Rehabilitation of Ndikwe-Kiria Road (3.90km) and Mucunguca-Kiangage Road (5.10km) in Murang'a County, Kenya

ESIA Project Report (Final Copy)

20 September 2019
Project No.: 0410731
Document title | Rehabilitation of Ndikwe-Kiria Road (3.90km) and Mucunguca-Kiangage Road (5.10km) in Murang’a County, Kenya
---|---
Document subtitle | ESIA Project Report (Final Copy)
Project No. | 0410731
Date | 20 September 2019
Version | 2.0
Author | As per document history below
Client Name | Mota – Engil Africa

<table>
<thead>
<tr>
<th>Version</th>
<th>Revision</th>
<th>Author</th>
<th>Reviewed by</th>
<th>ERM approval to issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0: Draft 1</td>
<td>00</td>
<td>Barnabas Busheshe, Mercy Kuria, Gideon Owaga and Faith Angasa</td>
<td>Mike Everett</td>
<td>20.09.2019</td>
</tr>
<tr>
<td>2.0: Final Copy</td>
<td>01</td>
<td>Barnabas Busheshe, Mercy Kuria, Gideon Owaga and Faith Angasa</td>
<td>Mike Everett</td>
<td>20.09.2019</td>
</tr>
</tbody>
</table>
Rehabilitation of Ndikwe-Kiria Road (3.90km) and Mucunguca-Kiargage Road (5.10km) in Murang'a County, Kenya

ESIA Project Report (Final Copy)

__________________________
Mike Everett
Partner

ERM East Africa (Pty) Ltd
Senteu Plaza, 1st Floor
Cnr of Galana and Lenana Roads
Kilimani
P.O Box 29170-00100
Nairobi, Kenya
T: +254 740 861 650/1

© Copyright 2019 by ERM Worldwide Group Ltd and / or its affiliates (“ERM”).
All rights reserved. No part of this work may be reproduced or transmitted in any form,
or by any means, without the prior written permission of ERM.
CONTENTS

1. INTRODUCTION ......................................................................................................................... 1
   1.1 Overview ................................................................................................................................. 1
   1.2 Purpose of the Report ............................................................................................................ 4
   1.3 Project Justification .............................................................................................................. 5
   1.4 Contracting Authority (KURA) ............................................................................................. 5
   1.5 Project Consultants .............................................................................................................. 5
       1.5.1 The Project Consortium ................................................................................................. 5
       1.5.2 The Environmental and Social Consultants (ERM) ................................................... 6
   1.6 Report Structure .................................................................................................................. 7

2. LEGAL AND INSTITUTIONAL FRAMEWORK ........................................................................... 8
   2.1 General Overview ................................................................................................................ 8
   2.2 Kenya Policy Provisions ...................................................................................................... 8
       2.2.1 Session Paper No. 5 on the Development and Management of the Road Sub-Sector for Sustainable Economic Growth, 2006 ............................................................... 8
       2.2.2 Session Paper No.10 of 2014 on the National Environment Policy, 2014 ............... 8
       2.2.3 Vision 2030 ................................................................................................................ 9
       2.2.4 National Policy on Water Resources Management and Development, 1999 .......... 9
   2.3 National Legal Framework .................................................................................................. 10
       2.3.1 Administrative Framework ........................................................................................... 10
   2.4 Relevant Statures ................................................................................................................ 11
       2.4.1 The Constitution of Kenya ............................................................................................ 11
       2.4.2 The Kenya Roads Act, 2007 (revised in 2012) ............................................................ 11
       2.4.3 Traffic Act (Cap 403, revised in 2012) ......................................................................... 12
       2.4.4 Urban Areas and Cities Act, 2011 ............................................................................... 12
       2.4.5 The National Transport and Road Safety Act, 2012 .................................................. 12
       2.4.6 The Environmental Management and Co-ordination Act, 1999 (and amendments made in 2015) ................................................................................................................ 13
       2.4.7 The Environmental (Impact Assessment and Audit) Regulations, 2003 (and amendments made in 2016) .............................................. 13
       2.4.8 The Environmental Management and Co-ordination (Water Quality) Regulations, 2006 ................................................................. 13
       2.4.9 The Environmental Management and Co-ordination (Waste Management) Regulations, 2006 ................................................................. 14
       2.4.10 The Environmental Management and Co-ordination Act (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 ......................................................... 15
       2.4.11 The Environmental Management and Co-ordination Act (Air Quality), Regulations, 2014 ......................................................................................................................... 16
       2.4.12 Land Act, 2012 ........................................................................................................... 16
       2.4.13 National Land Commissions Act, 2012 .................................................................... 18
       2.4.14 Environment and Land Court Act, 2011 (Revised in 2012) ................................... 19
       2.4.15 Land Registration Act, 2012 .................................................................................... 19
       2.4.16 Water Act, 2016 ......................................................................................................... 21
       2.4.17 Water Quality Regulations, 2006 ............................................................................. 22
       2.4.18 Water Resources Management Rules (2007) ........................................................... 22
       2.4.19 The Public Health Act (Cap 242) .............................................................................. 22
       2.4.20 The Public Health (Drainage and Latrine) Rules, Cap 130, 1958 ............................ 23
       2.4.21 The Physical Planning Act, 1996 .............................................................................. 23
       2.4.22 The Occupational Safety and Health Act, 2007 ..................................................... 23
       2.4.23 The Employment Act No 11, 2007 ........................................................................ 24
       2.4.25 List of Permits Required for the Project, as per the Requirements of Kenyan Law .... 24
   2.5 Lender Requirements ........................................................................................................ 26
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5.1</td>
<td>International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability, 2012</td>
</tr>
<tr>
<td>2.5.2</td>
<td>IFC Environmental, Health and Safety Guidelines</td>
</tr>
<tr>
<td>2.5.3</td>
<td>Parameter Specific International Guidelines</td>
</tr>
<tr>
<td>2.6</td>
<td>Institutional Framework</td>
</tr>
<tr>
<td>3.1</td>
<td>ESIA Objectives</td>
</tr>
<tr>
<td>3.2</td>
<td>Methodology</td>
</tr>
<tr>
<td>3.2.1</td>
<td>Screening</td>
</tr>
<tr>
<td>3.2.2</td>
<td>Baseline Data Collection</td>
</tr>
<tr>
<td>3.2.3</td>
<td>Impact Assessment Methodology</td>
</tr>
<tr>
<td>3.3</td>
<td>Reporting</td>
</tr>
<tr>
<td>3.3.1</td>
<td>Assumptions and Limitations</td>
</tr>
<tr>
<td>4.1</td>
<td>Project Location</td>
</tr>
<tr>
<td>4.2</td>
<td>Proposed Road Design</td>
</tr>
<tr>
<td>4.2.1</td>
<td>Road Design and Classification</td>
</tr>
<tr>
<td>4.2.2</td>
<td>Road Width</td>
</tr>
<tr>
<td>4.2.3</td>
<td>Junctions and Access Roads</td>
</tr>
<tr>
<td>4.2.4</td>
<td>Slope Protection</td>
</tr>
<tr>
<td>4.2.5</td>
<td>Road Signage</td>
</tr>
<tr>
<td>4.2.6</td>
<td>Other Key Project Features</td>
</tr>
<tr>
<td>4.2.7</td>
<td>Design Speed</td>
</tr>
<tr>
<td>4.3</td>
<td>Construction Materials</td>
</tr>
<tr>
<td>4.3.1</td>
<td>Nyeri County Quarries</td>
</tr>
<tr>
<td>4.3.2</td>
<td>Nanyuki Quarries</td>
</tr>
<tr>
<td>4.4</td>
<td>Labour Requirements</td>
</tr>
<tr>
<td>4.5</td>
<td>Materials and Equipment Storage/Laydown Areas</td>
</tr>
<tr>
<td>4.6</td>
<td>Project Implementation Schedule</td>
</tr>
<tr>
<td>4.7</td>
<td>Project Cost Estimates</td>
</tr>
<tr>
<td>5.1</td>
<td>Location Alternatives/ Alternative Project Roads</td>
</tr>
<tr>
<td>5.2</td>
<td>Realignment/ Design Alternatives</td>
</tr>
<tr>
<td>5.3</td>
<td>No-Go Alternative</td>
</tr>
<tr>
<td>6.1</td>
<td>Introduction</td>
</tr>
<tr>
<td>6.2</td>
<td>General Overview</td>
</tr>
<tr>
<td>6.3</td>
<td>Climate</td>
</tr>
<tr>
<td>6.4</td>
<td>Landscape and Topography</td>
</tr>
<tr>
<td>6.4.1</td>
<td>County Level</td>
</tr>
<tr>
<td>6.5</td>
<td>Hydrology</td>
</tr>
<tr>
<td>6.5.1</td>
<td>County Level</td>
</tr>
<tr>
<td>6.5.2</td>
<td>Project Area</td>
</tr>
<tr>
<td>6.6</td>
<td>Geology and Soils</td>
</tr>
<tr>
<td>6.6.1</td>
<td>County Level</td>
</tr>
<tr>
<td>6.6.2</td>
<td>Project Area</td>
</tr>
<tr>
<td>6.7</td>
<td>Biodiversity</td>
</tr>
<tr>
<td>6.7.1</td>
<td>County Level</td>
</tr>
<tr>
<td>6.7.2</td>
<td>Project Area</td>
</tr>
<tr>
<td>6.8</td>
<td>Summary of Biophysical Sensitivities</td>
</tr>
</tbody>
</table>
7. **Socio-Economic Baseline** ........................................................................................................................................ 65
   7.1 Introduction ......................................................................................................................................................... 65
   7.2 Project Road Location ......................................................................................................................................... 65
   7.3 Demographic Profile ............................................................................................................................................. 66
      7.3.1 County Level .................................................................................................................................................... 66
      7.3.2 Project Area ..................................................................................................................................................... 66
   7.4 Land Use and Land Tenure ............................................................................................................................... 66
      7.4.1 County Level .................................................................................................................................................... 66
      7.4.2 Project Area ..................................................................................................................................................... 67
   7.5 Economic Activities .............................................................................................................................................. 68
      7.5.1 County Level .................................................................................................................................................... 68
      7.5.2 Project Area ..................................................................................................................................................... 68
   7.6 Water and Sanitation ........................................................................................................................................... 72
      7.6.1 County Level .................................................................................................................................................... 72
      7.6.2 Project Area ..................................................................................................................................................... 72
   7.7 Education and Literacy ........................................................................................................................................ 73
      7.7.1 County Level .................................................................................................................................................... 73
      7.7.2 Project Area ..................................................................................................................................................... 74
   7.8 Health ...................................................................................................................................................................... 74
      7.8.1 County Level .................................................................................................................................................... 74
      7.8.2 Project Area ..................................................................................................................................................... 75
   7.9 Archaeology and Cultural Heritage ..................................................................................................................... 76
      7.9.1 County Level .................................................................................................................................................... 76
      7.9.2 Project Area ..................................................................................................................................................... 76
   7.10 Infrastructure ........................................................................................................................................................ 76
      7.10.1 County Level .................................................................................................................................................. 76
      7.10.2 Project Area .................................................................................................................................................. 76
   7.11 Summary of Socio-economic Baseline ............................................................................................................. 78
   8. **Stakeholder Engagement** ........................................................................................................................................ 80
   8.1 Objectives of Stakeholder Engagement .................................................................................................................. 80
   8.2 Project Stakeholders ............................................................................................................................................... 81
   8.3 Approach to Stakeholder Engagement ................................................................................................................ 82
      8.3.1 ESIA Process Engagement ............................................................................................................................. 82
      8.3.2 Post ESIA Engagement ................................................................................................................................... 83
   8.4 Outcomes of Engagement Conducted To Date .................................................................................................... 83
   8.5 Project Grievance Mechanism ........................................................................................................................... 84
   8.6 Monitoring and Reporting ..................................................................................................................................... 84
   9. **Anticipated Impacts and Mitigation Measures** .................................................................................................. 86
   9.1 Impact Assessment Layout ..................................................................................................................................... 86
   9.2 Construction Related Impacts ............................................................................................................................. 87
      9.2.1 Introduction ...................................................................................................................................................... 87
      9.2.2 Impacts on Local Air Quality .......................................................................................................................... 87
      9.2.3 Impacts on the Noise Environment (including vibrations) ................................................................................. 89
      9.2.4 Impacts on Water Quality and Flow .................................................................................................................. 93
      9.2.5 Waste and Effluent ........................................................................................................................................... 97
      9.2.6 Material Sites and Borrow Pits ......................................................................................................................... 100
      9.2.7 Impact on Community Service Infrastructure (Domestic Water Supply and, Electricity Transmission and Distribution) Network ............................................................................................................. 102
      9.2.8 Impacts on Employment, Procurement and the Economy; ................................................................................. 105
      9.2.9 Land Acquisition and Resettlement .................................................................................................................. 106
      9.2.10 Impact on Disease Transmission .................................................................................................................... 108
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.2</td>
<td>9.2.11 Traffic Impacts</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td>9.2.12 Labour and Working Conditions</td>
<td>113</td>
</tr>
<tr>
<td></td>
<td>9.2.13 Security Risks</td>
<td>116</td>
</tr>
<tr>
<td></td>
<td>9.2.14 Increased Infestation of Invasive Alien Plants</td>
<td>118</td>
</tr>
<tr>
<td>9.3</td>
<td>Operations Related Impacts</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>9.3.1 Introduction</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>9.3.2 Impacts on Local Air Quality;</td>
<td>121</td>
</tr>
<tr>
<td></td>
<td>9.3.3 Impacts on the Noise Environment (including vibration)</td>
<td>121</td>
</tr>
<tr>
<td></td>
<td>9.3.4 Impacts on Employment, Procurement and the Economy</td>
<td>123</td>
</tr>
<tr>
<td>9.4</td>
<td>Unplanned Events</td>
<td>123</td>
</tr>
<tr>
<td></td>
<td>9.4.1 Accidental Leaks and Spills</td>
<td>124</td>
</tr>
<tr>
<td></td>
<td>9.4.2 Road Accidents</td>
<td>125</td>
</tr>
<tr>
<td>9.5</td>
<td>Cumulative Impacts</td>
<td>126</td>
</tr>
<tr>
<td>9.6</td>
<td>Summary of Impacts and Residual Impacts</td>
<td>128</td>
</tr>
<tr>
<td>10.</td>
<td>ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP)</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>10.1 Introduction</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>10.2 Environmental and Social Management and Monitoring Plan (ESMMP)</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>10.3 Topic Specific Management Plans</td>
<td>153</td>
</tr>
<tr>
<td></td>
<td>10.3.1 Waste Management Plan</td>
<td>153</td>
</tr>
<tr>
<td></td>
<td>10.3.2 Emergency Response Plan</td>
<td>153</td>
</tr>
<tr>
<td></td>
<td>10.3.3 Water Management Plan</td>
<td>154</td>
</tr>
<tr>
<td></td>
<td>10.3.4 Traffic Management Plan</td>
<td>155</td>
</tr>
<tr>
<td></td>
<td>10.3.5 Health and Safety Management Plan</td>
<td>156</td>
</tr>
<tr>
<td></td>
<td>10.3.6 Workers Code of Conduct</td>
<td>156</td>
</tr>
<tr>
<td></td>
<td>10.4 Roles and Responsibilities</td>
<td>157</td>
</tr>
<tr>
<td></td>
<td>10.4.1 Contractual Obligation</td>
<td>157</td>
</tr>
<tr>
<td></td>
<td>10.4.2 Responsibilities and Duties</td>
<td>157</td>
</tr>
<tr>
<td></td>
<td>10.4.3 Monitoring</td>
<td>161</td>
</tr>
<tr>
<td>11.</td>
<td>CONCLUSIONS AND RECOMMENDATIONS</td>
<td>163</td>
</tr>
<tr>
<td>12.</td>
<td>REFERENCES</td>
<td>165</td>
</tr>
</tbody>
</table>

**APPENDIX A**  
ERM NEMA REGISTRATION AND PRACTICING LICENSE FOR 2019

**APPENDIX B**  
STAKEHOLDER ENGAGEMENT PLAN (SEP)

**APPENDIX C**  
BACKGROUND INFORMATION DOCUMENT USED IN STAKEHOLDER ENGAGEMENT ACTIVITIES

**APPENDIX D**  
DETAILED MINUTES OF STAKEHOLDER ENGAGEMENT MEETINGS CONDUCTED DURING THE ESIA PROCESS, MEETING PHOTOS AND ATTENDANCE REGISTERS
LIST OF TABLES

Table 1.1 Location ................................................................................................................................... 1
Table 1.2 ERM Project Team ............................................................................................................. 6
Table 1.3 Report Structure .................................................................................................................. 7
Table 2.1 Maximum Permissible Noise Levels for Construction Sites in Kenya ........................... 15
Table 2.2 Kenya Air Quality Emission Standards for Residential Areas ........................................ 16
Table 2.3 Relevant Environmental and Social Permits Required for the Project ............................ 25
Table 2.4 IFC Performance Standards ............................................................................................... 27
Table 2.5 Comparison of Applicable Air Quality Standards and Guidelines ................................. 31
Table 2.6 IFC Noise Level Guidelines ............................................................................................... 33
Table 2.7 Institutional Framework .................................................................................................. 33
Table 3.1 Impact Nature and Type .................................................................................................... 36
Table 3.2 Impact Characteristics Terminology .................................................................................. 37
Table 3.3 Definition for Likelihood Designations .............................................................................. 37
Table 3.4 Illustrative Example of Sensitivity/Vulnerability/Importance of the Resource/Receptor 38
Table 3.5 Impact Significance ............................................................................................................ 38
Table 3.6 Significance Definitions ...................................................................................................... 39
Table 4.1 Location ................................................................................................................................. 41
Table 4.2 Planned Road Surface Type ................................................................................................. 42
Table 4.3 Estimated Material Requirements for Laikipia Roads .................................................... 48
Table 4.4 Estimated Project Cost ......................................................................................................... 53
Table 5.1 Analysis of Alternative Project Roads ............................................................................... 54
Table 7.1: Location ................................................................................................................................ 65
Table 8.1 Project Stakeholders ............................................................................................................ 81
Table 8.2 Details of ESIA Process Stakeholder Engagement ........................................................... 82
Table 8.3 Outcomes of ESIA Process Stakeholder Engagements .................................................... 83
Table 9.1 Project Roads in Lot 15 Annuity Programme ..................................................................... 127
Table 9.2 Summary of Construction Phase Impacts ....................................................................... 128
Table 9.3 Summary of Operation Phase Impacts .......................................................................... 128
Table 10.1 Environmental and Social Management and Monitoring Plan (ESMMP) .................... 130
### LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>General Locality Map for Lot 15</td>
<td>2</td>
</tr>
<tr>
<td>1.2</td>
<td>General Locality Map for Lot 18</td>
<td>3</td>
</tr>
<tr>
<td>1.3</td>
<td>Alignment of the Proposed Project Roads</td>
<td>4</td>
</tr>
<tr>
<td>4.1</td>
<td>Alignment of the Proposed Project</td>
<td>41</td>
</tr>
<tr>
<td>4.2</td>
<td>Diagram indicating the application of hot-asphalt</td>
<td>42</td>
</tr>
<tr>
<td>4.3</td>
<td>Typical road cross-section</td>
<td>43</td>
</tr>
<tr>
<td>4.4</td>
<td>Typical Road Layers</td>
<td>43</td>
</tr>
<tr>
<td>4.5</td>
<td>Illustration of an Infiltration Chamber</td>
<td>45</td>
</tr>
<tr>
<td>4.6</td>
<td>Typical Junction 1</td>
<td>45</td>
</tr>
<tr>
<td>4.7</td>
<td>Typical Junction 2</td>
<td>46</td>
</tr>
<tr>
<td>4.8</td>
<td>Typical Junction 3</td>
<td>46</td>
</tr>
<tr>
<td>4.9</td>
<td>Typical Junction 4</td>
<td>47</td>
</tr>
<tr>
<td>4.10</td>
<td>Nyaribo Quarries</td>
<td>49</td>
</tr>
<tr>
<td>4.11</td>
<td>Chaka Crushed Stone Quarries</td>
<td>49</td>
</tr>
<tr>
<td>4.12</td>
<td>Equittel Limited Quarry</td>
<td>51</td>
</tr>
<tr>
<td>4.13</td>
<td>Diaga Quarry</td>
<td>51</td>
</tr>
<tr>
<td>6.1</td>
<td>Land use of the Project Area</td>
<td>57</td>
</tr>
<tr>
<td>6.2</td>
<td>Satellite Imagery of the Project Area</td>
<td>57</td>
</tr>
<tr>
<td>6.3</td>
<td>Topography of the Project Area</td>
<td>58</td>
</tr>
<tr>
<td>6.4</td>
<td>General Terrain along the Ndikwe - Kiria Road</td>
<td>59</td>
</tr>
<tr>
<td>6.5</td>
<td>General Terrain along the Mucunguca - Kiangage Road</td>
<td>59</td>
</tr>
<tr>
<td>6.6</td>
<td>Hydrology Features along the Ndikwe – Kiria Road</td>
<td>60</td>
</tr>
<tr>
<td>6.7</td>
<td>Hydrology along the Mucunguca - Kiangage Road</td>
<td>61</td>
</tr>
<tr>
<td>6.10</td>
<td>Vegetable growing in Red Volcanic Soils of the Project Area</td>
<td>62</td>
</tr>
<tr>
<td>6.11</td>
<td>Vegetation along the Ndikwe - Kiria Road</td>
<td>63</td>
</tr>
<tr>
<td>6.12</td>
<td>Vegetation along the Mucunguca - Kiangage Road</td>
<td>63</td>
</tr>
<tr>
<td>7.1</td>
<td>Location of the Project Roads in Murang’a County, Kenya</td>
<td>65</td>
</tr>
<tr>
<td>7.2</td>
<td>Land Use of the Project Area</td>
<td>67</td>
</tr>
<tr>
<td>7.3</td>
<td>Farming activities along the Ndikwe - Kiria Road</td>
<td>68</td>
</tr>
<tr>
<td>7.4</td>
<td>Business Activities along the Ndikwe-Kiria Road</td>
<td>70</td>
</tr>
<tr>
<td>7.5</td>
<td>Economic Activities along the Mucunguca-Kiangage Road</td>
<td>71</td>
</tr>
<tr>
<td>7.6</td>
<td>Water Infrastructure along the Ndikwe-Kiria Road</td>
<td>73</td>
</tr>
<tr>
<td>7.7</td>
<td>Water Infrastructure along the Mucunguca-Kiangage Road</td>
<td>73</td>
</tr>
<tr>
<td>7.8</td>
<td>Schools along the Ndikwe-Kiria Road</td>
<td>74</td>
</tr>
<tr>
<td>7.9</td>
<td>Maragi Dispensary Signpost</td>
<td>75</td>
</tr>
<tr>
<td>7.10</td>
<td>Infrastructure along the Ndikwe-Kiria Road</td>
<td>77</td>
</tr>
<tr>
<td>7.11</td>
<td>Infrastructure along Mucunguca-Kiangage Road</td>
<td>78</td>
</tr>
</tbody>
</table>
ACRONYMS AND ABBREVIATIONS

AC: Asphalt Concrete
CCL: CAPE Consult Limited
CECM: County Executive Committee Member
CEMP: Construction Environmental Management Plan
CIDP: County Integrated Development Plan
DOSHS: Directorate of Occupational Safety and Health Services
ECO: Environmental Compliance Officer
EHS: Environment, Health and Safety
EHS: Environmental, Health and Safety
EIA: Environmental Impact Assessment
EIA: Environmental Impact Assessment
EMCA: Environmental Management and Coordination Act
EMCA: Environmental Management and Co-ordination Act
ERM: Environmental Resources Management
ERP: Emergency Response Plan
ESIA: Environmental and Social Impact Assessment
ESMMP: Environmental and Social Management and Monitoring Plan
ESMS: Environmental and Social Management System
FBO: Faith Based Organisations
FGD: Focus Group Discussions
GPS: Global Positioning System
GRM: Grievance Redress Mechanism
IFC: International Finance Corporation
ILO: International Labour Organisation
IWRM: Integrated Water Resource Management
KeNHA: Kenya National Highways Authority
KeRRA: Kenya Rural Roads Authority
KII: Key Informant Interview
MUWASCO: Murang’a Water and Sewage Company limited
KPI: Key Performance Indicator
KURA: Kenya Urban Roads Authority
LCL: Lee Construction Limited
MEECA: Mota-Engil Engenharia e Construção (Engineering and Construction) Africa
MSDS: Material Safety Data Sheet
NEMA: National Environment Management Authority
NGO: Non-Governmental Organisations
NMT: Non-Motorised Transport
NTSA: National Transport and Safety Authority
NWSB: Northern Water Services Board
PCEA: Presbyterian Church of East Africa
PM: Project Management
PPE: Personal Protective Equipment
PR: Project Report
PS: Performance Standard
SAoI: Social Area of Influence
SEA: Strategic Environmental Assessment
SEP: Stakeholder Engagement Plan
SERC: Standard and Enforcement Review Committee
SHEQO: Safety, Health, Environment and Quality Officer
SIA: Social Impact Assessment
STD: Sexually Transmitted Diseases
TMP: Traffic Management Plan
TRL: Transport Research Laboratory
WHO: World Health Organisation
WRA: Water Resource Authority
EXECUTIVE SUMMARY

Project: Environmental and Social Impact Assessment (ESIA) Project Report for the proposed Rehabilitation of Ndikwe-Kiria Road (3.90km) and Mucunguca-Kiangage Road (5.10km) in Murang’a County, Kenya

Contracting Authority: Kenya Urban Roads Authority (KURA).


ESIA Consultants: Environmental Resources Management East Africa Limited (ERM)

Project Location: Kiharu Sub-County, Murang’a Municipality, Murang’a County.

Project Description

The Project is located at Kiharu Sub-County, Murang’a Municipality, Murang’a County. The two roads that will be upgraded are the Ndikwe-Kiria Road (3.90km) and Mucunguca-Kiangage Road (5.10km).

The Project Roads are primary roads categorised as class C, that is, roads linking provincially important centres to each other or to higher class roads (Urban / Rural Centres). The proposed Project is geared towards rehabilitating the small County Roads as part of KURA’s actions towards improvement of the road network within Murang’a County and to contribute towards the achievement of KURA’s mission, which is: “To provide and manage quality, safe and adequate urban road networks.”

Investment in transportation infrastructure yields considerable economic benefits by reducing transportation costs for existing activities, providing access to new areas with economic development potential and assists in generating new investment opportunities. The proposed Project is expected to stimulate the economy of Murang’a County and the country at large by easing mobility. The main Project Road design elements include:

- Carriageway width of 7 m (single carriage two-way road);
- Walkway width of 1.5 m on both sides of the road (total walkway width of 3.0 m); and
- Drainage Facilities of 1.5 m on both sides of the road (total drainage facilities are of 3.0 m).

Based on the above specifications, the total road width will be approximately 14m. The total road reserve allocated for the construction of the road will be 20 m. Minor adjustments to the proposed road section may arise after the detailed engineering designs have been completed.

ESIA Process/Methodology

The ESIA is being undertaken in fulfilment of the Environmental Management Coordination Act of 1999 and 2015 (EMCA) Schedule II that identifies projects that require an Environmental Impact Assessment (EIA) to be conducted prior to the commissioning/operation in order to identify the potential adverse impacts of a project and thereby devise appropriate mitigation measures. The ESIA is also aligned to the relevant IFC Performance Standards on Environmental and Social Sustainability, 2012.

Various data collection methods were used as follows:

Document Review
A literature review was undertaken based on the findings of the reconnaissance process, which involved reviewing legislation, policies, the County Integrated Development Plan, and previous studies carried out in the area to determine the baseline conditions and establish the legal, institutional and biophysical / socio-economic environmental setting of the Project area.

The desk based study also included the development of fieldwork tools, fieldwork schedules as well as the approach to stakeholder engagement as outlined in the Stakeholder Engagement Plan (Appendix B of this Project Report).

Site Visits
Site investigations were undertaken on 23rd August and 12th September 2019 during which detailed environmental and social baseline data was collected as well as conduct of stakeholder engagement. Data was collected through:

- a number of stakeholder meetings (including public meeting/baraza);
- Key Informant Interviews (KII) especially with the technocrats of the relevant institutions;
- Focus Group Discussions (FGD) with village elders; and
- Site walkovers.

Photography and Global Positioning Systems (GPS) were used to record the salient features and baseline conditions at the Project site and surroundings environs.

Impact Assessment Methodology
The purpose of impact assessment is to identify and evaluate the significance of potential impacts on identified receptors and resources according to defined assessment criteria and to develop and describe mitigation measures that will be taken to avoid or minimise any potential adverse effects and to enhance potential benefits.

The impacts of the proposed Project were identified based on the findings of stakeholder consultation, the existing baseline conditions, the proposed Project activities and professional knowledge of the consultants. Impacts are first be distinguished as either positive or negative (Chapter 9 of this Project Report). The cross-sectoral issues and aspects are: health; safety; air quality especially dust; waste management; social aspects particularly labour recruitment and management; infrastructure, and utilities.

ESIA Project Report Objectives
The objectives of this ESIA Project Report are to:

- Identify all potentially significant adverse environmental and social impacts of the project and recommend measures for mitigation.
- Gather baseline data to inform the assessment of impacts and to monitor changes to the environment as a result of the Project as well as evaluate the success of the mitigation measures implemented.
- Recommend measures to be used to avoid or reduce the anticipated negative impacts and enhance the positive impacts.
- Prepare an ESIA Project Report compliant to EMCA and the Environmental (Impact Assessment and Audit) Regulations (2003/2016), detailing findings and recommendations for review by NEMA.

Stakeholder Engagement
Stakeholder Engagement ensures that the views and concerns of stakeholders (including the community) are incorporated as early as possible into the project development, i.e., at the planning, implementation and operations phase, to minimise any potential unexpected opposition to the proposed development, and potential adverse effects to the environment. Incorporating the views of the stakeholders into the design process is also very beneficial for adopting the best workable models and systems.

The main objective of the Stakeholder Engagement is to inform stakeholders and the public about the proposed project and its likely effects, and in turn incorporate their inputs, views and concerns into project planning. Three KIIs and one Public Barazas were held during the ESIA process of stakeholder engagement in August and September 2019.

The key questions and concerns raised by stakeholders during the ESIA process are outlined in Table 0.1 and further detail is included in the SEP (Appendix B). Detailed minutes of the stakeholder engagement meetings conducted during the ESIA process, meeting photos, attendance registers, and the developed stakeholder engagement database, are all presented in Appendices C and D.

<table>
<thead>
<tr>
<th>Main Theme</th>
<th>Key stakeholders issues/comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Infrastructure along the Project Roads</td>
<td>The Project design should avoid road-site infrastructure where possible to avoid the need for relocation. Where avoidance is not possible, relocation of the electricity infrastructure should be done before the contractor is on-site.</td>
</tr>
<tr>
<td></td>
<td>It is KURA’s responsibility to have a wider corridor including where relocation should take place.</td>
</tr>
<tr>
<td></td>
<td>At the time of planning for the relocation, it will be important to jointly plan for electricity, water and sewerage infrastructure since at times, the institutions responsible for these facilities agree and relocate them on one side of the road to optimise space.</td>
</tr>
<tr>
<td></td>
<td>KPLC will quote and conduct the actual relocation of the electricity infrastructure; however, it is KURA’s responsibility to pay for the relocation exercise as well as provision of detailed Project design.</td>
</tr>
<tr>
<td>Employment opportunities</td>
<td>Village members especially the disabled should be considered for job opportunities.</td>
</tr>
<tr>
<td>Details of the Road Design</td>
<td>There are water lines along the Project Road and the contractor should ensure they are not damaged or water supply to the community is not affected.</td>
</tr>
<tr>
<td>Health and Safety</td>
<td>Measures should be put in place to reduce accidents along the road.</td>
</tr>
<tr>
<td>Communication</td>
<td>KURA to write a formal letter to the County Commissioner requesting a meeting to discuss the Project.</td>
</tr>
<tr>
<td></td>
<td>There should be comprehensive public participation with the local people. Accordingly, a community Barazas in the Project Area was held.</td>
</tr>
<tr>
<td>Compensation</td>
<td>There should be compensation for loss of crops.</td>
</tr>
<tr>
<td></td>
<td>Project Roads are in a heavily agricultural area and KURA should expect a lot of vegetation/agricultural encroachment within the Road reserve.</td>
</tr>
</tbody>
</table>

Potential Impacts and Mitigation Measures
The Physical, Biological and Socio-economic impacts during the construction and operations phase that have been identified and assessed in the ESIA include are summarised in Table 0.2 and Table 0.3.

### Table 0.2 Summary of Construction Phase Impacts

<table>
<thead>
<tr>
<th>Impact</th>
<th>Significance (pre-mitigation)</th>
<th>Residual Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impacts on Local Air Quality</td>
<td>MAJOR NEGATIVE</td>
<td>MINOR NEGATIVE</td>
</tr>
<tr>
<td>Impacts on the Noise Environment (including vibrations)</td>
<td>MAJOR NEGATIVE</td>
<td>MODERATE NEGATIVE</td>
</tr>
<tr>
<td>Impacts on Water Quality and Flow</td>
<td>MODERATE NEGATIVE</td>
<td>MODERATE NEGATIVE</td>
</tr>
<tr>
<td>Waste and Effluent</td>
<td>MAJOR NEGATIVE</td>
<td>MINOR NEGATIVE</td>
</tr>
<tr>
<td>Material Sites and Borrow Pits</td>
<td>MODERATE NEGATIVE</td>
<td>MINOR NEGATIVE</td>
</tr>
<tr>
<td>Impact on Community Service Infrastructure (Domestic Water Supply, Sewage and, Electricity Transmission and Distribution) Network</td>
<td>MAJOR NEGATIVE</td>
<td>MODERATE NEGATIVE</td>
</tr>
<tr>
<td>Impacts on Employment, Procurement and the Economy</td>
<td>POSITIVE</td>
<td></td>
</tr>
<tr>
<td>Land Acquisition and Resettlement</td>
<td>MODERATE NEGATIVE</td>
<td>NEGLIGIBLE NEGATIVE</td>
</tr>
<tr>
<td>Impact on Disease Transmission</td>
<td>MODERATE NEGATIVE</td>
<td>MINOR NEGATIVE</td>
</tr>
<tr>
<td>Traffic Impacts</td>
<td>MAJOR NEGATIVE</td>
<td>MODERATE NEGATIVE</td>
</tr>
<tr>
<td>Labour and Working Conditions</td>
<td>MAJOR NEGATIVE</td>
<td>MINOR NEGATIVE</td>
</tr>
<tr>
<td>Security Risks</td>
<td>MODERATE NEGATIVE</td>
<td>MINOR NEGATIVE</td>
</tr>
<tr>
<td>Increased Infestation of Invasive Alien Plants</td>
<td>MODERATE NEGATIVE</td>
<td>MINOR NEGATIVE</td>
</tr>
</tbody>
</table>

### Table 0.3 Summary of Operation Phase Impacts

<table>
<thead>
<tr>
<th>Impact</th>
<th>Significance (pre-mitigation)</th>
<th>Residual Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impacts on Local Air Quality</td>
<td>POSITIVE</td>
<td></td>
</tr>
<tr>
<td>Impacts on the Noise Environment (including vibration)</td>
<td>MODERATE NEGATIVE</td>
<td>MODERATE NEGATIVE</td>
</tr>
<tr>
<td>Impacts on Employment, Procurement and the Economy</td>
<td>POSITIVE</td>
<td></td>
</tr>
</tbody>
</table>

For most of the identified impacts, mitigation/management measures will reduce the significance of such impacts to a minor or negligible level, but with some impacts, even with mitigation, residual impacts will only be reduced to a moderate level mainly due to the location of the Project Roads in Murang’a Municipality where Murang’a Town is located (the County’s commercial and administrative centre).

A summary of the key impacts whose significance can only be minimised to a moderate level, even after the application of the appropriate mitigation measures, and which will require careful and consistent ongoing management during Project implementation, are provided below.

- **Impacts on the Noise Environment (including vibrations) during both the Construction and Operations Phase** – The main source of noise and vibrations will be attributed to the heavy construction machinery and construction vehicles that will be used during the construction phase; however, there will be no blasting at the Project site. For general construction activities, the potential for building damage (usually only cosmetic damage) is likely to be limited to a distance of less than 50 m from the construction activity. Moderate significant impacts may occur within this distance. There are structures (both residential and commercial) within a distance of 50 m from the Project Roads.
The main source of noise and vibrations during the operations phase will be attributed to the increased traffic volumes along the Project Roads.

The recommended management measures aim at reducing the intensity of emitted noise and vibrations during the construction phase. However, it is recommended that noise and vibration monitoring is periodically conducted during the construction phase and if excessive levels are recorded at sensitive receptors, additional measures will need to be devised and implemented to reduce the effects to acceptable levels. During the operations phase, the police in liaison with the Contractor (for the first eight years) and Project Developer will need to enforce the traffic laws.

- **Impacts on Water Quality and Flow during the Construction Phase** – The construction phase will be associated with earthwork activities including excavations which has a potential of damaging the domestic water supply and sewer network thus contaminating the water supply system. Excavated material; if not well managed; will be eroded during rainy seasons, and may potentially flow into the rivers Mathioya, Maragua and Kaihungu, and their tributaries, and cause sedimentation, which will further increase the concentration of suspended solids and turbidity already observed in the river. Another potential source of water contamination will be from small scale leaks and spills of petroleum products (fuel, oil, etc.) from Project machinery and fuel storage tanks (if applicable), e.g., due to accidental damage and/or improper maintenance. The paved road and improved drainage system will direct stormwater into the drainage channels thus increasing the volume and ultimately rate of flow of guided stormwater. There is uncertainty about effective management of impacts on water quality and flow once it has occurred; therefore, the recommended mitigation measures aim at preventing the occurrence of this impact. However, it is recommended that this is continuously monitored throughout the construction phase so that this impact does not occur beyond acceptable levels, and that appropriate measures are devised and implemented to further reduce it to acceptable levels. This may include temporarily suspending construction activities during intense rainy periods.

- **Impact on Community Service Infrastructure (Domestic Water Supply and, Electricity Transmission and Distribution) Network** – In order to pave way for the construction activities, the community service infrastructure within the road corridor ((domestic water supply and electricity transmission and distribution networks) will be relocated by the Contracting Authority (KURA) where possible as part of the easement process. During this process, the customers supplied by the affected networks may suffer short term temporary disruptions to the provided services. In practice, the water supply network that crosses the Project Roads will only be relocated during the carrying out of the construction activities since they will need to be temporarily removed and buried again to ensure that the customers on the opposite side of the road continue to access potable water after the construction phase disruptions. Relocation of electricity infrastructure is anticipated to be undertaken prior to the commencement of the construction activities. Another cause of the impact on water supply will be water abstraction to meet the Project’s water needs. This impact cannot be avoided since the community service infrastructure within the Project footprint has to be relocated. Therefore, the recommended mitigation measures aim at minimising the period of disruption as much as possible. Any activities that have a potential of disrupting the functioning of the community service infrastructure will need to be swiftly implemented with utmost care and closely monitored. In particular, relocation schedules must be prepared, communicated timeously to the affected stakeholders and followed as much as possible during the implementation of the relocation activities.

- **Traffic Impacts** – During the construction phase, it is expected that there will be increased vehicle movements in the Project area, as trucks will be required to transport materials and equipment. During the construction phase, residents will be disrupted and inconvenienced by detours, local road closures, safety hazards such as deep excavations, especially at the
junctions of access roads to their homes and business units, and by increased road traffic within the Project area, which will be exacerbated by heavy Project equipment and vehicles, and temporary blockages/reduced traffic flow along emergency services routes. The recommended mitigation measures aim at minimising these disruptions as much as possible; however, community sensitisation is paramount to enable the affected parties to adapt to the changes as they wait for the completion of the upgrade activities and begin to enjoy a better road.

An Environmental and Social Management and Monitoring Plan (ESMMP) has been prepared to ensure that social and environmental impacts and risks identified during the ESIA process are effectively managed during the construction and operations of the Project. The ESMMP specifies the mitigation and management measures to which KURA and the Contractor are committed and shows how the Project will mobilize organizational capacity and resources to implement these measures. The ESMMP also shows how mitigation and management measures will be scheduled and will ensure that the Project complies with the applicable laws and regulations within Kenya, as well as the requirements of IFC Performance Standards on environmental and social sustainability.

ERM is confident that every effort will be made by the Contracting Authority and Contractor to accommodate the mitigation measures recommended during the ESIA process to the extent that is practically possible, without compromising the economic viability of the Project or having a lasting impact on the environment.

In summary, based on the findings of this assessment, ERM finds no reason why the Project Roads, should not be authorised, contingent on the mitigations and monitoring for potential environmental and socio-economic impacts as outlined in the ESMMP.
INTRODUCTION

1.1 Overview

The Government of the Republic of Kenya, through the Ministry of Transport and Infrastructure, and represented by the Kenya Urban Roads Authority (KURA), has formed a Public Private Partnership (PPP) with the appointed consortium comprising of Lee Construction Limited (LCL), Cape Consult Limited (CCL) and Mota-Engil Engenharia e Construção (Engineering and Construction) Africa (“MEECA” or Mota-Engil Africa) (hereafter referred to as the Project Developer) to design, finance, construct and maintain urban roads in the Kenya Roads Annuity Programme, comprising Lot 15 (a total of 10 urban roads spread through six counties of Kenya, namely Nyeri, Laikipia, Kirinyaga, Embu, Muranga and Tharaka Nithi) and Lot 18 (a total of six urban roads spread through four counties in Kenya, namely Kakamega, Vihiga, Bungoma and Busia). All the Project Roads in these lots (Lot 15 and Lot 18) are existing murram/gravel roads located in largely urbanised areas which will be upgraded (paved, walkways added as well as the construction of effective drainage system) as part of the scope required of the Annuity programme (Figure 1.1 and Figure 1.2). It is understood that LCL and MEECA will be the construction Contractor for the Project Roads.

In order to ensure environmental and social compliance, the Project Consortium appointed Environmental Resources Management Consulting East Africa Limited (ERM) to act as independent environmental and social consultants to undertake the Environmental and Social Impact Assessment (ESIA) for the proposed rehabilitation of the Project Roads within the annuity programme.

The ESIA is being undertaken as part of the Kenyan Environmental Impact Assessment (EIA) Process in accordance with regulatory requirements stipulated in the Environmental Management and Coordination Act of 1999 and 2015 (EMCA), and the Environmental (Impact Assessment and Audit) regulations of 2003 (and 2016 Amendments). The ESIA was also guided by the lender requirements such as the International Finance Corporation’s (IFC’s) Performance Standards (2012) and IFC’s Environment, Health and Safety (EHS) guidelines.

During the screening exercise (refer to Chapter 3 for details), it was agreed that the best approach for the assessment is to prepare ESIA Project Reports per County, clearly specifying and adequately assessing the roads that falls within each of the Counties. Accordingly, this ESIA Project Report covers the two roads, hereafter referred to as the Project Roads, in Murang’a County presented in Table 1.1 and Figure 1.3.

Table 1.1 Location

<table>
<thead>
<tr>
<th>SN</th>
<th>County</th>
<th>Name of Road</th>
<th>Length (km)</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Murang’a</td>
<td>Ndikwe – Kiria Road</td>
<td>3.90</td>
<td>Kiria Location, Gakera Sub-Location, Kiharu Sub-County, Murang’a Municipality, Murang’a County</td>
</tr>
<tr>
<td>2</td>
<td>Murang’a</td>
<td>Mucunguca – Kiangage Road</td>
<td>5.10</td>
<td>Mbiri Location, Maragi Sub-Location, Kiharu Sub-County, Murang’a Municipality, Murang’a County</td>
</tr>
</tbody>
</table>
INTRODUCTION

Figure 1.1 General Locality Map for Lot 15
Figure 1.2 General Locality Map for Lot 18
1.2 Purpose of the Report

The information contained in this ESIA Project Report, along with comments and inputs received from stakeholders and commenting authorities will assist the competent authority, the National Environment Management Authority (NEMA), in deciding whether or not to grant environmental authorisation for the proposed Project, and to inform the conditions associated with such authorisation.

The ESIA process involves the identification, prediction and evaluation of actual and potential environmental and social impacts of the Project and outlines the proposed mitigation measures for negative impacts and enhancement measures for positive impacts which the Contracting Authority and Contractor (consortium) will implement.

The objectives of this document are to:

- Communicate the results of the ESIA process for the proposed Project and alternatives considered;
- Ensure that the impacts identified during the ESIA process are assessed;
- Present the mitigation and enhancement measures which will be implemented by the Contracting Authority and the Contractor (consortium) to manage the impacts identified;
- Provide a record of comments and responses received from Stakeholders during the ESIA process; and
- Facilitate an informed decision-making process by the relevant authorities.
1.3 Project Justification

The identified Project Roads are existing gravel surfaced roads that will need to be rehabilitated and upgraded to paved standards – Class C. The proposed Project forms part of the Kenyan Annuity Roads project which is geared towards rehabilitating the small County Roads as part of KURA’s actions towards improvement of the road network within Murang’a County. The Annuity Roads program aims to upgrade approximately 2,000 km of murran /gravel roads to surface roads and in so contribute towards the achievement of KURA’s mission, which is: “To provide and manage quality, safe and adequate urban road networks.”

Investment in transportation infrastructure yields considerable economic benefits by reducing transportation costs for existing activities, providing access to new areas with economic development potential and assists in generating new investment opportunities. The proposed Project is expected to stimulate the economy of Murang’a County and the country at large by easing mobility within Murang’a Municipality, Murang’a County.

1.4 Contracting Authority (KURA)

The Kenya Urban Roads Authority (KURA) is a state corporation under the Ministry of Transport and Infrastructure, established by the Kenya Roads Act, 2007 with the core mandate of management, development, rehabilitation and maintenance of national urban trunk roads.

1.5 Project Consultants

1.5.1 The Project Consortium

1.5.1.1 Mota Engil Africa

Mota-Engil Engenharia e Construção (Engineering and Construction) Africa (“MEECA”) belongs to a diversified and multinational business Group consisting of more than 250 legal entities involved in construction and infrastructure management. The Mota Engil Group head offices are based in Porto and Lisbon, Portugal, with a local branch Mota-Engil Kenya based in Nairobi. With a thorough knowledge of the African market, strengthened through a journey of continuous expansion, the Mota Engil Africa Group is currently present in fourteen African countries, including in Kenya.

Mota Engil Engenharia e Construção (Engineering and Construction) Africa has a wide portfolio, a long-term strategic outlook and an expanded horizon for work, seeking to develop partnerships to carry out projects in the areas of infrastructures in areas as diverse as Transports and Logistics, Energy, Oil & Gas and Environment.

1.5.1.2 Lee Construction Limited

Lee Construction Limited (LCL) is a wholly Kenyan owned Building and Civil Engineering Construction Company, incorporated in Kenya under the Companies Act CAP 486, Certificate No. C67951 dated 22nd Nov.1995. Since its incorporation, the Company has undertaken projects of diverse nature and complexity ranging from buildings to road works, drainage, sewerage and water supply, Irrigation. The company is ready to undertake projects in any part of this country and region.

LCL recognizes the need for adequate equipment and tools to complement the capabilities of its staff resources. In this regard therefore, the Company has invested in construction plant and equipment required for execution of building and civil engineering projects. The Company has also invested in advanced design tools to complement the field resources. These include modern computer hardware and CAD-based design software.
1.5.1.3 CAPE Consult Limited

CAPE Consult Limited (CCL) is a Kenyan based consulting firm offering professional services in engineering, planning and infrastructure development. Since establishment in 1996, CCL has handled an impressive and wide array of projects in the built industry for several clients in Kenya and the wider East Africa region. These range from planning and engineering design to works supervision.

Through associations with other regionally based firms, CCL is able to access a database of strategic and experienced experts all over Africa in order to enhance its capabilities when necessary. CCL also collaborates on a project-by-project basis with other international consulting firms and individuals from around the world when the need arises. These arrangements ensure that the firm is able to complement its services with specialist technology and expertise which may not be available locally.

From its wide array of project experience, CCL is well appraised on the needs of clients in the fulfilment of its mandate. The firm has participated on projects financed by the major development partners including Agence Francaise de Developpement, World Bank, African Development Bank, Japan International Co-operation Agency, European Union and GIZ amongst others, and is therefore well versed with procurement procedures, rules and regulations applicable to the wide range of development partner financed project administration.

1.5.2 The Environmental and Social Consultants (ERM)

Environmental Resources Management East Africa Limited (ERM) was appointed by the Concession to undertake the ESIA for the proposed Project. ERM (and specialists appointed by ERM during the course of this ESIA) has no financial ties to, nor are they a subsidiary, legally or financially, of the Contracting Authority or the Consortium.

ERM is a leading global provider of integrated environmental, health, safety, risk, social consulting and sustainability related services with over 160 offices in more than 40 countries and territories. ERM has operated throughout Africa for over thirty-five years and our Sub-Saharan Africa Business Division with over 200 employees is currently based in South Africa (Cape Town, Durban and Johannesburg), Mozambique (Maputo), Kenya (Nairobi) and Tanzania (Dar Es Salaam).

ERM East Africa Ltd. is registered with NEMA as a Firm of ESIA/Audit Experts, Reg. No 7264. (Refer to Appendix A for ERM East Africa’s Registration Certificate and 2019 Practicing Licence from NEMA).

The ESIA team for this Project is presented in Table 1.2.

Table 1.2 ERM Project Team

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partner in Charge</td>
<td>Michael (Mike)</td>
<td>M.Sc. Hydrology, B.Sc. (Hons) Hydrology and Soil Science, NEMA Kenya</td>
</tr>
<tr>
<td></td>
<td>Everett</td>
<td>Lead EIA/Audit Expert (Reg. No 7263)</td>
</tr>
<tr>
<td>Project Manager and</td>
<td>Barnabas</td>
<td>Bachelor of Science in Forestry (Honours), Makerere University, Uganda, 2011.</td>
</tr>
<tr>
<td>Environmental Specialist</td>
<td>Busheshe</td>
<td></td>
</tr>
<tr>
<td>Social Consultant</td>
<td>Faith Angasa</td>
<td>Masters in Sociology and Community Development (ongoing), Bachelor’s Degree in Economics with IT.</td>
</tr>
<tr>
<td>Social Consultant and Stakeholder Engagement Lead</td>
<td>Gideon Owaga</td>
<td>Master’s in Rural Sociology and Community Development, Bachelor of Arts in Sociology and Public Administration, Associate Member of Environmental Institute of Kenya (EIK), NEMA Kenya Associate EIA/Audit Expert (Reg. no 10452)</td>
</tr>
</tbody>
</table>
1.6 Report Structure

The structure of this ESIA Project Report is outlined in Table 1.3.

