MINISTRY OF TRANSPORT, INFRASTRUCTURE, HOUSING
AND URBAN DEVELOPMENT

Kenya Informal Settlements Improvement Project
(KISIP)

Environmental and Social Impact Assessment (ESIA) Project Report for
Infrastructure Upgrading of Dallas Informal Settlements, Embu Town,
Embua County

April 2017
<table>
<thead>
<tr>
<th><strong>Project Name</strong></th>
<th>Kenya Informal Settlements Improvement Project (KISIP)</th>
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<tr>
<td><strong>Assignment Name</strong></td>
<td>Environmental and Social Impact Assessment Project Report for KISIP Infrastructure Upgrading sub-projects in Dallas Informal Settlements, Embu County</td>
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<tr>
<td><strong>Lead Implementing Agency</strong></td>
<td>Ministry of Transport, Infrastructure, Housing and Urban Development (MoTIH&amp;UD)</td>
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<tr>
<td><strong>Funding Agencies</strong></td>
<td>Government of Kenya, World Bank, AFD, SIDA</td>
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<tr>
<td><strong>Consultants</strong></td>
<td>GA Consultants, Pamoja Trust and IPE Global</td>
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<tr>
<td><strong>Start Date</strong></td>
<td>May 12th 2014</td>
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<td><strong>Completion Date</strong></td>
<td>May 12th 2015</td>
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<td><strong>Target settlements</strong></td>
<td>Dallas</td>
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</tbody>
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ENG ELISHA AKETCH
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Client

Signed ...........................................Date.................................

KISIP – COORDINATOR
MINISTRY OF TRANSPORT, INFRASTRUCTURE, HOUSING AND URBAN DEVELOPMENT
LIST OF ACRONYMS

AFD  Agence Française de Development
CBOs  Community Based Organizations
EA  Environmental Assessment
ESIA  Environmental Social and Impact Assessment
EMSF  Environmental and Social Management Framework
CG  County Government
KERRA  Kenya Rural Roads Authority
KENSUP  Kenya Slum Upgrading Program
KISIP  Kenya Informal Settlements Slum Upgrading Project
KURA  Kenya Urban Roads Authority
MoTIH&UD  Ministry of Transport, Infrastructure, Housing and Urban Development
NEMA  National Environment Management Authority
OP  Operations Policy
PAD  Project Appraisal Document
PCR  Physical Cultural Resources
PPP  Private Public Participation
RAP  Resettlement Action Plan
RE  Resident Engineer
RPF  Resettlement Policy Framework
SIDA  Swedish International Development Cooperation Agency
SWM  Solid Waste Management
SUP  Settlement Upgrading Plans
WB  World Bank
WRMA  Water Resources Management Authority
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Annex 2 Generic Mitigation Measures for Contractors
E. EXECUTIVE SUMMARY

E-1 Project

The Ministry of Transport, Infrastructure, Housing and Urban Development (MoTIH&UD) is implementing the Kenya Informal Settlements Improvement Project (KISIP) in 14 counties. Embu is one of the Counties targeted to benefit from the Project. The Project is jointly financed by the World Bank, the Swedish International Development Agency (SIDA), the French Agency for Development (AFD) and the Government of Kenya (GoK). The Project’s development objective is to improve the living condition of people living in the informal settlements in the country through securing land tenure and provision of infrastructure and services.

In Embu, KISIP has proposed to implement infrastructure improvement Projects in Dallas Informal Settlement. The type of infrastructure to be implemented in the settlements include: roads, drainage, water and sewerage network extension. These Projects once commissioned will be responding to the current infrastructure challenges experienced in the informal settlements identified and prioritized through community consultations.

The socio-economic studies, feasibility studies and detailed engineering designs for the Project have been completed. The ESIA is therefore prepared for the proposed infrastructure upgrading of Dallas informal settlement under component three of the Project.

**Figure 1 below** illustrates the map of Embu Constituency within which Dallas Informal Settlement is Located

**Figure 1: Embu Constituency**

Source: IEBC Constituency Map 2013
The **Project specific components** will involve upgrading of internal settlement roads within Dallas Informal Settlement to bitumen standards and extension of sewer and water networks within the settlement. Specific works will be as described below:

- Upgrading of roads within Dallas settlement of approximately 1400m, the roads to be upgraded include, Amani, kwa Ringo, Mkondovia, Kaimu and Kwa Shaban roads.
- Extension of 1000m of sewer network within the settlement and construction of a septic tank of capacity 500m$^3$
- Extension of 500m of water network and construction of ten clean water stand pipes.

The total estimated Project cost estimated from Bills of Quantities is Kshs. 207,887,445.00

**E-2 Legal and Regulatory Instruments**


The assessment has also made reference to the World Bank Environment and Social Safeguards Policies, the Project’s Environmental and Social Management Framework (ESMF), and the Resettlement Policy Framework (RPF). The Project triggers the Bank’s Operational Policy 4.01 on Environmental Assessment, and Operational Policy 4.12 on Involuntary Resettlement. A precautionary approach is recommended in case OP 4.04 on Natural Habitats and OP 4.11 on Physical Cultural Properties which are not triggered by the Project.

**E-3 Highlights of Stakeholder Consultations**

Consultative meetings have been held in the region since inception of the Project. These meetings were held in order to involve the community and other key stakeholders in the Project implementation process.

More specific meetings on ESIA and RAP preparations were undertaken in the settlement within the month of September and October 2014. The community was sensitized on the issues related to ESIA and RAP. The meetings also formed a platform for the communities to share their concerns about the Project. These concerns were later used to finalize the detailed designs of the Project.
In summary, the community expressed concerns over the following issues: employment opportunities brought by the Project, wayleave and compensation issues, protecting of environment from pollution likely to be caused by Project activities and issues related to occupational health and safety of both workers and community during Project construction Phase.

E-4 Project Impacts

The impacts during the ESIA assessment were generated based on the analysis of the proposed Project activities to the natural and human environment in Dallas Informal Settlement. The impacts arising during each of the phases of the proposed development namely construction, operation and decommissioning, can be 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.

E4.1 Project Positive Impacts during Construction

The Project is a Socially Uplifting Project (SUP) and it’s envisaged to have more positive impacts after completion of the civil works and commissioning. A summary of anticipated positive impacts of the Project during construction phase include:

- Employment opportunities
- Creation of a market for construction materials
- Injection of money into the local economy
- Creation of wealth

E4.2 Positive Impacts during Operation

The Project will result to both direct and indirect benefits to the residents of Dallas Informal Settlement in Embu Town, these benefits are summarized below:

- The Project will lead to improved accessibility and mobility within the settlement due to upgrading of the proposed roads to bitumen standards and linking the roads to the main road infrastructure in the area.
- The Project will lead to improved status of drainage system within the settlement which will improve the sanitation status of the settlement therefore help in resolving problems associated with storm water and stagnant grey water
- The Project will improve the living standard and well-being of the local economy through provision of good roads, water and sewerage infrastructure.
- Improving the roads, water and sanitation infrastructure within the settlement will result to development of associate social services for example
health facilities, learning institutions and recreational centres which will eventually benefit the community

**E4.3 Negative Impacts and Mitigation Measures during Project Construction Period**

The Project Construction Phase will involve activities related to delivery of construction of pipes and associated fittings to the Project site, manual excavation of trenches, temporary stockpiling of soils, sub-soils and rock along the trenches and importing material. The activities discussed above have the potential of triggering negative environment and social impacts during Project Construction Phase, table E-1 below provides a summary of potential negative impact and proposed mitigation measure.

**Table E-1: Negative Impacts and Proposed Mitigation during Construction**

<table>
<thead>
<tr>
<th>Impact</th>
<th>Summary of Mitigations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project impact to private property and sources of livelihood</td>
<td>• Prepare a Resettlement Action Plan (RAP) for purposes of compensation of likely assets and sources of livelihood for Project affected persons.</td>
</tr>
<tr>
<td>Vegetation clearing, soil erosion and sedimentation</td>
<td>• Contain excavated soils to avoid making them susceptible to agents of erosion.</td>
</tr>
<tr>
<td></td>
<td>• Spilled cement or concrete should be collected and disposed away from natural water ways or storm water drainage;</td>
</tr>
<tr>
<td></td>
<td>• Sensitise workers and enable them to properly handle concrete spillages or waste cement.</td>
</tr>
<tr>
<td></td>
<td>• Re-vegetation of exposed areas around the site should be carried out immediately after completion of civil works and site reinstated</td>
</tr>
<tr>
<td>Air quality pollution from potential air pollution caused by emissions from construction plant and equipment</td>
<td>• Maintain construction equipment at manufactures recommended operational conditions, this will minimize on the emissions released into the atmosphere by the equipments.</td>
</tr>
<tr>
<td></td>
<td>• Earth moving be done under dump conditions to prevent emission of dust into the air.</td>
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<tr>
<td></td>
<td>• Measures to protect sensitive environments like schools and hospitals from dust and exhaust fumes e.g. erecting buffers and restricting parking and maintenance works near schools and hospitals.</td>
</tr>
<tr>
<td>Noise and excessive vibration from construction equipments and vehicles</td>
<td>• Contractor will comply with provisions of EMCA 1999 (Noise and Excessive Vibrations Regulations of 2009)</td>
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<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>Water quality pollution from construction activities this includes both solid and effluents pollution</td>
<td>• Earth moving and excavations for the construction are carried out considering safety of the river and surface drainage.</td>
</tr>
<tr>
<td></td>
<td>• Control siltation of rivers and other surface drains</td>
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<tr>
<td></td>
<td>• Ensure oil spills are not washed into the rivers and drainage channels; this should be done by containing any incidence of oil spill reported on site.</td>
</tr>
<tr>
<td></td>
<td>• Provide oil spill containment including concrete platform for servicing of construction equipment and holding of scrap oil drums.</td>
</tr>
<tr>
<td>Interference with drainage</td>
<td>• Excavated channels to follow contours to avoid interference with</td>
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</table>
### Impact and Hydrology within Project Site

<table>
<thead>
<tr>
<th>Summary of Mitigations</th>
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<tr>
<td>surface drains;</td>
</tr>
<tr>
<td>• Whenever necessary, drains along the construction line are directed towards existing drainage systems to cater for storm water during the rains. However, construction should be carried out during a dry season and should take the shortest period possible;</td>
</tr>
<tr>
<td>• Utilise excavated soil to level excavated ground where necessary and cover the water and sewer lines that will have been laid in the ground.</td>
</tr>
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### Interruption of Existing Infrastructure such as Roads, Waterlines and Power Lines

<table>
<thead>
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<th>Summary of Mitigations</th>
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<tbody>
<tr>
<td>• Formal request for permission to cross, break in and lay the infrastructure should be sought from affected property owners; and</td>
</tr>
<tr>
<td>• A work plan with clear responsibilities for each party should be developed to ensure smooth execution of the construction.</td>
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### Solid Waste Generation from Construction Activities

<table>
<thead>
<tr>
<th>Summary of Mitigations</th>
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<tbody>
<tr>
<td>• A site waste management plan should be prepared by the contractor prior to commencement of construction works. This should include designation of appropriate waste storage areas, collection and removal schedule and identification of approved disposal site;</td>
</tr>
<tr>
<td>• Ensure that the solid waste collection, segregation, and disposal system is functioning properly at all times during the construction phase;</td>
</tr>
<tr>
<td>• Recycle and re-use wastes where possible such as scraps metal.</td>
</tr>
</tbody>
</table>

### Burrowing and Opening of New Quarry for Soil and Hardcore which is Likely to Cause Degradation of Environment due to Abandoned Open Pits and Quarries

<table>
<thead>
<tr>
<th>Summary of Mitigations</th>
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<tbody>
<tr>
<td>• The Contractor will be responsible for ensuring that appropriate authorisation to use the proposed borrow pits and quarries has been obtained before commencing activities</td>
</tr>
<tr>
<td>• Topsoil shall be stripped prior to removal of borrow and stockpiled on site. This soil shall be replaced on the disturbed sections once the operation of the borrow site or quarry is complete.</td>
</tr>
</tbody>
</table>

### Asphalt and Bitumen Storage Area which is Likely to Cause Air Pollution and Water Resources Contamination

<table>
<thead>
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<th>Summary of Mitigations</th>
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<tbody>
<tr>
<td>• Topsoil shall be removed prior to site establishment and stockpiled for later rehabilitation of the site</td>
</tr>
<tr>
<td>• The area shall have a smooth impermeable (concrete or thick plastic covered in gravel) floor. The floor shall be enclosed and sloped towards a sump to contain any spillages of substances</td>
</tr>
</tbody>
</table>

### Cement and Concrete Batching Plant Pollution and Water Resources Contamination

<table>
<thead>
<tr>
<th>Summary of Mitigations</th>
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<tbody>
<tr>
<td>• a Concrete batching plant shall be located more than 20m from the nearest stream/river channel;</td>
</tr>
<tr>
<td>• Contaminated storm-water and wastewater runoff from the batching area and aggregate stockpiles shall not be permitted to enter streams but shall be led to a pit where the water can soak away</td>
</tr>
<tr>
<td>• Suitable screening and containment shall be in place to prevent windblown contamination associated with any bulk cement silos, loading and batching</td>
</tr>
</tbody>
</table>

### Occupational Health and Safety Risks Associated with the Project

<table>
<thead>
<tr>
<th>Summary of Mitigations</th>
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<tbody>
<tr>
<td>• Establish a Health and Safety Plan (HASP) for civil works areas ensuring the working hours are controlled and that employees are not allowed to extend the working hours beyond an acceptable limit for purposes of gaining extra pay;</td>
</tr>
<tr>
<td>• Provide workers with gloves, ear gears, sturdy rubber boots and overalls to protect their skin from the effects of cement;</td>
</tr>
<tr>
<td>• Provide workers training on safety procedures and emergency response such as fire and sewer pipe bursts before deployment;</td>
</tr>
<tr>
<td>• Establishment and training of safety committee at the work place</td>
</tr>
</tbody>
</table>
### Impact | Summary of Mitigations
--- | ---
Safety procedures posted on notice boards  
A dedicated officer on safety issues  
Regular safety reports and remedial actions taken by the contractor to the RE and client  
Safety issues / incidents to be discussed in the site meetings and remedial measures taken  
Ensure no worker is under the influence of alcohol or any other intoxicating substances that interfere with judgment.

**Spread of communicable diseases and HIV/AIDS infection**  
- Develop appropriate training and awareness materials for Information, Education and  
- Develop an intervention strategy compatible with the construction programme to address success of the HIV/AIDS prevention and provide peer educators for sustainability in collaboration with other stakeholders; and  
- Integrate monitoring of HIV/AIDS preventive activities as part of the construction supervision. Basic knowledge, attitude and practices are among the parameters to be monitored, and particularly on provision of condoms, status testing and use of ARVs.

---

### E4.4 Project Negative Impacts and Proposed Mitigation Measure during Operation Phase

The Project once commissioned has the potential of triggering negative impacts associated with operation and maintenance as summarized in table E-2 below.

**Table E-2: Negative Impacts during Project Operation**

<table>
<thead>
<tr>
<th>Impact</th>
<th>Summary of Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risk of encroachment and construction of structures on water/sewer wayleaves and road reserves</strong></td>
<td></td>
</tr>
</tbody>
</table>
- Mapping and installation of beacons to which illustrate the width of the pipeline and road reserve  
- Regular inspection of the road and pipeline corridor for encroachment.  
- Prosecution of encroachers as required by county by laws on way leaves and road reserves maintenance.  
- Conduct public sensitization programs on importance not interfering with way leaves and public reserve land. |
| **Increased Accidents associated with motor cycles over speeding within the settlement due to good roads** |  
- The County Government to enlighten motorist and cyclist on importance of obeying traffic rules especially in residential areas.  
- The County Government to enlighten residents and school children on the importance of adhering to provisions of road safety rules  
- Regular inspection and maintenances of the road by County Government of Embu to ensure the speed control parameters and signage are in good condition.  
- Regular crackdown, arrest and prosecution of motorists and cyclist who disobey road safety directions.  
- Provide pumps to slow down traffic at critical points. |
| **Risk of illegal connection to the sewer pipeline** |  
- This is common in the informal settlements where residents illegally connect to sewer infrastructure.  
- This will require constant inspection by EWASCO officials and installation of leak and burst detectors at designated areas along the sewer pipeline.  
- Conduct public sensitization programs on importance not interfering with the sewer pipeline and the need to seek official sewer connection from EWASCO |
| **Risk of Sewer blockage and overflows to the environment** |  
- Regular check, repair and maintenance of the sewer line  
- Activate a community watch group for information sharing on the status of the sewer line  
- Awareness rising among community members not to dump solids in manholes. |
### Impact | Summary of Mitigation
--- | ---
Development of an inventory of system components, with information including age, construction materials, and drainage areas served elevations. | • Design manhole covers to withstand anticipated loads and ensure that the covers can be readily replaced if broken to minimize entry of garbage and silt into the system.
• Ensure sufficient hydraulic capacity to accommodate peak flows and adequate slope in gravity mains to prevent build-up of solids and hydrogen sulphide generation.

#### Risk of Vandalism of the infrastructure (Manhole covers and manhole step irons)
| • This is common when the manhole covers are made using steel and concrete, also step iron bars in the manholes, the steel is usually stolen by steel scavengers.

#### Land and Soil Contamination
| • The EWASCO to attend to burst pipes promptly to prevent excessive loss of soil;
• Provide high risk areas with appropriate drainage for effective channelling of burst sewage spills;
• Encourage land owners along sewer lines to maintain vegetated belts along the pipeline to control any overflows flows and trap soil. They should be encouraged to take responsibilities at the lowest levels in regard to protecting the sewer line;
• Mark clearly the pipeline for ease of identification and protection by the adjacent landowners.

#### Increase in social vices
| • County Government and EWASCO to conduct community sensitization forum on importance of taking care of roads and water services infrastructure.
• Proper security measures should be put in place to guard the equipments 24 hours to reduce cases of vandalism, of road signage and sewer manholes.

#### Solid waste management – may block drains, increase flooding and risk of diseases outbreaks
| • Involvement of local CBOs for collection and manning the transfer stations.
• County Government to ensure:
  a) that the waste collection areas are zoned;
  b) timely and regular collection of all solid wastes either through door to door collection or from centralized collection points;
  c) waste collection facilities such as skips, bulk containers and waste cubicles are regularly emptied and do not become eye-sores;
  d) there is a designated site(s) for waste disposal
  e) that the disposal site is secured with a fence and a gate manned to control dumping and spread of waste outside the disposal site.
  f) motorable roads inside the site to ensure ease of access during disposal;
  g) the waste is spread, covered and compacted at regular intervals
  h) appropriate control measures for the management of dumpsite fires.

