.7. Socio Economic Environment

Infrastructure

The zone where this project is located has essential infrastructures to support this type of development.

Water resources

The proposed project site will get its water supply from Kilifi-Mariakani water supply company (KIMAWASCO).

Energy

The site shall be connected to the national grid. Fossil fuel will be used to power some machinery/equipment.

The area is well covered by all communication facilities such as landline and mobile services. All these will facilitate communication throughout the project cycle.

2.8. Environmental challenges faced by the County

Kilifi County faces a number of environmental challenges and some of the most pressing include the following: Resource consumption, land use, access to water, energy use, solid waste, waste water and air pollution ***(source***; district development plan, 2008-2012). However, other emerging challenge the County faces is traffic jams and an upsurge of human population, all with their consequent challenges.

- **Resource Consumption*:*** The County is a major consumer than a producer owing to its huge population. The county imports food, water, fuel and the town's huge population consumes a large share of natural resources such as building material, food, fuel wood, mangrove, timber and charcoal.

- **Land use*:*** Rapid population growth on the sensitive ecosystems along the coastline leads to poor land use. Quarrying, construction along the beach, industrial pollution, in appropriate waste management and some of the few factors that have lead to degradation of the coastline and loss of important wildlife habitats e.g. turtle nesting grounds along the beach.

- **Water and Sanitation*:*** The demand for water in the County is higher than the supply and this leads to frequent water shortages. This demand has resulted in the reliance on ground water reserves which has also lead to increased pressure on the same resource leading to over abstraction and heightened threat to the aquifer to intrusion by saline reserves. Lack of adequate Sanitation services is one of the greatest threats to the residents of the County. Poor sanitation has exposed most residents of most of the areas county to various health hazards and thereby threatening the lives of the residents.

- **Air Pollution*:*** There are various air pollution sources within the County and some of the major air pollution sources are industries, vehicular traffic and various sources of energy production.

- **Energy use*:*** The demand for fuel has been prompted by the rising urbanization, industrialization, growing economic development activities and rising population. The

demand for charcoal has contributed to local deforestation, land degradation and loss of biodiversity.

- **Traffic jams:** heavy commercial trucks cause traffic jam along Mombasa-Nairobi road all the way from Mariakani weighbridge. Contributing factors to this include roadside parking of trucks.

3. Policy and Legal Framework

The following legislations are relevant to the proposed project

- The Physical Planning Act;
- The Local Authority Act;
- The Public Health Act;
- 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 Employment Act 2007;
- The Labour Institutions Act 2007;
- The Work Injuries Benefits Act 2007;
- The Occupational Safety and Health Act 2007; and
- The Energy Act 2006.
- KEBS Standardisation/ISO

Table 1: Compliance with Relevant Legislation

Parameter	Established Regulations	Regulator	Compliance (Yes/No)	Remarks
Site Location	1. The Physical planning Act Cap 286**.** • Change of user 2. The Registration of Titles Act Cap 281 • Title deeds	Ministry of Lands County Govt. of Kilifi	Yes	– Area zoned for industrial use – There are site layouts obtained – The proponent in the process of obtaining relevant approvals
Operational Licenses	1. Local Authorities By-Laws • Single Business permit 2. EMCA 2015 3. Standards **Act** Cap 496	County Govt. of Kilifi NEMA KEBS	In process	Operational licences from the CGK and other Authority should be obtained
Building Code	1. The Physical planning Act Cap 286	County Govt. of	Partially	• Site designs/plans submitted to CGK for

	2. The Land Control Act Cap 302 3. Building and Development Control Rules Plan approval / certificate of occupation	Kilifi		approval
Health and Safety	1. The Public Health Act Cap 242 2. Occupational Health and Safety Act 2007 3. Company quality and Environmental policies 4. County Government of Kilifi (Department of Public Health)	Mininistry of Health Ministry of Labour CGK	To be implemented	Approval letters from relevant ministries to be obtained upon completion of installation and before operationalisation.
Wastewater	1. Environmental management coordination (Amendment) Act, 2015. 2. Effluent discharge permits from NEMA.	NEMA	To be implemented	Approvals to be sought from the relevant authorities upon operationalizing facility.
Air	1. Environmental Management and Coordination (Air Quality) Regulation, 2015	NEMA	To be implemented	Measures shall be put in place to ensure emissions meet the set standards.
Noise	1. International Labor Organization Quality Standards. 2. World Health Organization Quality Standards 3. Environment Management Coordination (Noise and Excessive Vibration control) Regulation, 2009.	NEMA CGK DOSH	To be implemented	Measures to be put in place to ensure insignificant noise levels and reduced exposure to noise by employees. Carry out frequent monitoring of sound level

Table 2: Standards to be used for the Proposed Cement manufacturing

Mechanical Works	
STANDARD	**SPECIFICATION**
BS EN 459-1:2015 (KS 1780) Building lime.	Definitions, specifications and conformity criteria: Applies to building limes used as binders for preparation of mortar (for masonry, rendering and plastering) and production of other construction products. Defines different types of building limes and gives their classification. Also specifies requirements for their chemical and physical properties, which depend on the type of building lime, and the conformity criteria.
BS EN 459-3:2015	Specifies the scheme for the attestation and verification of constancy of performance (AVCP) of building limes to their corresponding product standard EN 459-1. It provides rules for surveillance, assessment and evaluation of the factory production control and rules for the frequency of inspections. The Standard specifies technical rules for factory production control by the manufacturer, including autocontrol testing of samples. It also provides rules for actions to be followed in the event of non-conformity and requirements for dispatching centres.
KS EAS 148-5:2000	Cements - Test methods - Part 5: Pozzolanicity test for pozzolanic cements. Describes the method of measuring the pozzolanicity of pozzolanic cements conforming to KS EAS 18-1
BS 1363	1 3A plugs, socket-outlets and adapters
BS 4196	Sound Power Levels of Noise Sources

3.1. 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.

This Act provides for the preparation and implementation of physical development plans for connected purposes. It establishes the responsibility for the physical planning at various levels of Government in order to remove uncertainty regarding the responsibility for regional planning. It provides for a hierarchy of plans in which guidelines are laid down for the future physical development of areas referred to in specific plan. The ostensible intention is that the three tier order plans, the national development plan, regional development plan, and the local physical development plan should concentrate on broad policy issues.

The Act also promotes public participation in the preparation of plans and requires that in preparation of plans, proper consideration be given to the potential for economic development, socio-economic development needs of the population, the existing planning and future transport needs, the physical factors which may influence orderly development in general and urbanization in particular, and the possible influence of future development upon natural environment. The innovation in the Act is the requirement for Environmental Impact Assessment (EIA). Any change of use of the actual development without authority constitutes an offence.

The proposed site is located within an area zoned for commercial/industrial use. The layouts have been submitted to the department of planning and development in Kilifi County.

3.2. The Local Authorities Act

Under the Local Authorities Act Kilifi County Government assumes a number of roles in its area of jurisdiction, including the project site area which is Mariakani. 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. The County Government also approves development plans as per zonation.

The architectural drawings of the Cement factory have been submitted to CGK and the proponent has been issued with Change of Use approvals for the entire two plots.