Table 1.3 Report Structure

<table>
<thead>
<tr>
<th>Section</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 1 Introduction</td>
<td>Contains an overview of the Project, Project justification, Contracting Authority, Project consultants and an outline of the report structure.</td>
</tr>
<tr>
<td>Chapter 2 Legal and Institutional Framework</td>
<td>Outlines the legislative, policy and administrative requirements applicable to the proposed Project.</td>
</tr>
<tr>
<td>Chapter 3 Approach and Methodology</td>
<td>Outlines the approach to the ESIA and summarises the process undertaken by the Project to date.</td>
</tr>
<tr>
<td>Chapter 4 Project Description</td>
<td>Includes a detailed description of the proposed Project activities.</td>
</tr>
<tr>
<td>Chapter 5 Consideration of Alternatives</td>
<td>Describes the alternatives that have been considered and the reasons for the selection of the preferred alternative.</td>
</tr>
<tr>
<td>Chapter 6 Biophysical Baseline</td>
<td>Describes the receiving biophysical baseline environment.</td>
</tr>
<tr>
<td>Chapter 7 Socio-economic Baseline</td>
<td>Describes the receiving socio-economic baseline environment.</td>
</tr>
<tr>
<td>Chapter 8 Stakeholder Engagement</td>
<td>Describes the approach to and outcomes of the stakeholder engagement and public participation process.</td>
</tr>
<tr>
<td>Chapter 9 Impacts Assessment and Mitigation Measures</td>
<td>Describes and assesses the potential environmental and social impacts of the proposed Project. Mitigation measures are also presented.</td>
</tr>
<tr>
<td>Chapter 10 Environmental and Social Management and Monitoring Plan (ESMMP)</td>
<td>Specifies the mitigation and management measures to be undertaken and shows how the Project will mobilise organisational capacity and resources to implement these measures.</td>
</tr>
<tr>
<td>Chapter 11 Conclusions and Recommendations</td>
<td>Summarises the key findings of the ESIA process and provides recommendations for the mitigation of potential impacts and the management of the proposed Project.</td>
</tr>
<tr>
<td>Chapter 12 References</td>
<td>Contains a list of references used in compiling the report.</td>
</tr>
</tbody>
</table>

In addition, the Report includes the following Appendices:

Appendix A: ERM NEMA Registration and 2019 Practicing Licence
Appendix B: Stakeholder Engagement Plan (SEP)
Appendix C: Background Information Document (BID) used during Stakeholder engagement exercise
Appendix D: Detailed minutes of stakeholder engagement meetings conducted during the ESIA process, meeting photos and attendance registers
2. LEGAL AND INSTITUTIONAL FRAMEWORK

2.1 General Overview

This Chapter outlines the existing national and international environmental and social legislation, policies and institutions applicable to roads that will guide the development of the Project Roads subject to this ESIA. This includes a summary of the IFC’s Performance Standards on environmental and social sustainability. As Kenya is a signatory to various international conventions and laws, relevant international conventions are also presented.

2.2 Kenya Policy Provisions

2.2.1 Session Paper No. 5 on the Development and Management of the Road Sub-Sector for Sustainable Economic Growth, 2006

The goal of the policies outlined in this Sessional Paper is to attain an efficient road sector that supports and promotes economic growth through the cost effective provision and maintenance of infrastructure that is necessary for safe and reliable road transport. This Session Paper presents various policy statements on:

- Providing an appropriate Road Network;
- Road Maintenance;
- Technical Standards;
- Non-Motorised Transport (NMT);
- Traffic Management;
- Road Safety;
- Roads and Land-Use Planning; and
- Axle Load Compliance.

Relevance to this Project

- Section 5.1.1 of this policy statement states that “road development will be focused on improving accessibility, increasing the variety and quality of affordable urban and rural transport and improving accessibility for the development of key economic sectors” and,
- Section 5.1.5 states that “measures will be taken by the Government to provide bypasses, missing road links, improved junctions, dedicated bus lanes/corridors, public service vehicle terminals, parking spaces, carriageway capacity improvement, service roads and improved traffic information in order to reduce traffic congestion in urban areas and along highways, and improve the quality of the travelling environment for all road users including non-motorised transport”.

The proposed rehabilitation of the County roads is to improve accessibility within the Project Area and help achieve the goal of the policy statements.

2.2.2 Session Paper No.10 of 2014 on the National Environment Policy, 2014

The overall goal of this Session Paper is to ensure better quality of life for present and future generations through sustainable management and use of the environment and natural resources.

Section 5.6 of this Session Paper focusses on infrastructure development and environment and makes explicit policy statements to ensure sustainable management and use of the environment and
natural resources during the construction and operation of infrastructure developments including roads. These policy statements require the commitment of the Government to:

- Ensure Strategic Environmental Assessment (SEA), Environmental Impact Assessment (EIA), Social Impact Assessment (SIA) and Public Participation in the planning and approval of infrastructural projects;
- Develop and implement an environmentally-friendly national infrastructural development strategy and action plan; and
- Ensure that periodic Environmental Audits are carried out for all infrastructural projects.

Relevance to this Project

In line with the above policy statements, this ESIA has been conducted for the proposed rehabilitation of the Project Roads to ensure that environmental and social issues are appropriately addressed.

2.2.3 Vision 2030

Kenya Vision 2030 is the country’s development blueprint covering the period 2008-2030. It aims to transform Kenya into a newly industrialised, ‘middle income country providing a high quality life to all its citizens by the year 2030’.

Vision 2030 is based on 3 key pillars namely: Economic, Social, and Political. These pillars are anchored on the following foundations:

- macro-economic stability;
- continuity in governance reforms;
- enhanced equity and wealth creation opportunities for the poor;
- infrastructure;
- energy;
- science, technology and innovation (STI);
- land reform;
- human resources development;
- security; and
- public sector reforms.

Relevance to this Project

Vision 2030 aspires for a country firmly interconnected through, among others, a network of roads and recognises that in order to achieve this, investment in the nation’s infrastructure will be given the highest priority. The proposed Project is geared towards rehabilitating certain urban roads as part of the actions towards improvement of the road network within the country, which is in line with the objectives of Vision 2030.

2.2.4 National Policy on Water Resources Management and Development, 1999

The National Policy on Water Resources Management and Development promotes the systematic development of water facilities in all sectors while recognising wastewater as a by-product of this process. The Policy therefore calls for development of appropriate sanitation systems to protect people’s health and water resources from institutional pollution. This implies that industrial and
business development activities should be accompanied by corresponding waste management systems to handle the wastewater and other waste emanating there from.

Relevance to this Project

The policy advocates for appropriate waste management to avoid pollution of water resources. The Contractor will need to implement appropriate waste management practices to avoid pollution of rivers Mathioya and Maragua, and their tributaries which drain the Project area.

2.3 National Legal Framework

2.3.1 Administrative Framework

In 2001, the Government established the administrative structures to implement the Environmental Management and Co-ordination Act of 1999 (EMCA). The main administrative structures are described in the following sections.

The National Environmental Council

The National Environmental Council is responsible for policy formulation and directions in relation to the EMCA. The Council also sets national goals and objectives, and determines policies and priorities for the protection of the environment.

The 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 in the implementation of all policies relating to the environment.

Standard and Enforcement Review Committee (SERC)

EMCA provides for the establishment and enforcement of environmental quality standards by a technical committee of NEMA known as the Standards and Enforcement Review Committee (SERC).

Public Complaints Committee

EMCA has also established a Public Complaints Committee, which provides the administrative mechanism for addressing environmental harm. The Committee has the mandate to investigate complaints relating to environmental damage and degradation. The members of the Public Complaints Committee include representatives from the Law Society of Kenya, non-governmental organisations (NGOs) and the business community.

Water Resource Authority (WRA)

The WRA is responsible for the regulation of water resources such as water allocation, source protection and conservation, water quality management and pollution control and international waters. Its roles and responsibilities are as follows:

- Planning, management, protection and conservation of water resources;
- Planning, allocation, apportionment, assessment and monitoring of water resources;
- Issuance of water permits;
- Water rights and enforcement of permit conditions;
- Regulation of conservation and abstraction structures;
- Catchment and water quality management;
- Regulation and control of water use; and

**Relevance to this Project**

The above established institutions are relevant to the Project Roads to ensure appropriate and compliant management of both environmental and social issues associated with the Project. In particular, the Project Developer must obtain the NEMA EIA Certificate of approval prior to the commencement of the construction activities confirming that adequate mitigation measures have been proposed and will be implemented during the Project lifecycle to reduce any identified environmental and social impacts to acceptable levels.

**2.4 Relevant Statures**

The current legal provisions for natural resource management in Kenya are contained in over seventy sector-specific statutes. In 1999, the Government of Kenya enacted the Environmental Management and Co-ordination Act which is an umbrella legal framework and institutional framework under which the environment is managed. The Act prevails over all other sectoral laws relating to the environment in cases of conflict or contradictions. It also grants the public a *locus standi* in matters of the environment.

### 2.4.1 The Constitution of Kenya

In the Constitution of Kenya, 2010, Part II (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
- Utilise the environment and natural resources for the benefit of the people of Kenya.

It further stipulates in Part II that “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.”

**Relevance to this Project**

The Project should observe the above stated conditions in as far as environmental protection is concerned.

### 2.4.2 The Kenya Roads Act, 2007 (revised in 2012)

This Act provides for the establishment of the Kenya National Highways Authority (KeNHA), the Kenya Urban Roads Authority (KURA) and the Kenya Rural Roads Authority (KeRRA), and provides for the powers and functions of the authorities and for connected purposes.
Section 7 of this Act specifies the function of KURA, 10.(1) The Urban Roads Authority shall have the responsibility for the management, development, rehabilitation and maintenance of all public roads in the cities and municipalities in Kenya except where those roads are national roads.

Part IV of this Act elaborates the powers of the Authority which include land acquisition for the purpose of the Authority. In acquiring land for purposes of the Authority, Section 23(2b) states that “if the land is not public land, the Commissioner of Lands may, if satisfied that it is in the public interest to do so, acquire the land in accordance with the provisions of the Land Acquisition Act (Cap. 295).

**Relevance to this Project**

*KURA and the Project Developer will need to ensure that land acquisition and Project implementation is carried out in line with the provisions of this Act, if applicable.*

**2.4.3 Traffic Act (Cap 403, revised in 2012)**

This Act consolidates the law relating to traffic on the roads. Section 69 of this Act makes it the duty of the police:

- to regulate all traffic and to keep order and prevent obstruction in all roads, parking places and other places of public resort; and
- to divert traffic temporarily, or to restrict or close and deny public access to any road, parking place or other place of public resort, where any emergency or any assembly or other event appear to render advisable such a course.

Section 70 of this Act further makes it a requirement for the relevant authority to install road signs on or near a road including road traffic signs prescribing speed limits on the road.

**Relevance to this Project**

*In implementing the Project, KURA and the Contractor will need to follow the provisions of this Act. For instance, all the necessary traffic diversions to enable effective conduct of the construction activities will need to be done in collaboration with the police, as required by this Act, in addition to other traffic measures recommended Chapter 9 of this Report. The Contractor will be responsible for the installation of the necessary road signs and the maintenance thereof during the maintenance period of this project.*

**2.4.4 Urban Areas and Cities Act, 2011**

This Act provide for the, classification, governance and management of urban areas and cities, among others. Part V of this Act focusses on integrated development planning which shall give effect to the development of urban areas and cities as required by this Act and any other written law, among others.

**Relevance to this Project**

*Implementation of the Project will be aligned to the integrated development planning of the relevant County.*

**2.4.5 The National Transport and Road Safety Act, 2012**

This Act provides for the establishment of the National Transport and Safety Authority (NTSA), the powers and functions of the Authority, and for connected purposes. Section 22 of this Act provides for the establishment of county transport and safety committees in each county whose roles are to:

- Oversee the management and regulation of the road transport system by the Authority at the county level;
- Prepare and submit to the Authority such audit reports as the Authority may require on the safety, reliability and efficiency of the road transport system within the county;
- Advise the Authority on matters affecting the road transport system within the county; and
- Perform such other functions as may be assigned to it by the Authority.

Relevance to this Project

In implementing the proposed Project, the Project implementation team will liaise with county transport and safety committees.

2.4.6 The Environmental Management and Co-ordination Act, 1999 (and amendments made in 2015)

The Environment Management and Co-ordination Act (EMCA), 1999, and amendments made in 2015, is implemented by the guiding principle that every person has a right to a clean and healthy environment and can seek redress through the high court if this right has been, is likely to be or is being contravened.

Section 58 of the Act makes it a mandatory requirement for an EIA to be carried out by proponents intending to implement projects specified in the second schedule of the Act \(^1\). Such projects have a potential of causing significant impacts on the environment. Similarly, Section 68 of the same Act requires operators of existing projects or undertakings to carry out environmental audits in order to determine the level of conformance with statements made during the EIA.

Relevance to this Project

The proposed rehabilitation of the Project Roads falls within the category of medium risk projects (more specifically, construction and rehabilitation of roads), for which an EIA is required. This EIA has therefore been carried out in line with the requirements of this Act, and, KURA and the Project Developer shall be required to commit to implementing the Environmental and Social Management and Monitoring Plan (ESMMP) laid out in this Report and any other conditions laid out by NEMA, prior to being issued an EIA licence.

2.4.7 The Environmental (Impact Assessment and Audit) Regulations, 2003 (and amendments made in 2016)

The Environmental (Impact Assessment and Audit) Regulations state in Regulation 3 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 II of the Regulations indicates the procedures to be taken during preparation, submission and approval of the ESIA Project Report, i.e., this Report. Specifically, the Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2016 contains an updated version of the Second Schedule in which the proposed Project falls in the category of medium risk projects for which an EIA is required.

Relevance to this Project

This ESIA Project Report has been undertaken to comply with the requirements of these Regulations.

2.4.8 The Environmental Management and Co-ordination (Water Quality) Regulations, 2006

The Regulations provide for sustainable management of water resources including prevention of water pollution and protection of water sources. It is an offence under Regulation No. 4 (2), for any

\(^1\) The Second Schedule of the EMCA was updated in the Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2016.
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 to this Project

The policy advocates for appropriate waste management to avoid pollution of water resources. The Contractor will need to implement appropriate waste management practices to avoid pollution of rivers Mathioya and Maragua, and their tributaries which drain the Project area.

2.4.9 The Environmental Management and Co-ordination (Waste Management) Regulations, 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 wastes.

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.

Monitoring the product cycle from beginning to end is also required by:

- identifying and eliminating potential negative impacts of the product;
- enabling the recovery and re-use of the product where possible;
- 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 to this Project

The Project will generate wastes, during the construction and maintenance phases, which will need to be disposed of as per the guidelines in the Regulations.
2.4.10 The Environmental Management and Co-ordination Act (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009

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 centimetres 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.

<table>
<thead>
<tr>
<th>Facility</th>
<th>Day (06:01 – 18:00, $L_{Aeq, 12\text{ hour}}$)</th>
<th>Night (18:01 – 06:00, $L_{Aeq, 12\text{ hour}}$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Health facilities, educational institutions, homes for disable etc.</td>
<td>60</td>
<td>35</td>
</tr>
<tr>
<td>(ii) Residential</td>
<td>60</td>
<td>35</td>
</tr>
<tr>
<td>(iii) Areas other than those prescribed in (i) and (ii)</td>
<td>75</td>
<td>65</td>
</tr>
</tbody>
</table>
Relevance to this Project

The Contractor will be required to ensure compliance with the above Regulations in order to promote a healthy and safe working environment throughout the construction and maintenance phases. This shall include regular inspection and maintenance of equipment to reduce noise and vibration, prohibition of unnecessary noise emitted from construction equipment and project heavy and light vehicles, adherence to the noise levels stipulated for day and night etc.

2.4.11 The Environmental Management and Co-ordination Act (Air Quality), Regulations, 2014

The draft Kenyan Air Quality Standards as part of The Environmental Management and Co-ordination Act 1999, were transposed into Kenyan legislation through The Environmental Management and Co-ordination (Air Quality) Regulations, 2014. These standards include a consideration of the type of area within which the proposed Project is located – i.e. industrial area, residential area and controlled area.

Relevancy to this Project

For the purposes of the air quality assessment for the proposed Project, it is assumed that the residential area standards will apply along the proposed Project Roads (Table 2.2). Controlled areas are stated to include, but are not limited to, residential areas, hospitals, National Parks, Reserves and Sanctuaries and therefore not considered suitable for this Project since most of the environments included in the definition are not present along the Project Roads. This assumption is reasonable, as the large majority of receptors identified along the route are residential properties.

Note - where Kenyan standards are set out in terms of parts per million, these have been converted to µg/m³ for ease of comparison. The Kenyan air quality standards for SO₂, PM₁₀ and PM₂.₅ are similar to other international standards (i.e. IFC, EU and USEPA). For NO₂, the Kenyan air quality standard is somewhat less stringent than the standards set by these bodies, but are comparable to some other African countries (for example Egypt, Benin, Tunisia). The air quality standards for SO₂, PM₁₀ and PM₂.₅ are considered suitable for purpose, and whilst the NO₂ standards are less stringent than IFC, these are still considered reasonable and suitable for purpose in the protection of human health.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Averaging period</th>
<th>Criterion (µg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO₂</td>
<td>annual average</td>
<td>96</td>
</tr>
<tr>
<td>NO₂</td>
<td>monthly average</td>
<td>153</td>
</tr>
<tr>
<td>NO₂</td>
<td>24 hour maximum</td>
<td>100</td>
</tr>
<tr>
<td>NO₂</td>
<td>one hour maximum</td>
<td>383</td>
</tr>
<tr>
<td>NO₂</td>
<td>Instant peak maximum</td>
<td>957</td>
</tr>
<tr>
<td>PM₁₀</td>
<td>annual average</td>
<td>50</td>
</tr>
<tr>
<td>PM₁₀</td>
<td>24 hour 98 percentile</td>
<td>70</td>
</tr>
<tr>
<td>PM₂.₅</td>
<td>annual average</td>
<td>35</td>
</tr>
<tr>
<td>PM₂.₅</td>
<td>24 hour maximum</td>
<td>75</td>
</tr>
</tbody>
</table>

2.4.12 Land Act, 2012

This Act of Parliament intended to give effect to Article 68 of the Constitution, to revise, consolidate and rationalise land laws, to provide for the sustainable administration and management of land and land based resources, and for connected purposes.
2.4.12.1 **Principles and Values to Guide Land Management and Administration**

Parts 1 and 2 of Section 4 of the Act outline the main guiding principles in land management and administration, binding to all land actors including State officers. These principles are to be applied when enacting, applying or interpreting any provisions of this Act; and when making or implementing public policy decisions. In discharging their functions and exercising of their powers under this Act, the Commission and any State officer or Public officer shall be guided by the following values and principles:

- equitable access to land;
- security of land rights;
- sustainable and productive management of land resources;
- transparent and cost effective administration of land;
- conservation and protection of ecologically sensitive areas;
- elimination of gender discrimination in law, customs and practices related to land and property in land;
- encouragement of communities to settle land disputes through recognised local community initiatives;
- participation, accountability and democratic decision making within communities, the public and the Government;
- technical and financial sustainability;
- affording equal opportunities to members of all ethnic groups;
- non-discrimination and protection of the marginalized;
- democracy, inclusiveness and participation of the people; and
- alternative dispute resolution mechanisms in land dispute handling and management.

Article 5 of the Land Act, lists forms of land tenure: Freehold; Leasehold; such forms of partial interest as may be defined under this Act and other law, including but not limited to easements and customary land rights, where consistent with the Constitution. This article also provides for equal recognition and enforcement of land rights arising under all tenure systems and non-discrimination in ownership of, and access to land under all tenure systems.

Article 56 of the Land Act on the power to lease land states that the owner of private land may:

(a) Lease that land or part of it to any person for a definite period or for the life of the lessor or of the lessee or for a period which though indefinite, may be terminated by the lessor or the lessee; and

(b) Subject the lease to any conditions that may be required by this Act or any other law or that the lessor may impose.
Relevance to this Project

Although the Project Roads already exist on land under KURA’s management, on behalf of the Government, the above principles and values of land management will need to be observed to ensure undisputed land ownership as well as acceptable utilisation and management practices.

2.4.13 National Land Commissions Act, 2012

This is an Act of Parliament to make further provision as to the functions and powers of the National Land Commission, qualifications and procedures for appointments to the Commission, to give effect to the objects and principles of devolved government in land management and administration, and for connected purposes.

The mandate of the Commission, as provided for in the Act, Pursuant to Article 67(2) of the Constitution, shall be:

- to manage public land on behalf of the national and county governments;
- to recommend a national land policy to the national government;
- to advise the national government on a comprehensive programme for the registration of Title in Land throughout Kenya;
- to conduct research related to land and the use of natural resources, and make recommendations to appropriate authorities;
- to initiate investigations, on its own initiative or on a complaint, into present or historical land injustices, and recommend appropriate redress;
- to encourage the application of traditional dispute resolution mechanisms in land conflicts;
- to assess tax on land and premiums on immovable property in any area designated by law;
- to monitor and have oversight responsibilities over land use planning throughout the country;
- on behalf of, and with the consent of the national and county governments, alienate public land;
- to monitor the registration of all rights and interests in land;
- to ensure that public land and land under the management of designated state agencies are sustainably managed for their intended purpose and for future generations;
- develop and maintain an effective land information management system at national and county levels;
- manage and administer all unregistered trust land and unregistered community land on behalf of the county government; and
- develop and encourage alternative dispute resolution mechanisms in land dispute handling and management.
Relevance to this Project

Any land ownership documents required for the Project Roads must be confirmed by the National Land Commission (NLC), the government institution mandated with the acquisition and management of government land as well as issuance of land title deeds if and where applicable.

2.4.14 Environment and Land Court Act, 2011 (Revised in 2012)

This is an Act of Parliament to give effect to Article 162 (2) (b) of the Constitution; to establish a superior Court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land, and to make provision for its jurisdiction functions and powers, and for connected purposes. The principal objective of this Act is to enable the Court to facilitate the just, expeditious, proportionate and accessible resolution of disputes governed by this Act.

Section 13 (2) (b) of the Act outlines that in exercise of its jurisdiction under Article 162 (2) (b) of the Constitution, the Court shall have power to hear and determine disputes relating to environment and land, including disputes:

- relating to environmental planning and protection, trade, climate issues, land use planning, title, tenure, boundaries, rates, rents, valuations, mining, minerals and other natural resources;
- relating to compulsory acquisition of land;
- relating to land administration and management;
- relating to public, private and community land and contracts, choses in action or other instruments granting any enforceable interests in land; and
- any other dispute relating to environment and land.

Section 24 (2) also states that the Chief Justice shall make rules to regulate the practice and procedure, in tribunals and subordinate courts, for matters relating to land and environment.

Section 30 (1) states that all proceedings relating to the environment or to the use and occupation and title to land pending before any Court or local tribunal of competent jurisdiction shall continue to be heard and determined by the same court until the Environment and Land Court established under this Act comes into operation or as may be directed by the Chief Justice or the Chief Registrar.

Relevance to this Project

The overall goal is to implement the project in a proactive manner avoiding land and environment disputes and if any such disputes arise, effectively address them through the Project Grievance Management team that will be set up prior to the commencement of the construction activities. However, in the event that there are land or environment grievances that are escalated and require to be addressed through established courts of laws, these will need to be addressed through the Land and Environment Court, the dedicated court for addressing such matters.

2.4.15 Land Registration Act, 2012

This is an Act of Parliament intended to revise, consolidate and rationalise the registration of titles to land, to give effect to the principles and objects of devolved government in land registration, and for connected purposes.
Land Registry

Section 7(1) of the Act provides for establishment of a land registry in each registration unit which shall keep registers of the following regarding land:

- a land register, in the form to be determined by the Commission;
- the cadastral map;
- parcel files containing the instruments and documents that support subsisting entries in the land register;
- any plans which shall, after a date appointed by the Commission, be geo-referenced;
- the presentation book, in which shall be kept a record of all applications numbered consecutively in the order in which they are presented to the registry;
- an index, in alphabetical order, of the names of the proprietors; and
- a register and a file of powers of attorney.

Maintenance of Documents, including Land Title Deeds

Further, Section 9 (1) provides that the Registrar shall maintain the register and any document required to be kept under this Act in a secure, accessible and reliable format. These documents include:

- publications, or any matter written, expressed, or inscribed on any substance by means of letters, figures or marks, or by more than one of those means, that may be used for the purpose of recording that matter;
- electronic files; and
- an integrated land resource register.

The register, as provided for in Part 2 of Section 9, shall contain the following particulars:

- name, personal identification number, national identity card number, and address of the proprietor;
- in the case of a corporate body, name, postal and physical address, certified copy of certificate of incorporation, personal identification numbers and passport size photographs of persons authorised and where necessary attesting the affixing of the common seal;
- names and addresses of the previous proprietors;
- size, location, user and reference number of the parcel; and
- any other particulars as the Registrar may, from time to time, determine.

Relevance to this Project

The relevant Authority (KURA) will be responsible for updating any title deeds, as may be required in the event that land needs to be acquired for the execution of the Project.
2.4.16 Water Act, 2016

The Water Act No. 43 of 2016 provides for the regulation, management and development of water resources, water and sewerage services; and for other connected purposes. As stated in Section 63, every person in Kenya has the right to clean and safe water in adequate quantities and to reasonable standards of sanitation as stipulated in Article 43 of the Constitution.

Section 21(1) of this Act provides for national monitoring and information systems on water resources. Section 21(2) that follows mandates the Water Resources Authority (WRA) to demand from any person, within a reasonable time or on a regular basis, to provide it with specified information, documents, samples or materials in relation to the system referred to in Section 21(1). Under these rules, specific records may require to be kept by a site operator and the information thereof furnished to the authority.

Section 36 makes it a requirement to obtain a permit for any of the following purposes:

- any use of water from a water resource, except as provided by Section 37 (1);
- the drainage of any swamp or other land;
- the discharge of a pollutant into any water resource; and
- any other purpose, to be carried out in or in relation to a water resource, which is prescribed by Regulations made under this Act to be a purpose for which a permit is required.

Section 38 makes it an offence for any person who:

- without a permit, constructs or employs works for a purpose for which a permit is required; or
- being the holder of a permit, constructs or employs any such works in contravention of the conditions of the permit.

In line with Section 5(1) of the Second Schedule of this Act, the permit holder shall submit a completion certificate in the prescribed form upon the expiration of the time limited by a permit for construction of works authorised by the permit, or where the construction is completed before the expiration of that time.

Section 143 (1) further prohibits any person from participating in any of the following activities without authority conferred under this Act:

- wilfully obstruct, interfere with, divert or obstruct water from any watercourse or any water resource, or negligently allow any such obstruction, interference, diversion or abstraction; or

---

(1) Section 37 lists water use practices that are exempted from the acquisition of a water use permit. These include:

(a) for the abstraction or use of water, without the employment of works, from any water resource for domestic purposes by any person having lawful access to the water resource;
(b) for the abstraction of water in a spring which is situated wholly within the boundaries of the land owned by any one landholder and does not naturally discharge into a watercourse abutting on or extending beyond the boundaries of that land; or
(c) for the storage of water in, or the abstraction of water from a reservoir constructed for the purpose of such storage and which does not constitute a water course for the purposes of this Act.
throw, convey, cause or permit to be thrown or conveyed, any rubbish, dirt, refuse, effluent, trade waste or other offensive matter or thing into or near to any water resource in such manner as to cause, or be likely to cause, pollution of the water resource.

**Relevance to this Project**

*Water abstraction to meet the Project’s water requirements will need to be done in line with the provisions of this Act. In addition, any impacts to the domestic water supply network will need to be effectively managed to ensure that water quality is not compromised.*

### 2.4.17 Water Quality Regulations, 2006

The Water Quality Regulations (2006) are contained in the Kenya Gazette Supplement No 68, Legal Notice No 120. Of immediate relevance to the proposed roads for the purposes of this ESIA Project Report is Part II, Sections 4 - 5, as well as Part V, Section 24.

Part II, Section 4 states that “Every person shall refrain from any act which directly or indirectly causes, or may cause, immediate or subsequent water pollution.”

Part V, Section 24 states that “No person shall discharge or apply any poison, toxic, noxious or obstructing matter, radioactive wastes, or other pollutants or permit any person to dump or discharge any such matter into water meant for fisheries, wildlife, recreational purposes of any other uses.”

**Relevance to this Project**

*The Contractor will need to implement appropriate waste management practices to avoid pollution of rivers Mathioya and Maragua, and their tributaries which drain the Project area.*

### 2.4.18 Water Resources Management Rules (2007)

In addition to the Water Act 2016, the main document outlining applicable 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.

**Relevance to this Project**

*Water abstraction to meet the Project’s water requirements will need to be done in line with the provisions of this Act.*

### 2.4.19 The Public Health Act (Cap 242)

This is an Act of Parliament to make provision for securing and maintaining health. Section 115 of this Act prohibits causing nuisance or other condition liable to be injurious or dangerous to health. Section 118 provides a list of nuisances which includes any noxious matter, or waste water, flowing or discharged from any premises, wherever situated, into any public street, or into the gutter or side channel of any watercourse, irrigation channel or bed thereof not approved for the reception of such discharge.

**Relevance to this Project**

*Implementation of the Project will pose potential health risks to both the community members and Project workers such as dust impacts and Occupational Health and Safety (OHS) risks. All these will need to be appropriately managed as recommended in Chapter 9 of this report.*
2.4.20 The Public Health (Drainage and Latrine) Rules, Cap 130, 1958

Rule 85 provides that every owner or occupier of every workshop, workplace or other premises where persons are employed shall provide proper and sufficient latrines for use by employees.

Rule 87 requires every contractor, builder or other person employing workmen for the demolition, construction, reconstruction or alteration of any building or other work in any way connected with building to provide in an approved position sufficient and convenient temporary latrines for use by such workmen. Rule 91 provides that no person shall construct a latrine in connection with a building other than a water closet or a urinal, where any part of the site of such building is within 200 feet of a sewer belonging to the local authority which is at a suitable level, and where there is sufficient water supply.

Relevance to this Project

*Human waste particularly from the construction workers will need to be properly managed in line with the provisions of these rules. For instance, there should be toilets (whether permanent or temporary) for the Project workers at the work place.*

2.4.21 The Physical Planning Act, 1996

This is the main Act that governs land planning. It stipulates that all proposed developments must be approved by the respective local authority and a certificate of compliance issued accordingly.

This Act provides for the preparation and implementation of physical development plans for connected purposes. It establishes the responsibility for the physical planning at various levels of Government in order to remove uncertainty regarding the responsibility for regional planning.

Relevance to this Project

*A key provision of the Act is the requirement for an Environmental Impact Assessment (EIA) to be conducted prior to the issuing of a certificate of compliance.*

2.4.22 The Occupational Safety and Health Act, 2007

This is an Act of Parliament to provide for the safety, health and welfare of all workers and all persons lawfully present at workplaces, to provide for the establishment of the National Council for Occupational Safety and Health and for connected purposes.

It applies to all workplaces where any person is at work, whether temporarily or permanently.

The purpose of this Act is to:

- secure the safety, health and welfare of persons at work; and
- protect persons other than persons at work against safety and health arising out of, or in connection with the activities of persons at work.

Relevance to this Project

*The Act establishes codes of practices to be approved and issued by the Directorate of Occupational Safety and Health Services (DOSHS) for practical guidance of the various provisions of the Act. For the purposes of this Project, the Contractor will be required to have in place an adequate Health and Safety Plan, which may be subject to inspection as to its adequate implementation by the DOSHS.*
2.4.23 The Employment Act No 11, 2007

The Act is enacted to consolidate the law relating to trade unions and trade disputes, to provide for the registration, regulation, management and democratisation of trade unions and employers organisations and federations. Its purpose is to promote sound labour relations through freedom of association, the encouragement of effective collective bargaining and promotion of orderly and expeditious dispute the protection and promotion of settlement conducive to social justice and economic development for connected purposes. This Act is important since it provides for an employer – employee relationship that is important for the activities that would promote management of the environment at a workplace.

Relevance to this Project

With the Project Developer being the primary employer during the construction and operational phases of the Project, it is bound by this law to abide to its stipulations on employee management and relations.


This is an Act of Parliament to provide measures for the prevention, management and control of HIV and AIDS, to provide for the protection and promotion of public health and for the appropriate treatment, counselling, support and care of persons infected or at risk of HIV and AIDS infection, and for connected purposes.

Part II, Section 7 of this Act requires HIV and AIDS education in the workplace. In accordance with the requirements of this Act, the government is expected to ensure provision of basic information and instruction on HIV and AIDS prevention and control to: Employees of all Government ministries, Departments, authorities, and other agencies; and, Employees of private and informal sectors. The information on HIV and AIDS is expected to be treated with confidentiality at the work place and positive attitudes shown towards infected employees and workers.

Relevance to this Project

HIV and AIDS prevention and control is one of the main challenges facing many countries in Sub-Saharan Africa including Kenya. Its prevention and control will therefore need to be factored into the Project planning and implementation especially with the guidance of this Act. The Project Developer will need to implement an awareness programmes to share information with regards to HIV and AIDS prevention and control to all its employees.

2.4.25 List of Permits Required for the Project, as per the Requirements of Kenyan Law

Table 2.3 provides a summary of the environmental and social permits and licences required for the Project.
## Table 2.3 Relevant Environmental and Social Permits Required for the Project

<table>
<thead>
<tr>
<th>Phase</th>
<th>Sector</th>
<th>Legislation</th>
<th>Authority</th>
<th>Permit/Licence</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>Environment</td>
<td>EMCA</td>
<td>NEMA</td>
<td>EIA Licence</td>
<td>The EIA licence will give the decision criteria for NEMA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Environmental Management and Coordination (Waste Management) Regulations, 2006</td>
<td>NEMA</td>
<td>Ensure that the contracted waste handlers (transport and disposal) are licensed by NEMA</td>
<td>When disposing waste</td>
</tr>
<tr>
<td></td>
<td>Water Resources</td>
<td>Water Act, 2016</td>
<td>WRA</td>
<td>Water abstraction license.</td>
<td>To be obtained after making a final decision on the preferred source of water</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Physical Planning Act, 1996</td>
<td>Planning Department (Ministry of Lands)</td>
<td>Development Approval</td>
<td>Relates to building and urban planning</td>
</tr>
<tr>
<td>Operation</td>
<td>Environment</td>
<td>EMCA</td>
<td>NEMA</td>
<td>Initial Environmental Audit Acknowledgement Letter and Self-Audit Acknowledgement thereafter</td>
<td>Annual, throughout the operations phase</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phase</th>
<th>Sector</th>
<th>Legislation</th>
<th>Authority</th>
<th>Permit/Licence</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Legend:**
- **EMCA:** Environment Management and Coordination Agency
- **NEMA:** National Environment Management Authority
2.5 Lender Requirements

2.5.1 *International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability, 2012*

The International Finance Corporation (IFC), a division of the World Bank Group that lends to private investors, has a Sustainability Policy and set of Performance Standards (PSs) on Social and Environmental Sustainability (January 2012). It should be noted that even for Projects that do not anticipate seeking financing from the IFC, the IFC PSs are typically applied as a benchmark of international good practice.

The PSs are directed towards providing guidance on how to identify risks and impacts, and are designed to help avoid, mitigate and, manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities. In the case of direct investments for the IFC (including project and corporate finance provided through financial intermediaries), the IFC requires that its clients apply the PSs to manage environmental and social risks and impacts so that development opportunities are enhanced (IFC, 2012). A number of lenders have adopted these IFC PSs.

A summary of the scope of the IFC PSs and the applicability to the Project is set out in *Table 2.4*. 
## Table 2.4  IFC Performance Standards

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Key Requirement</th>
<th>Relevance to the Project</th>
</tr>
</thead>
</table>
| 1   | Assessment and Management of Social and Environmental Risks and Impacts | This PS relates to integrating and managing environmental and social performance throughout the life of a project in line with national regulations and international standards.  
The standard requires the development of an Environmental and Social Management System (ESMS) that entails a structured approach to managing environmental and social risks and impacts. | The proposed road rehabilitation will be associated with a number of environmental and social impacts which will need to be appropriately managed. |
| 2   | Labour and Working Conditions                                         | This standard aims to ensure that the client establishes, maintains and improves a worker-management relationship that promotes the fair treatment, non-discrimination and equal opportunity of workers, and compliance with national labour and employment laws and international standards (as defined by the International Labour Organisation (ILO). In particular, PS2 addresses child labour and forced labour, and promotes safe and healthy working conditions, and protecting and promoting the health of workers by recognising the role of employees. | Project workers (for all Project phases) will need to be provided with fair labour and working conditions.  
This will apply to all categories of workers irrespective of whether directly engaged by the developer or contractor (direct workers), engaged through third parties (contracted workers), and workers engaged by the client’s primary suppliers (supply chain). |
<p>| 3   | Resource Efficiency and Pollution Prevention                           | This PS aims to abate pollution to air, water, and land that may threaten people and the environment at the local, regional, and global levels. This Performance Standard promotes the ability of private sector companies to adopt such technologies and practices where feasible. | Rehabilitation of the proposed Project Roads will require a number of resources (such as water, aggregate, and fuel). All required resources will need to be used efficiently and all wastes managed in accordance with the waste management hierarchy, where avoidance of waste generation is the first priority to avoid or minimise pollution as much as possible. |
| 4   | Community, Health, Safety and Security                                | The role of this PS is to anticipate and avoid adverse impacts on the health and safety of the affected communities throughout the life of the project as a result of routine and none routine events. The PS also requires an assessment of how use of security by the Project to safeguard personnel and property could impact on community security taking into account considerations of human rights. | Implementation of the proposed Project Roads will need to ensure that the health, safety and security of all communities along its alignments are not compromised. This is particularly crucial due to the urban set-up of the Project areas with a number of nearby settlements and social infrastructure. |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Key Requirement</th>
<th>Relevance to the Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Land Acquisition and Involuntary Resettlement</td>
<td>PS5 aims to anticipate and avoid physical and economic displacement or, where avoidance is not possible, to minimise adverse social and economic impacts.</td>
<td>Although the Project Roads are already in existence and the planned rehabilitation activities are expected to take place within the road reserves, thorough assessment is required to ensure that any displacement (physical or economic) is appropriately managed. This also caters for acquisition of additional land if required to meet the requirements of the Project design.</td>
</tr>
<tr>
<td>6</td>
<td>Biodiversity Conservation and Sustainable Management of Living Resource</td>
<td>This PS aims to protect and conserve biodiversity based on the Convention on Biological Diversity. It divides habitat into three categories, modified, natural, and critical, and guides on the required level of assessment for Projects in each type of habitat. For modified habitats (^1), impacts on biodiversity should be minimised and mitigation measures implemented appropriately. For projects in natural habitat, mitigation measures should be designed to achieve no net loss of biodiversity where feasible. For projects in critical habitats, the project's mitigation strategy should be described in a Biodiversity Action Plan and be designed to achieve net gains of those biodiversity values for which the critical habitat was designated.</td>
<td>This PS is not applicable since the proposed Roads Project is located within modified habitats without any significant biodiversity value as described in detail in Chapter 6 of this report. However, reference has been made to this standard when designing the mitigation measures such as those for the appropriate management of invasive plant species.</td>
</tr>
<tr>
<td>7</td>
<td>Indigenous Peoples</td>
<td>This PS deals with safeguarding Indigenous Peoples. The aim of this PS is to protect the interests of Indigenous Peoples during project implementation. On a broader scale, it requires project implementation to avoid adverse impacts on Indigenous Peoples as well as ensuring their participation and consent.</td>
<td>This PS does not apply since no indigenous people as per the requirements of this standard have been identified along the proposed Project Roads alignments. This is mainly attributed to the metropolitan nature of the Project area as described in detail in Chapter 7 of this report.</td>
</tr>
</tbody>
</table>

\(^1\) This Performance Standard applies to those areas of modified habitat that include significant biodiversity value, as determined by the risks and impacts identification process.
<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Key Requirement</th>
<th>Relevance to the Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Cultural Heritage</td>
<td>Cultural heritage, according to this PS, refers to tangible forms of cultural heritage, such as tangible movable or immovable objects, property, sites, structures, or groups of structures, having archaeological (prehistoric), paleontological, historical, cultural, artistic, and religious values; unique natural features or tangible objects that embody cultural values, such as sacred groves, rocks, lakes, and waterfalls; and certain instances of intangible forms of culture that are proposed to be used for commercial purposes, such as cultural knowledge, innovations, and practices of communities embodying traditional lifestyles.</td>
<td>This PS is not applicable since no cultural heritage sites are known to exist along the proposed Project Roads alignments.</td>
</tr>
</tbody>
</table>
2.5.2 IFC Environmental, Health and Safety Guidelines

The Environmental, Health and Safety (EHS) Guidelines are technical reference documents that address the IFC's expectations regarding the EHS performance of its projects. They are designed to assist managers and decision makers with relevant industry background and technical information. This information supports actions aimed at avoiding, minimizing, and controlling EHS impacts during the construction, operation, and decommissioning phase of a project or facility. The EHS Guidelines serve as a technical reference source to support the implementation of the IFC Performance Standards.

General EHS Guidelines exist which contain information on cross-cutting environmental, health, and safety issues potentially applicable to all industry sectors; these are listed in Box 2.1.

Box 2.1 IFC General EHS Guidelines

1. Environmental
   1.1 Air Emissions and Ambient Air Quality
   1.2 Energy Conservation
   1.3 Wastewater and Ambient Water Quality
   1.4 Water Conservation
   1.5 Hazardous Materials Management
   1.6 Waste Management
   1.7 Noise
   1.8 Contaminated Land

2. Occupational Health and Safety
   2.1 General Facility Design and Operation
   2.2 Communication and Training
   2.3 Physical Hazards
   2.4 Chemical Hazards
   2.5 Biological Hazards
   2.6 Radiological Hazards
   2.7 Personal Protective Equipment (PPE)
   2.8 Special Hazard Environments
   2.9 Monitoring

3. Community Health and Safety
   3.1 Water Quality and Availability
   3.2 Structural Safety of Project Infrastructure
   3.3 Life and Fire Safety (L&FS)
   3.4 Traffic Safety
   3.5 Transport of Hazardous Materials
   3.6 Disease Prevention
   3.7 Emergency Preparedness and Response

4. Construction and Decommissioning
   4.1 Environment
   4.2 Occupational Health and Safety
   4.3 Community Health and Safety

Where applicable, the abovementioned EHS Guidelines will be applied to the proposed Project.
2.5.3 Parameter Specific International Guidelines

2.5.3.1 IFC EHS Guidelines – 1.1 Air Emissions and Ambient Air Quality

The IFC recommend that the air quality guidelines as set out by the World Health Organisation (WHO) be utilised in such an assessment. The WHO standards are divided into a number of stages, which have interim targets and a final guideline target. The WHO guidelines are recognised to be particularly conservative, as they make no consideration of the economic burden of achieving the stipulated guidelines. The WHO final guideline target is aspirational, and as such, this target should be progressively worked towards. In the case of the proposed Project, progression towards the achievement of the final guideline target may be assisted by regulatory changes to the quality of fuel used for construction and project-owned vehicles (for example, low sulphur fuels) and the regular maintenance and potential mandatory testing of those vehicle emissions.

On the basis of the above, Table 2.5 sets out the Draft Kenyan Air Quality Emission Standards for Residential Areas (as defined in Section 2.4.11) and IFC air quality assessment criteria used in this ESIA Project Report for the proposed Project, for comparison.

In addition to the criteria set out above, guidance published by the Institute of Air Quality Management (IAQM) has been used in the assessment (4), in the absence of any national or other international guidance pertaining to dust emissions. Whilst these documents are UK-focussed and therefore not specifically designed for use in Kenya, they do contain methods, criteria and descriptors for assessing potential impacts associated with construction dust, which are considered to be useful for this study.

The documents also recommend and outline mitigation measures where appropriate, to minimise the effect of any residual impacts.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Averaging Period</th>
<th>Criterion (µg/m²)</th>
<th>Pollutant</th>
<th>Averaging Period</th>
<th>Criterion (µg/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SO₂</td>
<td>annual average</td>
<td>50</td>
<td>SO₂</td>
<td>annual mean</td>
<td>40</td>
</tr>
<tr>
<td>SO₂</td>
<td>24 hour 98 percentile</td>
<td>80</td>
<td>SO₂</td>
<td>24 hour maximum</td>
<td>125 (Interim target 1) 50 (Interim target 2) 20 (Guideline)</td>
</tr>
<tr>
<td>NOₓ</td>
<td>annual average</td>
<td>60</td>
<td>NO₂</td>
<td>annual mean</td>
<td>40 (Guideline)</td>
</tr>
<tr>
<td>NO₂</td>
<td>annual average</td>
<td>96</td>
<td>NO₂</td>
<td>10 minute maximum</td>
<td>500 (Guideline)</td>
</tr>
<tr>
<td>NO₂</td>
<td>24 hour 98 percentile</td>
<td>80</td>
<td>NO₂</td>
<td>24 hour maximum</td>
<td>100</td>
</tr>
<tr>
<td>NO₂</td>
<td>one hour maximum</td>
<td>383</td>
<td>NO₂</td>
<td>1 hour maximum</td>
<td>200 (Guideline)</td>
</tr>
<tr>
<td>PM₁₀</td>
<td>annual average</td>
<td>50</td>
<td>PM₁₀</td>
<td>annual mean</td>
<td>70 (Interim target 1) 50 (Interim target 2) 30 (Interim target 3) 20 (Guideline)</td>
</tr>
</tbody>
</table>

In the majority of cases, the IFC EHS General Guidelines are substantially more stringent than the Kenyan Air Quality Standards; however, it is acknowledged that the IFC / WHO Standards do not consider the economic factors affecting guideline attainment. Using a pragmatic approach, the IFC Interim Target 1 values have been used in the assessment, as these represent a reasonable balance between protection of air quality and economic burden.

Within the assessment, both the relevant Kenyan and IFC standards and guidelines have been used.

2.5.3.2 IFC EHS Guidelines – 1.3 Wastewater and Ambient Water Quality

IFC EHS Guideline 1.3 specifies that discharges should not result in contaminant concentrations in excess of local ambient water quality criteria or, in the absence of local criteria, other sources of ambient water quality. Receiving water use and assimilative capacity, taking other sources of discharges to the receiving water into consideration, should also influence the acceptable pollution loadings and effluent discharge quality.

As Kenya has water quality criteria / standards for effluent discharge into environment (refer to Section 2.4.8), these will be used in this assessment.

2.5.3.3 IFC EHS Guidelines – 1.4 Water Conservation

Mechanisms included in the water conservation guidelines include –

- The setting of targets for water use, and monitoring of water flows against these targets;
- Water reuse where possible; and
- Reducing leaks and making more efficient use of water within the water reticulation system.

2.5.3.4 IFC EHS Guidelines – 1.7 Noise

The IFCs EHS Guidelines – General EHS Guidelines: Environmental Noise Management 1.7 Noise (IFC 1.7 Noise) is an internationally recognised guideline document containing information for the assessment and management of noise.

Table 2.6 presents the IFC noise guidelines that should not be exceeded at the nearest Noise Sensitive receptor (NSR) locations offsite. In addition to the absolute values provided in Table 2.1, the IFC also requires that noise increase above existing (background) levels should not exceed 3 dB.
### Table 2.6 IFC Noise Level Guidelines

<table>
<thead>
<tr>
<th>Receptor</th>
<th>One Hour $L_{Aeq}$ (dB(A))</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Daytime (07:00 – 22:00)</td>
</tr>
<tr>
<td>Residential; institutional; educational</td>
<td>55</td>
</tr>
<tr>
<td>Industrial; commercial</td>
<td>70</td>
</tr>
</tbody>
</table>

$L_{Aeq} = A$-weighted equivalent sound levels over a measurement period, dB(A) = A-weighted decibel

IFC Guidelines are designed to apply to noise emissions from facilities and stationary noise sources (such as factories), and are not applicable to linear infrastructure such as roadways. IFC EHS Guidance for Toll Roads (normally designed for speeds of 90 km.hr or higher) are also not applicable to the Project Roads since the recommended speed at the Project Roads will be 50 km/hr. Therefore, Kenya’s national recommended noise limits (Table 2.1) have been used in this assessment.

### 2.6 Institutional Framework

The overall authority for implementation of the environmental and social mitigation measures and management plans will be the Environmental Division at KURA through the Project Developer/Contractor. The key responsible implementing organisation for the construction phase of the Project will be the Contractor, due to their physical presence and direct involvement in the Project.

A summary of other organisations that are relevant to the proposed Project are provided in Table 2.7 and explained in more details in Chapter 10 of this report.

### Table 2.7 Institutional Framework

<table>
<thead>
<tr>
<th>Organization</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Transport and Infrastructure</td>
<td>• Provide policy guidance on national transportation infrastructure.</td>
</tr>
<tr>
<td>National Environmental Management Authority (NEMA)</td>
<td>• General supervision and, co-ordination of all matters relating to the environment. NEMA is the principal instrument in Government in the implementation of all policies relating to the environment. NEMA is also responsible for monitoring compliance with all the environmental regulations.</td>
</tr>
<tr>
<td>Department of Occupational Health and Safety</td>
<td>• Monitor the implementation of health and safety plans for construction workers and members of public coming into contact with construction activities.</td>
</tr>
<tr>
<td>County Government</td>
<td>• Monitor developments within the County.</td>
</tr>
<tr>
<td></td>
<td>• Collaborate on physical planning of relevance to the improved road.</td>
</tr>
<tr>
<td></td>
<td>• Review master plans for compatibility with the improved road.</td>
</tr>
<tr>
<td>Ministry of Health</td>
<td>• Surveillance of public health with respect to workers and affected communities, especially in regard to HIV/AIDS and other communicable diseases.</td>
</tr>
<tr>
<td></td>
<td>• Identify suitable linkages between the road and health facilities including emergency access.</td>
</tr>
<tr>
<td>Lands, Housing and Urban Development/National Land Commission</td>
<td>• Facilitate land acquisition when required.</td>
</tr>
<tr>
<td></td>
<td>• Protection of the road reserve after the construction.</td>
</tr>
<tr>
<td></td>
<td>• Initiating the process of land use zoning within the Project area.</td>
</tr>
</tbody>
</table>
3. METHODOLOGY AND APPROACH

3.1 ESIA Objectives

The objectives of the ESIA are to:

- Identify all potentially significant adverse environmental and social impacts of the Project and recommend measures for mitigation.
- Gather baseline data to inform the assessment of impacts and to monitor changes to the environment as a result of the Project as well as evaluate the success of the mitigation measures implemented.
- Recommend measures to be used to avoid or reduce the anticipated negative impacts and enhance the positive impacts.
- Prepare an ESIA Project Report compliant to EMCA and the Environmental (Impact Assessment and Audit) Regulations (2003/2016), detailing findings and recommendations for review by NEMA.

3.2 Methodology

3.2.1 Screening

The proposed Project was screened to determine the need to undertake an ESIA based on:

- Project characteristics;
- The Second Schedule of EMCA (as amended in the Environmental (Impact Assessment and Audit) Regulations amendments of 2016, which lists the projects that must undergo an EIA; and
- International Finance Corporation Performance Standards on Environmental and Social Sustainability, 2012

ERM carried out two reconnaissance site visits in December 2017 and September 2018. The purpose of the site visits was to familiarise the Project Team with the Project Area and to collect primary environmental and social baseline data to inform the required level of assessment. ERM also held two meetings with NEMA on 9th November 2017 and 11th June 2019 to discuss the proposed approach to the ESIA and confirm the required level of assessment.

Based on the above criteria and engagement with NEMA, it was concluded that although the Contracting Authority has identified a number of urban roads for rehabilitation under the Lot 15 and Lot 18 Annuity Programme, an ESIA Project Report per county would be required (each Project Report covering the roads within the considered county). The reasons for reaching this decision were as follows:

- Legal Notice no 149 of the National Environment (Impact Assessment and Audit) of 2016 classifies the proposed Project (specifically, construction and rehabilitation of roads including collectors and access roads) as Medium Risk which can be approved through the preparation and submission of ESIA Project Reports(5); and

(5) As per the 2016 amendments of the National Environment (Impact Assessment and Audit) Regulations, Projects are classified as Low, Medium and High Risk based on their environmental and social risks. Low and Medium Risk projects maybe...
The nature and extent of the potential impacts of the Project (all the Project Roads are existing roads and the upgrade/rehabilitation activities for these roads are expected to be limited to the existing and available road reserve.