---

**E-5 Conclusion and recommendation**

Through the assessment and evaluation of all environmental concerns of the proposed Project, it can be concluded that the establishment will bring a net ecological, economic, social and health benefits to all living within the Project area. On the other hand, some of the Project components are envisaged to have negative impacts depending on the different phases and components of the Project. These impacts have been discussed in details in this report and mitigation measures proposed as summarized below;
• The Project has an overall positive impact on the informal settlements as it will improve the living conditions of people living and working in the informal settlements, through improving accessibility, drainage, waste, and security.

• The Project does not have significant and potentially irreversible negative impacts on the environment and people. The few identified negative impacts associated with construction Projects can easily be mitigated, and an Environmental and Social Impact Management Plan has been prepared as part of this report.

• The Project will not lead to displacement of people as the roads are designed to follow the designated road reserves on the physical development plans (PDPs). However, there are encroachments on the road reserves mostly of temporal structures for informal traders. A RAP has been prepared to mitigate against this impact and to ensure that their livelihoods are not negatively impacted upon.

• The ESMP should be fully implemented and should form part of the contract with the selected contractors who will undertake the works. The implementation of the EMP should be monitored in accordance with the monitoring plan in this report. The Resident engineer should supervise and report on the implementation regularly as provided.

• The RAP should be fully implemented before the commencement of the Project.

• Provisional Budget of Kenya Shilling 7.5million should be included in the bidding documents for implementation of mitigation measures of potential negative
1.1 Background Information

The Kenya Informal Settlements Improvement Project (KISIP) is a five year project with the objective of improving living conditions of residents in Kenya’s urban informal settlements. The Project Development Objective (PDO) is ‘to improve living conditions in informal settlements in selected Counties in Kenya.’ This Project goal is consistent with Kenya’s Vision 2030 goal of ‘a well housed population living in an environmentally secure urban environment’. The Project is jointly financed by the World Bank, AFD and Sida. The Ministry of Transport, Infrastructure, Housing and Urban Development, is the implementing arm of the Government. The Project specific interventions included enhancing tenure security and also settlement level planning and infrastructure in the selected informal settlements. The KISIP became effective in June, 2011.

The Project covers the following fourteen (14) Counties: Nairobi City, Mombasa, Kisumu, Nakuru, Uasin Gishu, Nyeri, Kiambu, Embu, Garissa, Kakamega, Kericho, Kitui, Machakos and Kilifi. The project has the following four components:

- Institutional development and programme management which assists in strengthening the capacity of the Ministry of Transport, Infrastructure, Housing and Urban Development and the participating County Governments, and also finances programme management activities (including preparation of a baseline and systems for monitoring and evaluation).
- Enhancing tenure security, this supports scale-up and process systematization of ongoing efforts to regularize tenure in urban slums, and includes financing for the following types of activities: community organization and mobilization, identification and delineation of settlement boundaries, preparation of Local Physical Development Plans (LPDPs), and issuance of letters of offer/allotment to individuals/groups.
- Investing in settlement restructuring and infrastructure this supports implementation of settlement upgrading plans developed at the community level, investment in settlement level infrastructure, and, where necessary, extension of trunk infrastructure to settlements.
- Planning for growth: Supporting delivery of affordable housing and serviced land this supports proactive planning to dampen the growth of new slums and mechanisms for delivery of land and housing that can enhance affordability for middle- and low-income households.

This ESIA has been prepared for the proposed infrastructure upgrading of Dallas settlement in Embu County.
1.2 Project Justification and Benefits

The project is directly linked to Kenya’s Vision 2030, as a planning document, Vision 2030 is divided into three fundamental pillars: Economic, Social and Political pillars. The social pillar aims at realizing a just and cohesive society enjoying equitable social development in a clean and secure environment. The KISIP Project is in line with the millennium development goals number (7), target 7d which seeks to achieve significant improvement in lives of at least 100 million slum dwellers, by 2020.

The Project addresses improved water supply and sanitation, in small towns and surrounding rural areas, as well as water storage that underpins the Kenyan economic and social developments (Vision 2030) and its associated five years Medium Term Plan (MTP) for 2012 – 2017.

Sustainable Development Goal (6) which is the new 2030 agenda and expands Millennium Development Goal (MDG) as guided by resolutions of Rio+20 conference. The goal focuses more on investment in adequate infrastructure in water sanitation, Hygiene, water quality, waste Water Management, water scarcity and use efficiency, integrated water resource management and protection of water related ecosystems.

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 reviewed in 2009 established under the Environmental Management and Coordination Act (EMCA), 1999 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 and Social Management Plan to mitigate the identified impacts so as to ensure sustainability of the proposed Projects.
- To recommend cost effective measures to be implemented to mitigate against the expected impacts.
1.4 ESIA Assessment Methodology

The approach to this exercise was structured such as to cover the requirements under the EMCA, 1999, as well as the EIA regulations as stipulated under the Gazette Notice No. 56 of 13th June 2003 and World Bank Operational safeguards policies. The assessment involved an understanding of the Project background, the interim designs and the implementation plan as well as Project commissioning. In addition, baseline information was obtained through physical investigation of the site and the surrounding areas, interviews with a sample of surrounding community, Stakeholder benchmarking photography and most important discussions with the Client and the Design Team.

1.4.1 Environment and Social Scoping

Scoping process involved the identification of significant environmental and social issues associated with the proposed Works. Through reviews of the secondary documents and available data supported with field evaluations, it was possible to estimate the current status of the road, drainage, water and sanitation infrastructure. Interviews and discussions with stakeholders and Project beneficiaries were applied in determining the aspects such as adequacy of the supply, awareness ownership, willingness to pay for water and general opinions of the people. Significant issues identified through this process have been applied in drawing up the impacts as well as the management plan under this Report.

1.4.2 Desk Reviews

A desktop review was conducted prior to site visit. Documents reviewed include:

- Project Appraisal Document PAD for KISIP
- Environmental Management and Social Framework (EMSF)
- Resettlement Policy Framework (RPF) 2011
- Conceptual Design Report KISIP Embu2014
- Socio Economic Report for Embu 2014
- Community Consultation Report Embu 2014
- Inception Report for KISIP component 3 2014

1.4.3 Field Assessment

The physical evaluation of the Project area was carried out with specific focus on the environmental and social issues. The environmental issues assessed include, water sources and water quality, drainage and hydrology, air quality, sanitation and hygiene, biodiversity and sources of environmental pollution. The social issues include; settlement patterns, socio economic activities, land use, presence of traditional/cultural sites in the area. On the social economic front, structured
stakeholder consultation meeting were held in some specific areas in addition to rapid interactions with the stakeholders to capture the views of all the parties affected.

1.4.4 Key Informants

The process involved identification of relevant stakeholders to be consulted during the assessment; a meeting was organized between the Settlement Executive Committee (SEC), Environment Consultant, EWASCO, the key findings during the stakeholder consultations are presented in chapter 6 of this Report.

1.5 Socio Economic Survey Methodology

1.5.1 Socio Economic Survey

The survey was conducted within Dallas informal Settlement with target respondents being the anticipated Project beneficiaries. The information gathered was based on (a) review of secondary data and (b) collection of primary data, both qualitative and quantitative. The qualitative data was gathered through administration of questionnaires and public consultative meetings organized by the area local administration and community members and other stakeholders in the locations.

1.5.2 Household Surveys

The objectives of the household survey was to; understand demographic/economic profile of households of the locations, know status of and issues related to ownership and tenancy structure, assess resident’s access to infrastructure, social amenities, understand environmental conditions, health and various social issues and establish baseline for impact evaluation of prior the proposed investments.

1.5.3 Social Infrastructure Mapping

Social mapping was undertaken while doing the community survey using full participation from the local administration and community. The focus of the process was to help in the depiction of location boundaries, roads, drainage systems, schools, drinking water facilities, source of drinking water, community infrastructure, etc. It focused on the spatial dimension of the people’s realities as expressed in their background information. This process done to help in charting the various aspects related to land use and command areas, water bodies, rivers, drainage.

1.5.4 Sampling Design

The study design relied on probabilistic sample design for selection of households so as to ensure that every single household in the settlement area has a known and non-
zero chance being selected into the survey sample. For the household survey, it is quite common to use circular systematic sampling (Systematic sampling is a probability sample selection method in which the sample is obtained by selecting every kth element of the population, where k=N/n, N is population and n is the sample size). The first sampling unit is selected randomly within the first k units of the list.) Method for selection of households and the same has been followed in the present study.

1.5.5 Sample Size

The sample size was determined at 5% level of precision (also called desired margin of error), 95% confidence level and 50% population proportion of response to key study indicators. The choice of population response proportion is arbitrary; but this is what is assumed to generate the largest possible sample in the absence of a prior knowledge about population response to key study indicators. The sample size was not adjusted for non-response factor. Like in many surveys, non-response of the sampling unit (here household) has been tackled by substituting original sample unit by another.

1.5.6 Survey Questionnaire

The survey questionnaire was designed after reviewing the instruments used in similar kind of household studies in Kenya and prototype survey instruments available from the user guide of the World Bank Group (Preparing Surveys for Urban Upgrading Interventions – Prototype Survey Instrument and User Guide, March 2008). The questionnaire used contains six modules, namely: demographics and household composition; security of housing, land and tenure; settlement profile; economic and employment profile; infrastructure services; and health

1.5.7 Secondary Socio Economic Data

This information was largely drawn from the Kenya National Bureau of Statistic, The Kenya Population and Housing Census VII on Population and Household Distribution by Socio Economic Characteristic, August 2010 and findings from household survey undertaken during Environmental and Social Impact Assessment (ESIA) process within the month of April 2016.
CHAPTER 2: PROJECT DESCRIPTION

2.1 Community Prioritization

Based on socio-economic survey and stakeholders’ consultation in with beneficiaries in the settlement, the following infrastructure projects were recommended as shown in table 2-1.

Table 2-1: List of Recommended Projects

<table>
<thead>
<tr>
<th>Component</th>
<th>Conceptual design variant</th>
<th>Feasibility study variant 1</th>
<th>Feasibility study variant 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>R Road Component</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R1</td>
<td>Upgrading of main settlement access road based upon the planned KURA urban roads</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R2, R3, R4</td>
<td>Upgrading of Internal settlement roads based upon the settlement PDP</td>
<td>Upgrading of selected internal settlement roads based upon the settlements PDPs</td>
<td></td>
</tr>
<tr>
<td>R5</td>
<td>Upgrading of main settlement footpaths based upon the settlements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D Drainage component</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D1</td>
<td>Implementation of settlement level drainage network following the road network and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S Sewerage component</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td>Extension of the sewerage network to reach the settlement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>Facilitating household connections to the sewer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SL Street Lighting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SL</td>
<td>Implementation of floodlights in the settlements</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.2 Road and Drainage

The road sub-components proposed shall include upgrading the roads within the settlement to bitumen standards, currently roads in the settlement are poorly maintained earth road which become impressible during rainy seasons. Roads and Drainage Works in Dallas Settlements will involve construction of 870 m of urban roads and 400m of footpaths following the existing urban road and footpath alignment. Specific road as referred to by community members are illustrated in box 1 below.

Box 1: Proposed Roads to be upgraded
- Amani
- kwa Ringo
- Mkondovia
- Kaimu
- Kwa Shaban.

Ministry of Transport, Infrastructure, Housing and Urban Development
Annex 2 to this assessment presents a layout map of the proposed roads while Photo Plate 2.1 below presents status of roads in Dallas Settlement.

**Photo Plate 2.1: Roads in Dallas Settlement.**

### 2.3 Water and Sewerage Works

The settlement currently has no planned sanitation facilities, majority of the properties within the settlement are served by pit latrines, soakage pits and septic tanks. The soakage pits and septic tank often overflows and dispose raw sewage into the drainage channels which ultimately end up into the permeable subsoil posing pollution threat to water resources and soil contamination.

- The proposal is construct secondary Sewers, diameter varying in sizes from 200mm to 300mm approximate 1000m within the settlement
- The sewer will be drained to a proposed septic tank of capacity 500m$^3$ to be constructed within the settlement on public land, the septic tank will be operated and maintained by Embu Water and Sanitation Company (EWASCO)

The settlement currently is supplied by water from EWASCO network, however not all homes are adequately served, therefore in order to address the challenges of water supply, the project shall extend water supply within the settlement by approximate 500m and construct approximately 10nr. Stand water pipes.

### 2.4 Project Cost Estimate

The total estimated cost of the project is estimated to be Kshs. 207,887,445.00 as presented in the figure below

**Figure: 2.1: Summary of Bills of Quantities**
## ESIA Project Report for KISIP Infrastructure Upgrading sub-Projects

**Dallas Informal Settlements, Embu County**

<table>
<thead>
<tr>
<th>BILL NO.</th>
<th>DESCRIPTION</th>
<th>GRAND AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
<td>Pedestrians and Drainage</td>
<td>60,389,300.30</td>
</tr>
<tr>
<td><strong>4</strong></td>
<td>Site Clearance and Top Soil Shifting</td>
<td>408,400.28</td>
</tr>
<tr>
<td><strong>5</strong></td>
<td>Fashwords</td>
<td>56,099,000.00</td>
</tr>
<tr>
<td><strong>7</strong></td>
<td>Excavation and Filing for Structures</td>
<td>5,452,300.00</td>
</tr>
<tr>
<td><strong>9</strong></td>
<td>Pavement and Drainage Works</td>
<td>28,934,000.00</td>
</tr>
<tr>
<td><strong>10</strong></td>
<td>Passage of Traffic</td>
<td>2,094,000.00</td>
</tr>
<tr>
<td><strong>12</strong></td>
<td>Natural Material Surfacing and Base</td>
<td>7,162,000.00</td>
</tr>
<tr>
<td><strong>14</strong></td>
<td>Cement Treated Surfacing, Subbase and Base</td>
<td>4,005,400.00</td>
</tr>
<tr>
<td><strong>16</strong></td>
<td>Bitumen Surfaced Treatments</td>
<td>22,099,000.00</td>
</tr>
<tr>
<td><strong>20</strong></td>
<td>Road Furniture</td>
<td>11,727,425.20</td>
</tr>
<tr>
<td><strong>22</strong></td>
<td>Drainage</td>
<td>2,941,150.20</td>
</tr>
<tr>
<td><strong>23</strong></td>
<td>Sewer Works</td>
<td>20,855,400.00</td>
</tr>
</tbody>
</table>

**SUB TOTAL 1**  

| TOTAL | 2,078,714.50 |

**SUB TOTAL 2**  

| TOTAL | 228,879,109.94 |

| 10% VAT / (To be paid directly to KRA) | 26,891,300.22 |
| **SUB TOTAL 3** | 2,094,179.82 |
| 0.5% RCA LEV7 | 13,263,278.59 |
| **GRAND TOTAL** | 278,827,968.81 |
CHAPTER 3: BASELINE INFORMATION

3.1 Location of the Project

The baseline demographic data for Embu Town used in this ESIA assessment is available from web site www.citypopulation.de/Kenya. The web site www.citypopulation.de/Kenya compiles all available census data information for Kenyan urban areas. Data is available for 1979, 1989, 1999 and 2009. Based upon this data, the Town population numbers and the average annual growth in between the census period are shown in table 3-1 below.

Table 3-1 Embu Town population

<table>
<thead>
<tr>
<th>Year</th>
<th>1979</th>
<th>1989</th>
<th>1999</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>City population</td>
<td>263,173</td>
<td>370,138</td>
<td>449,141</td>
<td>516,212</td>
</tr>
<tr>
<td>Average annual growth</td>
<td>4.1%</td>
<td>2.1%</td>
<td>1.4%</td>
<td></td>
</tr>
</tbody>
</table>

Source: KNBS 2013

3.2 Population and Gender profile of Dallas Informal Settlement

Population of Dallas Settlement estimated from the total number of households of 262 households at 4.4 as the household size, therefore the population of Dallas is estimated to be 1152 people.

Referring to the Socio Economic Survey conducted in the settlement, 50% of the respondents were males while 49% of the respondents were female, apply the same principle to the population size to estimate gender profiles, it is estimated therefore that 576 are male while females are 566 people in the settlement.

3.3 Historical Information of Dallas Informal Settlement

The Dallas Informal Settlement is situated in the Dallas/Stadium sub location of Embu West Sub County. Although, the boundaries of the identified informal settlements’ project are not correspond to the larger Settlements’ area, but lies within the larger area, the population density values as well as the habitants/household values of the larger settlement area, can be used as benchmark figures during the course of the project. By applying the 1.4% annual growth rate to Embu Town calculated between 1999 and 2009, in 2012 the above sub location has the following characteristic.

Dallas settlement in Embu town, established in the 1960’s, was so named in the early
1960’s after early US films with plots based mostly on Texas and Dallas cowboys, popular then among the founding members; although a few residents state that one of their founders, the ex-mayor, also got an opportunity to go abroad and upon his return influenced the naming of the settlement, Dallas.

The settlement, made up of the Dallas slum and surrounded by four other settlements, is made up of 113 plots. Dallas slum came into existence after 1963 independence. A number of Muslims were living in the larger Dallas area and saw it fit to preserve and grow their faith and that of other Muslims in the area through establishing a community where they could support each other and their families. Thus they sold their plots and bought the now Dallas slum. In 1997, subdivision of the land making up the Dallas slum begun to be undertaken, today there are 113 plots owned individually by individuals and their families. Land in the slum is owned through title deeds. **Figure 3-1** below presents map showing the project area

**Figure 3-1: Location of the Project**

Source: IEBC Constituency Maps 2013
3.4 Physical Environment

This chapter will analyze the environmental characteristic surrounding the areas proposed for the Project. The sub-sections below describe the physical, biophysical, social and cultural environment of the Project area.

3.4.1 Climate

The climate of Embu County can be characterized as Tropical climate. Due to its location on the slopes of the Mt Kenya, the climate and temperatures within the Project area are influenced by the high altitude; Rainfall is bimodal with long rains occurring from March to June, and the short rains from October to December.

