Environmental and Social Impact Assessment Project Report for the Proposed Construction of Kangundo Road Fire Station in Nairobi City County of Nairobi Metropolitan Region

REPUBLIC OF KENYA

ENVIROMENTAL AND SOCIAL IMPACT ASSESSMENT PROJECT REPORT FOR THE PROPOSED CONSTRUCTION OF KANGUNDO ROAD FIRE STATION IN NAIROBI CITY COUNTY OF NAIROBI METROPOLITAN REGION

October 03, 2017

PROONENT
The Senior Principal Superintending Engineer
Ministry of Transport, Infrastructure, Housing and Urban Development, State Department of Housing and Urban Development, P.O. Box30130 –00100

NAIROBI

LEAD EXPERT
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Certificate of Declaration and Document Authentication

This document has been prepared in accordance with the Environmental (Impact Assessment and Audit) Regulations, 2003 of the Kenya Gazette Supplement No.56 of 13th June 2003, Legal Notice No. 101.

This report is prepared for and on behalf of:

The Proponent

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Designation  ------------------------------------------
Name  ------------------------------------------
Signature  ------------------------------------------
Date  ------------------------------------------

Lead Expert

Eng. Stephen Mwaura is a registered Lead Expert on Environmental Impact Assessment/Audit (EIA/A) by the National Environment Management Authority–NEMA(Reg. No.7284), confirms that the contents of this report are a true representation of the Environmental & Social Impact Assessment of the proposed Construction of Kangundo Road Fire Station in Nairobi City County of the Nairobi Metropolitan Region. This report is issued without prejudice.

Lead Expert – Eng. Stephen Mwaura

Signature: _______________________

Date: _______________________


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<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
</tr>
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<tbody>
<tr>
<td>EHS</td>
<td>Environment Health and Safety</td>
</tr>
<tr>
<td>EA</td>
<td>Environmental Assessment</td>
</tr>
<tr>
<td>ESAAP</td>
<td>Environment and Social Audit Action Plan</td>
</tr>
<tr>
<td>ESIA</td>
<td>Environmental and Social Impact Assessment</td>
</tr>
<tr>
<td>ESMMP</td>
<td>Environment and Social Management &amp; Monitoring Plan</td>
</tr>
<tr>
<td>EMCA</td>
<td>Environmental Management and Coordination Act</td>
</tr>
<tr>
<td>GoK</td>
<td>Government of Kenya</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>DM</td>
<td>Disaster Management</td>
</tr>
<tr>
<td>DOD</td>
<td>Department of Defense</td>
</tr>
<tr>
<td>CGN</td>
<td>County Government of Nairobi</td>
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<tr>
<td>GHG</td>
<td>Green House Gases</td>
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<tr>
<td>HSP</td>
<td>Health and Safety Plan</td>
</tr>
<tr>
<td>KCC</td>
<td>Kenya Cooperative Creameries (Informal Settlement)</td>
</tr>
<tr>
<td>KNBS</td>
<td>Kenya National Bureau of Statistics</td>
</tr>
<tr>
<td>NAMSIP</td>
<td>Nairobi Metropolitan Services Improvement Project</td>
</tr>
<tr>
<td>MTIH&amp;UD</td>
<td>Ministry of Transport, Infrastructure Housing and Urban Development</td>
</tr>
<tr>
<td>MTP</td>
<td>Medium Term Plan</td>
</tr>
<tr>
<td>MDG</td>
<td>Millennium Development Goal</td>
</tr>
<tr>
<td>MSF</td>
<td>Sustainable Development Goals</td>
</tr>
<tr>
<td>NEC</td>
<td>National Environment Council</td>
</tr>
<tr>
<td>NEP</td>
<td>National Environment Policy</td>
</tr>
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<td>NEMA</td>
<td>National Environment Management Authority</td>
</tr>
<tr>
<td>NCWSC</td>
<td>Nairobi City Water and Sewerage Company</td>
</tr>
<tr>
<td>NGO</td>
<td>Non Governmental Organization</td>
</tr>
<tr>
<td>NRM</td>
<td>Nairobi Metropolitan Region</td>
</tr>
<tr>
<td>PCR</td>
<td>Physical Cultural Resources</td>
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<td>PCT</td>
<td>Project Committee Team</td>
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<tr>
<td>PDO</td>
<td>Project Development Objectives</td>
</tr>
<tr>
<td>PRSP</td>
<td>Poverty Reduction Strategy Paper</td>
</tr>
<tr>
<td>RAP</td>
<td>Resettlement Action Plan</td>
</tr>
<tr>
<td>OP</td>
<td>Operation Policy</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Health and Safety</td>
</tr>
<tr>
<td>SDG</td>
<td>Modified Activated Sludge</td>
</tr>
<tr>
<td>SDH&amp;UD</td>
<td>State Department of Housing and Urban Development</td>
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<tr>
<td>SDG</td>
<td>Sustainable Development Goals</td>
</tr>
<tr>
<td>SUP</td>
<td>Socially Uplifting Project</td>
</tr>
<tr>
<td>WBG</td>
<td>World Bank Group</td>
</tr>
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<thead>
<tr>
<th>Programme Name</th>
<th>Nairobi Metropolitan Service Improvement Project (NAMSIP)</th>
</tr>
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<tbody>
<tr>
<td>Project Name</td>
<td>Proposed Construction of Kangundo Road Fire Station</td>
</tr>
<tr>
<td>Lead Implementing Agency</td>
<td>Ministry of Transport, Infrastructure, Housing and Urban Development (MOTIH&amp;UD) - State Department for Housing and Urban Development (SDFH&amp;UD)</td>
</tr>
<tr>
<td>Funding Agencies</td>
<td>World Bank and Government of Kenya</td>
</tr>
<tr>
<td>Project Components</td>
<td>Proposed Constructions of a fire Station which include:</td>
</tr>
<tr>
<td></td>
<td>• Two storey building which will house; Offices for fire station personnel, restaurant and gym</td>
</tr>
<tr>
<td></td>
<td>• A fire engine, water bowser, rapid response truck, rescue truck and a towing truck</td>
</tr>
<tr>
<td></td>
<td>• Borehole with a water reservoir</td>
</tr>
<tr>
<td></td>
<td>• Fuel pump station</td>
</tr>
<tr>
<td></td>
<td>• Hose drying/fire drilling tower</td>
</tr>
<tr>
<td></td>
<td>• Vehicle maintenance building, a guard house and an access road.</td>
</tr>
<tr>
<td></td>
<td>• 30m hydraulic hose real on every floor</td>
</tr>
<tr>
<td></td>
<td>• 1nr 9kg dry powder fire extinguisher in all shops</td>
</tr>
<tr>
<td></td>
<td>• 4nr 9kg of Carbon dioxide fire extinguisher on every floor.</td>
</tr>
<tr>
<td>Project Location</td>
<td>Nairobi City County – Embakasi West</td>
</tr>
<tr>
<td>Lead Expert</td>
<td>Eng. Stephen Mwaura</td>
</tr>
<tr>
<td></td>
<td>Registration Number 7284</td>
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E. EXECUTIVE SUMMARY

E-1 Project

The Project is proposed Construction of Kangundo Road Fire Station in Eastern Region of Nairobi within Nairobi City County Government Land Located next to Kangundo Road opposite Umoja Moi Drive Inter-Section with Kangundo Road.

The Project is planned to be financed under the Nairobi Metropolitan Services Improvement Project (NaMSIP) which is a Project funded jointly by the World Bank and Government of Kenya. The Project was approved by the Bank in May 2012 for a period of five years until 2017. The Project lead implementing agency is the State Department of Housing and Urban Development under the Ministry of Transport, Infrastructure, Housing & Urban Development (MTIH&UD). The Project is financing investments in infrastructure and service delivery in the Nairobi Metropolitan Region, the main Project Development Objective (PDO) is to strengthen urban services and infrastructure in the Nairobi metropolitan area.

E-2 Project location / Ownership

The site is located along Kangundo Road opposite Umoja Moi Drive Inter-Section with Kangundo Road. The land parcels belongs to Nairobi City County Government Land allocated by the County Government for Construction of Market and Fire Station. Also, during stakeholder engagement forums, the site ownership was verified by stakeholders as Nairobi City County Government. ESIA field assessment identified that the site is free from encroachment and therefore no Resettlement issues will be triggered as described by World Bank Policy on Involuntary Resettlement (OP) 4.12.

Figure 1: Google earth map showing project location
E-2 Policy and Legal Regulatory Instruments
The ESIA Report preparation was guided by provision of relevant policies, legislation and institutional frameworks that guide preparation of ESIA in Kenya and the World Bank O Safeguard Policies. These instruments are presented in Box E-1 below:

Box E-1: National Policy and Legal Instruments

Policy Provision
- National Policy for Disaster Management in Kenya 2009
- National Disaster Response Plan, 2009,
- Constitution of Kenya 2010
- Kenya Vision 2030
- Nairobi metro 2030
- The Sustainable Development Goals
- National Environment Policy (NEP)
- National Land Policy
- HIV and AIDS Policy 2009
- Gender Policy 2011

Acts of Parliament
- Environmental Management and Coordination Act (EMCA) 1999 amended in 2015
- County Government Act no 17 of 2012
- Physical Planning Act 1996 (286)
- Occupational Health and Safety Act (OSHA 2007), Public Health Act (Cap.242)

International Safeguard Policies and Standards
- World Bank OP 4.01 on Environment Assessment
- World Bank Group Environment, Health and Safety Guidelines

E-3 Highlights of Stakeholder Consultations
The World Bank Group (WBG) Environmental Assessment Policy (OP 4.01) and the EMCA 1999 amended in 2015 through the Legal Notice No. 101: the Environmental (Impact, Audit and Strategic Assessment) Regulations, 2003 requires that project-affected groups and local non-governmental organizations (NGOs) be consulted during the impact assessments process about the project’s potential environmental and social impacts.

A summary of outcomes of stakeholder consultations undertaken during preparation of this ESIA is as presented below:

a) The current fire fighting Infrastructure is inadequate in the Eastern parts of Nairobi.
b) Community members do not have technical skills required during fire emergencies, therefore fire infernos have resulted to over 50 deaths and loss of property
c) The community requires project Impacts to both the Bio Physical and Human environment to be appropriately mitigated.
d) The most common method of suppressing fire used by community is the use of water buckets which is inadequate
e) Isolated business and institutions use of hand held fire extinguishers which is inadequate
f) Others use of sand buckets which is also inadequate

g) Insufficient water is available to fight fire

h) Long distance travelled by fire engines located in the Nairobi Central Business District (CBD)

i) Lack of access roads in informal settlements due to poor planning, most pronounced in KCC informal settlement, however a government Project funded by the World Bank referred to as Kenya Informal Settlements Improvement Project (KISIP) has improved roads, drainage and lighting system in KCC.

j) The community members suggested construct fire fighting stations in different parts of the city

k) The community members suggested that the Nairobi City County Should ensure that all business entities have a hand held fire extinguisher

The ESIA chapters 6 and 7 provide a detailed approach and methodology of inclusion of the stakeholder comments into the Project implementation and operation operations.

E-4 Project Impacts

The Project impacts during the assessment were generated based on the analysis of the proposed project activities in relation to the Project area environment. The impacts arising during each of the phases of the proposed development namely; construction, operation and decommissioning, were categorized into:

- Impacts on biophysical environment;
- Health and safety impacts; and
- Social-economic impacts

Section E4.1 to E4.4 below provides a summary of the Project impacts, both positive and negative, discussed in this Report.

E-4.1 Project Positive Impacts during Construction

The City of Nairobi is characterized by fast developing economy, rapid improvement of people’s living standards; all these are triggered by rapid urbanization and population density. Therefore, the proposed fire station Project is a necessity, the fire station will be associated with the following positive impacts to the people living in the eastern parts of Nairobi.

- Assured public Safety associated with fire with fire Infernos
- Minimize loss of lives and property associated with fires.
- Ambulance services will be used on other services which include medical emergencies
- Towing trucks to be stationed at the station will be essential during emergency situations.
- Associated borehole to be drilled will provide water to the adjacent informal settlement of KCC.
- The water pumps to be installed at the station will assist in emergencies involving drowning.
- Employment opportunities during construction and operation phase
- Improvement of micro economy of residents through direct and indirect business

E-4.3 Negative Impacts and Mitigation Measures during Project Construction Period

The Project Construction Phase is associated with less significant negative impacts to both
human and natural environment, this impacts and proposed mitigation measures are summarized in Table E.4 to E.6. The impacts are presented in three categories of environment namely: Biophysical, Socio Economic and Occupational Health and Safety setting.

**E-4.3.1 Biophysical Environment Setting**

The project impacts on Biophysical environment setting of the Project area identified during the assessment is presented in table E.4 below

### Table E.4: Negative Impacts on Biophysical Environment and proposed Mitigation measure during Construction

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Proposed Mitigation</th>
</tr>
</thead>
</table>
| Destruction of Vegetation along the Pipeline Route and Storage Reservoir Site | • Site Clearance and Construction activities will be limited to the area set-out by the Project engineer; this will be done in order to minimize destruction to vegetation cover.  
• Reinstatement of the project sites to their original state to be carried out once construction works are completed to allow growth of vegetation. |
| Contamination of Surface Water Sources by Effluents from Construction Plant and Equipment | • Ensure Construction Equipment is well maintained and serviced according to manufacturers’ specifications to prevent oil leaks.  
• Cleaning / repair of Construction Plant and Equipment to be carried out at designated yards  
• Contractor to have designated storage areas for oils, fuels etc. that is protected from rain water and away from nearby surface water courses |
| Soil Erosion resulting to loss of top soil | • The risk of Soil Erosion is low as the design of the Project has incorporated measures to minimize this risk through provision of Erosion prevention structures i.e. gabions and other structures of runoff containment |
| Solid Wastes Generation from Construction Activities | • Construction wastes (residual earth, debris and scrap materials) to be collected at designated points and Contractor to dispose to designated Solid Waste Dumping Sites approved by the Nairobi City County Government  
• Contractor’s Camps and Construction Sites to have designated waste collection points,  
• Environmental Management, Health and Safety Training Programmes to be conducted for Contractor’s Staff to create awareness on proper solid wastes management |
| Air Pollution and Dust Generation. | • The contractor shall comply to the provisions of EMCA 1999 (Air Quality Regulations 2014)  
• Workers shall be trained on management of air pollution from vehicles and machinery. All construction machinery shall be maintained and serviced in accordance with the contractor’s specifications  
• Water sprays shall be used on all earthworks areas within 200 metres of from KCC informal settlement especially during the dry season. |

**E-4.3.2 Social Economic Environment Setting**

The project impacts on Social Economic environment setting of the Project area identified during the assessment is presented in table E.5 below

### Table E.5: Negative Impacts on Social Economic Environment and proposed Mitigation
measure during Construction

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Proposed Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influx of Workers during Project</td>
<td>• Adhere to provisions of Works Injuries and Benefits Act (WIBA 2007) and International Finance Cooperation Performance standard 2 on Labour and Working Conditions.</td>
</tr>
<tr>
<td>Construction</td>
<td></td>
</tr>
<tr>
<td>Increased Transmission of HIV/AIDS</td>
<td>• HIV/AIDS Awareness Program to be instituted and implemented as part of the Contractor’s Health and Safety Management Plan to be enforced by the Supervising. This will involve periodic HIV/AIDS Awareness Workshops for Contractor’s Staff</td>
</tr>
<tr>
<td></td>
<td>• Access to Contractor’s Workforce Camps by outsiders to be controlled</td>
</tr>
<tr>
<td></td>
<td>• Contractor to provide standard quality condoms to personnel on site</td>
</tr>
<tr>
<td>Increased Crime and Insecurity</td>
<td>• Contractor and Supervision Team to liaise regularly with the Local Administration and Police Service to address any security and crime arising during project implementation.</td>
</tr>
<tr>
<td></td>
<td>• Contractor to provide 24 hours security to Workforce Camps, Yards, Stores and to the Supervising Team’s Offices</td>
</tr>
</tbody>
</table>

E-4.3.3 Occupational Health and Safety Setting

The Project impacts on Occupational Health and Safety environment setting of the Project area identified during the assessment is presented in table E.6 below

Table E.6: Negative Impacts on Occupational Health and Safety Setting and proposed Mitigation measure during Construction