3.2.2 Baseline Data Collection

In order to understand the existing baseline environmental and social conditions in the area, a variety of data collection methods were used. These are described below:

3.2.2.1 Document Review

A literature review was undertaken based on the findings of the reconnaissance process, which involved reviewing legislation, policies, the County Integrated Development Plan, and previous studies carried out in the area to determine the baseline conditions and establish the legal, institutional and biophysical/socio-economic environmental setting of the Project area.

The desk based study also included the development of fieldwork tools, fieldwork schedules as well as the approach to stakeholder engagement as outlined in the Stakeholder Engagement Plan (Appendix B of this Project Report).

3.2.2.2 Site Visits

Site investigations were undertaken on 23rd August and 12th September 2019 during which detailed environmental and social baseline data was collected as well as conduct of stakeholder engagement. Data was collected through:

- a number of stakeholder meetings (including public meetings/barazas);
- Key Informant Interviews (KII) especially with the technocrats of the relevant institutions;
- Focus Group Discussions (FGD) with village elders; and
- Site walkovers.

Photography and Global Positioning Systems (GPS) were used to record the salient features and baseline conditions at the Project sites and surroundings environs.

3.2.3 Impact Assessment Methodology

3.2.3.1 Impact Assessment Process

The purpose of impact assessment is to identify and evaluate the significance of potential impacts on identified receptors and resources according to defined assessment criteria and to develop and describe mitigation measures that will be taken to avoid or minimise any potential adverse effects and to enhance potential benefits.

The impacts of the proposed Project were identified based on the findings of stakeholder consultation, the existing baseline conditions, the proposed Project activities and professional knowledge of the consultants. Impacts are first distinguished as either positive or negative (Chapter 9 of this Project Report). The cross-sectoral issues and aspects are: health; safety; air quality, especially dust; waste approved through the submission of ESIA Project Reports; however, these amendments specify that High Risk projects shall require submission of an ESIA Study Report.
3.2.3.2 Definition of Key Terminology

- **Project** - The features and activities that are a necessary part of the Project Developer’s development plans without which the Project cannot proceed. The Project is also the collection of features and activities for which authorisation is being sought.

- **Project Site** - The (future) primary operational area for the Project activities.

- **Project Footprint** - The area that may reasonably be expected to be directly affected by Project activities, across all phases. The Project Footprint includes land used on a temporary basis such as construction lay down areas, materials yards, borrow pits or construction haul roads, as well as disturbed areas in transport corridors, both public and private.

- **Area of Influence**: The area where impacts could reasonably be expected.

3.2.3.3 Impact Types and Definitions

An impact is any change to a resource or receptor brought about by the presence of a Project component or by the execution of a Project related activity. The evaluation of baseline data provides crucial information for the process of evaluating and describing how the Project could affect the bio-physical and socio-economic environment.

Impacts are described according to their nature or type, as summarised in Table 3.1.

<table>
<thead>
<tr>
<th>Nature or Type</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>An impact that is considered to represent an improvement on the baseline or introduces a positive change.</td>
</tr>
<tr>
<td>Negative</td>
<td>An impact that is considered to represent an adverse change from the baseline, or introduces a new undesirable factor.</td>
</tr>
<tr>
<td>Direct impact</td>
<td>An impact that results from a direct interaction between a planned project activity and the receiving environment/receptors (e.g. between occupation of a site and the pre-existing habitats or between an effluent discharge and receiving water quality).</td>
</tr>
<tr>
<td>Indirect impact</td>
<td>An impact that results from other activities that are encouraged to happen as a consequence of the Project (e.g. in-migration for employment placing a demand on resources).</td>
</tr>
<tr>
<td>Induced impact</td>
<td>An impact that results from other activities (which are not part of the Project) that happen as a consequence of the Project (e.g., influx of camp followers resulting from the importation of a large Project workforce).</td>
</tr>
<tr>
<td>Cumulative impact</td>
<td>An impact that acts together with other impacts (including those from concurrent or planned future third party activities) to affect the same resources and/or receptors as the Project.</td>
</tr>
</tbody>
</table>

3.2.3.4 Assessing Significance

Impacts are described in terms of ‘significance’. Significance is a function of the magnitude of the impact and the sensitivity/vulnerability/importance of resource/receptor.
Determining Impact Magnitude

Impact magnitude (sometimes termed severity) is a function of the type, extent, duration, scale and frequency of the impact. These characteristics apply to both planned and unplanned events/impacts and are briefly described in Table 3.2.

An additional characteristic that pertains only to unplanned events is likelihood. The likelihood of an unplanned event occurring is designated using a qualitative scale, as described in Table 3.3.

Table 3.2 Impact Characteristics Terminology

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Definition</th>
<th>Designations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>A descriptor indicating the relationship of the impact to the Project (in terms of cause and effect) as explained in Table 3.1.</td>
<td>Direct, Indirect, Induced</td>
</tr>
<tr>
<td>Extent</td>
<td>The “reach” of the impact (e.g., confined to a small area around the Project Footprint, projected for several kilometres, etc.).</td>
<td>Local - impacts that affect an area in a radius of 20km around the development site. Regional - impacts that affect regionally important environmental resources or are experienced at a regional scale as determined by administrative boundaries, habitat type/ecosystem. International - impacts that cross national borders, affect nationally important environmental resources or affect an area that is nationally important/or have macro-economic consequences.</td>
</tr>
<tr>
<td>Duration</td>
<td>The time period over which a resource / receptor is affected.</td>
<td>Temporary - impacts are predicted to be of short duration and intermittent/occasional. Short-term - impacts that are predicted to last only for the duration of the construction period. Long-term - impacts that will continue for the life of the Project, but ceases when the Project stops operating. Permanent - impacts that cause a permanent change in the affected receptor or resource (e.g. removal or destruction of ecological habitat) that endures substantially beyond the Project lifetime.</td>
</tr>
<tr>
<td>Scale</td>
<td>The size of the impact (e.g., the size of the area damaged or impacted, the fraction of a resource that is lost or affected, etc)</td>
<td>[no fixed designations; intended to be a numerical value or a qualitative description of “intensity”]</td>
</tr>
<tr>
<td>Frequency</td>
<td>A measure of the constancy or periodicity of the impact.</td>
<td>[no fixed designations; intended to be a numerical value or a qualitative description]</td>
</tr>
</tbody>
</table>

Table 3.3 Definition for Likelihood Designations

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unlikely</td>
<td>The event is unlikely but may occur at some time during normal operating conditions.</td>
</tr>
<tr>
<td>Possible</td>
<td>The event is likely to occur at some time during normal operating conditions.</td>
</tr>
<tr>
<td>Likely</td>
<td>The event will occur during normal operating conditions (i.e., it is essentially inevitable).</td>
</tr>
</tbody>
</table>

The overall magnitude of an impact is a combination of the above characteristics. The universal magnitude designations are:
NEGIGIBLE;  
SMALL;  
MEDIUM; and  
LARGE.

**Determining sensitivity/vulnerability/importance of resource/receptor**

There are a range of factors to be taken into account when defining the sensitivity/vulnerability/importance of the resource/receptor, which may be physical, biological, cultural or human. Other factors may also be considered when characterising sensitivity/vulnerability/importance, such as legal protection, government policy, stakeholder views and economic value.

As for the case of magnitude, the sensitivity/vulnerability/importance designations themselves are universally consistent, but the definitions for these designations vary on a resource/receptor basis. The sensitivity/vulnerability/importance designations used herein for all resources/receptors are:

- Low;
- Medium; and
- High.

*Table 3.4* presents an illustrative example of the sensitivity/vulnerability/importance of the resource/receptor.

**Table 3.4   Illustrative Example of Sensitivity/Vulnerability/Importance of the Resource/Receptor**

<table>
<thead>
<tr>
<th>Designation</th>
<th>Receiving environment</th>
<th>Sensio-economic environment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Biophysical environment</td>
<td>Socio-economic environment</td>
</tr>
<tr>
<td>Low</td>
<td>The impact affects the environment in such a way that natural functions and processes are not affected.</td>
<td>People/communities are able to adapt with relative ease and maintain pre-impact livelihoods.</td>
</tr>
<tr>
<td>Medium</td>
<td>Where the affected environment is altered but natural functions and processes continue, albeit in a modified way.</td>
<td>People/communities are able to adapt with some difficulty and maintain pre-impact livelihoods but only with a degree of support.</td>
</tr>
<tr>
<td>High</td>
<td>Where natural functions or processes are altered to the extent that they will temporarily or permanently cease.</td>
<td>Affected people/communities will not be able to adapt to changes or continue to maintain pre-impact livelihoods.</td>
</tr>
</tbody>
</table>

**Determining Impact Significance**

As earlier stated above, Impact Significance is a function of the magnitude of the impact and the sensitivity/vulnerability/importance of resource/receptor. As presented in *Table 3.5* below, the impact significance can be Negligible, Minor, Moderate or Major.

**Table 3.5   Impact Significance**

<table>
<thead>
<tr>
<th>SIGNIFICANCE</th>
<th>Sensitivity/Vulnerability/Importance of Resource/Receptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;</td>
<td>Low</td>
</tr>
</tbody>
</table>
### SIGNIFICANCE

<table>
<thead>
<tr>
<th>Significance</th>
<th>Negligible</th>
<th>Negligible</th>
<th>Negligible</th>
<th>Negligible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>Negligible</td>
<td>Minor</td>
<td>Moderate</td>
<td>Major</td>
</tr>
<tr>
<td>Medium</td>
<td>Minor</td>
<td>Moderate</td>
<td>Major</td>
<td>Major</td>
</tr>
<tr>
<td>High</td>
<td>Moderate</td>
<td>Major</td>
<td>Major</td>
<td>Major</td>
</tr>
</tbody>
</table>

Table 3.6 below presents a brief description of the different categories of Impact Significance.

#### Table 3.6  Significance Definitions

<table>
<thead>
<tr>
<th>Significance definitions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negligible significance</td>
<td>An impact of negligible significance (or an insignificant impact) is where a resource or receptor (including people) will not be affected in any way by a particular activity, or the predicted effect is deemed to be ‘negligible’ or ‘imperceptible’ or is indistinguishable from natural background variations.</td>
</tr>
<tr>
<td>Minor significance</td>
<td>An impact of minor significance is one where an effect will be experienced, but the impact magnitude is sufficiently small (with and without mitigation) and well within accepted standards, and/or the receptor is of low sensitivity/value.</td>
</tr>
<tr>
<td>Moderate significance</td>
<td>An impact of moderate significance is one within accepted limits and standards. The emphasis for moderate impacts is on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable (ALARP). This does not necessarily mean that ‘moderate’ impacts have to be reduced to ‘minor’ impacts, but that moderate impacts are being managed effectively and efficiently.</td>
</tr>
<tr>
<td>Major significance</td>
<td>An impact of major significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors. A goal of the ESIA process is to get to a position where the Project does not have any major residual impacts, certainly not ones that would endure into the long term or extend over a large area. However, for some aspects, there may be major residual impacts after all practicable mitigation options have been exhausted (i.e. ALARP has been applied). An example might be the visual impact of a development. It is then the function of regulators and stakeholders to weigh such negative factors against the positive factors such as employment, in coming to a decision on the Project.</td>
</tr>
</tbody>
</table>

**Note**: It is important to note that the positive impacts are not rated, merely stated. It is considered sufficient for the purpose of the Impact Assessment to indicate that the Project is expected to result in a positive impact, without characterising the exact degree of positive change likely to occur. However, positive impacts are presented quantitatively where possible.

#### 3.2.3.5 Identification of Mitigation and Enhancement Measures

For activities with significant impacts, the ESIA process is required to identify, in collaboration with the Project Developers, suitable and practical mitigation measures that can be implemented. Mitigation that can be incorporated into the project design, in order to avoid or reduce the negative impacts or enhance the positive impacts, have been defined and require final agreement with the client as these are likely to form the basis for any conditions of approval by NEMA. The implementation of the mitigation is ensured through compliance with the Environmental and Social Management and Monitoring Plan (ESMMP).

#### 3.2.3.6 Residual Impact Evaluation

After first assigning significance in the absence of mitigation, each impact is re-evaluated assuming the appropriate mitigation measure(s) is/are effectively applied, and this results in a significance rating for the residual impact.
3.3 Reporting

As a result of the ESIA process, a comprehensive EIA Project Report (this document) was developed for submission to NEMA for review.

3.3.1 Assumptions and Limitations

ESIA is a process that aims to identify and anticipate possible impacts based on past and present baseline information and details of the proposed Project. As the ESIA deals with the future there is, inevitably, always some uncertainty about what will actually happen in reality.

Impact predictions have been made based on field surveys and with the best data, methods and scientific knowledge available at this time. However, some uncertainties could not be entirely resolved. Where significant uncertainty remains in the impact assessment, this is acknowledged and the level of uncertainty is provided.

In line with best practice, this ESIA Project Report has adopted a precautionary approach to the identification and assessment of impacts. Where it has not been possible to make direct predictions of the likely level of impact, limits on the maximum likely impact have been reported and the design and implementation of the Project (including the use of appropriate mitigation measures) will ensure that these are not exceeded. Where the magnitude of impacts cannot be predicted with certainty, the team has used professional experience and available scientific research from road rehabilitation activities worldwide to judge whether a significant impact is likely to occur or not. Throughout the assessment, this conservative approach has been adopted to the allocation of significance.
4. PROJECT DESCRIPTION

4.1 Project Location

The location of the Project is summarised in *Table 4.1* and its alignment presented in *Figure 4.1*.

<table>
<thead>
<tr>
<th>SN</th>
<th>County</th>
<th>Name of Road</th>
<th>Length (km)</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Murang’a</td>
<td>Ndikwe – Kiria Road</td>
<td>3.90</td>
<td>Kiria Location, Gakera Sub-Location, Kiharu Sub-County, Murang’a Municipality, Murang’a County</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Mucunguca – Kiangage Road</td>
<td>5.10</td>
<td>Mbiri Location, Maragi Sub-Location, Kiharu Sub-County, Murang’a Municipality, Murang’a County</td>
</tr>
</tbody>
</table>

4.2 Proposed Road Design

4.2.1 Road Design and Classification

The Project is designed to meet the requirements of applicable Kenyan road design standards. These are:

- Road Design Manual, Part I; “Geometric Design of Rural Roads”, January 1979;
REHABILITATION OF NDIKWE-KIRIA ROAD (3.90KM) AND
MUCUNGUCA-KIANGAGE ROAD (5.10KM) IN MURANG'A COUNTY,
KENYA
ESIA Project Report (Final Copy)

- Proposed Manual for Traffic Signs in Kenya;
- Part I, “Road Markings”;
- Standard Specifications for Road and Bridge Construction, 1986; and
- Traffic surveys shall generally be carried out following the guidelines and recommendations of
  the Transport Research Laboratory (TRL) Overseas Road Note 40: A guide to axle load surveys
  and traffic counts for determining traffic loading on pavements (TRL Ltd, Crow Thorne,
  Berkshire, UK 2004).

Table 4.2 summarises the classification of the designed roads and surface type as guided by the above
standards; these are further described below.

<table>
<thead>
<tr>
<th>SN (Serial Number)</th>
<th>County</th>
<th>Name of Road</th>
<th>Length (km)</th>
<th>Surface Type</th>
<th>Road Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Murang’a</td>
<td>Ndikwe – Kiria Road</td>
<td>3.90</td>
<td>AC</td>
<td>Class C</td>
</tr>
<tr>
<td>2</td>
<td>Murang’a</td>
<td>Mucunguca – Kiangage Road</td>
<td>5.10</td>
<td>AC</td>
<td>Class C</td>
</tr>
</tbody>
</table>

Note: AC (Asphalt Concrete).

4.2.1.1 Classification of the Project Roads

<table>
<thead>
<tr>
<th>Class</th>
<th>Road Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class C</td>
<td>Primary Road</td>
<td>Roads linking provincially important centres to each other or to higher class roads (Urban/Rural Centres).</td>
</tr>
</tbody>
</table>

4.2.1.2 Asphalt Concrete (AC)

The construction of an AC road involves the preparation of a base, after which an asphalt layer is
applied. A hot asphalt layer is applied to a prepared road surface using a road paver; once applied it is
rolled and compacted using a pneumatic tyre roller (Figure 4.2).

Figure 4.2 Diagram indicating the application of hot-asphalt

4.2.2 Road Width

The Project is designed to meet the following specifications:
- Carriageway width of 7m (single carriage two-way road);
- Walkway width of 1.5m on both sides of the road (total walkway width of 3.0m); and
- Drainage Facilities of 1.5m on both sides of the road (total drainage facilities are of 3.0m).

*Figure 4.3* illustrates the proposed cross section that will be implemented for this Project.

Based on the above specifications, the total road width will be approximately 13 m. The total road reserve allocated for the construction of the road will be 20m, where allowed. Minor adjustments to the proposed road section may arise after the detailed engineering designs have been completed.

The Project Roads will comprise of three main layers (subgrade, sub-base and base) as illustrated in *Figure 4.4*.

### 4.2.2.1 Drainage Infrastructure

**Main Drainage Design**

The choice and design of cross drains that include culverts, bridge culverts and bridges will be directed towards satisfying hydraulic capacity, structural capacity, safety (vehicular, pedestrian, cyclist) and durability requirements. Hydraulic calculations for determining storm drain conduit sizes will be based on open channel and pressure flow as appropriate. Outlined below are the planned key features of the drainage system along the Project Road.

- **Pipe Slopes** - The physical slope shall be that which will produce a velocity of at least 0.762 m/s when the storm drain is flowing full. In areas of flat terrain where 0.762 m/s is not feasible, an absolute minimum velocity of 0.6096 m/s for full flow shall be obtained.

- **Outlets** - When the outlet velocity for the design storm discharge exceeds 1.2192 m/s, the need for special channel lining and/or energy dissipation shall be evaluated to avoid...
undesirable scour. For computation of the outlet velocity, the lowest anticipated tail-water condition that can be reasonably expected to occur during a storm event shall be assumed.

- **Manning’s Roughness Coefficients** – Concrete pipes and concrete box culverts whose Manning’s Roughness Coefficient will be taken as \( n = 0.012 \) shall be adopted.

- **Inlet Location and Spacing** - Inlet type, location and spacing shall consider the following:
  - Inlet capacity and width of spread.
  - Movement of vehicles to and from adjacent property on turnouts.
  - Pedestrian and Bicycle Safety.
  - Maximum pipe length without maintenance access.
  - Roadway Geometry (e.g. super-elevation transitions, roadway profile, etc.).
  - Hydraulic efficiency of the system.
  - Potential for flooding of off-site property.
  - Potential for low points at turn lanes and bus bays.
  - Maintenance accessibility.
  - Potential for concentrated flow to cause erosion when it leaves the pavement.

- Inlets shall be placed at all low grade points and/or ditch, and as appropriate at intersections and on side streets where drainage would adversely flow onto the highway pavement.

- Inlet spacing shall be based on spread standards.

- Inlets shall also be placed 3m to 6m prior to the level section in super-elevation transitions, to avoid concentrated flows across the pavement.

### Storm Water Discharge

As much as possible, storm water discharge will be designed to follow the existing natural drainage system. Discharge of storm water into private property (including structures and cropland) will be avoided as much as possible. Where it will be unavoidable to completely avoid discharging storm water into private property, it shall be directed near the property boundary to the nearest watercourse.

When there is no nearby watercourse, an infiltration solution will be adopted by the construction of infiltration chambers, which are devices for the infiltration of storm water. In this case it will be important to first check the permeability of the soil and the level of the groundwater. These chambers are generally filled with gravel and provide a slow infiltration of storm water into the groundwater (Figure 4.5).

Where necessary to avoid flooding of private property, infiltration ditches will be constructed to allow part of the storm water to infiltrate into the ground. The infiltration ditches will be covered with undergrowth.

To avoid soil erosion especially along slopes where the drainage flow rates are expected to be high, scour checks will be designed on a case by case basis and built.
4.2.3 Junctions and Access Roads

Junctions and access roads will be appropriately designed to enable smooth road joining and exit (enable acceleration and deceleration where necessary). Figure 4.6 to Figure 4.9 present illustrative diagrams for the design of typical junctions and access roads. These will be further analysed on a case by case scenario in the final stages of Project design.

Figure 4.6 Typical Junction 1
**Figure 4.7  Typical Junction 2**

---

**Figure 4.8  Typical Junction 3**
4.2.4 Slope Protection

The side slope shall be protected by using suitable slope protection measures wherever required along the present roads. The following slope protection methods will be considered; however, the selected method will be determined by the final designs and specific area conditions of the road:

- **Top soiling and grassing**: Sprigs of indigenous grass shall be planted on slopes, approximately 200mm apart in pockets of topsoil. Topsoil will be at a depth of approximately 75mm. Top soil removed during the early stages of constructions activities will be heaped along the Project Road and used in restoration activities and slope protection where needed thus minimising the need for importation of foreign material.

- **Surface treatment with seeds and fertilisers**: Where it is deemed that the soil conditions is healthy for the establishment of vegetation (negating the need for topsoil), a mixture of indigenous grass seeds, mulch and fertilisers will be applied, through a method called hydro-seeding.

- **Gravel or stone blanketing**: Erodible material shall be protected by placing a cover of gravel or stone material to a thickness of 40 to 75mm.

4.2.5 Road Signage

Appropriate road signage will be appropriately installed along the Project Roads. This will include:

- Standard warning signs;
- Standard informatory signs;
- Standard prohibitory and mandatory signs;
- Road markings; and
- Edge marker posts.
4.2.6 Other Key Project Features

Other key components of the Project where applicable will include:

- Minor bridges;
- Pedestrian facilities;
- Bus bays and bus shelters; and
- Culverts (pipe and box culverts).

The exact number of each of the above Project components will only be confirmed once the Project detailed design stage has been completed.

Given the type of the road under design, their location, the existing infrastructure along these roads, their short length and purpose, the following features are not included:

- Street lights;
- Rest areas;
- Truck lay-byes;
- Under passes/over passes; and
- Service roads especially when joining the existing roads.

4.2.7 Design Speed

The design speed for the Project Roads is 80km/hr; however, due to their location in largely urban areas, the recommended speed at most of the road sections will be 50km/hr (even lower at special locations such as entrances to hospitals, schools, etc.).

4.3 Construction Materials

The design of the proposed Roads Project is still on-going (currently at the advanced stage); however, like many road construction projects of this standard, the construction materials will include:

- Gravel material for application as sub base – borrow area;
- Material for embankments (fill and improved subgrade) – borrow area;
- Quarry stone for production of crushed stone and concrete – hard stone area;
- Water for compaction and concrete (as well as dust control) – water zone;
- Sand for concrete and mortar works – sand area; and
- Bitumen slurry and hot-mixed asphalt.

Table 4.3 presents the estimated materials for the Project Roads.

<table>
<thead>
<tr>
<th>Road</th>
<th>Base (m³)</th>
<th>Subbase (m³)</th>
<th>Subgrade 150 mm (m³)</th>
<th>Subgrade 400 mm (m³)</th>
<th>Total with subgrade 150 mm (m³)</th>
<th>Total with subgrade 400 mm (m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ndikwe-Kiria</td>
<td>4,446</td>
<td>7,020</td>
<td>6,084</td>
<td>16,224</td>
<td>17,550</td>
<td>27,690</td>
</tr>
</tbody>
</table>

Table 4.3 Estimated Material Requirements for Laikipia Roads
### Project Description

<table>
<thead>
<tr>
<th>Road</th>
<th>Base (m³)</th>
<th>Subbase (m³)</th>
<th>Subgrade 150 mm (m³)</th>
<th>Subgrade 400 mm (m³)</th>
<th>Total with subgrade 150 mm (m³)</th>
<th>Total with subgrade 400 mm (m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mucunguca - Kiangage Road</td>
<td>5,814</td>
<td>9,180</td>
<td>7,956</td>
<td>21,216</td>
<td>22,950</td>
<td>36,210</td>
</tr>
</tbody>
</table>

The contractor proposes to obtain construction materials (soil, gravel and aggregates) from existing commercial and licensed sources (quarries and borrow pits). At the current stage, the following materials sources have been identified and the necessary tests are being conducted to confirm their suitability for use.

#### 4.3.1 Nyeri County Quarries

##### 4.3.1.1 Nyaribo Quarries (Coordinates: 0°22'02"S, 37°00'00"E)

Two potential sites have been identified in the Nyaribo quarries (polygons blue and yellow in Figure 4.10).

![Figure 4.10 Nyaribo Quarries](source)

Source: AnguloRaso Kenya Limited, 22nd July 2019: General Design Considerations

##### 4.3.1.2 Chaka Crushed Stone Quarries (General Coordinates: S0.99978, E36.99555)

Three quarries operated independently (red, purple and yellow polygons) are found within this area (Figure 4.11). A fourth potential quarry (green polygon) is also found in this area.

![Figure 4.11 Chaka Crushed Stone Quarries](source)
Kirinyaga Construction Quarry – this is the oldest quarry in the area and offers a range of aggregate sizes used widely in road construction and in the building sector, highlighted in red.

Robben Aberdare Quarry – highlighted in purple, it is the most recent quarry and produces chippings of varied sizes most suited for road construction. The chippings extended are well rounded and pass the flakiness index.

Chinese Operated Quarry – highlighted in yellow, it is equally a new quarry in the area and has been supplying both road and building construction aggregates. It has an installed asphaltic concrete batching plant.

### 4.3.2 Nanyuki Quarries

4.3.2.1 Equittel Limited (Coordinate: N0.00546, E37.10690; Altitude 2010 m)

In Figure 4.12, the red polygon marks the area owned and operated by Equittel Limited while the blue polygon marks an area presently being exploited for both gravel and chippings by various companies. Equittel limited has an installed jaw crusher with sieves and corresponding separator conveyor belts. The crusher by its very nature thus extends angular chippings whose flakiness index makes the chippings produced unsuitable for riding surface material. The introduction of a cone crusher would lead to production of more rounded chippings suitable for road riding surface.
4.3.2.2 Daiga Quarry

This quarry (Figure 4.13) is located 13 km from Nanyuki Town and extends both gravel material and course aggregates.

**Figure 4.13 Diaga Quarry**

*Source: AnguloRaso Kenya Limited, 22nd July 2019: General Design Considerations*
In the event that new quarries and/or borrow pits will need to be opened up to extract the required construction materials, the contractor will conduct the necessary assessments and obtain the required permits or licenses prior to their use.

4.4 Labour Requirements

Implementation of the Project will require a workforce in categories of skilled, semi-skilled and unskilled workers; however, the required numbers per category will be estimated after the completion of the detailed design.

During recruitment, first priority will be given to the local community members for unskilled and semi-skilled labour, who will be able to commute from home daily. However, where the available local labour is insufficient, additional unskilled and semi-skilled labour will be recruited from the wider County and Kenya at large. To ensure quality, the skilled labour will be recruited at the national level supported by a few international expatriates in highly specialised areas; some of them are already full-time employees of the contractor.

Project workers from outside the Project area (mainly skilled labour) will be accommodated at locally available hotels or residential apartments; there will be no Project accommodation camps.

4.5 Materials and Equipment Storage/Laydown Areas

Materials and equipment storage/laydown areas will be required to store the required construction materials, preferably near the Project Roads. It is planned that in addition to material and equipment storage, there will be temporary Project offices at the materials and equipment storage/laydown areas. Given that the contractor will be constructing other roads in the region, it is planned that there will be one major materials and equipment storage/laydown area located within the region (not necessarily at the Project site, but within a reasonable travel distance) and, where necessary, smaller material laydown and equipment parking areas will be located along or within close proximity to the Project site. The suitability of locations for the material and equipment storage/laydown areas will be assessed separately and all the required approvals obtained in the next stages of the Project design and planning.

4.6 Project Implementation Schedule

The Project is currently at design stage (expected to be completed within a period of six months). Once the designs are complete, the contractor will acquire all the necessary permits/licenses from the relevant agencies prior to commencement of the construction activities (required environmental and social permits provided in Chapter 2). Therefore, the exact commencement of the construction activities is not known at this stage; however, it is expected to include a mobilisation stage, construction stage, operations phase for ten years (including the defects liability period) and handover of the Project Roads to KURA for subsequent operation; decommissioning of the constructed Project Roads is not anticipated as they are expected to be operational for many years, with the operator conducting periodic maintenance activities where necessary.

The contractor will be constructing other roads within the region and will categorise them into priorities 1, 2 and 3 and undertake the construction activities sequentially and where possible in parallel (using two separate teams); however, the construction activities at all the contractors’ roads (Lot 15 and Lot 18) are expected to be completed within a period of two years from the date of commencement. The Project Roads will be designed to last for a period of at least 50 years; with the first 8 years being the liability period during which the roads will be maintained by the Project Contractor.

4.7 Project Cost Estimates

Table 4.4 Presents the preliminary cost estimates for developing the proposed Project Roads.
## Table 4.4 Estimated Project Cost

<table>
<thead>
<tr>
<th>SN</th>
<th>County</th>
<th>Name of Road</th>
<th>Length (km)</th>
<th>Total Estimated Construction Cost (in Kenyan Shillings)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Murang’a</td>
<td>Ndikwe – Kiria Road</td>
<td>3.90</td>
<td>392,171,492</td>
</tr>
<tr>
<td>2</td>
<td>Murang’a</td>
<td>Mucunguca – Kiangage Road</td>
<td>5.10</td>
<td>512,839,644</td>
</tr>
</tbody>
</table>
5. ANALYSIS OF PROJECT ALTERNATIVES

5.1 Location Alternatives/ Alternative Project Roads

The proposed road networks were selected by the Project Developer (KURA), based on the criteria as set out in the Project Request for Proposal (RfP), for the roads to be implemented under the annuity roads project in Lot 15 and Lot 18. The criteria was to help in the evaluation and prioritization of the several roads proposed for consideration. The key parameters identified during the road identification and analysis of alternatives were:

- The road identified was to have a sufficient clear corridor/ reserve of not less than 20m;
- The road identified was to have a logical start and ending; and
- The road identified should also serve the greatest economic and growth potential for the respective town.

Guided by the above criteria, a number of different roads were identified and assessed, and Table 5.1 below presents a summary of the results of the analysis.

### Table 5.1 Analysis of Alternative Project Roads

<table>
<thead>
<tr>
<th>SN</th>
<th>County</th>
<th>Name of Road</th>
<th>Length (km)</th>
<th>Reason for Exclusion/ Inclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Muranga</td>
<td>Ndikwe – Kiria Road</td>
<td>3.90</td>
<td>Required corridor available/ no permanent or semi-permanent structures within the required road corridor (to be reconfirmed after the survey exercise) and has a logic end. Considered for further assessment and development (assessed in details in this report).</td>
</tr>
<tr>
<td>2</td>
<td>Mucunguca - Kiangage Road</td>
<td>5.10</td>
<td>Required corridor available/ no permanent or semi-permanent structures within the required road corridor (to be reconfirmed after the survey exercise) and has a logic end. Considered for further assessment and development (assessed in details in this report).</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Muranga - Kambirwa</td>
<td>1.90</td>
<td>At the time of the first reconnaissance stage, this road was already under construction by Kenya Rural Roads Authority (KeRRA) and was thus not accessed. Excluded from the list.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Mortuary – Workshop Roads</td>
<td>0.70</td>
<td>Excluded at the reconnaissance stage due to encroachment (a number of permanent houses within the required 15 m corridor.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Muranga High School - Junction of C71</td>
<td>1.50</td>
<td>Encroached (houses and electricity poles); available corridor too narrow. Excluded from the list.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Kangema Junction – Murang’a University</td>
<td>Not determined</td>
<td>Road already contracted for upgrading by the Regional Office. Excluded from the list.</td>
<td></td>
</tr>
</tbody>
</table>

5.2 Realignment/ Design Alternatives

The Project Roads are existing murram/ gravel roads. As part of the Project, these roads will be upgraded to paved standards, and will be fitted with pedestrian walkways and appropriate on both sides of the Road. A road corridor of approximately 20m is required to accommodate the Road as well as
the current and future services. The actual Road with sidewalks and drainage will occupy 14m of the 20m Road reserve, leaving 3m on each side for the installation of services and safety measures.

The extent of the Road reserve has been surveyed and is in the process of being set out and clearly marked with beacons. Given that the Road is located in a community area with settlements, social infrastructure and business infrastructure, along it, the centreline of the road will be slightly adjusted if required, to avoid physical displacement of permanent or semi-permanent structures.

Where necessary, and to avoid the need for physical displacement, changes will be made to the design by either only locating a sidewalk on one side of the road; taking into consideration the expected pedestrian movements. Alternatively, changes may allow for the sidewalk to be placed on top of the drainage structure on either one or both sides of the road. This will be reflected in the final designs of the Project Road to be completed at a later stage, which will be informed by the findings of this ESIA Project Report.

5.3 No-Go Alternative

Under the ‘No-Go’ alternative, the Project Developer would not carry out the intended rehabilitation works and the anticipated impacts resulting from construction and operation of the Project Road as proposed, would not occur. Additionally, the resultant socio-cultural/economic benefits that would be created by the proposed development would also be foregone. The No-Go project scenario means that the Project Area will continue to utilise the existing unimproved road which will continue to deteriorate.

Under this option, there will only be defined intermittent road repairs undertaken from time to time with a maintenance strategy to ensure that the road remains passable; however, at the current rate of urbanisation in the Project area, this is anticipated not to be sustainable.

The no project alternative will lead to the deterioration of the carrying capacity of the road as well as an increase in safety risks due to the decrease in ride ability of the Road surface and the anticipated increase in traffic.

In addition, leaving the Project Road in the current condition is not a viable option, especially as the desired objective of construction of the Project Road has not been achieved. This will necessitate continuous emergency maintenance of the road, which will require the import of gravel material and the potential further development of additional borrow pits, resulting in negative environmental impacts elsewhere.

The No-go alternative, with the forecasted increase in traffic are anticipated to contribute to:

- increased dust along the unpaved Project Road;
- An increase in safety concerns, due to an increase in vehicle pedestrian interaction;
- An increase in vehicle accidents due to the unsafe condition of the road surface; and
- A reduction in the socio-economic development opportunities in the Project area, due to an under development of the local transport sector.

This is therefore not a desirable alternative.
6. BIOPHYSICAL BASELINE

6.1 Introduction

This Chapter of the Report provides a description of the existing physical and biological conditions of the Project Area, which will directly or indirectly be affected by the proposed rehabilitation of the Project Roads. It is essential that the baseline conditions of an environment are characterised in order to accurately predict the potential impacts the Project Road will have on the environment. The collection of baseline data therefore focused on providing information to support the assessment of any potential impact resulting from the Project. Information was therefore collected at the following levels:

- **County Level**: Secondary information was collected at the County level, aimed at providing a contextual overview of the host County.

- **Project Area**: Secondary and primary information was collected within the Project area, specifically along the Road corridors, given the highly modified nature of the Project area (refer to Section 6.2 below for a general overview of the Project area). In general, a 500 m corridor was assessed (biophysical Area of Influence) along the existing road corridors.

6.2 General Overview

The Project Roads are located in Murang’a Municipality, Murang’a County. In particular, they are in the neighbourhood of Murang’a Town, the County’s commercial and administrative centre. Generally, the Project Roads traverse a predominantly rural setting area with residential houses, agricultural plantations and secondary vegetation, where the main land use activities include a few commercial activities and largely agricultural activities (crop growing and animal rearing) as presented in details in Sections 7.4 (Land Use and Land Tenure) and 7.5 (Economic Activities).

Given the above developments, the Project Roads are located in modified habitats where human activities (particularly settlements and farming) have substantially modified the primary ecological functions and fauna/flora species composition that occur along them. Available land use data supported by satellite imagery indicate that the Project Roads are located in cropland areas (6) *(Figure 6.1 and Figure 6.2)*, also refer to Section 7.4 for a detailed description of the land use of the Project area.

---

(6) Although the land use map indicate that the entire Project Roads are located within croplands, satellite imagery and fieldwork observations confirmed that the main land use activities include a few commercial activities, settlements and associated social infrastructure, and largely agricultural activities (crop growing and animal rearing).
Figure 6.1  Land use of the Project Area

Figure 6.2  Satellite Imagery of the Project Area
6.3 Climate

Murang’a County has three climatic regions: The western region with an equatorial type of climate, the central region with a sub-tropical climate and the eastern part with semi-arid conditions. Long rains fall in the months of March, April and May. April reliably records the highest amount of rainfall. The short rains are in the months of October and November. The Western region covering Kangema, Gatanga, and higher parts of Kigumo and Kandara, is generally wet and humid due to its proximity to the Aberdare Ranges and Mt. Kenya. The Eastern region, covering the lower parts of Kigumo, Kandara, Kiharu and Maragua constituencies receive less rain and crop production requires consistent irrigation.

6.4 Landscape and Topography

6.4.1 County Level

The County lies between 3,353 metres above sea level (m. a.s.l), in the West along the slopes of Aberdare Mountains and 914 m. a.s.l in the East. The western highlands have deep dissected topography and drain into various rivers. These rivers flow from Aberdare ranges to the West, South and East ward, and drain into the Tana River (please refer to Section 6.5 for details on hydrology). This dissected topography causes gulley erosion and landslides hence construction and maintenance of bridges and roads are very expensive. Project Area

Generally, the Project area has gentle hills and wide valleys. The altitudinal range is from 1,470 m. a.s.l in at the end of the Ndikwe - Kiria Road to 1,340 m. a.s.l at the start of the Mucnguca – Kiangage Road (Figure 6.3). Specific details about the topography along each of the Project Roads is further described in the sections below.

Figure 6.3 Topography of the Project Area
6.4.1.1 Ndikwe – Kiria Road

The Ndikwe – Kiria Road starts from a low point at an altitude of 1,380 m.a.s.l and generally traverses an area with gentle hills in a south-western direction, finally ending at a relatively raised point with an altitude of 1,470 m.a.s.l (Figure 6.3 and Figure 6.4). This implies that the area along this Project Road drains north-east wards by the tributaries of River Maragua which drains the southern part of the Project area (more details on hydrology in Section 6.5).

Figure 6.4 General Terrain along the Ndikwe - Kiria Road

---

6.4.1.2 Mucunguca - Kiangage Road

The Mucunguca - Kiangage Road generally traverses an area with gentle slopes and the altidunal range along it is from 1,340 – 1,370 m.a.s.l (Figure 6.3 and Figure 6.5).

As per the hydrology map, the area along the Project Road is drained by River Muthioya and its tributaries, which drains the northern part of the Project area (more details on hydrology details in Section 6.5).

Figure 6.5 General Terrain along the Mucunguca - Kiangage Road
6.5 Hydrology

6.5.1 County Level

Murang’a County is mainly drained by the Tana River. The western highlands of the County have deep dissected topography and drain into various rivers which flow from Aberdare ranges to the West, South and East ward, eventually draining into the Tana River.

The forests in the County are also the major sources of various rivers namely Maragua, Mathiolla North, Mathiolla South, Kiama and Thika rivers.

6.5.2 Project Area

The northern part of the Project area is drained by River Mathiolla while the southern part is drained by River Maragua (Figure 6.3). This is closely related to the topography of the Project area (Section 6.4) which indicates that the Project Roads generally traverse areas with gentle hills and valleys. The specific details of the hydrology along each of the Project Roads is described in more details below.

6.5.2.1 Ndikwe – Kiria Road

Although the Project Road does not cross any permanent river, it traverses two degraded wetlands (drained to support arable farming) where seasonal streams occur during rainy seasons (Figure 6.6). In particular, there is a bridge across a common path of a stream in one of the wetlands (Figure 6.6). During rainy seasons, run-off from the Project area flows into the Maragua River which drains the southern part of the Project area.

The upgrade of the Project Road will require implementation of appropriate mitigation/management measures to avoid further contamination of the River as further assessed in Chapter 9 of this Project Report.

Figure 6.6 Hydrology Features along the Ndikwe – Kiria Road

| Initial wetland drained to support arable farming along the Project Road. | A bridge across a common path of a stream along the Project Road. |
| Gardens in a drained wetland along the Project Road | Gardens in a drained wetland along the Project Road |
6.5.2.2 Mucunguca - Kiangage Road

The Mucunguca - Kiangage Road crosses the Maragi River which is a tributary of River Mathioya that drains the northern part of the Project area (Figure 6.7). As can be seen in Figure 6.7, Maragi River has high turbidity levels (which worsens during the rainy season) and this is attributed to the current land use practices in which arable farming is carried out up to the river banks. Protection of the riparian areas is inadequate. The upgrade of the Project Road will require implementation of appropriate mitigation/management measures to avoid further contamination of the River and its tributaries as well as contribution to the County’s restoration plan of riparian areas where feasible. This is further assessed in details in Chapter 9 of this Project Report.

Figure 6.7 Hydrology along the Mucunguca - Kiangage Road

6.6 Geology and Soils

6.6.1 County Level

Murang’a County’s geology and basement system comprises of volcanic rocks of the Pleistocene age and Achaean rock type respectively (Murang’a CIDP 2018 – 2022). The western part of the County bordering Aberdares is characterised by volcanic rocks while Eastern part is composed of the rocks of the basement system. Porous beds and disconformities within the volcanic rock system form important aquifers, collecting and moving ground water, thus regulating water supply from wells and boreholes. The County’s rugged, dissected topography and geology is both an asset and liability to the County’s development. The highest parts bordering Aberdares form the rain catchment areas, from where most of the rivers passing through the County originate.

The volcanic rocks have fertile soils that support agricultural activities. The ecological conditions in the high areas provide a suitable environment for tea and coffee farming.

6.6.2 Project Area

Like the wider Murang’a County, the Project area has fertile red volcanic soils (Figure 6.8). However, due to the dissected topography, they are prone to soil erosion and landslides. The design of the drainage infrastructure should ensure avoidance of Project induced soil erosion as assessed in details in Chapter 9 of this Project Report.
6.7 Biodiversity

6.7.1 County Level

The main land use activities in Murang’a County are cash crop farming, subsistence farming, livestock keeping, fish farming, housing and forestry.

The County has five indigenous gazetted forests covering a total area of 254.4 Km². These are Gatare, Karua, Kimakia, Kiambicho and Wanjerere forests. These forests are divided into two zones; the tropical montane forest zone located along the Aberdare ranges and the semi-arid forest zone located in the lower parts of the County.

The main forest products in the County include timber, firewood and seedling production, other minor forest products include grass, bamboo sticks, medicinal herbs, honey and charcoal.

The main wildlife habitats are the Arbadare Ranges which are also a gazetted national park. The main wildlife in are elephants and Columbus monkeys. Elephants are the major source of human-wildlife conflicts especially in Mathioya and Kigumo constituencies. This is due to the constituencies’ proximity to the Aberdare forest which forms the wildlife habitat. Vervet species of monkeys have also created conflicts with humans especially in Gatanga Sub County.

6.7.2 Project Area

Human activities (particularly settlements and farming) have substantially modified the primary ecological functions and species composition of the Project area and thus it is not of conservation value. The specific biodiversity features along each of the Project Roads is described in the sections below.

6.7.2.1 Ndikwe – Kiria Road

Due to the land use along the Ndikwe – Kiria Road (that is cropland/ arable farming and livestock rearing), the vegetation along it is dominated by secondary and agroforestry plant species which include Grevillea robusta (planted agroforestry tree) Napier grass (animal fodder), hedges and ornamental plants along private property and gardens (Figure 6.9). Of special consideration, Lantana camara, an invasive plant species, was observed along the Project Road during detailed site
investigations conducted in August 2019. There are no special fauna habitats located along the Project Road. During the Road upgrade activities, part of the vegetation along it will be cleared to pave way for the upgrade activities. Although this vegetation is not of conservation value, measures should be taken to minimise vegetation loss as well as prevent the spread of observed *Lantana Camara* as assessed in more details in Chapter 9 of this Project Report.

### 6.7.2.2 Mucunguca - Kiangage Road

Similar to the Ndikwe – Kiria Road, the vegetation along the Mucunguca – Kiangage Road is dominated by secondary and agroforestry plant species, which include *Grevillea robusta* (planted agroforestry tree) Napier grass (animal fodder), hedges and ornamental plants along private property and crop gardens (*Figure 6.10*). Given the exiting wider carriageway, the road upgrade activities will cause minimal loss of vegetation.
6.8 Summary of Biophysical Sensitivities

- In Murang’a County, the long rains fall in the months of March, April and May. April reliably records the highest amount of rainfall. The short rains are in the months of October and November.

- The hilly landscape of the Project area necessitate that an appropriate drainage system is incorporated in the Project and enough measures implemented to minimise the impact of soil erosion.

- The northern part of the Project area is drained by River Mathioya and its tributaries while the southern part is drained by River Maragua and its tributaries. The construction activities will need to ensure minimal impacts on these rivers and their tributaries (particularly sedimentation and siltation). Implementation of appropriate erosion control measures is necessary to ensure that this desirable outcome is realised.

- The Project area has fertile red volcanic soils; however, due to the dissected topography, they are prone to soil erosion and landslides. The design of the drainage infrastructure should ensure avoidance of Project induced soil erosion.

- Human activities (particularly settlements and farming) have substantially modified the primary ecological functions and species composition of the Project area and thus it is not of conservation value.
7. SOCIO-ECONOMIC BASELINE

7.1 Introduction

The purpose of this Chapter is to describe the socio-economic environment within which the Project Roads are located. The baseline provides a contextual component for identifying and assessing any potential socio-economic impacts of the Project.

7.2 Project Road Location

As indicated in Section 1.1, the location of the two Project Roads in Murang’a County is as presented in Table 7.1 and Figure 7.1.

<table>
<thead>
<tr>
<th>SN</th>
<th>County</th>
<th>Name of Road</th>
<th>Length (km)</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Murang’a</td>
<td>Ndikwe – Kiria Road</td>
<td>3.90</td>
<td>Kiria Location, Gakera Sub-Location, Kiharu Sub-County, Murang’a Municipality, Murang’a County</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Mucunguca – Kiangage Road</td>
<td>5.10</td>
<td>Mbiri Location, Maragi Sub-Location, Kiharu Sub-County, Murang’a Municipality, Murang’a County</td>
</tr>
</tbody>
</table>

Figure 7.1 Location of the Project Roads in Murang’a County, Kenya
7.3 Demographic Profile

7.3.1 County Level

According to the 2018-2022 Murang’a County Integrated Development Plan (CIDP), population in Murang’a County in 2009 was 936,228 persons consisting of 451,751 males and 484,477 females, and with a growth rate of 0.4% per annum. This was projected to rise to 1,170,109 and 1,214,050 persons in 2020 and 2022 respectively.

The human settlement patterns in the County is influenced by the population dynamics. Other factors influencing human settlement include soil fertility, availability of productive resources, other natural resources and general production capacity, level of economic development such as location of industry and urbanization among others (Murang’a CIDP, 2018 – 2022).

7.3.2 Project Area

Both Project Roads, Ndikwe – Kiria Road and Mucunguca – Kiangage Road are located in Kiharu Sub-County which had a population of 181,076 persons in 2009 that was projected to increase to 225,303 and 233,206 persons in 2020 and 2022 respectively. This Sub-County covers a land area of 409.8 km² and has population density of 441.9 persons per Km² (Murang’a CIDP, 2018 – 2022).

7.3.2.1 Ndikwe – Kiria Road

The Ndikwe – Kiria Road generally transverses a rural setting which is largely agricultural with few settlements and light commerce (refer to Section 7.4 for more details on land use along the Project Road). Field observations made at the time of detailed site investigations conducted in August 2019 indicated that upgrade of the Project Road is possible without causing physical displacement.

7.3.2.2 The Mucunguca – Kiangage Road

Like the Ndikwe – Kiria Road, the Mucunguca – Kiangage Road also traverses a rural setting which is largely agricultural with few settlements and light commerce (refer to Section 7.4 for more details on land use along the Project Road). Field observations made at the time of detailed site investigations conducted in August 2019 indicated that upgrade of the Project Road is possible without causing physical displacement.

7.4 Land Use and Land Tenure

7.4.1 County Level

The County has a total area of 2,558.9Km², of which 11.2Km² is water mass. The arable land is 2,135 Km² while non-arable land is 163.3 Km². The gazetted forest covers an area of 254.4 Km² while approximately 20 Km² is urban area. The average farm size under large-scale holdings is 6.4 ha. Total acreage under food crop farming is 180,225 ha while that under cash crop farming is 42,980 ha. The land under soil conservation is 55,780 ha; farm forestry is 108,352 ha while the land under organic farming is 11,156 ha (Murang’a CIDP, 2018 – 2022).

The main land use activities in the County are cash crop farming, subsistence farming, livestock keeping, fish farming, housing and forestry. It is estimated that about 33,000 households (with a population of about 250,000 farmers) have title deeds. Settlement patterns in Murang’a vary from town to town due to various reasons, which include socio-cultural basis, topographic characteristics, and economic output of the areas. For example; Linear Settlements are found on major roads and rivers. 80% of service centres in Murang’a County are located along roads while scattered settlements are mainly experienced in the semi-arid parts of the County. Nuclear settlements are also found around towns (Murang’a CIDP, 2018 – 2022).
7.4.2 Project Area

Generally, the Project area is a cropland (Figure 7.2). However, like many other Kenyan villages and outskirts of urban centres, settlements and social facilities as well as light commercial areas are scattered within the cropland. For the Project area, business activities and settlements have also been influenced by the location of the Project Roads in Murang’a Municipality which hosts Murang’a Town, the County’s main commercial and administrative centre. Sections 7.4.2.1 and 7.4.2.2 that follow describe the specific land use along each of the Project Roads.

Figure 7.2 Land Use of the Project Area

7.4.2.1 Ndikwe-Kiria Road

The Ndikwe-Kiria Road traverses a generally rural setting where the main land use is agriculture (mainly crop farming). The agriculture richness of the area along the Project Road is attributed to the strategic presence of the Kaihungu stream that runs in a southerly direction parallel to the Project Road towards the Kaihungu Valley (refer to Section 6.5 of this report for details on hydrology). There are few scattered settlements amidst the agricultural/cropland land as well as few retail shops and a school as described in details under the specific sections of this Chapter.

7.4.2.2 Mucunguca-Kiangage Road

The Mucunguca-Kiangage Road also transverses a generally rural setting with the main land use activities comprising of arable farming and livestock rearing. There are few scattered settlements amidst the agricultural/cropland land as well as few retail shops and a church as described in details under the specific sections of this Chapter.
7.5 Economic Activities

7.5.1 County Level

The main economic activities in Murang’a County are cash crop farming, subsistence farming and livestock keeping. The major cash crops grown in the County include tea, coffee, avocado, mangoes, macadamia and horticulture crops, among others. Horticultural crops include tomatoes, cabbages, kales, spinach and French beans while food crops include maize, beans, bananas, sweet potatoes and cassava. The main livestock reared in the County are cattle, pigs, goat, sheep and rabbits as well as chicken. Exotic cattle breeds are found in the upper parts of the County while indigenous breeds of cattle are found in the lower parts of the County (Murang’a CIDP, 2018 – 2022).

The labour force accounts for 55.3% of the total population of the County and was expected to be 538,339 persons by 2017. The unemployment rate in the County is approximately 17.67%. Other economic activities in the County include apiary (bee keeping), aquaculture (fish farming), mining and extractive activities, housing, forestry and tourism activities. Murang’a Quarries are the main source of building materials especially bricks and building stones. There are also sand quarries on the border of Murang’a and Machakos counties that are a source of income for the local residents (Murang’a CIDP, 2018 – 2022).

7.5.2 Project Area

7.5.2.1 Ndikwe-Kiria Road

During the detailed data collection, it was observed that the main economic activities along the Project Road are subsistence agriculture, livestock rearing, retail trade (small-scale business) and boda boda service provision.

Agriculture Activities

During the detailed site visit conducted in August 2019, crops observed along the Project Road included vegetables, maize, bananas, tomatoes, cucumber and napier grass (Figure 7.3). Irrigation of the crop farms is done through interconnected contour trenches that channel the water from the Kaihungu River located approximately 1km away.