3.3. The Public Health Act (Cap 242)

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 establishment,

maintenance and inspection of drainage system, septic tanks, cesspool or latrines. In implementing the proposed project, the developer has to carry out work in line with requirements and provision of this Act.

Section 119 states that a medical officer may require the owner of dwelling causing nuisance to remove the nuisance in the dwelling failure to which legal proceedings may be taken against the owner of the dwelling and penalties. Under section 126 the act includes The Public Health (Drainage and Latrine) Rules which in section 63 deals with sewerage and prohibits the disposal of solid or liquid sewage or sewage effluent in such a manner or in such a position as to cause or be likely to cause dampness in any building or part thereof, or to endanger the purity of any water supply, or to create any nuisance.

The main contractor will be required to provide sanitary facilities and solid waste containers for use by the construction workers on site during construction phase. A licensed solid waste transporter will also be contracted to collect all solid waste from the site for dumping at approved sites. Waste water from the proposed project during its operational phase will be discharged into on-site sewer system.

3.4. Environmental Management and Co-ordination (Amendment) Act (EMCA), 2015

The EMCA, 2015 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, 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 of the

Kenya Gazette Supplement No. 56 that was published on 13th June 2003. Some of the administrative procedures are as follows:

- 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, 2015.
- The Act gives the Governor powers to constitute County Environment Committee through a Gazette Notice. The CEC shall (a) be responsible for the proper management of the environment within the county for which it is appointed; (b) develop a county strategic environmental action plan every five years.
- 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 is 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.

The project proponent has caused an E.I.A study report be done for the proposed project.

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

This regulation is meant 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 any facility must be licensed according to the EMCA, 1999 and the subject regulation;
- 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.

There exists a septic tank and soak pit that serves to manage effluent from the warehouses.

3.6. 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;
- 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.

The proponent shall ensure that general waste is collected by a NEMA licensed waste handler and that recyclable waste to be recycled within the facility.

3.7. The Environmental Management and Coordination (Air Quality) Regulations, 2009

The objective of these Regulations is to provide for the prevention, control and abatement of air pollution to ensure clean and healthy ambient air.

These regulations apply to:-

a) All internal combustion engines,
b) All premises, places, processes, operations, or works to which the provisions of the Act and Regulations made thereunder apply, and
c) Any other appliance or activity that the Cabinet Secretary may by order in the Gazette, specify.

The regulation prohibits any person from:-

- Acting in a way that directly or indirectly causes, or is likely to cause immediate or subsequent air pollution;
- Emit any liquid, solid or gaseous substance or deposit any such substance in levels exceeding those set out in the First Schedule.
- Causing emission of the priority air pollutants prescribed in the Second Schedule to exceed the ambient air quality limits prescribed in the First Schedule.
- Causing the Ambient Air Quality levels specified in the First Schedule of these Regulations to be exceeded.
- Causing or allowing particulate emissions into the atmosphere from any facility listed under the Fourth Schedule to these Regulations in excess of those limits stipulated under the Third Schedule.

The regulation makes it mandatory for persons whose operations cause or are likely to cause the emission of pollutants in excess of the limits set out in the Third Schedule to use air pollution control systems set out in the seventh schedule of the regulation.

The fourteenth schedule to the regulations lists Cement plants (clinker plants included) among controlled facilities where these regulations apply.

Part V of this regulation makes it a requirement for any person or owner operating a controlled facility listed under fourteenth schedule this facility being among the list to apply for an emission license and that the holder of that license ensures monitoring is done.

Part VIII of the Fifth schedule to these regulations gives Guidelines on sources of fugitive emission air pollutants. The following are listed as the sources of fugitive emissions: construction activities; storage and handling, including loading and unloading, of materials such as bauxite, alumina, gypsum, or Portland cement or the raw materials therefore; mining and quarrying activities; haul roads; haul trucks; tailings piles and ponds; demolition activities; blasting activities; sandblasting operations; wind breaks; the paving of roads and conveyor belts. The fourth schedule to these regulations gives a table of guidelines on air pollution monitoring parameters from stationary sources.

3.8. 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 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.

3.9. Employment Act 2007

The proponent will adhere to all the regulations under this Act

3.9.1. 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.

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.

3.9.2. Part IV Rights and duties of employment

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

3.9.3. Maternity Leave

Section twenty nine of the Act stipulates that a female employee shall be entitled to two months maternity leave with full pay and an employer who has paid a female employee wages for two months during her maternity leave shall be reimbursed by the National Social Security Fund, the equivalent of wages paid by the employer during maternity leave or a lesser amount as may be determined by the Minister in rules made by the Minister for that purpose. Subsection 8 of section 29 further states that no female employee shall forfeit her annual leave entitlement on account of having taken her maternity leave.

3.9.4. Section 37 (conversion of casual employment to term contract)

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

3.9.5. Work Injuries Benefits Act 2007 (WIBA)

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.

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 that 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.

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.

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 nod Safety within twenty-four hours of its occurrence in case of fatal accident.

3.9.6. Occupational Safety and Health Act 2007

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 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.

3.10. Energy Act 2006 <The Energy (Energy Management) Regulations, 2012>

The regulation requires among other things that:-

1. All designated energy consuming facilities shall carry out energy audits at least once every three years;
2. All energy audits will be carried out by an energy auditor licensed by ERC;
3. All energy audit reports, Implementation plans and Energy Policies shall be submitted to ERC;
4. The designated facilities will be required to implement at least 50% of the energy audit recommendations within three years.

4. PROJECT DESIGN AND ALTERNATIVES

4.1. Design

Safari Cement Ltd will compromise of the following sections;

- Ramp/truck unloading: Offloading of raw materials is done in this area and is installed with hoppers for respective materials
- Clinker,Pozzolana and gypsum storage Shed: used for storage for clinker, gypsum and pozzolana before it is fed to the cement mill for conversion to cement. Shed of this type for clinker, Pozzolana and gypsum storage has the advantage that there is no dust pollution and spillages.
- Feed hoppers
- Cement mill: Clinker, along with additives, is ground in a cement mill. The output of a cement mill is the final product i.e. Cement. In a cement mill, there is a cylindrical shell lying horizontal which contains metallic balls and as it rotates, the crushing action of the balls helps in grinding the clinker to fine powder. The cement mill shall be installed with filters containing a number of tubular bags mounted in which the dust laden air is drawn through them by suction. It is very effective in removing dusty particles from discharge of cement mill. In a bag house system discharge gas containing dusty particles is passed through a series of bags made of strong fabrics.
- Cement silo: The cement storage silo is used for storing the finished product - cement.
- Cement packaging: The cement is packed with the help of a rotary packer and finally dispatched to the market.
- Central Control Room and Laboratory: It is the nerve center of the cement plant since all equipment is controlled from this place. It is the place from where all the process parameters are controlled. Samples of finished products are also tested in the lab to check on conformity with set standards or market requirement.
- Sanitary block
- Workshop: for maintenance of machineries within the facility including trucks
- Stores
- Administration block
- Fire station: to ensure fire safety of the plant

- Truck parking area with drivers rest shed
- Weigh bridge
- Canteen and dispensary

The proposed site is partly developed with warehouse; small administrative offices and is secured within a perimeter wall. The proposed layout includes all the above mentioned facilities and has provided room for landscaping and planting of trees. Proper drainage shall be done within the site and it is advised that a biodigetstor be installed to manage effluent within the site.