<table>
<thead>
<tr>
<th>Impact</th>
<th>Proposed Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise and Excessive Vibrations.</td>
<td>• Contractor will comply with provisions of EMCA 2015 (Noise and Excessive Vibrations Regulations of 2009)</td>
</tr>
<tr>
<td></td>
<td>• The Contractor shall keep noise level within acceptable limits (60 Decibels during the day and 35 Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas</td>
</tr>
<tr>
<td></td>
<td>• Hospitals and other noise sensitive areas such as schools shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity</td>
</tr>
<tr>
<td>Risk of Accidents at Work Sites</td>
<td>• Contractor to provide a Healthy and Safety Plan (HSP) prior to the commencement of works to be approved by the Supervising Engineer.</td>
</tr>
<tr>
<td></td>
<td>• Provide Personal Protective Equipment (PPE) including gloves, gum boots, overalls and helmets to workers, use of PPE to be enforced by the Supervising Engineer.</td>
</tr>
<tr>
<td></td>
<td>• Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles</td>
</tr>
<tr>
<td>Risk of Traffic Accidents along the Pipeline</td>
<td>• Strict use of warning signage and tapes where the trenches are open and at other active construction sites</td>
</tr>
<tr>
<td>Route</td>
<td>• Contractor to Employ and train Road Safety Marshalls who will be responsible for management of traffic on site</td>
</tr>
<tr>
<td></td>
<td>• Contractor to provide a Traffic Management Plan during construction to be approved by the Supervising Engineer</td>
</tr>
</tbody>
</table>

E-4.3.4 Negative Impacts and Mitigation Measures during Project Operation Period

Table E.7 below presents a summary of potential negative impacts likely to be experienced by Nairobi City County Government during operation of the fire station.
Table E-7: Potential Negative Impacts and proposed Mitigation measure during Operation

<table>
<thead>
<tr>
<th>Issue</th>
<th>Action required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk of pollution by the agents used in fire extinguishers</td>
<td>• Ensure carbon dioxide is stored in appropriate cylinders that are in good condition to avoid leakages</td>
</tr>
<tr>
<td></td>
<td>• Recycle empty fire extinguishers.</td>
</tr>
<tr>
<td></td>
<td>• Dry chemicals and foams should be disposed in sealed drains to avoid contaminating ground water</td>
</tr>
<tr>
<td></td>
<td>• Ensure incorporation of ABC dry powders into landfills preferably in sealed containers</td>
</tr>
<tr>
<td>Noise levels during operation of the station</td>
<td>• The operators of the station will comply with EMCA 2015 Noise level regulations, within acceptable limits (60 Decibels during the day and 35 Decibels during the night).</td>
</tr>
<tr>
<td></td>
<td>• Hospitals and other noise sensitive areas such as schools shall be consulted on expected level of noise during operation.</td>
</tr>
<tr>
<td></td>
<td>• The fire trucks should keep noise to the minimum during the night hours.</td>
</tr>
<tr>
<td>Vehicle garage</td>
<td>• Collect the used oils and re-use, re-sell, or dispose of appropriately using expertise from NEMA licensed waste handlers;</td>
</tr>
<tr>
<td></td>
<td>• Immediately institute clean up measures in case of an oil spill using sand and saw-dust for eventual disposal by the NEMA licensed handler</td>
</tr>
<tr>
<td></td>
<td>• Sell off recyclable wastes like used tyres from the garage for manufacture of other products, if applicable</td>
</tr>
<tr>
<td></td>
<td>• Avoid abandoning old vehicles in the garage and dispose off as scrap for reuse</td>
</tr>
<tr>
<td></td>
<td>• Dispose off used oil rags, used oil filters, used air filters and other used spare parts wastes using the licensed waste handler</td>
</tr>
<tr>
<td></td>
<td>• Used cartons to be re-used or disposed off by the licensed handler</td>
</tr>
</tbody>
</table>

E-5 Findings and Recommendations

E-5-1 Assessment findings

The assessment described in the report identified the below listed main findings:

- The project design has ensured that the project is constructed within existing public land and no private land will be acquired.
- The world Bank Operation Policy OP 4.12 is not triggered due to the fact that the proposed site is clear land free from encroachment.
- The Environmental and Social Screening undertaken for the project revealed that the investment will result in low impact on both social and biological environment; therefore, this project is categorized as a Category B project. The level of ESIA assessment required is at Project Report Stage which should be approved at the Nairobi NEMA office.
- Provisional ESMMMP Budget of Kshs. 600,000.00 is required for implementation of mitigation measures of potential negative environmental impacts identified in the report. The total project cost is Kshs. 166,508,322/12.
- The overall objective of project is to reduce the number of death and destruction of property associated with fire outbreaks in the Eastern region of Nairobi and its environs through provision fire fighting infrastructure.

E-5-1 Assessment Recommendation

The project is recommended for implementation provided the mitigation measures identified in the study for the potential negative impacts are implemented, the recommendations will also form part of Environment Licence that will be issued for the Project.
Report Structure

This Report has been prepared under the following chapters:

- **Chapter 1**: Background Information: This Chapter gives description of the Project background, location, purpose, objectives, study methodology, previous studies.
- **Chapter 2**: Project Description: This Chapter gives a description of the status of the Project in the Project cycle, specifically during construction, operation and decommissioning.
- **Chapter 3**: Baseline Information: This Chapter gives description of the environmental setting of proposed Project and surrounding areas, e.g., climate, soils, geology, vegetation, fauna, land use, human populations and socio-economics of the Project area.
- **Chapter 4**: Project Alternatives: This chapter gives a description of the Project details of the proposed Project, alternative options, designs and implementation strategies.
- **Chapter 5**: Policy, Legal and Institutional Framework: This chapter outlines the overview of legislative framework, regulatory, international guidelines and conventions relevant to this project.
- **Chapter 6**: Stakeholder Consultation: This Chapter gives description of the objectives, methods used and summary of results of the public consultation activities.
- **Chapter 7**: Environmental and Social impacts Assessment and mitigation measures: This chapter presents the analysis of beneficial and adverse impacts of the Project on the biophysical and human (social, cultural and economic) environments. The analysis covers anticipated impacts during the construction, operation phases and decommissioning phases and also describes the enhancement and mitigation measures proposed to enhance benefits or prevent, minimize, mitigate or compensate for adverse impacts as well as the estimated cost of mitigation.
- **Chapter 8**: Environmental and Social Management and Monitoring Plan: This Chapter presents the Environmental and Social Management and Monitoring Plan prepared for the project.
- **Chapter 9**: Conclusion and Recommendations: This Chapter briefly presents the environmental and social acceptability of the project, taking into account the impacts, measures and recommendations identified during the assessment process.
CHAPTER 1: INTRODUCTION AND BACKGROUND INFORMATION

1.1 Project Background

The Nairobi Metropolitan Region (NMR) is susceptible to numerous disasters such as fire outbreaks, floods, pandemics, epidemics as well as road, rail and air accidents. There have been numerous fires reported in the NMR with causes ranging from electrical faults to human oversight as well as family feuds, vengeance and business rivalry. Proper management and mitigation of these hazards will significantly reduce the extent of damage that is caused by fire outbreaks at both residential and commercial properties. This can be done through improvement of the fire and rescue services within the metropolitan region by constructing model fire stations, equipping them and recruiting additional person who are adequately trained.

The Ministry of Transport, Infrastructure, Housing and Urban Planning is charged with the responsibility of providing policy direction and coordinating all matters related to lands, housing and urban development in the country. The ministry partly through NaMSIP is systematically strengthening and expanding its capacity and undertaking major infrastructure projects to address challenges as a way of attaining its mandate. To this end, the ministry is partnering with various development partners, which are providing funding and technical assistance for various projects. The ministry secured World Bank funding for the proposed Metropolitan Region Services Improvement project through which it proposes to construct fire station in Kangundo Road in Nairobi City County of Nairobi metropolitan region (NMR).

The proposed project will enable the region to be able to reduce the extent of damages caused by fires in the region. This will directly be translated into amounts of money saved by investors in terms of property and lives and the economy at large. The Proposed model fire stations fall under the category of ‘Urban Development’ and further under the general provisions of second schedule of the EMCA 1999. The act requires that an ESIA is undertaken for proposed activities that are likely to have a significant adverse impact on the environment.

1.2 Project Justification and Benefits

The main aim of constructing Kangundo Road Fire Station in the Eastern regions of the Nairobi City is to enhance preparedness for fire disaster in the NMR. In addition these fire stations will contribute to the goals of the government’s Nairobi Metro 2030 which is;

- To achieve its vision of creating a world class African metropolis by 2030 by addressing several key challenges facing the metro area. These challenges include loss of live and property destruction normally caused by fire infernos.

Kenya National Policy for Disaster Management 2009, the policy overall goal is to build a safe, resilient, and sustainable society. This goal is to be achieved by a number of objectives. Relevant Policy objective to this Project are:

- (a) To ensure that institutions and activities for disaster risk management are coordinated, focused to foster participatory partnerships between the Government (including mainstreamed and emergency disaster-related activities by sectoral
Ministries) and other stakeholders, at all levels, including international, regional, sub-regional Eastern African, national and sub-national bodies.

(b) To promote linkages between disaster risk management and sustainable development for reduction of vulnerability to hazards and disasters

1.3 Objectives and Scope of the ESIA
This ESIA assessment has been conducted in compliance with the Environmental Impact Assessment Regulation as outlined under the Gazette Notice No. 56 of 2003 established under the Environmental Management and Coordination Act (EMCA), 2015 of Kenya. The Environmental & Social Impact Assessment (ESIA) is expected to achieve the following objectives:

- To identify all potential significant environmental and social impacts of the proposed Project and recommend measures for mitigation.
- To assess and predict the potential impacts during site preparation, construction and operational phases of the project.
- To verify compliance with environmental regulations.
- To generate baseline data for monitoring and evaluation of how well the mitigation measures will be implemented during the project cycle.
- To allow for public participation.
- To give an Environmental Management Plan to mitigate the identified impacts so as to ensure sustainability of the proposed Project.
- To recommend cost effective measures to be implemented to mitigate against the expected impacts.

1.4 ESIA APPROACH METHODOLOGY
The systematic investigative and reporting methodology specified for conduct of Project Report Studies (Legal Notice 101 of EMCA) was adopted in this Study. Baseline data on project design was generated through discussion with the client and review of project documentation. Opinions formed were revalidated through field work entailing site investigations and interviews with potentially affected people and secondary stakeholders.

To identify, predict, analyze and evaluate potential impacts that may emanate from the project, diverse study methods and tools including use of checklists, matrices, expert opinions and observations were employed. An Environmental Management and Monitoring Plan comprising of an impact mitigation plan and modalities for monitoring and evaluation were then developed to guide environmental management during all phases of project development.

Once approved by the Ministry of Transport, Infrastructure, Housing and Urban Development, NEMA and the World Bank, the Project Report will be disclosed as required.

Consequently, this report provides the following:

- The location of the project including the physical environment that may be affected by the project’s activities.
- The activities that shall be undertaken during the project design, construction, operation and of the project.
- The materials to be used, products and by-products including waste to be generated by the project and the methods of disposal.
- The potential environmental and social impacts of the project and mitigation measures to be taken during and after the implementation of the road construction project.
- An action plan for prevention and management of possible accidents during the project cycle.
A plan to ensure the health and safety of the workers and the neighboring communities
- The project cost is Kshs. 166,508,322/12
- Any other information that the proponent may be requested to provide by NEMA

This report also seeks to ensure that all the potential environmental and social impacts are identified and that workable mitigation measures are adopted. The report also seeks to ensure compliance with the provisions of the EMCA 2015, Environmental (Impact Assessment and Audit) Regulations 2003 as well as other regulations and safeguards policies. Finally, a comprehensive Environmental Management and Monitoring Plan (EMMP) is mandatory for a project of this nature to ensure monitoring and mitigation of negative environmental and social impacts during the different phases of the project.

1.5 Project description

The Proposed Constructions of Kangundo Road Fire Station will include:
- Two storey building which will house: Offices for fire station personnel, restaurant and gym
- A fire engine, water bowser, rapid response truck, rescue truck and a towing truck
- Borehole with a water reservoir
- Fuel pump station
- Hose drying/fire drilling tower
- Vehicle maintenance building, a guard house and an access road.
- 30m hydraulic hose reel on every floor
- 1nr 9kg dry powder fire extinguisher in all shops
- 4nr 9kg of Carbon dioxide fire extinguisher on every floor.

1.6 Project Cost

The total project cost is Kshs. 166,508,322/12 for the proposed Kangundo Road Fire Station. The implementation of the ESMMP at a total estimated cost of Kshs. 600,000 is included into the BoQ.

1.7 Proposed project location

The site is located along Kangundo Road opposite Umoja Moi Drive Inter-Section with Kangundo Road. The land parcels belongs to Nairobi City County Government Land allocated by the County Government for Construction of Market and Fire Station. Also, during stakeholder engagement forums, the site ownership was verified by stakeholders as Nairobi City County Government. ESIA field assessment identified that the site is free from encroachment and therefore no Resettlement issues will be triggered as provided for by World Bank Policy on Involuntary Resettlement (OP) 4.12.
Map showing location of the proposed Kangundo fire station
CHAPTER 2: PROJECT DESCRIPTION

2.1 Existing fire Management Infrastructure at Nairobi City County Government

The mandate of fire Disaster Preparedness and Management within Nairobi City is the responsibility of Nairobi City County Government. The County Government has its major fire station located within Nairobi Central Business District along Tom Mboya Street. The other two fire stations are located in Industrial area and Ruaka along Thika Road.

The fire Disaster Management within the County Government is managed by the Fire Brigade which is a section under City Engineers Department and has several other sub-sections. The administration of the fire Brigade section comprises of:

(a) Chief Fire Officer as the head
(b) Assistant Chief Fire Officer
(c) Divisional Fire Officers
(d) Assistant Divisional Fire Officers
(e) Station Officers
(f) Non-commissioned Officers
(g) Firemen/ Fire engine drivers

The Role of the County Government Fire Brigade Section is to offer the below listed services

(a) Fire prevention services
(b) Enforcing regulation in accordance to building code
(c) Fire fighting within the city and its environs
(d) First aid and accident rescue services and other humanitarian services that the service may be called upon to undertake
(e) Training of firefighters for the Nairobi City County, other local authorities, learning institutions and private firm.

The fire Brigade section of Nairobi City County faces a number of challenges which hinder the smooth fire prevention and management within the city. These challenges include:

(a) Limited number of fire station within Nairobi Metropolitan region.
(b) Late calling and giving wrong address of the fire incidences.
(c) Unplanned road networks and poorly constructed buildings within the City.
(d) Ineffective transport and communication which include issues such as poor road infrastructure, telephone network, traffic jams, inaccessibility to slums largely undermine effective fire fighting.

The risks associated with fire are management by other stakeholders in addition to what the County Government offers; these include both Government and Non-Governmental Organization which include:

(a) Kenya Railways fire services which provide safety within the railway stations, goods sheds, and workshops and wagon yards.
(b) Department of Defence (DOD) fire services which is a military control and suppression of fire in the military camps. However, they reinforce the County Government services in case of a big fire. The services are found at Eastleigh or Kahawa station.
Environmental and Social Impact Assessment Project Report for the Proposed Construction of Kangundo Road Fire Stations in Nairobi City County of Nairobi Metropolitan Region

(c) Privately owned Non Governmental Organisation such as Kenya Red cross EM-plus, St John’s Ambulance and G4S Security Company.

Figure 2.1: Images of Fire Station Headquarters in Nairobi along Tom Mboya Street

2.2 Fire Station along Kangundo Road in Eastern Nairobi – Proposed Project

The general objective of the project is to improve disaster preparedness and response system within Nairobi, necessitated by the long period of time it take for fire engines to respond to fire outbreaks. Currently Nairobi has only one public fire station situated in the CBD along Tom Mboya Street. Proposals have been made to construct two additional fire stations one at Waithaka and another one at Kangundo Road under The Nairobi Metropolitan Service Improvement Project (NaMSIP). The proposed fire station includes installation of the following components:

(a) Two storey building which will house which include; Offices for fire station personnel, a restaurant and gym
(b) A fire engine, water bowser, rapid response truck, rescue truck and a towing truck
(c) Borehole with a water reservoir
(d) Fuel pump station
(e) Hose drying/fire drilling tower
(f) Vehicle maintenance building, a guard house and an access road.

The proposed site is illustrated by Photo Plate 2.1 and site Layout Plan 2.2 below.

Photo Plate 2.1: Proposed Site along Kangundo Road

Figure 2.1: Site Layout Plan
Environmental and Social Impact Assessment Project Report for the Proposed Construction of Kangundo Road Fire Stations in Nairobi City County of Nairobi Metropolitan Region
CHAPTER 3: BASELINE INFORMATION

3.1 Location of the Project
The Project is located in Kariobangi South within County Government Land located near Kenya Cooperative Creameries (KCC) Limited; the site is accessible using Kangundo Road from Kangundo Road Junction with Outering Road. The site can also be accessed from Mama Lucy Hospital along Kangundo Road to a Moi drive Umoja Junction.

The site is currently free of encroachment and used as a solid waste sorting site by a private entity appointed by Nairobi City County Government. The site is also planned for establishment of a modern market. Photo plate 3.1 below presents images of the Project site.

Satellite Image of Proposed Kangundo Fire Station Site

Photo Plate 3.1 Proposed access and site identified
3.2 Physical Environment
This chapter analyzes the environmental characteristic of the Project site. The sub-sections below describe the physical, biophysical, social and cultural environment of the Project area.