It was established through discussion with the area Chief that the communities in the area practice zero grazing system. Napier grass, a common fodder crop is also commonly planted along the road and used to feed the livestock.

KURA recently marked the required extent of the road corridor with beacons. Based on the installed road beacons, narrow strips of crop gardens/land along the Project Road will be lost to the Project (Figure 7.3).
Banana Plantations along the Project Road
Maize gardens along the Project Road.

Water supply irrigation contour trenches along the crop farms
Napier grass along the Project Road

KURA beacon along the Project Road showing the required extent of the Road Corridor.
A KURA beacon along the Project Road showing the strip of crops/farming area that will be lost.

Business Activities

Wanguru Market is located opposite the start of the Project Road but about 100 m away (Figure 7.4). In addition, there is a sign post of Ndikwe Market along the Project Road.

Although the Project Road traverses a predominantly agricultural and rural area, few permanent and temporary business structures were observed during the site visit conducted in August 2019. The observed structures are located a considerable distance from the Project Road and it will be possible to upgrade the it without physically relocating them; however, some of the temporary structures are too close and will need to be removed/relocated to pave way for the proposed road upgrade activities.

Boda boda services are also available in the Project area. In particular, some boda bodas were observed operating along the Project Road.
7.5.2.2 Mucunguca-Kiangage Road

Like the Ndkwe-Kiria Road, agricultural and small-scale businesses are the main economic activities along the Mucunguca-Kiangage Road. In addition, selling bricks and building stones is a common source of income in the area given that Maragi Quarry is less than 200 m from the nearest point of the Project Road (Figure 7.5).

Agriculture Activities

The agricultural activities along the Mucunguca-Kiangage Road are similar to the ones along Ndkwe-Kiria Road. However, unlike the crop gardens along the Ndkwe-Kiria Road, the ones along the Mucunguca-Kiangage Road are generally smaller and fewer. During the site visit, the crops observed along the Project Road include bananas, maize and Napier grass (Figure 7.5). The upgrading of the Project Road will affect narrow strips of crop land and fences.
**Business Activities**

Although the Project Road traverses a rural area, few permanent and temporary business structures were observed along it (*Figure 7.5*). In addition, there are building stones laid along several sections of the Project Road indicating that stone masonry is a common economic activity in the Project area. It was established through discussions with the community members that there are about four quarries located in the Project area of which Maragi Quarry is the nearest (about 200 m from the Project Road). The proposed road upgrade is possible without physically affecting the permanent structures; however, some of the temporary business structures are close to the existing road carriageway and will need to be removed/relocated to pave way for the construction activities.

*Figure 7.5  Economic Activities along the Mucunguca-Kiamburg Road*

- Napier grass and trees along the Project Road. KURA beacon showing the encroached land.
- Banana and maize plantations along the Project Road.
- A permanent business structure along the Project Road.
- A temporary business structure along the Project Road.
- Building stones laid along the Project Road.
- Maragi quarry about 200 m from the nearest point of the Project Road.
7.6 Water and Sanitation

7.6.1 County Level

Murang’a County’s water resources are rivers, shallow wells, springs, dams, boreholes and roof catchment. There are 10 permanent rivers, 400 shallow wells, 75 springs, 30 dams and 100 boreholes that supply water for domestic and agricultural use in the County. All these sources supply 60% of the County population with clean and safe drinking water. An estimate of 99.78% of the households in the County use toilet facilities. (Murang’a CIDP, 2018 – 2022).

The Murang’a Water and Sanitation Company Limited (MUWASCO) is the main provider of water and sewerage services in the County. Currently it operates one water treatment plant at Kiawambeu and one sewerage treatment plant at Karii. The company has 10,000 active water connections and 3,900 sewerage connections which serve a population of approximately 60,000 people.

The County does not have a robust solid waste management facility; however, there is a proposed sanitary landfill facility at Mitubiri, co-funded by Murang’a County Government and Nairobi Metropolitan Authority (Murang’a CIDP, 2018 – 2022).

7.6.2 Project Area

7.6.2.1 Ndikwe-Kiria Road

Access to safe water is a challenge along the Ndikwe-Kiria Road. Discussions with the area Chief indicated that majority of the community members rely on the nearby Kaihungu River for their domestic water needs. They also harvest rainwater from the roofs of their houses. Murang’a Water and Sanitation Company Limited (MUWASCO) is the main public water service provider in the area, however only few homestead along the Project Road have access to piped water supply. During the detailed site visit conducted in August 2019, water manhole vaults and overhead water storage tanks were observed along the Project Road (Figure 7.6). Some of the MUWASCO water pipelines are located beneath or across the Project Road and it will be important to obtain easements prior to the commencement of the road construction activities as assessed in details in the impact assessment chapter of this report (Chapter 9).

It was also established that there is no sewerage infrastructure along the Ndikwe-Kiria Road and most of the community members use pit latrines privately constructed within their homesteads. Within the Project Area, solid waste is mainly managed at household level through composting and open burning.
7.6.2.2 Mucunguca-Kiangage Road

The status of water and sanitation along the Mucunguca-Kiangage Road is similar to the one along the Ndikwe-Kiria Road; however, the nearby river that community members rely on for domestic water use is the Maragi River. During the detailed site visit conducted in August 2019, culverts and MUWASCO water manhole vaults were also observed along the Project Road (Figure 7.7). This indicates that it will be important to obtain easements from MUWASCO for the water pipelines that are located beneath or across the Project Road prior to commencement of the road construction activities as assessed in details in the impact assessment chapter of this report (Chapter 9).

It was also established that there is no sewerage infrastructure along the Project Road and most of the community members use pit latrines privately constructed within their homesteads.

7.7 Education and Literacy

7.7.1 County Level

Murang’a County has 1,000 Early Childhood Development (ECD) centres with total enrolment of 47,960 pupils and 1,503 teachers; the teacher/pupil ratio is 1:32. There are 512 primary schools, 306 secondary schools, one science and technology institute (Michuki Technical Training Institute), 65 youth polytechnics, three accredited colleges and four non-accredited colleges. All these are middle level institutions where the youth acquire suitable skills needed in the labour market. The County also
has a public university; Murang’a University of Technology and a private university; Pioneer University (Murang’a CIDP, 2018 – 2022).

### 7.7.2 Project Area

#### 7.7.2.1 Ndikwe-Kiria Road

No schools were observed along the Ndikwe-Kiria Road. However, there is a crossing point/junction to Ngaru Primary School that is located approximately 200 m away. A children crossing road sign is erected just before the crossing junction (Figure 7.8). The upgrading of the Project Road will not physically impact on the school. However, the presence of the school junction along the Project Road indicates it’s the crossing point for the children of Ngaru Primary School. The school children also walk along the Project Road daily during school periods thus the need for appropriate measures to mitigate any Project impacts on them such as noise, dust, health and safety among others as assessed in details in Chapter 9 of this report.

![Figure 7.8](image)

**Figure 7.8 Schools along the Ndikwe-Kiria Road**

Signpost at the junction of Ngaru Primary School located approximately 200m from the Project Road

Children’s crossing signage along the Project Road; installed before access road/junction of Ngaru Primary School

#### 7.7.2.2 Mucunguca-Kiangage Road

No schools were identified along the Mucunguca-Kiangage Road during the detailed site visit conducted in August 2019.

### 7.8 Health

#### 7.8.1 County Level

The health infrastructure in Murang’a County consist of 272 health facilities serving a population of 959,701 people. It has one County referral hospitals and six sub-County hospitals, three mission and one private hospital. There are 26 public health centres, 114 dispensaries (89 public and 25 mission/NGO) and 137 private clinics. There are 1250 medical personnel working in government health facilities with 650 nurses, 39 doctors, 54 clinical officers, 138 public health officers and 38 laboratory technicians and technologists among other medical personnel (Murang’a CIDP, 2018 – 2022).

The most prevalent diseases in the County are malaria/fever (2%), flu (20.64%) diarrhoea (11.45%), respiratory tract infections - RTIs (10.86%) and stomach ache (6.54%). HIV prevalence rate in the Country is 6%, an average of 1.6 million people which is higher than the national average 5.2%, an
average of about 58,666 persons. HIV prevalence rate in females and males is 9.8% and 1.2% respectively (Murang’a CIDP, 2018 – 2022).

### 7.8.2 Project Area

Disease prevalence in the Project area mirrors that of the wider County as stated above with the most prevalent ones being malaria/fever, diarrhoea, respiratory tract infections and stomach ache. Due to the location of the Project Roads in the neighbourhood of Murang’a Town, the community members of the Project area obtain health services from the town.

#### 7.8.2.1 Ndikwe-Kiria Road

No health facility or drug shop was identified along Ndikwe-Kiria Road during the detailed site visit conducted in August 2019.

#### 7.8.2.2 Mucunguca-Kiangage Road

Though no health facilities or drug shops are located along Mucunguca-Kiangage Road, Maragi Dispensary (Figure 7.9) is located approximately 200 m from the nearest point along the Project Road opposite the Maragi Chief’s Camp. It is important to note that even though there will be no physically displacement of the health facility structures, there will be impacts such as noise and dust as assessed in details in Chapter 9 of this report.

**Figure 7.9 Maragi Dispensary Signpost**
7.9 Archaeology and Cultural Heritage

7.9.1 County Level

The County has various cultural sites among them; Mukunwe- wa-Nyagathanga in Kiharu, Tuthu Cultural Site (Karuri WA Gakure) in Kangema, and Mugo (Chege) WA Kibiru Cultural Centre in Gatanga. Mukurwe wa Nyagathanga is located in Gaturi location in Murang’a East District of Kiharu Constituency in Murang’a County. It is believed to be the mythical Garden of Eden of the Agikuyu tribe. Historically, it was the central point of dispersal of the Agikuyu after arrival into the Mt. Kenya area (Murang’a CIDP, 2018 – 2022).

Murang’a County has Mugumo tree, a sacred tree among the Kikuyus and was a place to offer sacrifices and it is symbolic that the missionaries did their first mass under a sacred tree where other sacrifices had been offered. Today, a modern shrine has been built in the design of a cut tree trunk which is going to grow into a tree, symbolizing faith (Murang’a CIDP, 2018 – 2022).

7.9.2 Project Area

No archaeological or cultural sites were identified along the Ndikwe-Kiria Road and the Mucunguca-Kiangage Road during the detailed site visit conducted in August 2019.

7.10 Infrastructure

7.10.1 County Level

The main aims of Murang’a County’s infrastructure is ensuring good road and transport network, Information Communication Technology and access to electricity. There are five bus parks in the County, namely: Murang’a in Murang’a Town, Kiria-ini in Mathioya, Kangema in Kangema Town, Kangari in Kigumo, and Kirwara in Gatanga. The County has a piece of land earmarked for constructing an airstrip at Kambirwa in Kiharu constituency. The old railway (65Km) line traverses through the County with one terminus at Maragua. If revived the railway line would be useful for transporting fertilizer, coffee and tea. This railway line however, is underutilised.

The County has high mobile network coverage of about 97% of the area with Safaricom, Equitel, Jamii Telkom, Airtel Kenya, and Telkom Kenya as the main service providers. There are six post offices, three sub-post offices, a Huduma Centre, and four courier services operating in the County. The County is served by all national mainstream TV and Radio stations with more than 6 of the radio stations and 5 TV stations broadcasting in the local language. Two radio stations that have their studios in the County are Kangema FM (Ranet FM) in Kangema Town, and Radio Maria in Murang’a Town. (Murang’a CIDP 2018-2022).

Most housing units in the County are roofed with corrugated iron sheets (about 95%), while makuti and grass roof constitute 0.18% of the households. Majority of these housing units have earth floor (60%), followed by cement floor at 39%. Records from the County department of housing indicate that in the County there are 47 low grade, 13 middle grade County government owned houses and no high-grade houses.

7.10.2 Project Area

7.10.2.1 Ndikwe-Kiria Road

The infrastructure along the Ndikwe-Kiria Road include electricity transmission lines along and across some sections of the Road, signposts, Kaihungu Bridge, MUWASCO water manhole vaults and KURA Road beacons (Figure 7.10).
7.10.2.2 **Mucunguca-Kiangage Road**

The infrastructure along the Mucunguca-Kiangage Road include electricity transmission lines, MUWASCO water manhole vaults, high mast electricity lighting, religious institutions and signposts (Figure 7.11).
7.11 Summary of Socio-economic Baseline

General

- The presence of a school along one of the Project Roads implies that school going children are an important component of the pedestrians and should be considered throughout the Project lifecycle.
- The most prevalent diseases are malaria/fever, diarrhoea, respiratory tract infections and stomach ache. Most people in the Project area seek health services from the neighbouring Murang’a Town.
- There are no archaeological or cultural sites located along the Project Roads.

Ndikwe-Kiria Road

- The Ndikwe-Kiria Road generally transverses a rural setting with dense agricultural and crop fields with few settlements and light commerce along the road.
The main economic activities along the road include agriculture, retail trade (small-scale businesses) and boda boda service provision.

Kaihungu River is the main source of domestic water along the Project Road. The area along Ndikwe-Kiria Road has low coverage of piped water under the management of MUWASCO. Some of the water pipelines are located along and beneath the Project Road. Easements for the water supply network and infrastructure within the Project footprint will need to be obtained prior to the commencement of the construction activities to minimise disruptions in water supply.

The infrastructure along the Ndikwe-Kiria Road include electricity transmission lines, signposts, Kaihungu Bridge, MUWASCO water manhole vaults and KURA Road beacons.

**Mucunguca-Kiangage Road**

The Mucunguca-Kiangage Road generally transverses a rural area with few scattered settlements, light commerce and social infrastructure such as churches.

The main economic activities along the Mucunguca-Kiangage Road include agriculture and small-scale businesses. In addition, brick making and stone quarrying are common sources of income in the Project area given that Maragi Quarry is less than 200 m from the nearest point of the Project Road.

Maragi River is the main source of domestic water along the Project Road.

There is no sewerage system along the Project Road and most of the community homesteads have pit latrines.

The infrastructure along the Mucunguca-Kiangage Road include electricity transmission lines, MUWASCO water manhole vaults, high mast electricity lighting, religious institutions and signposts.
8. STAKEHOLDER ENGAGEMENT

This Chapter presents a summary of the stakeholder engagement undertaken as part of the ESIA process for the Project Roads in Murang’a County. It also serves as a summary of a more detailed Stakeholder Engagement Plan (SEP), which presents the engagement approach and identifies stakeholders and the mechanisms through which stakeholders have been engaged. The complete SEP is included in Appendix B.

The engagement process has been designed to meet both Kenyan legal requirements for public participation in relation to an ESIA Project Report and international requirements for engagement as outlined in the IFC Performance Standards.

8.1 Objectives of Stakeholder Engagement

The objectives of engaging stakeholders and the community during the ESIA process and beyond include:

- **Ensuring understanding**: An open, inclusive and transparent process of culturally appropriate engagement and communication is undertaken to ensure that stakeholders are well informed about the proposed Project as it develops. Information is disclosed as early and as comprehensively as possible and as appropriate.

- **Involving stakeholders in the assessment**: Stakeholders are included in the scoping of issues, the assessment of impacts, the generation of mitigation and management measures and the finalisation of the ESIA Project Report. They also play an important role in providing local knowledge and information for the baseline to inform the impact assessment.

- **Building relationships**: Through supporting open dialogue, engagements help establish and maintain a productive relationship between the Project and stakeholders. This supports not only an effective ESIA, but also strengthens the existing relationships and builds new relationships between the Contracting Authority, the Contractor and stakeholders.

- **Engaging vulnerable peoples**: An open and inclusive approach to consultation increases the opportunity of stakeholders to provide comment on the Project and to voice their concerns. During such a process, stakeholders who need special attention due to their vulnerability are identified for consideration in the next stages of Project development. Such stakeholders normally require special measures to ensure that the perspectives of vulnerability are heard and considered.

- **Managing expectations**: It is important to ensure that the Project does not create or allow unrealistic expectations to develop amongst stakeholders about Project benefits. The engagement process serves as one of the mechanisms for understanding and then managing stakeholder and community expectations, where the latter is achieved by disseminating accurate information in an accessible way.

- **Ensuring compliance**: The process is designed to ensure compliance with both local regulatory requirements and international best practice.

One of the key outcomes of engagement should be free, prior and informed consultation of stakeholders, where this can be understood to be:

- **Free**: engagement free of external manipulation or coercion and intimidation;

- **Prior**: engagement undertaken in a timely way, for example the timely disclosure of information; and

- **Informed**: engagement enabled by relevant, understandable and accessible information.


8.2 Project Stakeholders

A stakeholder is defined as any individual or group which is potentially affected by the Project or who has an interest in the Project and its potential impacts. Different issues are likely to concern different stakeholders, so stakeholders have been grouped based on their connections to the Project.

Table 8.1 presents the range of stakeholder groups that have been identified and included within the stakeholder engagement process to date.

<table>
<thead>
<tr>
<th>Stakeholder Category</th>
<th>Stakeholder Group</th>
<th>Connection to the Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Government</td>
<td>National regulatory bodies; and Government agencies</td>
<td>National Government are of primary importance in terms of establishing policy, granting permits or other approvals for the Project, and monitoring and enforcing compliance with Kenyan Law throughout all stages of the Project lifecycle.</td>
</tr>
<tr>
<td>County Government</td>
<td>County Authorities</td>
<td>County Governments are responsible for implementation of legislation, and development plans and policies at the County level. The County Governments also have a role in issuing permits and processing applications associated with the Project (such as Project design drawings). In addition, the Counties will be impacted by the Project and will need to be kept informed of progress and plans in their area, to consider the Project activities in their policy-making, regulatory and other duties and activities.</td>
</tr>
<tr>
<td>Local Communities</td>
<td>Local Community Leaders (including the village elders); and Both directly and indirectly affected community members</td>
<td>Households and communities that may be directly or indirectly affected by the proposed Project and its activities. This includes people affected by social and/or environmental impacts attributable to the Project.</td>
</tr>
<tr>
<td>Vulnerable groups</td>
<td>Groups that due to their socio-economic characteristics may experience impacts more severely compared to the rest of the rest of the community members.</td>
<td>Vulnerable groups may be severely affected by the Project by virtue of their physical disability, social or economic standing, limited education, lack of employment or access to land.</td>
</tr>
<tr>
<td>Civil Society</td>
<td>Community Based Organisations</td>
<td>Organisations with direct interest in the Project, and its social and environmental aspects and that are able to influence the Project directly or indirectly through public opinion. Such organisations may also have useful data and insight and may be able to become partners to the Project in areas of common interest.</td>
</tr>
<tr>
<td>Other Developers in the Project area</td>
<td>Government Departments or Parastatals with developments in the Project Area; and Private Entities with developments in the Project Area</td>
<td>Other developments such as water supply pipelines and electricity transmission and distribution systems in the Project Area may be affected by the Project activities. Other developments in the Project Area also contribute to cumulative impacts.</td>
</tr>
<tr>
<td>Non-Governmental Organisations (NGOs)</td>
<td>NGOs at the national, county or local level.</td>
<td>NGOs with direct interest in the proposed Project, and its social and environmental aspects, and that are able to contribute to the Project directly or through public opinion.</td>
</tr>
</tbody>
</table>
## STAKEHOLDER ENGAGEMENT

### Stakeholder Category

<table>
<thead>
<tr>
<th>Stakeholder Category</th>
<th>Stakeholder Group</th>
<th>Connection to the Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private sector</td>
<td>Business Organisations; and Companies - potential suppliers and contractors.</td>
<td>Individuals or organisations with direct economic interest in the proposed Project. This may be through gaining contracts with the proposed Project or due to economic impacts caused by the Project.</td>
</tr>
<tr>
<td>Project Lenders</td>
<td>International Financial Institutions, such as the Standard Chartered Bank</td>
<td>The Project Consortium will be financed by international financial institutions to implement the Project.</td>
</tr>
</tbody>
</table>

### 8.3 Approach to Stakeholder Engagement

Stakeholder engagement for the proposed Project is planned to be undertaken using a staged approach in line with the various phases of its development as follows:

- ESIA process engagement; and
- Post ESIA engagement.

### 8.3.1 ESIA Process Engagement

The Objectives of the ESIA process engagement were:

- To meet key stakeholders and introduce them to the Project and ESIA process.
- To discuss the Project with the stakeholders including identified impacts and the plans in place to manage them.
- To obtain stakeholders’ view on the proposed Project.
- To obtain stakeholders’ concerns about the Project.
- To understand stakeholders’ expectations of the Project.
- To collect baseline data through a variety of methods including using participatory tools.
- To notify stakeholders of the next steps of the Project development.

Table 8.2 presents a summary of the ESIA process stakeholder engagements conducted while a summary of the key issues raised/comments made is presented in Section 8.4.

### Table 8.2 Details of ESIA Process Stakeholder Engagement

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Mode of Engagement</th>
<th>Engagement Date</th>
<th>Venue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Government</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEMA County Director of Environment (CDE) - Muranga</td>
<td>KII</td>
<td>23rd August 2019</td>
<td>NEMA Offices- Muranga.</td>
</tr>
<tr>
<td>County Government</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>County Commissioner’s Personal Assistant - Muranga</td>
<td>KII</td>
<td>23rd August 2019</td>
<td>County Commissioner’s Office- Muranga.</td>
</tr>
<tr>
<td>Local Communities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local community members</td>
<td>Public Baraza</td>
<td>12th September 2019</td>
<td>Ndikwe Police Post</td>
</tr>
</tbody>
</table>
8.3.2 Post ESIA Engagement

The Project is committed to continuous engagement with stakeholders throughout the life of the Project, from the current stages of planning and design, through construction into operation, and eventually to closure and decommissioning.

Plans and activities implemented during the next stages of Project planning and development will therefore feed into and inform on-going stakeholder engagement as the Project moves into these stages, ensuring that two-way dialogue with those affected, both positively and negatively by the proposed Project is maintained.

The aim will be to ensure that the Project remains in contact with all interested parties and cognisant of their concerns, and that these are addressed in an effective and timely manner. At each stage, a detailed schedule of activities and events will be developed and widely disseminated so that people know how to interact with and participate in the Project.

In particular, post ESIA stakeholder engagement is expected at the following Project stages:

- Resettlement Action Plan (RAP)/ Livelihood Restoration Plan (LRP) stage. At that stage, the Project team will hold discussions with each of the directly affected persons to confirm and agree on the affected property and, a RAP/LRP prepared and implemented.
- Mobilisation phase: At this stage, information regarding the location of associated project infrastructure, detailed construction schedule, expected construction team (including employment opportunities) will be shared with the Project stakeholders.
- Construction phase.
- Demobilisation phase notifying the stakeholders of the end of the construction activities and close-out of outstanding construction phase related grievances.

8.4 Outcomes of Engagement Conducted To Date

As indicated in Table 8.2, six stakeholder engagement meetings were held during the ESIA process of stakeholder engagement to date.

The key questions and concerns raised by stakeholders during the ESIA process are outlined in Table 8.3 and further detail is included in the SEP (Appendix B). The Background Information Document (BID), detailed minutes of the stakeholder engagement meetings conducted during the ESIA process, meeting photos, attendance registers, and the developed stakeholder engagement database, are all presented in Appendices C and D.

<table>
<thead>
<tr>
<th>Main Theme</th>
<th>Key stakeholders issues/ comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Infrastructure along the Project Roads</td>
<td>The Project design should avoid road-site infrastructure where possible to avoid the need for relocation. Where avoidance is not possible, relocation of the electricity infrastructure should be done before the contractor is on-site.</td>
</tr>
<tr>
<td></td>
<td>It is KURA’s responsibility to have a wider corridor including where relocation should take place.</td>
</tr>
</tbody>
</table>
## Stakeholder Engagement

<table>
<thead>
<tr>
<th>Main Theme</th>
<th>Key stakeholders issues/comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>At the time of planning for the relocation, it will be important to jointly plan for electricity, water and sewerage infrastructure since at times, the institutions responsible for these facilities agree and relocate them on one side of the road to optimise space.</td>
<td>KPLC will quote and conduct the actual relocation of the electricity infrastructure; however, it is KURA’s responsibility to pay for the relocation exercise as well as provision of detailed Project design.</td>
</tr>
<tr>
<td>Employment opportunities</td>
<td>Village members especially the disabled should be considered for job opportunities.</td>
</tr>
<tr>
<td>Details of the Road Design</td>
<td>There are water lines along the Project Road and the contractor should ensure they are not damaged or water supply to the community is not affected.</td>
</tr>
<tr>
<td>Health and Safety</td>
<td>Measures should be put in place to reduce accidents along the road.</td>
</tr>
<tr>
<td>Communication</td>
<td>KURA to write a formal letter to the County Commissioner requesting a meeting to discuss the Project.</td>
</tr>
<tr>
<td></td>
<td>There should be comprehensive public participation with the local people. Accordingly, a community Barazas in the Project Area was held.</td>
</tr>
<tr>
<td>Compensation</td>
<td>There should be compensation for loss of crops.</td>
</tr>
<tr>
<td></td>
<td>Project Roads are in a heavily agricultural area and KURA should expect a lot of vegetation/agricultural encroachment within the Road reserve.</td>
</tr>
</tbody>
</table>

All stakeholder comments were noted and were considered in the assessment of the Project for all phases. Where necessary, responses were given by both the ERM team, the Contracting Authority and the Contractor’s representative present in the various meetings (refer to Appendices C and D for the Background Information Document (BID) used in stakeholder engagement meetings and detailed minutes of the stakeholder engagement meetings).

### 8.5 Project Grievance Mechanism

In accordance with international good practice, the Project has established a specific mechanism for dealing with grievances. A grievance is a complaint or concern raised by an individual or organisation who judges that they have been adversely affected by a project during any stage of its development. Further detail on the grievance mechanism process is outlined in the SEP in Appendix B.

### 8.6 Monitoring and Reporting

Stakeholder engagement has been monitored and reported through the following means:

- updates to the stakeholder database; and
- records of all consultations held.

These records have been updated throughout the ESIA process. Thus the SEP and the records that are created as a result have served as a tool, not only to plan engagement, but also to record previous phases of the process.

In order to assess the effectiveness of the SEP and associated engagement activities, the Contractor and the Contracting Authority will implement a database management and monitoring process as part
of the overall monitoring of ESIA commitments and performance, as well as on the implementation of the Grievance Mechanism.
9. ANTICIPATED IMPACTS AND MITIGATION MEASURES

The predicted impacts to the physical, biological and socioeconomic environment as a result of the Project are described in this Chapter. This Chapter also details potential mitigation measures in order to avoid, minimise, reduce, remedy or compensate for potentially negative impacts, and enhance potential benefits of the proposed Project. Furthermore this Chapter provides a prediction of the residual impacts that will remain, assuming that the appropriate mitigation measures are implemented.

The development of mitigation/management measures and the management of residual impacts are fully described in the Environmental and Social Management and Monitoring Plan (ESMMP) (see Chapter 10). The methodology to identify and assess impacts is explained in Chapter 3.

9.1 Impact Assessment Layout

The impact assessment laid out in this Chapter is as follows:

- Each section begins with the type of impact being assessed (e.g. Section 9.2.1 – Impacts on local air quality, and Section 9.2.2 – Impacts on the noise environment).
- Background information relating to the impact is then provided. This includes a description of the baseline environment that will be affected, the Project aspect or activities that will cause the impact and a description of the effected receptors.
- The significance of the impact pre-mitigation is then assessed and rated through use of a rating table.
- Following the pre-mitigation rating tables a section describing the recommendations and mitigation/management measures proposed are provided.
- Once the recommended mitigation/management measures are provided a residual impact (post-mitigation) is rated through use of a less detailed rating table.

Descriptions of impact assessment terminology are provided in Chapter 3.

The predicted impacts on the physical, biological and socioeconomic environment are discussed as follows:

- Physical and Biological Environment:
  - Impacts on Local Air Quality.
  - Impacts on the Noise Environment (including vibration).
  - Impacts on Water Quality and Flow.
  - Wastes and Effluents.
  - Material Sites and Borrow pits.

- Socioeconomic Environment:
  - Impact on Community Service Infrastructure (Domestic Water Supply and, Electricity Transmission and Distribution) Network.
  - Impacts on Employment, Procurement and the Economy.
  - Land Acquisition and Resettlement
  - Impact on Disease Transmission.
  - Traffic Impacts.
Note: It is important to note that the positive impacts are not rated, merely stated. It is considered sufficient for the purpose of the Impact Assessment to indicate that the Project is expected to result in a positive impact, without characterising the exact degree of positive change likely to occur.

9.2 Construction Related Impacts

9.2.1 Introduction

Given the current land use along the Project Road where human activities (urbanisation) have substantially modified the primary ecological functions of the area, and that habitat is highly modified; impacts on biodiversity (both flora and fauna) associated with the Project activities will be negligible, and are therefore not assessed any further in this report.

9.2.2 Impacts on Local Air Quality

9.2.2.1 Description of the Baseline Environment

The Ndikwe – Kiria Road generally transverses a rural setting with dense agricultural and crop fields with few settlements and light commerce along the Road as described in more details under the respective sections below.

The Mucunguca-Kiangage Road also transverses a generally rural setting with main land use being arable farming and livestock rearing. There are few scattered settlements amidst the agricultural/cropland land as well as few retails shops centres and a church.

9.2.2.2 Proposed Project Activities

During the construction phase, gaseous and dust emissions will mainly be associated with excavations and earth moving activities, construction truck movements, construction machinery and vehicle engines. The main components of gaseous and dust emissions will be hydrocarbons, CO₂, NOₓ, SOₓ and Particulate Matter, including Total Suspended Particulates (TSP) and the respirable fraction, namely PM₁₀.

9.2.2.3 Sensitive Receptors

The main sensitive receptors along the Ndikwe – Kiria Road and Mucunguca – Kiangage are a few scattered settlements as well as few retails shops and a school along the roads.

9.2.2.4 Significance of Impact (Pre-mitigation)

Based on the analysis provided above, impacts on local air quality during the construction phase will be “Major Negative Impact” pre-mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Direct Negative Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating of Impact</td>
<td></td>
</tr>
<tr>
<td>Characteristic</td>
<td>Designation</td>
</tr>
<tr>
<td>Extent</td>
<td>Local</td>
</tr>
</tbody>
</table>
### 9.2.2.5 Mitigation/Management Measures

- Develop and implement a grievance procedure to manage any dust complaints.
- Impacts associated with construction road traffic during the construction phase should be adequately mitigated by either regularly wetting the road near sensitive receptors such as schools and businesses or chemically treating unpaved roads.
- Speed limits should be set to as low as possible on unpaved roads where surface binding agents have not yet been applied.
- Work vehicles should as far as reasonably possible be kept free of excessive mud especially when moving outside of the construction area.
- Work vehicles transporting soils and aggregates materials should be kept adequately covered to prevent materials being inadvertently spread around and off the construction site.
- Where feasible, surface binding agents should be used on exposed open earthworks such as at the material laydown areas. Upon completion of earthworks, stabilization of surfaces (i.e., establishing vegetative cover, or placing ground cover) should occur as soon as possible.
- The smallest possible area for cleared ground required for construction work should be exposed, and where feasible, surface binding agents should be used on exposed open earthworks. Where the use of surface binding agents is not possible, the use of localised dampening and activity-specific dampening should be used to reduce localised emissions of dust.
- Drop heights of material should be minimised, as far as reasonably possible.
- Soil and aggregate stockpiles should be managed in accordance with the mitigation / management measures provided for Impacts on Water Quality (refer to Section 9.2.4).
- Where feasible and reasonable, vehicles that are compliant with recent emission standards (for example, EURO Tier 3) should be used. These vehicles should be maintained in...
reasonable working order. When not in use, vehicles should be switched off, unless impractical for health and safety reasons (for example maintenance of air conditioning).

- Construction equipment should be maintained and serviced on a regular basis to ensure that it functions optimally and to reduce excessive emissions, this will also apply to all stationary generators utilised on site.

- The Contractor proposes to extract construction materials from existing commercial quarries and borrow pits. However, in the event that new quarries and borrow pits are to be opened up, they should be situated at a minimum of 2,000 m from sensitive receptors, in line with Kenyan law.

- Issue all the Project workers appropriate Personal Protective Equipment (PPE) including dust masks where required.

- Develop and implement an appropriate Traffic Management Plan (TMP) throughout the construction phase.

- Prepare and share the construction schedule with the local community members and create community awareness to keep them informed of anticipated Project impacts and how they can be minimised.

- Any spillages along construction access routes should be cleaned up within a reasonable time (preferably the same shift) to prevent secondary dust sources.

### 9.2.2.6 Residual Impact (Post-Mitigation)

Based on the implementation of the proposed mitigation measures, the significance of the impact on local air quality will be a “Minor Negative Impact” post mitigation per the assessment below.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Designation</th>
<th>Summary of Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent</td>
<td>Local</td>
<td>The gaseous and dust emissions will be localised along the Projects Roads and limited within the Project area.</td>
</tr>
<tr>
<td>Duration</td>
<td>Short term</td>
<td>The effects of gaseous and dust emissions will cease shortly after the construction phase.</td>
</tr>
<tr>
<td>Scale</td>
<td>Small</td>
<td>This impact will be manifested within a narrow stretch along the Project Roads. More so, the concentration of emissions will be kept below the maximum levels permitted in the National Environmental Management and Coordination Act (Air Quality) Regulations, 2014 and IFC guidelines (Chapter 3).</td>
</tr>
<tr>
<td>Frequency</td>
<td>Continuous</td>
<td>This impact will be manifested throughout the construction phase.</td>
</tr>
</tbody>
</table>

**Magnitude**

- Small Magnitude
- Significant Rating After Mitigation

**Minor Negative Impact**

### 9.2.3 Impacts on the Noise Environment (including vibrations)

#### 9.2.3.1 Description of the Baseline Environment

The Project Roads are located within a rural area with a few settlements where noise levels are generally lower.
9.2.3.2 Proposed Project Activities

The main source of noise and vibrations will be attributed to the heavy construction machinery and construction vehicles that will be used during the construction phase. There will be no blasting at the Project site.

For general construction activities, the potential for building damage (usually only cosmetic damage) is likely to be limited to a distance of less than 50 m from the construction activity. Moderate significant impacts may occur within this distance.

9.2.3.3 Sensitive Receptors

The main sensitive receptors along the Ndikwe – Kiria Road and Mucunguca – Kiangage are a few scattered settlements as well as few retails shops and a school along the roads.

9.2.3.4 Significance of Impact (Pre-mitigation)

Based on the analysis provided above, impacts on the noise environment during the construction phase will be “Major Negative Impact” pre-mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Designation</th>
<th>Summary of Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent</td>
<td>Local</td>
<td>The noise and vibration impacts are expected to be limited to the immediate Project area in Kiharu Sub-County</td>
</tr>
<tr>
<td>Duration</td>
<td>Short term</td>
<td>This impact will cease as soon as the construction activities are completed.</td>
</tr>
<tr>
<td>Scale</td>
<td>High</td>
<td>The noise and vibrations generated along the Project Road will likely exceed the maximum levels permitted in the National Environmental Management and Coordination Act (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 and IFC guidelines (Chapter 3).</td>
</tr>
<tr>
<td>Frequency</td>
<td>Continuous</td>
<td>Noise and vibrations will be generated throughout the construction phase (daytime); however, no noise will be generated at night since construction activities are expected to be limited to daytime activities only.</td>
</tr>
</tbody>
</table>

Magnitude

<table>
<thead>
<tr>
<th>Sensitivity/Vulnerability/Importance of the Resource/Receptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Magnitude</td>
</tr>
</tbody>
</table>

Although the sensitive receptors along the Project Roads are already experiencing noise and vibration impacts associated with road traffic as well as that associated with commercial activities, a further increase in noise levels will cause nuisance impacts. It is anticipated that there will be a temporary increase in vibrations within the immediate Project area during compaction and layer works. There is the potential for vibration arising from driven piling and vibratory compaction to impact buildings within approx. 50 metres from the road. In the absence of mitigation, vibration damage to buildings is possible within this distance.

Significant Rating Before Mitigation

<table>
<thead>
<tr>
<th>Major Negative Impact</th>
</tr>
</thead>
</table>
9.2.3.5 Mitigation/Management Measures

General Measures

The following mitigation measures are recommended where necessary to keep the noise and vibration levels below the applicable national standards at the closest sensitive receptors to the source:

- The Project should develop and implement a grievance procedure in the event of any noise and vibration impact complaints being received.
- A one-page summary of applicable noise criteria that relate to relevant work practices and nearby receptors should be developed. This summary should be placed on a noticeboard so that all site operators can quickly reference noise information.
- Site management should periodically check the site and nearby residences (or other sensitive land uses) for noise and vibration related issues so that solutions can be efficiently and timeously applied.
- Periods of respite should be provided in the case of unavoidable maximum noise level events. These respite periods should be negotiated with the relevant local stakeholders.
- Regular inspection and maintenance of all machinery and vehicles.
- Installation of silencers or acoustic enclosures on machinery, where applicable, such as installation of suitable mufflers on engine exhausts and compressor components as well as the use of portable sound barriers around equipment like generators.
- Reverse alarms on construction vehicles are necessary for health and safety reasons, but do contribute to noise levels and maybe a nuisance to surrounding communities. As such, construction equipment must be used during daylight hours only, unless in unavoidable circumstances.
- Where feasible and reasonable, the throttle settings on plant and machinery should be reduced and equipment and plant should be turned off when not being used.
- As far as reasonably possible, avoid or minimise Project traffic routing through community areas and the implementation of speed limits for all construction vehicles.
- Limiting hours of operation for specific equipment or operations (e.g. trucks or machines operating in or passing through community areas).
- Restricting noise levels at the sensitive receptors from long term construction activities to 60 dB LAeq during the daytime, and 35 dB LAeq at night as far as is practicable, or to other standards that have been agreed with the local authority.
- All potentially impacted receptors should be informed of the nature of works to be carried out, the expected noise and vibration levels and duration, as well as contact details for an appropriate representative that can be contacted in the event of a complaint. All complaints should be managed as part of the Projects external feedback and grievance mechanism.
- Where needed, and especially if buildings are located within close proximity of the work area, the buildings should be inspected and photographic evidence kept prior to construction. These buildings should be inspected for damage during and after activities which may contribute to an increase in vibrations such as during compaction.
- Noise monitoring against the performance criteria presented above should be implemented if persistent noise complaints are received.
- All employees are to be provided with, and are to wear, appropriate hearing protection such as earmuffs and earplugs where necessary.
- Avoid idling of Project vehicles and equipment when not in use.
Additional Specific Measures

- Careful siting of Construction Camps and associated plants is the most effective mitigation in terms of noise impacts. Care should be taken to site Construction Camps and associated plant at least (preferably more than) 180 m from sensitive receptors (health and educational facilities, residential homesteads) where applicable.

- Storing excavated material (with cover to avoid dust erosion), or use of buildings/structures or temporary noise barriers to form a noise barrier between the Construction Camp and any noise sensitive receptors.

- Shutting down of machines in intermittent use in the intervening periods between work (or throttle them down to a minimum).

- Positioning of all ancillary plant (e.g. crushers, mixers, loaders, generators, compressors, etc.) so as to cause minimum noise disturbance.

- Providing acoustic enclosures, if necessary.

- As far as reasonably possible, limit noisy construction activities to day time hours only, between the hours of 06h00 and 18h00.

- Share the construction schedule with all the affected stakeholders indicating periods when unusual construction activities with extraordinary noise levels will be carried out.

- Inform the neighbouring communities of any un-usual construction activities with extraordinary noise levels including time, expected duration and any safety precautions.

- Undertake structural integrity assessments of existing structures along the Project Roads prior to construction as a baseline control for damages from vibrations during construction.

9.2.3.6 Residual Impact (Post-Mitigation)

Based on the implementation of the proposed mitigation measures, the significance of the impact on the noise environment will be a “Minor Negative Impact” post mitigation per the assessment below.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Designation</th>
<th>Summary of Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent</td>
<td>Local</td>
<td>The noise and vibration impacts are expected to be limited to the Project area in Kiharu Sub-County.</td>
</tr>
<tr>
<td>Duration</td>
<td>Short term</td>
<td>This impact will cease as soon as the construction activities are completed.</td>
</tr>
<tr>
<td>Scale</td>
<td>Low</td>
<td>The noise and vibration levels reaching the sensitive receptors will be within the permitted levels in the National Environmental Management and Coordination Act (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 and IFC guidelines.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Intermittent</td>
<td>Noise and vibrations will only be generated when Project equipment and machinery are being operated. No Project associated noise will be generated at night.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Magnitude</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Magnitude</td>
<td></td>
</tr>
<tr>
<td>Significant Rating After Mitigation</td>
<td>Moderate Negative Impact</td>
</tr>
</tbody>
</table>
9.2.4 Impacts on Water Quality and Flow

9.2.4.1 Description of the Baseline Environment

The northern part of the Project area is drained by River Mathioya and its tributaries while the southern part is drained by River Maragua and its tributaries. In particular, the Mucunguca - Kiangage Road crosses the Maragi River which is one of the tributaries of River Mathioya. Field observations indicated that Maragi River has high turbidity levels (which worsens during the rainy season) and this is attributed to the current land use practices in which arable farming is carried out up to the river banks. The local community members along the Ndikwe – Kiria Road mainly fetch water for domestic use from River Kaihungu.

The upgrade of the Project Roads will require implementation of appropriate mitigation/management measures to avoid further contamination of the rivers and tributaries that drain the Project area.

9.2.4.2 Proposed Project Activities

The construction phase will be associated with earthwork activities. Earthwork activities including excavations has a potential of damaging the domestic water supply and sewer network thus contaminating the water supply system. Excavated material; if not well managed; will be eroded during rainy seasons, and may potentially flow into Rivers Mathioya and Maragua, and their tributaries and cause sedimentation, which will further increase the concentration of suspended solids and turbidity already observed in the tributary of River Mathioya.

Another potential source of water contamination will be from small scale leaks and spills of petroleum products (fuel, oil, etc.) from Project machinery and fuel storage tanks (if applicable) e.g., due to accidental damage and/or improper maintenance. Accidental leaks and spills are also further assessed separately in Section 9.4.1.

The paved road and improved drainage system will direct stormwater into the drainage channels thus increasing the volume and ultimately rate of flow of guided stormwater. If the outlet channels are not well and strategically designed, the guided stormwater may cause localised flooding, may result in increased soil erosion, with potential resultant impacts to rivers Mathioya and Maragua, and their tributaries.

9.2.4.3 Sensitive Receptors

The main sensitive receptor of any potential water quality impact are rivers Mathioya, Maragua and Kaihungu, and their tributaries into which storm water will flow.

9.2.4.4 Significance of Impact (Pre-mitigation)

Based on the analysis provided above, impacts on water quality during the construction phase will be “Moderate Negative Impact” pre-mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Direct Negative Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating of Impacts</td>
<td>Characteristic</td>
</tr>
<tr>
<td>Extent</td>
<td>Regional</td>
</tr>
</tbody>
</table>
### Duration
Medium term
The impact will only occur during the construction period (the total construction period for Lot 15 and Lot 18 with selected roads in ten counties is planned to take a total of two years and specific construction activities in each of the counties will take an average of six months – exact period to be determined after the completion of the detailed designs and a construction schedule developed for each of the Project Roads).

### Scale
Medium
The scale of this impact is dependent on the type of water contaminants as well as their concentrations. For this particular Project, the contaminants will mainly be silt and suspended sediments and the possibility of petroleum contaminants (fuel, oil and used oil) especially if there are leakages from the Project machinery.

### Frequency
Continuous
Continuous during the construction phase.

<table>
<thead>
<tr>
<th>Magnitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium Magnitude</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sensitivity/Vulnerability/Importance of the Resource/Receptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium Sensitivity</td>
</tr>
</tbody>
</table>

Rivers Mathioya, Maragua and Kaihungu, and their tributaries flow through a highly modified area in the Project area (particularly by human settlement and agricultural) and are already impacted by a high sediment load. Any contamination from the construction activities will further exacerbate the poor water quality of this river.

<table>
<thead>
<tr>
<th>Significant Rating Before Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate Negative Impact</td>
</tr>
</tbody>
</table>

### 9.2.4.5 Mitigation/Management Measures

#### General Measures
- The Project should develop and implement a grievance procedure to deal with complaints received in the event of disruption to water supply due to damages to services and or any impact on water quality as result of the construction activities.
- To the furthest extent practicably possible, construction activities including the storage of materials, especially bituminous products and overnight parking of equipment should be conducted > 100 m away from water bodies, except where crossings are required.

#### Specific Measures – Water Quality
- In liaison with the Murang’a County Water and Sewerage Company (MUWASCO), the Contracting Authority (KURA) should develop and implement an easement plan for the domestic water supply network along the Project Roads, prior to the commencement of the construction activities.
- Communicate all the construction related plans and schedules including the easement plans to the local community members prior to the commencement of the construction and easement activities.
- Regularly maintain the Project equipment as per the manufacturer’s instruction to avoid the possibility of any leaks and spills.
- The Project should consult with the appropriate Kenyan government departments to confirm the need and applicability for water discharge permits/licenses necessary for the successful construction of the proposed Project Roads. Such discharge permits/licenses will be associated with effluent discharges (viz. stormwater and treated sanitary/domestic sewage).
Method Statements detailing spill emergency response and clean-up procedures for spills should be developed.

Training regarding proper methods for transporting, transferring and handling hazardous substances that have the potential to impact surface and groundwater resources should be undertaken.

Areas where spillage of soil contaminants occurs should be excavated (to the depth of contamination) and suitably rehabilitated. If any other minor spillage occurs the spillage should be cleaned as soon as possible, but within the same shift and the contaminated area should be reinstated. All contaminated material should be suitably disposed of.

The washing of Project vehicles in any surface water bodies in and around the Project Roads should be prohibited. All Project vehicles should be washed at designated wash bays on site. These wash bays should include oil/grease and sediment traps for grey water.

The ad hoc maintenance, with the exception of emergency repairs; of vehicles in and around the area of the Project Roads should be prevented, as far as reasonably possible. All major services and ad hoc maintenance of vehicles and equipment should be done at a designated workshop. The workshop should be properly constructed to prevent pollution and should as far as reasonably practical include containment berms and an oil/grease trap.

All construction areas and associated facilities should be maintained in a good and tidy condition; debris and wastes should be contained in such a way that they cannot become entrained in surface runoff during periods of heavy rain.

Where practical, exposed surfaces and friable materials should be covered/sheeted.

Sufficient portable chemical toilets at active work areas should be provided for site staff and workers and these should be serviced regularly by a competent and suitably qualified person.

The sewage treatment/containment system should be managed in a manner that results in zero discharge of raw sewage to the environment, and if treated sewage is discharged into the environment then this should conform to recognised Kenyan discharge standards prior to discharge.

All wastewater which may be contaminated with oily substances should be managed in accordance with an approved (by Contractor’s and KURA’s top Management or authorised Project personnel) Waste Management Plan, and no hydrocarbon-contaminated water should be released into the environment.

Fixed fuel storage infrastructure should be on flat, impermeable surfaces and surrounded by a bund with a volume of 110% of the volume of the storage tank(s), and fuel transfer at fixed stations should be performed on a concrete surface.

Position the materials yard/laydown areas, waste disposal sites, spoil dumping areas and access roads as far as possible from local watersheds, i.e. on local high points, to minimise risk of affecting surface water quality through the generation of silt (e.g.: by erosion) or waste (e.g.: from ablution facilities, refuelling of vehicles etc.).

Chemicals storage and dispensing areas should be located no less than 500 m away from surface water bodies, and in no instance should they be located within floodplains. Storage areas should be on flat, impermeable surface and surrounded by a bund or be an enclosed storage facility.

To avoid siltation of rivers and other surface water bodies, soil stockpiles should be located away from surface water bodies.
**Specific Measures – Flow (including stormwater water)**

- Integrate an appropriate drainage system in the overall road planning and across the construction site to align it to the natural drainage system as much as possible, and to prevent downstream flooding.
- Project infrastructure should be designed and located to minimise the impacts to natural water flow.
- Harmonize drainage with all point sources of surface runoff such as valleys/lowlands and rivers, and the pavement surface structure.
- To the furthest extent possible, the disturbance of the natural topography and catchment characteristics should be minimised (e.g. limit large-scale earthworks, vegetation removal, soil compaction etc.), so as to not alter the natural flow characteristics of the rivers.
- The design of all the culverts should be informed by hydrological studies to be able to manage peak runoff.
- As far as reasonably possible, drainage outfalls should not be directed into private land or premises.
- Ensure protection of soil adjacent to the side drains and the constructed drainage facilities.
- Construct appropriate drainage trenches along the entire section of the Project Road.
- Identify appropriate areas for the dumping of excess earth material. This should preferably be done in consultation with the local NEMA offices to identify potential areas such as old quarries and borrow-pits which may require backfilling and rehabilitation.
- Spoil/excavations should be visually assessed to determine if it is contaminated. In the event that the spoil is contaminated, it should be handled as a hazardous material and disposed of under supervision and into controlled dumping areas.
- The drainage outfalls should be properly constructed to reduce the erosion from surface runoff and stormwater.

**9.2.4.6 Residual Impact (Post-Mitigation)**

Based on the implementation of the proposed mitigation measures, the significance of the impact on water quality will be a “Moderate Negative Impact” post mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Designation</th>
<th>Summary of Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent</td>
<td>Regional</td>
<td>Any negative impacts on rivers Mathioya, Maragua and Kaimhungu, and their tributaries will be of a regional concern since the rivers are not limited to the Project area.</td>
</tr>
<tr>
<td>Duration</td>
<td>Medium term</td>
<td>The impact will only occur during the construction period (the total construction period for Lot 15 and Lot 18 with selected roads in ten counties is planned to take a total of two years and specific construction activities in each of the counties will take an average of six months to a year – exact period to be determined after the completion of the detailed designs and a construction schedule developed for each of the Project Roads).</td>
</tr>
</tbody>
</table>
Scale | Low | The scale of this impact is dependent on the type of water contaminants as well as their concentrations. With the application of the proposed mitigation measures, contamination of the water in the water supply network will be avoided despite minimal disruptions in water availability during the relocation of the water supply network (refer to the impact on water availability in Section 9.2.7). The sedimentation of rivers Mathioya, Maragua and Kaihungu, and their tributaries will be low.

Frequency | Occasional | This impact will be manifested whenever working along river crossing points.

<table>
<thead>
<tr>
<th>Magnitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
</tr>
<tr>
<td>Medium</td>
</tr>
<tr>
<td>Significant</td>
</tr>
</tbody>
</table>

9.2.5 Waste and Effluent

9.2.5.1 Description of the Baseline Environment

Murang’a County does not have a robust solid waste management facility; however, there is a proposed sanitary landfill facility at Mitubiri. Within the Project Area, solid waste is mainly managed at household level through composting and open burning. There is no sewerage system in the Project area and most of the community homesteads have pit latrines.

9.2.5.2 Proposed Project Activities

Road upgrade activities for the Project Road will be associated with a number of wastes ranging from earth material from excavations, hazardous waste and domestic waste that will be generated during the construction process.

In addition, effluent waste will be generated in form of both grey and black water by the construction crew.

If the generated waste is not well managed, it will cause a nuisance in the Project area as it can jeopardise the sanitation among others.

9.2.5.3 Sensitive Receptors

The sensitive receptors to poor waste and effluent management will be the local community members, commercial areas and institutions within the Project area. Specifically, the County waste management institutions will be overwhelmed by large volumes of waste generation if proper waste management measures are not put in place.