4.2. Manufacturing Process

The process begins by receiving truck ferried raw materials (imported clinker and gypsum/pozzolana) on site at truck unloading area where there are hoppers for each raw material and additive. Using conveyor belts, the raw materials are directed to their respective storage facilities.

When in operation, raw materials are conveyed to feed hoppers which convey them to cement mill (ball mill) in specific proportions based on the quality requirement through material hoppers. Feed material is ground in the ball mill, discharged and fed to a separator/classifier with the help of a bucket elevator for classification of the ground cement into two streams – coarse and fines. The coarse fraction is sent back to the mill and the fines are collected in cyclones and / or a baghouse as finished product and directed to cement silo by aid of compressed air.

Movement of material in the mill is achieved by rotation effect and ventilation, a draft fan at the end of the mill pulls the material that is they are air swept. Ventilation helps in the cooling of the mill and also prevents the cement from agglomerating. Ambient air will be taken in by fans and heated to 350-450°C and leave the mill at around 85-90°C. The mill will have an outlet diaphragm which has smaller perforations to only allow cement particles of required size to leave the second chamber. Cement leaves the mill with the flowing air. The very fine particles tend to behave fluidized thus they move with air to the mill bag filters where air is filtered out to the atmosphere and the solids drop down due to gravity to the air slides to meet the heavier ones which had fallen down directly from the mill outlet through to the air slide. The recirculating elevator, in principle a bucket elevator, picks these solids from the air slides and conveys them up to the separation, system of fine cyclones, where the solids are separated by centrifugal

means. The coarse cement (rejects) retaken back into the mill to be reduced further through the larger center unit. Fine cement (fines) is then channeled from the four small outer units in separation to screw conveyors to be taken to top of silo by another system of bucket conveyor.

Cement extraction will be done by packing plant operation through compressed air and will be dispatched in two modes namely in bulk and in bag of 50kg capacity.

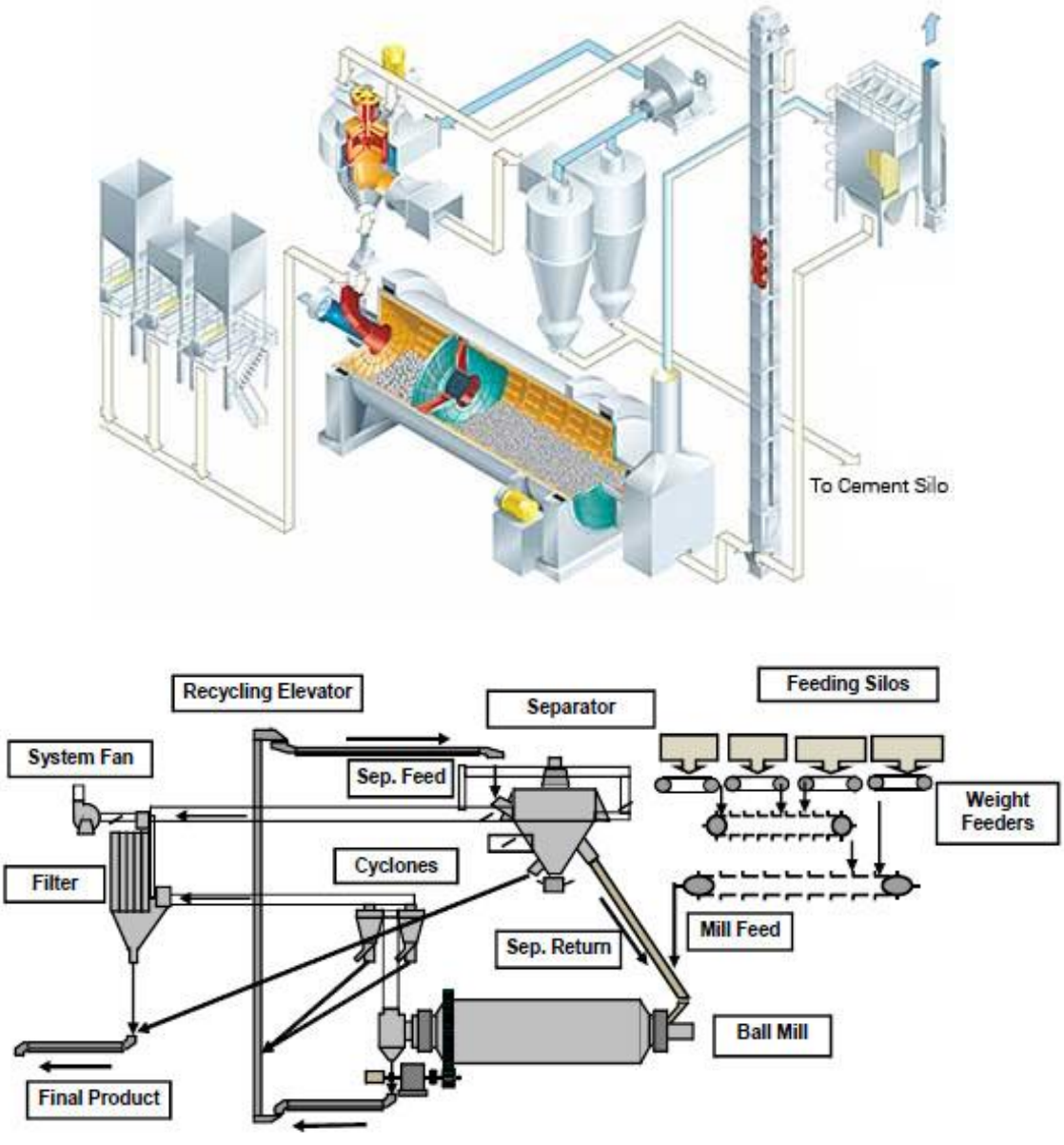

Figure 1: Closed circuit grinding system.

4.3. The facility's Works commissioning

Implementation of the proposed project will follow the following order;

- The Authorities Planning and Consent and Sitting
- The Project Execution as per design and establishment plans.

In all these appropriate tools, equipment and technology will be needed to be employed to minimise environmental pollution and occupational hazards.

The main activities at the site will be manufacturing of Portland cement for sale. Clinker will be shipped from outside Kenya and ferried from the Port of Mombasa to the mini cement plant by road using tipper trucks. Materials shall be stored on site in a manner that shall not cause any pollution to the environment. The proponent will ensure use machines that have already been tested and calibrated and found to be within the recommended noise and will not emit pollutants to the operators or environment in general.

4.4. Products

The primary product of the proposed project during the operational phase will be Portland cement as per client specification and that meets set standards by Kenya Bureau of Standards and ISO.

4.5. By-products

During the operational phase of the project it is not expected that there will be any by- products generated rather than dust collected by filters and returned to the ball mill.