The project area is characterized with mean maximum temperatures range from 24 to 36 degree C, while the mean minimum ranges from 10 to 14 degree C. Rainfall distribution is controlled by the north-south movement of tropical convergence zone. This gives rise to two seasons. The dry season in January and February is followed by the rainy season from mid- March to the end May (long rains). The dry season from June to mid-October is followed by the wet season from mid-October to the end of December. The average rainfall is about 1495 mm in the region above 2000 mm

3.4.2 Topography

Embun county topography is characterized by typical tropical highlands, midlands and
other features including hills and valleys, with wide variations in altitudes. Altitudes for the highlands range from 1,500 to 4,500 m at the foot of Mount Kenya. The midlands range from 1,200 to 1,500 m above the sea level.

3.4.3 Geology and Soils

The soil structure of Embu town comprises of volcanic soils. The soils are dark reddish brown, well drained, friable and very calcareous derived from tertiary volcanic rocks. These are suitable for agricultural development. The geology is prevalently basement system rocks consisting of undifferentiated quartz. The basement system is covered by a layer of Kenya Basalt.

3.5 Biological Environment

3.5.1 Flora

The project area has no significant vegetation due to its urban setting. Due to high population density, most of the area is built-up.

3.5.2 Fauna

There is no terrestrial wildlife observed in the Project areas since the area is a built-up urban area.

3.6 Social Setup

3.6.1 Water Supply

The settlement is supplied with water from the main water line from Embu Water and Sanitation Company (EWASCO) as well as by two Water Kiosks both established by donors, one of which is the UNDP funded project through UMANDE trust. The other was established by a joint partnership between KfW, European Union and Water and Sanitation Company. The water is sold to residents who do not have piped water at a fee of Ksh. 3/= for a 20 liters jerry-can. Connections to households are metered and in some cases, families sell to others who do not have access to their own piped water at a rate of Ksh. 5/= for a 20 liters jerry-can.

3.6.2 Solid Waste Management

The community does not have garbage collection points. Consequently, garbage is dumped in any open space that is available and mostly along roads. Some youth groups have attempted to create collection systems although funding has impeded their effectiveness. Currently, Unity for Development, a youth initiative is attempting to provide weekly collection of solid waste at about Ksh. 350 a month; however residents are reluctant to pay the fee. In addition, residents are not interested in
storing waste in their households for a week waiting for the once a week collection and prefer to dump it wherever is convenient. **Photo plate 3.1** below illustrates Solid Waste Management within the Settlement

The town does not operate a land fill and the final destination of waste is open dumpsites. In the meantime, as a mitigation measure, the County Governments are expected to improve the conditions of the dumpsites by implementing minimum requirements across the waste management cycle as developed by NEMA.

**Photo Plate 3.1: Solid Wastes Handling in Dallas**

3.6.3 **Waste Water Management**

No sewer exists in the area. All households rely on pit latrines which are basically 20 – 30m deep holes which when are full are either cleared through exhaust pipes or closed and another dug. Septic tanks are another alternative used by households. The number of houses found in each plot depend on landlords abilities to expand and may range from 4 units to 15.

3.6.4 **Storm water Drainage**

No drainages exist along the roads in the settlement. Storm water flows into the settlement and along the roads. There is frequent damping of grey water on roads. All water passing through the settlement especially following rains ends up in a pond adjacent to the settlement, which is the lowest point.

3.6.5 **Electricity Supply**

Electricity is available in the settlement supplied by the Kenya Power. Connection is determined by affordability. Majority have access to electricity supply, connection is only limited where a household cannot raise the fee required for connection although the area is well served by the electricity lines. Illegal connections are very few and only occur within plots where one household may connect others living in the same plot to their meter.
3.6.6 Social Amenities

Not much effort has been made by the government or the community to have social amenities within the settlement. All social amenities are located outside the settlement. The public amenities within proximity of the community are inadequate. The closest amenities include one private nursery and primary school and one health facility.
CHAPTER 4: PROJECT ALTERNATIVES

4.1 Project Alternative

This section analyses the Project alternatives in terms of site, technology scale and waste management alternatives. However, under this study the alternatives that were considered for the Project were focused on variables illustrated below;

- Settlement size and density: larger and denser settlements chosen receive priority to ensure that as many people as possible benefit from the investments.
- Scale of potential displacement of residents: physical upgrading of the settlement should not entail large-scale displacement (and, thereby, relocation) of residents.
- Land tenure status: a settlement must be located on land that is owned by the government.
- Location: a settlement cannot be located on a hazardous site or in an environmentally fragile area.
- Proximity to trunk infrastructure: to maximize settlement coverage within a limited budget and to ensure that participating settlements receive connections to the main infrastructure networks and maintenance systems, in the initial years of project implementation settlements that are in close proximity to core trunk infrastructure on the main road was a consideration.
- Sustainability of the proposed rehabilitation is ensured through community’s willingness to participate and remain engaged in the program.

4.2 KISIP Investments Identification

In the case of KISIP, identification of investments was also a reflection of the community felt needs, selection of investments was guided by given principles namely;

- The service should be selected from the agreed investment menu.
- The investment should be a priority specified in the Physical Development Plan (PDP) of the County.
- The chosen infrastructure investments should be economically justifiable.
- Arrangements for operations and maintenance must be sound and give confidence that service delivery will be sustainable.
- Environmental and social impacts of infrastructure investments are positive.
- Budget and per hectare cost must be within agreed limits.
4.3 Project Option Alternatives

The proposed KISIP interventions in the settlement are long overdue considering the growth and expansion of the settlement population for the last 3 – 4 decades, and rising demand for improvement of roads, sewerage, water supply and solid waste management.

The project option as described in the ESIA is recommended as it to achieve significant improvement in lives of at least 100 million slum dwellers, by 2020 by providing the basic infrastructure.

4.4 Land Requirement

The projects have been designed to only utilize the road reserves as designated on the Physical Development Plans (PDPs). No private land will be acquired for the project. This has significantly minimized displacement of populations and livelihoods as a result of the Project and the need to carry out resettlement.

4.5 Chosen Alternatives from KISIP Menu

Material for fill shall be preferably red soil which is available on site. Other material such as rock and clay is also readily available within many small quarries a few kilometers from the settlement.

The Project designs were prepared for each of the infrastructure priorities identified by the communities in the settlement during the socio economic assessment and priority validation forums organized by the design consultants. Factors that determined the choice and design of the infrastructure was based on the below listed principles;

- Defining technical, social and environmental feasibility.
- Detailing design standards for each infrastructure component.
- Estimating quantities.
- Preparing unit cost rates and a feasibility design cost estimate.
- Evaluating O&M issues and potential costs.
- Revising the scope of the infrastructure components if required.

**Table 4-1** below presents the scoring of priority interventions in the settlement
Table 4-1 scoring of priority interventions in the settlement

<table>
<thead>
<tr>
<th>Settlement</th>
<th>Socio Economic report</th>
<th>Community consultation</th>
<th>On the basis of Conceptual design</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Roads and drainage</td>
<td>Roads</td>
<td>Roads and drainage</td>
</tr>
<tr>
<td>2</td>
<td>Garbage disposal system (19.8%)</td>
<td>Solid waste Management</td>
<td>Sewerage</td>
</tr>
<tr>
<td>3</td>
<td>Sewerage (18.3%)</td>
<td>Sewerage</td>
<td>Solid waste management</td>
</tr>
<tr>
<td>4</td>
<td>Storm water drainage (11.1%)</td>
<td>Storm water drain</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Electricity (8.5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Water supply (6.8%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Street lighting (4.0%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Others (1.9%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Open spaces (1.1%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Feasibility Study Report KISIP 2015

4.6 No Project Alternative

The No Project Option in respect to the proposed Project implies that the status quo is maintained. The no Project option is the least preferred option from the socio-economic and partly environmental perspective due to the following factors:

- The will be no improved accessibility and mobility within the settlements.
- The will be no improved drainage system within the settlements.
- The will be no improved Health and Sanitation within the settlements.
- There will be no improved living standard/well-being, employment and local economy in the target settlements.
- The will be no creation of employment both during construction and operation phases of the projects.
- The will be no increased Land Value within the settlements.
- The will be no improved Access to Social Services within the settlements.

From the analysis above, it becomes apparent that the No Project alternative is no alternative to the community.
CHAPTER 5: POLICY, LEGAL, AND INSTITUTIONAL FRAMEWORK

5.1 Introduction

Development of infrastructure Projects is dealt with under several laws, By-laws, regulations and Acts of parliament, as well as policy documents and it is not possible to bring all those statutes under one heading. This section is therefore aimed at assessing the existing policies and legislative framework, economic tools and enforcement mechanisms for the management of infrastructure Projects at different stages. In so doing, the discussion will be based on the following legislations and policy provision.

5.2 Policy Provision

5.2.1 Constitution of Kenya

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.

5.2.2 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. 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 in to 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 Water and sanitation services in Embu town through the construction of sewerage Project.

5.2.3 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 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.

5.2.4 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 physical infrastructure within the settlement.

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.
5.2.5 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.

5.2.6 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 Kenyan Legislation

5.3.1 The Environmental Management and Coordination Act (EMCA), 1999

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 Impact Assessment and Audit Regulations state in Regulation 3 states that “the Regulations should apply to all policies, plans, programmes, Projects and activities specified in Part IV, Part V and the Second Schedule of the Act. Part III of the Regulations indicates the procedures to be taken during preparation, submission and approval of the environmental Project report.

**Relevance**

Part 4(1) of the Regulation further states that: “no Proponent shall implement a Project”

- Likely to have a negative environmental impact; or
- For which an environmental impact assessment is required under the Act or these Regulations, unless an environmental impact assessment has been concluded and approved in accordance with these Regulation.

- **The Environmental Management and Coordination (Waste Management) Regulations, 2006 Legal Notice No. 121;** These Regulations were published in the Kenya Gazette Supplement No. 69, Legislative Supplement No. 37, and Legal Notice No. 121 of 29th September, 2006. The regulations provide details on management (handling, storage, transportation, treatment and disposal) of various waste streams including:
  - Domestic waste;
  - Industrial waste;
  - Hazardous and toxic waste;
  - Pesticides and toxic substances;
  - Biomedical wastes; and
  - Radioactive waste.

Regulation No. 4 (1) makes it an offence for any person to dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle. Regulation 5 (1) provides categories of cleaner production methods that should be adopted by waste generators in order to minimize the amount of waste generated and they include:

(i) Improvement of production process through
- Conserving raw materials and energy;
- Eliminating the use of toxic raw materials and wastes;
- Reducing toxic emissions and wastes.

(ii) Monitoring the product cycle from beginning to end by
- Identifying and eliminating potential negative impacts of the product;
- Enabling the recovery and re-use of the product where possible, and
• Reclamation and recycling and
• Incorporating environmental concerns in the design and disposal of a product.

Regulation 6 requires waste generators to segregate waste by separating hazardous waste from non-hazardous waste for appropriate disposal. Regulation 15 prohibits any industry from discharging or disposing of any untreated waste in any state into the environment. Regulation 17 (1) makes it an offence for any person to engage in any activity likely to generate any hazardous waste without a valid Environmental Impact Assessment license issued by NEMA.

Relevance
The proposed Project, during construction phases will generate wastes which will need to be disposed of as per the guidelines in the regulations.

• The Environmental Management and Coordination (Water Quality) Regulations, 2006 Legal Notice No. 120; - These Regulations were published in the Kenya Gazette Supplement No. 68, Legislative Supplement No. 36, and Legal Notice No. 120 of 29th September, 2006. The Regulations provides for sustainable management of water resources including prevention of water pollution and protection of water sources (lakes, rivers, streams, springs, wells and other water sources). It is an offence under Regulation No. 4 (2), for any person to throw or cause to flow into or near a water resource any liquid, solid or gaseous substance or deposit any such substance in or near it, as to cause pollution. Regulation No. 11 further makes it an offence for any person to discharge or apply any poison, toxic, noxious or obstructing matter, radioactive waste or other pollutants or permit the dumping or discharge of such matter into the aquatic environment unless such discharge, poison, toxic, noxious or obstructing matter, radioactive waste or pollutant complies with the standards for effluent discharge into the environment.

Relevance
During the construction and maintenance phases, the proposed Project will discharge its final effluent into Kariari Swamp. The discharge must comply with the standards specified in this regulation before being allowed into the river in order to protect the rivers ecological function.

• The Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 Legal Notice No. 61; - These regulations were published as legal Notice No. 61 being a subsidiary legislation to the Environmental Management and Co-ordination Act, 1999. The regulations provide information on the following:
  • Prohibition of excessive noise and vibration;
  • Provisions relating to noise from certain sources;
  • Provisions relating to licensing procedures for certain activities with a
potential of emitting excessive noise and/or vibrations and
• Noise and excessive vibrations mapping.

According to regulation 3 (1), no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment. Regulation 4 prohibits any person to (a) make or cause to be made excessive vibrations which annoy, disturb, injure or endanger the comfort, repose, health or safety of others and the environment; or (b) cause to be made excessive vibrations which exceed 0.5 centimeters per second beyond any source property boundary or 30 metres from any moving source.

Regulation 5 further makes it an offence for any person to make, continue or cause to be made or continued any noise in excess of the noise levels set in the First Schedule to these Regulations, unless such noise is reasonably necessary to the preservation of life, health, safety or property.

Regulation 12 (1) makes it an offence for any person to operate a motor vehicle which (a) produces any loud and unusual sound; and (b) exceeds 84 dB(A) when accelerating. According to sub-regulation 2 of this regulation, No person shall at any time sound the horn or other warning device of a vehicle except when necessary to prevent an accident or an incident. Regulation 13 (1) provides that except for the purposes specified in sub-Regulation (2) there under, no person shall operate construction equipment (including but not limited to any pile driver, steam shovel, pneumatic hammer, derrick or steam or electric hoist) or perform any outside construction or repair work so as to emit noise in excess of the permissible levels as set out in the Second Schedule to these Regulations.

Regulation 19 (1) prohibits any person to carry out activities relating to fireworks, demolitions, firing ranges or specific heavy industry without a valid permit issued by the Authority. According to sub-regulation 4, such permit shall be valid for a period not exceeding three months.

Relevance
The contractor /sub contractor for civil works will be required to ensure compliance with the above regulations in order to promote a healthy and safe working environment throughout the construction phase. This shall include regular inspection and maintenance of equipment and prohibition of unnecessary hooting of vehicles.

• The Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006 Legal Notice No. 160; - Part II of Regulations, section 4 states that no person shall engage in any activity that may have adverse impacts on ecosystems, lead to introduction of exotic species or lead to unsustainable use of
natural resources without an EIA license. The regulation puts in place measures to control and regulate access and utilization of biological diversity that include among others banning and restricting access to threatened species for regeneration purposes. It also provides for protection of land, sea, Lake or river declared to be a protected natural environmental system in accordance to section 54 of EMCA, 1999.

Other relevant EMCA 1999 to be considered during construction and operation of the Project are

- 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 and above listed regulations shall 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 assessment. This report also in compliance with the requirement of the EIA/EA regulations

5.3.2 Water Act 2002

The Act is currently under review to align the water sector with the new constitution now Water Bill 2014, however, it vest the responsibility of developing water and Sanitation infrastructure (sewerage and water supply) to Tana Water Services Board (TWSB)

Section 73 of the Act allows a person with a license to supply water (licensee) to make regulations for purposes of protecting against degradation of sources of water which he is authorized to take. Under the Act, the licensee could be a local authority, a private Trust or an individual and the law will apply accordingly under the supervision of the Regulatory Board.

Section 75 and sub-section 1 allows a licensee for water supply to construct and maintain drains, sewers and other works for intercepting, treating or disposing of any foul water arising or flowing upon land for preventing water belonging to the licensee or which he is authorized to take for supply from being polluted. However, if the proposed works will affect or is likely to affect any body of water in the catchment, the licensee shall obtain consent from the Water Resources Management Authority.
Section 76 states that no person shall discharge any trade effluent from any trade premises into sewers of a licensee without the consent of the licensee upon application indicating the nature and composition of the effluent, maximum quantity anticipated, flow rate of the effluent and any other information deemed necessary. The consent shall be issued on conditions including the payment rates for the discharge as may be provided under section 77 of the same Act.

**Relevance to the Project**

This Act shall be relevant during both construction operation phases of the Project whereby the contractor and proponent shall ensure that all relevant water resources are not polluted from both liquid and solid wastes

**Water Rules 2007**

One of the outcomes of the water sector reforms has been improved regulatory framework for water resource management and use. In addition to the Water Act 2002, the main document outlining the regulations is the Water Resource Management Rules 2007. The rules set out the procedures for obtaining water use permits and the conditions placed on permit holders. Sections 54 to 69 of the Water Resources Management Rules 2007 impose certain statutory requirements on dam owners and users in this regard.

Other sections within the rules imply that WRMA can impose water quality sampling requirements from the water sources and impacts to the hydrology, water chemistry and river morphology downstream basin. Section 16 of the Water Rules requires approval from the Water Resources Management Authority (WRMA) for a variety of activities that affect the water resources, including the storage of water in dams and pans. Approval by WRMA is conferred through a Water Permit. A permit is valid for five years and must be renewed.

Section 104 of the Water Resource Management Rules requires certain water permit holders to pay water use charges. The intention of the water use charges was to raise revenue for water resource management, raise revenue for catchment conservation activities, improve efficiency of water resource abstraction and provide a system of data collection on water resource usage.

**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 Project once commissioned shall be handed over to Embu Water and Sanitation Company (EWASCO) which is a water utility, wholly owned Embu County Government for operation and maintenance in accordance to the Act.

**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 entire Project sites has been designed within the reserve land stipulated reserve land under this Act, this was in an effort to avoid cases of acquisition of private property and resettlement complications.

**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 **HIV Prevention and Control Act of 2006**

The works are proposed in the informal settlement where the HIV and AIDs perseverance is high, the act shall be cited in an effort to address challenges of HIV and Aids. The HIV and AIDS Prevention and Control Act makes specific reference to HIV and AIDS in relation to discrimination, privacy, confidentiality and personal rights.

Specifically the Bill provides:

- Under section 13, no person shall compel another to undergo an HIV test save where a person is charged with an offence of a sexual nature under Chapter XV of the Penal Code;
- Section 22 prohibits the disclosure of an HIV test result of another person without his written consent; and
- Part VIII, the Act makes it an offence for any person to be discriminated against on the grounds of actual, perceived or suspected HIV status, in relation to employment, access to education, credit, insurance, healthcare, travel, habitation and seeking public office.
5.3.8 Eviction Way Leave and Rehabilitation Bill (2014)

Once passed by the parliament, it will be an Act of Parliament to provide for procedures for the evictions of unauthorized occupants from private or public land and the resettlement of displaced persons coerced or involuntary displacement and for matters incidental and related thereto.