9.2.5.4 Significance of Impact (Pre-mitigation)

Based on the analysis provided above, impact of effluent and waste management during the construction phase will be "Major Negative Impact" pre-mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Type of Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Negative Impact</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Designation</th>
<th>Summary of Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent</td>
<td>Local</td>
<td>This impact will only be manifested within the Project area.</td>
</tr>
</tbody>
</table>
If appropriate waste management measures are not put in place, the impacts of poor waste and effluent management will continue to be manifested even after the construction period of (the total construction period for Lot 15 and Lot 18 with selected roads in ten counties is planned to take a total of two years and specific construction activities in each of the counties will take an average of six months to a year – exact period to be determined after the completion of the detailed designs and a construction schedule developed for each of the Project Roads).

The scale of this impact refers to the amount of waste that is likely to be generated. Given the short length of the Project Roads, medium volumes of waste will be generated.

Wastes will be generated daily throughout the construction phase.

**Magnitude**

| Sensitivity/Vulnerability/Importance of the Resource/Receptor | High |

The County does not have a robust solid waste management system and there is no appropriate system for management of effluent and hazardous wastes.

**Significant Rating Before Mitigation**

| Major Negative Impact |

### 9.2.5.5 Mitigation/Management Measures

- Spoil generated should be disposed of on pre-identified and approved locations (impact assessment should be completed for the locations if not already approved).

- A Waste Management Plan (WMP) will be produced for the construction phase:
  - following the principles of:
    - waste minimisation at source,
    - segregation for reuse,
    - recycling, and
    - safe disposal of waste.
  - With detailed measures stipulated such as:
    - using waste minimisation techniques;
    - allocating responsibilities for waste management;
    - identifying all sources of waste;
    - ensuring wastes are handled by personnel licensed to do so especially in the case of hazardous waste;
    - making suitable facilities available for the collection, segregation and safe disposal of the waste, also ensuring wastes are not blown off site by wind contributing to wind-blown litter in the area;
    - creating waste collection areas with clearly marked facilities such as colour coded bins and equipment for handling the various waste types; and
    - The collection of wastes that cannot be reused or recycled to be collected by approved waste contractors and transferred to an appropriately waste management facility for treatment and ultimate disposal (NEMA licensed).
Construction vehicles and equipment will be serviced off site at designated and approved servicing locations.

The use, storage, transport and disposal of hazardous materials used for the Project will be carried out in accordance with all applicable Kenyan regulations, and Material Safety Data Sheets (MSDS). As Kenya does not have a specific hazardous waste facility, any hazardous wastes to be disposed of should be documented beforehand, treated as per any requirements of the MSDS sheets, and disposed of in consultation with the applicable County Authorities and via NEMA approved waste handlers.

The Contractor will be required to supply the required temporary ablution facilities and be responsible for the treatment and/or removal of sewage wastes off site. The Contractor will also be required to ensure that any sub-contracting company is accredited and has the necessary permits to remove sewage waste.

The sewage will be treated in accordance with the applicable laws like the Environmental Management and Coordination (Waste Management) Regulations, 2006.

All construction laydown areas shall comply with the Project Waste Management Plan (WMP) and be provided with appropriate waste handling equipment.

Work sites will have appropriate solid waste holding receptacles to be regularly emptied for disposal.

In line with the requirements of the Waste Management Regulations, any generated hazardous waste should be transported and managed by NEMA permitted hazardous waste handlers.

9.2.5.6 Residual Impact (Post-Mitigation)

Based on the implementation of the proposed mitigation measures, the significance of the impact of waste and effluent management will be a "Minor Negative Impact" post mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Designation</th>
<th>Summary of Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent</td>
<td>Local</td>
<td>This impact will only be manifested within the Project area.</td>
</tr>
<tr>
<td>Duration</td>
<td>Short term</td>
<td>With application of appropriate waste and effluent management measures, the impact of waste and effluent management will cease to manifest shortly after the construction phase.</td>
</tr>
<tr>
<td>Scale</td>
<td>Low</td>
<td>The scale of this impact refers to the amount of waste that is likely to be generated. With the application of appropriate waste management measure including the application of the waste management hierarchy, less waste will be generated.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Daily</td>
<td>Wastes will be generated daily throughout the construction phase.</td>
</tr>
</tbody>
</table>

**Magnitude**

<table>
<thead>
<tr>
<th>Small Magnitude</th>
</tr>
</thead>
</table>

**Significant Rating After Mitigation**

<table>
<thead>
<tr>
<th>Minor Negative Impact</th>
</tr>
</thead>
</table>
9.2.6 Material Sites and Borrow Pits

9.2.6.1 Description of the Baseline Environment

Existing largescale commercial quarries have been identified in the region for the source of construction materials.

These existing quarries have already been used to supply construction materials for other roads in the region; however, the suitability of the materials from them will be reconfirmed during the detailed Project design. Where possible, additional potential sources of construction materials will be identified and tested as part of the detailed Project design. It is not anticipated that any new borrow-pits or quarries will be needed for this Project. However, in the unlikely event of the material not being suitable, and the contractor will need to open new borrow-pits or quarries, a separate NEMA authorisation process will be followed to obtain approvals for these areas.

9.2.6.2 Proposed Project Activities

When material sites and borrow pits are excavated, the owner cannot use the land (with the exception of already existing commercial quarries and borrow pits). Excavation often leaves these areas infertile, as topsoil is removed, and the soils become compacted and lose their structure as a result of the movement of construction vehicles collecting these construction materials. Other major concerns relating to material sites include vegetation clearance, visual impacts, dust and noise impacts during excavation, as well as the need to reinstate or landscape the gravel sites when the contractors have completed excavation works (which is often overlooked or not enforced).

9.2.6.3 Sensitive Receptors

If the sites and pits are exhausted and left open, stagnant water can result in the breeding of mosquitoes, which in turn will increase the spread of malaria and waterborne diseases. Should these pits be left with steep sides, there is the risk of falling/drowning in the open pits, especially by children and livestock. The pits and excavated areas, if left un-rehabilitated, also result in land lost to cultivation or its prior land-use, contributing to food insecurity locally.

9.2.6.4 Significance of Impact (Pre-mitigation)

Based on the analysis provided above, impacts resulting from material sites and borrow pits during the construction phase will be “Moderate Negative Impact” pre-mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Designation</th>
<th>Summary of Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent</td>
<td>Regional</td>
<td>The identified sources of construction materials are the major sources in the region.</td>
</tr>
<tr>
<td>Duration</td>
<td>Short term</td>
<td>This impact attributed to construction activities will cease to be manifested after the construction phase (the total construction period for Lot 15 and Lot 18 with selected roads in ten counties is planned to take a total of two years and specific construction activities in each of the counties will take an average of six months to a year – exact period to be determined after the completion of the detailed designs and a construction schedule developed for each of the Project Roads).</td>
</tr>
<tr>
<td>Scale</td>
<td>Low</td>
<td>The estimated quantities of the required construction materials are available at the identified existing commercial quarries within the region.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Continuous</td>
<td>The construction materials will be continuously required throughout the construction phase.</td>
</tr>
</tbody>
</table>
Although the Consortium will utilise commercial and existing sources for construction materials, in the event that the contractor will need to open new borrow-pits and quarries and leave them unrestored, the following impacts are possible: stagnant water can result in the breeding of mosquitoes, which in turn will increase the spread of malaria and waterborne diseases; should these pits be left with steep sides, there is the risk of falling/drowning in the open pits, especially by children and livestock; the pits and excavated areas, if left un-rehabilitated, also result in land lost to cultivation or its prior land use, contributing to food insecurity locally.

Given that it is assumed that already existing borrow pits and quarries will be used, the sensitivity drops to Medium.

### Significant Rating Before Mitigation

**Moderate Negative Impact**

8.2.6.5 **Mitigation/Management Measures**

- Implement resource efficient measures to avoid waste of construction materials. In particular, only extract the volume of materials needed for the construction of the Project Roads.
- Where feasible, the existing road base material should be recycled back into the road construction process to minimize the need for additional material to be imported.
- Conduct a due diligence on the identified commercial quarries to confirm that the operators (supply chain suppliers) have all the necessary approvals and manage them in the most appropriate manner. In particular, confirm that they restore exhausted borrow pits.
- All access routes to material sites should be planned ahead of construction and described in the contract documents.
- Haulage routes should be maintained by watering to minimize the impact of dust.
- Use existing quarries and borrow pits to the greatest extent possible.

In the event that new borrow pits/ quarries are to be opened specifically for this Project, the following additional measures should be implemented:

- A separate NEMA authorisation process will be followed to obtain approvals for any new borrow-pits or quarries.
- Contracts with the landowners should be signed before the commencement of extraction activities, which should include terms and conditions for payment, the area of land to be excavated, and the rehabilitation measures to be carried out on the gravel sites, if required. The Contract documents should instruct the contractor to construct and maintain fences and rehabilitate the site after use.
- The material site areas to be excavated should be cordoned off, as these areas tend to be deep and pose a danger to children and livestock.
- Gravel pits must be landscaped and reinstated or backfilled to ensure safety and stability of the borrow-pit / quarry area. If excavation is properly planned, organized and executed, it will be possible to rehabilitate most of the gravel pits.
- It should be ensured that topsoil and overburden material are stored separately to allow for use during the rehabilitation phase.
- The end use and rehabilitation requirements of the borrow-pit should clearly be stated in the lease agreement with the landowner, as far as reasonably possible; the areas should not be
left un-rehabilitated. The Contractor should ensure that the all post-activity safety concerns are adequately addressed prior to leaving the area.

- Landowners should be informed of the environmental implications of the excavation works at the time of identification of the gravel pits. They must be informed at the earliest, by the Contractor and Resident Engineer, whether testing has revealed that material from their plot was acceptable or not for use on the Project Roads.

9.2.6.6 Residual Impact (Post-Mitigation)

Based on the implementation of the proposed mitigation measures, the significance of the impacts associated with material sites and borrow pits will be a “Minor Negative Impact” post mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Designation</th>
<th>Summary of Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent</td>
<td>Regional</td>
<td>The identified sources of construction materials are the major sources in the County.</td>
</tr>
<tr>
<td>Duration</td>
<td>Short term</td>
<td>This impact attributed to construction activities will cease to be manifested after the construction phase. If any new borrow pits/quarries are opened up, they will be rehabilitated and restored.</td>
</tr>
<tr>
<td>Scale</td>
<td>Very Low</td>
<td>The estimated quantities of the required construction materials are available at the identified existing commercial quarries within the region.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Continuous</td>
<td>The construction materials will be continuously required throughout the construction phase.</td>
</tr>
</tbody>
</table>

**Magnitude**

<table>
<thead>
<tr>
<th>Significant Rating After Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor Negative Impact</td>
</tr>
</tbody>
</table>

9.2.7 Impact on Community Service Infrastructure (Domestic Water Supply and, Electricity Transmission and Distribution) Network

9.2.7.1 Description of the Baseline Environment

Same as presented in Section 9.2.4 above.

9.2.7.2 Proposed Project Activities

In order to pave way for the construction activities, the community service infrastructure within the road corridor ((domestic water supply and, electricity transmission and distribution) network) will be relocated by the Contracting Authority (KURA) where possible as part of the easement process. During this process, the customers supplied by the affected network may suffer short term temporary disruptions to the provided services. In practice, the water supply network that cross the Project Road will only be relocated during the conduct of the construction activities since they will need to be temporarily removed and buried again to ensure that the customers on the opposite side of the road continue to access potable water after the construction phase disruptions. Relocation of electricity infrastructure is anticipated to be undertaken prior to the commencement of the construction activities.

Another cause of the impact on water supply will be water abstraction to meet the Project’s water needs. During the conduct of the construction activities, water will be required to aid in soil compaction and mixing of cement during the construction of the Project Roads. The estimated quantities of the required amount of water as well as potential sources will be based on the final road design; however, this is now expected to be excessive given the short length of the Project Roads as
presented in Section 1.1. Where required, the Contractor will need to obtain the relevant water abstraction approvals from the Water Resources Authority (WRA) and County Government.

9.2.7.3 Sensitive Receptors

The receptors for this impact will be local community members who rely on the existing community service infrastructure.

9.2.7.4 Significance of Impact (Pre-mitigation)

Based on the analysis provided above, the impact of reduction in water quantity/availability during the construction phase will be “Major Negative Impact” pre-mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Rating of Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Negative Impact</td>
<td></td>
</tr>
</tbody>
</table>

**Characteristic** | **Designation** | **Summary of Reasoning** |
--- | --- | --- |
Extent | Local | This impact will only be felt within the Project area. |
Duration | Medium term | This impact will only be felt during the acquisition of easements for the Project Roads and construction phase (the total construction period for Lot 15 and Lot 18 with selected roads in ten counties is planned to take a total of two years and specific construction activities in each of the counties will take an average of six months to a year – exact period to be determined after the completion of the detailed designs and a construction schedule developed for each of the Project Roads). |
Scale | High | There will be disruptions in the provision of community services (water and electricity) during the relocation of the service infrastructure along the Project Roads. |
Frequency | Intermittent | The community services will be intermittently cut-off during the relocation of the infrastructure along the Project Roads. Water will only be abstracted whenever it is needed to aid soil compaction and concrete mixing. |

**Magnitude**

- Medium Magnitude

**Sensitivity/Vulnerability/Importance of the Resource/Receptor**

- High Sensitivity

The community members rely on the community service infrastructure for these services. They will be greatly affected by any disruptions in the availability of these services.

**Significant Rating Before Mitigation**

- Major Negative Impact

9.2.7.5 Mitigation/Management Measures

**Measures for disruptions to existing service infrastructure**

- In liaison with the Murang’a County Water and Sewerage Corporation (MUWASCO), the Contracting Authority (KURA) needs to develop and implement an easement acquisition plan focussed on the domestic water supply network.
- In liaison with the Kenya Power and Lighting Company Limited (KPLC), the Contracting Authority (KURA) needs to develop and implement an easement acquisition plan focussed on
electricity infrastructure within the Project footprint. The easement plan should consider electricity transmission and distribution lines both along and across the Project Roads.

- Communicate the easement plans including implementation schedule to all the affected people in advance to enable them to store water for use during the periods of unavailability and avoid surprises during power outages.
- Relocate the affected infrastructure in the most efficient manner to minimise the duration of the impact as much as possible. In particular, ensure that continuous disruption of the affected services do not take more than 24 hours, where possible. As far as reasonably possible, ensure that service availability is restored every evening to enable customers temporary access at night (for example to be able to fetch and store water for use in the following day, and recharge chargeable electrical appliances) until the easement process is completed.

**Measures for impacts on water supply attributable to the Project’s water needs**

- Select the preferred water abstraction points based on a hydrology study.
- Where necessary, obtain water abstraction permits from the Water Resources Authority (WRA) prior to the commencement of the water abstraction activities.
- Observe the conditions in the water abstraction permits to ensure that the permitted quantities of water abstracted are not exceeded.
- Avoid abstracting water from points used by the local community members as a main source of water, where possible.
- Keep records of water quantities abstracted to minimize over abstraction. Only abstract water volumes needed to meet the Project requirements.
- Monitor the water levels of the abstraction points during abstraction. If the water levels are lower than expected, an alternative location should be identified.
- Schedule the water abstraction activities to avoid the times of the day when the affected community members need it more.
- Where reasonable, install temporary water storage tanks to store water for future use.

**9.2.7.6 Residual Impact (Post-Mitigation)**

Based on the implementation of the proposed mitigation measures, the significance of the impact of reduction in water availability will be a “Moderate Negative Impact” post mitigation per the assessment below.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Designation</th>
<th>Summary of Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent</td>
<td>Local</td>
<td>This impact will only occur within the Project area.</td>
</tr>
<tr>
<td>Duration</td>
<td>Short term</td>
<td>This impact will only be felt during the acquisition of easements for the specific Project Roads and during the construction phase (less than two years; more accurate duration of the construction activities to be determined during the detailed Project design, which is currently in progress).</td>
</tr>
<tr>
<td>Scale</td>
<td>Medium</td>
<td>The affected water supply network will be the one along the Project Roads and the connections thereof.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Very intermittent</td>
<td>This impact will only occur when the water supply network within the Project footprint is being relocated.</td>
</tr>
</tbody>
</table>

**Magnitude**
9.2.8 Impacts on Employment, Procurement and the Economy;

9.2.8.1 Description of the Baseline Environment

The primary occupations in the Project Area, also referred to here as the Social Area of Influence (SAoI) are business oriented (both formal and informal) as well as agriculture. Many of the local community members are engaged in business enterprises within the Murang’a Town as well as farming especially in the rural parts of the Project area, either directly or indirectly.

As identified during stakeholder engagement, there are, however limited sources of livelihoods, and a large number of the youth are unemployed, and present a potential source of unskilled labour.

9.2.8.2 Proposed Project Activities

The number of personnel to be employed by the Project will be estimated during the detailed Project design; however, the construction of the Project Road will create both direct and indirect employment opportunities across different skills levels, from unskilled to semi-skilled to skilled labour.

Impacts from the Project include:

- Direct employment opportunities, mainly during road construction.
- Indirect employment generated by the procurement of construction materials, and other goods and services for the Project.
- Induced employment related to jobs ensuing from the expenditure of incomes associated with direct and indirect Project related jobs.
- The Project Road will also provide direct and indirect business opportunities to the local population, as individual and small businesses are expected to benefit from selling goods and services to workers involved with Construction activities.

9.2.8.3 Sensitive Receptors

Receptors in the SAoI that may be able to make the most of the direct and indirect employment opportunities and the procurement of goods and services, are those who have some experience of formal employment, as well as those who have gained a basic education, or those who have basic English language skills. However, there will also be a number of unskilled employment opportunities during the construction phase that will be available.

Access to education, educational achievement and experience of formal employment in the affected area is fairly low. It is therefore assumed that the majority of local labour sourced by the Project would be unskilled, or at most semi-skilled. Furthermore, based on the nature of trading undertaken in the Project area, the type and quality of equipment that will be required, only some of the goods required will be procured locally; however, the required equipment will most likely be obtained at the national level or even imported.

Given the traditional role of women in the County, they are unlikely to be able to easily access employment opportunities as these would traditionally be taken by men. However, due to the cosmopolitan nature of the Project area, the gap in gender roles is narrower as compared to far-rural areas, and a number of women are likely to be employed on the Project during the construction phase. The local community members are already hopeful of potential employment opportunities.
9.2.8.4 Impact Summary (Pre-enhancement)

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Positive Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct and indirect employment opportunities and the procurement of construction materials, goods and services, and combined multiplier effect of this economic growth will result in increased incomes for successful candidates and their local communities; promoting some degree of an increase in standards of living.</td>
<td></td>
</tr>
</tbody>
</table>

9.2.8.5 Enhancement/ Management Measures

In order to enhance this positive impact the following management measures will be required:

- The Project should prioritise the employment of unskilled labour from the local community in the first instance.
- Semi-skilled and skilled opportunities should be sourced in order of preference from communities along the Project Road, the affected County, and only then, nationally.
- The Project should develop a fair and transparent employment and procurement policy and process that prevents any form of nepotism and favouritism. The policy should be shared with the local community members.
- The Contractor, in liaison with KURA, should notify identified representatives of the County Government and Local Administration (i.e. the Area Chiefs) of the specific jobs and the skills required for the Project, prior to the commencement of construction. This will give the local population time, prior to the commencement of construction, to attain the relevant skills to be employable on the Project, where appropriate. This is applicable to un-skilled and semi-skilled workers.
- The Project should prioritise the procurement of goods and services from the affected County as much as possible. In the event that construction materials, goods and services cannot be procured from within the affected County, then preference should be given to national (Kenyan) companies.
- Advertisements on the employment and procurement opportunities during the construction phase should be placed at the Chief’s Office notice board, and applications are to be done through this office. In the event that the position cannot be filled from within the Project area, it should be advertised further county-wide then nationally.
- The Contractor should aim at procuring locally available materials where feasible and use local suppliers where appropriate.

9.2.9 Land Acquisition and Resettlement

9.2.9.1 Description of the Baseline Environment

Generally, the Project area is cropland. However, like many other Kenyan villages and outskirts of urban centres, settlements and social facilities as well as light commercial areas are scattered within the cropland.

9.2.9.2 Proposed Project Activities

While the Project comprises the upgrade of existing Roads within an existing road reserve and, KURA and the Contractor are committed to avoiding any physical resettlement of any form of structures (which is possible based on field observations at the time of detailed site investigations conducted in August and September 2019). The KURA beacons installed along the Project Road also indicate that...
only economic displacement is expected and a detailed extent of this extent is expected to be investigated in the on-going RAP/LRP studies.

9.2.9.3 Sensitive Receptors

Receptors in the SAoI that will be affected include the few informal business operators and garden owners that have encroached into the Road corridor. The businesses may have difficulty in obtaining suitable relocation sites: they may lose clients, and, upon relocation, may incur additional costs to re-establish themselves. However, this is expected to be minimal as the required 20 m corridor for the Project is largely available. In particular, the Project will not cause any physical displacement of residential houses, although property boundaries may have encroached into the road reserve.

9.2.9.4 Significance of Impact (Pre-mitigation)

Based on the analysis provided above, impacts caused by land acquisition and resettlement during the construction phase will be "Moderate Negative" pre-mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Designation</th>
<th>Summary of Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent</td>
<td>Local</td>
<td>It is anticipated that the potential impacts of loss of livelihoods factors associated with the Project’s land requirements will have impacts at the local level within the Project Area.</td>
</tr>
<tr>
<td>Duration</td>
<td>Medium term</td>
<td>The 20 m corridor will be permanently utilised for the road purposes; however, given that encroachments are minimal, the PAPs will either identify alternative land where they can carry-on with their businesses or adopt different forms of livelihoods in the medium term.</td>
</tr>
<tr>
<td>Scale</td>
<td>Low</td>
<td>Given the large availability of the clear road corridor, encroachments where economic displacement is expected is minimal.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Once</td>
<td>This impact will only be manifested during the opening up of the boundaries for the road reserve.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sensitivity/Vulnerability/Importance of the Resource/Receptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium Sensitivity</td>
</tr>
</tbody>
</table>

Sensitive receptors to this impact are the local community members who currently operate from within the road reserve (particularly the owners of the few identified business stalls and owners of the garden).

<table>
<thead>
<tr>
<th>Significant Rating Before Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate Negative Impact</td>
</tr>
</tbody>
</table>

9.2.9.5 Mitigation/Management Measures

- Complete the on-going RAP/LRP and appropriately implement the outcomes.

- Any valuation should be guided by the relevant departments in the Ministry of Lands and County officers or a registered valuer; these rates should be in line with IFC PS5 requirements and agreed by all parties concerned before engaging the community.
The Contracting Authority (KURA) should work with the local leaders to establish a community grievance mechanism. Issues should be solved before work continues to avoid conflict.

9.2.9.6 Residual Impact (Post-Mitigation)

Based on the implementation of the proposed mitigation measures, the significance of the impacts caused by land acquisition and resettlement will be a "Negligible Negative" post mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Designation</th>
<th>Summary of Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent</td>
<td>Local</td>
<td>Where necessary compensation will be provided for loss of assets.</td>
</tr>
<tr>
<td>Duration</td>
<td>Short Term</td>
<td>This impact will only be felt at the RAP/LRP study and implementation stage.</td>
</tr>
<tr>
<td>Scale</td>
<td>Low</td>
<td>Given the large availability of the road corridor, very minimal acquisitions are expected.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Once</td>
<td>This impact will only be manifested during the opening up of the boundaries for the road reserve.</td>
</tr>
</tbody>
</table>

9.2.10 Impact on Disease Transmission

9.2.10.1 Description of the Baseline Environment

The most prevalent diseases in the County are malaria/fever, diarrhoea, stomach ache, respiratory diseases and flu in order of ranking. Due to proximity to Murang’a Town, the community members of the Project area access health facilities from the town. HIV prevalence in the County is 6.0% which is slightly higher than the national one of 5.9%.

9.2.10.2 Proposed Project Activities

Construction projects may lead to an increase in communicable and sexually transmitted diseases including HIV/AIDS, mainly as a result of the influx of construction workers interacting with the local community, especially women. Workers from outside of the local area may have higher prevalence rates of communicable diseases and STDs and as they have higher incomes, may be more likely to engage in high risk activities, thereby contributing to an increases prevalence of diseases in the local community.

In addition to increases in disease prevalence related to direct interactions with the workforce, absence of adequate sanitation could contribute to an increased incidence of infectious disease, in particular, water borne diseases. Construction activities, if resulting in increased dust levels, may exacerbate respiratory illnesses, already prevalent in the Project area.

9.2.10.3 Sensitive Receptors

The receptors of increased disease transmission will be the local community members who will be potentially interacting with the Project workers. An increased disease prevalence will overwhelm the already overburdened existing health facilities in the Project area.
9.2.10.4 **Significance of Impact (Pre-mitigation)**

Based on the analysis provided above, impacts on disease transmission during the construction phase will be “Moderate Negative” pre-mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Rating of Impacts</th>
<th>Summary of Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Negative Impact</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Characteristic</td>
<td>Designation</td>
<td>Summary of Reasoning</td>
</tr>
<tr>
<td>Extent</td>
<td>Local</td>
<td>It is anticipated that the potential impacts of increased social disturbance factors will have impacts at the local level i.e. communities along the roads.</td>
</tr>
<tr>
<td>Duration</td>
<td>Short-term</td>
<td>The impacts identified are expected to be linked to the construction period and therefore short-term.</td>
</tr>
<tr>
<td>Scale</td>
<td>Medium - High</td>
<td>Communities have limited ability to access health care and therefore any increase in disease transmission will result in negative impacts to an already over-burdened health system.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Intermittent</td>
<td>The incidence of communicable disease is likely to recur in the absence of mitigation and monitoring measures.</td>
</tr>
</tbody>
</table>

**Magnitude**

<table>
<thead>
<tr>
<th>Sensitivity/Vulnerability/Importance of the Resource/Receptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Sensitivity</td>
</tr>
</tbody>
</table>

Vulnerability of receptors is dictated by the local people not having access to sexual health and family planning services, the current prevalence of disease, the health status of receptors as well as the lack of access to health care, and an already over-burdened health system.

**Significant Rating Before Mitigation**

| Moderate Negative |

9.2.10.5 **Mitigation/Management Measures**

**General Measures**

- Workers should receive awareness training as part of their induction and then at least every 6 months on potential high risk communicable and vector borne diseases, symptoms, preventative measures and transmission routes as well as treatment options. This will be particularly important for diseases with which non-local workers are unfamiliar and in case of any emerging disease outbreaks.

- In the event of a new disease, increased transmission or outbreak compared to the baseline, the Project should interact with local health care facilities and workers to ensure there is an appropriate response in place to make workers aware and to ensure proper precautionary measures are implemented.

- A Worker Code of Conduct should be developed providing a worker code of behaviour including worker-worker interactions, worker-community interactions and development of personal relationships with members of the local communities.

- Accommodation should be provided to workers from outside the Project area in accordance with international good practice on workers’ accommodation, including IFC / EBRD standards to prevent transmission of diseases associated with poor living conditions.

- The following will be implemented at a minimum in order to minimise disease transmission:
Providing workers with appropriate sanitary facilities, which are appropriately designed to prevent contamination.

Developing a robust waste handling system to avoid the creation of new vector breeding grounds or attracting rodents to the area.

Implementing measures to reduce the presence of standing water onsite through environmental controls and source reduction to avoid the creation of new breeding grounds.

Ensuring appropriate food preparation and monitoring measures are in place.

If deemed necessary providing insecticide-impregnated bed nets as a physical barrier to repel and kill mosquitos for workers that have been provided accommodation.

The workforce will be provided with access to selected treatment at health facilities on site as deemed necessary for this Project. The requirements for these health facilities should be based on a risk assessment taking into account access to existing health facilities and travel time to facilities that offer international standards of care. Access to health care should include direct employees, and sub-contractors working on site.

Pre-employment screening protocols will be put in place. This should include pre-employment medicals and follow up medicals as appropriate. The screening protocols should consider health conditions related to the nature of the work undertaken, employee country of origin and legal requirements. Workers should not be denied employment on the basis of the outcomes of the screening but should be provided treatment or alternative roles as appropriate.

The Project should prepare and implement a vector borne disease management plan during the construction phase focussing on malaria and chikungunya, which includes vector control, avoidance, diagnosis, treatment and training.

The Project should implement TB awareness and prevention measures including testing and referral for treatment for all personnel working on the Project. This approach should be explained clearly to the workforce along with making it clear that there are no consequences for their employment.

The Project should monitor the emergence of major pandemics through World Health Organisation (WHO) alerts and in the event of a pandemic, review mobilisation and demobilisation of ex-patriate Project personnel and/or implement appropriate control measures and Emergency Response Plans.

Specific Measures for HIV/AIDS Prevention and Control

The Project should implement an HIV/AIDS and Sexually Transmitted Diseases (STD) awareness programme to minimise the spread of HIV infection and other STDs. The programme should be prepared with the assistance of a specialist in sexually transmitted diseases. A typical programme would include, among other things, the following measures:

- An HIV/AIDS awareness and on-going education on transmission of HIV/AIDS and STDs, to employees, through workshops, posters and informal information sessions;
- Encouragement of employees to determine their HIV status;
- Supply of condoms/femidoms at the construction site(s); and
- Development of a comprehensive Worker Management Plan, including rules for on-site behaviour, entrance and exit policies and prohibition of sex workers on site.

As part of the HIV/AIDS and STD awareness programme, information should be provided to workers on STD prevalence rates in Kenya and/or the relevant Counties as well as the
expectations of local communities if a woman is made pregnant by a worker (e.g. marriage, financial implications etc.).

- Workers should have access to confidential health care for the treatment of HIV/Aids and STDs through medical facilities/health care at Project sites.
- The Project should partner with other NGOs and CBOs to support the provision of information, education and communication campaigns around safe sexual practices and transmission of STDs. These activities should be focussed in locations where Project workers are accommodated or where drivers rest.
- The Project should consult with local leaders such as Area Chiefs, village elders and Nyumba Kumi leaders among others. The consultations should be aimed at finding ways of ensuring social vices such as prostitution are minimised either through punitive measures for clients, in particular Project workers, or rehabilitative measures for the Commercial Sex Workers (CSWs).
- A grievance mechanism should be developed, whereby affected people can raise issues and concerns associated with social vices, prostitution and the behaviour of workers and drivers.

9.2.10.6 Residual Impact (Post-Mitigation)

Based on the implementation of the proposed mitigation measures, the significance of the impact on disease transmission will be a "Minor Negative" post mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Designation</th>
<th>Summary of Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent</td>
<td>Local</td>
<td>This impact will be manifested within the Project area.</td>
</tr>
<tr>
<td>Duration</td>
<td>Low</td>
<td>With the implementation of the mitigation measures, community and worker exposure to diseases attributed to the Project will be avoided or effectively controlled within a short period of time.</td>
</tr>
<tr>
<td>Scale</td>
<td>Low</td>
<td>With the implementation of the mitigation measures, the increase in disease prevalence attributable to the Project will be avoided.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Rare</td>
<td>The incidence of communicable diseases and other diseases attributable to the Project will be avoided or only occur rarely.</td>
</tr>
</tbody>
</table>

9.2.11 Traffic Impacts

9.2.11.1 Description of the Baseline Environment

The Project Roads proposed for the upgrade are currently unpaved and commonly used by motor cycle riders (boda bodas) and private cars, who are mainly residents in the Project area. Some of the local community members walk along the Project Road; in particular, children walk along the Project Roads daily to schools during school time, which is located along the Project Roads.

9.2.11.2 Proposed Project Activities

During the construction phase, it is expected that there will be increased vehicle movements in the Project area as trucks will be required to transport materials and equipment. During the construction phase, residents will be disrupted and inconvenienced by detours, local road closures, safety hazards such as deep excavations, especially at the junctions of access roads to their homes and business
units, and by increased road traffic within the Project area, which will be exacerbated by heavy Project equipment and vehicles, and temporally blockage/ reduced traffic flow along emergency services route7.

9.2.11.3 Sensitive Receptors

The receptors for traffic impacts will be the local community members who reside or operate businesses and farming within the Project area, including along routes that will be used to transport and deliver construction materials and equipment. School children using the Ngaru Primary School along the Ndiikwe - Kiria Road are major sensitive receptors.

9.2.11.4 Significance of Impact (Pre-mitigation)

Based on the analysis provided above, traffic impacts during the construction phase will be “Major Negative” pre-mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Designation</th>
<th>Summary of Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent</td>
<td>Local</td>
<td>This impact will be manifested within the Project area.</td>
</tr>
<tr>
<td>Duration</td>
<td>Medium term</td>
<td>This impact will be manifested throughout the construction phase.</td>
</tr>
<tr>
<td>Scale</td>
<td>Medium</td>
<td>Although the Project Roads are short, they are location in a community area, including schools, means that a larger number of people other than the people in the immediate Project area, will be potentially affected.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Continuous</td>
<td>This impact will be continuously felt throughout the construction phase.</td>
</tr>
</tbody>
</table>

Traffic impacts will inconvenience the local community members and other local road users and this will be worse if access to their homes or business areas are blocked. Special attention also needs to be paid to school children using the existing roads. Construction workers will also be at risk from public vehicle interactions using the existing road.

9.2.11.5 Mitigation/Management Measures

- Develop a construction schedule which must be communicated to the Project stakeholders including the local community members.
- For any blockage of access to any facility including the main access routes to the homes of residents along the Project Roads, a suitable alternative / diversion must be identified and communicated to the affected persons in advance.
- Develop a Traffic Management Plan covering the routes to be used by the Project vehicles, vehicle safety, speed limits on roads, driver and passenger behaviour, use of drugs and alcohol, hours of operation, rest periods and location of rest stops, and accident reporting and investigations.

7 Please note that the impacts of dust and noise are assessed separately in details under Sections 9.2.1 (Impacts on Local Air Quality) and 9.2.2 (Impacts on the Noise Environment) respectively. In addition, accidents by nature are unplanned; therefore, road accidents has been assessed separately in Section 9.4.2 (Traffic Accidents).
Speed limits for construction vehicles (of less than 30 km/h) should be adhered to along the Project Roads. Public vehicles using the existing roads should also be forced to slow down through the use of speed humps or other traffic calming measures; this to protect construction workers from public vehicle interactions.

Undertake consultations with communities along key transport routes to inform them about the potential for increased traffic movements prior to any changes. Put up road signs such as “Heavy Trucks Turning Ahead” to warn Boda Boda drivers and other road users of danger/ risk of accidents occurrence ahead especially during the construction phase.

Provide safe and clearly demarcated access routes for pedestrians, especially near schools to divert them away from possible construction dangers.

If deemed necessary, conduct traffic safety and construction awareness programmes with the schools to inform learners of the potential dangers of vehicles and the construction activities.

Prepare and implement an appropriate community Grievance Redress Mechanism (GRM). The GRM should be communicated to all the local community members.

### 9.2.11.6 Residual Impact (Post-Mitigation)

Based on the implementation of the proposed mitigation measures, the significance of traffic impacts will be a “Minor Negative” post mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Designation</th>
<th>Summary of Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent</td>
<td>Local</td>
<td>This impact will be manifested within the Project area.</td>
</tr>
<tr>
<td>Duration</td>
<td>Medium term</td>
<td>This impact will be manifested throughout the construction phase.</td>
</tr>
<tr>
<td>Scale</td>
<td>Low</td>
<td>With the implementation of the mitigation measures, the number of affected persons will be low.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Continuous</td>
<td>This impact will continue to be manifested throughout the construction phase.</td>
</tr>
</tbody>
</table>

Magnitude

- Medium Magnitude
- Significant Rating After Mitigation
- **Moderate Negative Impact**

### 9.2.12 Labour and Working Conditions

#### 9.2.12.1 Description of the Baseline Environment

The Project is located in outskirts of Murang’a Town. During stakeholder engagement, the local community members expressed an interest in being employed by the Project; however, this will be mainly as casual labourers (unskilled workers) who will have limited knowledge with respect to occupational health and safety as well as worker rights.

With regards to on-site worker welfare, the Contractor will be required to adhere to:

- The requirements of the IFC PS2: Labour and Working Conditions,
- Kenyan Labour Law, and
- The ILO conventions ratified by Kenya.
9.2.12.2 Proposed Project Activities

The number of Project workers will be estimated during detailed design; however, the construction of the Project Road will create direct employment opportunities across different skills levels, from unskilled to semi-skilled to skilled labour.

9.2.12.3 Sensitive Receptors

Sensitive receptors are the people who will be employed by the Project (including direct, contract and supply chain workers). Of particular attention will be the casual workers who are normally less educated and have a very limited knowledge of occupational health and safety as well labour rights.

Labour and working conditions, including occupational health and safety, will need to be considered to avoid any incidents and/or injuries. Issues that need to be considered include: fair treatment of workers, non-discrimination, equal opportunities, as well as the provision of a safe and healthy working and living conditions.

9.2.12.4 Significance of Impact (Pre-mitigation)

Based on the analysis provided above, impacts to exposure of the workforce to poor labour and working conditions will be a *High Negative Impact* pre-mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Characteristic</th>
<th>Designation</th>
<th>Summary of Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Negative Impact</td>
<td>Extent</td>
<td>Local</td>
<td>The impact is only relevant for the workforce (including direct, third party and supply chain workers) all of whom are at a local level (although they may come from elsewhere in Kenya or globally).</td>
</tr>
<tr>
<td></td>
<td>Duration</td>
<td>Short to medium term</td>
<td>The implications of poor health and safety practices can be severe including loss of life which can significantly affect households and communities ability to maintain their quality of life and livelihoods.</td>
</tr>
<tr>
<td></td>
<td>Scale</td>
<td>Large</td>
<td>Although the number of Project workers will be estimated during the detailed design, the short length of the Project Road indicate that the Project workers who will be exposed to occupational health and safety risks will be low in number.</td>
</tr>
<tr>
<td></td>
<td>Frequency</td>
<td>Intermittent</td>
<td>Impact is likely to recur / occur intermittently throughout the construction phase.</td>
</tr>
</tbody>
</table>

**Magnitude**

**Medium Magnitude**

**Sensitivity/Vulnerability/Importance of the Resource/Receptor**

**High Sensitivity**

Receptors to this impact will include those contracted or subcontracted to work on the Project. Receptors with heightened sensitivity may include employees who have a poor/low understanding of the requirements of OHS standards or limited choices regarding employment options.

**Significant Rating Before Mitigation**

**Major Negative Impact**
9.2.12.5 Mitigation/Management Measures

Management System

- The Project should develop and implement an Occupational Health and Safety Management System in line with good industry practice. This system should include consideration of hazard identification, risk assessment and control, use of Personal Protection Equipment (PPE), incident investigation and reporting, reporting and tracking of near misses, incidents etc. The management system should also include emergency response plans. Roles and responsibilities should be clearly defined.

Contractor Management

- In all contracts, the Contracting Authority (KURA) should make explicit reference to the need to abide by Kenyan law, international standards (in particular IFC PS2), ratified ILO conventions, and KURA’s policies in relation to health and safety, labour and welfare standards.
- As part of the contractor and supplier selection process, the Contracting Authority should take into consideration performance with regard to worker management, worker rights, and health and safety as outlined in Kenyan law and international standards.
- Regular checks by the Contracting Authority (KURA) should be undertaken to ensure the relevant labour laws and occupational health and safety plans are adhered to at all times.
- All workers (including those of contractors and subcontractors) should, as part of their induction, receive training on health and safety and should receive updated training routinely, as well as when undertaking new tasks, such as working at heights or working in confined spaces.

Workers’ Rights

- The Contractor in liaison with the Contracting Authority (KURA) should put in place hiring mechanisms to ensure no employee or job applicant is discriminated against on the basis of his or her gender, marital status, nationality, ethnicity, age, health status, religion or sexual orientation.
- All workers (including those of Contractors and subcontractors) will, as part of their induction, receive training on worker rights in line with Kenyan legislation to ensure that positive benefits around understanding labour rights are enhanced. This process will be formalised within the Code of Conduct that will be provided by the Contractor.
- All workers (including those of Contractors and subcontractors) will have contracts which clearly state the terms and conditions of their employment and their legal rights. Contracts will be verbally explained to all workers where this is necessary to ensure that workers understand their rights. Contracts must be in place prior to workers commencing work.
- The Contractor and Contracting Authority (KURA) will put in place a worker grievance mechanism that will be accessible to all workers, whether permanent or temporary, or directly or indirectly employed. The worker grievance mechanism shall be open to all the Project workers in the event that their grievance is not adequately resolved by their direct employer.
- All workers (including those of the Contractor and subcontractors) will have access to training on communicable diseases and STDs and community interactions in general. This training will be developed in collaboration with local health institutions.
- Surveillance and assurance that no children or forced labour is employed directly by the Contractor, and to the extent possible by third parties related to the Project and primary suppliers where any such risk may exist.
9.2.12.6 Residual Impact (Post-Mitigation)

Based on the implementation of the proposed mitigation measures, the significance of the residual impact related to exposure of the workforce to Occupational Health and Safety (OHS) risks will be a “Minor Negative Impact” post mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Designation</th>
<th>Summary of Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent</td>
<td>Local</td>
<td>The impact is only relevant for the workforce (including direct, third party and supply chain workers) all of whom are at a local level (although they may come from elsewhere in Kenya or globally).</td>
</tr>
<tr>
<td>Duration</td>
<td>Long-term</td>
<td>The implications of poor health and safety practices can be severe including loss of life which can significantly affect households and communities ability to maintain their quality of life and livelihoods.</td>
</tr>
<tr>
<td>Scale</td>
<td>Very Small</td>
<td>With the implementation of the management measures, the number of Project workers exposed to OHS risks will be very small.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Rare</td>
<td>With the implementation of the management measures, exposure of Project workers to OHS risks will be rare.</td>
</tr>
</tbody>
</table>

**Magnitude**

<table>
<thead>
<tr>
<th>Small Magnitude</th>
<th>Significant Rating After Mitigation</th>
</tr>
</thead>
</table>
| Minor Negative Impact

9.2.13 Security Risks

9.2.13.1 Description of the Baseline Environment

The Project area is generally safe; however, like many areas in the outskirts of urban centres, it is prone to petty crime mainly attributed to a high number of unemployed youth.

9.2.13.2 Proposed Project Activities

During the construction of the proposed Project, a number of people will be employed mainly in the form of casual workers. This will provide employment opportunities to the local people especially the unemployed youth. Evidence from other projects shows that employing people can stop them from being idle and therefore reduce insecurity as they concentrate on delivering on their jobs and earn an income.

Despite the above positive impact, construction projects have a potential of attracting people from neighbouring areas in the hope of securing employment. Given the number of limited employment opportunities, some of the job seekers will not be employed and become idle within the Project area which poses a security threat as some of them resort to criminal acts such as theft and drug abuse.

9.2.13.3 Sensitive Receptors

The sensitive receptors for this impact will be the local community members and Project workers who will be affected by the increased crime threat.

---

8 The conduct of OHS awareness trainings amongst the Project workers will reduce their sensitivity to Low thus resulting in a Minor Negative residual impact.
9.2.13.4 **Significance of Impact (Pre-mitigation)**

Based on the analysis provided above, the impacts of security risks during the construction phase will be "Moderate Negative" pre-mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Indirect Negative Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rating of Impacts</strong></td>
<td></td>
</tr>
<tr>
<td>Characteristic</td>
<td>Designation</td>
</tr>
<tr>
<td>Extent</td>
<td>Local</td>
</tr>
<tr>
<td>Duration</td>
<td>Medium Term</td>
</tr>
<tr>
<td>Scale</td>
<td>Low</td>
</tr>
<tr>
<td>Frequency</td>
<td>Recurrent</td>
</tr>
</tbody>
</table>

**Magnitude**

<table>
<thead>
<tr>
<th>Medium Magnitude</th>
</tr>
</thead>
</table>

**Sensitivity/Vulnerability/Importance of the Resource/Receptor**

<table>
<thead>
<tr>
<th>Medium Sensitivity</th>
</tr>
</thead>
</table>

The Project area is generally safe although like many urban areas, it is prone to petty crime.

**Significant Rating Before Mitigation**

| Moderate Negative |

9.2.13.5 **Mitigation/Management Measures**

- The Contractor in liaison with the Contracting Authority (KURA), should develop and implement an appropriate recruitment plan. As part of the recruitment plan, it should be clear that recruitment at the gate/ Project site is prohibited to avoid attracting unemployed people to the Project site.

- Recruitment of all the Project workers (including casual workers) must be done through formal processes such as through the office of the Chief and County administrators.

- All prospective Project workers should undergo a security screen to avoid employing convicted criminals. Consultations with the local leaders have indicated that this can be through obtaining of a recommendation letter from the Location Chief.

- The Contractor in liaison with the local security operatives should develop and implement a Project Security Management Plan to protect the Project equipment and workers.

- The Project should continue to undertake engagement and consultations with the local stakeholders as per the Stakeholder Engagement Plan (SEP).

- During construction, an Emergency Preparedness and Response Plan (including security emergencies) should be prepared and implemented by the Contractor.

9.2.13.6 **Residual Impact (Post-Mitigation)**

Based on the implementation of the proposed mitigation measures, the significance of the impact related to security will be a "Minor Negative" post mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Rating of Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristic</td>
</tr>
</tbody>
</table>

...
### Anticipated Impacts and Mitigation Measures

#### Extent
Increased security threats attributable to the Project will be limited to the Project area.

#### Duration
The security threats attributable to the Project will cease to exist after the construction activities.

#### Scale
Very few opportunistic individual will disguise as prospective employees and cause security threats.

#### Frequency
With the implementation of mitigation measures, security incidents attributable to the Project will be completely avoided or rarely occur.

### 9.2.14 Increased Infestation of Invasive Alien Plants

#### Description of the Baseline Conditions

*Lantana camara*, an invasive alien plant species (IAPs), was identified along the Ndikwe - Kiria. The Convention on Biological Diversity (CBD) defines an invasive alien species as one that is established outside of its natural past or present distribution, and whose introduction and/or spread threatens biological diversity (9). The IUCN Red List of Threatened Species (10) rates the presence of invasive alien species globally as the second most significant threat to biodiversity, (11) and there is a growing global awareness of the problems associated with alien and invasive species. Alien species can be introduced either accidentally or intentionally. Although only a small percentage of alien species have the potential to become invasive, their impact is marked and usually is irreversible, displacing native species and leading to degradation of habitats.

#### Proposed Project Activities

Construction activities will include bush clearing (along the Project Roads), heavy machinery involved in cut and fill activities, and construction machinery movement. Construction materials will also be transported from identified quarries and borrow pits.

Of most relevance to this potential impact, is bush clearing, soil disturbance and the transport of large volumes of soils for cut and fill, as well as the transport of construction materials from quarries and borrow pits.

All disturbed areas will be reinstated through appropriate topsoil management during construction and through landscaping.

#### Significance of Impact (Pre-mitigation)

Based on the analysis provided above, the impact of increased infestation of invasive alien plants will be a “Moderate Negative Impact” pre-mitigation as summarised below.

---

(9) Convention for Biological Diversity, invasive species page. Available at: https://www.cbd.int/invasive/WhatareIAS.shtml
(10) IUCN Red List of Threatened Species. Available at http://www.iucnredlist.org/
(11) IUCN Website, invasive species page. Available at: https://www.iucn.org/theme/species/our-work/invasive-species
**Extent**  
Local  
The spread of IAPs is expected to be restricted to the construction footprint and areas of soil disturbance.

**Duration**  
Long Term  
Many infestations of IAPs are extremely persistent once established, unless active control measures are implemented.

**Scale**  
Large  
The identified *Lantana camara* presents a risk of being spread. Without proper control, IAP infestation can be on a large scale.

**Frequency**  
Constant  
IAP infestation will occur constantly on disturbed sites and will multiply if inadequately controlled.

<table>
<thead>
<tr>
<th>Extent</th>
<th>Local</th>
<th>The spread of IAPs is expected to be restricted to the construction footprint and areas of soil disturbance.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration</td>
<td>Long Term</td>
<td>Many infestations of IAPs are extremely persistent once established, unless active control measures are implemented.</td>
</tr>
<tr>
<td>Scale</td>
<td>Large</td>
<td>The identified <em>Lantana camara</em> presents a risk of being spread. Without proper control, IAP infestation can be on a large scale.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Constant</td>
<td>IAP infestation will occur constantly on disturbed sites and will multiply if inadequately controlled.</td>
</tr>
</tbody>
</table>

**Magnitude**

**Medium Magnitude**

**Sensitivity/Vulnerability/Importance of the Resource/Receptor**

**Medium Sensitivity**

The impact will be largely within modified habitats along the Project Roads.

<table>
<thead>
<tr>
<th>Significance Rating Before Mitigation</th>
<th>Moderate Negative Impact</th>
</tr>
</thead>
</table>

### 9.2.14.4 Mitigation/Management Measures

**Minimisation Measures**

- An invasive weed management plan will be developed for the Project to guide the control of IAPs.

**Control Measures**

- Biological control measures would only be applied if these specific measures have been approved for application in Kenya. Alternatively, labour intensive manual control of IAPs would be applied in preference to application of herbicides or other chemicals.
- All alien vegetative and/or seed bearing material that is removed through control measures should be burnt on site to prevent the distribution of seed and fertile vegetative material, regardless of the status of the surrounding areas.
- Vehicles and construction equipment should be washed on a regular basis and should be kept clean to minimise distribution of seeds and invasive plant material.
- Tyre checks of vehicles should be conducted daily to check that seeds, thorns and vegetative material is not being distributed.
- Tyre checks of vehicles should be conducted prior to entry into protected areas.
- Source areas such as quarries, borrow pits, vehicle parking and Construction Camps should be kept clean of IAPs to minimise the presence of seeds that can be dispersed unintentionally.

**Rehabilitation Measures**

- Disturbed areas would need to be rehabilitated at the earliest opportunity to minimise the establishment of IAPs.
- Regular and ongoing monitoring of the presence of IAP should be conducted within construction and rehabilitated sites and IAP removal operations implemented according to the results, based on areas as per the above objectives.
9.2.14.5 Residual Impact (Post-mitigation)

Based on the implementation of the proposed mitigation measures, the significance of the impact of increased infestation of invasive alien plants will be a "Minor Negative Impact" post mitigation as per the summary below.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Designation</th>
<th>Summary of Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent</td>
<td>Local</td>
<td>The extent of the area exposed to disturbance will not change.</td>
</tr>
<tr>
<td>Duration</td>
<td>Short Term</td>
<td>Effective control measures will reduce the duration of infestation by IAPs.</td>
</tr>
<tr>
<td>Scale</td>
<td>Medium</td>
<td>With adequate controls in place, and follow up rehabilitation and control, the spread and infestation of IAPs can be controlled.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Often</td>
<td>The frequency and intensity of control measures will decline if effectively implemented</td>
</tr>
</tbody>
</table>

**Magnitude**

- Small Magnitude

**Sensitivity/Vulnerability/Importance of the Resource/Receptor**

<table>
<thead>
<tr>
<th>Significance Rating After Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor Negative Impact</td>
</tr>
</tbody>
</table>

9.3 Operations Related Impacts

9.3.1 Introduction

The following impacts are only applicable to measures to the construction phase or measures to appropriately manage them are supposed to be implemented during the construction phase as stated and will thus not occur during the operation phase:

- **Impacts on Water Quality**: no operational phase activities will interact with water sources.
- **Reduction in Water Availability**: minimal water will be required during the operations phase.
- **Impact on Domestic Water Supply**: no more excavations are expected during the operations phase; thus, interference with the domestic water supply network attributable to the Project is not expected.
- **Impacts associated with stormwater management**: These will be avoided by implementation of appropriate mitigation measures recommended for the construction phase and routine maintenance of the road infrastructure (which will include the stormwater systems) during the operation phase.
- **Impacts on Electricity Transmission and Distribution Network**: No more excavations are expected during the operations phase; thus, no possibility of interfering with the electricity transmission and distribution network attributable to the Project activities at this stage.
- **Impacts on Material Sites and Borrow Pits**: no more construction materials are required during the operations phase; if any materials are required for maintenance works, the quantities will be insignificant.
- **Wastes and Effluents**: minimal wastes and effluents are expected to be generated during the operation and maintenance activities. These are expected to be easily managed by implementation of the waste management plan developed during the construction phase.
- **Impacts on biodiversity conservation**: the current land use along the Project Road (urbanisation) has substantially modified the primary ecological functions and species composition and areas adjacent to the Project roads are thus not of conservation value.
**Land Acquisition and Resettlement:** no more land will be required for the Project during the operations phase.