3.2.1 Climate
The climate of the project area identifies with that of wider Nairobi conditions. Due to its central position of two climatic regimes, the area climate is influenced by the Aberdares on the far west as well as the dry Machakos plains on the east. The rainfall is bi-modal with two rainy seasons from March to May and short rains from mid-October to mid-December, mean annual rainfall in Nairobi ranges between 800mm and 1,300mm.

The minimum and maximum temperatures ranges from 12°C to 28°C with annual mean of about 19°C. Relative humidity ranges from a daily maximum of 88% in the month of May to a daily minimum of 36% in the month of April. In early mornings, the air is frequently at or very close to saturation that causes notable accumulation of fog over the city.

Daily evaporation ranges from a minimum of 89mm in the month of July to a maximum of 191mm in the month of March. Wind direction is generically to the west or north-west through May, June and July experiences a minor but significant southerly component.

3.2.2 Topography
The project area lies in a generally flat terrain with undulating and gentle slopes towards the south and southeast. The elevation varies from about 1,700m above sea level on the south falling to 1,580m around Kasarani, 1,540m above sea level around Marurui, Zimmerman down to 1380 to 1400m around Kariobangi South.

3.2.3 Geology and Soils
Upper Athi Series formations mainly consist of sandy sediments, gravel, or pebble beds, tuffs and pyroclastic sediments. Clayey material is sub-ordinate. This is characterized by course, gritty volcanic sand usually in a fine matrix as identified in boreholes of the Kiambu – Kamiti – Ruaraka area. Thin gravel beds are common as the one in Kamiti area at or near the base of the series is an important aquifer. The upper Athi series outcrops in most of the eastern half, and particularly the north and northeastern parts of Nairobi.

The upper Athi series outcrops in most of the eastern half, and particularly the north and northeastern parts of Nairobi. Nairobi is dominated by volcanic activity. As a result of the area mainly comprise a succession of lavas and pyroclastic of Cainozoic age overlaying the folded schist and gneiss of Precambrian basement system. The volcanic eruptions occurred intermittently with periods of quiescence in between. During the quiescence periods, erosion would occur of the lavas already laid forming, weathered interfaces between the lava layers. The interfaces are called old-land-surfaces and are inter-bedded with the lava flows. They constitute a common groundwater reservoir in Nairobi area.

Soils
The soils in the project area are products of weathering of mainly volcanic rocks, climatic factors (rainfall and temperatures variations). The Eastern sections comprise black cotton soils with
calcareaous and non-calcareaous variants being dominant within the Project area in Kariobangi South.

3.3 **Surface Water Resources and Hydrology**

The Project area is drained by various rivers including; Mathare River, Nairobi River and Ngong River traverse the city rising from the west towards the East. The streams provide the key sinks and modes of pollution transport without any economic value. There have been efforts on clean-up programs mainly for Nairobi and Ngong Rivers and clear results are yet to show. All the rivers drain into Nairobi River which eventually joins Athi River after the Dandora Sewerage Treatment Plant located in Ruai.

3.4 **Land Use**

The Project area is located within intense development of residential establishments from Dandora, Kariobangi to Kayole Soweto. Other commercial centers such as banks, retails outlets, fuel stations, market centers are prominent along this route mostly high density i.e. Korogocho, Kariobangi, Dandora, Umoja and Kayole estates.

3.5 **Biological Environment**

The Project area is highly influenced by human activities which have resulted into clearing of vegetation cover to provide space for establishment of housing units. The proposed site is a bare area which is currently used a solid waste sorting centre by a private entity. There is no wildlife in the project area but here is less significant presence of domestic animals (mainly cows, poultry, goats and sheep).

3.6 **Human Environment**

3.6.1 **Administrative Setting**

According to National Government Administrative structure, under County Government; the Project is located in Kariobangi South within Embakasi Sub County.

3.6.2 **Population**

Nairobi City County has a total population of 3,138,369. Kariobangi South ward where the proposed fire fighting station site is located has a population of 62,560.

The population of the areas served by the Project is ethnically mixed with all tribes of the country being represented. The population is dominated by people in the age bracket of 20-30 years (46.4%). 30-40 years (25.2%). Those below 20 years and over 60 years comprise 4.6% and 2.3% respectively.

3.7 **Social Setup**

3.7.1 **Water and Sewerage**

Approximately 95% of all properties within the Project area connected on main sewer. However, the KCC informal Settlement adjacent to the Project area is not connected to the Sewer System and people use communal toilet systems. People in the project area rely on the piped water supplied by Nairobi city water and Sewerage Company which is unreliable and in adequate due to rationing.

The proposed project has identified a site where a borehole and a reservoir will be constructed. The station will rely fully on this borehole for its water services since water supply from Nairobi City water and sewer company which is the main water supply in the area is unreliable and in adequate.
The residents around the project area will be allowed to use water from the borehole. Test pumping will be carried out by performing a 24 hour continuous discharge test to ascertain yield of the borehole hence determine rate of pumping water to the reservoir to ensure its regular fill. The pump will be set to start pumping automatically at a threshold level (to be determined during pump testing) of the tank has been reached. A sewer extension to serve the proposed fire station has been included in the project.

3.7.2 Waste Management
Garbage collection is inadequate and there are mounds of un-collected garbage along the drainage corridors and road junctions. This is well pronounced in Kariobangi, Nairobi River Bridge and Korogocho Slums that are adjacent to the Mathari River and Umoja. A mound of un-collected garbage that is generated from the neighbourhoods and the trading activities in the vicinity is evident along the road.

3.7.3 Gender and Social Relations
The household survey shows that the women are well represented in the economic life in the area and their participation is almost equal to that of the male gender. During the public consultations forums, the women were equally represented and were more vocal on issues of the community such as lack of schools and safety of the children accessing school facilities once the proposed roads are improved with faster speeds. Of particular interest was the source of capital for the women trading within the road reserve. Majority of them obtained their capital from personal savings (67.6%) whole only 28.6% obtained their working capital from loans. This included those (4) who received financial support from Chama.

3.7.4 Health Facilities
Health facilities within the Project area comprises of public facilities sponsored by the central government or the Nairobi City County. There are also health facilities sponsored by religious organizations where services are offered at cost or private clinics that are distributed within the vicinity of the proposed fire fighting station. Most of the health facilities are within walking distance for minor ailments and emergency cases except referral cases where the services are only available at the main hospitals of Mama Lucy, Kenyatta, Aga Khan, M.P. Shah and Mater Hospitals.

HIV/AIDS: HIV and AIDS continue to be a major public health and socio-economic challenge adversely affecting all the sectors of the Kenyan economy. The 2007 Kenya Aids Indicator Survey (KAINS) indicates that 7.4% of Kenyans aged 16 - 64 and 7.8% of adults age 15-49 are infected with HIV compared to 6.7% in the 2003 Kenya Demographic and Health Survey (KDHS) and 5.1% in 2006 Sentinel Surveillance Survey. Approximately 1.4 million people were living with the virus as at the end of 2007. More women are infected with the HIV (8.7%) compared to men (5.6%).

Embakasi Constituency has a prevalence of 6.4% (PMTCT ANC prevalence- DHIS 2012). Approximately 5 ART facilities lie in the proximity of the planned dual Outer Ring Road between GSU round about and Taj Mall. The facilities offer ART services among other health services to approximately 3951 PLHIV as at end of 2012.

3.7.5 Settlement Patterns and Housing Conditions
There are wide variations in population densities reflecting different land use patterns within the
settlements. The settlements have an average population density of 4,531 persons per Km$^2$. These settlement patterns have been influenced greatly by various factors such as rural urban migration, well developed infrastructure and the many employment opportunities associated with Nairobi City.

The Project is located next to KCC informal Settlement which is characterized by uncontrolled squatter settlements created by low income migrants. In these slums, there is overcrowding with inadequate social facilities like education, health, water and sanitation among others. Kariobangi estates combine both old housing and new institutional housing estates.

However, the Umoja side is characterized by middle lower class formal housing unit made of stone which originally belonged to the Nairobi City County Government. Rising housing demand has resulted to house owners developing story apartments for rental purposes.

3.7.6 Socio-cultural Profile
The Project area depicts a population with ethnic cosmopolitan and residents are bilingual in English and Swahili. In addition, a large percentage speaks their ethnic tribal mother tongue. Composition of the many ethnic groups resident along the project areas differ from one area to another. However, the dominant ethnic groups include the Kikuyu, Luhya, Luo, Kalenjin, Kamba, Kisii and Meru. There are also few non-Africans consisting of Asians, Europeans and Arabs.

3.7.7 Economic Activities
The economic activities around the Project area range from modern formal sector that includes wages and salaried employment in the private and public sector. The informal sector include retail trade activities that are mostly prevalent in the low class estates and consist of petty trade (Green groceries, “juakali”, hawking). 50% of the residents are engaged in businesses, 22% are employed and the rest are engaged in other various activities.

These businesses consist of both small scale and large scale informal establishments undertaking transport, storage, Fruit vending, shop-keeping, hotel and restaurants as well as furniture and general wares. Others include Shoe shiners/menders, Firewood selling, maize roasting, sale of credit cards and sweets, welding, charcoal dealers, newspaper and textile (mostly second hand cloth) vendors. There are a number of major markets on the project including Kariobangi
CHAPTER 4: PROJECT ALTERNATIVES

4.1 Project Alternative
Regulation 18(1) of Legal Notice 101 specifies the basic content of an Environmental Impact Assessment Study / Project Report subsequent to which, subsection (i) requires an analysis of alternatives including project site, design and technologies and reasons for preferring the proposed site. Therefore, this section analyses the Project alternatives in terms of site, technology scale and waste management options. However, under this study the alternative that was considered for the Project was focused on:

(a) “No-action” Alternative
(b) Relocation Alternative
(c) Alternative Land-uses
(d) The Proposed Development as described in the ESIA Report

4.1.1 The “No-action” Alternative
The selection of the “No-action” alternative would mean the discontinuation of project designs and result in the site being retained in its existing form. If the site is left undeveloped, the proponent would lose in terms of not achieving the Nairobi Metro Goal which is:

➢ To achieve its vision of creating a world class African metropolis by 2030 by addressing several key challenges facing the metro area which include loss of live and property destruction normally caused by fire infernos.

4.1.2 Re-location Alternative
This option is based on the criteria that the proposed development is to be sited in a zone planned for other developments or there is need to preserve any threatened, endangered, rare or unique species of plants or animals found at the site or the site is in or close to ecologically sensitive area.

The ESIA processes established that the project is not out of character from the surrounding. Therefore, the proposed development cannot be an impediment to any other developments since it is compatible with adjacent facilities. There are no physical, biological, cultural and socio-economic features of special concern at the site.

If this option is selected the proponent is required to look for an alternative site either within or outside the zone. This implies that the proponent has to buy or lease another piece of land elsewhere since at the moment, the proponent does not have an alternative site. It might take a very long time looking for and finding a similar sized land and completing all official transactions relating to change of land ownership. There is also no guarantee that the land would be available, and if such land is available, its cost might be beyond affordable for the proponent.

The processes of designing and planning will have to be started over again. The proponent will need to re-engage professionals like architects, ESIA experts, land surveyors and physical planners to assess the viability of the new site. Additional costs will arise from the design and approval of the building plans for the new site.
4.1.3 Alternative Land-use
The option allows the developer to explore other alternative land uses for the site other than the proposed housing project. This will require application for change or extension of use to allow for the alternative development. This is costly and might take a long time to mature since it also requires relevant authorities to approve the change of land-use. Any other commercial, industrial and recreational would mean user incompatibility with current neighbourhood land uses. The change might also be massively objected by the residents in the neighborhood.

4.1.4 The Proposed Development as described in the ESIA Report
The impacts and mitigation measures for this alternative are discussed in detail throughout this report. The positive impacts have been identified. This alternative will have minimal impacts on the environment and has considered the necessary measures to eliminate the identified issues of concern.

The alternative is likely to have the greatest implications on socio-economic environment of the area and surrounding communities. Due to the proposed quality of the development, it is anticipated that it would provide fire services to the people living in the Eastern Parts of Nairobi.

The Project will enable Nairobi City County Government achieve the Objective of fire disaster Management, below listed objective of Nairobi Metropolitan Services vision and Kenya National Policy for Disaster Management 2009 will be achieves. The objectives are;

- To achieve its vision of creating a world class African metropolis by 2030 by addressing several key challenges facing the metro area. These challenges include loss of live and property destruction normally caused by fire infernos.

- To ensure that institutions and activities for disaster risk management are coordinated, focused to foster participatory partnerships between the Government (including mainstreamed and emergency disaster-related activities by sectoral Ministries) and other stakeholders, at all levels, including international, regional, sub regional Eastern African, national and sub-national bodies.

- To promote linkages between disaster risk management and sustainable development for reduction of vulnerability to hazards and disasters
CHAPTER 5: POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

5.1 Introduction
The Kenyan legal framework does not have specific by laws or regulations addressing Disaster Management (DM) specifically, but there are provisions in other sectoral laws that are relevant to DM.

National Policy for Disaster Management in Kenya (March 2009). The policy sets out the goal and objectives of DM in Kenya, arrangements for effective management, roles and responsibilities of different stakeholders at different levels. It provides an implementation framework and guiding principles for DM. details of the Policy are discussed in sub sections below among other legal and Policy Provisions.

5.2 Policy Provision

5.2.1 National Policy for Disaster Management in Kenya 2009
The policy sets out the goal and objectives of Disaster Management (DM) in Kenya, arrangements for effective management, roles and responsibilities of different stakeholders at different levels. It provides an implementation framework and guiding principles for (DM).

The overall goal of the policy is to “build a safe, resilient and sustainable society”, incorporating the following objectives:

(a) To establish a policy/legal and institutional framework for management of disasters, including promotion of a culture of disaster awareness and for building the capacity for disaster risk reduction, at all levels;
(b) To ensure that institutions and activities for disaster risk management are coordinated, focused to foster participatory partnerships between the Government (including mainstreamed and emergency disaster-related activities by sectoral Ministries) and other stakeholders, at all levels, including international, regional, sub-regional Eastern African, national and sub-national bodies;
(c) To promote linkages between disaster risk management and sustainable development for reduction of vulnerability to hazards and disasters;

Relevance of the Policy
The Proposed Fire Station once commissioned will enable the government gradually achieve the policy goal of building a safe, resilient and sustainable society. The Project once operational will reduce the response time taken by the County Government to reach and suppress fire often reported in the Eastern region of Nairobi.

5.2.2 National Disaster Response Plan, 2009,
The plan seeks to ensure that disaster preparedness for response is carried in a coordinated and collaborative manner, ensuring the greatest protection of life, property, health and environment.”

The plan establishes a system of operating procedures associated with day-to-day operational
response to emergencies by relevant actors when disasters occur.

The plan contains hazard specific and departmental or thematic contingency plans and emergency procedures in the event of a disaster, and provides for:

(a) The allocation of responsibilities to the various role players and coordination in the carrying out of those responsibilities;
(b) Effective early warning linked to early response and relief; and
(c) Early recovery linked to longer-term development after disaster.”

5.2.3 Constitution of Kenya
Article 24, Part 1, Article 14, Part 2, Fourth Schedule provides that “Disaster management” is included as a function of both the national and county governments.

Article 42 of Bill of Rights of the Kenyan Constitution provides that every Kenyan has a right to a clean and healthy environment, which includes the right to have the environment protected for the benefit of present and future generations through legislation and other measures.

Part II of Chapter 5 of the Constitution (Environment and Natural Resources), (I) the State clearly undertakes to carry out the following:

- Ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits;
- Work to achieve and maintain a tree cover of at least ten per cent of the land area of Kenya;
- Protect and enhance intellectual property in, and indigenous knowledge of, biodiversity and the genetic resources of the communities;
- Encourage public participation in the management, protection and conservation of the environment; Protect genetic resources and biological diversity;
- Establish systems of environmental impact assessment, environmental audit and monitoring of the environment;
- Eliminate processes and activities that are likely to endanger the environment; and

Part (II) “Every person has a duty to cooperate with State organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources.

Chapter 5 on Land and Environment emphasizes on the following:

- Land use and management shall by law benefit local communities
- Community land is protected from encroachment by State.
- Law shall protect Rivers, forests and water bodies.
- Equitable access to land.
- All lawful land rights are secured; only someone who has stolen land needs to worry.
- County governments will manage land in trust of the people in accordance with the constitution.
Relevance
The constitution of Kenya provides for sound management and sustainable development of all of Kenya’s projects, both public and private investments. It also calls for the duty given to the Project proponent to cooperate with State organs and other persons to protect and conserve the environment as mentioned in Part II.

5.2.4 Kenya Vision 2030
Kenya Vision 2030 is the current national development blueprint for period 2008 to 2030 and was developed following on the successful implementation of the Economic Recovery Strategy of Wealth and Employment Creation which saw the country’s economy back on the path to rapid growth since 2002. Gross Domestic Product (GDP) growth rose from 0.6% to 7% in 2007, but dropped between 1.7% and 1.8% in 2008 and 2009 respectively.