The Bill main objective is to set out appropriate procedures applicable to evictions and resettlement, the bill also has outlined principles that are intended to guide the resettlement and eviction procedures including:

- Every person shall be protected from arbitrary eviction;
- the persons, affected by an eviction should not suffer detriment to their human rights;
- the State while carrying out eviction and resettlement, must observe the human dignity, equity, social justice, human rights, non discrimination and protection of the marginalized and vulnerable groups; and
- every person has the right to administrative action that is expeditious, efficient, reasonable and procedurally fair

Part (111) section (17) of the bill elaborates of the process to the undertaken when the government intends to evict persons from their land to create room for Project, the bill gives power to the cabinet secretary based on the Environmental and Social Impact Assessment Report prepared, prepare a plan for the resettlement of the affected persons after consultation with the representatives of the affected persons.

Relevance to the Project

The Project route is entirely a government road reserve which implies that no person shall claim ownership of land on which the investments are to be constructed, the Projects have been designed on government road reserves.

The bill read together with reference to, World Bank OP 4.12 shall be used as reference during preparation and implementation of Project in case private assets and sources of livelihood are impacted.

5.4 Institutional Structure of the Water Sector

The National Policy on Water Resources Management and Development and the Water Act 2002, presently guides water resources management. The Water Bill 2014 will realign this arrangement slightly to comply with the requirements of the new constitution 2010.

Therefore, the status quo remains as guided by the Water Act 2012. The overall goal of the national water development policy is to facilitate the provision of water in
sufficient quantity and quality and within a reasonable distance to meet all competing uses in a sustainable, rational and economical way.

The Ministry of Environment, Water and Natural Resources is responsible for policy development, sector co-ordination, monitoring and supervision to ensure effective Water and Sewerage Services in the Country, sustainability of Water Resources and development of Water resources for irrigation, commercial, industrial, power generation and other uses. The Ministry executes its mandate through the following sector institutions:

5.4.1 Water Services Regulatory Board (WASREB)

The regulatory Board is responsible for the regulation of the water and sewerage services in partnership with the people of Kenya. The mandate of the regulator covers the following key areas:

- Regulating the provision of water and sewerage services including licensing, quality assurance, and issuance of guidelines for tariffs, prices and disputes resolution.
- Overseeing the implementation of policies and strategies relating to provision of water services licensing of Water Services Boards and approving their appointed Water Services Providers,
- Monitoring the performance of the Water Services Boards and Water Services Providers,
- Establish the procedure of customer complaints,
- Inform the public on the sector performance,
- Gives advice to the Minister in charge of water affairs.

5.4.2 Water Resources Management Authority (WRMA)

The authority is responsible for sustainable management of the Nation’s Water Resources:

- Implementation of policies and strategies relating to management of water resources, (ii) Develop principles, guidelines and procedures for the allocation of water,
- Development of Catchments level management strategies including appointment of catchments area advisory committees,
- Regulate and protect water resources quality from adverse impact
- Classify, monitor and allocate water resources.

5.4.3 Water Services Trust Fund (WSTF)

This body assists in the financing of the provision of Water Services to areas of Kenya which are without adequate water services. This shall include providing financing support to improved water services towards:
• Capital investment to community water schemes in underserved areas
• Capacity building activities and initiative among communities
• Water services activities outlined in the Water Services Strategic Plan as prioritized by the Government
• Awareness creation and information dissemination regarding community management of water services
• Active community participation in the management of water service

5.4.4 Water Services Boards (WSBs)

The WSBs are responsible for the efficient and economical provision of water and sewerage services in their areas of jurisdiction. Tana Water Service Board is among the seven catchment Boards established under the Water Act, 2002 and is mandated to:

• Develop the facilities, prepare business plans and performance targets
• Planning for efficient and economical provision of Water and sewerage services within their areas of jurisdiction;

The water services Board relevant to this Project is the Tana Water Services Board (TWSB)

5.4.5 Water Services Providers

Water Service Providers are the utilities or water companies. They are state owned but have been commercialized to improve performance and run like business within a context of efficiency, operational and financial autonomy, accountability and strategic, but minor investment.

Relevant water services providers under Tana Water Services Board (TWSB) operate within 6 counties namely Nyeri, Murang’a, Kirinyaga, Embu, Tharaka Nithi and Embu.

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.

Other stakeholder authorities include Ministry of Water Resources and Irrigation, Ministry of Environment and Natural Resources, Ministry of Health and Sanitation, Ministry of Local Government, Ministry of Transport, Infrastructure, Housing and Urban Development, Ministry of Social and Cultural Services as well as the County Administration. Others are the Embu County Government and EWASCO as well as key groups working with the beneficiary communities in the respective areas.

5.7 Project Implementation Institutional Structure

Tana Water Services Board has established implementation units for Project with Project engineers in charge for various county Projects, the board hires on case by case basis the services of environment specialist to oversee implementation of the ESMMP developed for Projects.

5.7.1 The Contractor

The contractor will be required to establish an environmental office to continuously advise on environmental components of the Project implementation. Elements in the environmental and social management plan are expected to be integrated in the Project with appropriate consultations with KISIP through the supervising environmental expert. The environmental officer of the contractor is also expected to fully understand the engineering and management aspects of the Project for effective coordination of relevant issues.

5.7.2 The Supervisor

The supervisor will be engaged by MoTIH&UD (KISIP) (as the Project proponent) to ensure effective implementation of the environmental management plan. It is expected that supervisor engages the services of an environmental expert who should in return understand the details of the recommendations on environment management and especially the proposed action plans, timeframes and expected targets of the management plan. The environmental supervisor expert should also be the liaison person between the contractor and KISIP on the implementation of
environmental concerns as well as issues of social nature associated with the Project.

5.8 World Bank Safeguard Policies

5.8.1 Environmental Assessment OP 4.01

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 Info-Shop of the World Bank and the date for disclosure must precede the date for appraisal of the Project.

Relevance
The Project components will trigger EA safeguards and is Category B due to the interaction with the physical, biological and social setting within the immediate surroundings.

5.8.2 Involuntary Resettlement (OP 4.12)

The objective of this policy to avoid where feasible, or minimize, exploring all viable alternative Project designs, to avoid resettlement. This policy is triggered in situations involving involuntary taking of land and involuntary restrictions of access to legally designated parks and protected areas. The policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts.

This Policy covers direct economic and social impacts that both result from Bank-assisted investment Projects, and are caused by (a) the involuntary taking of land resulting in (i) relocation or loss of shelter; (ii) loss of assets or access to assets, or (iii) loss of income sources or means of livelihood, whether or not the affected persons must move to another location; or (b) the involuntary restriction of access to legally designated parks and protected areas resulting in adverse impacts on the livelihoods of the displaced persons.
The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Project appraisal of proposed Projects. The objective of this policy to avoid where feasible, or minimize, exploring all viable alternative Project designs, to avoid resettlement. This policy is triggered when a Project activity causes the involuntary taking of land and other assets resulting in: Relocation or loss of shelter, loss of assets or access to assets, loss of income sources or means of livelihood, whether or not the affected persons must move to another location, loss of land

**Relevance**

The Project has been designed on existing road reserve, however the reserve has been encroached by assets and people’s sources of livelihood hence RAP is required.

### 5.8.3 Bank Operational Policy 4.11-Physical Cultural Resources

The objective of this policy is to assist in preserving Physical Cultural Resources (PCR) and avoiding their destruction or damage. PCR includes archaeological, paleontological, architecturally significant, and religious sites including graveyards, burial sites, and sites of unique natural value.

Initial indications are that no observed physical or cultural resources will be affected by the Project. Nevertheless, the Contractor is responsible for familiarizing themselves with the following “Chance Finds Procedures”, in case culturally valuable materials are uncovered during excavation, including:

1. Stop work immediately following the discovery of any materials with possible archaeological, historical, paleontological, or other cultural value, announce findings to Project manager and notify relevant authorities;
2. Protect artefacts as well as possible using plastic covers, and implement measures to stabilize the area, if necessary, to properly protect artefacts
3. Prevent and penalize any unauthorized access to the artefacts
4. Restart construction works only upon the authorization of the relevant authorities.

All contracts under this Project shall include a Chance Finds Procedure clause.

### 5.8.4 Bank Operational Policy OP/BP 4.04 (Natural Habitats)

The policy is designed to promote environmentally sustainable development by supporting the protection, conservation, maintenance and rehabilitation of natural habitats and their functions. The policy seeks to ensure that World Bank-supported infrastructure and other development Projects take into account the conservation of
biodiversity, as well as the numerous environmental services and products which natural habitats provide to human society. The policy strictly limits the circumstances under which any Bank-supported Project can damage natural habitats (land and water area where most of the native plant and animal species are still present).

The Project will have limited direct interaction with any natural ecosystems, the Project area is an informal settlement within Embu town, and hence this safeguard Policy is not triggered.

5.8.5 Bank Operational Policy OP/BP 4.36 (Forests)

The policy on forest safeguards seeks to realize the potential of forests to reduce poverty in sustainable manner, integrate forests effectively into sustainable economic development and protect the vital local and global environmental services and values of forests. Among the principles is to screen as early as possible for potential impacts on forest health and quality and on the rights and welfare of the people who depend on them.

The Project will have no direct linkage with any forest, the Project area is an informal settlement within Embu town, and hence this safeguard Policy is not triggered

5.8.6 World Bank OP/BP 4.10 (Indigenous Peoples)

This policy contributes to the Bank’s mission of poverty and sustainable development by ensuring that the development process fully respects the dignity, human rights, economies and cultures of indigenous peoples. For all Projects that are proposed for Bank financing and affect indigenous peoples, the Bank requires the borrower to engage in a process of free, prior, and informed consent.

The bank support of the Project by the affected Indigenous Peoples includes:
1. Preventive measures to adverse effects to the indigenous cultures and practices,
2. Avoid potential adverse effects on the Indigenous Peoples’ communities;
3. When avoidance is not feasible, minimize, mitigate, or compensate for such effects.

Bank-financed Projects are also designed to ensure that the Indigenous peoples receive social and economic benefits that are culturally appropriate and gender and inter-generationally inclusive.

The objective of this policy is to design and implement Projects in a way that fosters full respect for Indigenous Peoples’ dignity human rights and cultural uniqueness and so that they receive culturally compatible social and economic benefits and do not suffer adverse effects during the development process. This safeguard is not
triggered in this Project.

5.8.7 **Banks Operational Policy OP/BP 4.09 (Pests Control Management)**

The policy is meant to minimize and manage the environmental and health risks associated with pesticides use and promote and support safe, effective and environmentally sound pest management. The safeguard is not triggered under this Project. **Table 5-1** below illustrates the project activities relevant policy triggered.

<table>
<thead>
<tr>
<th>Policy</th>
<th>Criteria in The Project</th>
<th>Discussions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Assessment (OP4.01, BP4.01, GP 4.01)</td>
<td>Yes</td>
<td>The Project components will trigger EA safeguards and is Category B due to the interaction with the physical, biological and social setting within the immediate surroundings</td>
</tr>
<tr>
<td>Forestry (OP4.36, GP4.36)</td>
<td>No</td>
<td>No forest within Project area</td>
</tr>
<tr>
<td>OP/BP 4.04 (Natural Habitats)</td>
<td>No</td>
<td>No natural habitats within Project area</td>
</tr>
<tr>
<td>Involuntary Resettlement (OP4.12,BP4.12)</td>
<td>Yes</td>
<td>The Project has been designed on existing road reserve, however the reserve has been encroached by assets and people’s sources of livelihood hence RAP is required.</td>
</tr>
<tr>
<td>Physical Cultural Resources(OP/BP4.1)</td>
<td>yes</td>
<td>No cultural features however ‘chance find clause’ will be applied</td>
</tr>
<tr>
<td>Indigenous Peoples Policy OP/BP4.10</td>
<td>No</td>
<td>No indigenous peoples</td>
</tr>
<tr>
<td>OP/BP 4.09 (Pests Control Management)</td>
<td>No</td>
<td>No linkage to agricultural activities</td>
</tr>
</tbody>
</table>
6.1 Stakeholder Consultations

Stakeholder consultation is useful for gathering environmental data, understanding likely impacts, determining community and individual preferences, selecting Project alternatives and designing viable and sustainable mitigation and compensation plans.

Stakeholder consultation in the EIA process is undertaken during the Project design, implementation and initial operation. The aim is to disseminate information to interested and affected parties (stakeholders), solicit their views and consult on sensitive issues.

Inadequate public consultation can result in significant information gaps, which could mislead environmental planners undertaking an environmental assessment. Lack of attention to communication and consultation processes can generate individual, community, or regional opposition to a Project. This can ultimately be a cause of substantial delays, increased costs, and unsatisfactory compromise solutions, which could have been avoided through earlier consultations. Participation is therefore a process through which different stakeholders influence and share their views regarding development initiatives and the decisions and resources that affect them.

6.1.1 Stakeholder Mapping

The aim of this mapping was to ensure that all the stakeholders likely to be affected or influence the Project are identified and targeted as part of the ESIA study. The below listed stakeholders formed part of the consultations.

- County Government in Project Area e.g. County Executive Committee Members (CECM) for Water, Social, Environment and Land affairs, Ward Representatives
- County Administration-County Commissioners, Deputy County Commissioners Assistant County Commissioners, Chiefs and Assistant Chiefs, Village elders etc.
- Ministry of Transport, Infrastructure, Housing and Urban Development. (Embu County KISIP office)
- Project Affected Persons (PAPs) within Dallas Informal Settlement

The Table 6-1 below indicates detailed stakeholders indentified and consulted during the assessment.
Table 6-1; Relevant Stakeholders

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tana Water Services Board (TWSB)</td>
<td>Government Parastatal</td>
</tr>
<tr>
<td>Embu Water and Sanitation Company</td>
<td>Public Utility Company</td>
</tr>
<tr>
<td>Embu County officials</td>
<td>County Government</td>
</tr>
<tr>
<td>Members of County Assembly</td>
<td></td>
</tr>
<tr>
<td>County Commissioner representatives</td>
<td>National Government Administration</td>
</tr>
<tr>
<td>Deputy County Commissioners representative</td>
<td></td>
</tr>
<tr>
<td>Representative of the legislature</td>
<td>National Legislature</td>
</tr>
<tr>
<td>Water Resources Management Authority (WRMA)</td>
<td>Water Regulatory Body</td>
</tr>
<tr>
<td>Population in Dallas Informal Settlement</td>
<td>Project beneficiaries and Affected Persons</td>
</tr>
</tbody>
</table>

6.1.2 Key Informants Consultation

The assessment involved public and stakeholder consultations with relevant stakeholders in Dallas Informal Settlement concerning the project, the aim of stakeholder consultations was to give communities the required Project information, collect their concerns regarding the Project and also to discuss with the relevant issues raised that concerns the project. The issues were then analyzed and used in finalization of the Project designs and planning on how best to implement the Project. Public participation was held in the month of September and October 2014 within Dallas Settlement.

Table 6-2; Schedule of Meetings

<table>
<thead>
<tr>
<th>Meeting</th>
<th>Venue</th>
<th>Date</th>
<th>Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stakeholder Meeting</td>
<td>Embu County offices</td>
<td>17th September 2014</td>
<td>KISIP Rep Embu County (Miss Jane)</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>Embu Water and Sewerage Company</td>
<td>17th September 2014</td>
<td>Technical Officer EWASCO (Mr. Njiru)</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>Tana Water Services Board</td>
<td>15th September 2014</td>
<td>Technical Officer TWSB (Mr. Arthu)</td>
</tr>
<tr>
<td>Public Meeting</td>
<td>Dallas Mosque</td>
<td>17th September 2014</td>
<td>County Government Project Beneficiaries</td>
</tr>
<tr>
<td>Public Meeting (Validation and Disclosure of Designs)</td>
<td>Dallas Mosque</td>
<td>20th October 2014</td>
<td>County Government officials and Project Beneficiaries</td>
</tr>
</tbody>
</table>
6.1.3 **Key Issues for the Consultation**

The key findings during the stakeholder consultations are presented below.

**Box 6-1; Stakeholder Consultations Resolutions**

<table>
<thead>
<tr>
<th>ESIA consultation resolutions and agreements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members present in the meeting agreed that on the following:</td>
</tr>
<tr>
<td>1. Local Labour should be sourced from the local community i.e. Dallas</td>
</tr>
<tr>
<td>2. Residents requested for protection of adjacent Kariari Swamp which is a watering point for livestock (goats and ship)</td>
</tr>
<tr>
<td>3. Contractors activities to comply to Muslim prayer hours Dallas being a Muslim village i.e. reduce noise and allow workers to pray at 1pm and 4pm</td>
</tr>
<tr>
<td>4. Residents confirmed that the road reserves have not been encroached and that there is adequate space for the sub projects.</td>
</tr>
</tbody>
</table>

*(Source: Key Informant Consultations ESIA field date September 2014)*

6.2 **Inclusion of Outcomes of Stakeholder Engagement in the Final Design of the Project**

6.2.1 **Employment Opportunities for the Public**

The Stakeholder consultations identified the need to provide employment opportunities to the local community members during project implementation period as the main concern from the community. The Project will provide employment opportunities for the estimated (67) number of people as illustrated in **table 6.4** below.

**Table 6.4: Employment Opportunities to be provided 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>2</td>
</tr>
</tbody>
</table>
The opportunities will be shared equally as Project by Gender Policy 2011

6.2.2 Protection of Karari Swamp

The topography of the Settlement drops towards Karari Swamp which in the lowest point within the Project area, the swamps provides water during dry seasons to free range livestock within the area hence requires to be protected from any form of pollution as discussed below.

(a) Pollution Prevention During Construction

The Environment Social Management & Monitoring Plan (ESMMP) prepared for the Project has proposed specific measures which the contractor shall be required to comply with during Project Construction Phase. Some of these activities will be related to the way Liquid and Solid Wastes are handled on site, effluents from Concrete batching sections and Asphalt preparation section, details are provided in the ESMMP in chapter 8 of this report.

(a) Pollution Prevention During Operation

At Project Operation phase, the status of sewerage infrastructure will be the main factor that could result to pollution of water that inflow into the swamp. Embu Water and Sanitation Company (EWASCO) will be responsibility in making sure the sewer infrastructure is properly maintained and cases of blockages and overflows into the natural drainage channels are eliminated.

6.2.3 Way leave Acquisition and Impacts to Peoples Assets and Sources of Livelihood

The design of the Project has adopted the recommendations of the RAP report prepared for the project which proposed the main principles of reducing project impact to people’s assets and sources of livelihood. The roads have been designed on existing dimension of internal settlements roads land in an effort to limit Project impacts to peoples’ assets and sources of livelihood.