**Impact on Disease Transmission:** there will be minimal staff during operations/maintenance.

**Traffic Impacts:** significant traffic related impacts are related to increased risk of road accidents which is discussed under unplanned events in Section 9.4.2.

**Labour and Working Conditions:** there will be minimal staff during operations/maintenance and mostly skilled who understand their rights and thus minimal labour risks; however, in case of major maintenance works, the management measures recommended for the construction should be implemented.

**Security risks:** there will be minimal staff during operations/maintenance who will be formally recruited.

Therefore, the impacts that will be manifested during the operations phase include:

- Impacts on Local Air Quality.
- Impacts on Employment, Procurement and the Economy.
- Impacts on the Noise Environment (including vibration).

These impacts are discussed in the Sections below:

**9.3.2 Impacts on Local Air Quality;**

**9.3.2.1 Description of the Baseline Environment**

As already explained in Section 9.2.2, the Project Roads are currently unpaved and ambient air quality is largely influenced by gaseous and dust emissions from vehicles which operate along these roads.

**9.3.2.2 Proposed Project Activities**

Since the Project Road will be upgraded to bitumen standard, dust emissions during the operations phase will be negligible, thus resulting in a significant reduction in dust emissions along the Project Road.

The Project Roads are basically urban roads aimed at increasing accessibility and mobility within and around Murang’a Town and any increase in gaseous emissions attributable to the operations activities are negligible. In fact, increased mobility within the and around the town will result in an overall reduction in gaseous emissions since it will result in reduced travel time and avoidance of unnecessary congestion along the existing roads within the town.

Based on the discussion above, the Project will result in a **positive impact** on air quality during the operations phase.

**9.3.3 Impacts on the Noise Environment (including vibration)**

**9.3.3.1 Description of the Baseline Environment**

Noise and vibrations along the Project Roads is largely influenced by the traffic along them and commercial activities especially within the neighbouring Murang’a Town. However the Project Roads are generally located within rural areas with a few settlements where noise levels are generally low.
9.3.3.2 Proposed Project Activities

The main source of noise and vibrations will be attributed to the increased traffic volumes along the Project Roads. The magnitude of this impact will be increased if faulty vehicles (poorly maintained and poorly serviced vehicles) are driven along the Road. However, the Roads that are to be rehabilitated are already in existence and, as noise and vibrations are already being manifested along them.

9.3.3.3 Sensitive Receptors

The main sensitive receptors along the Project Roads are the rural homes and School located along them.

9.3.3.4 Significance of Impact (Pre-mitigation)

Based on the analysis provided above, impacts on the noise environment during the operations phase will be “Minor Negative Impact” pre-mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Rating of Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Negative Impact</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Designation</th>
<th>Summary of Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent</td>
<td>Local</td>
<td>The noise and vibration impacts are expected to be limited to the Project area in Kiharu Sub-County.</td>
</tr>
<tr>
<td>Duration</td>
<td>Permanent</td>
<td>This impact will continue to be manifested as long as the road is being utilised.</td>
</tr>
<tr>
<td>Scale</td>
<td>Low</td>
<td>The noise and vibrations generated along the Project Road will be within the limits permitted in the National Environmental Management and Coordination Act (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Intermittent</td>
<td>Noise and vibrations will be generated when there are vehicles moving along the Project Road.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Magnitude</th>
<th>Sensitivity/Vulnerability/Importance of the Resource/Receptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium</td>
<td></td>
</tr>
</tbody>
</table>

Although the sensitive receptors along the Project Roads are already experiencing noise and vibration impacts associated with road traffic as well as that associated with commercial activities, a further increase in noise levels will cause nuisance impacts.

<table>
<thead>
<tr>
<th>Significant Rating Before Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate Negative Impact</td>
</tr>
</tbody>
</table>

9.3.3.5 Mitigation/Management Measures

- In liaison with the traffic police and/or appropriate authorities, enforce speed limits. Appropriate signage along the road routes indicating the speed limit to be enforced, is to be adequately displayed.
- At rumble strips and speed bumps, the drivers will be required to steadily reduce speed to avoid unnecessary generation of noise.
- The Contracting Authority (KURA) should consult with other organisations including the Police to ensure they are aware of how the road will function when operational e.g. avoidance of trucks/trailers, etc. so that these organisations can consider this in their emergency response planning.
- The Contractor should not open the Project Roads until all safety measures and controls are in place to avoid confusion in the future over the use of the road for local vehicles etc.
9.3.3.6 Residual Impact (Post-Mitigation)

Based on the implementation of the proposed mitigation measures, the significance of the impact on the noise environment will be a “Negligible Negative Impact” post mitigation as per the assessment below.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Designation</th>
<th>Summary of Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent</td>
<td>Local</td>
<td>The noise and vibration impacts are expected to be limited to the Project area in Kiharu Sub-County.</td>
</tr>
<tr>
<td>Duration</td>
<td>Permanent</td>
<td>This impact will continue to be manifested as long as the road is being utilised.</td>
</tr>
<tr>
<td>Scale</td>
<td>Very low</td>
<td>The noise and vibrations generated along the Project Road will be considerably below the limits permitted in the National Environmental Management and Coordination Act (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Intermittent</td>
<td>Noise and vibrations will be generated when there are vehicles moving along the Project Roads.</td>
</tr>
</tbody>
</table>

**Magnitude**

<table>
<thead>
<tr>
<th>Significant Rating After Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium Magnitude</td>
</tr>
<tr>
<td>Positive Impact</td>
</tr>
</tbody>
</table>

9.3.4 Impacts on Employment, Procurement and the Economy

9.3.4.1 Description of the Baseline Environment

As already explained in Section 9.2.8, the primary occupations in the Project area are business oriented as well as agriculture.

9.3.4.2 Proposed Project Activities

Employment opportunities during the operations phase will be minimal. However, improvement of the Project Road to bitumen/paved standard will ease transport and spur growth.

9.3.4.3 Sensitive Receptors

Local community members and interested business and industrial oriented individual.

9.3.4.4 Impact Summary (Pre-enhancement)

<table>
<thead>
<tr>
<th>Type of Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Impact</td>
</tr>
</tbody>
</table>

Better roads will spur economic and social growth along the Project Roads.

9.3.4.5 Enhancement Measures

- Integrate the developments along the Project Road with the County Physical Development Plan.

9.4 Unplanned Events

Impacts associated with unplanned events such as accidental leaks and spills, and road accidents, are difficult to assess within the framework described in Chapter 3 (used to assess expected potential project impacts), because:
The frequency of unplanned events is usually low, since project design, planning and operational procedures are designed to minimise the risk of an occurrence;

- The intensity of these impacts are difficult to quantify, since there is a wide range of possible events (i.e. the impact intensity is highly variable); and

- Unplanned events that may result in a severe environmental or social impact usually result in high financial, social and political liabilities and costs for the Contractor. Therefore, the project has substantial built-in controls to avoid such occurrences.

The Project is designed to prevent unplanned/ undesirable events, which is described in the Project Description (Chapter 4).

Therefore, the impact assessment for unplanned events presented below does not include impact significance (since the intensity of these impacts are highly variable and the Project design and planning has inbuilt measures aimed at avoiding their occurrence). However, management measures are included to further ensure that their occurrence is avoided during Project implementation or in the event that they happen, appropriate response measures are implemented for the effective management of the consequences. For purposes of this assessment, the unplanned impacts include those where the available baseline information does not include aspects for their occurrence but which could be discovered during Project implementation; for example, although baseline information indicate that there are no cultural or archaeological sites along the Project Road, the impact should occur if Chance Finds are found during the construction phase.

9.4.1 Accidental Leaks and Spills

9.4.1.1 Description of the Baseline Environment

As already described in Section 9.2.5 (Wastes and Effluents), Murang’a County does not have a robust solid waste management facility; however, there is a proposed sanitary landfill facility at Mitubiri. Within the Project Area, solid waste is mainly managed at household level through composting and open burning. There is no sewerage system in the Project area and most of the community homesteads have pit latrines.

9.4.1.2 Proposed Project Activities

Accidental leaks and spills by their nature are undesirable and unplanned since their effects are largely unpredictable depending on the extent of the leak or spill. Therefore, the Contractor (during construction phase) and the Contracting Authority KURA (throughout the project life cycle) will incorporate best industry standard controls to minimise the possibility of having an accidental leak or spill.

Despite the above, accidental leaks and spills can potentially occur in areas where liquids are stored or used. In reference to the Project, the project equipment and machinery will use fuel (diesel and/or petrol) as well as oil for lubrication. If there are any unnoticed leaks on the fuel or oil tanks, the fuel and/or oil will flow to the ground thus contaminating the soils and can potentially flow in storm water to the nearby rivers thus reducing their water quality.

9.4.1.3 Sensitive Receptors

The main sensitive receptors for this impact are the local community members who at times utilise the water from the rivers and operate from within the Project area.

9.4.1.4 Mitigation/Management Measures

- All Project equipment and machinery will be properly maintained as per the manufacturer’s recommendations. In particular, the status of fuel and oil tanks will be checked regularly.
At the start of every work day, Project vehicles and equipment will be checked for spills and leakages.

- Project equipment and machinery will be serviced off site at approved/licensed vehicle and equipment service stations.
- Fuel, oil and used oil storage areas will be contained in bunds of 110% capacity of the stored material. Fuels will be stored in above-ground storage tanks.
- Spill containment and clean up kits will be available onsite and clean-up from any leakage or spill will be appropriately contained and disposed of.
- The Contractor will develop a Spill Management Plan (SMP) which will be implemented in case of any spills.

9.4.2 Road Accidents

9.4.2.1 Description of the Baseline Environment

As already explained in Section 9.2.11, the Project Roads proposed for the upgrade are currently unpaved and commonly used by motor cycle riders (boda bodas) and cars mainly of residents in the Project area. Some of the local community members walk along the Project Road; in particular, children walk along the Project Roads daily to the schools during school time.

9.4.2.2 Proposed Project Activities

During the construction phase, it is expected that there will be increased vehicle movements in the area as trucks will be required to transport materials and equipment. The increase in traffic will increase the risk of road accidents if not properly managed.

During the operations phase, improved (paved) Project Road will attract more traffic and motivate drivers to drive at higher speeds. This will also increase the risk of traffic accidents.

The impacts of traffic accidents are severe ranging from vehicle damage and minor injuries at the lowest end to fatalities on the highest end.

9.4.2.3 Sensitive Receptors

The receptors for the traffic impacts will be the local community members who reside or operate businesses and agriculture within the Project area including routes that will be used to transport and deliver construction materials and equipment. Particularly, the children schooling from the schools within the Project area are major sensitive receptor.

9.4.2.4 Mitigation/Management Measures

Construction Phase

- During construction, arrangements and routes for abnormal loads (if required) will be agreed in advance with the relevant authorities (Kenya National Transport Safety Authorities, NTSA) and the appropriate permit will be obtained for the use of public roads. However, it is anticipated that transport will be carried out with standard containers.
- Develop and implement a Traffic Management Plan covering vehicle safety, speed limits on roads, driver and passenger behaviour, use of drugs and alcohol, hours of operation, rest periods and location of rest stops and accident reporting and investigations.
- Require Project drivers to be trained in defensive driving within the previous 3 years.
- All vehicles used for the Project should be regularly serviced and maintained.
Speed limits (of less than 30 km/h) should be adhered to along the Project Road.

Undertake consultation with communities along key transport routes to inform them about the potential for increased traffic movements prior to any changes. Put up road signs such as “Heavy Trucks Turning Ahead” to warn Boda Bodas and other vehicle users of danger/ risk of accidents occurrence ahead- especially during construction phase.

A grievance procedure, as outlined above, will be established whereby any complaints by neighbours or affected parties are recorded and responded to.

**Operations Phase**

The Project design includes a number of measures to avoid traffic accidents. These measures include provision of pedestrian walkways, installation of the required and appropriate road signs, road marking (including zebra crossings at designated pedestrian crossing points), bumps and rumbles near sensitive receptors such as the schools. The design speed for the Project Road is 80 km/hr; however, the speed limit of the road will be 50 km/h or as per the national traffic rules and regulations, especially given the high level of urbanisation.

The below management measures are recommended for the operations phase to further avoid the risk of road accidents.

- In liaison with the traffic police and/or appropriate authorities, enforce speed limits. Appropriate signage along the road routes indicating the speed limit to be enforced, is to be adequately displayed.
- A grievance procedure should be established whereby any complaints by neighbours or affected parties are recorded and responded to.
- The Contracting Authority (KURA) in liaison with NTSA will set appropriate speed limits for the Project Roads; the traffic police should enforce observance of the set speed limits.
- Maintenance of the road to prevent mechanical failure of vehicles due to poor road conditions.

### 9.5 Cumulative Impacts

Cumulative impacts are a result of effects that act together (including those from concurrent or planned future third party activities) to affect the same resources and/or receptors as the project under consideration (e.g. the combined effect of other similar projects (including other roads) in the general area). An effect of a single project to a resource in itself may not be considered significant, but may become significant when added to the existing and potential effects eventuating from similar or diverse developments in the area.

Cumulative impacts have been defined as “those (impacts) that result from the successive, incremental, and/or combined effects of an action, project, or activity (collectively referred to as “developments”) when added to other existing, planned, and/or reasonably anticipated future ones (impacts)”\(^\text{12}\).

Specifically, Cumulative Impacts Assessments (CIA) are typically expected to:

- Assess impacts over a larger (i.e. “regional”) area that may cross jurisdictional boundaries (includes impacts due to natural perturbations affecting environmental components and human actions);
- Assess impacts during a longer period of time into the past and future;

Consider impacts on Valued Ecosystem Components (VECs) due to interactions with other actions, and not just the impacts of the single action under review;

Include other past, existing and future (e.g., reasonably foreseeable) actions; and

Evaluate significance in consideration of other than just local, direct impacts.

Cumulative impacts are not necessarily that much different from impacts examined in the Sections 9.2 to 9.4 above; in fact, they may be the same. CIA is conducted to ensure that the incremental impacts resulting from the combined influences of various actions are assessed. These incremental impacts may be significant even though the impacts of each action, when independently assessed, are considered insignificant.

In practice, effective design and implementation of complete CIA processes is often beyond the technical and financial capacity of a single developer; in fact, a single developer often lacks detailed information on other planned developments in the area. CIA thus transcends the responsibility of a single project developer. However, CIA is conducted using the best available information as much as possible. For this particular Project, the ESIA consultants are aware that it is part of the Lot 15 annuity programme projects which comprises of a total of ten urban roads distributed in six counties as per Table 9.1. These roads have been considered in this CIA.

<table>
<thead>
<tr>
<th>SN</th>
<th>County</th>
<th>Name of Road</th>
<th>Length (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nyeri</td>
<td>Riamukwa – Gatitu Road</td>
<td>3.70</td>
</tr>
<tr>
<td>2</td>
<td>Laikipia</td>
<td>Munungaine - Nyeri UCB4 - Nyeri</td>
<td>8.40</td>
</tr>
<tr>
<td>3</td>
<td>Laikipia</td>
<td>Industrial Road</td>
<td>0.90</td>
</tr>
<tr>
<td>4</td>
<td>Laikipia</td>
<td>Upper Muthaiga Road</td>
<td>2.20</td>
</tr>
<tr>
<td>5</td>
<td>Kirinyaga</td>
<td>Kutus-Kiarie Road</td>
<td>4.00</td>
</tr>
<tr>
<td>6</td>
<td>Embu</td>
<td>Mutharati –Kimangaru Road</td>
<td>6.50</td>
</tr>
<tr>
<td>7</td>
<td>Majimbo</td>
<td>Majimbo - Karurina Road</td>
<td>3.40</td>
</tr>
<tr>
<td>8</td>
<td>Muranga</td>
<td>Ndikwe – Kiria Road</td>
<td>3.90</td>
</tr>
<tr>
<td>9</td>
<td>Muranga</td>
<td>Mucunguca -Kiangage Road</td>
<td>5.10</td>
</tr>
<tr>
<td>10</td>
<td>Tharaka Nithi</td>
<td>Kanjuki - Athwana - Kathwana – Makutano Road</td>
<td>6.80</td>
</tr>
</tbody>
</table>

Based on the current planning, the construction activities for the above roads is expected to be completed in a period of two years. In order to minimise the cumulative impacts of the above Lot 18 road projects, the following mitigation/management measures are recommended.

9.5.1.1 Mitigation/Management Measures

- Each of the project roads in each county is subjected to a separate environmental and social impact assessment resulting in the preparation of ESIA Project Reports per county.

- The Contractor will prepare a detailed Project schedule, including all the planned Lot18 roads to confirm the roads where construction activities will be conducted simultaneously.

- ESMMPs of projects occurring simultaneously will be jointly analysed to ensure that any cumulative impacts are addressed and any additional required mitigation measures identified.

- As much as possible, the contractor will use the same sources of construction materials for the different roads.
The Contractor will establish one major camp at an appropriate location for the bulk storage of construction materials equipment for all the roads in Lot 15. For each of the counties, only a small camp/ materials yard will be established.

### 9.6 Summary of Impacts and Residual Impacts

#### Table 9.2 Summary of Construction Phase Impacts

<table>
<thead>
<tr>
<th>Impact</th>
<th>Significance (pre-mitigation)</th>
<th>Residual Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impacts on Local Air Quality</td>
<td>MAJOR NEGATIVE</td>
<td>MINOR Impact</td>
</tr>
<tr>
<td>Impacts on the Noise Environment (including vibrations)</td>
<td>MAJOR NEGATIVE</td>
<td>MODERATE NEGATIVE</td>
</tr>
<tr>
<td>Impacts on Water Quality and Flow</td>
<td>MODERATE NEGATIVE</td>
<td>MODERATE NEGATIVE</td>
</tr>
<tr>
<td>Waste and Effluent</td>
<td>MAJOR NEGATIVE</td>
<td>MODERATE NEGATIVE</td>
</tr>
<tr>
<td>Material Sites and Borrow Pits</td>
<td>MODERATE NEGATIVE</td>
<td>MINOR NEGATIVE</td>
</tr>
<tr>
<td>Impact on Community Service Infrastructure (Domestic Water Supply and, Electricity Transmission and Distribution) Network</td>
<td>MAJOR NEGATIVE</td>
<td>MODERATE NEGATIVE</td>
</tr>
<tr>
<td>Impacts on Employment, Procurement and the Economy</td>
<td>POSITIVE</td>
<td></td>
</tr>
<tr>
<td>Land Acquisition and Resettlement</td>
<td>MODERATE NEGATIVE</td>
<td>MINOR NEGATIVE</td>
</tr>
<tr>
<td>Impact on Disease Transmission</td>
<td>MODERATE NEGATIVE</td>
<td>MINOR NEGATIVE</td>
</tr>
<tr>
<td>Traffic Impacts</td>
<td>MAJOR NEGATIVE</td>
<td>MODERATE NEGATIVE</td>
</tr>
<tr>
<td>Labour and Working Conditions</td>
<td>MAJOR NEGATIVE</td>
<td>MINOR NEGATIVE</td>
</tr>
<tr>
<td>Security Risks</td>
<td>MODERATE NEGATIVE</td>
<td>NEGLIGIBLE NEGATIVE</td>
</tr>
<tr>
<td>Increased Infestation of Invasive Alien Plants</td>
<td>MODERATE NEGATIVE</td>
<td>MINOR NEGATIVE</td>
</tr>
</tbody>
</table>

#### Table 9.3 Summary of Operation Phase Impacts

<table>
<thead>
<tr>
<th>Impact</th>
<th>Significance (pre-mitigation)</th>
<th>Residual Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impacts on Local Air Quality</td>
<td>POSITIVE</td>
<td></td>
</tr>
<tr>
<td>Impacts on the Noise Environment (including vibration)</td>
<td>MODERATE NEGATIVE</td>
<td>MODERATE NEGATIVE</td>
</tr>
<tr>
<td>Impacts on Employment, Procurement and the Economy</td>
<td>POSITIVE</td>
<td></td>
</tr>
</tbody>
</table>
10. ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP)

10.1 Introduction

The purpose of the Environmental and Social Management and Monitoring Plan (ESMMP) is to ensure that social and environmental impacts and risks identified during the ESIA process are effectively managed during the construction and operations of the Project. The ESMMP specifies the mitigation and management measures to which KURA and the Contractor are committed and shows how the Project will mobilize organizational capacity and resources to implement these measures. The ESMMP also shows how mitigation and management measures will be scheduled and will ensure that the Project complies with the applicable laws and regulations within Kenya, as well as the requirements of IFC Performance Standards on environmental and social sustainability.

The key objectives of the ESMMP are to:
- Formalize and disclose the programme for environmental and social management; and
- Provide a framework for the implementation of environmental and social management initiatives.

Best practice principles require that every reasonable effort is made to reduce, and preferably to prevent, negative impacts while enhancing the Project benefits. These principles have guided the ESIA process.

Given that the Contracting Authority (KURA) has already appointed Mota - Engil Africa and Lee Construction Limited as the Contractor, overall responsibility for the ESMMP lies with the Contractor, who will be responsible for carrying out the specific Project activities. However, the Contractor’s activities will be supervised by KURA to ensure the Project implementation is performed as planned, and as per this ESMMP.

10.2 Environmental and Social Management and Monitoring Plan (ESMMP)

The ESMMP covers information on the management and/or mitigation measures that will be taken into consideration to address impacts with respect to:
- The construction phase (including mobilisation and demobilisation activities associated with the construction phase); and
- The operations/ Maintenance phase.

Table 10.1 summarises the ESMMP for the Project. It describes the mitigation measures to be undertaken, and, to ensure the mitigation measures are adequately implemented, a monitoring programme is also described. This programme provides for parameters that can be monitored, and suggests how monitoring should be done, how frequently, and who should be responsible for such monitoring.
## Table 10.1 Environmental and Social Management and Monitoring Plan (ESMMP)

<table>
<thead>
<tr>
<th>Issue</th>
<th>Mitigation/Management Measure</th>
<th>Responsibility for Implementation</th>
<th>Completion Indicator</th>
<th>Frequency of Monitoring</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction Phase</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>Contractor required to develop and implement a Construction Environmental Management Plan (CEMP) meeting the conditions set out in the environmental authorisation, as well as this ESIA Project Report (PR) and lender requirements.</td>
<td>Contractor</td>
<td>A comprehensive and appropriate CEMP in place</td>
<td>Once – off (prior to commencement of construction activities, but after obtaining NEMA ESIA PR Approval)</td>
<td>No additional cost (expected to be undertaken by the Consortium’s in-house environmental and social staff)</td>
</tr>
<tr>
<td>Impacts on Local Air Quality (Section 9.2.2)</td>
<td><strong>Air Quality</strong></td>
<td>Contractor</td>
<td>No recorded incidents or dust-related grievances to surrounding land users</td>
<td>Daily</td>
<td>All associated costs presumed included in overall construction costs</td>
</tr>
<tr>
<td></td>
<td>▪ Develop and implement a grievance procedure to manage any dust complaints.</td>
<td></td>
<td>Records of audits/visual inspection</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Impacts associated with construction road traffic during the construction phase should be adequately mitigated by either regularly wetting the road near sensitive receptors such as schools and businesses or chemically treating unpaved roads.</td>
<td></td>
<td>Air quality emissions at respective receptors not exceeding the maximum permitted limits (Table 2.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Speed limits should be set to as low as possible on unpaved roads where surface binding agents have not yet been applied.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Work vehicles should as far as reasonably possible be kept free of excessive mud, especially when moving outside of the construction area.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Work vehicles transporting soils and aggregates materials should be kept adequately covered to prevent materials being inadvertently spread around and off the construction site.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Where feasible, surface binding agents should be used on exposed open earthworks such as at the material laydown areas. Upon completion of earthworks, stabilization of surfaces (i.e. establishing vegetative cover, or placing ground cover) should occur as soon as possible.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ The smallest possible area for cleared ground required for construction work should be exposed, and where feasible,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Surface binding agents should be used on exposed open earthworks. Where the use of surface binding agents is not possible, the use of localised dampening and activity-specific dampening should be used to reduce localised emissions of dust.

- Drop heights of material should be minimised, as far as reasonably possible.
- Soil and aggregate stockpiles should be managed in accordance with the mitigation/management measures provided for Impacts on Water Quality (refer to Section 9.2.4).
- Where feasible and reasonable, vehicles that are compliant with recent emission standards (for example, EURO Tier 3) should be used. These vehicles should be maintained in reasonable working order. When not in use, vehicles should be switched off, unless impractical for health and safety reasons (for example maintenance of air conditioning).
- Construction equipment should be maintained and serviced on a regular basis to ensure that it functions optimally and to reduce excessive emissions; this will also apply to all stationary generators utilised on site.
- The Contractor proposes to extract construction materials from existing commercial quarries and borrow pits. However, in the event that new quarries and borrow pits are to be opened up, they should be situated at a minimum of 2,000 m from sensitive receptors, in line with Kenyan law.
- Issue all the Project workers appropriate Personal Protective Equipment (PPE) including dust masks, where required.
- Develop and implement an appropriate Traffic Management Plan (TMP) throughout the construction phase.
- Prepare and share the construction schedule with the local community members and create community awareness to keep them informed of anticipated Project impacts and how they can be minimised.
- Any spillages along construction access routes should be cleaned up within a reasonable time (preferably the same shift) to prevent secondary dust sources.
### Issue

#### Impacts on the Noise Environment (including vibration)  
(*Section 9.2.3*)

<table>
<thead>
<tr>
<th>Mitigation/Management Measure</th>
<th>Responsibility for Implementation</th>
<th>Completion Indicator</th>
<th>Frequency of Monitoring</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Noise and Vibration</strong></td>
<td>Contractor</td>
<td>No recorded noise-related incidents or grievances to surrounding land users</td>
<td>Monthly</td>
<td>Noise management costs presumed included in overall construction costs</td>
</tr>
<tr>
<td>▪ The Project should develop and implement a grievance procedure in the event of any noise and vibration impact complaints being received.</td>
<td></td>
<td>Noise monitoring records</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ A one-page summary of applicable noise criteria that relate to relevant work practices and nearby receptors should be developed. This summary should be placed on a noticeboard so that all site operators can quickly reference noise information.</td>
<td></td>
<td>Noise emissions at respective receptors not exceeding the maximum permitted limits (<em>Table 2.1</em>)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Site management should periodically check the site and nearby residences (or other sensitive land uses) for noise and vibration related issues so that solutions can be efficiently and timeously applied.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Periods of respite should be provided in the case of unavoidable maximum noise level events. These respite periods should be negotiated with the relevant local stakeholders.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Regular inspection and maintenance of all machinery and vehicles.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Installation of silencers or acoustic enclosures on machinery, where applicable, such as installation of suitable mufflers on engine exhausts and compressor components, as well as the use of portable sound barriers around equipment like generators.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Reverse alarms on construction vehicles are necessary for health and safety reasons, but do contribute to noise levels and maybe a nuisance to surrounding communities. As such, construction equipment must be used during daylight hours only, where practical</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Where feasible and reasonable, the throttle settings on plant and machinery should be reduced and equipment and plant should be turned off when not being used.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ As far as reasonably possible, avoid or minimise Project traffic routing through community areas and the implementation of speed limits for all construction vehicles.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue</td>
<td>Mitigation/Management Measure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Limiting hours of operation for specific equipment or operations (e.g. trucks or machines operating in or passing through community areas).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Restricting noise levels at the sensitive receptors from long term construction activities to 60 dB LAeq during the daytime, and 35 dB LAeq at night as far as is practicable, or to other standards that have been agreed with the local authority.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ All potentially impacted receptors should be informed of the nature of works to be carried out, the expected noise and vibration levels and duration, as well as contact details for an appropriate representative that can be contacted in the event of a complaint. All complaints should be managed as part of the Project’s external feedback and grievance mechanism.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Where needed, and especially if buildings are located within close proximity of the work area, the buildings should be inspected and photographic evidence kept prior to construction. These buildings should be inspected for damage during and after activities which may contribute to an increase in vibrations such as during compaction.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Noise monitoring against the performance criteria presented above should be implemented if persistent noise complaints are received.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ All employees are to be provided with, and are to wear, appropriate hearing protection such as earmuffs and earplugs where necessary.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Avoid idling of Project vehicles and equipment when not in use.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Careful siting of Construction Camps and associated plant is the most effective mitigation in terms of noise impacts. Care should be taken to site Construction Camps and associated plant at least (preferably more than) 180 m from sensitive receptors (health and educational facilities, residential homesteads) where applicable.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Storing excavated material (with cover to avoid dust erosion), or use of buildings/structures or temporary noise barriers to form a noise barrier between the Construction Camp and any noise sensitive receptors.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Issue Mitigation/Management Measure

- Shutting down of machines in intermittent use in the intervening periods between work (or throttle them down to a minimum).
- Positioning of all ancillary plant (e.g. crushers, mixers, loaders, generators, compressors, etc.) so as to cause minimum noise disturbance.
- Providing acoustic enclosures, if necessary.
- As far as reasonably possible, limit noisy construction activities to day time hours only, between the hours of 06h00 and 18h00.
- Share the construction schedule with all the affected stakeholders indicating periods when unusual construction activities with extraordinary noise levels will be carried out.
- Inform the neighbouring communities of any unusual construction activities with extraordinary noise levels including time, expected duration and any safety precautions.
- Undertake structural integrity assessments of existing structures along the Project Road prior to construction as a baseline control for damages from vibrations during construction.

### Impacts on Water Quality and Flow (Section 9.2.4)

#### General
- The Project should develop and implement a grievance procedure to deal with complaints received in the event of disruption to water supply due to damages to services and or any impact on water quality as result of the construction activities.
- To the furthest extent practically possible, construction activities including the storage of materials, especially bituminous products, and overnight parking of equipment should be conducted > 100 m away from water bodies, except where crossings are required.

#### Water Quality
- In liaison with the Murang’a Water and Sewerage Company (MUWASCO), the Contracting Authority (KURA) should develop and implement an easement plan for the domestic water supply.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Mitigation/Management Measure</th>
<th>Responsibility for Implementation</th>
<th>Completion Indicator</th>
<th>Frequency of Monitoring</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Contractor in liaison with MUWASCO</td>
<td>No recorded water (quality, quantity or stormwater flow) - related incidents or grievances to surrounding land users</td>
<td>Weekly</td>
<td>Included in overall construction activities as good practice</td>
</tr>
</tbody>
</table>
### Issue Mitigation/Management Measure

- Communicate all the construction related plans and schedules including the easement plans to the local community members prior to the commencement of the construction and easement activities.
- Regularly maintain the Project equipment as per the manufacturer’s instruction to avoid the possibility of any leaks and spills.
- The Project should consult with the appropriate Kenyan government departments to confirm the need and applicability for water discharge permits/licenses necessary for the successful construction of the proposed Project Roads. Such discharge permits/licenses will be associated with effluent discharges (viz. stormwater and treated sanitary/domestic sewage).
- Method Statements detailing spill emergency response and clean-up procedures for spills should be developed.
- Training regarding proper methods for transporting, transferring and handling hazardous substances that have the potential to impact surface and groundwater resources should be undertaken.
- Areas where spillage of soil contaminants occurs should be excavated (to the depth of contamination) and suitably rehabilitated. If any other minor spillage occurs, the spillage should be cleaned as soon as possible, but within the same shift and the contaminated area should be reinstated. All contaminated material should be suitably disposed of.
- The washing of Project vehicles in any surface water bodies in and around the Project Roads should be prohibited. All Project vehicles should be washed at designated wash bays on site. These wash bays should include oil/grease and sediment traps for grey water.
- The ad hoc maintenance, with the exception of emergency repairs, of vehicles in and around the area of the Project Roads should be prevented, as far as reasonably possible. All major network along the Project Roads, prior to the commencement of the construction activities.

### Responsibility for Implementation

Areas used for temporary construction activities fully restored

### Completion Indicator

Frequency of Monitoring

Cost
<table>
<thead>
<tr>
<th>Issue</th>
<th>Mitigation/Management Measure</th>
<th>Responsibility for Implementation</th>
<th>Completion Indicator</th>
<th>Frequency of Monitoring</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>services and ad hoc maintenance of vehicles and equipment should be done at a designated workshop. The workshop should be properly constructed to prevent pollution and should as far as reasonably practical include containment berms and an oil/grease trap.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ All construction areas and associated facilities should be maintained in a good and tidy condition; debris and wastes should be contained in such a way that they cannot become entrained in surface runoff during periods of heavy rain.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Where practical, exposed surfaces and friable materials should be covered/sheeted.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Sufficient portable chemical toilets at active work areas should be provided for site staff and workers and these should be serviced regularly by a competent and suitably qualified person.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ The sewage treatment/containment system should be managed in a manner that results in zero discharge of raw sewage to the environment, and if treated sewage is discharged into the environment, then this should conform to recognised Kenyan discharge standards prior to discharge.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ All wastewater which may be contaminated with oily substances should be managed in accordance with an approved (by Contractor’s and KURA’s top Management or authorised Project personnel) Waste Management Plan, and no hydrocarbon-contaminated water should be released into the environment.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Fixed fuel storage infrastructure should be on flat, impermeable surfaces and surrounded by a bund with a volume of 110% of the volume of the storage tank(s), and fuel transfer at fixed stations should be performed on a concrete surface.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Position the materials yard/laydown areas, waste disposal sites, spoil dumping areas and access roads as far as possible from local watersheds, i.e. on local high points, to minimise risk of affecting surface water quality through the generation of silt (e.g.: by erosion) or waste (e.g. from ablation facilities, refuelling of vehicles etc.).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Chemicals storage and dispensing areas should be located no less than 500 m away from surface water bodies, and in no instance should they be located within floodplains. Storage areas should be on flat, impermeable surfaces and surrounded by a bund or be an enclosed storage facility.

To avoid siltation of rivers and other surface water bodies, soil stockpiles should be located away from surface water bodies.

Flow

- Integrate an appropriate drainage system in the overall road planning and across the construction site to align it to the natural drainage system as much as possible, and to prevent downstream flooding.
- Project infrastructure should be designed and located to minimise the impacts to natural water flow.
- Harmonize drainage with all point sources of surface runoff such as valleys/lowlands and rivers, and the pavement surface structure.
- To the furthest extent possible, the disturbance of the natural topography and catchment characteristics should be minimised (e.g. limit large-scale earthworks, vegetation removal, soil compaction etc.), so as to not alter the natural flow characteristics of the rivers.
- The design of all the culverts should be informed by hydrological studies to be able to manage peak runoff.
- As far as reasonably possible, drainage outfalls should not be directed into private land or premises.
- Ensure protection of soil adjacent to the side drains and the constructed drainage facilities.
- Construct appropriate drainage trenches along the entire section of the Project Road.
- Identify appropriate areas for the dumping of excess earth material. This should preferably be done in consultation with the local NEMA offices to identify potential areas such as old quarries and borrow-pits which may require backfilling and rehabilitation.
<table>
<thead>
<tr>
<th>Issue</th>
<th>Mitigation/Management Measure</th>
<th>Responsibility for Implementation</th>
<th>Completion Indicator</th>
<th>Frequency of Monitoring</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Spoil/excavations should be visually assessed to determine if it is contaminated. In the event that the spoil is contaminated, it should be handled as a hazardous material and disposed of under supervision and into controlled dumping areas.</td>
<td>Contractor</td>
<td>An effective WMP in place</td>
<td>Monthly</td>
<td>Included in overall construction costs</td>
</tr>
<tr>
<td></td>
<td>The drainage outfalls should be properly constructed to reduce the erosion from surface runoff and stormwater.</td>
<td></td>
<td>Records of audits/visual inspection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wastes and Effluents (Section 9.2.5)</td>
<td><strong>Wastes/Effluents</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spoil generated should be disposed of on pre-identified and approved locations (impact assessment should be completed for the locations if not already approved).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A Waste Management Plan (WMP) will be produced for the construction phase.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction vehicles and equipment will be serviced off site at designated and approved servicing locations.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The use, storage, transport and disposal of hazardous materials used for the Project will be carried out in accordance with all applicable Kenyan regulations, and Material Safety Data Sheets (MSDS). As Kenya does not have a specific hazardous waste facility, any hazardous wastes to be disposed of should be documented beforehand, treated as per any requirements of the MSDS sheets, and disposed of in consultation with the applicable County Authorities and via NEMA approved waste handlers.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Contractor will be required to supply the required temporary ablution facilities and be responsible for the treatment and/or removal of sewage wastes off site. The Contractor will also be required to ensure that any sub-contracting company is accredited and has the necessary permits to remove sewage waste.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue</td>
<td>Mitigation/Management Measure</td>
<td>Responsibility for Implementation</td>
<td>Completion Indicator</td>
<td>Frequency of Monitoring</td>
<td>Cost</td>
</tr>
<tr>
<td>-----------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------</td>
<td>-----------------------</td>
<td>-------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td></td>
<td>▪ The sewage will be treated in accordance with the applicable laws like the Environmental Management and Coordination (Waste Management) Regulations, 2006.</td>
<td>Contractor</td>
<td>Due diligence reports on existing commercial sources</td>
<td>Monthly</td>
<td>Internal</td>
</tr>
<tr>
<td></td>
<td>▪ All construction laydown areas shall comply with the Project WMP and be provided with appropriate waste handling equipment.</td>
<td></td>
<td>Transportation of construction materials included in the Traffic Management Plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Work sites will have appropriate solid waste holding receptacles to be regularly emptied for disposal.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ In line with the requirements of the Waste Management Regulations, any generated hazardous waste should be transported and managed by NEMA permitted hazardous waste handlers.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impacts from Material Sites and Borrow Pits (Section 9.2.6)</td>
<td>Use of Existing Commercial Quarries and Borrow Pits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Implement resource efficient measures to avoid waste of construction materials. In particular, only extract the volume of materials needed for the construction of the Project Roads.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Where feasible, the existing road base material should be recycled back into the road construction process to minimize the need for additional material to be imported.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Conduct a due diligence on the identified commercial quarries to confirm that the operators (supply chain suppliers) have all the necessary approvals and manage them in the most appropriate manner. In particular, confirm that they restore exhausted borrow pits.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ All access routes to material sites should be planned ahead of construction and described in the contract documents.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Haulage routes should be maintained by watering to minimize the impact of dust.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Use existing quarries and borrow pits to the greatest extent possible.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**New Borrow Pits and Quarries**

- A separate NEMA authorisation process will be followed to obtain approvals for any new borrow-pits or quarries.
- Contracts with the landowners should be signed before the commencement of extraction activities, which should include terms and conditions for payment, the area of land to be excavated, and the rehabilitation measures to be carried out on the gravel sites, if required. The contract documents should instruct the Contractor to construct and maintain fences and rehabilitate the site after use.
- The material site areas to be excavated should be cordoned off, as these areas tend to be deep and pose a danger to children and livestock.
- Gravel pits must be landscaped and reinstated or backfilled to ensure safety and stability of the borrow-pit/quarry area. If excavation is properly planned, organized and executed, it will be possible to rehabilitate most of the gravel pits.
- It should be ensured that topsoil and overburden material are stored separately to allow for use during the rehabilitation phase.
- The end use and rehabilitation requirements of the borrow-pit should clearly be stated in the lease agreement with the landowner, as far as reasonably possible; the areas should not be left un-rehabilitated. The Contractor should ensure that all post-activity safety concerns are adequately addressed prior to leaving the area.
- Landowners should be informed of the environmental implications of the excavation works at the time of identification of the gravel pits. They must be informed at the earliest, by the Contractor and Resident Engineer, whether testing has revealed that material from their plot was acceptable or not for use on the Project Roads.
### Measures for Disruptions to Existing Service Infrastructure

- In liaison with the Murang’a County Water and Sewerage Corporation (MUWASCO), the Contracting Authority (KURA) needs to develop and implement an easement acquisition plan focussed on the domestic water supply network.
- In liaison with the Kenya Power and Lighting Company Limited (KPLC), the Contracting Authority (KURA) needs to develop and implement an easement acquisition plan focussed on electricity infrastructure within the Project footprint. The easement plan should consider electricity transmission and distribution lines both along and across the Project Roads.
- Communicate the easement plans including implementation schedule to all the affected people in advance to enable them to store water for use during the periods of unavailability and avoid surprises during power outages.
- Relocate the affected infrastructure in the most efficient manner to minimise the duration of the impact as much as possible. In particular, ensure that continuous disruption of the affected services do not take more than 24 hours, where possible. As far as reasonably possible, ensure that service availability is restored every evening to enable customers temporary access at night (for example to be able to fetch and store water for use in the following day, and recharge chargeable electrical appliances) until the easement process is completed.

### Measures for Impacts on Water Supply attributable to the Project’s Water Needs

- Select the preferred water abstraction points based on a hydrology study.
- Where necessary, obtain water abstraction permits from the Water Resources Authority (WRA) prior to the commencement of the water abstraction activities.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Mitigation/Management Measure</th>
<th>Responsibility for Implementation</th>
<th>Completion Indicator</th>
<th>Frequency of Monitoring</th>
<th>Cost</th>
</tr>
</thead>
</table>
| Impact on Community Service Infrastructure (Domestic Water Supply and Electricity Transmission and Distribution Networks (Section 9.2.7)) | **Measures for Disruptions to Existing Service Infrastructure**<br>- In liaison with the Murang’a County Water and Sewerage Corporation (MUWASCO), the Contracting Authority (KURA) needs to develop and implement an easement acquisition plan focussed on the domestic water supply network.<br>- In liaison with the Kenya Power and Lighting Company Limited (KPLC), the Contracting Authority (KURA) needs to develop and implement an easement acquisition plan focussed on electricity infrastructure within the Project footprint. The easement plan should consider electricity transmission and distribution lines both along and across the Project Roads.<br>- Communicate the easement plans including implementation schedule to all the affected people in advance to enable them to store water for use during the periods of unavailability and avoid surprises during power outages.<br>- Relocate the affected infrastructure in the most efficient manner to minimise the duration of the impact as much as possible. In particular, ensure that continuous disruption of the affected services do not take more than 24 hours, where possible. As far as reasonably possible, ensure that service availability is restored every evening to enable customers temporary access at night (for example to be able to fetch and store water for use in the following day, and recharge chargeable electrical appliances) until the easement process is completed. | Contractor in liaison with MUWASCO | Appropriate water easement plan prepared | Daily | Easement costs presumed included in overall construction costs
| | **Measures for Impacts on Water Supply attributable to the Project’s Water Needs**<br>- Select the preferred water abstraction points based on a hydrology study.<br>- Where necessary, obtain water abstraction permits from the Water Resources Authority (WRA) prior to the commencement of the water abstraction activities. | | | | |
### Issue Mitigation/Management Measure

- Observe the conditions in the water abstraction permits to ensure that the permitted quantities of water abstracted are not exceeded.
- Avoid abstracting water from points used by the local community members as a main source of water, where possible.
- Keep records of water quantities abstracted to minimize over abstraction. Only abstract water volumes needed to meet the Project requirements.
- Monitor the water levels of the abstraction points during abstraction. If the water levels are lower than expected, an alternative location should be identified.
- Schedule the water abstraction activities to avoid the times of the day when the affected community members need it more.
- Where reasonable, install temporary water storage tanks to store water for future use.

### Impacts on Employment, Procurement and the Economy (Section 9.2.8)

#### Employment/Procurement

- The Project should prioritise the employment of unskilled labour from the local community in the first instance.
- Semi-skilled and skilled opportunities should be sourced in order of preference from communities along the Project Roads, the affected County, and only then, nationally.
- The Project should develop a fair and transparent employment and procurement policy and process that prevents any form of nepotism and favouritism. The policy should be shared with the local community members.
- The Contractor, in liaison with KURA, should notify identified representatives of the County Government and Local Administration (i.e. the Area Chiefs) of the specific jobs and the skills required for the Project, prior to the commencement of construction. This will give the local population time, prior to the commencement of construction, to attain the relevant skills to be employable on the Project, where appropriate. This is applicable to un-skilled and semi-skilled workers.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Mitigation/Management Measure</th>
<th>Responsibility for Implementation</th>
<th>Completion Indicator</th>
<th>Frequency of Monitoring</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Contractor</td>
<td>Employment records</td>
<td>Preparation of Human Resources guiding documents (including recruitment guidelines) prior to construction Employment records checked monthly</td>
<td>Internal costs</td>
</tr>
<tr>
<td>Issue</td>
<td>Mitigation/Management Measure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
|       | The Project should prioritise the procurement of goods and services from the affected County as much as possible. In the event that construction materials, goods and services cannot be procured from within the affected County, then preference should be given to national (Kenyan) companies.  
Advertisements on the employment and procurement opportunities during the construction phase should be placed at the Chief’s Office notice board, and applications are to be done through this office. In the event that the position cannot be filled from within the Project area, it should be advertised further county-wide, then nationally.  
The Contractor should aim at procuring locally available materials where feasible and use local suppliers where appropriate.                                                                                                                                                                                                                                                                                                                                                             |
|       | **Land Acquisition/Resettlement** (Section 9.2.9)  
Complete the on-going RAP/LRP and appropriately implement the outcomes.  
Any valuation should be guided by the relevant departments in the Ministry of Lands and County officers or a registered valuer; these rates should be in line with IFC PS5 requirements and agreed by all parties concerned before engaging the community.  
The Contracting Authority (KURA) should work with the local leaders to establish a community grievance mechanism. Issues should be solved before work continues to avoid conflict.                                                                                                                                                                                                                                                                                           |
|       | **General Measures**  
Workers should receive awareness training as part of their induction and then at least every 6 months on potential high risk                                                                                                                                                                                                                                                                                                                                                                      |
|       | Responsibility for Implementation | Completion Indicator | Frequency of Monitoring | Cost   |
|       | KURA in liaison with the Contractor and National Land Commission (NLC) | The boundary of the Road Corridor marked with appropriate KURA pillars  
Project land titled  
Compensation records (if any)  
No grievances in relation to demarcation and titling of the Project land | Monthly | KURA’s internal costs |
|       | Contractor in liaison with KURA | HIV/AIDS/Malaria/TB Policy | Monthly | Internal costs |
communicable and vector borne diseases, symptoms, preventative measures and transmission routes, as well as treatment options. This will be particularly important for diseases with which non-local workers are unfamiliar and in case of any emerging disease outbreaks.

- In the event of a new disease, increased transmission or outbreak compared to the baseline, the Project should interact with local health care facilities and workers to ensure there is an appropriate response in place to make workers aware and to ensure proper precautionary measures are implemented.
- A Worker Code of Conduct should be developed providing a worker code of behaviour including worker-worker interactions, worker-community interactions and development of personal relationships with members of the local communities.
- Accommodation should be provided to workers from outside the Project area in accordance with international good practice on workers' accommodation, including IFC/EBRD standards to prevent transmission of diseases associated with poor living conditions.
- Implement appropriate measures to minimise the risk of disease transmission (refer to Section 9.2.10 for details).
- The workforce will be provided with access to selected treatment at health facilities on site as deemed necessary for this Project. The requirements for these health facilities should be based on a risk assessment taking into account access to existing health facilities and travel time to facilities that offer international standards of care. Access to health care should include direct employees and sub-contractors working on site.
- Pre-employment screening protocols will be put in place. This should include pre-employment medicals and follow up medicals as appropriate. The screening protocols should consider health conditions related to the nature of the work undertaken, employee country of origin and legal requirements. Workers should not be denied employment on the basis of the outcomes of the screening, but should be provided treatment or alternative roles as appropriate.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Mitigation/Management Measure</th>
<th>Responsibility for Implementation</th>
<th>Completion Indicator</th>
<th>Frequency of Monitoring</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Worker Code of Conduct</td>
<td>Disciplinary procedures for workers who contravene the Code of Conduct</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue</td>
<td>Mitigation/Management Measure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ The Project should prepare and implement a vector borne disease management plan during the construction phase focussing on malaria and chikungunya, which includes vector control, avoidance, diagnosis, treatment and training.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ The Project should implement TB awareness and prevention measures including testing and referral for treatment for all personnel working on the Project. This approach should be explained clearly to the workforce along with making it clear that there are no consequences for their employment.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ The Project should monitor the emergence of major pandemics through World Health Organisation (WHO) alerts and, in the event of a pandemic, review mobilisation and demobilisation of ex-patriate Project personnel and/or implement appropriate control measures and Emergency Response Plans.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Specific Measures for HIV/AIDS Prevention and Control</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ The Project should implement an HIV/Aids and sexually transmitted diseases (STD) awareness programme to minimise the spread of HIV infection and other STDs. The programme should be prepared with the assistance of a specialist in sexually transmitted diseases.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ As part of the HIV/Aids and STD awareness programme, information should be provided to workers on STD prevalence rates in Kenya and/or the relevant Counties, as well as the expectations of local communities if a woman is made pregnant by a worker (e.g. marriage, financial implications etc.).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Workers should have access to confidential health care for the treatment of HIV/Aids and STDs through medical facilities/health care at Project sites.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ The Project should partner with other NGOs and CBOs to support the provision of information, education and communication campaigns around safe sexual practices and transmission of STDs. These activities should be focussed in locations where Project workers are accommodated or where drivers rest.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Traffic Impacts

**Traffic Control**

- Develop a construction schedule which must be communicated to the Project stakeholders including the local community members.
- For any blockage of access to any facility, including the main access routes to the homes of residents along the Project Roads, a suitable alternative/diversion must be identified and communicated to the affected persons in advance.
- Develop a Traffic Management Plan covering the routes to be used by the Project vehicles, vehicle safety, speed limits on roads, driver and passenger behaviour, use of drugs and alcohol, hours of operation, rest periods and location of rest stops, and accident reporting and investigations.
- Speed limits for construction vehicles (of less than 30 km/h) should be adhered to along the Project Roads. Public vehicles using the existing roads should also be forced to slow down through the use of speed humps or other traffic calming measures; this to protect construction workers from public vehicle interactions.
- Undertake consultations with communities along key transport routes to inform them about the potential for increased traffic movements prior to any changes. Put up road signs such as “Heavy Trucks Turning Ahead” to warn Boda Bodas and other road users of danger/risk of accidents occurrence ahead, especially during the construction phase.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Mitigation/Management Measure</th>
<th>Responsibility for Implementation</th>
<th>Completion Indicator</th>
<th>Frequency of Monitoring</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The Project should consult with local leaders such as Area Chiefs, village elders and Nyumba Kumi leaders among others. The consultations should be aimed at finding ways of ensuring social vices such as prostitution are minimised either through punitive measures for clients, in particular Project workers, or rehabilitative measures for the Commercial Sex Workers (CSWs).</td>
<td>Contractor in liaison with KURA and Kenya Police</td>
<td>Incident records</td>
<td>Monthly</td>
<td>Internal costs</td>
</tr>
<tr>
<td></td>
<td>A grievance mechanism should be developed, whereby affected people can raise issues and concerns associated with social vices, prostitution and the behaviour of workers and drivers.</td>
<td></td>
<td>Records of complaints</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traffic Impacts (Section 9.2.11)</td>
<td>Traffic Control</td>
<td></td>
<td>Traffic Management Plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Grievance mechanism in place, where traffic incidents are recorded and addressed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Labour and Working Conditions (Section 9.1.12)

#### Management System

- The Project should develop and implement an Occupational Health and Safety Management System in line with good industry practice. This systems should include consideration of hazard identification, risk assessment and control, use of Personal Protection Equipment (PPE), incident investigation and reporting, reporting and tracking of near misses, incidents etc. The management system should also include emergency response plans. Roles and responsibilities should be clearly defined.