The objective of the vision 2030 is to “transform Kenya into a middle income country with a consistent annual growth of 10% by the year 2030”. One of this aims is to make Kenya to be a nation that has a clean, secure and sustainable environment by 2030. This will be achieved through promoting environmental conservation to better support the economic pillar.

Kenya’s transformation into a middle income country will be achieved by bringing and improving basic infrastructure and services namely: roads, street lights, storm water drains, footpaths, and water and sanitation facilities among others. This Project aims at improving the sanitation services in Nairobi Metropolitan area through the construction of a fire station.

5.2.5 Nairobi Metro 2030
Nairobi Metro 2030 was developed in the year 2008 to provide a guide for the Nairobi Metropolitan Region (NMR) play its role in the National growth strategies under the Kenya Vision 2030. It is a transitional document that brings into focus challenges faced under urban growth and development. The document provides forum to achieve sustained rates of economic growth necessary for successful economic and social development. The Metro 2030 provides links with the Central Government through Kenya Vision 2030 and other development plans as well as seeking to strengthen the Local Authorities as part of the devolution of power and recognizing need for ensuring efficient and effective management of resources at the grassroots.

Nairobi Metro 2030 carries the vision for Nairobi Metropolitan Region to be a World Class African Metropolis supportive to the overall national agenda under the Kenya Vision 2030. The agenda to achieve this vision is the need to enhance mechanisms for economic growth, employment creation, improved lifestyles and improved infrastructure. Therefore, the proposed project contributes to the Nairobi Metro 2030 by providing development that will contribute to the economic and employment growth within the metropolitan.

5.2.6 The Sustainable Development Goals (SDGs)
The 2030 Agenda comprises 17 new Sustainable Development Goals (SDGs), or Global Goals, which will guide policy and funding for the next 15 years, beginning with a historic pledge to end poverty.

The concept of the SDGs was born at the United Nations Conference on Sustainable Development, Rio+20, in 2012. The objective was to produce a set of universally applicable
goals that balances the three dimensions of sustainable development: environmental, social, and economic.

The Global Goals replace the Millennium Development Goals (MDGs), which in September 2000 assembled the world around a common 15-year agenda to tackle the indignity of poverty.

The MDGs established measurable, universally-agreed objectives for eradicating extreme poverty and hunger, preventing deadly but treatable disease, and expanding educational opportunities to all children, among other development imperatives. The MDGs drove progress in several important areas:

- Income
- Poverty
- Access to improved sources of water
- Primary school enrolment
- Child mortality

With the job unfinished for millions of people, we need to go the last mile on ending hunger, achieving full gender equality, improving health services and getting every child into school. Now we must shift the world onto a sustainable path. The Global Goals aim to do just that, with 2030 as the target date. This new development agenda applies to all countries, promotes peaceful and inclusive societies, creates better jobs and tackles the environmental challenges of our time particularly climate change.

Nationally, the GOK has taken bold steps to domesticate the SDGs as illustrated by:

i) Investment in the Poverty Reduction Strategy Paper (PRSP) process through which participatory mapping of poverty incidence at both District and National Level was undertaken,

ii) Implementation of the Economic Recovery Strategy for Wealth and Employment Creation, and

iii) Implementation of projects that directly confront specific aspects of the SDGs. By anchoring the Economic Pillar of Vision 2030 which seeks to generate resources needed to address SDGs, implementation development of the proposed project is attuned to the national and indeed global agenda for economic and social development. Kangundo Road Fire Station project contributes to the policy by creating direct and indirect employment opportunities for many people that be served by the operation of the market.

5.2.7 National Environment Policy (NEP)

Sessional Paper No. 6 of 1999 on Environment and Development since adoption by parliament in 1999 has been in use and influenced the formation of EMCA in 1999 reviewed in 2015 but has since been surpassed by time and is therefore under revision to comprehensively cover areas that were previously left out to augment it.

The revised draft of the National Environmental Policy, dated April 2012, sets out important provisions relating to the management of ecosystems and the sustainable use of natural resources, and recognizes that natural systems are under intense pressure from human
activities particularly for critical ecosystems including forests, grasslands and arid and semi-arid lands. The objectives of the Policy include developing an integrated approach to Environmental management, strengthening the legal and institutional framework for effective coordination, promoting environmental management tools.

Relevance
The Project shall implement the Environmental and Social Management and Monitoring Plan (ESMMP) to mitigate the impacts of the resulting impacts during the construction and operational phases of the project, this will ensure that the sensitive ecosystems are not destabilized by the subsequent Project activities.

5.2.8 National Land Policy
Chapter 2 of the policy is linked to constitutional reforms; regulation of property rights is vested in the government by the Constitution with powers to regulate how private land is used in order to protect the public interest. The Government exercises these powers through compulsory acquisition and development control. Compulsory acquisition is the power of the State to take over land owned privately for a public purpose. However, the Government must make prompt payment of compensation.

Chapter 4 of the land policy under Environmental Management Principles, The policy provides actions for addressing the environmental problems such as the degradation of natural resources, soil erosion, and pollution.

For the management of the urban environment it provides guidelines to prohibit the discharge of untreated waste into water sources by industries and local authorities; it also recommends for appropriate waste management systems and procedures, including waste and waste water treatment, reuse and recycling. This Project aims at improving the management of waste water before discharge to water sources serving other areas of downstream users.

The policy goes further to advocate for environmental assessment and audit as a land management tool to ensure environmental impact assessments and audits are carried out on all land developments that may degrade the environment and take appropriate actions to correct the situation. Public participation has been indicated as key in the monitoring and protection of the environment.

Chapter 4 further advocates for the Implementation of the polluter pays principle which ensures that polluters meet the cost of cleaning up the pollution they cause, and encourage industries to use cleaner production technologies.

5.2.9 HIV and AIDS Policy 2009
The proposed project is to be implemented in the Informal Settlements which have high freelance cases of HIV and Aids. This policy shall provide a framework to both the project proponent and contractor to address issues related to HIV and Aids. In Summary the policy provides a mechanism for:

- Setting Minimum Internal Requirements (MIR) for managing HIV and AIDS
- Establishing and promoting programmes to ensure non-discrimination and non-
stigmatization of the infected;
• Contributing to national efforts to minimize the spread and mitigate against the impact of HIV and AIDS;
• Ensuring adequate allocation of resources to HIV and AIDS interventions;
• Guiding human resource managers and employees on their rights and obligations regarding HIV and AIDS.

5.2.10 Gender Policy 2011
The overall goal of this Policy Framework is to mainstream gender concerns in the national development process in order to improve the social, legal/civic, economic and cultural conditions of women, men, girls and boys in Kenya.

The policy provides direction for setting priorities. An important priority is to ensure that all ministerial strategies and their performance frameworks integrate gender equality objectives and indicators and identify actions for tackling inequality. In addition, each program will develop integrated gender equality strategies at the initiative level in priority areas. Within selected interventions, the policy will also scale-up specific initiatives to advance gender equality.

This policy will be referred to during project implementation especially during hiring of staff to be involved in the project, procuring of suppliers and sub consultants and sub-contractors to the project.

5.3 Kenya Legislations

5.3.1 The Environmental Management and Coordination Act (EMCA) 1999 amended in 2015
The Act provides for the establishment of a Legal and Institutional Framework for the management of the environment and for matters connected therewith and incidental thereto. Just as in the new constitution, Part II of EMCA confers to every person the right to a clean and healthy environment and to its judicial enforcement.

The new Constitution and EMCA therefore obligates the project’s Executing Agency and Contractor to work in a clean environment and not to contravene the right of any person within its zone of influence, to this entitlement. EMCA has provided for the development of several subsidiary legislations and guidelines which govern environmental management and are relevant to the Project implementation.

These include:
• The Environmental (Impact Assessment and Audit) Regulations, 2009 Legal Notice No. 101;
• The Environmental Management and Coordination (Waste Management) Regulations, 2006 Legal Notice No. 121;
• The Environmental Management and Coordination (Water Quality) Regulations, 2006 Legal Notice No. 120;
• The Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 Legal Notice No. 61;
• The Environmental Management and Coordination (Air Quality Regulations 2014)
- The Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006 Legal Notice No. 160;


- The Environmental Management and Coordination (Fossil Fuel Emission Control) Regulations, 2006 Legal Notice No. 131;

- The Environmental Management and Coordination (Controlled Substances) Regulations, 2007 Legal Notice No. 73.

Relevance to the Project
EMCA 1999 amended in 2015 and above listed regulations will form the main statutory instruments which will guide the implementation of the project so that any likely adverse impacts that could be caused by the project are promptly mitigated as recommended in this study.

5.3.2 Grass Fire Act (Cap 327)
The act regulates burning vegetation, constructing and maintaining firebreaks to prevent the spread of fire and “counter-firing”.

The local Authorities now county governments and the Director of Agriculture (upon consultation with the local Authorities now county governments) are responsible for regulation of fire in their respective counties.

Sections 13, 17 provides that private persons may also be liable for damages if they light “counter-fires” to prevent the spread of approaching fire to protect their property, and causes damage to another.

5.3.3 County Government Act No. 17 of 2012
Part II of the Act empowers the county government to be in charge of function described in Article 186 of the constitution, (county roads, water and Sanitation, Health), Part XI of the Act vest the responsibility of planning and development facilitation to the county government with collaboration with national government, this arrangement has been adopted for interventions in order not to conflict with provisions of the Kenyan Constitution.

Relevance to the Project
The Act empowers County Governments to establish and maintain a fire brigade. The County may take all necessary steps to prevent and extinguish fires. The County has the power to compensate owners of property demolished or damaged for the purpose of preventing or extinguishing fires.

5.3.4 Physical Planning Act 1996 (286)
Section 29 of the said Act empowers the local Authorities (now county governments) to reserve and maintain all land planned for open spaces, parks, urban forests and green belts as well as land assigned for public social amenities.
The same section allows for prohibition or control of the use and development of an area. Section 30 states that any person who carries out development without development permission will be required to restore the land to its original condition. It also states that no other licensing authority shall grant license for commercial or industrial use or occupation of any building without a development permission granted by the respective local Authority.

**Relevance to the Project**

*Thus the Act directs, regulates and harmonizes development and use of land over the Country, the proposed Project site belongs to the County Government of Nairobi designated for establishment of fire Station and Market.*

**5.3.5 Occupational Health and Safety Act (OSHA 2007)**

This legislation provides for protection of workers during construction and operation phases. It is tailored at implementation of the EHS plan in compliance with the relevant sections of this Act. The EMP prepared under this assessment has provided for specific health and safety aspects to be complied with during implementation of the project.

**Relevance to the Project**

*The Act provides Occupational Health and Safety guidelines which shall be followed by both the contractor and supervising consultant during implementation of the Project in order to avoid injuries and even loss of life to workers and neighbouring community.*

**5.3.6 The Public Health Act (Cap.242)**

Part IX section 115 of the Act states that no person/institution shall cause nuisance or condition liable to be injurious or dangerous to human health. Section 116 requires Local Authorities to take all lawful, necessary and reasonably practicable measures to maintain their jurisdiction clean and sanitary to prevent occurrence of nuisance or condition liable for injurious or dangerous to human health. Such nuisance or conditions are defined under section 118 and include nuisances caused by accumulation of materials or refuse which in the opinion of the medical officer of health is likely to harbour rats or other vermin.

**Relevance to the Project**

*The Act provides guideline to the contractor on how he shall manage all wastes (Liquid and Solid Wastes) emanating from the Project in a way not to cause nuisance to the community, this Act during construction shall be read alongside the waste management regulations of EMCA 1999 for utmost compliance. The Act also shall be applied to ensure that the food that is provided to the workers during construction of the Project meets the safety requirements.*

**5.3.7 The Urban Areas and Cities Act 2011**

This law passed in 2011 provides legal basis for classification of urban areas (City) when the population exceeds 500,000; a municipality when it exceeds 250,000; and a town when it exceeds 10,000) and requires the city and municipality to formulate County Integrated Development Plan (Article 36 of the Act). Under Article 36, the integrated development plan so developed is required to be the central pillar in public administration of the city or municipality this forming the basis for:

- the preparation of environmental management; preparation of valuation rolls for
property taxation plans;
- provision of physical and social infrastructure and transportation;
- preparation of annual strategic plans for a city or municipality;
- disaster preparedness and response;
- overall delivery of service including provision of water, electricity, health, telecommunications and solid waste management; and
- The preparation of a geographic information system for a city or municipality.

The strategy plan as stated above denotes an annual plan to be adopted in the county assembly following the integrated development plan, and the Act requires the board of town committee to formulate the strategy plan soon after the adoption of the integrated development plan (Article 39). The integrated development plan as stipulated in the Act has to reflect:

- vision for the long term development of the city or urban area;
- An assessment of the existing level of development;
- Any affirmative action measures to be applied; development priorities and objectives;
- Development strategies which shall be aligned with any national or county sectoral plans and planning requirements;
- A spatial development framework;
- Operational strategies; and
- Applicable disaster management plans
- A regulated city and municipal agricultural plan;
- A financial plan and;
- The key performance indicators and performance targets (Article 40).

The integrated development plan thus formulated has to be submitted to the county executive committee, and the committee has to submit the plan to the county assembly with an opinion within 30 days (Article 41).

*Proposed Construction of Fire Station complies with the urban area and other cities act. It is integrated in the County Integrated Development plan, and will comply with all the regulations set in the Act especially the clause on Disaster Preparedness and Planning.*

**5.3.8 Work Injury Benefits Act, (WIBA 2007)**

This is an Act of Parliament to provide for compensation to employees for work related injuries and diseases contracted in the course of their employment and for connected purposes. An employee is a person who has been employed for wages or a salary under a contract and includes apprentice or indentured learner.

*The proposed project will adhere to the provisions of this act throughout the construction period of the project.*
5.4 Institutional Structure

5.4.1 Ministry of Environment and Natural Resource
Kenya’s Ministry of Environment and Natural Resource is mandated to monitor, protect, conserve and manage environment and natural resources of the country. The Ministry is to achieve this monumental task through sustainable exploitation of natural resources for socio-economic development geared towards eradication of poverty, improving living standards and maintaining a clean environment for present and future generations.

5.4.2 The Ministry of Transport, Infrastructure, Housing and Urban Development (MTIHUDE)
The MTIHUD is the project proponent and is implementing the development of Kangundo Road Fire Station through Nairobi Metropolitan Services Improvement Project (NaMSIP).

5.4.3 The Directorate of Nairobi Metropolitan Development
In the capacity of Employer, the Ministry of Land, Housing and Urban Development, Nairobi Metropolitan Development through the NaMSIP Project Coordinating Team (PCT) has administrative jurisdiction over the ESIA process.

5.4.4 Nairobi City County Government
The mandate of fire Disaster Preparedness and Management within Nairobi City is the responsibility of Nairobi City County Government. The County Government has her major fire station located within Nairobi City Central business district along Tom Mboya Street. The other two fire stations are located in Industrial area and Ruaraka along Thika Road. The fire Disaster Management within the County Government is managed by the Fire Brigade which is a section under City Engineers Department.

5.5 NEMA Compliance
The government established the National Environmental Management Authority (NEMA) as the supreme regulatory and advisory bodies on environmental management in Kenya under EMCA 1999. NEMA is charged with the responsibility of coordinating and supervising the various environmental management activities being undertaken by other statutory organs. NEMA also ensures that environmental management is integrated into development policies, programmes, plans and projects.

5.6 Sectoral Integration
This integration encourages provision of sustainable development and a healthy environment to all Kenyans. The key functions of NEMA through the NEC include policy direction, setting national goals and objectives and determining policies and priorities for the protection of the environment, promotion of cooperation among public departments, local authorities, private sector, non-governmental organizations and such other organizations engaged in environmental protection programmes and performing such other functions as contained in the act.

5.7 World Bank Safeguard Policies
The Project will only trigger Environmental Assessment OP 4.01 as discussed below. Other Operational Safeguard Policies of the World Bank as illustrated by table 5-1 below are not triggered.
Table 5-1: Analysis of potential triggers to World Bank Safeguards Policies

<table>
<thead>
<tr>
<th>World Bank Operation Policy</th>
<th>Applicability to the Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Assessment OP 4.01</td>
<td>Applicable. As a result of environmental and social screening, the project was identified as a Category B</td>
</tr>
<tr>
<td>Natural Habitats OP 4.04</td>
<td>Not applicable - there are no natural habitats at the project site</td>
</tr>
<tr>
<td>Pest Management OP 4.09</td>
<td>Not applicable- the project will not involve any pest management</td>
</tr>
<tr>
<td>Indigenous Peoples OP 4.10</td>
<td>Not applicable- there are no indigenous peoples at the project site</td>
</tr>
<tr>
<td>Physical Cultural Resources OP 4.11</td>
<td>Not applicable. Site inspections and literature searches have not indicated the presence of any cultural (historical, archaeological) sites in the construction area. However, to manage “chance finds” an appropriate procedure is included in this ESIA. Such procedure to be followed by contractors during the construction phase.</td>
</tr>
<tr>
<td>Involuntary Resettlement OP 4.12</td>
<td>Not Applicable. The site is currently empty land belonging to Nairobi City County Government; no encroachment was reported on site.</td>
</tr>
<tr>
<td>Forests OP 4.36</td>
<td>Not applicable- there is no forest at the site</td>
</tr>
<tr>
<td>Safety of Dams OP 4.37</td>
<td>Not applicable because the project will not involve construction of dams.</td>
</tr>
<tr>
<td>Projects on International Waters (OP 7.50)</td>
<td>Not applicable- the site does not sit on international waters</td>
</tr>
<tr>
<td>Projects in Disputed Areas (7.60)</td>
<td>The site is not classified as disputed in the project area.</td>
</tr>
</tbody>
</table>

5.7.1 Environmental Assessment OP 4.01
The Project is planned to be implemented in Embakasi West Constituency a site identified near KCC factory along Kangundo Road. The area over time and due to anthropogenic activities has exerted pressure on both natural and social environment. Therefore, the Project will have less significant impact on physical, biological and social setting within the immediate surroundings. However OP 4.01 will be triggered.