A Separate RAP document has been prepared to address Project impacts to people’s assets and sources of livelihood.
6.3 Public Disclosure of ESIA and RAP

In accordance with World Bank/IFC Guidelines, the Project Proponent in this case Ministry of Transport, Infrastructure, Housing and Urban Development (MoTIH&UD) will ensure ESIA and RAP are published on her website for wider circulation and review. EMCA 1999 also requires that the reports and information are disclosed at the ESIA Stage by NEMA for wider review and comments for at least 45 days.

The Reports will also be made available at Chiefs’ Offices in the affected Locations for ease of access by the Project interested parties at location level. This disclosure will be done early before commencement of Project Works, 60 days before Contractor’s mobilization on site. In addition, MoTIH&UD will ensure that the ESIA and RAP are available throughout the Project implementation Phase.

NEMA requires that MoTIH&UD 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).

6.4 Consultations Beyond ESIA Process

Therefore, in order to ensure that the developments are implemented smoothly, these consultations should be carried out during the project’s construction and operation phases to ensure any emerging issues are handled satisfactorily.
CHAPTER 7: ENVIRONMENTAL AND SOCIAL IMPACTS ASSESSMENT & MITIGATION

7.1 Introduction

This ESIA assessment has been systematically conducted to determine whether the proposed Project will have a diverse impact on the environment. The Environmental Management and Co-ordination Act (EMCA) No.8 of 1999 provide the legal and statutory guideline for the Environment and Social Impact Assessment process in Kenya.

The impacts in this chapter have been generated based on the analysis of the proposed environment in relation to the proposed Project. The impacts arising during each of the phases of the proposed development namely construction, operation and decommissioning, can be categorized into:

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

7.2 Definition and Classification of Environment 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 the operations phases of the Project and at both stages positive and negative impacts would occur.

7.2.1 Impact Significance

The purpose of this ESIA report is to identify the significant impacts related to the Project or activity 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:

- Are subject to legislative control;


- Relate to protected areas or to historically and culturally important areas;
- Are of public concern and importance;
- Are determined as such by technically competent specialists;
- Trigger subsequent secondary impacts;
- Elevate the risk to life threatening circumstances; and
- Affect sensitive environmental factors and parameters

7.2.2 Impact Assessment and Scoring

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 and 7-2** below presents the impact rating matrix adopted in this assessment.

**Table 7-1: Environment Impact Scoring and Rating Criteria**

<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>

<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</td>
<td>-4/+4</td>
<td>High</td>
</tr>
<tr>
<td>National</td>
<td>-5/+5</td>
<td>Very high</td>
</tr>
</tbody>
</table>

<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>

*(Source: ESIA September 2014)*

**Example of Cumulative Impact Scoring**

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

<table>
<thead>
<tr>
<th>Significance Rating</th>
<th>Negative Impact Mitigation</th>
<th>Positive Impact Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Low</td>
<td>Maintain current management</td>
<td>Improve current management</td>
</tr>
<tr>
<td>Low</td>
<td>Maintain current management</td>
<td>Improve current management</td>
</tr>
<tr>
<td>Medium</td>
<td>Improve current management</td>
<td>Improve current management</td>
</tr>
<tr>
<td>High</td>
<td>Improve current management</td>
<td>Maintain current management</td>
</tr>
<tr>
<td>Very high</td>
<td>Improve current management</td>
<td>Maintain current management</td>
</tr>
</tbody>
</table>

(Source: ESIA September 2014)

### 7.3 Positive Impacts during Construction Phase

The Project construction phase normally includes Pre Construction Phase and Construction Phase, construction period depends on the nature of the project activities and normally vary from one year to three years, sub sections 7.3.1 to 7.3.4 below presents anticipated positive Project impacts and their impact rating.

#### 7.3.1 Employment Opportunities

With the construction of the proposed Project, there will be employment opportunities for both professionals and unskilled workers, earnings from the wages will improve their living standards.

The workers will include casual laborers, plumbers and engineers are expected to work on the site for a period of time. Semi skilled, unskilled laborers and formal employees are expected to obtain gainful employment during the period of construction. With labor intensive construction technologies, the Project will provide employment for youths and provide support to the Government of Kenya initiatives on creation of jobs.

#### Impact Scoring

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Severity of Impact</td>
<td>+4</td>
</tr>
<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>
7.3.2 Creation of Market for Construction Materials

The Project will require materials, some of which will be sourced locally and some internationally. These include plant (pump sets, switch gear, instrumentation and surge protection systems), steel and plastic pipes, valves, cement, sand, hardcore and chemicals. This will provide a ready market for suppliers in and outside the Project area.

Impact Scoring

<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>

7.3.3 Injection of Money into Local Economy

A large sum of the Project money shall be released into the local economy due to the construction activities. It is envisaged that during construction a large number of downstream activities shall take place including but not limited to the following listed below, It is estimated that at least 30% of the Project funds shall be used up directly within the Project area.

- Payments for skilled and unskilled labour;
- Purchases of construction materials; and
- Payments for local provisions including fuel, foods and accommodation

Impact Scoring

<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>

7.3.4 Creation of wealth

The proposed development brings many opportunities in investment and procurement where the youth and people of Embu town can compete to provide different goods and services to the proponent during construction of the Project. This in turn creates opportunities for entrepreneurship and wealth creation for the youth of the Settlement.

The construction phase will attract temporary business such as food vendors who will
benefit from the trade by selling the food to the construction workers. This will improve their living standards from their earnings.

**Impact Scoring**

<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>

### 7.4 Negative Impacts during Construction Phase

The Project construction phase shall involve the following activities:

- Delivery of construction of pipes made of concrete or PCC to the Project site
- Temporary stockpiling of soils, sub-soils and rock along the trenches;
- Importing material for bedding of concrete joints of the water lines and sewer lines (e.g. sand, cement, and concrete); and
- Delivering of construction materials to site.

The following negative impacts are associated with the construction of the Project

#### 7.4.1 Resettlement Impacts

The Project design has ensured that the Project components are implemented within existing public land, road reserves and way leaves.

Referring to World Bank Operational Safeguards Policy 4.12 on land acquisition and involuntary resettlement, a Resettlement Action Plan (RAP) for affected persons and their assets shall be prepared

**Impact Scoring**

<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>Interpretation</td>
<td>Medium Negative</td>
</tr>
</tbody>
</table>

**Mitigation measures**

- Prepare a Resettlement Action Plan (RAP) for purposes of compensation of likely assets and sources of livelihood for Project affected persons.
-
7.4.2 Vegetation Clearing, Soil Erosion and Sedimentation

Assessment of the all the Project target areas indentified that the areas densely populated, 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 in the settlement.

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**Impact Rating**
Low Negative

**Mitigation measures**
The following is proposed to mitigate against soil erosion and its effects and enhance vegetation cover.
- Site Clearance and Construction activities will be limited to available reserve and public land within the settlements 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.
- All hedges damaged during construction to be reinstated after completion of the Works

7.4.3 Air Quality Pollution

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 all the settlements under this assessment.

The Impact Rating for Air Pollution and Dust Generation is as shown in Table 7.13 below.

**Table 7.13: Impact Scoring for Air Pollution and Dust Generation**

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**Impact Rating**
Medium - Negative
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.
• Additional measures e.g. barriers to control dust at sensitive receptacles e.g. schools, hospitals, open water sources etc.
• Machines and vehicles should be parked and serviced away from sensitive receptacles e.g. schools and hospitals

7.4.4 Excessive vibrations Noise Pollution

Construction phase for the proposed Project will most likely result in noise emissions as a result of the machines that will be used (excavation equipment among others) and construction vehicles delivering materials to site. Noise can be a nuisance to the local community if construction works begin too early in the day and continues into the night.

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Impact Rating | Medium - Negative

Mitigation measures

To control noise pollution:

• 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
- Work will be restricted within working hours
- Special provisions made in areas around schools and other community service infrastructure to minimize disturbance as per the Noise regulations.

7.4.5 Water Quality Pollution

Limited discharge of silt into rivers and other local drainage system from earth moving during construction, Potential discharge of oil residuals into the same rivers and open rains from the construction equipment and disruption of accumulated solid wastes from work areas and washed down into the river and other drains

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Mitigation Measures

- Isolate solid wastes disrupted from the works during excavations for safe disposal. The wastes should be collected and disposed in approved sites.
- Earth moving and excavations for the construction are carried out considering safety of the river and surface drainage. Control siltation of rivers and other surface drains
- Ensure spilt oil does not discharge into water sources Provide oil spill containment including concrete platform for servicing of construction equipment and holding of scrap oil drums.

7.4.6 Drainage and Hydrology Disruptions.

Project construction will involve earthworks and excavation that could interfere with local drainage in Embu town with a potential to divert the normal surface drains towards homes and private plots. Earthworks activities will result in the generation of some spoil materials, when not handled properly the soils could lead to sedimentation of the nearby water sources which will interfere with the habitats and hence flora and fauna downstream of such rivers within the Project area.
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Mitigation Measures

- Excavated channels to follow contours to avoid interference with surface drains;
- Whenever necessary, drains along the construction line are directed towards existing drainage systems to cater for storm water during the rains. However, construction should be carried out during a dry season and should take the shortest period possible;
- Utilise excavated soil to level excavated ground where necessary and cover the water and sewer lines that will have been laid in the ground;
- Construction materials and other debris (lime, cement and fresh concrete.) should be handled carefully to prevent them from finding their way into the nearby water sources;
- Ensure compliance with environmental laws.

7.4.7 Interference with the Physical Setting

The proposed Project could result into the following negative impacts to the physical setting:

- Blockage of natural drainage system at valley crossings;
- Excavation for creation of access routes and related structures.

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Mitigation measures

- The structures to be developed should be aesthetically acceptable to blend in with the surrounding;
- The proponent shall as much as possible complete the works in such a way that natural aesthetics shall be retained at the locations. Restoration shall be undertaken to ensure that the original setting is as much as possible retained.

7.4.8 Interruption of Existing Infrastructure
There are various installations that will be crossed, move in or move along installations among them; Roads both main roads and feeder roads in the towns and estates, Underground utilities e.g. electricity and water lines with the estates and Fences and temporal structures along the main roads. These services are critical and have implications with spillover effects on the social and economic performance.

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**Mitigation measures**

- Formal request for permission to cross, break in construct the Project should be sought from affected property owners; and
- A work plan with clear responsibilities for each party should be developed to ensure smooth execution of the construction.

### 7.4.9 Extraction and Use of Construction Materials

Construction materials that will be used in the construction such as hard core, cement and rough stone will be obtained from quarries, hardware shops and sand harvesters who extract such materials from natural resource banks such as rivers and land that are supposed to be regulated to enable for their natural regeneration.

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**Mitigation measures**

- The materials shall be sought from licensed suppliers and licensed quarry sites by NEMA. This will allow for protection of quarry sites to be used within their natural regenerative capacity.

### 7.4.10 Solid Waste Generation
Solid wastes generated during construction include papers used for packing, plastics, cuttings and trimmings off materials among others. Dumping around the site will interfere with the aesthetic status on the surrounding environment. Plastic bags may act as pest breeding grounds which may be disease causing vectors to the local residents.

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### Mitigation measures

- A site waste management plan should be prepared by the contractor prior to commencement of construction works. This should include designation of appropriate waste storage areas, collection and removal schedule and identification of approved disposal site;
- Proper solid waste receptacles and storage containers should be provided, particularly for the disposal of lunch and drink boxes so as to prevent littering of the site.
- Arrangements should be made for the regular collection of litter and for its disposal with the County Government
- Ensure that the solid waste collection, segregation, and disposal system is functioning properly at all times during the construction phase;
- Recycle and re-use wastes where possible such as scraps metal.

#### 7.4.11 Occupational Health and Safety Risks

Potential impacts during construction include: exposure to physical hazards from the use of equipments; trips and fall hazards; rock falls/slides in steep areas and exposure to dust and noise. Construction workers are likely to have injuries and hazards as the construction works such as trenching and excavations, unavoidably expose workers to occupational health and safety risks. The workers are also likely to be exposed to risk of construction noise and air pollution.

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Mitigation measures

- Ensure that all construction machines and equipment are in good working conditions to prevent occupational hazards during excavation activities and laying of the pipes;
- Establish a Health and Safety Plan (HASP) for civil works areas ensuring the working hours are controlled and that employees are not allowed to extend the working hours beyond an acceptable limit for purposes of gaining extra pay;
- Provide adequate manual labour to meet the requirements of the tasks;
- Appoint a trained health and safety team for the duration of the construction work, monitor and advise appropriately on health and safety matters during the rehabilitation activities;
- Provide workers with gloves, ear gears, sturdy rubber boots and overalls to protect their skin from the effects of cement;
- Provide workers training on safety procedures and emergency response such as fire and sewer pipe bursts before deployment;
- Establishment and training of safety committee at the work place
- Safety procedures posted on notice boards
- A dedicated officer on safety issues
- Regular safety reports and remedial actions taken by the contractor to the RE and client
- Safety issues / incidents to be discussed in the site meetings and remedial measures taken
- Ensure no worker is under the influence of alcohol or any other intoxicating substances that interfere with judgment.

7.4.12 Spread of Communicable Diseases and HIV/AIDS Infection

The Project will attract new people to the Project area and this can lead to several repercussions leading to the spread of HIV/AIDS and/or other sexually transmitted diseases (STDs). Influx of new people to the Project area especially construction workers can affect the number of new cases of HIV, because they often interfere with an otherwise stable situation but the contrary can also happen where the newcomers find themselves at higher risk.

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Mitigation Measures

Develop HIV/AIDS awareness programmes or initiatives to target the construction workers both from the Project site and beyond, institutional communities and the general members of the community, particularly the youth; with the objective of reducing the risks of exposure and the spread of HIV virus in the Project area. Measures
recommended for implementation to enable reduce the spread of the virus include the following;

- Review the construction activities to integrate with the HIV/AIDS campaigns;
- Develop appropriate training and awareness materials for Information, Education and Communication (IEC) on HIV/AIDS;
- Identify other players (local CBOs, NGOs, and government organizations) on HIV/AIDS for enhanced collaboration;
- Develop an intervention strategy compatible with the construction programme to address success of the HIV/AIDS prevention and provide peer educators for sustainability in collaboration with other stakeholders; and
- Integrate monitoring of HIV/AIDS preventive activities as part of the construction supervision. Basic knowledge, attitude and practices are among the parameters to be monitored, and particularly on provision of condoms, status testing and use of ARVs.

7.5 Positive Impacts during Operational Phase

The project main objective is to improve the quality of life of people within Dallas Settlement through improvement of infrastructure services. Sub Section 7.5.1 to 7.5.3 illustrates the main direct benefits of the project once commissioned.

7.5.1 Improved Mobility within the Settlement due to improved roads

The project will result to direct benefit to the residents of Dallas through improved mobility, transportation of products to market will be enhanced and general accessibility of the settlement improved, this is also important during disaster response within the settlement.

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7.5.2 Improved Sanitation of Dallas Settlement

As described in Kenya’s development blue print (Vision 2030), 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, water and sanitation facilities among others. This Project aims at improving the sanitation services in Embu town and environs through the Project.

The sewerage component of the Project will improve the sanitation status in towns. Providing basic sanitation through improved sewer network coverage together with hygiene education may bring about a major reduction of water-related health risks and
child morbidity and mortality as described in the MDG no. 4.

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7.6 **Negative Impacts during Operation Phase**

The project operation phase will have potential negative impacts, this impacts are less significant and can be easily be mitigated as described in sub sections 7.6.1 to 7.6.6 below.

7.6.1 **Increased Risk of Accidents associated with motor cycles**

The roads will result to improved road condition which is likely to increase risk associated with reckless driving and over speeding, most vulnerable to this risk are children under the age of 10 years.

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**Mitigation**

- County Government to enlighten motorist and cyclist on importance of obeying traffic rules especially in residential areas.
- The County Government to enlighten residents and school children on the importance of adhering to provisions of road safety rules
- Regular inspection and maintenances of the road by County Government of Embu to ensure the speed control parameters and signage are in good condition.
- Regular crackdown, arrest and prosecution of motorists and cyclist who disobey road safety directions.
- Provide for bumps at critical points to slow down traffic and improve road safety.

7.6.2 **Health risks from burst sewers**

Poorly maintained and designed sewers can lead to dispersal of raw sewage particularly at manholes and burst areas. These can cause outbreaks of cholera and typhoid from contamination of water sources by raw sewage.
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Mitigation measures

- Ensure proper and periodic maintenance of sewer lines and treatment plant;
- Activate a community watch group for information sharing on the status of the sewer line;
- Regular check, repair and maintenance of the sewer line;
- Awareness rising among community members not to dump solids in manholes;
- Development of an inventory of system components, with information including age, construction materials, and drainage areas served elevations;
- Design manhole covers to withstand anticipated loads and ensure that the covers can be readily replaced if broken to minimize entry of garbage and silt into the system;
- Ensure sufficient hydraulic capacity to accommodate peak flows and adequate slope in gravity mains to prevent build-up of solids and hydrogen sulphide generation.

7.6.3 Land and Soil Contamination

Possible erosion and soil loss near burst sewer lines or manhole overflow locations running along steep slopes. The related land could be contaminated.

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Mitigation measures

- EWASCO to attend to burst pipes promptly to prevent excessive loss of soil;
- Provide high risk areas with appropriate drainage for effective channelling of burst sewage spills;
- Encourage land owners along sewer lines to maintain vegetated belts along the pipeline to control any overflows flows and trap soil. They should be encouraged to take responsibilities at the lowest levels in regard to protecting the sewer line;
- Mark clearly the pipeline for ease of identification and protection by the adjacent landowners.

7.6.4 Increase in Social Vices
There is a high likelihood of vandalism of the sewer equipments could occur during the operational stage if proper security measures are not put in place. This vandalism is common where manhole covers and step irons are made of iron are stolen by metal scrap dealers.

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**Mitigation measures**

- Proper security measures should be put in place to guard the equipments 24 hours to reduce cases of vandalism;
- The design has proposed a security chain link fence including a gate and guard house be erected at sewer treatment plant to protect the site from theft and vandalism.

7.7 Positive Environmental Impacts during decommissioning phase

This section describes the anticipated positive and negative impacts during decommissioning stage. Most of the mitigation measures for these impacts are already discussed in the previous sections.