#### Contractor Management

- In all contracts, the Contracting Authority (KURA) together with the Contractor should make explicit reference to the need to abide by Kenyan law, international standards (in particular IFC PS2), ratified ILO conventions, and KURA’s policies in relation to health and safety, labour and welfare standards.
- As part of the contractor and supplier selection process, the Contractor should take into consideration performance with regard to worker management, worker rights, and health and safety as outlined in Kenyan law and international standards.
- Regular checks by the Contracting Authority (KURA) should be undertaken to ensure the relevant labour laws and occupational health and safety plans are adhered to at all times.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Mitigation/Management Measure</th>
<th>Responsibility for Implementation</th>
<th>Completion Indicator</th>
<th>Frequency of Monitoring</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Provide safe and clearly demarcated access routes for pedestrians, especially near schools to divert them away from possible construction dangers.</td>
<td>KURA (contractual arrangements)</td>
<td>Employment records and other key performance indicators (KPIs) for worker rights</td>
<td>Monthly</td>
<td>Internal costs</td>
</tr>
<tr>
<td></td>
<td>If deemed necessary, conduct traffic safety and construction awareness programmes with the schools to inform learners of the potential dangers of vehicles and the construction activities.</td>
<td>Contractor (implementation)</td>
<td>A record of workers’ grievances</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prepare and implement an appropriate community Grievance Redress Mechanism (GRM). The GRM should be communicated to all the local community members.</td>
<td></td>
<td>Induction documentation for all workers to include necessary items</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Monthly Internal costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue</td>
<td>Mitigation/Management Measure</td>
<td>Responsibility for Implementation</td>
<td>Completion Indicator</td>
<td>Frequency of Monitoring</td>
<td>Cost</td>
</tr>
<tr>
<td>-------</td>
<td>--------------------------------</td>
<td>----------------------------------</td>
<td>----------------------</td>
<td>------------------------</td>
<td>------</td>
</tr>
<tr>
<td></td>
<td>All workers (including those of contractors and sub-contractors) should, as part of their induction, receive training on health and safety and should receive updated training routinely, as well as when undertaking new tasks, such as working at heights or working in confined spaces.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Workers’ Rights</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Contractor in liaison with the Contracting Authority (KURA) should put in place hiring mechanisms to ensure no employee or job applicant is discriminated against on the basis of his or her gender, marital status, nationality, ethnicity, age, health status, religion or sexual orientation.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All workers (including those of Contractors and sub-contractors) will, as part of their induction, receive training on worker rights in line with Kenyan legislation to ensure that positive benefits around understanding labour rights are enhanced. This process will be formalised within the Code of Conduct that will be provided by the Contractor.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All workers (including those of Contractors and sub-contractors) will have contracts which clearly state the terms and conditions of their employment and their legal rights. Contracts will be verbally explained to all workers where this is necessary to ensure that workers understand their rights. Contracts must be in place prior to workers commencing work.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Contractor and Contracting Authority (KURA) will put in place a worker grievance mechanism that will be accessible to all workers, whether permanent or temporary, or directly or indirectly employed. The worker grievance mechanism shall be open to all the Project workers in the event that their grievance is not adequately resolved by their direct employer.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All workers (including those of the Contractor and sub-contractors) will have access to training on communicable diseases and STDs and community interactions in general. This training will be developed in collaboration with local health institutions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue</td>
<td>Mitigation/Management Measure</td>
<td>Responsibility for Implementation</td>
<td>Completion Indicator</td>
<td>Frequency of Monitoring</td>
<td>Cost</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------</td>
<td>----------------------</td>
<td>------------------------</td>
<td>---------------------</td>
</tr>
</tbody>
</table>
| Security Risks (Section 9.2.13)                                       | *Security*  
  - The Contractor in liaison with the Contracting Authority (KURA), should develop and implement an appropriate recruitment plan. As part of the recruitment plan, it should be clear that recruitment at the gate/Project site is prohibited to avoid attracting unemployed people to the Project site.  
  - Recruitment of all the Project workers (including casual workers) must be done through formal processes such as through the office of the Chief and County administrators.  
  - All prospective Project workers should undergo a security screen to avoid employing convicted criminals. Consultations with the local leaders have indicated that this can be through obtaining of a recommendation letter from the Location Chief.  
  - The Contractor in liaison with the local security operatives should develop and implement a Project Security Management Plan to protect the Project equipment and workers.  
  - The Project should continue to undertake engagement and consultations with the local stakeholders as per the Stakeholder Engagement Plan (SEP).  
  - During construction, an Emergency Preparedness and Response Plan (including security emergencies) should be prepared and implemented by the Contractor. | Contractor  
  - KURA  
  - Ministry of Interior and Coordination of National Government | Security Management Plan  
  - Emergency Preparedness and Response Plan | Monthly | Internal costs |
| Increased Infestation of Invasive Alien Plants (Section 9.2.15)       | *Minimisation Measures*  
  - An invasive weed management plan will be developed for the Project to guide the control of IAPs. | Contractor | No noticeable increase in the spread of observed *Lantana camara* | Throughout the construction and first five years of the operations phase. | Internal costs |
|                                                                      | *Control Measures*  
  - Biological control measures would only be applied if these specific measures have been approved for application in Kenya. | | | | |
<table>
<thead>
<tr>
<th>Issue</th>
<th>Mitigation/Management Measure</th>
<th>Responsibility for Implementation</th>
<th>Completion Indicator</th>
<th>Frequency of Monitoring</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Alternatively, labour intensive manual control of IAPs would be applied in preference to application of herbicides or other chemicals.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ All alien vegetative and/or seed bearing material that is removed through control measures should be burnt on site to prevent the distribution of seed and fertile vegetative material, regardless of the status of the surrounding areas.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Vehicles and construction equipment should be washed on a regular basis and should be kept clean to minimise distribution of seeds and invasive plant material.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Tyre checks of vehicles should be conducted daily to check that seeds, thorns and vegetative material is not being distributed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Tyre checks of vehicles should be conducted prior to entry into protected areas.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Source areas such as quarries, borrow pits, vehicle parking and Construction Camps should be kept clean of IAPs to minimise the presence of seeds that can be dispersed unintentionally.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Rehabilitation Measures**
- Disturbed areas would need to be rehabilitated at the earliest opportunity to minimise the establishment of IAPs.
- Regular and ongoing monitoring of the presence of IAP should be conducted within construction and rehabilitated sites and IAP removal operations implemented according to the results, based on areas as per the above objectives.

**Operations Phase**

**General**
- Develop and implement an operational phase Environment, Health and Safety (EHS) Management Plan meeting the conditions set out in the environmental authorisation, as well as this ESIA PR and lender requirements.

<table>
<thead>
<tr>
<th>Impact Area</th>
<th>Responsibility</th>
<th>Frequency</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impacts on Noise Environment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Noise</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ In liaison with the traffic police and/or appropriate authorities, enforce speed limits. Appropriate signage along the road</td>
<td>Contractor (for the first 8 years)</td>
<td>Daily</td>
<td>No additional costs</td>
</tr>
<tr>
<td>Issue</td>
<td>Mitigation/Management Measure</td>
<td>Responsibility for Implementation</td>
<td>Completion Indicator</td>
</tr>
<tr>
<td>-------</td>
<td>--------------------------------</td>
<td>---------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td></td>
<td>routes indicating the speed limit to be enforced, is to be adequately displayed.</td>
<td>Maintenance Contractor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ At rumble strips and speed bumps, the drivers will be required to steadily reduce speed to avoid unnecessary generation of noise.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ The Contracting Authority (KURA) should consult with other organisations including the Police to ensure they are aware of how the road will function when operational e.g. avoidance of trucks/trailers, etc. so that these organisations can consider this in their emergency response planning.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ The Contractor should not open the Project Roads until all safety measures and controls are in place to avoid confusion in the future over the use of the road for local vehicles etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impacts on Employment, Procurement and the Economy (Section 9.3.4)</td>
<td>Employment/Procurement</td>
<td>Contractor (for the first 8 years)</td>
<td>Harmony between the Project and the County Physical Development Plan</td>
</tr>
<tr>
<td></td>
<td>▪ Integrate the developments along the Project Roads with the County Physical Development Plan</td>
<td>KURA (for the rest of the operations phase)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Maintenance Contractor</td>
<td>Maintenance Contractor</td>
<td></td>
</tr>
<tr>
<td>Traffic Impacts (Section 9.4.2)</td>
<td>Traffic Control</td>
<td>Contractor (for the first 8 years)</td>
<td>Incident records</td>
</tr>
<tr>
<td></td>
<td>▪ In liaison with the traffic police and/or appropriate authorities, enforce speed limits. Appropriate signage along the road routes indicating the speed limit to be enforced, is to be adequately displayed.</td>
<td>KURA (for the rest of the operations phase)</td>
<td>Records of complaints</td>
</tr>
<tr>
<td></td>
<td>▪ A grievance procedure should be established whereby any complaints by neighbours or affected parties are recorded and responded to.</td>
<td>Maintenance Contractor</td>
<td>Traffic Management Plan</td>
</tr>
<tr>
<td></td>
<td>▪ The Contracting Authority (KURA) in liaison with NTSA will set appropriate speed limits for the Project Roads; the traffic police should enforce observance of the set speed limits.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Maintenance of the road to prevent mechanical failure of vehicles due to poor road conditions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue</td>
<td>Mitigation/Management Measure</td>
<td>Responsibility for Implementation</td>
<td>Completion Indicator</td>
</tr>
<tr>
<td>-------</td>
<td>--------------------------------</td>
<td>----------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>All Project Phases</td>
<td><strong>Leaks/Spills</strong></td>
<td>Contractor (during construction and the first 8 years of operations phase)</td>
<td>An appropriate Spill Management Plan</td>
</tr>
<tr>
<td></td>
<td>All Project equipment and machinery will be properly maintained as per the manufacturer’s recommendations. In particular, the status of fuel and oil tanks will be checked regularly.</td>
<td>KURA (for the rest of the operations phase)</td>
<td>Records of accidental leaks/spillages</td>
</tr>
<tr>
<td></td>
<td>At the start of every work day, Project vehicles and equipment will be checked for spills and leakages.</td>
<td>Maintenance Contractor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Project equipment and machinery will be serviced off site at approved/licensed vehicle and equipment service stations.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fuel, oil and used oil storage areas will be contained in bunds of 110% capacity of the stored material. Fuels will be stored in above-ground storage tanks.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spill containment and clean up kits will be available on-site and clean-up from any leakage or spill will be appropriately contained and disposed of.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Contractor will develop a Spill Management Plan which will be implemented in case of any spills.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
10.3 Topic Specific Management Plans

The following Sections present the specific management plans foreseen for construction and operations, based on the outcomes of the impact assessment. Please note that this is in addition to the SEP which has been prepared during the ESIA process (Appendix B).

10.3.1 Waste Management Plan

The Waste Management Plan (WMP) will be developed to manage solid and liquid wastes and to avoid any discharges into the soil or water for both the construction and operations phases. It will establish procedures for the storage, collection and disposal of waste, including liquid and solid waste, as well as hazardous and non-hazardous waste.

The WMP will provide for the following:

- Compliance with the Environmental Management and Coordination (Waste Management) Regulations of 2006;
- Compliance with the National Solid Waste Management Strategy, 2015;
- Compliance with the National Environment Policy, 2014;
- Outline of waste characteristics and sufficient capacity for managing different waste streams and waste quantities; and
- The WMP will be developed following KURA’s Policies, and will consider IFC PS 3.

Furthermore, it will contribute to ensuring that the capacity and the nature of waste collection and treatment systems are in line with the wastes to be managed.

The overall objective is to minimise impact of waste generated during the construction and operational phases through the following:

- minimise the amount of waste that is generated;
- maximise the amount of waste that is recovered for recycling – including segregation of recyclable wastes at source;
- minimise the amount of waste that is deposited at landfill;
- ensure any hazardous wastes (e.g. used oils) are securely stored and transferred to appropriate facilities;
- avoid dust impacts from handling of construction wastes;
- ensure all wastes are properly contained, labelled and disposed of in accordance with local regulations; and
- ensure waste is disposed of in accordance with the waste management hierarchy. In particular, solid waste should be disposed of at the Murang’a County solid waste disposal site.

10.3.2 Emergency Response Plan

The Emergency Response Plan (ERP) will assemble and describe in one document the site-specific actions and procedures to be taken in emergency situations occurring during construction and operational phases.

The objective of the ERP is to be prepared to respond to process upset, accidental, and emergency situations in a manner appropriate to the operational risks and to prevent their potential negative
The ERP will clearly make a distinction between all the project phases, since the actions to be undertaken will be different during the construction, operations and decommissioning phases.

The content of the ERP can be summarized as follows:

- Kenyan legal provisions on civil emergencies;
- The identification of the potential hazards (i.e. natural disasters, civil disturbances, fire or explosions, malfunctioning of the devices during the processes, pressure issues, etc.) related with the Project Roads and its construction and operations and the possible impact to the environment and health;
- Identification of the governmental authorities, the media and other relevant stakeholders to be notified and description of the procedures for communicating with them;
- The necessary measures to limit human and environmental consequences associated with project related accidents; co-operation between the Contractor, local and central authorities, as well as the local community;
- Safety technical measures to be described and appropriate measures to protect the public safety or property from potential hazards;
- Preliminary description of the organization structure, and explain interactions with Project and operational procedures;
- Preliminary identification of the system and procedures for providing personnel refuge, evacuation, rescue, medical treatment and repatriation; and
- Preliminary description of training activities and the arrangement for training response teams and for testing emergency systems and procedures.

Finally, the Plan shall include provisions for the training of all workers on the emergency response procedures, and will include procedures related to communication to stakeholders and community improvement opportunities.

**10.3.3 Water Management Plan**

The Water Management Plan will have the following objectives:

- Monitor water use: the Plan will set procedures for estimating water used by the Project, identifying activities that use this resource and following a reporting procedure for registering used volumes of water;
- Minimize water use: the Plan will provide a series of measures to be considered for minimising the use of water;
- Document water sources and extraction locations: water sources to be used will be agreed in advance with the relevant local authorities;
- Sources of water will be identified and registered in the Plan, together with the GPS co-ordinates and the maximum water volumes allowed from the source; and
- Record all communications with Water Authorities.

The Water Management Plan will be developed following KURA’s policies and will consider all the relevant IFC PSs.
Finally, the Plan will include provisions for the training of all workers on how to minimise the use of water.

### 10.3.4 Traffic Management Plan

A Traffic Management Plan (TMP) will be developed to manage traffic attributed to the Project, minimise traffic disruption and road user delay and provide for the on-going safety of road users, including pedestrians and cyclists. All of the traffic related impacts described previously can be mitigated very effectively by the implementation of standard best practices in terms of environmental controls and management practices during construction. These measures will be detailed in the TMP, which will describe in detail the measures that the Contractor will implement during the construction of the Project.

The key issues that will be addressed by the TMP in terms of mitigation measures will include:

- Access to construction areas;
- Routing of construction traffic;
- Prevention of road user delay;
- Temporary traffic control and management;
- Reducing the probability of traffic accidents and improving safety for road users and others;
- Preventing and remediying road degradation;
- Road crossings; and
- Parking facilities.

The Contractor shall regularly update their TMP as their construction methods are developed and vehicle movement requirements are identified in detail. The Contractor will consult with the principal representative of any communities that will suffer a significant increase in traffic in order to develop awareness of the mitigation measures within the TMP.

A TMP is important both in ensuring the safety of construction personnel and local communities. The TMP is intended to be a ‘live’ document and its traffic management principles will form the basis for subsequent detailed construction traffic management arrangements between the appointed Contractor and the road authorities.

The TMP will include the following minimum requirements:

- Levels of development related to traffic that will use this road network;
- Identification of key sensitivities along proposed access routes;
- Identification, demarcation and construction of access routes;
- Measures to provide for the on-going safety of road users, including pedestrians and cyclists;
- Project driver training requirements with respect to road safety and environment;
- Project Schedule;
- Roles and responsibilities for implementation of the TMP;
- Measures to prohibit “off-route” driving;
- Speed limits and methods of enforcement;
- Means to inform the community of traffic risks;
10.3.5 Health and Safety Management Plan

The Health and Safety (H&S) Management Plan will be a tool that will provide a framework for the following:

- Planning for Health and Safety;
- Accident and Incident Investigation; and
- Health and Safety Auditing.

The H&S Management Plan will be developed following all the relevant IFC PSs. The H&S Management Plan will include, at a minimum, the following elements:

- KURA’s HSE Policy.
- H&S Organisation: detailed organisation chart and description of roles and responsibilities associated to managing H&S. The organization proposed in the Plan will take into account the competency of the proposed professionals, and will provide mechanisms to ensure cooperation and communication between the H&S management team members.
- H&S Standards, including: site safety inductions; hazards identification and risk assessment, including task analysis and construction hazards; H&S targets, and a procedure for safety performance evaluation and review; emergency procedures; toolbox meeting procedure; site visit registers; and MSDS sheet register.
- Accidents and Incidents, including: definitions; reporting and registering procedures; root-cause analysis.
- H&S Auditing, including the following: auditing plan; setting audit objectives and measuring H&S performance; site safety inspection checklists and first-aid equipment checklist.

The Plan will include provisions for the training of all workers and will include procedures related to communication to stakeholders and community improvement opportunities.

10.3.6 Workers Code of Conduct

The Workers Code of Conduct will set out the KURA and the Project Consortium’s expectations of the workers’ behaviour, consistent with the national labour laws and international good practice standards. Specifically, the Workers Code of Conduct will be explicit on the following:

- The scope of the Workers Code of Conduct;
- A requirement by all the Project employees to comply with all the Contractor’s rules and regulations;
- Prohibited and restricted activities at the workplace like drug abuse;
- Respect at the workplace including respect for other Project workers as well as the local community members;
- Protection of Project property;
- Professionalism;
  - Working hours,
  - Personal appearance,
  - Leave policy,
  - Absenteeism and tardiness,
  - Conflict of Interest,
  - Pronouncement on giving and receiving gifts,
  - Confidentiality, and
  - Communication.
- Contractor’s pronouncement on all forms of harassment;
- Grievance management; and
- Discipline of workers who bleach the requirements of the Contractor’s Code of Conduct.

10.4 Roles and Responsibilities

10.4.1 Contractual Obligation

In order to ensure that this ESMMP and/or derivatives thereof are enforced and implemented, these documents must be given legal standing. This shall be achieved through incorporating the ESMMP and/or derivative documents as an addendum to the contract documents for the Project Consortium and sub-contractors (if any) and specifying that the requirements of this ESMMP and/or derivative documents apply and must be met (as a supplement since the Consortium Agreement is already signed). This will ensure that the obligations are clearly communicated to Contractors.

10.4.2 Responsibilities and Duties

10.4.2.1 The Contracting Authority (KURA)

The Contracting Authority has overall responsibility for ensuring that the construction and development of the Project is undertaken in an environmentally sound and responsible manner, and in particular, reflects the requirements and specifications of the ESMMP and recommendations from the relevant authorities.

The responsibilities of the Contracting Authority will include:

- Appoint or designate a suitably qualified Project Manager to manage the implementation of the proposed Project;
- Appoint the Project Contractor (already completed);
- Establish and maintain regular and proactive communications with the designated/appointed PM Contractor(s) and Environmental Compliance Officer (ECO); and
- Ensure that the ESMMP is reviewed and updated as necessary.
Reporting Structure

The Contracting Authority will liaise with and/or take instruction from the following:

- Government/regulatory authorities such as NEMA; and
- General Public.

10.4.2.2 Contracting Authority’s Project Manager (PM)

The primary role of the PM is to ensure that the Contractor and Contracting Authority’s staff complies with the environmental specifications in the ESMMP. The PM shall further:

- Oversee the general compliance of the Contractor with the ESMMP and other pertinent site specifications; and
- Liaise with the Contractor and ECO on environmental matters, as well as any pertinent engineering matters where these may have environmental consequences.

In addition the PM shall:

- Designate or appoint a suitably qualified Environmental Manager (EM) that will manage all environmental aspects on behalf of the PM and the Project Proponent;
- Review and approve Method Statements produced by the Contractor in connection with the ESMMP;
- Assume overall responsibility for the effective implementation and administration of the ESMMP;
- Be familiar with the contents of the ESMMP, and his/her role and responsibilities as defined therein;
- Ensure that the ESMMP is included in the Contractor’s contract;
- Communicate to the Contractor, verbally and in writing, the advice of the ECO and the contents of the ECO reports;
- In conjunction with the Construction Supervisor; undertake regular inspections of the Contractor’s site as well as the installation works in order to check for compliance with the ESMMP in terms of the specifications outlined therein. Inspections shall take place at least once a week and copies of the monitoring checklist contained in the file;
- Review and approve drawings produced by the Contractor or professional team in connection with, for example, the construction site layout, access/haul roads, etc.;
- Issue site instructions giving effect to the ECO requirements where necessary;
- Keep a register of all complaints and incidents (spills, injuries, legal transgressions, etc.) and other documentation related to the ESMMP;
- Report to the ECO any problems (or complaints) which cannot first be resolved in co-operation with the Contractor(s);
- Implement recommendations of possible audits;
- Implement Temporary Work Stoppages as advised by the ECO, where serious environmental infringements and non-compliances have occurred;
Facilitate proactive communication between all role-players in the interests of effective environmental management; and

Ensure that construction staff is trained in accordance with requirements of the ESMMP.

**Reporting Structure**

The PM will report to the Contracting Authority (KURA), as and when required.

**10.4.2.3 Contracting Authority’s Environmental Control Officer (ECO)**

Through the PM the Project Proponent will appointed an independent ECO to monitor and oversee implementation of the ESMMP for the proposed construction works. The ECO is independent from the Project Proponent, the PM and the Contractor(s). The ECO is given authority to ensure that the ESMMP is fully implemented and that appropriate actions are undertaken to address any discrepancies and non-compliances.

The role of the ECO shall be to:

- Act as site ‘custodian’ for the implementation, integration and maintenance of the ESMMP in accordance with the contractual requirements;
- Ensure successful implementation of the ESMMP; and
- Ensure that the Contractor, his employees and/or sub-contractors receive the appropriate environmental awareness training prior to commencing activities.

The responsibilities of the ECO will be to:

- Liaise with the PM on the level of compliance with the ESMMP achieved by the Contractor on a regular basis for the duration of the contract;
- Advise the PM on the interpretation and enforcement of the Environmental Specifications (ES), including evaluation of non-compliances;
- Supply environmental information as and when required;
- Review and approve Method Statements produced by the Contractor, in conjunction with the PM;
- Demarcate particularly sensitive areas (including all No-Go areas) and to pass instructions through the PM concerning works in these areas;
- Monitor any basic physical changes to the environment as a consequence of the construction works according to an audit schedule;
- Attend regular site meetings and project steering committee meetings;
- Undertake regular monthly audits of the construction works and to generate monthly audit reports. These reports are to be forwarded to the PM who will communicate the results and conclusions with the Project Proponent;
- Communicate frequently and openly with the Contractor and the PM to ensure effective, proactive environmental management, with the overall objective of preventing or reducing negative environmental impacts and/or enhancing positive environmental impacts;
- Advise the PM on remedial actions for the protection of the environment in the event of any accidents or emergencies during construction, and to advise on appropriate clean-up activities;
Review complaints received and make instructions as necessary; and

Identify and make recommendations for minor amendments to the ESMMP as and when appropriate.

**Reporting Structure**

The ECO will report to the PM, who in turn will report to the Contracting Authority.

**10.4.2.4 Contractor (Mota Engil Africa and Lee Construction Limited)**

The Contractor will implement the development. The Contractor will be contractually required to undertake their activities in an environmentally responsible manner, as described in the ESMMP.

The role of the Contractor shall be to:

- Ensure that the environmental specifications of this document (including any revisions, additions or amendments) are effectively implemented. This includes the on-site implementation of steps to mitigate environmental impacts;
- Preserve the natural environment by limiting any destructive actions on site;
- Ensure that suitable records are kept and that the appropriate documentation is available to the PM;
- Take into consideration the legal rights of the individual Landowners, Communities and Project Proponent’s staff;
- Ensure quality in all work done, technical and environmental;
- Underwrite the Project Proponent’s Environmental Policy at all times, and
- Ensure that all sub-contractors and other workers appointed by the Contractor are complying with and implementing the ESMMP during the duration of their specific contracts.

The responsibilities of the Contractor will be to:

- Discuss implementation of and compliance with this document with staff at routine site meetings;
- Designate, appoint and/or assign tasks to personnel who will be responsible for managing all or parts of the ESMMP. The Contractor must appoint or designate a Safety, Health, Environment and Quality Officer (SHEQO) to monitor daily implementation of the ESMMP on the Contractor’s behalf as a minimum;
- Monitor environmental performance and conformance with the specifications contained in this document during site inspections;
- Report progress towards implementation of and non-conformances with this document at site meetings with the PM;
- Advise the PM of any incidents or emergencies on site, together with a record of action taken;
- Report and record all accidents and incidents resulting in injury or death; and
- Resolve problems and claims arising from damage immediately to ensure a smooth flow of operations.
Reporting Structure

The Contractor will report to the PM and ECO, as and when required.

10.4.2.5 Sub-contractors

The Contractor may from time to time appoint sub-contractors.

The role of the sub-contractors shall be to:

- Perform certain services and/or provide certain products on behalf of the Contractor. The sub-contractors will be contractually required to undertake their activities in an environmentally responsible manner, as described in the ESMMP; and
- Ensure environmental awareness among employees so that they are fully aware of, and understand the Environmental Specifications and the need for them.

The responsibilities of the sub-contractor will be to:

- Be familiar with the contents of the ESMMP, and his/her roles and responsibilities as defined therein;
- Comply with the Environmental Specifications in the ESMMP and associated instructions issued by the Contractor to ensure compliance;
- Notify the Contractor verbally and in writing, immediately in the event of any accidental infringements of the Environmental Specifications and ensure appropriate remedial action is taken; and
- Notify the Contractor, verbally and in writing at least 10 working days in advance of any activity he/she has reason to believe may have significant adverse environmental impacts, so that mitigation measures may be implemented timeously.

Reporting Structure

Sub-contractors will report to and receive instructions from the Contractor (Mota Engil Africa and Lee Construction).

10.4.3 Monitoring

10.4.3.1 Undertaking Audits

The PM shall appoint a qualified and experienced ECO to ensure implementation of and adherence to the ESMMP.

The ECO shall conduct audits 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 and the Method Statements being used are the up to date versions.
- Variations to the ESMMP, Method Statements and non-compliances and corrective actions are documented.
- Emergency procedures are in place and effectively communicated to personnel.
The audit programme shall consist of the following at a minimum:

- First audit no later than 1 month after construction commences;
- Thereafter audits at monthly intervals, at a minimum;
- An audit one week prior to practical completion of the project is granted; and
- A post construction audit within 1 week after the Contractor has moved off site.

10.4.3.2 Compliance with the ESMMP

The Contractor and/or his agents are deemed not to have complied with the ESMMP and remedial action if:

- There is evidence of contravention of the ESMMP clauses within the boundaries of the site or extensions;
- Environmental damage ensues due to negligence; and
- The Contractor fails to comply with corrective or other instructions issued by the PM, within a time period specified by the PM.
11. CONCLUSIONS AND RECOMMENDATIONS

11.1 Conclusions

The ESIA process undertaken has identified and assessed a range of potential impacts to the physical, biological and socio-economic environments. Where impacts have been identified, mitigation measures to manage those impacts have been provided in this ESIA Project Report. With most of the identified impacts, mitigation will reduce the significance of such impacts to a minor or negligible level, but with some impacts, even with mitigation, residual impacts will only be reduced to a moderate level mainly due to the location of the Project Roads in Murang’a Municipality where Murang’a Town is located (the County’s commercial and administrative centre). The analysis of these impacts is briefly summarised in Section 11.2. The mitigation measures provided and the management of residual impacts are described in a suite of Management Plans in the ESMMP, and an ESMS has been described as a vehicle for the continued integrated management of all such impacts.

11.2 Key Impacts

A summary of the key impacts whose significance can only be minimised to a moderate level, even after the application of the appropriate mitigation measures, and which will require careful and consistent ongoing management during Project implementation, are provided below.

- **Impacts on the Noise Environment (including vibrations) during both the Construction and Operations Phase** – The main source of noise and vibrations will be attributed to the heavy construction machinery and construction vehicles that will be used during the construction phase; however, there will be no blasting at the Project site. For general construction activities, the potential for building damage (usually only cosmetic damage) is likely to be limited to a distance of less than 50 m from the construction activity. Moderate significant impacts may occur within this distance. There are structures (both residential and commercial) within a distance of 50 m from the Project Roads.

  The main source of noise and vibrations during the operations phase will be attributed to the increased traffic volumes along the Project Roads.

  The recommended management measures aim at reducing the intensity of emitted noise and vibrations during the construction phase. However, it is recommended that noise and vibration monitoring is periodically conducted during the construction phase and if excessive levels are recorded at sensitive receptors, additional measures will need to be devised and implemented to reduce the effects to acceptable levels. During the operations phase, the police in liaison with the Contractor (for the first eight years) and Project Developer will need to enforce the traffic laws.

- **Impacts on Water Quality and Flow during the Construction Phase** – The construction phase will be associated with earthwork activities including excavations which has a potential of damaging the domestic water supply and sewer network thus contaminating the water supply system. Excavated material; if not well managed; will be eroded during rainy seasons, and may potentially flow into the rivers Mathioya, Maragua and Kaihungu, and their tributaries, and cause sedimentation, which will further increase the concentration of suspended solids and turbidity already observed in the river. Another potential source of water contamination will be from small scale leaks and spills of petroleum products (fuel, oil, etc.) from Project machinery and fuel storage tanks (if applicable), e.g., due to accidental damage and/or improper maintenance. The paved road and improved drainage system will direct stormwater into the drainage channels thus increasing the volume and ultimately rate of flow of guided stormwater. There is uncertainty about effective management of impacts on water quality and flow once it has occurred; therefore, the recommended mitigation measures aim at preventing the occurrence of this impact. However, it is recommended that this is continuously monitored throughout the construction phase so that this impact does not occur...
beyond acceptable levels, and that appropriate measures are devised and implemented to further reduce it to acceptable levels. This may include temporarily suspending construction activities during intense rainy periods.

- **Impact on Community Service Infrastructure (Domestic Water Supply and, Electricity Transmission and Distribution) Network** – In order to pave way for the construction activities, the community service infrastructure within the road corridor ((domestic water supply and electricity transmission and distribution networks) will be relocated by the Contracting Authority (KURA) where possible as part of the easement process. During this process, the customers supplied by the affected networks may suffer short term temporary disruptions to the provided services. In practice, the water supply network that crosses the Project Roads will only be relocated during the carrying out of the construction activities since they will need to be temporarily removed and buried again to ensure that the customers on the opposite side of the road continue to access potable water after the construction phase disruptions. Relocation of electricity infrastructure is anticipated to be undertaken prior to the commencement of the construction activities. Another cause of the impact on water supply will be water abstraction to meet the Project’s water needs. This impact cannot be avoided since the community service infrastructure within the Project footprint has to be relocated. Therefore, the recommended mitigation measures aim at minimising the period of disruption as much as possible. Any activities that have a potential of disrupting the functioning of the community service infrastructure will need to be swiftly implemented with utmost care and closely monitored. In particular, relocation schedules must be prepared, communicated timeously to the affected stakeholders and followed as much as possible during the implementation of the relocation activities.

- **Traffic Impacts** – During the construction phase, it is expected that there will be increased vehicle movements in the Project area, as trucks will be required to transport materials and equipment. During the construction phase, residents will be disrupted and inconvenienced by detours, local road closures, safety hazards such as deep excavations, especially at the junctions of access roads to their homes and business units, and by increased road traffic within the Project area, which will be exacerbated by heavy Project equipment and vehicles, and temporary blockages/reduced traffic flow along emergency services routes. The recommended mitigation measures aim at minimising these disruptions as much as possible; however, community sensitisation is paramount to enable the affected parties to adapt to the changes as they wait for the completion of the upgrade activities and begin to enjoy a better road.

### 11.3 Recommendations

ERM is confident that every effort will be made by the Contracting Authority and Contractor to accommodate the mitigation measures recommended during the ESIA process to the extent that is practically possible, without compromising the economic viability of the Project or having a lasting impact on the environment. The implementation of the mitigation measures detailed in Chapters 9 and listed in the ESMMP (Chapter 10) will provide a basis for ensuring that the potential positive and negative impacts associated with the establishment of the development are enhanced and mitigated, respectively, to a level which is deemed adequate for the development to proceed.

In summary, based on the findings of this assessment, ERM finds no reason why the Project Roads, should not be authorised, contingent on the mitigations and monitoring for potential environmental and socio-economic impacts as outlined in the ESMMP.
12. REFERENCES


IFC, 2012: IFC Performance Standards on Environmental and Social Sustainability.

IFC, 2012: Policy on Social and Environmental Sustainability.


APPENDIX A  ERM NEMA REGISTRATION AND PRACTICING LICENSE FOR 2019
NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)
THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT
CERTIFICATE OF REGISTRATION AS AN ENVIRONMENTAL IMPACT ASSESSMENT/ AUDIT EXPERT

Certificate No: NEMA/EIA/RC/572
Application Reference No: NEMA/EIA/ER/1915

This is to certify M/s Environmental Resource Management East Africa Ltd (ERM) of P.O Box 100798 - 00101 Nairobi (Address) has been registered as an Environmental Impact Assessment Expert in accordance with the provisions of the Environmental Management and Coordination Act and is authorized to practice in the capacity of a Lead Expert/Associate Expert/Firm of Experts

Type of Experts (Type) Firm of Experts

Expert Registration No: 7264

Issued Date: 9/16/2014

Signature
(Seal)

Director-General
The National Environmental Management Authority

P. T. O.

ISO 9001: 2008 Certified
NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)
THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT
ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE
License No: NEMA/EIA/ERPL/9130
Application Reference No: NEMA/EIA/EL/12711

M/S ENVIRONMENTAL RESOURCE MANAGEMENT EAST AFRICA LTD (ERM)
(individual or firm) of address
P.O. Box 29170-00100, Nairobi

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) Firm of Experts
registration number 7264

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

Issued Date: 1/23/2019
Expiry Date: 12/31/2019

Signature...

(Seal)
Director General
The National Environment Management Authority

P.T.O.
APPENDIX B   STAKEHOLDER ENGAGEMENT PLAN (SEP)
Rehabilitation of Lot 15 and 18 annuity programme roads in Laikipia, Nyeri, Kirinyaga, Embu, Muranga, Tharaka Nithi, Vihiga, Kakamega, Bungoma and Busia Counties, Kenya

Stakeholder Engagement Plan (SEP) – Final Version

19 August 2019
Project No.: 0410731
<table>
<thead>
<tr>
<th>Document title</th>
<th>Rehabilitation of Lot 15 and 18 annuity programme roads in Laikipia, Nyeri, Kirinyaga, Embu, Muranga, Tharaka Nithi, Vihiga, Kakamega, Bungoma and Busia Counties, Kenya</th>
</tr>
</thead>
<tbody>
<tr>
<td>Document subtitle</td>
<td>Stakeholder Engagement Plan (SEP) – Final Version</td>
</tr>
<tr>
<td>Project No.</td>
<td>0410731</td>
</tr>
<tr>
<td>Date</td>
<td>19 August 2019</td>
</tr>
<tr>
<td>Version</td>
<td>2.0</td>
</tr>
<tr>
<td>Author</td>
<td>As per Document history below</td>
</tr>
<tr>
<td>Client Name</td>
<td>Mota – Engil Africa</td>
</tr>
</tbody>
</table>

### Document history

<table>
<thead>
<tr>
<th>Version</th>
<th>Revision</th>
<th>Author</th>
<th>Reviewed by</th>
<th>Name</th>
<th>Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0: Draft 1</td>
<td>00</td>
<td>Gideon Owaga</td>
<td>Barnabas Busheshe</td>
<td>Mike Everett</td>
<td>08.08.2019</td>
<td>Draft issued to client for review</td>
</tr>
<tr>
<td>2.0: Draft 2</td>
<td>01</td>
<td>Gideon Owaga</td>
<td>Barnabas Busheshe</td>
<td>Mike Everett</td>
<td>14.08.2019</td>
<td>Draft 2 for Contracting Authority (KURA) and Lender Review</td>
</tr>
<tr>
<td>3.0: Final Copy</td>
<td>02</td>
<td>Gideon Owaga</td>
<td>Barnabas Busheshe</td>
<td>Mike Everett</td>
<td>19.08.2019</td>
<td>Final Copy of the ESIA Project Report for Submission to NEMA</td>
</tr>
</tbody>
</table>
CONTENTS

B1. INTRODUCTION .......................................................................................................................... 1
   B1.1 Overview ........................................................................................................................................ 1
   B1.2 Purpose of the Stakeholder Engagement Plan .............................................................................. 1
   B1.3 Objectives of the Stakeholder Engagement ................................................................................... 3
   B1.4 Structure of the SEP ...................................................................................................................... 4

B2. KEY STANDARDS AND LEGISLATION GUIDING STAKEHOLDER ENGAGEMENT ............. 6
   B2.1 Introduction .................................................................................................................................... 6
   B2.2 Kenyan Legislative Requirements ............................................................................................... .. 6
      B2.2.1 The Kenyan Constitution ............................................................................................... 6
      B2.2.2 Environmental Legislation ............................................................................................. 6
   B2.3 International Requirements ............................................................................................................ 6
      B2.3.1 IFC Performance Standards on Environmental and Social Sustainability ..................... 6

B3. PROJECT STAKEHOLDERS ...................................................................................................... 8
   B3.1 Introduction .................................................................................................................................... 8
   B3.2 Stakeholder Identification ............................................................................................................... 8
   B3.3 Stakeholder Analysis ...................................................................................................................... 9

B4. APPROACH TO STAKEHOLDER ENGAGEMENT .................................................................. 17
   B4.1 Basic Principles of stakeholder Engagement ............................................................................... 17
   B4.2 Communication Methods ......................................................................................................... .... 17

B5. OUTCOMES OF STAKEHOLDER ENGAGEMENTS TO DATE .............................................. 20

B6. NEXT STEPS IN THE STAKEHOLDER ENGAGEMENT PROCESS ..................................... 21

B7. PROJECT GRIEVANCE MECHANISM ..................................................................................... 22
   B7.1 Purpose ........................................................................................................................................... 22
   B7.2 Grievance Principals ....................................................................................................................... 22
   B7.3 Process ......................................................................................................................................... 22
      B7.3.1 Receiving and Recording the Grievances ................................................................... 23
      B7.3.2 Site Inspection, Investigation and Resolution ............................................................. 23
      B7.3.3 Response .................................................................................................................... 23
      B7.3.4 Monitoring and Evaluation .......................................................................................... 23
   B7.4 Roles and Responsibilities ........................................................................................................... 24
   B7.5 Review of the Grievance Log ....................................................................................................... 24

B8. MONITORING AND REPORTING ............................................................................................. 25
B1. INTRODUCTION

B1.1 Overview

The Government of the Republic of Kenya, through the Ministry of Transport and Infrastructure, and represented by the Kenya Urban Roads Authority (KURA), has formed a Public Private Partnership with the appointed consortium comprising of Lee Construction Limited (LCL), Cape Consult Limited (CCL) and Mota-Engil Engenharia e Construção (Engineering and Construction) Africa (“MEECA” or Mota-Engil Africa) (hereafter referred to as the Project Developer) to design, finance, construct and maintain urban roads in the Kenya Roads Annuity Programme, comprising Lot 15 (a total of 10 urban roads spread through six counties of Kenya, namely Nyeri, Laikipia, Kirinyaga, Embu, Muranga and Tharaka Nithi) and Lot 18 (a total of six urban roads spread through four counties in Kenya, namely Kakamega, Vihiga, Bungoma and Busia). All the Project Roads in these lots (Lot 15 and Lot 18) are existing murram/gravel roads located in largely urbanised areas which will be upgraded (paved, walkaways added as well as the construction of effective drainage system) as part of the scope required of the Annuity programme (Figure 1.1 and Figure 1.2). It is understood that LCL and MEECA will be the construction Contractor for the Project Roads.

This Stakeholder Engagement Plan (SEP) therefore maps out the plan for engaging stakeholders as part of the ESIA as well as the required post ESIA Stakeholder Engagement activities.

Stakeholder engagement refers to a process of sharing information and knowledge, seeking to understand and respond to the concerns of potentially impacted or affected individuals, and building relationships based on trust. As such, stakeholder engagement is essential for the successful implementation of not only the ESIA, but the Project itself.

Where necessary, this SEP makes references to Appendices C and D where specific details of minutes of the stakeholder engagement meetings conducted during the ESIA process, meeting photos, attendance registers, and developed stakeholder engagement database are presented. Therefore, where required, these Appendices should be read, reviewed and updated jointly during the next stages of Project development and implementation.

B1.2 Purpose of the Stakeholder Engagement Plan

The purpose of the SEP is to ensure that a consistent, comprehensive, coordinated and culturally appropriate approach is taken to stakeholder management and public disclosure. The SEP is prepared in accordance with national legislation and Lenders’ requirements and therefore aims to ensure engagement that is free of manipulation, interference, coercion and intimidation. This SEP:

- Outlines the approach and plans to be adopted and implemented to engagement, showing how the engagement process will integrate into the rest of the ESIA processes;
- Identifies stakeholders and mechanisms through which they will be included in the process;
- Serves as a way to document the processes; and
- Identifies the requirements for the Proponent (in this case the Contracting Authority and Contractor) and their engagement process.
INTRODUCTION

Figure 1.1 General Locality Map for Lot 15
Stakeholder engagement should be undertaken for the Project throughout the planning, construction, operation and decommissioning phases. This plan focuses on consultation and disclosure activities undertaken during the development of the ESIA Project Report.

The SEP for the Project is a “living document” that will be updated and adjusted as the Project planning evolves. It thus provides and will continue to provide a framework to manage effective and meaningful engagement with stakeholders.

**B1.3 Objectives of the Stakeholder Engagement**

The objectives of engaging stakeholders and the community during the ESIA process and beyond include:

- **Ensuring understanding:** An open, inclusive and transparent process of culturally appropriate engagement and communication is undertaken to ensure that stakeholders are well informed about the proposed Project as it develops. Information is disclosed as early and as comprehensively as possible and as appropriate.

- **Involving stakeholders in the assessment:** Stakeholders are included in the scoping of issues, the assessment of impacts, the generation of mitigation and management measures and the
finalisation of the ESIA Project Report. They also play an important role in providing local knowledge and information for the baseline to inform the impact assessment.

- **Building relationships:** Through supporting open dialogue, engagements help establish and maintain a productive relationship between the Project and stakeholders. This supports not only an effective ESIA, but also strengthens the existing relationships and builds new relationships between the Proponent (in this case the contracting Authority and Contractor) and stakeholders.

- **Engaging vulnerable peoples:** An open and inclusive approach to consultation increases the opportunity of stakeholders to provide comment on the Project and to voice their concerns. During such a process, stakeholders who need special attention due to their vulnerability are identified for consideration in the next stages of Project development. Such stakeholders normally require special measures to ensure that the perspectives of vulnerability are heard and considered.

- **Managing expectations:** It is important to ensure that the Project does not create or allow unrealistic expectations to develop amongst stakeholders about Project benefits. The engagement process serves as one of the mechanisms for understanding and then managing stakeholder and community expectations, where the latter is achieved by disseminating accurate information in an accessible way.

- **Ensuring compliance:** The process is designed to ensure compliance with both local regulatory requirements and international best practice.

The engagement is designed to:

- be free of external manipulation, coercion or intimidation;
- be undertaken in a timely way and prior to decisions being made so that views of stakeholders can be considered in Project design and development;
- disclose relevant, clear and accessible Project information to enable stakeholders to understand the risks, impacts and opportunities of a Project; and
- provide stakeholders, including any affected communities, with opportunities to express their views on Project risks, impacts and mitigation measures. These will be considered and responded to throughout the engagement process.

**B1.4 Structure of the SEP**

The remainder of the document is structured as follows:

- Chapter B2: outlines the key standards and legislation guiding stakeholder engagement.
- Chapter B 3: presents Project stakeholders identified to date.
- Chapter B 4: outlines the approach to the engagement process.
- Chapter B 5: details the stakeholder engagement activities undertaken to date.
- Chapter B 6: presents the next steps in the stakeholder engagement process.
Chapter B 7: presents the Project grievance mechanism that will be available for the duration of the Project.

Chapter B 8: presents an overview of how records of the process will be kept and monitored.

In addition the SEP is linked to the following appendixes which should be read, reviewed and updated jointly whenever required:

- Appendix C: Background Information Document (BID) used during Stakeholder engagement exercise
- Appendix D: Detailed minutes of stakeholder engagement meetings conducted during the ESIA process, meeting photos and attendance registers
B2. KEY STANDARDS AND LEGISLATION GUIDING STAKEHOLDER ENGAGEMENT

B2.1 Introduction

The stakeholder engagement process has been designed to ensure compliance with Kenyan legislative requirements, as well as the IFC Performance Standards on environmental and social sustainability. This Chapter presents the relevant standards and legislation identifying the key Kenyan and IFC requirements for engagement.

B2.2 Kenyan Legislative Requirements

B2.2.1 The Kenyan Constitution

Part II Section (I) of the Kenyan Constitution encourages public participation in the management, protection and conservation of the environment.

In conducting the ESIA and stakeholder engagement process, the Project is ensuring the effective participation of the public in the Project, as well as identifying potential impacts, and how these can be managed in a manner that strives to protect both the physical and social receiving environments of the Project area.

Ongoing engagement during next stages of Project planning and development will ensure that the public continue to be involved in the protection of the biophysical and social environment.

B2.2.2 Environmental Legislation

B2.2.2.1 The Environmental Management and Coordination Act, 1999, Amended 2015 (EMCA)

Section 59 of EMCA (1999) outlines the stakeholder engagement requirements for both the Contractor and Authorising Authority (KURA).

B2.2.2.2 The Environmental (Impact Assessment and Audit) Regulations, 2003 and 2016

These Regulations outline various requirements with regards to stakeholder engagement. Section 8 and 17 provide specific requirements for stakeholder engagement during the ESIA process.

The legislative requirements outlined in the Regulations specifically relate to stakeholder engagement activities to be conducted during the ESIA process.

B2.3 International Requirements

In addition to aligning to national standards, the Project has committed to meeting international standards, in particular the IFC performance Standards on environmental and social sustainability

B2.3.1 IFC Performance Standards on Environmental and Social Sustainability
The IFC PS on Environmental and Social Sustainability and the IFC Environmental, Health and Safety (EHS) Guidelines, effective since 1 January 2012, are generally accepted as the benchmark of best practice for environmental and social safeguards. These standards include guidelines for engagement.

The IFC Performance Standard 1 requires project proponents (in this case Contracting Authority and Contractor) to engage with affected communities through disclosure of information, consultation, and informed participation, in a manner commensurate with the risks to and impacts on the affected communities. PS1 contains clear requirements for community engagement, disclosure of information and consultation as well as the management of grievances throughout the Project. Box 2.1 below outlines the main requirements for consultation and disclosure under PS1, the umbrella Standard on the Assessment and Management of Environmental and Social Risks and Impacts.

### Box 2.1 Requirements for Public Consultation and Disclosure as per IFC PS1

**Aim:**
To ensure that affected communities are appropriately engaged on issues that could potentially affect them; to build and maintain a constructive relationship with communities; and to establish a grievance mechanism.

**Who to Consult**
Specifically with:
- directly and indirectly affected communities;
- positively and negatively affected communities/individuals;
- those with influence due to local knowledge or political influence;
- elected representatives;
- non-elected community officials and leaders;
- informal/traditional community institutions and/or elders; and
- indigenous peoples, where the Project is identified to have adverse impacts on them, and
- communities in the wider area of influence (AoI).

**When to Consult**
As early as possible or at the latest consultation should begin prior to construction. Consultation should be an on-going process throughout the life of the Project, i.e. iterative. Consultation should also allow for a feedback mechanism where affected people are able to present their concerns and grievances for consideration and redress.

**What to Consult on**
Specifically:
- disclosure of Project information (purpose, nature, scale) throughout the Project lifecycle;
- disclosure on the Action Plan as a result of consultation, with periodic reports to demonstrate implementation;
- risks and impacts of the Project; and
REHABILITATION OF LOT 15 AND 18 ANNUITY PROGRAMME
ROADS IN LAIKIPIA, NYERI, KIRINYAGA, EMBU, MURANGA,
THARAKA NITHI, VIHIGA, KAKAMEGA, BUNGOMA AND BUSIA
COUNTIES, KENYA
Stakeholder Engagement Plan (SEP) – Final Version

PROJECT STAKEHOLDERS

---

- updates on actions and proposed mitigation measures to address impacts and areas of concern for affected communities.

How to Consult

Consultation should:

- be inclusive and culturally appropriate;
- allow for free, prior and informed participation of affected communities;
- be in the language preferred by the affected communities;
- consider the needs of disadvantaged and vulnerable groups;
- be fed into the decision making process including proposed mitigation, sharing of benefits and opportunities;
- be iterative;
- be documented;
- be responsive to community concerns and grievances;
- be easily understood and transparent; and
- allow for differentiated means of engagement particularly for disadvantaged or vulnerable groups.

Where engagement relies substantially upon a community representative the client will aim to ensure that the views of affected communities are communicated, and that the results of consultation are communicated back to the community.

---

B3. PROJECT STAKEHOLDERS

B3.1 Introduction

For the purposes of this SEP, a stakeholder is defined as “any individual or group who is potentially affected by the Project, or who has an interest in the Project and its potential impacts”. It is therefore important to establish which organisations, groups and individuals may be directly or indirectly affected (positively and negatively) by the Project and which might have an interest in the Project.

It should be noted that stakeholder identification is an on-going process, requiring regular review and updating as the Project progresses.

B3.2 Stakeholder Identification

In order to develop an effective SEP it was necessary to determine exactly who the stakeholders are and understand their priorities and objectives in relation to the proposed Project. By classifying and analysing the stance, influence, capacity and interests of stakeholders, it was then possible to develop a SEP that was tailored to the needs of different stakeholder groups.

For the Project, stakeholders have been, and will continue to be identified on an on-going basis by:

- Identifying the different categories of stakeholders who may be affected by or interested in the Project.
- Identifying specific individuals or organisations within each of these categories taking into account:
- the geographical area over which the Project may cause impacts (both positive and negative) over its lifetime, and therefore the localities within which stakeholders could be affected; and
- the nature of the impacts that could arise and therefore the types of government bodies, academic and research institutions and other bodies who may have an interest in these issues.

The details of stakeholders (meeting attendance registers) have been included in Appendix D and it is expected that more stakeholders will be identified and engaged throughout the Project lifecycle. In particular, new stakeholders are expected to come to the attention of the Project through continuing engagement activities, field work and unsolicited contacts made with the Project.

**B3.3 Stakeholder Analysis**

Once stakeholders were identified, a basic analysis was applied to determine the level of engagement necessary to appropriately include them.

*Table 3.1* below details the potential stakeholder groups that might have an interest in or influence over the proposed Project and explains their connections to the proposed Project.