This policy requires Environmental Assessment (EA) of Projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision making. The EA is a process whose breadth, depth, and type of analysis depend on the nature, scale, and potential environmental impact of the proposed investment. The EA process takes into account the natural environment (air, water, and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples, and cultural property) and Trans-boundary and global environmental aspects.

Operational Policy 4.01 further requires that the EA report must be disclosed as a separate and stand-alone document by the Government of Kenya and the World Bank. The disclosure should be both in Kenya where it can be accessed by the general public and local communities and at the WB Website of the World Bank and the date for disclosure must precede the date for appraisal of the Project.
In addition, the project and contractor shall adhere to World Bank Environmental, Occupational Health and Safety (WB EHS) guidelines in the works especially during project implementation. Such requirements include observing safety guidelines, provision of protective clothing, clean water, and insurance cover are observed so as to protect all from work related injuries or other health hazards.

The proposed improvement of the proposed project has been classified as environmental category B and hence requirement for this Environmental Assessment.

5.7.2 Harmonization of both WB and GOK requirements for Social and Environmental Sustainability

The World Bank (WB) and Government of Kenya (GoK) require that Projects of such nature are subjected to environmental and social impact assessment as stipulated under EMCA 2015 and its tools; the same process simultaneously fully resolves requirements of OP 4.01. Generally, both requirements are aligned in principle and objective in that:

- Both require Environmental Assessment before project implementation leading to development of comprehensive Environmental and social Management plans to guide resolution of social and environmental impacts as anticipated.
- Both require public disclosure of Project Report and stakeholder consultation during preparation,
- While OP 4.01 of World Bank stipulates different scales of Project Report for different category of projects, EMCA requires Project Report for all sizes of projects, which are required to be scoped as relevant
- Where EMCA requires consultation of Lead Agencies comprising of relevant sectors with legal mandate under GoK laws, the WB has equivalent safeguards for specific interests.
- The Bank requires that stakeholder consultations be undertaken during planning, implementation and operation phases of the project which is equivalent to the statutory annual environmental audits at the operation phase of projects in Kenya.
- The understanding of this Project Report study is that, pursuit of an in-depth Project Report process as stipulated by EMCA 2015 is adequate to address all World Bank requirements for environmental and social assessment. This is a major guiding principle in this study.

Therefore, in keeping with this trend, public consultation has been done to the stakeholders, and their comments have been incorporated in the final Environmental Assessment and final design of the project. In addition, the Environmental Assessment report will be made publicly available to all stakeholders through disclosure at the project’s proponent website, NEMA, and WB website, as well as copy of the report available at the project site.
CHAPTER 6: STAKEHOLDER CONSULTATION

6.1 Legal and Policy Provisions for Stakeholder Consultations


The regulation requires that during the process of conducting Scoping, Environmental Impact Assessment the Proponent shall in consultation with the Authority here in referred to National Environment Management Authority (NEMA); seek the views of persons who may be affected by the Project. In seeking the views of the public, after the approval of the scoping report, of the proposed project by the Authority, the proponent shall publicize the project and its anticipated effects and benefits by:

- Posting posters in strategic public places in the vicinity of the site of the proposed project informing the affected parties and communities of the proposed project;
- Publishing a notice on the proposed project for two successive weeks in a newspaper that has a nation-wide circulation;
- Making an announcement of the notice in both official and local languages in a radio with a nation-wide coverage for at least one week for two consecutive weeks.
- Hold at least three public meetings with the affected parties and communities to explain the project and its effects, and to receive their oral or written comments; ensure that appropriate notices are sent out at least one week prior to the meetings and that the venue and times of the meetings are convenient for the affected communities and the other concerned parties; and
- Ensure, in consultation with the Authority that a suitably qualified co-coordinator is appointed to receive and record both oral and written comments and any translations thereof received during all public meetings for onward transmission to the Authority.

6.1.2 World Bank Group (WBG) Environmental Assessment Policy (OP 4.01 )

The World Bank Group’s Environmental Assessment Policy (OP 4.01, January 1999) requires that project-affected groups and local non-governmental organizations (NGOs) be consulted during the impact assessments process about the project’s potential environmental and social impacts.

The purpose of this consultation is to take local views into account in designing the environmental and social management plans as well as in project design. For complex projects where the environmental impacts and risks are high, the policy requires public consultation at least twice: first, shortly after Environmental Screening and before the terms of reference for the ESIA are finalized and secondly, once a draft ESIA Report is prepared. Consultation during project execution is also required. Section 5 summarizes the consultation programme for the ESIAs, and confirms that the project meets and indeed exceeds these requirements.
6.2 Kangundo Road Fire Station Stakeholder Consultations

6.2.1 Stakeholder Mapping
The main key informants targeted in the consultations were both Government and private Institutions operating within the Project area as well as general residents residing within along Kangundo Road. Table 6-1 below presents specific stakeholders consulted during the assessment.

Table 6-1: Stakeholder Consultation Details

<table>
<thead>
<tr>
<th>Meeting Details</th>
<th>Date</th>
<th>Venue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16th February 2017</td>
<td>Kariobangi South location Chiefs Office</td>
</tr>
<tr>
<td>2</td>
<td>22nd February 2017</td>
<td>Embakasi West MCA offices</td>
</tr>
<tr>
<td>3</td>
<td>22nd February 2017</td>
<td>Kariobangi South location Chiefs Office</td>
</tr>
<tr>
<td>4</td>
<td>23rd January 2017</td>
<td>Respective respondents business premise</td>
</tr>
</tbody>
</table>

The key findings during public consultations and key informant interview forums during the ESIA process are presented in table 6-2 below.

Table 6-2: Outcomes of Stakeholder Consultations

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Category</th>
<th>Issues Discussed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office of the chief Kariobangi south.</td>
<td>Institution</td>
<td>• Current fire fighting Infrastructure is inadequate</td>
</tr>
<tr>
<td>Embakasi West Member of County Assembly</td>
<td>Institution</td>
<td>• Domestic fire Handling Challenges which</td>
</tr>
</tbody>
</table>
The stakeholder consultations also involved questionnaire administration to various relevant stakeholders, a summary of interpreted questionnaires is presented in table 6-3 below

### Table 6-3: Summary of Outcomes of Questionnaire Administration

<table>
<thead>
<tr>
<th>Baseline fire fighting Situation</th>
<th>Response recorded in questionnaire</th>
</tr>
</thead>
</table>
| Mention previous fire incidences that have occurred in your area | • Many fire incidences reported in KCC informal settlement and Kariobangi light industries  
• These infernos have claimed approximately 50 lives from the year 2015 and also destroyed property. |
| Mention how fire outbreaks are handled in homes or institutions near you. | • Use of water buckets which is inadequate  
• Use of hand held fire extinguishers which is inadequate  
• Use of sand buckets which is inadequate |
| Challenges faced in handling fire outbreaks | • Insufficient water to fight fire  
• Long distance travelled by fire engines located in the CBD  
• Lack of access roads in informal settlements |
| What are your proposal to government on fire fighting infrastructure in your area | • Construct fire fighting stations in different parts of the city  
• Ensure all business entities have a hand held fire extinguisher |

### Project Impacts

*This impacts are discussed in detail in chapter 7*

**General respondents option:** all respondents supported the Project initiative

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6.3 Public Disclosure of ESIA, RAP, SEP and Annual Monitoring Reports

In accordance with NEMA and World Bank guidelines on environmental and social safeguards, the Project Proponent in this case State Department for Housing and Urban Development (SDH&UD) will ensure that the Results of public Consultations including ESIA, and annual Monitoring Reports are published on the Ministry website for wider circulation and review.

The Reports will also be made available at Chiefs’ Offices and Member of County Assembly for Kariobangi South, This disclosure will be done early before commencement of Project Works, approximately 60 days before Contractor’s mobilization on site. In addition, (SDH&UD) will ensure that the ESIA Report is available throughout the project construction phase.

The ESIA report and information will be disclosed at the ESIA Stage by NEMA and during Project Implementation Stage by (SDH&UD). NEMA will require (SDH&UD) to undertake a closeout audit after completion of the Project and also undertake and initial Environment Audit (EA) immediately after
commissioning of the project in the 1st year, these audits are essential in determining the performance of the project in addressing issues related to environment and social safeguards, gaps identified are corrected through implementation of recommendation of the Environment and Social Audit Action Plan (ESAAP).
CHAPTER 7: ENVIRONMENTAL AND SOCIAL IMPACTS ASSESSMENT & MITIGATION MEASURES

7.1 Introduction
This Chapter presents the assessment of the issues likely to arise as a result of implementation of the proposed project. For each issue, the analysis is based on its nature, the predicted impact, extent, duration, intensity and probability, and the stakeholders and/or values affected. In accordance with best practice, the analysis includes issues relating to the project’s environmental and social sustainability. Appropriate Impact Rating has been presented for the situation without mitigation.

7.2 Definition and Classification of Environmental Impact
An environmental impact is any change to the existing condition of the environment caused by human activity or an external influence. Impacts may be:

- Positive (beneficial) or negative (adverse);
- Direct or indirect, long-term or short-term in duration, and wide-spread or local in the extent of their effect.

Impacts are termed cumulative when they add incrementally to existing impacts. In the case of the Project, potential environmental impacts would arise during the construction and operation phases of the Project and at both stages positive and negative impacts would occur.

7.3 Impact Significance
The purpose of this ESIA Report is to identify the significant impacts related to the Project under consideration and then to determine the appropriate means to avoid or mitigate those which are negative. Significant impacts are defined, not necessarily in order of importance, as being those which:

- Result in Loss of property and of livelihood.
- Relate to protected areas or to historically and culturally important areas;
- Are of public concern and importance.
- Trigger subsequent secondary impacts.
- Elevate the risk to life threatening circumstances.
- Affect sensitive environmental factors and parameters.

7.4 Impact Scoring and Rating Criteria
The potential impacts associated with the proposed development have been assessed as presented in the matrix below. Precautionary principle was used to establish the significance of impacts and their management and mitigation i.e. where there is uncertainty or insufficient information, the Environmentalist erred on the side of caution.

Table 7.1 below summarizes the Impact Rating Criteria adopted in the Study.

| Table 7.1: Environment Impact Scoring and Rating Criteria |
### Severity of Impact

<table>
<thead>
<tr>
<th>Severity of Impact</th>
<th>Rating</th>
<th>Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insignificant / non harmful/less beneficial</td>
<td>-1/+1</td>
<td>Very Low</td>
</tr>
<tr>
<td>Small/ Potentially harmful / Potentially beneficial</td>
<td>-2/+2</td>
<td>Low</td>
</tr>
<tr>
<td>Significant / slightly harmful / significantly beneficial</td>
<td>-3/+3</td>
<td>Medium</td>
</tr>
<tr>
<td>Great/ harmful / beneficial</td>
<td>-4/+4</td>
<td>High</td>
</tr>
<tr>
<td>Disastrous/ extremely harmful / extremely beneficial</td>
<td>-5/+5</td>
<td>Very high</td>
</tr>
</tbody>
</table>

### Spatial Scope of the Impact

<table>
<thead>
<tr>
<th>Spatial Scope of the Impact</th>
<th>Rating</th>
<th>Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity specific</td>
<td>-1/+1</td>
<td>Very Low</td>
</tr>
<tr>
<td>Right of way specific</td>
<td>-2/+2</td>
<td>Low</td>
</tr>
<tr>
<td>Within Project area 5km radius</td>
<td>-3/+3</td>
<td>Medium</td>
</tr>
<tr>
<td>Regional / County</td>
<td>-4/+4</td>
<td>High</td>
</tr>
<tr>
<td>National</td>
<td>-5/+5</td>
<td>Very high</td>
</tr>
</tbody>
</table>

### Duration of Impact

<table>
<thead>
<tr>
<th>Duration of Impact</th>
<th>Rating</th>
<th>Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>one day to one month</td>
<td>-1/+1</td>
<td>Very Low</td>
</tr>
<tr>
<td>one month to one years</td>
<td>-2/+2</td>
<td>Low</td>
</tr>
<tr>
<td>Within Project construction period</td>
<td>-3/+3</td>
<td>Medium</td>
</tr>
<tr>
<td>within the Project life</td>
<td>-4/+4</td>
<td>High</td>
</tr>
<tr>
<td>at decommissioning</td>
<td>-5/+5</td>
<td>Very high</td>
</tr>
</tbody>
</table>

### Example of Cumulative Impact Scoring

1. +3,+2,+5,+4, +4,+1=+4 (the weight that occurs more becomes the overall rating)
2. +2,+2,+5,+4, +4,+1=+3 (if two scores or more tie, then an average of the scores shall be adopted)

### 7.5 Positive Impacts during the Construction Phase

#### 7.5.1 Creation of Employment and Business Opportunities

During the construction period, new employment opportunities will be created in the form of skilled and unskilled labour. The majority of unskilled labour will be sourced from estates around the project site which include city Estates of KCC, Umoja and Kariobangi South. Business and employment Opportunities will also be created for Suppliers, Sub-Contractors and other small businesses such as food kiosks that may be set-up near the contractor’s camps.

Based on the Scope of Works for the construction of the fire station in Peri Urban and Informal Settlements, it is estimated that the following employment opportunities will be created during the Construction Phase:

#### Table 7.2: Estimate of Jobs Created by the Project

<table>
<thead>
<tr>
<th>Employment Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casual Labourers</td>
<td>50</td>
</tr>
<tr>
<td>Skilled Staff</td>
<td>10</td>
</tr>
<tr>
<td>Plant Operators / Drivers</td>
<td>5</td>
</tr>
<tr>
<td>Managerial Staff</td>
<td>5</td>
</tr>
</tbody>
</table>
In the Operation Phase of the project more job opportunities will arise, staff and personnel will be required to work at the station and other sectors of the economy such as the transport industry, commerce and trade. Taken together, job creation will help to reduce the problem of unemployment with attendant improvement in income for the workers’ household and revenue.

The Impact Rating for Creation of Employment and Business is given in Table 7.3 below.

### Table 7.3: Impact Rating for Creation of Employment

<table>
<thead>
<tr>
<th>Severity of Impact</th>
<th>+4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial Scope of the Impact</td>
<td>+3</td>
</tr>
<tr>
<td>Duration of Impact</td>
<td>+3</td>
</tr>
<tr>
<td>Overall score</td>
<td>+3</td>
</tr>
<tr>
<td>Impact Rating</td>
<td>Medium – Beneficial</td>
</tr>
</tbody>
</table>

#### 7.6 Positive Impacts during Operation Phase

7.6.1 Minimize loss of lives and property associated with fires.
The station once commissioned will reduce time taken by fire engines from Nairobi Tom Mboya Street Fire Station to arrive at a fire outbreak scene in the Eastern sections of Nairobi. This region of Nairobi is characteristic by heavy traffic throughout the days and also poor road infrastructure. The station once commissioned will significantly decrease in the number of casualties and damage to property.

The Impact Rating for reduced number of casualties and loss of property in the in the Project Area is as shown in Table 7.4 below.

### Table 7.4: Reduced number of casualties and loss of Property

<table>
<thead>
<tr>
<th>Severity of Impact</th>
<th>+4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial Scope of the Impact</td>
<td>+3</td>
</tr>
<tr>
<td>Duration of Impact</td>
<td>+4</td>
</tr>
<tr>
<td>Overall score</td>
<td>+4</td>
</tr>
<tr>
<td>Impact Rating</td>
<td>High – Beneficial</td>
</tr>
</tbody>
</table>

7.6.2 Ambulance Services to the Community

The station once commissioned will have an onsite ambulance complete with trained emergency response personnel, this ambulance will be involved in both fire related emergencies and also other common emergencies like medical and accidents.

The Impact Rating for available ambulance services at the stations is as shown in Table 7.5 below.