7.7.1 Positive Impacts of decommissioning

(a) Employment opportunities
This a positive impact where both skilled, semi-skilled and unskilled workers will be employed during decommissioning phase.

(b) Site Rehabilitation
Decommissioning phase will lead to rehabilitation of the site that was cleared to pave way for construction activities. This will ensure that the environment is left as natural as possible close to or better than before.

7.7.2 Negative Impacts of decommissioning

(a) Loss of jobs and income
The people that will be employed to operate and maintain the water and sewerage Project system will lose their jobs immediately after the closure of the Project. The loss of jobs will have far reaching impacts as it will lead to loss of income and social stress.

**Mitigation measures include:**

- Notify the employees in advance on the Project closure date and adequately compensate them;
• Dismissal procedures to be compliant with Employment Act, 2007;
• Provide counselling & alternative skills for alternative activities;
• Employer should find alternative means of livelihood for the staff who were employed at the solar power plant.

(b) Noise Pollution
Activities likely to produce noise during decommissioning include demolition of structures and excavation of works and structures at the intake areas as well as any staff offices and quarters built on site.

Mitigation measures include:
• Schedule noisy activities during the day time period;
• Use silencers on machines where possible;
• Ensure machinery is well maintained to reduce noise emitted.

(c) Odour and Air/dust Pollution
This is expected to result from demolishing of structures and excavation of waste water pipelines. This will affect demolition staff as well as the neighbouring residents

Mitigation measures include:
• Practice dust management techniques, including watering down during drier period;
• Flush pipes and tanks of sewer appropriately before decommission;
• Set up dust barriers/ screens at strategic locations;
• Provide and enforce the appropriate use of PPE against dust.

(d) Solid Waste Material
It is expected that large amounts of solid waste material arising during decommissioning will include: glass panels, stones, pipes, wood, metal, paper, plastic, equipment, vegetation, etc. The proper disposal of these materials is critical.

Although demolition waste is generally considered as less harmful to the environment since they are composed of inert materials, there is growing evidence that large quantities of such waste may lead to release of certain hazardous chemicals into the environment.

Mitigation measures include:
• Disposal of solid waste in compliance with Waste Management Regulations 2006 of EMCA1999;
• Segregation of waste to encourage reuse and recycling;
• Ensuring that the contracted waste collector is registered with NEMA to collect and dispose wastes.

(e) Occupational health and safety
If not handled with care the demolition may lead to exposure of raw sewage to the
workers and surrounding communities which poses as health risks to them. Machinery and equipment used for the same also posses as danger to the workers if not handled well and with the correct PPE.

Mitigation measures include:
- Provide the correct PPE for the workers when conducting the demolition activities;
- Conduct training on health and safety procedures to the workers prior to commencement of demolition;
- Proper plans should be made prior to demolition so as to contain the raw sewage and other waste water that poses as health risk to human beings and the environment, to prevent the workers and surrounding communities from getting into contact with it.

(f) Noise and vibration
The demolition works will lead to significant deterioration of the acoustic environment within the Project site and the surrounding areas. This will be mitigated by the following measures:
- Ensure scheduled demolition timing is observed;
- Contractor to give timely prior information to stakeholders and neighbouring institutions

(g) Interference with private property
Project team should communicate with locals if activities will involve entering private property to avoid conflicts and destruction of property.

(h) Poor Infrastructure in Dallas Settlement
Demolition of the roads and sewer expansion networks will result to recurrence of the current poor roads and sanitation status in Dallas town. This will attract breakout of diseases that arise from poor sanitation. To mitigate this: the proponent through EWASCO should ensure sensitize the public to support the Project implementation and its maintenance
CHAPTER 8: ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP)

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

County Government of Embu and 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 and reported on a quarterly basis during project construction
- Undertake initial audits and self annual audits after project commissioning

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:
8.3.1 County Government/ EWASCO

County Government of Embu in conjunction with EWASCO, who is the proponent, will be charged with the responsibility of ensuring that the proposed development has been put up in an environmentally sound manner. This can be achieved by inclusion of environmental specifications in the tender specifications, selection of renowned environmentally conscious contractors and supervision to ensure that the objectives of this ESMMP are met.

8.3.2 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.

8.3.3 The Contractor

The persons/firms contracted to put up the proposed water and sanitation Projects plant 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.

8.3.4 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.

8.3.5 County Government of Embu

The relevant departmental officers in the above local authorities should be called upon where necessary during Project implementation to provide the necessary permits and advisory services to the Project implementers.
Tables 8-1, 8-2 and 8-3 present the ESMMP for the proposed water and sanitation 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 8-1: Construction Phase: Environmental and Social Management and Monitoring Plan

<table>
<thead>
<tr>
<th>Activity</th>
<th>Associated Impacts</th>
<th>Impact Levels</th>
<th>Management Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seeking approvals from NEMA for ESIA and Approval of plans from County</td>
<td>Delay in</td>
<td>Low</td>
<td>The Contractor shall ensure that all pertinent permits, certificates and licences have been obtained prior to any activities commencing on site and are strictly enforced/ adhered to; The Contractor shall maintain a database of all pertinent permits and licences required for the contract as a whole and for pertinent activities for the duration of the contract</td>
</tr>
<tr>
<td>and National Government</td>
<td>implementation of</td>
<td></td>
<td>All the Project components Responsibility KISIP &amp; Contractor</td>
</tr>
<tr>
<td></td>
<td>the Project due</td>
<td></td>
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<tr>
<td></td>
<td>to objections and</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>stop orders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>construction campsites</td>
<td>Environmental</td>
<td>Medium</td>
<td>Isolate through fencing the camp sites from access by the public for their safety Preferably to be located on land already cleared land wherever possible The Contractor’s Camp layout shall take into account availability of access for deliveries and services and any future works</td>
</tr>
<tr>
<td></td>
<td>degradation risks</td>
<td></td>
<td>Campsites Responsibility Contractor(s)</td>
</tr>
<tr>
<td>Access to campsites and construction sites</td>
<td>Environmental</td>
<td>Medium</td>
<td>Utilize to the extent possible the existing public roads to avoid social and economic disruption Ensure road safety measures for the construction vehicles to the extent possible by observing all traffic regulations</td>
</tr>
<tr>
<td></td>
<td>degradation risks</td>
<td></td>
<td>Access Roads Responsibility Contractor(s)</td>
</tr>
<tr>
<td>Environmental and Social Training and</td>
<td>Risks of Environmental and Social</td>
<td>High</td>
<td>The Contractor and sub-contractors shall be aware of the environmental requirements and constraints on</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>All Workers Responsibility</td>
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<tr>
<td></td>
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</tr>
</tbody>
</table>

Target Areas & Responsibilities

<table>
<thead>
<tr>
<th>Monitoring Indicator</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>~KShs.2M</td>
</tr>
<tr>
<td></td>
<td>~KShs. 0.5M</td>
</tr>
</tbody>
</table>

No direct cost associated

KShs. 0.5M
<table>
<thead>
<tr>
<th>Activity</th>
<th>Associated Impacts</th>
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<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness</td>
<td>degradation risks and occupational health and safety related accidents</td>
<td></td>
<td>construction activities contained in the provisions of the ESMMP</td>
<td>Contractor(s)</td>
<td>Availability of Training reports, Attendanc e list of participant s during the trainings sessions</td>
<td></td>
</tr>
<tr>
<td>HIV/AIDS awareness and prevention campaign</td>
<td>Risks of Increased HIV and Aids transmission in the area</td>
<td>Medium</td>
<td>The Contractor shall institute HIV/AIDS awareness and prevention campaign amongst his workers for the duration of the contract, contracting an 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</td>
<td>All Workers Responsibility Contractor(s)</td>
<td>Number of Trainings Held, Availability of Training reports, Attendanc e list of participant s during the trainings sessions</td>
<td>KShs. 0.5M</td>
</tr>
<tr>
<td>Setting out and clearance of Project routes</td>
<td>Delay in Project implementation due to opposition from PAPs</td>
<td>Medium</td>
<td>Ensure that land acquisition is done within the provision of Land Act 2012 Prepare and Implement RAP recommendations before commencement of civil works</td>
<td>All the Project Lots Responsibility Contractor &amp; County Government</td>
<td>Numbers of satisfied PAPs, Ext end of route opened to the</td>
<td>~KShs. 1M</td>
</tr>
</tbody>
</table>
## ESIA Project Report for KISIP Infrastructure Upgrading sub-projects
### Dallas Informal Settlements, Embu Count

<table>
<thead>
<tr>
<th>Activity</th>
<th>Associated Impacts</th>
<th>Impact Levels</th>
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<th>Target Areas &amp; Responsibilities</th>
<th>Monitoring Indicator</th>
<th>Budget</th>
</tr>
</thead>
</table>
| 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 | All the Project Lots  
Responsibility Contractor     | • Number of workforce employed from the local community  
• Number of female employed | No direct costs associated |
| EMP management records                        | Risks of non conforming to ISO 9001 on QMS and ISO 14001 on EMS                   | Medium        | ▪ The updated version of the EMP should be kept on site  
▪ Copies of all necessary permits and licences should be kept on site  
▪ All site specific plans prepared as part of the updated ESMMP  
▪ All related environmental, social, health and safety management registers and correspondence, including any complaints  
▪ A register of audit non-conformance reports and corrective actions | All the Project Lots  
Responsibility Contractor     | • Number of available permits on site  
• ISO audit report on non conformities  
• Number of corrective measure adopted | No direct associated costs |
| Earth moving and excavations                  | ▪ 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 public safety  
▪ Where there are potential for nuisance from dust generation, ensure earth | All work areas  
Responsibility Contractor(s) | • Accidents occurrence incidences  
• Cases of respiratory complicati on at nearby | Included in BoQ |

Ministry of Transport, Infrastructure, Housing and Urban Development
<table>
<thead>
<tr>
<th>Activity</th>
<th>Associated Impacts</th>
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<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>▪ Vegetation Cover destruction</td>
<td>Low</td>
<td>▪ Construction activities will be limited to Project sites / routes 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></td>
<td>▪ Loss of biodiversity</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>▪ loss of top soil</td>
<td>Low</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></td>
<td>▪ Public Health and safety risks</td>
<td>Medium</td>
<td>▪ Notify public the intent to cut sections of the road for safety precautions</td>
<td>civil works areas Responsibility Contractor(s) Supervision</td>
<td>• Accidents occurrence incidences</td>
<td>Included in BoQ</td>
</tr>
<tr>
<td></td>
<td>▪ Worker Occupational safety risks</td>
<td></td>
<td>▪ Provide signage and safety information in all work areas</td>
<td></td>
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<tr>
<td></td>
<td>▪ Disruption of amenities (access roads, services lines and driveways) causing</td>
<td>Medium</td>
<td>▪ 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)</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>▪ Notify other services providers and</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>▪ Open small sections that can be reinstated within the shortest period to avoid public disruption</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>▪ Mark the lines to avoid conflicts with other activities</td>
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</tbody>
</table>

Ministry of Transport, Infrastructure, Housing and Urban Development
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<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 | • Environme ntal Status of reinstated burrow pits  
• Complains from the community on burrow pits and material transportation | Included in BoQ |
| Concrete / cement batching plant            | Risks associated with water resource pollution, noise and vibration and air pollution from dust this could lead to respiratory       | 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-water and waste water runoff from the batching area and aggregate stock piles shall not be permitted to enter streams but shall directed to a pit where the water can soak away | Concrete / cement batching plant  
Responsibility Contractor(s) Supervision | • Number of incidence of Environment pollution around the plant | Included in BoQ |
### Wastes generation and disposal

**Activity**
- Risks of contaminating surface and underground water resources
- Contaminated organic matter in the work areas to be isolated for safe disposal
- Material residuals to be disposed off in accordance with established regulations

**Impact Levels**
- High

**Management Actions**
- Construction wastes (residual earth, debris and scrap materials) to be removed for safe disposal
- Encourage recycling where possible (concrete debris for access road surfacing)
- Material residuals to be disposed off in accordance with established regulations

**Target Areas & Responsibilities**
- Construction areas
- Responsibility Contractor(s) Supervision

**Monitoring Indicator**
- Number of complaint(s) from community not happy with waste management of the contractor

**Budget**
- KShs. 0.5M

### Spoil Storage site

**Activity**
- Risks of solid waste mismanagement leading to pollution
- Contouring of spoil site to approximate natural topography and drainage and/or reduce erosion impacts on the site

**Impact Levels**
- Medium

**Management Actions**
- 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

**Target Areas & Responsibilities**
- Construction areas
- Responsibility Contractor(s) Supervision

**Monitoring Indicator**
- Number of complaint(s) from community not happy with waste management of

**Budget**
- Contractor best management practice
## Occupational Health and Safety

**Risks of Accidents, Injuries or death of workers or community member**

<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></td>
<td></td>
<td>High</td>
<td>▪ 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</td>
<td></td>
<td>spoil material</td>
<td>KShs. 2.0M</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>▪ Provide construction workers with personal protective gear (gloves, gum boots, overalls and helmets),</td>
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<td></td>
<td></td>
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<td>▪ Provide temporary toilets and bathrooms for the construction workers at the work sites</td>
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<td>▪ Provide onsite first aid kit accessible by the workers on need,</td>
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<td>▪ Isolate the site for access by the local communities during the construction for their safety and health</td>
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<td></td>
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<td>▪ Contractor to provide a Healthy and Safety Plan prior to the commencement of works to be approved by the resident engineer.</td>
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<td></td>
<td></td>
<td></td>
<td>▪ Establishment and training of safety committee at the work place</td>
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<td></td>
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<td></td>
<td>▪ Training of all workers on safety before deployment</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>▪ Safety procedures posted on notice boards</td>
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<td></td>
<td></td>
<td></td>
<td>▪ A dedicated officer on safety issues</td>
<td></td>
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<td></td>
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<td></td>
<td>▪ Regular safety reports and remedial actions taken by the contractor to the RE and client</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>▪ Safety issues / incidents to be discussed in the site meetings and remedial measures taken</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>▪ Ensure no worker is under the influence of an alcoholic intoxicating substance</td>
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</tr>
<tr>
<td>Activity</td>
<td>Associated Impacts</td>
<td>Impact Levels</td>
<td>Management Actions</td>
<td>Target Areas &amp; Responsibilities</td>
<td>Monitoring Indicator</td>
<td>Budget</td>
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<td>------------------------------------------------------</td>
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</tr>
<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, EMCA 1999 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 regarding noise will be recorded and communicated to the RE  
- The Contractor must adhere to Noise | civil works areas and access roads  
Responsibility Contractor(s) Supervision engineer | Reported complaints from neighbor community and institutions  | No direct cost associated       |
### Activity
Traffic management on site

### Associated Impacts
Risks of Accidents, Injuries or death of workers or community member

### Impact Levels
High

### Management Actions
- 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

### Target Areas & Responsibilities
- Civil works areas and access roads
- Responsibility Contractor(s) Supervision engineer

### Monitoring Indicator
Accidents occurrence incidences

### Budget
KShs. 0.5M

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### Activity
Air Quality Control

### Associated Impacts
Air pollution causing respiratory disorders to human

### Impact Levels
High

### Management Actions
- 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 within 200metres of human settlement.
- Additional measures e.g. barriers to

### Target Areas & Responsibilities
- All work areas
- Responsibility Contractor(s) Supervision

### Monitoring Indicator
Cases of respiratory complication at nearby health centre

### Budget
No direct costs (integrated in the works costs)
### ESIA Project Report for KISIP Infrastructure Upgrading sub-projects

Dallas Informal Settlements, Embu Count

<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>
| Contractor de-mobilization and site reinstatement | Associated risks of environmental degradation | High          | - The site is to be cleared of all construction materials, including litter prior to hand over  
- 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 | All work areas  
Responsibility Contractor(s) Supervision | Closeout audit report findings  
No direct anticipated | EMP  
KES 7.5M |

### Total Estimated Cost for EMP

<table>
<thead>
<tr>
<th>Activity</th>
<th>Associated Impacts</th>
<th>Impact Levels</th>
<th>Management Actions</th>
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<th>Monitoring Indicator</th>
<th>Budget</th>
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</table>
| Contractor de-mobilization and site reinstatement | Associated risks of environmental degradation | High          | - The site is to be cleared of all construction materials, including litter prior to hand over  
- 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 | All work areas  
Responsibility Contractor(s) Supervision | Closeout audit report findings  
No direct anticipated | EMP  
KES 7.5M |
### Table 8-2: Operational Phase: Environmental and Social Management and Monitoring Plan

<table>
<thead>
<tr>
<th>No.</th>
<th>Issue</th>
<th>Action required</th>
<th>Responsibility</th>
<th>Provisional Budget</th>
</tr>
</thead>
</table>
| 1   | Increased Accidents associated with motor cycles over speeding within the settlement due to good roads | - The County Government to enlighten motorist and cyclist on importance of obeying traffic rules especially in residential areas.  
- The County Government to enlighten residents and school children on the importance of adhering to provisions of road safety rules  
- Regular inspection and maintenances of the road by County Government of Embu to ensure the speed control parameters and signage are in good condition.  
- Regular crackdown, arrest and prosecution of motorists and cyclist who disobey road safety directions.  
- Provide speed bumps at critical points to slow traffic and improve road safety. | Embu County Government                  | To be established at operation phase and included in the operation of the Projects |
| 2   | Risk of encroachment and construction of structures on sewer wayleaves | - Mapping and installation of beacons to which illustrate the width of the pipeline reserve  
- Regular inspection of the pipeline corridor for encroachment.  
- Prosecution of encroachers as required by county by laws on way leaves and road reserves maintenance.  
- Conduct public sensitization programs on importance not interfering with way leaves and public reserve land. | EWASCO                                 | To be established at operation phase and included in the operation of the Projects |
| 3   | Risk of illegal connection to the sewer pipeline                      | - This is common in the informal settlements where residents illegally connect to sewer infrastructure.  
- This will require constant inspection by EWASCO officials and installation of leak and burst detectors at designated areas along the sewer pipeline.  
- Conduct public sensitization programs on importance not interfering with the sewer pipeline and the need to seek official sewer connection from EWASCO | EWASCO                                 | To be established at operation phase and included in the operation of the Projects |
<p>| 4   | Risk of Vandalism of the infrastructure (Manhole covers and man hole step irons, road) | - This is common when the manhole covers are made using steel and concrete, also step iron bars in the manholes, the steel is usually stolen by steel scavengers | EWASCO                                 | To be established at operation phase and included in the operation of the Projects |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Issue</th>
<th>Action required</th>
<th>Responsibility</th>
<th>Provisional Budget</th>
</tr>
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<tbody>
<tr>
<td>5</td>
<td>Solid waste management – potential to block drains,</td>
<td>• Involvement of local CBOs for collection and manning the transfer stations.</td>
<td>CBOs/Community</td>
<td>To be factored in the County budget – waste management.</td>
</tr>
</tbody>
</table>
|     | potential to block drains, increase the risk of flooding and disease   | • County Government to ensure:  
  a) that the waste collection areas are zoned;  
  b) timely and regular collection of all solid wastes either through door to door collection or from centralized collection points;  
  c) waste collection facilities such as skips, bulk containers and waste cubicles are regularly emptied and do not become eye-sores;  
  d) there is a designated site(s) for waste disposal  
  e) that the disposal site is secured with a fence and a gate manned to control dumping and spread of waste outside the disposal site.  
  f) motorable roads inside the site to ensure ease of access during disposal;  
  g) the waste is spread, covered and compacted at regular intervals  
  h) appropriate control measures for the management of dumpsite fires | County Government         | operation of the Projects                                                            |
|     | incidences.                                                            |                                                                                                                                                                                                           |                           |                                                                                     |
8.4 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.