4.6. Waste

Effluent Waste

The following wastewater will be generated during Project operations:

- Storm water run-off.
- Contaminated waste water from the truck parking area from potential spills which together with the storm water will be directed through an oil water separator prior to discharge to on-site treatment plant.
- Waste water from sanitary facilities shall be channeled to already installed bio-digester within the site

Waste

Some of the domestic waste to be generated at the facility will include office waste such as paper, empty cans among others. During maintenance of machines and servicing of trucks in the workshop, waste oil shall be generated

Sewage Waste

The employees of the Proponent; and visitors who will be based within the project area are expected to generate sewage waste which will be channeled to the on-site treatment plant.

4.7. Fire protection

The facility will have a comprehensive firefighting system covering all hazardous areas and the other areas of the facility. This ensures that any fire within is quickly surpassed and extinguished.

4.8. Project Alternatives

Two project alternatives are available namely the 'no project' alternative and 'yes project' alternative. Analysis of each alternative is as follows.

4.8.1. The "no project" alternative

This option will mean that the project will not be undertaken. This implies that the proposed Mini Cement Manufacturing plant establishment will not be undertaken. This implies that all possible rising of standards for safety, health and environment will not be affected.

This option was not considered viable because:

- This would mean no job creation: The current government policy on employment and wealth creation aims at creating jobs annually will not be realized by encouraging and supporting projects such as the proposed one. If the 'no option project' was to be considered then this government target may not be realized.
- Income to government: Income in form of taxes to the government from the increased profits will not be realised;
- The area will not open up for other investments which will also be a source of employment for the locals
- Available land already zoned for industrial use would not have been put to optimal use

4.8.2. The 'yes project alternative'

This option was considered viable as opposed to the 'no option' because:

- More jobs will be created;
- Available land will be optimally utilized
- It will ensure availability of affordable and quality cement whose demand is ever increasing due to the rapid infrastructure developments;
- Reduces importation of cement to meet demand and exporting finished product to neighbouring countries thus boosting foreign exchange;
- The project will increase land value of the area as more industrialists would want to invest in the area;
- The project will come with benefits such as infrastructure development in the area;
- It will result in further development and improvement of local business;
- There will be increased revenue inform of taxes to the government.

4.8.3. Alternative Use of Proposed Project Site

Alternative use of proposed site was not considered because of the following: -

- ✓ The proposed project site is within a sparsely populated area zoned for commercial/industrial use;
- ✓ The site already meets the necessary requirements for factory establishment;
- ✓ The facility will cater for a lot of needy families in the area through provision of employment and business opportunities;
- ✓ The necessary safety and security measures have been assessed within the neighbourhood.

4.8.4. Technology Alternatives

The most challenging issues of establishment work are observance of safety and health issues. The contractor who will be awarded establishment tender will be required to use appropriate technology that will not result in noise pollution and that will conform to operating with full implementation of safety and health matters relating to establishment.

The plant will be installed with fans and will employ the use of compressed air in control of dust.

Use of suitable grinding aids also is recommended to improve grinding. It is recommended that all operational and process deficiencies be eliminated and that the system be optimized before considering use of a grinding aid to further improve the process.

Results of the optimization can be measured by multiple parameters such as separator efficiency, specific power consumption, system throughput, and wear rate of grinding media and liners.

The separator is expected to perform in a way that a minimum of the fines is carried in the coarse reject fraction and sent to the mill for regrinding. Changing the separator to a high efficiency type brings about better residue value (on 45 micron) for the same Blaine. Alternatively, the cement can be ground to a lower Blaine with the same residue, which determines the strength of cement. In most cases the layout permits replacing the separator to a high efficiency type.

An evaluation of the grinding system and operation includes meaningful and critical inspection of all equipment, components and the process parameters by experts.

4.8.5. Preferred Technology

The proponent inteds to optimise use of closed circuit ball mill as the separator returns rejects to the mill and the system to control dust emission ensures all the dust is returned to the ball mill.

To accurately quantify the emissions, continuous measurements are recommended for the following parameters:

- Exhaust volume, humidity, temperature,
- Dust,
- O_2
- NO_x
- SO_2
- CO

Air quality measurements will be undertaken on a quarterly basis and in areas towards the proximity to the residential areas. Five Monitoring sites will be chosen and mapped. The sampling procedure should at all times take into consideration issues raised by neighbors and

other stakeholders. Both sampling and analysis of air quality measurements will be undertaken by a NEMA designated testing facility. The parameters to be investigated will include;

- Nitrogen dioxide (NO2)
- Sulphur dioxide (SO2)
- Oxygen (O2)
- Carbon Dioxide (CO2)
- Volatile Organic Compounds (VOC)
- Hydro Carbons (CXHY)
- PM (Particulate matter)

Table 3: The General Anticipated Impacts and Mitigation Measures during establishment and operation activities

The machine tools factory establishment will be carried out by experienced personnel familiar with their duties. The work will include all safety features, foundation, concrete, brick work etc plus all electrical installations for lighting.

Possible Impacts	Mitigation Measures
Waste Management (solid and liquid)	▪ Provide solid waste collection facilities and segregation during site preparation. ▪ Suitable method of disposal for each kind of waste will apply ▪ Operational measures should be designed and put in place to guide the process of waste reduction on-site. ▪ Waste reduction mechanisms should be employing on-site to reduce the volume of any solid wastes generated. ▪ The collection and safe storage of solid wastes on-site should be encouraged to facilitate transportation off-site. ▪ The facilitation of safe transport of wastes off-site to authorized solid waste disposal sites should be encouraged. This would discourage accidental waste disposal during transport. ▪ The provision of adequate access to toilet and bathroom facilities that meet both numerical standards (to prevent workers from using the neighbours') and treatment standards. ▪ The separation of sewage and grey water streams to reduce sewage effluent volumes. ▪ The employment of on-site treatment of wastewater.

Public and Occupational Health and Safety during establishment and operation	▪ Provision of appropriate protective clothing and equipment (overalls, head-covers/caps, gloves, ear muffs, nose muffs) and training to workers. ▪ Provide suitable equipment during site preparation to avoid muscular strains. ▪ Ensure that drinking water is safe for workers. ▪ Ensure workers work in shifts whereby duration of each shift has a maximum of 8 hours. ▪ Provide well equipped first aid box on site ▪ Ensure First Aid training to employees and two or three First Aiders be identified within the workers and their mobile numbers placed at strategic points ▪ Ensure compliance with OSHA 2007 ▪ Segregate motor traffic from pedestrian traffic in the design. ▪ The limiting of regularized vending at the perimeter of the development to restrict the generation of uncontrolled solid and liquid wastes.
Surface Run-off	▪ Ensure that no waste water is directed into surface run-off drains. ▪ Put in place roof catchments so as to harvest rain water ▪ The use of permeable surfaces for parking, walkway and roadway areas to facilitate ground infiltration. ▪ The use of ground-based storm water disposal options where the geology of the area will facilitate its use. ▪ The control of storm water accessing the site from offsite locations. ▪ The incorporation of all drainage mitigations, along with a back-up surface drainage proposal, within an overall drainage plan for the development, with specific attention being placed on the terminal portion of the surface drainage, which may present a flooding risk within the site and it's neighbourhood. ▪ The employment of drainage mitigation measures to assist in the reduction of the volume and velocity of run-off from the site. ▪ The covering and berming of stockpiles of materials during rainfall periods to prevent the washing away of these materials. ▪ The recycling of sediment-loaded wash-water from batching plants to prevent the discharge of these waters into the