### Table 7.5: Ambulance Services to the Community

<table>
<thead>
<tr>
<th>Severity of Impact</th>
<th>+4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial Scope of the Impact</td>
<td>+3</td>
</tr>
<tr>
<td>Duration of Impact</td>
<td>+4</td>
</tr>
<tr>
<td>Overall score</td>
<td>+4</td>
</tr>
<tr>
<td>Impact Rating</td>
<td>High – Beneficial</td>
</tr>
</tbody>
</table>
7.6.3 Water Pumps on Site within the Station
The station once commissioned will involve equipping the station with high head water pumps, these water pumps are necessary and are required during drawing of water from deep wells, the pumps will also be essential during emergency situation associated by drowning of community members in wells.

The Impact Rating for Importance of Water Pumps at the stations is as shown in Table 7.6 below.

<table>
<thead>
<tr>
<th>Severity of Impact</th>
<th>+4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial Scope of the Impact</td>
<td>+3</td>
</tr>
<tr>
<td>Duration of Impact</td>
<td>+4</td>
</tr>
<tr>
<td>Overall score</td>
<td>+4</td>
</tr>
<tr>
<td>Impact Rating</td>
<td>High – Beneficial</td>
</tr>
</tbody>
</table>

7.6.4 On site Borehole and Elevated Tanks
The station will be supplied with water from Nairobi City Water and Sewerage Company (NCWSC) network, however due to rampant water shortage experience in Eastern parts of Nairobi, the proposal is to drill and equip a borehole on site. This borehole once completed will provide water to the fire station and also to the neighboring community living in KCC, Umoja and Kariobangi Estates.

The Impact Rating for a borehole drilled at the stations is as shown in Table 7.7 below.

<table>
<thead>
<tr>
<th>Severity of Impact</th>
<th>+4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial Scope of the Impact</td>
<td>+3</td>
</tr>
<tr>
<td>Duration of Impact</td>
<td>+4</td>
</tr>
<tr>
<td>Overall score</td>
<td>+4</td>
</tr>
<tr>
<td>Impact Rating</td>
<td>High – Beneficial</td>
</tr>
</tbody>
</table>

7.6.5 Emergency Towing Trucks
The station once commissioned will have a towing lorry on site; this towing lorry will be used by the station and also the community at emergency situations involving road accidents and also collapse of building among other emergencies.

The Impact Rating for available towing services at the stations is as shown in Table 7.8 below.

<table>
<thead>
<tr>
<th>Severity of Impact</th>
<th>+4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial Scope of the Impact</td>
<td>+3</td>
</tr>
<tr>
<td>Duration of Impact</td>
<td>+4</td>
</tr>
<tr>
<td>Overall score</td>
<td>+4</td>
</tr>
<tr>
<td>Impact Rating</td>
<td>High – Beneficial</td>
</tr>
</tbody>
</table>

7.6.6 Creation of Employment
The station once commissioned will create employment for fire engine drivers and fire fighting personnel. This will reduce the number of unemployed youth within the area. The Impact Rating for creation of employment in the Project area is as shown in Table 7.9 below.

| Severity of Impact | +4 |
Spatial Scope of the Impact | +3  
Duration of Impact | +4  
Overall score | +4  
Impact Rating | High – Beneficial

7.6.7 Spark Economic Growth
More investors will be attracted to the area without fire of property destruction caused by fire outbreaks which take long to be put out. This will lead to increased investment rate that will in turn spark economic growth.

The Impact Rating for a spark in economic growth rate in the Project area is as shown in Table 7.10 below.

Table 7.10: Spark in economic growth
| Severity of Impact | +4  
| Spatial Scope of the Impact | +3  
| Duration of Impact | +4  
| Overall score | +4  
| Impact Rating | High – Beneficial

7.6.8 Reduced Poverty Level
Generally in the event of a fire outbreak, property for example houses and business premises are burnt down leading to massive destructions which impoverish owners. Construction of the fire station will ensure timely response to fire out breaks which will lead to significant reduction in property destruction hence reduction poverty levels.

The Impact Rating for Reduced poverty level is as shown in Table 7.11 below.

Table 7.11: Impact Rating for Reduced poverty level
| Severity of Impact | +3  
| Spatial Scope of the Impact | +3  
| Duration of Impact | +4  
| Overall score | +3  
| Impact Rating | Medium – Beneficial

7.7 Potential Negative Impacts and Mitigation Measures during the Construction Phase
The Project Construction Phase shall involve the following activities among others:

- Delivery of Construction Equipment and Materials to the Project Site including Contractor’s Equipment, iron bars, cement and Fittings, etc.
- Site Clearance and Excavation activities;
- Temporary stockpiling of soils, sub-soils and rock when digging up the foundation.
- Construction Works including construction of pillars, walls and pavements.
- Ground Reinstatement

These activities will be associated with less significant negative impacts to both human and natural environment, this impacts and proposed mitigation measures are described in the sub chapter below.
7.7.1 Negative Impacts to the Biophysical Environment and Mitigation Measures

7.7.1.1 Destruction of Vegetation on the proposed fire station Site.
Assessment of the Project target area identified that the Project area is a settled area; human activities have completely resulted to the areas being cleared of vegetation to provide land for development of structures. Therefore less significant impact of the project to vegetation in anticipated.

The Impact Rating for Destruction of Vegetation Cover is as shown in Table 7.12 below.

<table>
<thead>
<tr>
<th>Severity of Impact</th>
<th>-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial Scope of the Impact</td>
<td>-2</td>
</tr>
<tr>
<td>Duration of Impact</td>
<td>-3</td>
</tr>
<tr>
<td>Overall score</td>
<td>-3</td>
</tr>
<tr>
<td>Impact Rating</td>
<td>Low Negative</td>
</tr>
</tbody>
</table>

Mitigation Measures
- Site Clearance and Construction activities will be limited to the area set out for construction.
- Reinstatement of the project sites to their original state to be carried out once construction works are completed to allow growth of vegetation.

7.7.1.2 Contamination of Surface Water Sources by Effluents from Construction Plant and Equipment
The assessment identified that no water resource is located within close proximity to the proposed project area; therefore chances of pollution of water resources are less significant.

However, effluents from Construction Plant and Equipment (oils, grease, hydro-carbonates) are potential point pollutants. This can occur during cleaning, repair of the equipment as well as through leakages during normal operation of the equipment. These effluents can further contaminate the surface water channels within the project areas and eventually pollute adjacent water resources.

The Impact Rating is as shown in Table 7.13 below.

<table>
<thead>
<tr>
<th>Severity of Impact</th>
<th>-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial Scope of the Impact</td>
<td>-1</td>
</tr>
<tr>
<td>Duration of Impact</td>
<td>-3</td>
</tr>
<tr>
<td>Overall score</td>
<td>-2</td>
</tr>
<tr>
<td>Impact Rating</td>
<td>Low – Negative</td>
</tr>
</tbody>
</table>

Mitigation
The risk of surface water pollution by discharges from Construction Equipment is low and will be further minimized by ensuring Construction Equipment is well maintained and serviced according to manufacturers’ specifications to prevent oil leaks, Cleaning / repair of Construction Plant and Equipment.
to be carried out at designated yards and the Contractor to have designated storage areas for oils, fuels etc. that is protected from rain water and away from nearby surface water courses

7.7.1.3 Soil Erosion Resulting to Loss of Top Soil
Site clearance, excavation and ground leveling activities during construction can cause the top soil to be loose and susceptible to agents of erosion which include wind and water. This impact applies only to the public land that was targeted under this assessment.

The Impact Rating for Soil Erosion is as shown in Table 7.14 below.

<table>
<thead>
<tr>
<th>Table 7.14: Impact Rating for Soil Erosion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severity of Impact</td>
</tr>
<tr>
<td>Spatial Scope of the Impact</td>
</tr>
<tr>
<td>Duration of Impact</td>
</tr>
<tr>
<td>Overall score</td>
</tr>
<tr>
<td>Impact Rating</td>
</tr>
</tbody>
</table>

Mitigation

- Minimize the areas to be cleared and leave as much vegetation as possible to filter runoff water from the site
- Divert uphill water around the building site with stabilised banks and channels
- Avoid stock piling topsoil, sand and other building materials on foot path, roads and drainage channels.
- Fill and compact trenches immediately after services have been laid down.

7.7.1.4 Solid Wastes Generation from Construction Activities
Construction activities at the sites and Contractor’s Camps will generate some solid wastes such as plastic containers, used tyres, metal parts, plastics and cables, etc. Such wastes can lead to pollution of nearby water courses and blockage of drainage and sewerage systems if not properly handled and disposed of. This impact applies to the targeted public land under this assessment.

The Impact Rating for Pollution by Solid Wastes is as shown in Table 7.15 below.

<table>
<thead>
<tr>
<th>Table 7.15: Impact Scoring for Solid Waste Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severity of Impact</td>
</tr>
<tr>
<td>Spatial Scope of the Impact</td>
</tr>
<tr>
<td>Duration of Impact</td>
</tr>
<tr>
<td>Overall score</td>
</tr>
<tr>
<td>Impact Rating</td>
</tr>
</tbody>
</table>

Mitigation Measures

- Construction wastes (residual earth, debris and scrap materials) to be collected at designated points and Contractor to dispose to designated Solid Waste Dumping Sites approved by the Nairobi City County Government
- Contractor’s Camps and Construction Sites to have designated waste collection points,
- Environmental Management, Health and Safety Training Programmes to be conducted for
Contractor’s Staff to create awareness on proper solid wastes management

7.7.1.5 Air Pollution and Dust Generation.
Air Pollution can be caused by emissions from Construction Plant and Equipment and Vehicles. Dust can be generated by vehicles travelling on unpaved roads and tracks, and dust from exposed, non-vegetated surfaces. Some dust will also be generated during excavation works, by blowing from dump truck loads, and possibly from project borrow pits and quarries. This impact applies to the public land under this assessment.

The Impact Rating for Air Pollution and Dust Generation is as shown in Table 7.16 below.

<table>
<thead>
<tr>
<th>Severity of Impact</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial Scope of the Impact</td>
<td>-2</td>
</tr>
<tr>
<td>Duration of Impact</td>
<td>-3</td>
</tr>
<tr>
<td>Overall score</td>
<td>-3</td>
</tr>
<tr>
<td>Impact Rating</td>
<td>Medium – Negative</td>
</tr>
</tbody>
</table>

Mitigation Measures
- The contractor shall comply to the provisions of EMCA 1999 (Air Quality Regulations 2014)
- Workers shall be trained on management of air pollution from vehicles and machinery. All construction machinery shall be maintained and serviced in accordance with the contractor’s specifications
- The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be re-vegetated or stabilized as soon as practically possible
- The contractor shall not carry out dust generating activities (excavation, handling and transport of soils) during times of strong winds
- Vehicles delivering construction materials and vehicles hauling excavated materials shall be covered to reduce spills and windblown dust
- Water sprays shall be used on all earthworks areas within 200 metres of human settlement especially during the dry season.

7.7.2 Negative Impacts to the Socio-Economic Environment and Mitigation Measures

7.7.2.1 Increased Influx of Workers.
The Project will attract new people to the Project area seeking employment during the construction period. In the event that the construction contract is awarded to an international Contractor, the contractor will mobilize technical personnel from foreign country as well. Labour influx to the Project area could result to various social vices which include, discrimination, sexual abuse, drug and alcoholism, child labour among others

The Impact Rating for influx of workers is as shown in Table 7.17(b) below.
7.7.2.2 Increased Transmission of HIV/AIDS
The Project will attract new people to the Project area seeking employment during the construction period and this can lead to increased transmission of HIV/AIDS and other sexually transmitted diseases (STDs). This impact applies to the settlements under this assessment.

The Impact Rating for Increased Transmission of HIV/AIDS is as shown in Table 7.17 (b) below.

Table 7.17: Impact Rating for Increased Transmission of HIV/AIDS

<table>
<thead>
<tr>
<th>Severity of Impact</th>
<th>-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial Scope of the Impact</td>
<td>-3</td>
</tr>
<tr>
<td>Duration of Impact</td>
<td>-3</td>
</tr>
<tr>
<td>Overall score</td>
<td>-3</td>
</tr>
<tr>
<td>Impact Rating</td>
<td>Medium – Negative</td>
</tr>
</tbody>
</table>

Mitigation Measures
The contractor and the supervising engineer should ensure that the personal on site are protected as provided for under the Worker Injuries and Benefits Act (WIBA 2007). The standard aims to ensure:

- To promote the fair treatment, non discrimination, and equal opportunity of workers.
- To establish, maintain, and improve the worker-management relationship.
- To promote compliance with national employment and labor laws.
- To protect workers, including vulnerable categories of workers such as children.

7.7.2.3 Increased Crime and Insecurity
Influx of persons to the project area may lead to increased insecurity and incidences of crime.

The Impact Rating for Increased Insecurity is as shown in Table 7.18 below.

Table 7.18: Impact Scoring for Insecurity

<table>
<thead>
<tr>
<th>Severity of Impact</th>
<th>-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial Scope of the Impact</td>
<td>-2</td>
</tr>
<tr>
<td>Duration of Impact</td>
<td>-3</td>
</tr>
<tr>
<td>Overall score</td>
<td>-2</td>
</tr>
<tr>
<td>Impact Rating</td>
<td>Medium - Negative</td>
</tr>
</tbody>
</table>
Mitigation Measures

- Contractor and Supervision Team to liaise regularly with the Local Administration and Police Service to address any security and crime arising during project implementation.
- Contractor to provide 24 hours security to Workforce Camps, Yards, Stores and to the Supervising Team’s Offices

7.7.3 Negative Impacts on Occupational Health and Safety and Mitigation Measures

7.7.3.1 Noise and Excessive Vibrations.
Noise and Excessive Vibrations are caused by operation of construction plant and equipment and activities such as excavation and rock breaking. This impact poses a health and safety risk to both the communities living in the project area and construction workers. This impact applies to the settlements under this assessment.

The Impact Rating for Noise and Excessive Vibrations is as shown in Table 7.19 below.

<table>
<thead>
<tr>
<th>Severity of Impact</th>
<th>-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial Scope of the Impact</td>
<td>-1</td>
</tr>
<tr>
<td>Duration of Impact</td>
<td>-3</td>
</tr>
<tr>
<td>Overall score</td>
<td>-3</td>
</tr>
<tr>
<td>Impact Rating</td>
<td>Medium - Negative</td>
</tr>
</tbody>
</table>

Mitigation Measures

- Contractor will comply with provisions of EMCA 1999 (Noise and Excessive Vibrations Regulations of 2009)
- The Contractor shall keep noise level within acceptable limits (60 Decibels during the day and 35 Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas
- Hospitals and other noise sensitive areas such as schools shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity
- Any complaints received by the Contractor regarding noise will be recorded and communicated to the Supervising Engineer for appropriate action

7.7.3.2 Risk of Accidents at Work Sites
Accidents during construction activities may occur due to failure to use Personal Protective Equipment (PPE) by workers on site and members of the public illegally accessing the work sites. Accidents may result in injuries or even death of workers or members of the public. This impact applies to all settlements under this assessment.

The Impact Rating for Risk of Accidents at Work Sites is as shown in Table 7.20 below.

<table>
<thead>
<tr>
<th>Severity of Impact</th>
<th>-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial Scope of the Impact</td>
<td>-3</td>
</tr>
</tbody>
</table>
Environmental and Social Impact Assessment Project Report for the Proposed Construction of Kangundo Road Fire Station in Nairobi City County of Nairobi Metropolitan Region

<table>
<thead>
<tr>
<th>Duration of Impact</th>
<th>-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall score</td>
<td>-3</td>
</tr>
<tr>
<td>Impact Rating</td>
<td>Medium - Negative</td>
</tr>
</tbody>
</table>

Mitigation Measures

- Construction Workers and the Supervising Team to be provided with Personal Protective Equipment including gloves, gum boots, overalls and helmets. Use of PPE to be enforced by the Supervising Engineer.
- Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles
- Adequate Ablution Facilities to be provided at the Camps and Work Sites and cleanliness maintained
- Isolate the site for access by the local communities during the construction for their safety and health
- Contractor to provide a Healthy and Safety Plan prior to the commencement of works to be approved by the Supervising Engineer.
- Camps and Work Sites to be fenced off and Security Guards provided to restrict access to members of the public.

7.8 Potential Negative Impacts and Mitigation Measures during the Operation Phase

7.8.1.1 Risk of pollution by the agents used in fire extinguishers.
The risk of environmental pollution by agents used to extinguish fire for example wastes from dry chemicals, carbon dioxide and dry powders if not properly disposed.

The Impact Rating is as shown in Table 7.21 below.