Table 8-3: Decommissioning Flow Chart

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Actor</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Initiation</td>
<td>Proponent then</td>
</tr>
<tr>
<td></td>
<td>Development of an Objective Worksheet and checklist incorporating references, legal and policies Undertake decommissioning audit</td>
<td>Proponent then</td>
</tr>
<tr>
<td>2</td>
<td>Prepare Road Map for Decommissioning Design</td>
<td>Proponent then</td>
</tr>
<tr>
<td></td>
<td>Conduct design review to validate elements of the design and ensure design features are incorporated in the decommissioning design. Public consultations</td>
<td>Proponent then</td>
</tr>
<tr>
<td>3</td>
<td>Prepare and Award Contract</td>
<td>Proponent then</td>
</tr>
<tr>
<td></td>
<td>Prepare a contract that incorporates validated Project information and award to a contractor as per the Procurement rules.</td>
<td>Proponent then</td>
</tr>
<tr>
<td>4</td>
<td>Execute Decommission Works</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td>Contractor</td>
</tr>
<tr>
<td>5</td>
<td>Commissioning Environmental Management Plan</td>
<td>Contractor</td>
</tr>
<tr>
<td>6</td>
<td>Non-Conformance, Corrective/Préventive Action</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td>Détermine root cause</td>
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<tr>
<td></td>
<td>Propose corrective measures</td>
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</tr>
<tr>
<td></td>
<td>Propose future preventive measures.</td>
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8.5 END OF PROJECT IMPACT MONITORING

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<tr>
<th>Aspect</th>
<th>Indicator</th>
<th>Means of Verification</th>
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</thead>
<tbody>
<tr>
<td>Improvements in health</td>
<td>Disease incidences e.g. Malaria, cholera, dysentery, diarrhoea, typhoid, respiratory diseases etc.</td>
<td>Reports</td>
</tr>
<tr>
<td></td>
<td>Infant mortality rate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Life expectancy</td>
<td></td>
</tr>
<tr>
<td>Environmental</td>
<td>Access to garbage disposal</td>
<td>Field inspection</td>
</tr>
</tbody>
</table>
| Quality | facilities and collection either by municipality or CBO.  
|---------|-------------------------------------------------------------|
|         | • Incidences of flooding and mudslides.  
|         | • Water quality of the streams in the three areas  
|         | • Groundwater quality  
|         | • Connection to formal sewer system  
|         | • Incidences of smell  
|         | • Dust prevalence  
|         | • Noise levels | Reports |

| Quality of life | • Average household size  
|                | • School attendance rates for boys and girls.  
|                | • Monthly household income  
|                | • Monthly per capita consumption expenditure of the households  
|                | • Percentage of households engaged in business (formal and informal);  
|                | • Land and property/structure ownership- security of tenure.  
|                | • Average duration of stay in the settlement  
|                | • Percentage of households with access to paved roads.  
|                | • Percentage of households with access to piped water supply either through shared connection or private individual connection.  
|                | • Percentage of households with access to electricity connection.  
|                | • Households with access to flush toilets and pit latrines. | Field inspection Reports |
CHAPTER 9: CONCLUSION AND RECOMMENDATIONS

9.1 Conclusion and Recommendations

Through the assessment and evaluation of all environmental concerns of the proposed Project, it can be concluded that the establishment will bring a net ecological, economic, social and health benefits to all living within the Project area. On the other hand, some of the Project components are envisaged to have negative impacts depending on the different phases and components of the Project. These impacts have been discussed in details in this report and mitigation measures proposed as summarized below;

- The Project has an overall positive impact on the informal settlements as it will improve the living conditions of people living and working in the informal settlements, through improving accessibility, drainage, waste, and security.
- The Project does not have significant and potentially irreversible negative impacts on the environment and people. The few identified negative impacts associated with construction Projects can easily be mitigated, and an Environmental and Social Impact Management Plan has been prepared as part of this report, whose implementation will be monitored to ensure compliance and protection of the environment. A monitoring plan to ensure this happens has also been developed.
- The Project will not lead to displacement of people as the roads are designed to follow the designated road reserves on the physical development plans (PDPs). However, there are encroachments on the road reserves mostly of temporal structures for informal traders. A RAP has been prepared to mitigate against this to ensure that their livelihoods are not negatively impacted upon.
- The EMP should be fully implemented and should form part of the contract with the selected contractors who will undertake the works. The implementation of the EMP should be monitored in accordance with the monitoring plan in this report. The Resident engineer should supervise and report on the implementation regularly as provided.
- The RAP should be fully implemented before the commencement of the Project.
- Provisional Budget of Kenya Shilling 7.5million should be included in the bidding documents for implementation of mitigation measures of potential negative
ANNEXES

Annex 1 Public Participation Minutes and List of Participants
Annex 2 Generic Mitigation Measures for Contractors
Annex 1

Public Participation Minutes and List of Participants
KENYA INFORMAL SETTLEMENTS IMPROVEMENT PROJECT

MINUTES OF PUBLIC PARTICIPATION MEETING DALLAS SETTLEMENT ON 1st AUGUST 2014 SEPTEMBER 2014

MEMBERS PRESENT

<table>
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<tr>
<th>NO</th>
<th>NAME</th>
<th>DESIGNATION</th>
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<td>As per Attached Attendance list</td>
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AGENDA OF THE MEETING

- Validation of community selected priorities
- Share Project information with PAPs and other interested parties in regards to project
- To discuss the issues the PAPS had regarding the project
- Deliberate on best way forward of handling issues likely to result from Resettlement and environmental issues.

PROCEEDINGS OF MEETINGS

The meetings started at 9am hours with introductions of the parties’ present and opening remarks from the SEC chairs.

The following were issues discussed in relation to Resettlement action Plans

Minute 1 /07/15 Reconstruction of the structures.
The residents wanted to know if they will be allowed to reconstruct their structures where they initially were after the line has been laid down.

Response
Safeguards team responded that reconstruction of the structures will be illegal since there is a law governing against construction of illegal structures on road reserves and way leaves.

Minute 2 /07/2015 Job opportunities and subcontracts
The residents wanted to know if they will be allowed to place tender fort the company they own, especially companies associated with youth and women.

Discussion and Response
Safeguard team responded that the procurement process will be free to the public, the contract advertised publically and all interested companies will be invited to submit their proposals for vetting, the most qualified company will be awarded the contract.
Concerning the issue of job opportunities for the youths the Safeguards team informed the gathering that some of the responsible youths in the area will be considered for jobs as proposed by the ESIA project report.

He was also informed that interested youth should mobilize themselves and register with the area chief so that their request for jobs can be forwarded formally to the contractor through the chiefs office.

**Minute 3 /07/2015 Timings for Notices to the PAPs on when to commence works**

Generally residents wanted to know whether adequate notice will be issued by the authority in charge in order to allow them ample time to relocate.

**Discussion and Response**

Yes adequate time will be given to them just before the contractor mobilizes to the ground and also this RAP and ESIA report has proposed for the them to be allowed ample time to salvage materials from their structures in addition to reconstructions assistance offered.

**Minute 4 /10/2014 Project Width Uncertainties**

Residents wanted to know what will happen for the areas where their structures are likely to the affected by the project, they complained that in some cases the road reserves are narrow to as low as 6m while the area needed for the road is at a minimum of 9m.

**Discussion and Response**

RAP team responded that areas like those ones will be given specific attention and possibility of consulting with them with an aim of properly acquiring the extra needed metres will be considered, such process will be spearheaded by respective county governments.

**Minute 5 /10/2014 Timings for Notices to the PAPs on when to commence works**

Resident of the settlement wanted to know whether adequate notice will be issued by the authority in charge in order to allow them ample time to relocate.

**Discussion and Response**

Yes adequate time will be given to them just before the contractor mobilizes to the ground an also this RAP report has proposed for the them to be allowed ample time to salvage materials from their structures in addition to reconstructions assistance offered,

**Minute 6 /10/2014 More Information about the Project Route**

Generally, PAPs wanted to know the extent of road and assets to be affected if the proposed roads will follow surveyor’s beacons.
Discussion and Response
RAP team respondent remarked that the extend of structures to be affected will be those falling within the 12m corridor for the main settlement access roads and 9m for those falling within the internal settlement roads, yes the project will be constructed within existing road reserve an no private land will be acquired.

There being no any other business the meeting closed at 5pm with a word of prayer

Minutes Signed

[Signature]

SECRETARY

PUBLIC PARTICIPATION PHOTOS

Dallas Member of county assembly addressing PAPs in Dallas
Mosque during a PAPs meeting
Women listen to deliberations during the PAPs meeting
### List of Participates

**Activity:** Environmental Impact Assessment

**Venue:** Dallas, Mosque

**Date:** 1/4/2019

<table>
<thead>
<tr>
<th>Name</th>
<th>Settlement/scheme/group</th>
<th>Phone Number</th>
<th>Gender (M/F)</th>
<th>Youth (Please tick)</th>
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<td>Hbd. K. Paraka</td>
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<td>0163393226</td>
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<tr>
<td>K. Mathcham Jendejo</td>
<td>Dallas</td>
<td>0714637975</td>
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<td>Hanja A. Jitu</td>
<td>Dallas</td>
<td>0744173810</td>
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<tr>
<td>Saliha K. Ansari</td>
<td>Dallas</td>
<td>0792022522</td>
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<tr>
<td>Kevin N. Mohamed</td>
<td>Dallas</td>
<td>0718618825</td>
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<tr>
<td>Shama N. Jeycham</td>
<td>Dallas</td>
<td>0714301038</td>
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<tr>
<td>S. Hussein</td>
<td>Chair, SEC</td>
<td>0722470027</td>
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<tr>
<td>M. Kamal Githiny</td>
<td>Dallas</td>
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<tr>
<td>Hannah W.</td>
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<td>Zania I. D.</td>
<td>Dallas</td>
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<td>Khawj Valani</td>
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<td>Susan W.</td>
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<tr>
<td>She. Linda</td>
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<td>Amina J.</td>
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<td>Zainab C.</td>
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Staff facilitating: ____________________________  Sign: ____________________________
# LIST OF PARTICIPANTS

**ACTIVITY:** Environmental Impact Assessment  

**VENUE:** Sugar Mosque  

**DATE:** 17/9/2014

<table>
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<tr>
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<td>Jomvu</td>
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<td>Michael Kamara</td>
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<td>Okuya</td>
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<td>Samwel Minah</td>
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<td>Agnes Farmanjoh</td>
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<td>Roger Ayuma</td>
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<td>Abiara Hindah</td>
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Staff facilitating: [Signature]

Creating voice and space with the urban poor
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Staff facilitating: ____________________ Sign: ____________________

EMBU PHOTO LOG

- Community Members follow public consultation session
- Sample of roads planned for upgrading
- Existing water supply Kiosk
- Inspection of project routes
- Livestock rearing within the settlement (zero grazing)
- Sanitation services (pit latrines)
Annex 2

Generic Mitigation Measures for Contractors
APPENDIX 2: GENERIC MITIGATION MEASURES FOR CONTRACTORS

Permits and licenses

(i) The Contractor shall ensure that all pertinent permits, certificates and licenses have been obtained prior to any activities commencing on site and are strictly enforced/ adhered to;
(ii) The Contractor shall maintain a database of all pertinent permits and licenses required for the contract as a whole and for pertinent activities for the duration of the contract and renew if so required.

Site preparation phase

Location of Contractor’s camp site

Where the contractor will require setting up a site, the same shall be determined in collaboration with the RE taking into consideration the following:

(i) Preferably to be located on land already cleared wherever possible;
(ii) Not to be installed in the areas used as wildlife grazing areas or migratory corridors or in the area with more dense vegetation or densely settled areas;
(iii) It should also avoid the areas, where the soil has higher erosion risk;
(iv) The need to be more than 20 meters from watercourses in a position that will facilitate the prevention of storm-water runoff from the site from entering the watercourse;
(v) The local administration and the community representatives (CBO) shall be involved in the site location to avoid destruction of any ritual site or any other conflict;
(vi) The Contractor’s Camp layout shall take into account availability of access for deliveries and services and any future works;
(vii) The Contractor’s Camp should also be of sufficient size to accommodate the needs of all sub-contractors that may work on the project.

Environmental Training and Awareness

(i) The Contractor and sub-contractors shall be aware of the environmental requirements and constraints on construction activities contained in the provisions of the EMP;
(ii) The Contractor will be required to provide for the appropriate Environmental Training and Awareness as described in this EMP in his costs and programming;
(iii) An initial environmental awareness training session shall be held by the LA prior to any work commencing on site, with the target audience being all project personnel;
(iv) The training shall include but not limited to the following
  • Basic awareness and understanding of the key environmental features of the work site and environs;
  • Understanding the importance of and reasons why the environment must be protected;
  • Ways to minimize environmental impacts;
  • Relevant requirements of the EMP;
  • Prevention and handling of fire;
  • Health risks pertinent to the site, including prevention of communicable diseases;
  • Awareness, prevention and minimization of risk with regard to the contraction and spread of HIV/AIDS and other sexually transmitted diseases;
  • The Contractor shall erect and maintain Environmental and Health Information Posters for his employees regarding HIV/AIDS, protection of wildlife and natural resources;
• The Environmental and Health Information Posters shall be erected at the eating areas and any other locations specified by the RE.

**HIV/AIDS awareness and prevention campaign**

(i) The Contractor shall institute HIV/AIDS awareness and prevention campaign amongst his workers for the duration of the contract, contracting an implementing organization, with preference for an organization already working on this issue in the project area;

(ii) 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.

**Local Labour / Employment**

(i) Wherever possible, the Contractor shall use local labour, and women must be encouraged to be involved in construction work.

**Construction phase**

**EMP management records**

Environmental management records shall be kept on site during the duration of construction and shall include the following:

(i) The updated version of the EMP;
(ii) All necessary permits and licences;
(iii) All site specific plans prepared as part of the updated EMP;
(iv) All written instructions and reports issued by the RE / Supervising Consultant;
(v) A register of audit non-conformance reports and corrective actions;
(vi) All related environmental, social, health and safety management registers and correspondence, including any complaints;
(vii) All records shall be kept at site premises and maintained in a legible state for the full period of construction.

**Contractor’s Camp**

The Contractor shall implement the following as required:

(i) A suitable storm-water drainage system to prevent soil erosion, protect storage areas and to prevent stagnant ponds forming;
(ii) A suitable potable water supply;
(iii) Suitable facilities for bathing, washing clothes or vehicles – site staff will not be permitted to use open water bodies for such activities;
(iv) Suitable sanitation facilities, adequate for the number of staff on site;
(v) Facilities for cooking;
(vi) Facilities for solid waste collection;
(vii) Facilities for waste water management.

The method for provision of these services will be approved by the RE.

**Water Supply**
The Contractor must adhere to water quality regulations and rules as described in Legal Notice No. 120 of the Kenya Gazette Supplement No. 68 of September 2006. These Rules describe the following:

(i) Water sources for domestic use;
(ii) Sewage treatment;
(iii) Ground water;
(iv) Water for agricultural use;
(v) Water for other uses;
(vi) Schedules depicting standards.

Abstractions from natural, municipal and/or private water resources (e.g. rivers, boreholes and springs) for potable water and construction water shall be approved by the Water Resources Management Authority. The Contractor shall arrange for the necessary approvals / permits from the water authorities under the direction of MoR for the abstraction of water.

**Conservation of vegetation and protection of wildlife**

(i) Except to the extent necessary for establishing the construction site and carrying out the construction works, vegetation shall not be removed, damaged or disturbed. Nor should any unauthorized planting of vegetation take place;

(ii) The clearance of the site for construction purposes shall be kept to a minimum. The use of existing cleared or disturbed areas for the Contractor’s Camp, stockpiling of materials etc shall be encouraged;

(iii) Areas with dense indigenous vegetation are not to be disturbed unless required for construction purposes, nor shall new access routes be cut through such areas.

(iv) Trees should be trimmed rather than removed wherever possible;

(v) The use of indigenous plants as firewood is prohibited unless they are obtained from approved sources;

(vi) There is a possibility of encountering wildlife during the construction works, these animals should be avoided and not perturbed;

(vii) Wildlife poaching or game hunting is forbidden.

**Protection of watercourses**

(i) The Contractor shall ensure that the footprint of construction activities is minimised at river and stream crossings;

(ii) Sedimentation from the construction works of perennial rivers and streams must be minimised;

(iii) No construction materials shall be stockpiled within areas that are at risk of flooding;

(iv) The Contractor shall ensure that all construction activities at the seasonal river crossings are commenced and completed during the dry seasons;

(v) All temporary and permanent fill used adjacent to, or within, the perennial river bed shall be of clean sand or larger particles. Silts and clays shall not be permitted in the fill;

(vi) Plastic sheeting, sandbags or geofabric approved by the RE shall be used to prevent the migration of fines through the edges of the fill into the river;

(vii) The Contractor shall not modify the banks or bed of a watercourse other than necessary to complete the specified works. If such unapproved modification occurs, the Contractor shall restore the affected areas to their original profile;

(viii) The Contractor shall preserve all riparian vegetation;

(ix) The Contractor shall not pollute the watercourse through any construction activities.

**Planning Borrow Pits and Quarries**
Where required, all borrow pits sites shall be clearly indicated on a plan and approved by the RE.