	environment.
Security	▪ 24 hours security measures to be provided including inco-operation of technology ▪ Police emergency numbers to be placed at strategic points
Drainage system	▪ Ensure effective waste water management as guided by law. ▪ Avoid as much pollution on the drainage system in the area.
Increased resource (water & electricity) demand	▪ Management of water usage. Avoid unnecessary wastage. ▪ Recycling/reuse of water at the establishment time where possible. ▪ Install water-conserving taps that turn off automatically when water is not being used. ▪ Install energy saving electrical appliances to reduce energy consumption ▪ Carry out Energy Audit so as to know areas that need improvement
Air, Dust and Noise Pollution (during establishment and opération)	▪ Regular maintenance of operating machines and equipment. ▪ Use of appropriate protective equipment (PPE) such as ear protectors dust masks by workers ▪ Carry out regular sound level (noise) and dust survey ▪ The use of the lowest noise-emitting equipment appropriate for the given task should be opted for, since this will result in less noise generated on-site. ▪ Time limits should be imposed to limit the periods during which construction noises can be generated. The following times are proposed: - Mondays to Fridays 0800hrs to 17hrs. Saturdays 0800hrs to 1300hrs. Sundays and Holidays – no noisy activities are to be permitted. ▪ Physical noise barriers should be considered for the property. ▪ Check the performance of the major equipment periodically, in order to troubleshooting ant fix the problem by lubricating, repairing and etc. All operational and process deficiencies be eliminated ▪ Reduce the noise exposure level of the employees especially machine operators or altering their activity zones between safe and unsafe acoustical zones. ▪ Installation of pollution control devices most preferably compressor, fans and filter bags for dust pollution control

	▪ Ensure trucks ferrying raw materials especially clinker to the site are well covered to prevent dust spread ▪ Preventing fugitive dust from exiting the construction site through the use of containment barriers at the site's periphery. This mitigation would work in tandem with noise mitigation measures to prevent sound releases into the external environment. ▪ Controlling fugitive dust generation from sources external to the construction site, such as at Concrete Batching plants and from trucks transporting raw materials to the site – using the containment methods. ▪ Apply for emission license from NEMA as per Air Quality Regulation
Increase in traffic	▪ Provision of adequate parking within the compound ▪ Comply with traffic regulations such as speed limits at the site ▪ Provide bill boards at the site/entrance to notify other motorists in the area about the project ▪ Apply from KeNHA for installation of speed bumps 100 meters away from both sides of the main entrance to the facility ▪ Develop a traffic management plan
Fuel leakage	▪ Ensure fuel storage tank is bunded ▪ Designated staff at storage area to be trained on how to prevent, contain and clean up spills ▪ Ensure provision of spill kits
Resource efficiency	▪ Monitor electricity and water use ▪ Put in place energy and water saving procedures and targets ▪ Install energy saving motors; water saving devices

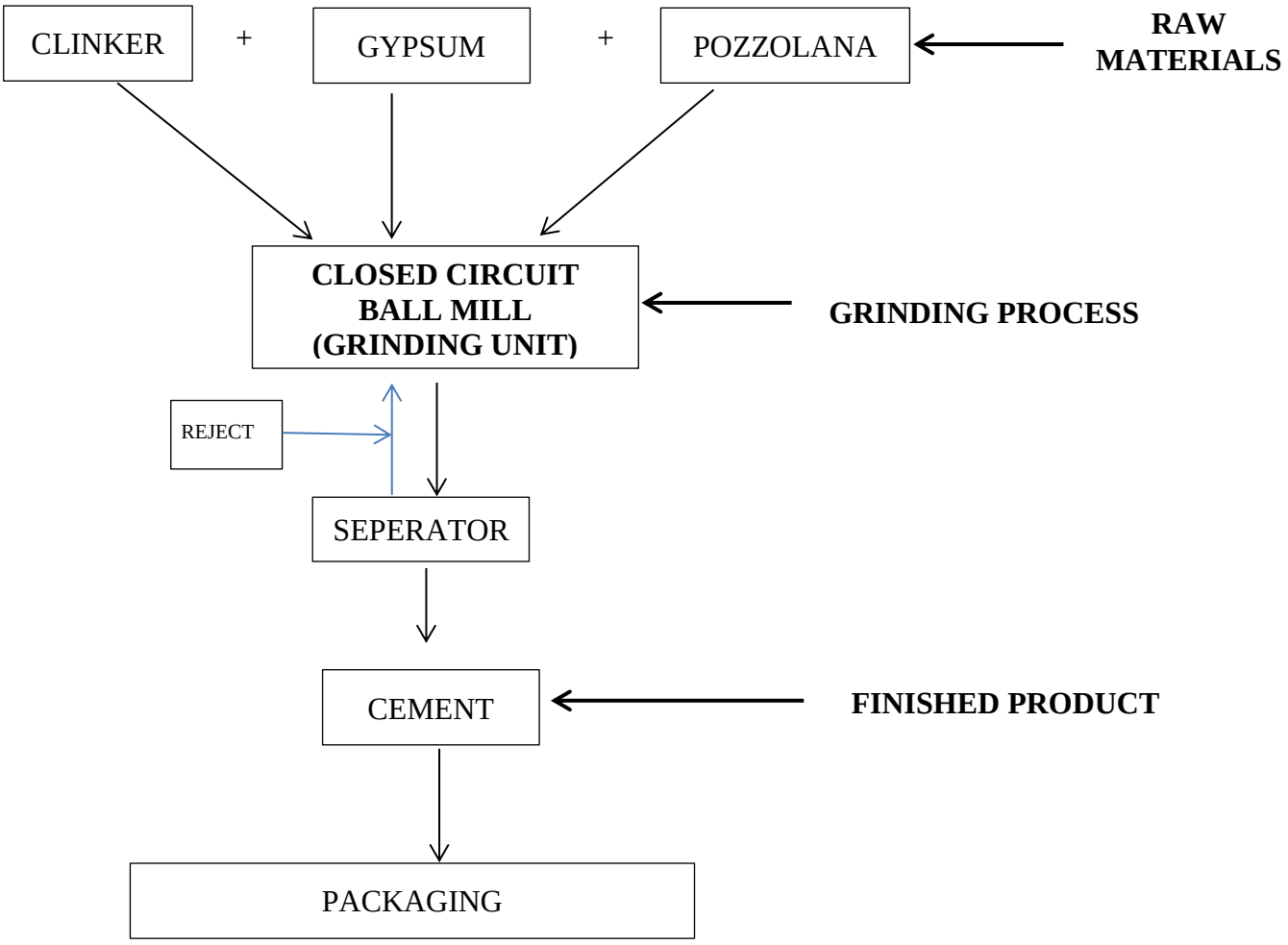

Figure 1: Flow chart showing process of manufacturing Cement

5. CONSULTATION WITH NEIGHBOURS

5.1. Introduction

Consultation with the neighbours especially those drawn from the proposed project site and the immediate neighbourhood on the proposed project was conducted. The consultation was vital and served to:-

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

5.2. Mode of consultation

The consultation was twofold namely;

- Public baraza
- Informal interviews and discussions; and
- Questionnaire survey.