<table>
<thead>
<tr>
<th>Severity of Impact</th>
<th>-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial Scope of the Impact</td>
<td>-2</td>
</tr>
<tr>
<td>Duration of Impact</td>
<td>-4</td>
</tr>
<tr>
<td>Overall score</td>
<td>-3</td>
</tr>
<tr>
<td>Impact Rating</td>
<td>Medium - Negative</td>
</tr>
</tbody>
</table>

Mitigation Measures

- Ensure carbon dioxide is stored in appropriate cylinders that are in good condition to avoid leakages
- Recycle empty fire extinguishers.
- Dry chemicals and foams should be disposed in sealed drains to avoid contaminating ground water
- Ensure incorporation of ABC dry powders into landfills preferably in sealed containers

7.8.1.2 Impact related to vehicle garage
Maintenance of vehicles will lead to oil spills in the garage area as well as wastes associated with vehicle maintenance such as used oil and used oil filters and oiled rugs and air filters, old tyres and tubes, broken wind-screens, driving mirrors, abandoned old vehicles and others.
Table 7.22: Impact Rating for Impact related to vehicle garage

<table>
<thead>
<tr>
<th>Severity of Impact</th>
<th>-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial Scope of the Impact</td>
<td>-2</td>
</tr>
<tr>
<td>Duration of Impact</td>
<td>-4</td>
</tr>
<tr>
<td>Overall score</td>
<td>-3</td>
</tr>
<tr>
<td>Impact Rating</td>
<td>Medium– Negative</td>
</tr>
</tbody>
</table>

Mitigation Measures

- Collect the used oils and re-use, re-sell, or dispose of appropriately using expertise from NEMA licensed waste handlers;
- Immediately institute clean up measures in case of an oil spill using sand and saw-dust for eventual disposal by the NEMA licensed handler;
- Sell off recyclable wastes like used tyres from the garage for manufacture of other products, if applicable;
- Avoid abandoning old vehicles in the garage and dispose off as scrap for reuse;
- Dispose off used oil rags, used oil filters, used air filters and other used spare parts wastes using the licensed waste handler;
- Used cartons to be re-used or disposed off by the licensed handler.

7.8.1.3 Risk of increased runoff water.

There is a risk of increased runoff water from the roof of the fire station when it rains. The Impact Rating is as shown in Table 7.22 below.

Table 7.22: Impact Scoring for Risk of Increased Surface Run-off

<table>
<thead>
<tr>
<th>Severity of Impact</th>
<th>-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial Scope of the Impact</td>
<td>-2</td>
</tr>
<tr>
<td>Duration of Impact</td>
<td>-4</td>
</tr>
<tr>
<td>Overall score</td>
<td>-3</td>
</tr>
<tr>
<td>Impact Rating</td>
<td>Medium - Negative</td>
</tr>
</tbody>
</table>

Mitigation

- Contractor should ensure that good quality gutters are installed to cover the entire surface of the roof to collect all the water when it rains. The water can be stored either in ground or underground tanks for future use.

Tables 7-1, 7-2 and 7-3 present the ESMMP for the proposed fire station Project during the construction, operation and decommissioning phases respectively wastes and debris holding sites will be cleared with maximum re-use of the debris either on surfacing the passageways or other grounds such as schools and church compounds.
<table>
<thead>
<tr>
<th>Activity</th>
<th>Associated Impacts</th>
<th>Impact Levels</th>
<th>Management Actions</th>
<th>Target Areas &amp; Responsibilities</th>
<th>Monitoring Indicator</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seeking approvals from NEMA for ESIA and Approval of plans from County</td>
<td>Delay in implementation of the Project due to objections and stop orders</td>
<td>Low</td>
<td>▪ The Contractor shall ensure that all pertinent permits, certificates and licences</td>
<td>All the Project components</td>
<td>• Number of approvals / permits issued</td>
<td>~Kshs.200,000</td>
</tr>
<tr>
<td>and National Government</td>
<td></td>
<td></td>
<td>have been obtained prior to any activities commencing on site and are strictly enforced/ adhered to;</td>
<td>Responsibility MTH&amp;UD &amp; Contractor</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>▪ The Contractor shall maintain a database of all pertinent permits and licences required</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>for the contract as a whole and for pertinent activities for the duration of the contract</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction campsites</td>
<td>Environmental degradation risks</td>
<td>Medium</td>
<td>▪ Isolate through fencing the camp sites from access by the public for their safety</td>
<td>Campsites</td>
<td>• Number of public grievances due to accidents</td>
<td>~included in BoQ</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>▪ Preferably to be located on land already cleared land wherever possible</td>
<td>Responsibility Contractor(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>▪ The Contractor’s Camp layout shall take into account availability of access for deliveries and services and any future works</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to campsites and construction sites</td>
<td>Environmental degradation risks</td>
<td>Medium</td>
<td>▪ Utilize to the extent possible the existing public roads to avoid social and economic disruption</td>
<td>Access Roads</td>
<td>• Cases of private land required</td>
<td>No direct cost associated</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>▪ Ensure road safety measures for the construction vehicles to the extent possible by observing all traffic regulations</td>
<td>Responsibility Contractor(s)</td>
<td>• Accidents occurrence</td>
<td></td>
</tr>
<tr>
<td>Environmental and Social Training and Awareness</td>
<td>Risks of Environmental and Social degradation risks and occupational health and safety related accidents</td>
<td>High</td>
<td>▪ The Contractor and sub-contractors shall be aware of the environmental requirements and constraints on construction activities contained in the provisions of the ESMMP</td>
<td>All Workers</td>
<td>• Number of Trainings Held</td>
<td>Kshs. 50,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>▪ The Contractor will be required to provide for the appropriate Environmental Training and Awareness as described in this ESMMP in his costs and programming</td>
<td>Responsibility Contractor(s)</td>
<td>• Availability of Training reports</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>▪ An initial environmental awareness training</td>
<td></td>
<td>• Attendance list of participants during the construction process</td>
<td></td>
</tr>
</tbody>
</table>
### Environmental and Social Impact Assessment Project Report for the Proposed Construction of Kangundo Road Fire Station in Nairobi City County of Nairobi Metropolitan Region

<table>
<thead>
<tr>
<th>Activity</th>
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<th>Impact Levels</th>
<th>Management Actions</th>
<th>Target Areas &amp; Responsibilities</th>
<th>Monitoring Indicator</th>
<th>Budget</th>
</tr>
</thead>
</table>
| HIV/AIDS awareness and prevention campaign    | Risks of Increased HIV and Aids transmission in the area                              | Medium        | - The Contractor shall institute HIV/AIDS awareness and prevention campaign amongst his workers for the duration of the contract, contracting and implementing organisation, with preference for an organisation already working on this issue in the Project area;  
  - The campaign shall include the training of facilitators within the workers, information posters in more frequented areas in the campsite and public areas, availability of promotional material (T-shirts and caps), availability of condoms (free), and theatre groups | All Workers  
  **Responsibility Contractor(s)** | • Number of Trainings Held  
  • Availability of Training reports  
  • Attendance list of participants during the training sessions  
  • Local health clinic statistics | KShs. 50,000 |
| Local Labour / Employment                     | Delay in Project implementation due to opposition from aggrieved community members    | Medium        | - Wherever possible, the Contractor shall use local labour, and women must be encouraged to be involved in construction work  
  - The contractor shall ensure compliance to the gender balance as required by the 2/3 gender rule  
  - The contractor shall comply to the provisions of WIBA 2007  
  - The contractor must ensure there are no minors employed at the site. | All the Project Lots  
  **Responsibility Contractor** | • Number of workforce employed from the local community  
  • Number of female employed | No direct costs associated |
| Earth moving and excavations (Vegetation clearance, channeling and) | Health and Safety risks  
  Air pollution  
  Social nuisance | Medium | - Provide notices, signage and information to the public for their safety at all locations  
  - Install barriers along walkways, crossings and public places affected by the works for | All work areas  
  **Responsibility Contractor(s)** | • Accidents occurrence incidences  
  • Cases of respiratory | ~KShs. 100,000 |
<table>
<thead>
<tr>
<th>Activity</th>
<th>Associated Impacts</th>
<th>Impact Levels</th>
<th>Management Actions</th>
<th>Target Areas &amp; Responsibilities</th>
<th>Monitoring Indicator</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>site preparations)</td>
<td></td>
<td></td>
<td>public safety ▪ Where there are potential for nuisance from dust generation, ensure earth moving is under dump conditions (consider watering where necessary) ▪ Inform immediate communities or stakeholders of the activities.</td>
<td></td>
<td>complicatio at nearby health centre</td>
<td></td>
</tr>
<tr>
<td>▪ Vegetation Cover destruction ▪ Loss of biodiversity</td>
<td>Low</td>
<td></td>
<td>Construction activities will be limited to Project sites which already exist therefore limited destruction to vegetation cover</td>
<td>All work areas Responsibility Contractor(s)</td>
<td>▪ Soil erosion extend and intensity on site</td>
<td>No direct cost</td>
</tr>
<tr>
<td>▪ loss of top soil</td>
<td>Low</td>
<td></td>
<td>Stock piling of top soil, construction material and wastes should be done only at designated sites approved by the supervising engineer, erosion prevention through berming of loose soil sites should be done in all areas susceptible to agents of erosion</td>
<td>All work areas Responsibility Contractor(s)</td>
<td>▪ Soil erosion extend and intensity on site</td>
<td>No direct cost</td>
</tr>
<tr>
<td>▪ Public Health and safety risks ▪ Worker Occupational safety risks</td>
<td>Medium</td>
<td></td>
<td>Notify public the intent to cut sections of the road for safety precautions ▪ Provide signage and safety information in all work areas ▪ Ensure compliance by workers with safety safeguards including the OHS, provision of safety gear and enforcement of application</td>
<td>civil works areas Responsibility Contractor(s) Supervision</td>
<td>▪ Accidents occurrence incidences</td>
<td>KShs. 50,000</td>
</tr>
<tr>
<td>Disruption of amenities (access roads, services lines and driveways) causing inconveniences to the community</td>
<td>Medium</td>
<td></td>
<td>Notify other services providers and Open small sections that can be reinstated within the shortest period to avoid public disruption ▪ Mark the lines to avoid conflicts with other activities</td>
<td>civil works areas Responsibility Contractor(s) Supervision</td>
<td>▪ Number of complaints from community due to lack of certain services</td>
<td>No direct costs</td>
</tr>
</tbody>
</table>
### Environmental and Social Impact Assessment Project Report for the Proposed Construction of Kangundo Road Fire Station in Nairobi City County of Nairobi Metropolitan Region

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<th>Target Areas &amp; Responsibilities</th>
<th>Monitoring Indicator</th>
<th>Budget</th>
</tr>
</thead>
</table>
| Materials sourcing, from burrow pits and quarries delivery and storage | Environmental and Safety risks associated with burrowing and opening up of new quarry sites | High | - The Contractor will be responsible for ensuring that appropriate authorisation to use the proposed borrow pits and quarries have been obtained before commencing activities  
- Topsoil shall be stripped prior to removal of borrow and stockpiled onsite. This soil shall be replaced on the disturbed once the operation of the borrow site or quarry is complete  
- Construction material sources should be environmentally sustainable (approved accordingly)  
- Delivery routes and modes of transport should be approved  
- Material storage on site not to be internal or external nuisance | Burrow Pits and Quarry Site  
Responsibility Contractor(s) Supervision | - Environmental Status of reinstated burrow pits  
- Complains from the community on burrow pits and material transportaton | KShs. 50,000 |
| Concrete / cement batching plant | Risks associated with water resource pollution, noise and vibration and air pollution from dust this could lead to respiratory problems | High | - Where required, a Concrete batching plant shall be located more than 20m from the nearest stream/river channel;  
- Top soil removed from the batching plant site and stockpiled  
- Contaminated storm-waterandwastewaterrunofffromthebatching gareaandaggregate stock piles shall not be permitted to enter streams but shall directed to a pit where the water can soak away  
- Suitable screening and containment shall be in place to prevent windblown contamination associated with any bulk cement silos, loading and batching  
- Cleaning of equipment and flushing of | Concrete / cement batching plant  
Responsibility Contractor(s) Supervision | - Number of incidence of Environment pollution around the plant | No direct cost |
### Environmental and Social Impact Assessment Project Report for the Proposed Construction of Kangundo Road Fire Station in Nairobi City County of Nairobi Metropolitan Region

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<th>Monitoring Indicator</th>
<th>Budget</th>
</tr>
</thead>
</table>
| Wastes generation and disposal        | Risks of contaminating surface and underground water resources                      | High          | - Construction wastes (residual earth, debris and scrap materials) to be removed for safe disposal  
- Encourage recycling where possible (concrete debris for access road surfacing),  
- Contaminated organic matter in the work areas to be isolated for safe disposal  
- Material residuals to be disposed off in accordance with established regulations | Construction areas              | • Number of complaints from community not happy with waste management of the contractor                      | KShs. 50,000             |
| Spoil Storage site                    | Risks of solid waste mismanagement leading to pollution                             | Medium        | - Preferably to be located on land already cleared wherever possible. Communities shall be involved in the site location to avoid conflict  
- The need to be more than 20 meters from water courses and in a position that will facilitate the prevention of storm-water runoff from the site from entering the watercourse  
- Contouring of spoil site to approximate natural topography and drainage and/or reduce erosion impacts on the site  
- The Contractor shall ensure that the placement of spoil is done in such a manner to minimise the spread of materials and the impact on surrounding vegetation and that no materials‘ creep into no-go areas | Construction areas              | • Number of complaints from community not happy with waste management of spoil material                   | Contractor best management practice |
| Occupational Health and Safety         | Risks of Accidents, Injuries or death of workers or community member                 | High          | - Provide construction workers with personal protective gear (gloves, gum boots, overalls and helmets),  
- Provide temporary toilets and bathrooms for the construction workers at the work | All work areas                   |                                                                                                           | KShs. 50,000             |
## Environmental and Social Impact Assessment Project Report for the Proposed Construction of Kangundo Road Fire Station in Nairobi City County of Nairobi Metropolitan Region

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<th>Target Areas &amp; Responsibilities</th>
<th>Monitoring Indicator</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage of fuel oils, lubricants, chemicals and flammable materials</td>
<td>Hazards of fire outbreak, oil and chemical spills.</td>
<td>High</td>
<td>- Follow specifications of the Occupational Health and Safety Act, EMCA1999 and others in the development and operation of stores.</td>
<td>All work areas</td>
<td>Incidence of reported cases of fuel leaks and fire incidences</td>
<td>No direct cost associated</td>
</tr>
</tbody>
</table>
| Sanitation issues resulting from both solid and liquid wastes on site. | Risks associated with water born diseases exposed to community and workforce | Medium        | - The Contractor shall -laws relating to public health and sanitation  
- All temporary/ portable toilets or pit latrines shall be secured to the ground to the satisfaction of the RE to prevent them from toppling over  
- A wash basin with adequate clean water and soap shall be provided alongside each toilet. Staff shall be encouraged to wash their hands after use of the toilet, in order to minimise the spread of possible disease | All work areas                  | Incidence of reported cases of water related diseases among the workforce and neighbor community | No direct cost associated |
| Noise and Vibration control from plant and equipment | Risk to health and safety of community and workers     | Medium        | - The Contractor shall keep noise level within acceptable limits and construction activities shall, where possible, be confined to normal working hours in the residential areas  
- Hospitals and other noise sensitive areas shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity  
- Any complaints received by the Contractor | civil works areas and access roads | Reported complaints from neighbor community and institutions | No direct cost associated |
## Table 1: Environmental and Social Impact Assessment

<table>
<thead>
<tr>
<th>Activity</th>
<th>Associated Impacts</th>
<th>Impact Levels</th>
<th>Management Actions</th>
<th>Target Areas &amp; Responsibilities</th>
<th>Monitoring Indicator</th>
<th>Budget</th>
</tr>
</thead>
</table>
| Traffic management on site       | Risks of Accidents, Injuries or death of workers or community member | High          | - Strict use of warning signage and tapes where the trenches are open and active sites  
- Employ and train road safety Marshalls who will be responsible for management of traffic on site  
- Contractor to provide a traffic management plan during construction to be approved by the resident engineer | .civil works areas and access roads  
Responsibility Contractor(s) Supervision engineer | Accidents occurrence incidences | No direct costs (integrated in the works costs) |
| Air Quality Control              | Air pollution causing respiratory disorders to human     | High          | - Workers shall be trained on management of air pollution from vehicles and machinery. All construction machinery shall be maintained and serviced in accordance with the contractor’s specifications  
- The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be re-vegetated or stabilised as soon as practically possible  
- The contractor shall not carry out dust generating activities (excavation, handling and transport of soils) during times of strong winds  
- Vehicles delivering soil materials shall be covered to reduce spills and windblown dust  
- Water sprays shall be used on all earthworks areas. | All work areas  
Responsibility Contractor(s) Supervision | Cases of respiratory complication at nearby health centre | No direct costs (integrated in the works costs) |
<p>| Contractor de-mobilization and    | Associated risks of environmental                       | High          | - The site is to be cleared of all construction materials, including litter prior to hand over | All work areas Closeout audit report findings | No direct anticipated |                                                                                                                                 |</p>
<table>
<thead>
<tr>
<th>Activity</th>
<th>Associated Impacts</th>
<th>Impact Levels</th>
<th>Management Actions</th>
<th>Target Areas &amp; Responsibilities</th>
<th>Monitoring Indicator</th>
<th>Budget</th>
</tr>
</thead>
</table>
| site reinstatement     | degradation        |               | ▪ Fences, barriers and demarcations associated with the construction phase must be removed from the site  
▪ Fences, barriers and demarcations associated with the construction phase must be removed from the site  
▪ Rehabilitation Activities of Environmental Cases identified must continue throughout the defect liability period | Responsibility Contractor(s) Supervision |                      |                      |