(i) The Contractor will be responsible for ensuring that appropriate authorization to use the proposed borrow pits and quarries has been obtained before commencing activities;

(ii) Borrow pits and quarries shall be located more than 20 meters from watercourses in a position that will facilitate the prevention of storm-water runoff from the site from entering the watercourse;

(iii) The Contractor shall give 14 days’ notice to nearby communities of his intention to begin excavation in the borrow pits or quarries;

(iv) The Contractor shall prepare and implement borrow pit plans and borrow pit rehabilitation plans, which would minimize the risk of erosion.

Construction and Operation of New Borrow Pits and Quarries

(i) Topsoil shall be stripped prior to removal of borrow and stockpiled on site. This soil shall be replaced on the disturbed once the operation of the borrow site or quarry is complete;

(ii) Storm-water and groundwater controls shall be implemented to prevent runoff entering streams and the slumping of soil from hillside above;

(iii) The use of borrow pits or quarries for material spoil sites may be approved by the RE (and/or with the appropriate consent of the “landowner”). Where this occurs, the materials spoiled in the borrow pit shall be profiled to fit into the surrounding landscape and covered with topsoil.

Blasting

(i) If blasting is required, the Contractor will be responsible for obtaining a current and valid authorization from the Department of Mines and Geology prior to any blasting activity. A copy of this authorization shall be given to the RE;

(ii) A qualified and registered blaster by the Department of Mines and Geology shall supervise all blasting and rock-splitting operations at all times;

(iii) The Contractor shall ensure that appropriate pre blast monitoring records are in place (i.e. photographic and inspection records of structures in close proximity to the blast area);

(iv) The Contractor shall ensure that emergency services are notified, in writing, a minimum of 24 hours prior to any blasting activities commencing on Site;

(v) The Contractor shall take necessary precautions to prevent damage to special features and the general environment, which includes the removal of fly-rock. Environmental damage caused by blasting/drilling shall be repaired at the Contractor’s expense to the satisfaction of the RE and the relevant authorities;

(vi) The Contractor shall ensure that adequate warning is provided to the local communities immediately prior to all blasting. All signals shall also be clearly given;

(vii) The Contractor shall use blast mats for cover material during blasting. Topsoil shall not be used as blast cover.

Asphalt, Bitumen and Paving

The site of the asphalt plant shall be selected and maintained according to the following basic criteria:

(i) The plant shall be situated on flat ground;

(ii) Topsoil shall be removed prior to site establishment and stockpiled for later rehabilitation of the site;

(iii) Bitumen drums / products shall be stored in an area approved by the RE. This area shall be indicated on the construction camp layout plan. The storage area shall have a smooth impermeable (concrete or thick plastic covered in gravel) floor. The floor shall be bunded and sloped towards a sump to contain any spillages of substances;

(iv) The area shall be covered to prevent rainwater from contacting the areas containing fuels, oils, bitumen etc and potentially generating contaminated runoff;
The plan shall be secured from trespassers and animals through the provision of fencing and a lockable gate to the satisfaction of the RE; 

Well-trained staff shall be responsible for plant workings.

Within the bitumen plant site, areas shall be demarcated/mark for plant materials, wastewater and contaminated water;

An area should be clearly marked for vehicle access;

Drums/tanks shall be safely and securely stored;

Materials requiring disposal shall be disposed of at an appropriate waste facility.

Cement/Concrete Batching

Where required, a Concrete batching plant shall be located more than 20m from the nearest stream/river channel;

Topsoil shall be removed from the batching plant site and stockpiled;

Concrete shall not be mixed directly on the ground;

The concrete batching works shall be kept neat and clean at all times;

Contaminated storm-water and wastewater runoff from the batching area and aggregate stockpiles shall not be permitted to enter streams but shall be led to a pit where the water can soak away;

Unused cement bags are to be stored so as not to be effected by rain or runoff events;

Used bags shall be stored and disposed of in a manner which prevents pollution of the surrounding environment (e.g. via windblown dust);

Concrete transportation shall not result in spillage;

Cleaning of equipment and flushing of mixers shall not result in pollution of the surrounding environment;

Suitable screening and containment shall be in place to prevent windblown contamination associated with any bulk cement silos, loading and batching;

Waste concrete and cement sludge shall be scraped off the site of the batching plant and removed to an approved disposal site;

All visible remains of excess concrete shall be physically removed on completion of the plaster or concrete and disposed at an approved disposal site. Washing the remains into the ground is not acceptable;

All excess aggregate and sand shall also be removed;

After closure of the batching plant or any area where concrete was mixed all waste concrete/cement sludge shall be removed together with contaminated soil. The surface shall then be ripped to a depth of 150mm and the topsoil replaced evenly over the site and re-grassed.

Air and dust emissions

Air emissions from construction machinery, including dust, is regarded as a nuisance when it reduces visibility, soils private property, is aesthetically displeasing or affects palatability of grazing. Dust generated by construction related activities must be minimized.

The Contractor shall be responsible for the control of air emissions and dust arising from his operations and activities.

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;
(ii) Asphalt plants and concrete batching plants shall be well sealed and equipped with a dust removal device;

(iii) Workers shall be trained on dust minimization techniques;

(iv) 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;

(v) The contractor shall not carry out dust generating activities (excavation, handling and transport of soils) during times of strong winds. The RE shall suspend earthworks operations wherever visible dust is affecting properties adjoining the road;

(vi) Water sprays shall be used on all earthworks areas within 200 metres of human settlement. Water shall be applied whenever dust emissions (from vehicle movements or wind) are visible at the site in the opinion of the RE;

(vii) Vehicles delivering soil materials shall be covered to reduce spills and windblown dust;

(viii) Vehicle speeds shall be limited to minimize the generation of dust on site and on diversion and access roads;

(ix) Any complaints received by the Contractor regarding dust will be recorded and communicated to the RE and ESO.

Disruption of Access to Property

Disruption of access to property must be kept to a minimum at all times. Where such disruption is unavoidable, the Contractor shall advise the affected parties and the RE at least seven working days in advance of such disruption.

Spoil Sites

Where the Contractor is required to spoil material, environmentally acceptable spoil sites must be identified and approved by the RE and EO, taking into consideration the following:

(i) Preferably to be located on land already cleared wherever possible. Communities shall be involved in the site location to avoid destruction of any ritual site or any other conflict;

(ii) The need to be more than 20 meters from watercourses and in a position that will facilitate the prevention of storm-water runoff from the site from entering the watercourse;

(iii) The development and rehabilitation of spoil areas shall include the following activities:

(iv) Stripping and stockpiling of topsoil;

(v) Removal (to a nominal depth of 500mm) and stockpiling of subsoil;

(vi) Placement of spoil material.

(vii) Contouring of spoil site to approximate natural topography and drainage and/or reduce erosion impacts on the site;

(viii) Placement of excavated subsoil and then topsoil over spoil material;

(ix) Contouring and re-vegetation;

(x) 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.

Noise Control

(i) 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;
(ii) Schools, 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 excessively noisy activity shall be conducted outside of school hours, where approved by the RE;

(iii) Any complaints received by the Contractor regarding noise will be recorded and communicated to the RE;


Storm-water Management and Erosion Control

The Contractor shall take reasonable measures to control storm water and the erosive effects. During construction the Contractor shall protect areas susceptible to erosion by installing necessary temporary and permanent drainage works as soon as possible and by taking measures to prevent the surface water from being concentrated in drainage channels or streams and from scouring slopes, banks or other areas.

Areas affected by construction related activities and/or susceptible to erosion must be monitored regularly for evidence of erosion, these include:

(i) Areas stripped of topsoil;
(ii) Soil stockpiles;
(iii) Spoil sites;
(iv) Borrow pits;
(v) Sites for bridges and drainage structures.

On any areas where the risk of erosion is evident, special measures may be necessary to stabilize the areas and prevent erosion. These may include, but not be limited to:

(i) Confining construction activities;
(ii) Using cut off drains;
(iii) Using mechanical cover or packing structures such as geofabric to stabilize steep slopes or hessian, gabions and mattress and retaining walls;
(iv) Mulch or chip cover;
(v) Constructing anti-erosion berms;
(vi) The erosion prevention measures must be implemented to the satisfaction of the RE;
(vii) Where erosion does occur on any completed work/working areas, the Contractor shall reinstate such areas and areas damaged by the erosion at his own cost and to the satisfaction of the RE and ESO;
(viii) The Contractor shall be liable for any damage to downstream property caused by the diversion of overland storm water flows.

Equipment Maintenance and Storage

(i) All vehicles and equipment shall be kept in good working order, are serviced regularly and stored in an area approved by the RE;
(ii) Leaking equipment shall be repaired immediately or removed from the site;
(iii) All washing of equipment shall be undertaken in the workshop or maintenance areas which shall be equipped with suitable impermeable floor and sump/oil trap. The use of detergents for washing shall be restricted to low phosphate/nitrate-type detergents;
(iv) Rivers and streams shall not be used for washing of equipment and vehicles.

Sanitation

(i) The Contractor shall comply with all laws and any by-laws relating to public health and sanitation;
(ii) 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;

(iii) The type and exact location of the toilets shall be approved by the RE prior to establishment. The use of septic tanks may only be used after appropriate investigations have been made and the option has been approved by the RE;

(iv) All toilets shall be maintained by the Contractor in a clean sanitary condition to the satisfaction of the RE;

(v) 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;

(vi) The Contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from the site to an appropriate location/facility for disposal;

(vii) The Contractor shall instruct their staff and sub-contractors that they must use toilets provided and not the bush or watercourses.

Solid Waste Management

The site is to be kept clean, neat and tidy at all times. No burying or dumping of any waste materials, vegetation, litter or refuse shall be permitted. The Contractor must adhere to Environmental Management and Co-ordination (Waste Management) Regulations 2006. The Contractor shall implement measures to minimise waste and develop a waste management plan to include the following:-

(i) All personnel shall be instructed to dispose of all waste in a proper manner;

(ii) At all places of work the contractor shall provide litter collection facilities;

(iii) The final disposal of the site waste shall be done at the location that shall be approved by the RE, after consultation with local administration and local leaders;

(iv) The provision of sufficient bins (preferably vermin and weatherproof) at the camp and work sites to store the solid waste produced on a daily basis;

(v) Wherever possible, materials used or generated by construction shall be recycled;

(vi) Provision for responsible management of any hazardous waste generated during the construction works.

Wastewater and Contaminated Water Management

(i) No grey water runoff or uncontrolled discharges from the site/working areas (including wash down areas) to adjacent watercourses and/or water bodies shall be permitted;

(ii) Water containing such pollutants as cements, concrete, lime, chemicals and fuels shall be discharged into a conservancy tank for removal from site. This particularly applies to water emanating from concrete batching plants and concrete swills;

(iii) The Contractor shall also prevent runoff loaded with sediment and other suspended materials from the site/working areas from discharging to adjacent watercourses and/or water bodies;

(iv) Potential pollutants of any kind and in any form shall be kept, stored and used in such a manner that any escape can be contained and the water table not endangered;

(v) Wash areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas (including groundwater) are not polluted;

(vi) The Contractor shall notify the RE of any pollution incidents on site.

Workshops

Where practical, all maintenance of equipment and vehicles on Site shall be performed in the workshop.

(i) If it is necessary to do maintenance on site, but outside of the workshop area, the Contractor shall obtain the approval of the RE prior to commencing activities;
The Contractor shall ensure that there is no contamination of the soil, vegetation or surface water in his workshop and other plant or emergency maintenance facilities.

The workshop shall be kept tidy at all times and shall have the following as a minimum:

(i) A smooth impermeable floor either constructed of concrete or suitable plastic covered with sufficient gravel to protect the plastic from damage;
(ii) The floor shall be bunded and sloped towards an oil trap or sump to contain any spillages of substances (e.g. oil);
(iii) Drip trays shall be used to collect the waste oil and lubricants during servicing and shall also be provided in construction areas for stationary plant (such as compressors);
(iv) The drip trays shall be inspected and emptied daily;
(v) Drip trays shall be closely monitored during wet weather to ensure that they do not overflow.

**General Materials Handling, Use and Storage**

(i) All materials shall be stored within the Contractor’s camp unless otherwise approved by the RE;
(ii) Stockpile areas shall be approved by the RE;
(iii) All imported fill, soil and/or sand materials shall be free of weeds, litter and contaminants. Sources of imported materials shall be listed and approved by the RE;
(iv) The Contractor shall ensure that delivery drivers are informed of all procedures and restrictions (including ‘No go’ areas) required;
(v) Any electrical or petrol driven pumps shall be equipped and positioned so as not to cause any danger of ignition of the stored product;
(vi) Collection containers (e.g. drip trays) shall be placed under all dispensing mechanisms for hydrocarbons or hazardous liquid substances to ensure contamination from any leaks is reduced;
(vii) Regular checks shall be conducted by the Contractor on the dispensing mechanisms for all above ground storage tanks to ensure faulty equipment is identified and replaced in timely manner;
(viii) Only empty and externally clean tanks may be stored on bare ground. All empty and externally dirty tanks shall be sealed and stored on an area where the ground has been protected.

**Fuels, Oils, Hazardous Substances and other Liquid Pollutants**

(i) Hazardous materials shall not be stored within 2 kilometres of the top water level of public water supply reservoirs;
(ii) Hazardous materials shall be stored above flood level and at least 20 metres from any watercourse;
(iii) Areas for the storage of fuel and other flammable materials shall comply with standard fire safety regulations;
(iv) Chemicals and fuel shall be stored in storage tanks within a secure compound. All chemicals and fuels shall be stored in accordance with manufacturer’s instructions;
(v) Storage areas or secondary containment shall be constructed of waterproof reinforced concrete or approved equivalent, which is not adversely affected by contact with chemicals captured within them;
(vi) The minimum volume for secondary containment shall be 110% of the capacity of the largest tank system, plus 10% of the total capacity of all other separate tanks and containers within the bund wall with closed valves for controlled draining during rains;
(vii) Pipe-work carrying product from the tank to facilities outside the containment shall be provided with secondary containment;
(viii) Tank equipment such as dispensing hoses, valves, meters, pumps, and gauges shall be located within the containment or provided with own containment;
Health, Safety and Security

General Health and Safety

(i) The Contractor shall comply with all standard and legally required health and safety regulations as promulgated by Occupational Health and Safety Act and the Factories and Other Places of Work Regulations;

(ii) The Contractor shall provide a standard first aid kit at the site office;

(iii) The Contractor shall ensure that staff are made aware of the risks of contracting or spreading sexually transmitted diseases, particularly HIV/AIDS and how to prevent or minimise such risks;

(iv) The Contractor shall be responsible for the protection of the public and public property from any dangers associated with construction activities, and for the safe and easy passage of pedestrians and traffic in areas affected by the construction activities;

(v) All works which may pose a hazard to humans and domestic animals are to be protected, fenced, demarcated or cordoned off as instructed by the RE. If appropriate, symbolic warning signs must be erected;

(vi) Speed limits appropriate to the vehicles driven are to be observed at all times on access and haul roads. Operators and drivers are to ensure that they limit their potential to endanger humans and animals at all times by observing strict safety precautions;

(vii) No unauthorized firearms are permitted on site;

(viii) The Contractor shall provide the appropriate Personal Protective Equipment for staff.

Security

Security shall be provided to guard against vandalism when the site is unattended. This includes:

(i) Fencing of the tank compound with locks or other adequate security controls at the site;

(ii) Locks on unattended dispensing hoses;

(iii) Appropriate training for the handling and use of fuels and hazardous material is to be provided by the Contractor as necessary. This includes providing spill response and contingency plans;

(iv) Extreme care will be taken when transferring chemicals and fuels from storage vessels to equipment and machinery on an impervious sealed area which is kerbed and graded to prevent run-off. Chemical and fuel transfer areas shall drain away from the perimeter bund to a containment pit. The design shall provide for the safe and efficient movement of vehicles;

(v) All chemicals stored within the bunded areas shall be clearly labelled detailing the nature and quantity of chemicals within individual containers;

(vi) Any chemical or fuel spills shall be cleaned up immediately. The spilt liquid and clean-up material shall be removed, treated and transported to an appropriate site licensed for its disposal;

(vii) Storm water shall be diverted away from the fuel handling and storage areas. An oil water interceptor shall be provided to treat any rainwater from fuel storage and handling areas.

HIV/AIDS

The implementing agency for HIV/AIDS campaign shall monitor activities regularly to assess effectiveness and impact. This should include an initial, interim and final assessment of basic knowledge, attitude and practices taking account of existing data sources and recognizing the limitations due to the short timeframe to show behavior change. The assessment will be supported by qualitative information from focus group discussions.

Fire Prevention and Control
(i) The Contractor shall take all reasonable and precautionary steps to ensure that fires are not started as a consequence of his activities on site;

(ii) The Contractor shall ensure that there is basic fire-fighting equipment available on site;

(iii) The Contractor shall supply all living quarters, site offices, kitchen areas, workshop areas, materials, stores and any other areas identified by the RE with tested and approved fire fighting equipment;

(iv) Flammable materials should be stored under conditions that will limit the potential for ignition and the spread of fires;

(v) ‘Hot’ work activities shall be restricted to a site approved by the RE;

Smoking shall not be permitted in those areas where there is a fire hazard. These areas shall include:

(i) Workshop;

(ii) Fuel storage areas;

(iii) Any areas(e.g. park/forest areas) where vegetation or other material is such as to make liable the rapid spread of an initial flame;

The Contractor shall ensure that all site personnel are aware of the fire risks and how to deal with any fires that occur. This shall include, but not be limited to:

(i) Regular fire prevention talks and drills;

(ii) Posting of regular reminders to staff;

(iii) Any fires that occur shall be reported to the RE immediately and then to the relevant authorities;

(iv) In the event of a fire, the Contractor shall immediately employ such plant and personnel as is at his disposal and take all necessary action to prevent the spread of the fire and bring the fire under control;

(v) Costs incurred through fire damage will be the responsibility of the Contractor, should the Contractor’s staff be proven responsible for such a fire.

Emergency Procedures

The Contractor shall submit Method Statements covering the procedures for the main activities which could generate emergency situations through accidents or neglect of responsibilities. These situations include, but are not limited to:

(i) Accidents at the work place;

(ii) Accidental fires;

(iii) Accidental leaks and spillages;

(iv) Vehicle and plant accidents;

Specific to accidental leaks and spillages:

(i) The Contractor shall ensure that his employees are aware of the procedure for dealing with spills and leaks;

(ii) The Contractor shall also ensure that the necessary materials and equipment for dealing with the spills and leaks is available on site at all times;