The public baraza was held on 20th December, 2017 at the proposed project site. Turn out of residents of the area was good and they unanimously supported the project. The baraza was organised in conjunction with the area Chief. The meeting was attended by 40 people residing within the neighbourhood and officials from Safari Cement Ltd. *Attached is attendance list of the meeting.*

The major issues raised include:-

i. Dust pollution: They commented that measures to be put in place to reduce dust emission.

ii. Employment: They requested that priority be given to the locals on employment. They proposed that measures such as putting up a training institute be put in

place where interested locals who were not privileged to proceed their education to tertiary level to be trained on machine operations.

iii. Benefits to the community: The community representatives suggested that Safari Cement comes up with programs that support the community. This includes supporting talents in youths; providing bursary for bright children from the area as the majority people of this area are less privileged; supporting development groups.

Representatives from Safari Cement Ltd guaranteed the locals that they would be first priority when it comes to employment. They were urged to embrace the project as it is within their locality hence should take advantage as they will be prioritised in employment.

6. OCCUPATIONAL SAFETY AND HEALTH

Occupational Safety and Health (OSH) is of paramount importance at establishment 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 establishment, the neighbourhood, visitors, contractors, sub-contractors and the general public. Therefore before commissioning the establishment, 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 establishment 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, establishment materials, and employee training.

Managers, Supervisors and Hosts shall analyze work for hazards, authorize work to proceed, and ensure that work is performed within established controls.

Managers, Supervisors and Hosts shall ensure that the scope of work properly considers all elements of the workshop's operational priorities.

All authorized machine users shall identify, evaluate, and control hazards in order to ensure that work is conducted safely and in a manner that is compliant, and protects the environment and the public.

5.1. General Equipment Requirements

Operating Controls

A mechanical or electrical power control must be provided on each machine to make it possible for the operator to cut off the power from each machine without leaving his position at the point of operation.

Power controls and operating controls should be located within easy reach of the operator while s/he is at his/her regular work location, making it unnecessary for him/her to reach over the cutter to make adjustments. This does not apply to constant pressure controls used only for setup purposes.

Machine Guarding

i. One or more methods of machine guarding must be provided to protect the operator and other workers in the area of the machine from hazards such as those created by points-of operation, ingoing nip points, rotating parts, flying chips and sparks. Examples of guarding methods are barrier guards, two-hand tripping devices, electronic safety devices, etc. Point of operation guarding must be so designed and constructed as to prevent the operator from having any part of their body in the danger zone during the operating cycle. All guarding will be in compliance with OSHA and manufacturer specifications,

ii. Special hand tools for placing and removing material must be such as to permit easy handling of material without the operator placing a hand in the danger zone. Such tools must not be in lieu of guarding requirement and only provide supplemental protection.

iii. The following are some of the machines which usually require point-of-operation guarding: cutters, shears, alligator shears, power presses, jointers, table saws, pedestal grinders, chop saws, and belt/disc sanders.

iv. All mechanical power transmission apparatus, including belts, pulleys, gears, shafts and moving parts, must be guarded. All horizontal belts pulleys, flywheels, and fan blades and those portions of vertical and inclined belts seven (7) feet or less from the floor (or working level) are required to be enclosed by a guard when worker exposure is possible. Flywheel guards must be placed no less than 15 inches or more than 20 inches from the rim. If wheels are in a pit or within 12 inches of the floor, a toe board is required. **Note:** If workers are naturally guarded from exposure to hazardous areas by location of the belt/components (such as walls and mechanical structures), no additional guard enclosure is required.

v. Guards must be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. The guard must be such that it does not offer an accident hazard in itself.

vi. Guard construction and design must comply with OSHA 2007,

Anchoring fixed machinery

i. Machines designed for a fixed location must be securely anchored to prevent walking or moving.

Emergency Stops

Fixed machine tools, other than those operated with constant pressure switches, require a minimum Type 1 emergency stop that complies with OSHA and manufacturer specifications, and is easily accessible from the normal operator position(s). This requirement is effective immediately for all procurement of new fixed machine tools. In accordance with the implementation plan and HAEPZL Fixed Machine Tool Improvement Program. The installed emergency stop should be selected so as to not add or increase the hazard of the machine.

Anti-restart Devices

Provision must be made to prevent fixed machine tools from automatically restarting upon restoration of power after a loss of power. This requirement is effective immediately for all woodworking tools and procurements of new fixed machine tools. Fixed machine tools, other than woodworking tools, at HAEPZL at the time of promulgation of this subject area must be brought into compliance by the Line Organization in accordance with the implementation plan and HAEPZL Fixed Machine Tool Improvement Program.

Before operating a specific machine for the first time that day, each authorized user must conduct a Pre-use Inspection and completely review the machine to ensure that safe operation of the equipment can be performed. The operator should utilize the available machine operator aid to identify critical inspection points and settings. Operator aids must identify existing controls that address predominate hazards of machine use.

5.2. Internal Safety Matters

Once the factory establishment is complete, a comprehensive occupational safety and health management system should be developed/reviewed for the workplace. Internal safety needs will need to be addressed right from the establishment phase through to the operational phase of this project exercise. Some of the things that need to be in place include; -

5.2.1. Emergency Preparedness

There is a fire plan in place for the existing facility. An integrated emergency response plan should now be developed.

- ✓ Each emergency exit must always be clear of any obstruction;
- ✓ Each emergency exit must be clearly marked;

- ✓ There should be an elaborate fire-fighting system in place with the following fire-fighting equipment, potable fire extinguishers, horse reel, fire blanket, sprinkler, CO_2 flooding, and fire alarm;
- ✓ An evacuation procedure should be in place in case of a fire or other occurrence. The procedure should be available to all workers who must familiarise themselves with it;
- ✓ Fire drills should be conducted periodically.

5.2.2. First-Aid

- Proponent/Contractor to ensure First Aid services are provided to employees at all times;
- An appropriately equipped First-Aid station to be easily accessible at the establishment site;
- A written Emergency Procedure to be in place.
- Training of employees on First Aid

5.2.3. Personal Protective Equipment

- Proponent/Contractor to identify and provide appropriate Personal Protective Equipment (PPE) such as helmets, gloves, safety boots, ear muffs and dust masks, that will offer adequate protection to the workers and occasional visitors without incurring unnecessary inconveniences;
- The proponent/contractor to actively enforce use of PPE;
- The proponent/contractor to ensure PPE are cleaned when dirty, properly maintained and replaced when damaged or worn out.

5.3. Ambient factors in the establishment site

5.3.1. Noise

- Employees not to be exposed to noise levels greater than 85dB(A) for a duration of more than 8 hours per day;
- No unprotected ear to be exposed to peak sound pressure level (instantaneously) of more than 140 dBA; and
- The use of ear protectors must be actively enforced.

5.3.2. Dust

- Exposure to dust to be controlled by ensuring dust accumulation at workplace is controlled;
- Employee exposed to dust to be provide with disposable dust masks.