Total Estimated Cost for ESMMP  
*Include Chance Find Procedures BP OP 4.11in all contracts*  
ESMMP  
KES 600,000
### Table 7-2: Operational Phase: Environmental and Social Management and Monitoring Plan

<table>
<thead>
<tr>
<th>No.</th>
<th>Issue</th>
<th>Action required</th>
<th>Monitoring Indicator</th>
<th>Responsibility</th>
<th>Provisional Budget</th>
</tr>
</thead>
</table>
| 1   | Risk of pollution by the agents used in fire extinguishers             | • Ensure carbon dioxide is stored in appropriate cylinders that are in good condition to avoid leakages  
• Recycle empty fire extinguishers.  
• Dry chemicals and foams should be disposed in sealed drains to avoid contaminating ground water  
• Ensure incorporation of ABC dry powders into landfills preferably in sealed containers | Number of complaints from Community members                                                                                                   | County Government of Nairobi                                                          | To be established at operation phase and included in the operation of the projects |
| 2   | Noise from operation of fire trucks                                   | • The station staff should keep the noise levels within acceptable limits and minimize noise during night hours in the residential areas             | Number of complaints from Community members                                                                                                 | County Government of Nairobi                                                          | To be established at operation phase and included in the operation of the projects |
| 3   | Community safety                                                      | • The fire station vehicles to maintain speed limits                                                                                                                                                       | Number of complaints from Community members                                                                                                 | County Government of Nairobi                                                          | To be established at operation phase and included in the operation of the projects |
| 4   | Vehicle garage                                                       | • Collect the used oils and re-use, re-sell, or dispose of appropriately using expertise from NEMA licensed waste handlers;  
• Immediately institute clean up measures in case of an oil spill using sand and saw-dust for eventual disposal by the NEMA licensed handler  
• Sell off recyclable wastes like used tyres from the garage for manufacture of other products, if applicable  
• Avoid abandoning old vehicles in the garage and dispose off as scrap for reuse  
• Dispose off used oil rags, used oil filters, used air filters and other used spare parts wastes using the licensed waste handler  
Used cartons to be re-used or disposed off by the licensed handler | Standard of housekeeping and cleanliness – use of checklists                                                                                  | Garage supervisor – County Government of Nairobi City                                    | To be established at operation phase and included in the operation of the projects |
7.9 Decommissioning Flow Chart
The Project has been designed to operate effectively for over 20 years. In the event that the infrastructure will be required to be overhauled, then the following steps should be considered in order to undertake the procedure in a structured manner with minimum impact to both human and natural environment as illustrated in table 8-3 below.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Action</th>
<th>Actor</th>
</tr>
</thead>
</table>
| Step 1 | Initiation  
Development of an Objective Worksheet and checklist incorporating references, legal and policies  
Undertake decommissioning audit | Proponent then |
| Step 2 | Prepare Road Map for Decommissioning Design  
Conduct design review to validate elements of the design and ensure design features are incorporated in the decommissioning design. Public consultations | Proponent then |
| Step 3 | Prepare and Award Contract  
Prepare a contract that incorporates validated Project information and award to a contractor as per the Procurement rules. | Proponent then |
| Step 4 | Execute Decommission Works  
Implement design elements and criteria on the Project in accordance with specifications and drawings. Inspect during decommissioning and at Project completion to ensure that all design elements are implemented according to design specifications. | Contractor |
| Step 5 | Commissioning Environmental Management Plan | Contractor |
| Step 6 | Non-Conformance, Corrective/Preventive Action  
Determine root cause  
Propose corrective measures  
Propose future preventive measures. | Contractor |
CHAPTER 8: IMPLEMENTATION ARRANGEMENT AND CAPACITY BUILDING

8.1 Purpose and Objectives of ESMMP

The specific objectives of the ESMMP are to:

- Serve as a commitment and reference for the contractor to implement the ESMMP including conditions of approval from NEMA.
- Serve as a guiding document for the environmental and social monitoring activities for the supervising consultant, contractor and the client management including requisite progress reports.
- Provide detailed specifications for the management and mitigation of activities that have the potential to impact negatively on the environment.
- Provide instructions to relevant project personnel regarding procedures for protecting the environment and minimizing environmental effects, thereby supporting the Project goal of minimal or zero incidents.
- Document environmental concerns and appropriate protection measures; while ensuring that corrective actions are completed in a timely manner.

8.2 Auditing of ESMMP

The contractor shall conduct regular audits to the ESMMP to ensure that the system for implementation of the ESMMP is operating effectively. The audit shall check that a procedure is in place to ensure that:

- The ESMMP being used is the up to date version;
- Variations to the ESMMP and non-compliance and corrective action are documented;
- Appropriate environmental training of personnel is undertaken;
- Emergency procedures are in place and effectively communicated to personnel;
- A register of major incidents (spills, injuries, complaints) is in place and other documentation related to the ESMMP; and
- Ensure that appropriate corrective and preventive action is taken by the Contractor once instructions have been issued.

8.3 Management Responsibility of ESMMP

In order to ensure the sound development and effective implementation of the ESMMP, it will be necessary to identify and define the responsibilities and authority of the various persons and Organizations which will be involved in the project. The following entities should be involved in the implementation of this ESMMP:

- NEMA;
- Contractor;
- Consultant ;
- County Government of Nairobi.

8.3.1 National Environment Management Authority (NEMA)

The responsibility of NEMA is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of Government of Kenya in the
implementation of all policies relating to the environment.

8.3.2 The Contractor

The persons/firms contracted to put up the proposed fire station infrastructure will be required to comply with the requirements of the ESMMP within this report. To ensure strict compliance environmental specifications of this ESMMP should form part of the contract documents.

8.3.3 Consultant

The sourced consultant will have to ensure that the proposed ESMMP is up to date and is being used by the contractor. Periodic audits of the ESMMP will have to be done to ensure that its performance is as expected.

8.3.4 County Government of Nairobi

The relevant departmental officers in the above County government will be called upon where necessary during Project implementation to provide the necessary permits and advisory services to the Project implementers. The Project once commissioned will be operated by the County Government of Nairobi under the Fire Bridget department.

8.4 Grievance Redress Management Plan

This ESIA provides for a Grievance redress mechanisms (GRM) includes instruments, methods, and processes by which a resolution to a grievance is sought and provided. The processes are as shown in the sections below.

(i) Local Residents Complaints Procedure

The purpose and scope of local resident’s complaints procedure is to ensure all complaints from local residents are dealt with appropriately with corrective actions being implemented and the complainant being informed of the outcome. It will be applicable to all complaints received from any local within the project area.

The contractor will employ a Community Liaison Officer and or sociologist who will be responsible for collating written complaints and co-coordinating responses to all complaints.

(ii) Procedure

All complaints shall be handled in accordance with the flowchart in Figure 8.1 below. Both verbal and written complaints are to be entered a Grievance Complaint Log

When receiving a complaint all employees shall refer the complainant to the Community Liaison Officer (CLO) or the resident engineer. The person receiving a complaint shall ensure that the Grievance Complaint Log is completed. The form shall then be forwarded to the Community Liaison Officer who will assign it a number. The Community Liaison Officer shall ensure that all actions are made to close out the complaint.
(iii) Grievance Complaint Log
Ensures that each complaint has an individual number and that tracking and recording actions are carried out. It also records who is responsible for an individual complaint and records dates for the following actions:

- Date the complaint was reported;
- Information on proposed corrective action sent to complainant (if appropriate);
- The date the complaint was closed out; and
- Date response sent to complainant.

(iv) Responding to a Complaint
All complaints shall be responded to in writing, though a verbal response will be provided as well if this is more appropriate in the circumstances (e.g., where the complainant cannot read). All complaints must be responded to within two weeks of being received, even if the response is just a summary of what is planned and when it is likely to be implemented. Further correspondence should be given once the complaint is closed out.

(v) Monitoring Complaints
The CLO through the contractor will be responsible for providing (SDH&UD) with a Monthly report detailing the level of complaints and any outstanding issues to be addressed. Monthly reports will include analysis of the type of complaints, levels of complaints and action taken to reduce complaints. The CLO shall file all documentation related to complaints in a file in his office.
Figure 8-1: Grievance Resolution Flow Chart

Complaint Received (verbally or writing) → Complete Complaint Action Form → Complete Immediate Action Section (if appropriate) and assign responsibility

Immediate action enough to satisfy complaint

YES → Establish long-term corrective action

NO → Establish follow-up details

Inform complainant (if appropriate) of the proposed corrective action

Implement the corrective action

Carry out follow-up of the corrective action

Record date on the Complaint Log

YES → Corrective action satisfies the complaint

Inform complainant of corrective action

Record date on the Complaint Log

NO → Close out of Complaint

Inform complainant of corrective action

Record date on the Complaint Log

Close out of Complaint
CHAPTER 9: CONCLUSION AND RECOMMENDATIONS

9.1 Findings and Recommendations

9.2 Assessment findings
The assessment described in the report identified the below listed main findings

- The project design has ensured that the project is constructed within existing public land and no private land will be acquired.
- The world Bank Operation Policy OP 4.12 is not triggered due to the fact that the proposed site is clear land free from encroachment.
- The Environmental and Social Screening undertaken for the project revealed that the investment will result in low impact on both social and biological environment; therefore, this project is categorized as a category B project. The level of ESIA assessment required is at Project Report Stage which should be approved at the Nairobi NEMA office.
- Provisional Budget of Kshs. 600,000.00 is required for implementation of mitigation measures of potential negative environmental impacts identified in the report.
- The overall objective of project is to reduce the number of death and destruction of property associated with fire outbreaks in the Eastern region of Nairobi and its environs through provision fire fighting infrastructure.

9.3 Assessment Recommendation
The project is recommended for implementation provided the mitigation measures identified in the study for the potential negative impacts are implemented, the recommendations will also form part of Environment Licence that will be issued for the Project.
Annex 1 Public Participation Minutes

PUBLIC CONSULTATIVE MEETING FOR THE CONSTRUCTION OF THE PROPOSED KANGUNDO ROAD FIRE STATION HELD AT KARIOBANGI SOUTH CHIEF’S OFFICE.

AGENDA OF THE MEETING
- Share Project information with the residents.
- Fire fighting infrastructure in Nairobi
- Proposed Fire Station site issues.
- Public/stakeholders concern.
- A.O.B/Adjournment.

PROCEEDINGS OF MEETINGS
The meeting started at 1100hours with introduction of the parties’ present and opening remarks from the Area Chief. An opening prayer was said by Kariuki Francis a resident of KCC village. Residents had goodwill for the Fire station project, they were happy to be consulted before commencement of the actual construction and promised to cooperate throughout project implementation till completion.

The area MCA Hon. Martin Kinyanjui informed residents that the project was not anyone’s personal initiative, it has nothing to do with politics but it was for the general public wellbeing. He welcomed the project stating that it is long overdue and construction should start immediately to reduce damages caused by frequent fire outbreaks within Mowlem Ward. He further urged landlords to avoid encroaching on roads within the informal settlement of KCC village as this could hinder free movement of fire engines while trying to put out fires.

The settlement committee secretary urged residents to support the project to its completion and present any grievances that may arise during project implementation in an orderly manner so that necessary recourse maybe undertaken.

Fire fighting personnel in attendance informed residents that the current fire station on Tom Mboya Street was constructed in 1907. Due to population pressure the station is overwhelmed and they face numerous challenges to arrive at a fire outbreak scene. He urged residents to support the project since it will greatly reduce time taken for their engine to respond to an emergency call.

Minute 1/02/2017 Project Sustainability.
Residents wanted to know sustainability of the fire station considering that Ruaraka and Industrial Area fire stations stalled shortly after construction.

Discussion and Response
The Team informed residents that this project is intended to improve services within the Nairobi Metropolitan region in line with vision 2030. Also with the devolved system management of the stations will be easier leading to its sustainability.
Minute 2/02/2017 Commencement date.
Residents wanted to know the expected commencement date since they felt that the project is long overdue.

Discussion and Response
EIA team responded that the project will commence immediately after all the preliminary surveys and consultations have been finalized. It is expected that the project will commence this year depending on availability of funds.

Minute 3/02/2017 Areas to be served by the fire station.
Residents wanted to know if the fire station will only serve residents of Kariobangi South.

Discussion and Response
The team informed residents that the station is a public facility expected to serve the general public focusing majorly on the eastern parts of Nairobi. This is aimed at reducing the time it takes for fire engines to drive all the way from the city centre to a fire outbreak site.

Minute 4/02/2017 Water source for the fire station.
Residents wanted to know where the station will be getting water from to avoid cases of lack of water in the event of a fire outbreak.

Discussion and Response
The Team informed residents that a borehole will be drilled on site and a water hydrant installed to refill the engine incase it runs out of water while putting out a fire. There will also be a water bowser on site to supplement the available water capacity for fire engines while putting out a fire.

Minute 5/02/2017 Land acquisition for the proposed station.
The community wanted to know how land to construct the proposed station will be acquired considering the fact that land is scarce and too expensive within Nairobi.

Discussion and Response
The team informed residents that a public parcel of land belonging to Nairobi City County government has been identified off Kangundo Road opposite KCC plant. According to the fire station design, the parcel is enough and no private land will be acquired.

Minute 6/02/2017 Employment opportunities.
Residents wanted to know if the contractor will source workforce from the area residents during construction of the Fire station.

Discussion and Response
The EIA team informed residents that during construction, the contractor will source some responsible youth from the area for casual employment to supplement his permanent staff. Residents with relevant skills and training can also present their certificates to be considered for employment opportunities if need arises.
The team also cautioned the youth against over indulging in alcohol as this would ruin their chances of getting the needed employment. Residents especially youth were encouraged to train as fire fighter volunteers in order to assist in the event of a fire outbreak. This will also improve their chances of getting employment when vacancies emerge.

**A.O.B.**
The area MCA urged residents to maintain peace during this election year and also turn out in large numbers during voting day so as to elect good leaders, who have good development agendas for them.

There being no other issue the Area Chief thanked the residents for keeping time and attending the meeting despite the short notice. The meeting adjourned at 1230hours with a word of prayer from Mr. Kariuki.

**Minutes Signed**
Annex 2  Photo Plate

SEC member giving his remarks  ESIA expert responding to questions

A resident raising her concerns  Resident engineer responding to questions

Residents following proceedings  A resident asking questions.
### Annex 3  Public Participation Meeting Lists of Participants

<table>
<thead>
<tr>
<th>NAME</th>
<th>DATE</th>
<th>ORGANIZATION</th>
<th>VILLAGE</th>
<th>MOBILE NO.</th>
<th>SIGNATURE</th>
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<td>Peter Muchingi</td>
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<td>James Mumo Muga</td>
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<td>Simon Muga</td>
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<td>John Mumo Muga</td>
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<td>David Mumo Muga</td>
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<td>Elizabeth Mumo Muga</td>
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<td>John Muga</td>
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<td>David Muga</td>
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**STAKEHOLDER ENGAGEMENT FORUM**
Nairobi Metropolitan Service Improvement Project (NAMISP) - Kangundo Road Fire Station Project

**Attendee List**
Annex 4  Project Layout Plans

Site layouts
Chance find procedures are an integral part of the project EMMP and civil works contracts. The following is proposed in this regard:

If the Contractor discovers archeological sites, historical sites, remains and objects, including graveyards and/or individual graves during excavation or construction, the Contractor shall:

- Stop the construction activities in the area of the chance find;
- Delineate the discovered site or area;
- Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the Ministry of State for National Heritage and Culture take over;
- Notify the supervisor, Project Environmental Officer and Project Engineer who in turn will notify the responsible local authorities and the Ministry of State for National Heritage and Culture immediately (within 24 hours or less);

Responsible local authorities and the Ministry of State for National Heritage and Culture would then be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archaeologists of the National Museums of Kenya. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage, namely the aesthetic, historic, scientific or research, social and economic values.

Decisions on how to handle the find shall be taken by the responsible authorities and the Ministry of State for National Heritage and Culture. This could include changes in the layout (such as when finding irremovable remains of cultural or archeological importance) conservation, preservation, restoration and salvage.

Implementation for the authority decision concerning the management of the finding shall be communicated in writing by relevant local authorities.

Construction work may resume only after permission is given from the responsible local authorities or the Ministry of State for National Heritage and Culture concerning safeguard of the heritage.
Annex 6  Summarized Bills of Quantities

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<th>Amount (KShs)</th>
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<td>1. Bill No 1: General Items</td>
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<td>2. Bill No. 2 Building Works</td>
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<td>4. Bill No 4: Mechanical Works</td>
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<td>5. Bill No. 5: Access Road</td>
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<tr>
<td><strong>Total</strong></td>
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Annex 7: Detailed Book of Drawings