5.4. Fire Fighting

Fire extinguishers and other fire-fighting equipment will be available as close as practicable within the plant premises. Within the site development layout, there is provision of fire station.

7. PONTENTIAL ENVIRONMENTAL IMPACTS

7.1. Positive impacts

Positive impacts likely to result from implementation of the proposed project include the following: -

- ✓ Job opportunities;
- ✓ Support of local businesses;
- ✓ Revenue to government.

7.1.1. Employment opportunities

Establishment sites are a major source of employment. Although the jobs are not permanent, a considerable number of casuals and contracted people are able to get employment opportunities. The proposed project if implemented will likely create employment opportunities due to increased production. The probable number to be employed either directly or indirectly is estimated to 350 people.

The company will provide market for suppliers and professionals.

7.1.2. Support of local businesses

The proposed project will require the services of different expertise during the implementation stage. This will include contractors, electricians, and consultants who will be hired for various works. Others will be transporters, suppliers and other services providers to the project. This will contribute to support of local businesses. The company will require security and cleaning services all of which will be outsourced thus creating business.

Investors will have the confidence of investing in residential developments as people who will work in this company.

7.1.3. Community Social Responsibility

Safari cement management will ensure that the community benefits from the project being within this location. Some of the benefits the company intends to pass to the community include:

- ✓ Beautifying the area thus improving aesthetics
- ✓ Supporting local community facilities such as medical facilities and public schools one identified is Kajiwe Primary school
- ✓ Support small contractors in the area by improving their skills through organized seminars
- ✓ Offer internships and support of best perfoming students from the area.

7.1.4. Government revenue

Once implemented, the proposed project will boost revenue collection to the central government and local city council. This will be in form of permits, licence fees and other government taxes.

7.2. Negative impacts

Potential negative impacts likely to result from the proposed project include:

- Noise disturbance to neighbours and employees;
- Dust disturbance to employees;
- Injuries;
- Waste resulting from establishment and operation phase.
- Air emissions
- There would be influx of workers during construction phase which could lead to pressure on key local infrastructure such as water, healthcare, electricity.

8. ENVIRONMENTAL MANAGEMENT PLAN

7.1. Introduction

To safeguard the environment, the project proponent together with the contractor will need to undertake the following:-

- Develop and document Environmental Management Policies that will guide establishment work and other site operations during and after establishment. The policies should address environmental conservation measures to be put in place, occupational safety and health matters of workers and management of sewage and other waste.
- The project proponent to avail required finances for implementation of EMP; and
- Contractor to ensure that establishment work is done within the requirements of Occupational Safety and Health regulations.

7.2. Environmental Management Plan (EMP)

This EMP covers four identified potential negative impacts of noise, dust, occupational hazards, waste. The issues of this EMP are in management plans that will need to be put in place concurrently with project implementation. The Management Plans are as follows: -

- ✓ Noise Management Plan;
- ✓ Dust Management Plan;
- ✓ Occupational Hazards Management Plan; and
- ✓ Waste Management.

7.3. Noise Management Plan

7.3.1. Objective

The objective of the Noise Management Plan (NMP) is to ensure that the proposed cement manufacturing plant does not generate and result in significant noise pollution to employees, neighbours and the general public. The NMP covers site establishment activities that are likely to result in noise and ways of reducing possible noise. The NMP is to be achieved by continuous monitoring of noise levels on site, implementation of recommendations and mitigation measures made in this report in respect to noise pollution and ensuring the conditions subjected to licence approval with respect to noise management are adhered to.

7.3.2. Enforcement

The NMP guiding principle will be continuous and sustained improvement in site establishment work and associated activities, safety and environmental performance, supported by regular feedback from neighbours and general public through consultative meetings, management reviews and evaluations.

7.3.3. Background

Elements of operation during the implementation of the proposed factory establishment that are likely to result in noise pollution are routine use of machinery, presence of large human labour force and actual establishment work.
Quieter machines and use of silencers on machines will be employed.

7.3.4. Route use of machinery

Routine machine use and movement of machine on site can produce much noise. Quieter machines and use of silencers would assist in noise reduction.

Some machines have inbuilt mechanisms that ensure that when operational they do not produce much noise. Some of these mechanisms include silencers. Other machines have options of fitting noise reduction devices. Use of machines with this technology at site will significantly reduce noise pollution.

Of concern will be Ball mill, separator, compressor and conveyors.

7.3.4.1. Noise management action plan

Activity	Potential Environmental Impacts	Proposed Mitigation measures	Monitoring	Actors	Timeframe	Coast Estimates (KSh)
Route use of machinery	Noise pollution to employees Noise pollution to neighbours Noise pollution to the general public	– Have noise producing machines be fitted with silencers – Provide employees with ear protectors – Ensure construction of generator house within the compound – Construction of compressor house	Survey of noise levels	Project proponent, contractors.	Throughout project cycle	50,000 for fitting silencers 75,000 for providing ear protectors to employees 20,000 to carry out noise level survey 600,000 to construct generator and compressor house

7.4. Occupational Hazards Management Plan

The objective of the Occupational Hazards Management Plan (OHMP) is to ensure that the proposed plant establishment does not result in occupational hazards. The OHMP covers possible occupational hazards such as falls, dust inhalation, high noise levels, cuts and burns. The plan is to be achieved by continuous monitoring of work standards at site, implementation of recommendations and mitigation measures made in this report in respect to occupational hazards and ensuring the conditions subjected to licence approval with respect to occupational hazards are adhered to.

Reduce the exposure time/level of the employees especially those exposed to hazards such as noise, dust and machines.

7.4.1.1. **Action Plan**

Concern	Potential Environmental Impacts	Proposed Mitigation Measures	Monitoring	Actors	Timeframe	Estimated Cost (KSh)
Falls	Injury to employees on site Injury to visitors/ clients	Employees working at height to be provided with appropriate working gear Use appropriate working platforms Discourage installation/use of stairs/steps within workshop	Constant site inspections to ensure that required site working conditions are followed to the later.	Proponent, Contractors, Site Engineer, Occupational Health and Safety Officer and NEMA officials	From onset of the project and then throughout the project life.	20,000 for provision of appropriate working gear
Inhalation of dust(metal dust)	Dust related ailment to employees	Provide employees with dust masks Reduce exposure time of employees exposed to dust Put in place pollution control devices (filters) during operation phase	Sampling and analysis of site particulate matter content	Proponent, Contractors, Site Engineer, Occupational Health and Safety Officer and NEMA officials	From onset of the project and then throughout the project life.	10,000 for dust protective clothing
High noise levels	Hearing effects to Employees on site	Carry out site noise survey	Reports of noise survey, feedback from employees,	Proponent, Contractors,	From onset of the project and then	95,000 for ear protectors and noise survey

	Hearing impediments to neighbours and the general public	Provide employees with ear protectors	neighbours and general public	Site Engineer, Occupational Health and Safety Officer and NEMA officials	throughout The project life	
Cuts and burns	Accidental cuts to employees by machines and poorly stored metal plates Accidental burns to employees especially at furnace and during welding	Provide employees with appropriate protective clothing e.g. safety boots, overalls and gloves. Installation of machine guards Authorised personnel to be allowed to access furnace area Provision of fully equipped First Aid Box Provision of incidence recording book	No. of accidents reported Availability of first aid box	Proponent, Contractors, Site Engineer, Occupational Health and Safety Officer and NEMA officials	Throughout project cycle	100,000/=

7.5. Waste Management Plan

Solid waste will start to be produced once the project is commissioned. This will be in the form of general office and household waste; medical waste from dispensary, scrap metal, used tyres and used oil

Measures should be put in place with the objective of ensuring that handling, management and disposal of solid waste for the proposed cement manufacturing plant establishment does not result in environmental pollution.

7.5.1. Action Plan

Concern/issue	Potential environmental impact	Proposed mitigation measure	Environmental monitoring	Actor	Time frame	Cost estimate (KSh)
Waste disposal	Poor disposal practice can result in Environmental pollution	Licensed waste handler to be contracted to collect waste. Waste bins to be located in Strategic places for placement of litter Recyclables to be recycled.	Record of waste collection and disposal by licensed company	Contractor, Management, Public Health Officer and NEMA	From the onset of implementation of the project.	Part of contract fee

		Waste oil, medical waste and scrap metal to be handled by a registered handlers for the respective wastes.				

7.6. Air quality management plan

The objective of the Air Quality Management Plan is to ensure that the proposed plant establishment does not result in air pollution. It covers management of gaseous and dust emission. The plan is to be achieved by continuous monitoring of emission standards, implementation of recommendations and mitigation measures made in this report in respect to air quality and ensuring the conditions subjected to licence approval with respect to air quality are adhered to. The plan shall ensure air emissions meet the set standards in the Environmental Management and Coordination (Air Quality) regulation, 2009.

Employees shall be provided with adequate personal protective clothing and the cement fill shall be fitted with bag filters.

During operation of a cement manufacturing plant, dust particles may be emitted from the following processes/activities:

- ✓ Grinding and blending operations
- ✓ Raw material storage
- ✓ Packing
- ✓ Transport between the processes
- ✓ Transport to and from the site

The following pollutants are also considered to be of concern for the production of cement:

- ✓ Carbon monoxide (CO)
- ✓ Volatile Organic Compounds (VOC).
- ✓ Nitrogen oxides (NO_x) and other nitrogen compounds;
- ✓ Sulphur dioxide (SO_2) and other sulphur compounds;

Mini Cement plant operation on air pollution and abatement techniques generally focus on these air pollutants.

The accurate prediction of dust impacts is very difficult given the changing natural dust levels; an appropriate way of dealing with this subject is:

- ✓ To identify the main sources of dust attributable to the development and the scale on which dust may arise;
- ✓ To identify the people or resources that may be affected by this dust and the level of any nuisance caused; and
- ✓ To consider what measures should be taken to reduce dust from sources associated with the development to an acceptable level.

This approach is effectively based on reducing any emissions to a level which will not cause nuisance rather than attempting to predict impacts with precision.

Optimization of management and control of an industrial process is necessary in order to achieve general objectives of environmental protection.

It can be distinguished two main types of actions:

- ✓ Process monitoring (chemical, physical parameters like pressure, temperature, flow rates, etc.), aimed at controlling the performance of the plant, within fixed values;
- ✓ Monitoring of source emissions;
- ✓ Monitoring of the impacts (level of pollutants and their effects in the infuenced area, inside and outside the factory.

Continuous monitoring of the pollutants of concern is recommended.

9. ENVIRONMENTAL MONITORING AND AUDITING

8.1. Introduction

Monitoring to be undertaken will be both active and reactive. Active monitoring will include the following:-

- Monitoring of the achievements of Specific plans of the EMP, performance criteria and fulfilment 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.

Reactive monitoring will include the following:-

- Work related injuries, ill health (including record keeping and monitoring of sickness/absence, disease and Accidents;
- Losses such as damage to property;
- Deficient safety and health performance including OHSMS failures;
- Workers rehabilitation and health restoration programmes.

8.2. Monitoring schedule

Description of parameter	Monitoring schedule and duration
Solid waste	Daily throughout project Life
Noise level	After every six months
Effluent discharge	Quarterly a year
Air quality	Continuous

8.3. Environmental Auditing

Annual Environmental Audits should be carried out as provided for in the62Environmental (Impact Assessment and Audit) Regulations of June 2003. The Audits will serve to confirm62the efficacy and adequacy of the proposed Environmental Management Plan. The audits should include but not62limited to the following;

- Waste generation, management and disposal,
- Operations,
- Utilities,
- Views and comments from neighbours and progress in implementation of Environmental Management Plan.

Noise mapping

Noise mapping and measurements should initially be undertaken monthly for both day and night operations by NEMA itself or by a designated competent authority. Noise levels will be metered in dB (A).

Water quality monitoring

Water quality monitoring is critical for the conservation of the surface and ground water around the plant area. The water collecting at the site should be sampled and analyzed for presence of pollutants that may have been exposed by excavation using the recommended protocol required by Water Quality Regulations, 2006.

Laboratory Analysis

This will include the determination of the following effluent characteristics.

- Total Suspended Solids
- Heavy metals
- Total Nitrites
- Total phosphates
- BOD
- COD
- E. Coli
- Total and Fecal Coliform

9. DECOMISSIONING PHASE

During decommissioning, for the demolition option, the following should be done:

- ✓ The general public to be informed of demolition exercise well in advance by placing notices in public places concerning the intended demolition at least two weeks in advance;
- ✓ The site must be sealed off from public access;
- ✓ The firm commissioned to demolish must have enough relevant machines and equipment such as high cranes, fleet of dumpers, dozers that will enable the work be undertaken smoothly and be completed within stipulated time;
- ✓ The firm must have experienced labour force to undertake the exercise;
- ✓ Adequate measures are in place to minimise environmental degradation;
- ✓ Site supervision from relevant Central Government Departments and The Kilifi County Government must be in place throughout the exercise;
- ✓ Waste materials resulting from demolished must be handled and disposed according to environmental requirements and procedures;

10. Conclusion and Recommendations

10.1. Recommendations

The project seems to enjoy considerable support from the immediate neighbours and that they do not seem to give any form of resistance to project execution. This support is based on the belief they have of the project proponent and the belief that their comments as issued during the public consultation sessions will be taken into account. Of emphasis among those are the following and these forming the recommendations which must be taken into account.

- The work schedule must strictly be observed as suggested in the mitigation measures.
- Deliveries to the site must be during the day time and truck drivers must be informed well enough in advance on the time recommended for such an activity.
- Best Available Technologies such as use of bag filters should be encouraged

10.2. CONCLUSION

The installation and commissioning of the mini cement plant is expected to translate to high economic returns on investment. The government and the local population will benefit through taxation income and employment opportunities respectively. This proposal therefore considers the plant beneficial.

The project whose focus is this report has been accorded the due process as far as procedures are concerned. The plot on which it is situated was acquired procedurally, the permission to develop was acquired in the right procedure, the Environmental Impact Assessment exercise duly carried out and findings forming the report and in the same vein, neighbours consulted and their views incorporated in the project design. This is sufficient to have this project given a clean bill of health and that it is procedurally compliant.