### Table 3.1 Project Stakeholders

<table>
<thead>
<tr>
<th>Stakeholder Category</th>
<th>Stakeholder Group</th>
<th>Connection to the Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Government</td>
<td></td>
<td>National Government are of primary importance in terms of establishing policy, granting permits or other approvals for the Project, and monitoring and enforcing compliance with Kenyan Law throughout all stages of the Project lifecycle.</td>
</tr>
<tr>
<td></td>
<td>National regulatory bodies; and Government agencies</td>
<td></td>
</tr>
<tr>
<td>County Government</td>
<td>County Authorities</td>
<td>County Governments are responsible for implementation of legislation, and development plans and policies at the County level. The County Governments also have a role in issuing permits and processing applications associated with the Project (such as Project design drawings). In addition, the Counties will be impacted by the Project and will need to be kept informed of progress and plans in their area, to consider the Project activities in their policy-making, regulatory and other duties and activities.</td>
</tr>
<tr>
<td>Local Communities</td>
<td></td>
<td>Households and communities that may be directly or indirectly affected by the proposed Project and its activities. This includes people affected by social and/or environmental impacts attributable to the Project.</td>
</tr>
<tr>
<td></td>
<td>Local Community Leaders (including the village elders); and Both directly and indirectly affected community members</td>
<td></td>
</tr>
</tbody>
</table>
### Stakeholder Engagement Plan (SEP) – Final Version

#### Stakeholder Analysis

<table>
<thead>
<tr>
<th>Stakeholder Category</th>
<th>Stakeholder Group</th>
<th>Connection to the Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vulnerable groups</td>
<td>Groups that due to their socio-economic characteristics may experience impacts more severely compared to the rest of the community members.</td>
<td>Vulnerable groups may be severely affected by the Project by virtue of their physical disability, social or economic standing, limited education, lack of employment or access to land.</td>
</tr>
</tbody>
</table>
| Civil Society                     | ▪ Community Based Organisations  
▪ Community or Other Associations  
▪ Research and Academic Institutions | Organisations with direct interest in the Project, and its social and environmental aspects and that are able to influence the Project directly or indirectly through public opinion. Such organisations may also have useful data and insight and may be able to become partners to the Project in areas of common interest. |
| Other Developers in the Project area | ▪ Government Departments or Parastatals with developments in the Project Area; and  
▪ Private Entities with developments in the Project Area | Other developments such as water supply pipelines and electricity transmission and distribution systems in the Project Area may be affected by the Project activities. Other developments in the Project Area also contribute to cumulative impacts. |
| Non-Governmental Organisations (NGOs) | NGOs at the national, county or local level. | NGOs with direct interest in the proposed Project, and its social and environmental aspects, and that are able to contribute to the Project directly or through public opinion. |
| Private sector                    | ▪ Business Organisations; and  
▪ Companies - potential suppliers and contractors. | Individuals or organisations with direct economic interest in the proposed Project. This may be through gaining contracts with the proposed Project or due to economic impacts caused by the Project. |
| Project Lenders                   | International Financial Institutions, such as the Standard Chartered Bank          | The Project Consortium will be financed by international financial institutions to implement the Project.                                                        |

The stakeholder analysis tool in *Table 3.2* (below) was thereafter used to group stakeholders according to their influence on and support to the Project. This analysis allowed for the ESIA team to focus engagement efforts and helped identify the key objectives of engagement with different parties.
## Table 3.2 Stakeholder Matrix

<table>
<thead>
<tr>
<th>Stakeholder Name</th>
<th>Organisation</th>
<th>Stakeholder’s Role in the Project</th>
<th>Stakeholder’s Importance in the Project</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>L = Low M = Medium H = High</td>
</tr>
<tr>
<td>National Level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office of the President-Administration</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>Office of the President-Administration</td>
<td>National Environmental Management Authority (NEMA)</td>
</tr>
<tr>
<td>Deputy County Commissioners</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
</tr>
<tr>
<td>Area Chief</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
</tr>
<tr>
<td>County Commissioners</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
</tr>
<tr>
<td>Deputy County Commissioners</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
</tr>
<tr>
<td>Area Chief</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
</tr>
<tr>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
</tr>
<tr>
<td>County Level</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
</tr>
<tr>
<td>Deputy County Commissioners</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
</tr>
<tr>
<td>Area Chief</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
</tr>
<tr>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
</tr>
</tbody>
</table>

### National Level

<table>
<thead>
<tr>
<th>Stakeholder Name</th>
<th>Organisation</th>
<th>Stakeholder’s Role in the Project</th>
<th>Stakeholder’s Importance in the Project</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>L = Low M = Medium H = High</td>
</tr>
<tr>
<td>Deputy County Commissioners</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
</tr>
</tbody>
</table>

### County Level

<table>
<thead>
<tr>
<th>Stakeholder Name</th>
<th>Organisation</th>
<th>Stakeholder’s Role in the Project</th>
<th>Stakeholder’s Importance in the Project</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>L = Low M = Medium H = High</td>
</tr>
<tr>
<td>Deputy County Commissioners</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>National Environmental Management Authority (NEMA)</td>
</tr>
</tbody>
</table>

### Strategy of Involvement/Follow up Actions and Communication

- Continuous engagement throughout the whole Project life cycle.
- Submission of the ESIA Project Report and continuous engagement with NEMA County Offices throughout the whole Project life cycle.
<table>
<thead>
<tr>
<th>Stakeholder Name</th>
<th>Organisation</th>
<th>Stakeholder’s Role in the Project</th>
<th>Stakeholder’s Importance in the Project</th>
<th>Stakeholder’s Current level of Support for the Project</th>
<th>Stakeholder’s Interests, Goals and Concerns (what they want)</th>
<th>Stakeholder’s Influence on the project</th>
<th>Strategy of Involvement/Follow up Actions and Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office of the County Executive Committee member - Environment</td>
<td>County Government</td>
<td>• Implementation of legislation, and development plans and policies at the County level</td>
<td>L = Low</td>
<td>M = Medium</td>
<td>H = High</td>
<td>• Monitor the construction of the Project Road as per the ESMMP</td>
<td>Influence the implementation by: • Lobbying for government support</td>
</tr>
<tr>
<td>Office of the County Executive Committee member - Physical Planning</td>
<td>County Government</td>
<td>• Issuing permits and processing applications associated with the Project • Approve land use change documentation • Policy-making and regulatory influence at county level</td>
<td>L = Low</td>
<td>M = Medium</td>
<td>H = High</td>
<td>• Monitor the land use change as per the ESMMP</td>
<td>Influence the implementation by: • Lobbying for government support • Disapprove land use change and construction of the Project Road</td>
</tr>
<tr>
<td>Office of the County Executive Committee member - Lands</td>
<td>County Government</td>
<td>• Implementation of legislation, and development plans and policies at the County level</td>
<td>L = Low</td>
<td>M = Medium</td>
<td>H = High</td>
<td>• Monitor the land use change and Project Road construction</td>
<td>Influence the implementation by: • Lobbying for government support • Disapprove land use change and construction of the Project Road</td>
</tr>
</tbody>
</table>
### Stakeholder Engagement Plan (SEP) – Final Version

<table>
<thead>
<tr>
<th>Stakeholder Name</th>
<th>Organisation</th>
<th>Stakeholder's Role in the Project</th>
<th>Stakeholder's Importance in the Project L = Low M = Medium H = High</th>
<th>Stakeholder's Current level of Support for the Project L = Low M = Medium H = High</th>
<th>Stakeholder's Interests, Goals and Concerns (what they want)</th>
<th>Stakeholder’s Influence on the project</th>
<th>Strategy of Involvement/Follow up Actions and Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office of the County Executive Committee member- Public Health</td>
<td></td>
<td></td>
<td>M</td>
<td>H</td>
<td>Monitor the construction of the Project Road as per the ESMMP</td>
<td>Influence the implementation by:</td>
<td>Continuous engagement throughout the whole Project life cycle.</td>
</tr>
<tr>
<td>Office of the Governor</td>
<td>Host counties</td>
<td>Community leaders acting as representatives of their local community.</td>
<td>H</td>
<td>H</td>
<td>Public development and progress at County level</td>
<td>Lobbying government and influencing the public to support the development of the Project</td>
<td>Continuous engagement throughout the whole Project life cycle.</td>
</tr>
<tr>
<td>Members of County Assembly</td>
<td></td>
<td></td>
<td>M</td>
<td>H</td>
<td>Public development and progress at Ward level</td>
<td></td>
<td>Continuous engagement throughout the whole Project life cycle.</td>
</tr>
<tr>
<td>Local Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Stakeholders’ Current level of Support for the Project**
- **L** = Low
- **M** = Medium
- **H** = High

**Stakeholders’ Interests, Goals and Concerns (what they want)**
- Monitor the construction of the Project Road as per the ESMMP
- Influence the implementation by:
  - Issuing public and community health notices- in relation to the Project Road

**Strategy of Involvement/Follow up Actions and Communication**
- Continuous engagement throughout the whole Project life cycle.
## PROJECT STAKEHOLDERS

<table>
<thead>
<tr>
<th>Stakeholder Name</th>
<th>Organisation</th>
<th>Stakeholder's Role in the Project</th>
<th>Stakeholder's Importance in the Project L = Low M = Medium H = High</th>
<th>Stakeholder's Current level of Support for the Project L = Low M = Medium H = High</th>
<th>Stakeholder's Interests, Goals and Concerns (what they want)</th>
<th>Stakeholder's Influence on the project</th>
<th>Strategy of Involvement/Follow up Actions and Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local community members</td>
<td>Host locations</td>
<td>Source of labour (mainly casual). Directly affected stakeholders who may benefit from or be negatively affected by the project.</td>
<td><strong>H</strong></td>
<td><strong>H</strong></td>
<td>Be given first priority during recruitment of Project workers. Minimise all the negative impacts. Enhance all the positive impacts.</td>
<td>If brought on board, they can ensure the Project's success through provision of labour and security to the Project. On the other hand, if they are dissatisfied communities have the potential of blocking the progress of the Project activities through demonstrations and destroying Project property.</td>
<td>Continuous engagement throughout the whole Project life cycle. Update them on the status of CSR projects.</td>
</tr>
</tbody>
</table>
# Stakeholder Engagement Plan (SEP) – Final Version

## Project Stakeholders

<table>
<thead>
<tr>
<th>Stakeholder Name</th>
<th>Organisation</th>
<th>Stakeholder's Role in the Project</th>
<th>Stakeholder's Importance in the Project</th>
<th>Stakeholder's Current level of Support for the Project</th>
<th>Stakeholder's Interests, Goals and Concerns (what they want)</th>
<th>Stakeholder's Influence on the project</th>
<th>Strategy of Involvement/Follow up Actions and Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Churches/ mosques</td>
<td>Places of worship in the Project Area</td>
<td>n/a</td>
<td>H</td>
<td>H</td>
<td>Minimal disturbance from the Project activities</td>
<td>Majority are members of the local community members.</td>
<td>Keep them updated of the status of the Project. Update them on the status of CSR projects and if possible, involve them in such Projects.</td>
</tr>
<tr>
<td>Schools</td>
<td>Education Facilities in the Project Area</td>
<td>n/a</td>
<td>H</td>
<td>H</td>
<td>Minimal disturbance from the Project activities</td>
<td>They provide formal education to the school going children many of whom come from the local communities. Any disturbance to them can easily be received by the local community members.</td>
<td>Keep them updated of the status of the Project. In particular, inform them of the busy period during the implementation of the Project.</td>
</tr>
</tbody>
</table>
## Stakeholder Engagement Plan (SEP) – Final Version

### Project Stakeholders

<table>
<thead>
<tr>
<th>Stakeholder Name</th>
<th>Organisation</th>
<th>Stakeholder’s Role in the Project</th>
<th>Stakeholder’s Importance in the Project</th>
<th>Stakeholder’s Current level of Support for the Project</th>
<th>Stakeholder’s Interests, Goals and Concerns (what they want)</th>
<th>Stakeholder’s Influence on the project</th>
<th>Strategy of Involvement/Follow up Actions and Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Centres</td>
<td>Health Facilities in the Project Area</td>
<td>Can provide medical aid to project workers</td>
<td>L = Low M = Medium H = High</td>
<td>L = Low M = Medium H = High</td>
<td>Minimal disturbance from the Project activities</td>
<td>They provide medical care to the sick. Any disturbance will be experienced by the patients many of whom will be from the local communities.</td>
<td>Keep them updated on the status of the Project.</td>
</tr>
</tbody>
</table>

- **Health Centres**
  - Can provide medical aid to project workers
  - Minimal disturbance from the Project activities
  - They provide medical care to the sick. Any disturbance will be experienced by the patients many of whom will be from the local communities.
  - Keep them updated on the status of the Project.
B4. APPROACH TO STAKEHOLDER ENGAGEMENT

B4.1 Basic Principles of stakeholder Engagement

As per the IFC’s Good Practice Handbook on Stakeholder Engagement, Ideally, a good consultation and engagement process should be:

- targeted at those most likely to be affected by the project;
- early enough to scope key issues and have an effect on the project decisions to which they relate;
- informed as a result of relevant information being disseminated in advance;
- meaningful to those consulted because the content is presented in a readily understandable format and the techniques used are culturally appropriate;
- two-way so that both sides have the opportunity to exchange views and information, to listen, and to have their issues addressed;
- gender-inclusive through awareness that men and women often have differing views and needs;
- localized to reflect appropriate timeframes, context, and local languages;
- free from manipulation or coercion;
- documented to keep track of who has been consulted and the key issues raised;
- reported back in a timely way to those consulted, with clarification of next steps; and
- ongoing as required during the life of the project.

Note: There is no one right way of undertaking consultation. Given its nature, the process will always be context-specific.

B4.2 Communication Methods

Stakeholder engagement aims at making information about the Project accessible to interested and affected parties. Communicating such information in a manner that is understandable to the Project stakeholders is an important first (and ongoing) step in the process of stakeholder engagement.

A variety of communication methods are used to engage with stakeholders reflecting their level of authority, socio-economic context, and cultural and intellectual factors such as level of education and literacy.

English is the official language of Kenya, and is used universally in schools in addition to Kiswahili which is the national language. Although there are a number of other ethnic-related languages, the national language of Kiswahili is quite often spoken throughout the country and the main mode of communication. Therefore, for all the stakeholder engagements particularly with local community members, the main mode of communication is through the Kiswahili language; any information communicated in English is translated into Kiswahili to ensure that it is fully understood. For official meetings, English is the main mode of communication given that it is the official language in the country.
Box 4.1 below provides an overview of the common methods used to disseminate information to stakeholders depending on the stakeholder group and literacy levels. Table 4.1 that follows present examples of communication tools that are used to disseminate information.

**Box 4.1  Common Methods used in Information Dissemination**

**Focus Group Discussion:** Targeted discussion with a group of individuals with similar characteristics such as women, men, youth, indigenous peoples and Project Affected Households (PAHs) to capture targeted information that may not be captured in an open space. These meetings also create a platform for vulnerable or marginalised groups to freely voice their opinions and concerns to be factored into the Project design and implementation of the Project elements and programmes.

**Key Informant Interview:** One-to-one meeting with a professional or individual with knowledge and expertise about a specific subject area that can provide targeted information in relation to specific aspects of the project for consideration in project design and implementation of project elements or programmes.

**Formal Meeting:** Formal meeting to present project information to a group of individuals with authority or that may be a key stakeholder, such as the government or NGOs, and to gather feedback for consideration in Project design and implementation of Project elements or programmes.

**Community Meeting/Barazas:** Gathering of all members of the community residing in a particular area to present project information and gather feedback for consideration in project design and implementation of project elements or programmes.

**Household Surveys:** Administering a household survey questionnaire to each of the households that will be directly affected by land acquisition activities to have a good understanding of their household characteristics and livelihoods. This method is often used during the conduct of RAPs.

| **Table 4.1  Communication Tools** |
|---|---|---|---|
| **Tool** | **Purpose** | **Stakeholder Groups** | **Use** |
| Power Point presentations | Detailed presentation to provide technical information regarding the Project. | National and County authorities NGOs/institutions Key informants/professionals | Used at formal meetings |
| Basic flipbook / pictorial presentation | Present general information regarding Project information. | Affected communities | Used at community meetings and orally presented in local language(s). |
| Flyers/leaflets/background information document | Provides an overview of a specific topic being discussed. Allows stakeholder to take information home and have a line of contact with the developer should they have any questions. | All | Distributed at consultation meetings and placed in accessible public locations (e.g. copies left with community chief, at health center and schools). |
## Approach to Stakeholder Engagement

<table>
<thead>
<tr>
<th>Tool</th>
<th>Purpose</th>
<th>Stakeholder Groups</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reports and plans</td>
<td>Technical written reports that present details on potential impacts of the Project and how the Project Developer will manage the environmental and social aspects of the Project to minimize adverse impacts and maximize benefits. This includes the ESIA Project Report and this SEP.</td>
<td>Government/ regulatory institutions, Project lenders, professional, academics and civil society/public</td>
<td>Available online/shared electronically, Project office, relevant government authorities and public places.</td>
</tr>
<tr>
<td>Question and answer guide</td>
<td>List of most frequently asked questions to be used as guideline to respond to any questions from stakeholders.</td>
<td>Internal use by Project staff. Can also be accessible on the Project website if appropriate.</td>
<td>Used by the Project teams as appropriate.</td>
</tr>
<tr>
<td>Household Survey Questionnaires</td>
<td>To obtain a full understanding of the livelihoods of the Project Affected Households (PAHs) for use in designing an appropriate LRP/ RAP. Obtain the PAHs’ preferred compensation and livelihood restoration option.</td>
<td>Project Affected Households.</td>
<td>Used by the social survey team during the conduct of household census.</td>
</tr>
<tr>
<td>Informal discussion while touring the Project Footprint</td>
<td>Determination of the owners and users of the affected land as well as identifying community/ individual land boundaries. Ground-truth all developments within the Project Footprint.</td>
<td>Directly affected communities and Project Affected Households</td>
<td>Used at the time of asset inventory and Project site walk-over.</td>
</tr>
</tbody>
</table>
B5. OUTCOMES OF STAKEHOLDER ENGAGEMENTS TO DATE

A summary of the outcomes of the stakeholder engagement activities conducted to date as well as detailed minutes of the engagement meetings held are presented in Appendix D. The stakeholder views have informed the preparation of the ESIA Project Report and subsequent engagements in the next phases of Project planning and development should continue to shape the Project in the best way possible.
B6. NEXT STEPS IN THE STAKEHOLDER ENGAGEMENT PROCESS

The Project is committed to continuous engagement with stakeholders throughout the life of the Project, from the current stages of planning and design, through construction into operation, and eventually to closure and decommissioning.

Plans and activities implemented during the next stages of Project planning and development will therefore feed into and inform on-going stakeholder engagement as the Project moves into these stages, ensuring that two-way dialogue with those affected, both positively and negatively by the proposed Project is maintained.

The aim will be to ensure that the Project remains in contact with all interested parties and cognisant of their concerns, and that these are addressed in an effective and timely manner. At each stage a detailed schedule of activities and events will be developed and widely disseminated so that people know how to interact with and participate in the Project.

In particular, post ESIA stakeholder engagement is expected at the following Project stages:

- Demarcation of the final Project Corridor indicating the extent on either side of the existing roads. At that stage, the Contractor in conjunction with the Contracting Authority (KURA) will hold discussions with each of the directly affected persons and if necessary (based on the final extent of the corridor), and if required a Resettlement Action Plan (RAP) will be prepared and implemented.
- Mobilisation phase: At this stage, information regarding the location of associated project infrastructure, detailed construction schedule, expected construction team (including employment opportunities) will be shared with the Project stakeholders.
- Construction phase.
- Demobilisation phase notifying the stakeholders the end of the construction activities and close-out of outstanding construction phase related grievances.

Particularly, engagements with the following stakeholders are deemed critical to update them prior to the commencement of the Project implementation:

- Local community members through public barazas (at least one public baraza per affected community).
- PAPs to disclose the entitlement matrix and implement the RAP, if applicable. If the road design necessitates impacts on properties that were initially not considered for compensation, a supplementary RAP to cover them should be conducted and compensation effectively given.
- County, parastatal and central government leaders to update them on the project schedule and ascertain the likely commencement date of the construction activities.
- Other developers in the Project area, CSOs and NGOs operating in the Project area to update them of the Project schedule.
B7. PROJECT GRIEVANCE MECHANISM

B7.1 Purpose

The Project will need to establish a specific mechanism for dealing with stakeholder grievances. A grievance is a complaint or concern raised by an individual or organisation who judges that they have been adversely affected by a project during any stage of its development. Grievances may take the form of specific complaints for actual damages or injury, general concerns about Project activities, incidents and impacts, or perceived impacts.

This section outlines the approach to managing grievances which will be used throughout the Project lifetime but more importantly during the construction and operation.

B7.2 Grievance Principals

A grievance mechanism should be based on the following principles:

- Transparency and fairness: The process for grievance resolution should be transparent, in harmony with the local culture and in the appropriate language. It should explicitly assure potential users that the mechanism will not impede their access to other judicial or administrative remedies.

- Accessibility and cultural appropriateness: All stakeholders including every member of a community or group should have access to the grievance procedure. Any individual or group that is directly or indirectly affected by the Project’s and its contractors’ activities, can raise a grievance.

- Openness and communication regularity: There should be multiple channels available for individuals and groups to choose their preferred method for lodging grievances.

- Channels of communication should be kept open throughout the process of addressing each grievance and up to three months after the situation has been resolved.

- Written records: All grievances should be registered on a Grievance Form and tracked through to resolution. This should include documentation of how the grievance has been resolved.

- Dialogue and site visits: All grievances should warrant discussions with the complainant and a site visit to gain a first-hand understanding of the nature of the concern. The purpose of the visit is to verify the validity and severity of the grievance.

- Timely resolution: The Project aims to resolve 90% of grievances within 30 days. Grievances that have not been resolved in this time frame should at a minimum have been acknowledge and investigated.

B7.3 Process

Based on the principles described above, the grievance mechanism process should involve four main stages:

- Receiving and recording the grievance;
- Investigation and site inspection;
Response; and

Monitoring and evaluation.

**B7.3.1 Receiving and Recording the Grievances**

Verbal or written grievance should be received via various channels and should be passed to Contractor and/or the Contracting Authority (KURA) as appropriate. The grievance should then be recorded on a Grievance Form and a formal confirmation along with a copy of the form should be signed by both the complainant and the Project employee receiving the grievance. The name of the village, location, date recorded, name of complainant, and name of the person that receives the grievance should be noted. Details of the grievance should also be recorded.

All grievances should be registered regardless of whether they are likely to be ultimately deemed not legitimate.

**B7.3.2 Site Inspection, Investigation and Resolution**

The Project Employee shall organise a site inspection, undertaken either by himself or by an assigned member of the Project team. The purpose of the site inspection is to check the validity and severity of the grievance. The inspection should be undertaken within seven days of receiving the grievance. The Project Employee/assigned individual should work with other relevant members of the Project team to investigate the problem and identify measures to resolve the grievance as appropriate. This could involve provision of information to clarify the situation, undertaking measures to remedy problems or compensation for any damage that has been caused either by financial compensation or compensation in-kind, and introduction of mitigation measures to prevent recurrence of the problem in the future. Where a grievance is found to be invalid or not severe, a clear explanation should be provided to the complainant as to why this is the case.

**B7.3.3 Response**

A formal response detailing how the grievance will be resolved should be provided to each complainant within 30 days where possible. Where resolution is delayed the complainant should be provided with regular updates on progress. The complainant has the right to reject the resolution proposed in which case the assigned individual should discuss the complainant expectations and review and update the proposed resolution on the basis of these discussions. If resolution can’t be agreed then the complaint has the right to seek other judicial or administrative remedies.

*Note: It should be noted that the duration to address grievances is dependent on its characteristics and some grievances can be appropriately addressed instantly.*

**B7.3.4 Monitoring and Evaluation**

Two to three weeks after implementing the resolution, the Project Employee should pay a visit to the complainant to ensure that the complainant is satisfied and to gather feedback on the grievance resolution process. The visit should be registered on the grievance log. If required, further follow up visits should be scheduled.
B7.4 Roles and Responsibilities

Implementing the grievance mechanism and recording all grievances is the responsibility of a Community Liaison Officer (CLO). However, it is likely that at times the CLO will need support from the wider Project team in investigating or resolving a grievance. Other key players are likely to include:

- the EHS Manager of the Project Consortium during construction;
- the Site Project manager during operation;
- technical experts to determine if the complaint is legitimate; and
- legal teams in cases where the grievance involves a breach in regulations or agreement on resolution can’t be reached.

B7.5 Review of the Grievance Log

It is essential that the grievances are logged and reviewed on a regular basis (quarterly) to determine if the same or similar grievances are being recorded at one or more location. Multiple grievances related to the same or similar issues indicate a more systemic problem within the Project which needs to be mitigated through the development of Project controls or measures.
B8. MONITORING AND REPORTING

It will be important to monitor and report on the ongoing stakeholder engagement efforts to ensure that the desired outcomes are being achieved, and to maintain a comprehensive record of engagement activities and issues raised.

To date this has been done and the detailed information is presented in Appendices C and D, and will continue through the Project’s stakeholder engagement activities.

These records and outputs will be updated as the Project progresses and further phases of engagement are undertaken.
APPENDIX C  BACKGROUND INFORMATION DOCUMENT USED IN STAKEHOLDER ENGAGEMENT ACTIVITIES
DEVELOPMENT OF 2,000 KM OF ROADS SUPPORTING PRIMARY GROWTH SECTORS THROUGH CONTRACTOR FACILITATED FINANCING MECHANISM (PHASE 1); TENDER NO. KURA/PPP/240/2014-2015

BACKGROUND INFORMATION DOCUMENT (BID)

General Structure of the BID

- About ERM
- Environmental and Social Impact Assessment (ESIA) Process
- Project Background
- Proposed Project Road
- Baseline Data
- Potential Impacts and Mitigation Measures
- Question and Answer Session

1. About ERM

ERM is a leading global provider of environmental, health, safety, risk, social consulting and sustainability related services. We deliver innovative solutions for business clients as well as selected government clients through a combination of in-depth technical knowledge of sustainability issues and strategic business advice.
2. Environmental and Social Impact Assessment (ESIA) Process

Undertaken in full compliance with the following:

- National Environmental Management and Coordination Act (EMCA) of 1999 (reviewed in 2012, and 2015 amendments) and associated HSE Regulations (Kenya),
- The Environmental (Impact Assessment and Audit) Regulations, 2003 (and 2016 amendments); and
- International Finance Corporation’s (IFC) Performance Standards on Environmental and Social Sustainability (2012)

**Aim of the ESIA**: to identify significant potential impacts and mitigate any adverse impacts to the environment and people’s health (and enhance any positive impacts).

**Stakeholder Engagement** a very important part of the process. Key objectives of Stakeholder Engagement are to:

- Inform the stakeholders of the proposed project, associated impacts and identified measures to manage their significance to acceptable levels;
- Obtain stakeholders’ views on the proposed project to inform its design and implementation, and gain stakeholder support/social license to operate; and
- Open communication channels for use through the lifecycle of the project.

Output of the ESIA process is an ESIA Project Report submitted to the NEMA for their review and consideration for approval.

3. Project Background

The Government of the Republic of Kenya through the Ministry of Transport and Infrastructure represented by the Kenya Urban Roads Authority (KURA) has appointed a consortium comprising of Lee Construction Ltd, Cape Consult and, Mota Engenharia and Construcaco Africa (hereafter referred to as the Developer) to design, construct (upgrade to paved standards) and maintain 2,000 km of urban roads in the Kenya Roads Annuity Programme, Lots 15 and 18. The selected roads aim at supporting primary growth sectors of commerce, tourism, agriculture and rural production and extractives industry. The construction activities are planned to last for a period of two years and the maintenance period is planned to last for eight years after which the consortium will fully hand over the roads to KURA. The commencement of the construction phase activities is dependent on the completion and approval of the road designs as well as obtaining of all the relevant permits, including the Environmental and Social Impact Assessment (ESIA) Certificates of Approval.

The following sections are specific for every Project Road and presented separately – refer to maps, images and information in the next pages.

- Proposed Project Road
- Baseline Data
- Potential Impacts and Mitigation Measures
- Question and Answer Session
Proposed Project Road

Ndikwe - Kiria Road (3.9 km) – Dark Red
Mucunguca – Kiangage (5.1 km) – Gold Ascent 2

Example of Construction Equipment

Example of Construction Activities in Progress

Typical Road Cross-Section

Carriageway width of 7 m, walkway width of 1.5 m on both sides of the road (total walkway width of 3.0 m), and drainage Facilities of 1.5 m on both sides of the road (total drainage facilities are of 3.0 m)

Baseline Data
### Ndikwe - Kiria Road

<table>
<thead>
<tr>
<th>Description</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetable garden along the Project Road</td>
<td><img src="image1" alt="Vegetable garden along the Project Road" /></td>
</tr>
<tr>
<td>Kaihungu Valley along the Project Road</td>
<td><img src="image2" alt="Kaihungu Valley along the Project Road" /></td>
</tr>
<tr>
<td>Banana Plantations along the Project Road</td>
<td><img src="image3" alt="Banana Plantations along the Project Road" /></td>
</tr>
<tr>
<td>Maize gardens along the Project Road</td>
<td><img src="image4" alt="Maize gardens along the Project Road" /></td>
</tr>
<tr>
<td>Water supply irrigation contour trenches along the crop farms</td>
<td><img src="image5" alt="Water supply irrigation contour trenches along the crop farms" /></td>
</tr>
<tr>
<td>Napier grass along the Project Road</td>
<td><img src="image6" alt="Napier grass along the Project Road" /></td>
</tr>
<tr>
<td>KURA beacon along the Project Road showing the required extent of the Road Corridor.</td>
<td><img src="image7" alt="KURA beacon along the Project Road showing the required extent of the Road Corridor." /></td>
</tr>
<tr>
<td>A KURA beacon along the Project Road showing the strip of crops/farming area that will be lost.</td>
<td><img src="image8" alt="A KURA beacon along the Project Road showing the strip of crops/farming area that will be lost." /></td>
</tr>
</tbody>
</table>
## Mucunguca-Kiangage Road

<table>
<thead>
<tr>
<th>Image</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Napier Grass" /></td>
<td>Napier grass and trees along the Project Road. KURA beacon showing the encroached land.</td>
</tr>
<tr>
<td><img src="image2" alt="Banana Plantation" /></td>
<td>Banana and maize plantations along the Project Road</td>
</tr>
<tr>
<td><img src="image3" alt="Business Structure" /></td>
<td>A permanent business structure along the Project Road</td>
</tr>
<tr>
<td><img src="image4" alt="Temporary Structure" /></td>
<td>A temporary business structure along the Project Road</td>
</tr>
<tr>
<td><img src="image5" alt="Building Stones" /></td>
<td>Building stones laid along the Project Road</td>
</tr>
<tr>
<td><img src="image6" alt="Maragi Quarry" /></td>
<td>Maragi quarry about 200 m from the nearest point of the Project Road</td>
</tr>
</tbody>
</table>

### Potential Impacts and Mitigation Measures (the ones identified so far – to be assessed in details and presented in the Project Report)
<table>
<thead>
<tr>
<th>Impact</th>
<th>Mitigation Measure</th>
</tr>
</thead>
</table>
| Poverty Reduction and Improvement of Livelihoods                     | Construction works will contribute towards poverty reduction through the promotion of:  
  • local direct and indirect employment of skilled and unskilled labour; and  
  • local procurement of goods and services by road contractors during construction.                                                                          |
| Flooding due to poor drainage. This is a current issue as drainage    | Streamlined Drainage Outfalls will be designed and constructed to reduce the potential for flooding and associated damage.                                                                                           |
|   channels are broken on some sections.                              |                                                                                                                                                                                                                       |
| Air emissions during construction period including dust               | • Dust suppression measures including a watering programme.  
  • Ensure construction equipment and vehicles are regularly maintained in good working conditions  
  • Dust control measures at the quarry sites and aggregate crushing sites.                                                                             |
| Noise and Vibrations                                                 | • Inform the neighbouring communities of any un-usual construction activities with extraordinary noise levels including time, expected duration and any safety precautions.  
  • Undertake structural integrity assessment of existing buildings and other structures along the road to avoid damages from vibrations. |
| Health and Safety                                                    | • Enhance information and appropriate signage at all-time along the Project Road and work areas.  
  • Ensure Occupational Health and Safety (OHS) requirements are observed at all times during the construction at work areas.  
  • Provide acceptable alternative road diversions where needed to allow construction activities.  
  • Establish Worker Codes of Conduct for construction works to minimise negative community- worker interactions. |
| Traffic Management                                                   | • The Contractor(s) shall adopt and review traffic management plan for the construction works.  
  • The Traffic Management Plan will be communicated to the affected communities.  
  • Appropriate signage and information will be provided at all the diversions (beginning and end points). |
| Health and HIV/AIDS                                                  | • Initiate an awareness creation, prevention and training programmes on HIV/AIDS upon commencement of works.  
  • Establish wellness centres including Voluntary Counselling and Testing (VCT) and Antiretroviral Therapy (ARV) centres at strategic location along the Project Road.  
  • Incorporate HIV/AIDS control program for workers.  
  • Establish worker codes of conduct for all workers which include measures to limit the spread of diseases. |

**Question and Answer Session**
SUMMARY OF STAKEHOLDER ENGAGEMENT MEETINGS HELD

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Mode of Engagement</th>
<th>Engagement Date</th>
<th>Venue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Government</td>
<td>KII</td>
<td>23rd August 2019</td>
<td>NEMA Offices- Muranga.</td>
</tr>
<tr>
<td>NEMA County Director of Environment (CDE) - Muranga.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>County Government</td>
<td>KII</td>
<td>23rd August 2019</td>
<td>County Commissioner’s Office- Muranga.</td>
</tr>
<tr>
<td>County Commissioner’s Personal Assistant - Muranga.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local Communities</td>
<td>Public Baraza</td>
<td>12th September 2019</td>
<td>Ndikwe Police Post</td>
</tr>
<tr>
<td>Local community members</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Developers in the Project area</td>
<td>KII</td>
<td>16th August 2019</td>
<td>KPLC Head Offices, Nairobi</td>
</tr>
<tr>
<td>Kenya Power and Lighting Company Limited (KPLC)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple/ General Stakeholder Engagement</td>
<td>Public Baraza</td>
<td>12th September 2019</td>
<td>Ndikwe Police Post</td>
</tr>
<tr>
<td>Multiple stakeholders</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SUMMARY OF KEY ISSUES RAISED/ COMMENTS MADE DURING STAKEHOLDER ENGAGEMENT EXERCISE

<table>
<thead>
<tr>
<th>Main Theme</th>
<th>Key stakeholders issues/ comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Infrastructure along the Project Roads</td>
<td>The Project design should avoid road-site infrastructure where possible to avoid the need for relocation. Where avoidance is not possible, relocation of the electricity infrastructure should be done before the contractor is on-site.</td>
</tr>
<tr>
<td></td>
<td>It is KURA’s responsibility to have a wider corridor including where relocation should take place.</td>
</tr>
<tr>
<td></td>
<td>At the time of planning for the relocation, it will be important to jointly plan for electricity, water and sewerage infrastructure since at times, the institutions responsible for these facilities agree and relocate them on one side of the road to optimise space.</td>
</tr>
<tr>
<td></td>
<td>KPLC will quote and conduct the actual relocation of the electricity infrastructure; however, it is KURA’s responsibility to pay for the relocation exercise as well as provision of detailed Project design.</td>
</tr>
<tr>
<td>Employment opportunities</td>
<td>Village members especially the disabled should be considered for job opportunities.</td>
</tr>
<tr>
<td>Details of the Road Design</td>
<td>There are water lines along the Project Road and the contractor should ensure they are not damaged or water supply to the community is not affected.</td>
</tr>
<tr>
<td>Health and Safety</td>
<td>Measures should be put in place to reduce accidents along the road.</td>
</tr>
<tr>
<td>Communication</td>
<td>KURA to write a formal letter to the County Commissioner requesting a meeting to discuss the Project.</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Main Theme</th>
<th>Key stakeholders issues/ comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>There should be comprehensive public participation with the local people. Accordingly, a community Barazas in the Project Area was held.</td>
</tr>
<tr>
<td>Compensation</td>
<td>There should be compensation for loss of crops.</td>
</tr>
<tr>
<td></td>
<td>Project Roads are in a heavily agricultural area and KURA should expect a lot of vegetation/agricultural encroachment within the Road reserve.</td>
</tr>
</tbody>
</table>

**DETAILED MEETING MINUTES, PHOTOS AND ATTENDANCE REGISTERS**
MEETING MINUTES

Stakeholder Consulted | Kenya Power and Lighting Company Limited (KPLC)
--- | ---
Subject/Project | Development of 2,000 km of roads supporting primary growth sectors through contractor facilitated financing mechanism (Phase 1); Tender No. KURA/PPP/240/2014-2015 (Lot 15 and 18 Annuity Programme Roads)
Project Number | 0410731
Venue | KPLC Head Offices, Stima Plaza, Kolobot Road, Parklands, Nairobi, Kenya
Date of Meeting | 16th August 2019
Participants/Attendance | Refer to the Attendance Register attached
Minutes by | Gideon Owaga
Distribution | To be included in the ESIA Project Report

1. Introduction

The meeting started at 8:50 am with the KPLC Acting Chief Engineer for Business Development, Vincent Okello and Engineer Peter Nyanzi who welcomed the ERM consultants. Barnabas Busheshe of ERM shared the agenda of the meeting and described to them the Project.

In his introductory remarks, Barnabas stated that ERM is an environmental and social consultancy firm with offices in over 40 countries and 160 offices worldwide and has been appointed by Mota - Engil Africa to undertake the Environmental and Social Impact assessments for the Project Roads. He further Explained that the Kenya Urban Roads Authority (KURA) has identified a number of roads in different counties that need to be upgraded to tarmac from the current marram/gravel standards as well as construct the walkway and drainage.

2. Project Description

The Government of the Republic of Kenya through the Ministry of Transport and Infrastructure represented by the Kenya Urban Roads Authority (KURA) has appointed a consortium comprising of Lee Construction Ltd, Cape Consult and, Mota Engenharia and Construcao Africa (hereafter referred to as the Consortium) to design, construct (upgrade to paved standards) and maintain 2,000 km of urban roads in the Kenya Roads Annuity Programme, Lots 15 and 18. The selected roads aim at supporting primary growth sectors of commerce, tourism, agriculture and rural production and extractives industry. The construction activities are planned to last for a period of two years and the maintenance period is planned to last for eight years after which the Consortium will fully hand over the roads to KURA. The commencement of the construction phase activities is dependent on the completion and approval of the road designs as well as obtaining of all the relevant permits, including the Environmental and Social Impact Assessment (ESIA) Certificates of Approval. The roads in Lots 15 and 18 are spread in 10
3. Environmental and Social Impact Assessment (ESIA) Process

The ESIA process is guided by Environmental Management and Coordination Act (EMCA) of 1999 (reviewed in 2012) and the 2015 amendments and the associated Environmental (Impact Assessment and Audit) Regulations of 2003 (and the amendments of 2016). Reference is also made to Good International Industry Practice (GIIP) guidelines and the lender requirements, particularly, the IFC Performance Standards on environmental and social sustainability. As part of the ESIA process, stakeholder engagement and consultation is a paramount step to:

- Inform the stakeholders of the proposed project, associated impacts and identified measures to manage their significance to acceptable levels;
- Obtain stakeholders’ views on the proposed project to inform its design and implementation, and gain stakeholder support/social license to operate; and
- Open communication channels for use through the lifecycle of the project.

In particular, there are electrical transmission and/or distribution lines as well as street lights along the Project Roads. Some of these electrical infrastructure fall within the Road corridor that will be used to upgrade the Project Roads and will thus require to be relocated. Therefore, in addition to the above key objectives of stakeholder engagement and consultation, this meeting sought to understand KPLC’s relocation process for electrical infrastructure.

4. Discussion

The KPLC team welcomed the Project and made the following comments to ensure appropriate and timely implementation of the Project.

- KPLC will provide the necessary support in terms of coordinating her teams and ensuring timely relocation at a time when this will be required.
- The Project design should avoid infrastructure where possible to avoid the need for relocation.
- Where avoidance is not possible, relocation of the electricity infrastructure should be done before the contractor is on-site.
- It is KURA’s responsibility to have a wider corridor including where relocation should take place. This should be okay for the Project Roads since there will be a corridor of 20 m and the road will only occupy 14 m; relocation of the service infrastructure can be done within the remaining 6 m of the road reserve (about 3 m either side of the roads).
- At the time of planning for the relocation, it will be important to jointly plan for electricity, water and sewerage infrastructure since at times, the institutions responsible for these facilities agree and relocate them on one side of the road to optimise space, for example, it is possible to have electricity distribution lines above the water supply pipelines (it is possible to have the two in one corridor).
- The relocation process for the electricity infrastructure is as follows:
  - The design team or KURA is required to provide the final road design drawings to KPLC. To make it easy, the design drawing should show the location of affected electricity poles and a total number of the poles to be relocated.
  - Upon receipt of detailed design drawings, the KPLC central office in Nairobi will liaise with their field/county offices to prepare quotations for the relocation exercise. The quotations will be ready and shared with KURA after at least two weeks.
- KURA will be required to pay the amount indicated in the quotations to KPLC (they indicated that this is usually where delays happen when the payment is delayed; KURA must therefore be aware of this expected cost and allocate the budget for the relocation so that as soon as the quotations with confirmed amounts are available, they make the payment promptly).
- For most of the Project Roads, KPLC will be required to give at least a two-week relocation notice to the affected electricity customers. This implies that the actual relocation can only start at least two weeks from the time of payment of relocation fees.
- On average, KPLC relocates infrastructure within 1 km in one week (in KPLC’s good practice, they only switch-off customers for a maximum of 8 hours per day). This implies that the relocation team only works 8 hours a day, they connect the customers back to power at the end of each work-day so that the customers should at least have power throughout the night.
- The contractor can mobilise and start construction works along a Project Road once relocation activities along that particular road have been completed.

5. Way forward/Conclusion/General feedback from stakeholder consulted
The Project design team or KURA to share the detailed road design plans with KPLC to kick start the relocation process.

6. Closure
There being no other issues to discuss, the meeting ended at 09:30 am.

Attendance Register
MEETING MINUTES

<table>
<thead>
<tr>
<th>Stakeholder Consulted</th>
<th>County Government Chief Officer Housing &amp; Urban Development - Muranga.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject/Project</td>
<td>Development of 2,000 km of roads supporting primary growth sectors through contractor facilitated financing mechanism (Phase 1); Tender No. KURA/PPP/240/2014-2015 (Lot 15 Ndikwe-Kiria Road (3.9km) and Mucunguca-Kiangage Road (5.10km).</td>
</tr>
<tr>
<td>Project Number</td>
<td>0410731.</td>
</tr>
<tr>
<td>Venue</td>
<td>County Government Offices- Muranga.</td>
</tr>
<tr>
<td>Date of Meeting</td>
<td>23rd August 2019.</td>
</tr>
<tr>
<td>Participants/Attendance</td>
<td>Refer to the Attendance Register attached.</td>
</tr>
<tr>
<td>Minutes by</td>
<td>Gideon Owaga.</td>
</tr>
<tr>
<td>Distribution</td>
<td>To be included in the ESIA Project Report.</td>
</tr>
</tbody>
</table>

1. Introduction

The one on one meeting began at 10:00 AM with the Muranga County Government Chief Officer Housing and Urban Development Eng. Gabriel Kamau welcoming Gideon Owaga, the project team member from ERM.

In his introductory remarks, Gideon stated that ERM is an environmental and social consultancy firm in over 40 countries and 160 offices worldwide and have been appointed by Mota Engil to undertake the Environmental and Social Impact assessment for the proposed project. He further introduced the proponent Mota Engil, a Portuguese engineering and construction company currently present in fourteen African Countries including Nairobi. Kenya Urban Roads Authority (KURA) had identified a number of roads in different counties that need to be upgraded to tarmac from the current mararam and well as construct the walkway and drainage.

2. Project Description

The Government of the Republic of Kenya through the Ministry of Transport and Infrastructure represented by the Kenya Urban Roads Authority (KURA) has appointed a consortium comprising of Lee Construction Ltd, Cape Consult and, Mota Engenharia and Construcao Africa (hereafter referred to as the Developer) to design, construct (upgrade to paved standards) and maintain 2,000 km of urban roads in the Kenya Roads Annuity Programme, Lots 15 and 18. The selected roads aim at supporting primary growth sectors of commerce, tourism, agriculture and rural production and extractives industry. The construction activities are planned to last for a period of two years and the maintenance period is planned to last for eight years after which the consortium will fully hand over the roads to KURA. The commencement of the construction phase activities is dependent on the completion and approval of the road designs as well as
obtainment of all the relevant permits, including the Environmental and Social Impact Assessment (ESIA) Certificates of Approval.

The roads in Lots 15 and 18 are spread in 10 counties; however, the purpose of this meeting is to discuss the Ndikwe-Kiria Road (3.9km) and Mucunguca-Kiangage Road (5.10km).

3. Environmental and Social Impact Assessment (ESIA) Process

The ESIA process is guided by Environmental Management and Coordination Act (EMCA) of 1999 (reviewed in 2012) and the 2015 amendments and the associated Environmental (Impact Assessment and Audit) Regulations of 2003 (and the amendments of 2016). Reference is also made to Good International Industry Practice (GIIP) guidelines and the lender requirements, particularly, the IFC Performance Standards on environmental and social sustainability. As part of the ESIA process, stakeholder engagement and consultation is a paramount step to:

- Inform the stakeholders of the proposed project, associated impacts and identified measures to manage their significance to acceptable levels;
- Obtain stakeholders’ views on the proposed project to inform its design and implementation, and gain stakeholder support/social license to operate; and
- Open communication channels for use through the lifecycle of the project.

4. Discussion

<table>
<thead>
<tr>
<th>Comment/ Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Chief Office (CO) appreciated the visit and pointed out it was important to establish channels of communication during such significant projects in the county.</td>
<td>Point was noted.</td>
</tr>
<tr>
<td>The CO pointed out that he is familiar with the Project Roads since he is incharge of carrying out regular maintenance works along the adjacent roads.</td>
<td>Point was noted.</td>
</tr>
<tr>
<td>The CO pointed out that the Project Roads are in a heavily agricultural area and KURA should expect a lot of vegetation/agricultural encroachment within the Road reserve.</td>
<td>Point was noted.</td>
</tr>
</tbody>
</table>

5. Way forward/ Conclusion/ General feedback from stakeholder consulted

KURA to ensure regular stakeholder engagement with the County Government.

6. Closure

Gideon thanked the County Commissioner for his time and there being no other business, the meeting ended at 11:30 AM.
## Attendance Register

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
<th>Designation</th>
<th>Email Address</th>
<th>Telephone No</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Gabriel W. Kamaro</td>
<td>Muungano</td>
<td>Co-ordinator</td>
<td><a href="mailto:engabry@gmail.com">engabry@gmail.com</a></td>
<td>0723879000</td>
<td></td>
</tr>
<tr>
<td>Eileen Okware</td>
<td>ERM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MEETING MINUTES

<table>
<thead>
<tr>
<th>Stakeholder Consulted</th>
<th>County Commissioner's Personal Assistant - Muranga.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject/Project</td>
<td>Development of 2,000 km of roads supporting primary growth sectors through contractor facilitated financing mechanism (Phase 1); Tender No. KURA/PPP/240/2014-2015 (Lot 15 Ndikwe-Kiria Road (3.9km) and Mucunguca-Kiangage Road (5.10km).</td>
</tr>
<tr>
<td>Project Number</td>
<td>0410731.</td>
</tr>
<tr>
<td>Venue</td>
<td>County Commissioner's Office- Muranga.</td>
</tr>
<tr>
<td>Date of Meeting</td>
<td>23rd August 2019.</td>
</tr>
<tr>
<td>Participants/Attendance</td>
<td>Refer to the Attendance Register attached.</td>
</tr>
<tr>
<td>Minutes by</td>
<td>Gideon Owaga.</td>
</tr>
<tr>
<td>Distribution</td>
<td>To be included in the ESIA Project Report.</td>
</tr>
</tbody>
</table>

1. Introduction

The one on one meeting began at 9:00 AM with the County Commissioner's Personal Assistant Mrs. Martha Nyaga welcoming Gideon Owaga, the project team member from ERM.

In his introductory remarks, Gideon stated that ERM is an environmental and social consultancy firm in over 40 countries and 160 offices worldwide and have been appointed by Mota Engil to undertake the Environmental and Social Impact assessment for the proposed project. He further introduced the proponent Mota Engil, a Portuguese engineering and construction company currently present in fourteen African Countries including Nairobi. Kenya Urban Roads Authority (KURA) had identified a number of roads in different counties that need to be upgraded to tarmac from the current marram and well as construct the walkway and drainage.

2. Project Description

The Government of the Republic of Kenya through the Ministry of Transport and Infrastructure represented by the Kenya Urban Roads Authority (KURA) has appointed a consortium comprising of Lee Construction Ltd, Cape Consult and, Mota Engenharia and Construcao Africa (hereafter referred to as the Developer) to design, construct (upgrade to paved standards) and maintain 2,000 km of urban roads in the Kenya Roads Annuity Programme, Lots 15 and 18. The selected roads aim at supporting primary growth sectors of commerce, tourism, agriculture and rural production and extractives industry. The construction activities are planned to last for a period of two years and the maintenance period is planned to last for eight years after which the consortium will fully hand over the roads to KURA. The commencement of the construction phase activities is dependent on the completion and approval of the road designs as well as obtaining of all the relevant permits, including the Environmental and Social Impact Assessment (ESIA) Certificates of Approval.
The roads in Lots 15 and 18 are spread in 10 counties; however, the purpose of this meeting is to discuss the Ndikwe-Kiria Road (3.9km) and Mucunguca-Kiangage Road (5.10km).

### 3. Environmental and Social Impact Assessment (ESIA) Process

The ESIA process is guided by Environmental Management and Coordination Act (EMCA) of 1999 (reviewed in 2012) and the 2015 amendments and the associated Environmental (Impact Assessment and Audit) Regulations of 2003 (and the amendments of 2016). Reference is also made to Good International Industry Practice (GIIP) guidelines and the lender requirements, particularly, the IFC Performance Standards on environmental and social sustainability. As part of the ESIA process, stakeholder engagement and consultation is a paramount step to:

- Inform the stakeholders of the proposed project, associated impacts and identified measures to manage their significance to acceptable levels;
- Obtain stakeholders’ views on the proposed project to inform its design and implementation, and gain stakeholder support/social license to operate; and
- Open communication channels for use through the lifecycle of the project.

### 4. Discussion

<table>
<thead>
<tr>
<th>Comment/ Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Personal Assistant appreciated the presentation and promised to share the</td>
<td>Point was noted.</td>
</tr>
<tr>
<td>information with the CC, however she requested that a more formal meeting to be</td>
<td></td>
</tr>
<tr>
<td>held between KURA and the CC.</td>
<td></td>
</tr>
<tr>
<td>KURA to write a formal letter to the CC requesting a meeting to discuss the Project¹.</td>
<td>Point was noted.</td>
</tr>
<tr>
<td>The CC will help in mobilization an authorization of the Area Chiefs</td>
<td>Point was noted.</td>
</tr>
</tbody>
</table>

### 5. Way forward/ Conclusion/ General feedback from stakeholder consulted

KURA to write an official letter to the CC requesting for a formal meeting.

### 6. Closure

Gideon thanked the County Commissioner for his time and there being no other business, the meeting ended at 1:00 PM.

¹ The PA to the CC emphasized that the communication protocol should be Government to Government and the letter should be specifically directed to the CC on a KURA Letterhead.
## Attendance Register

**ERM East Africa (Pty) Ltd**
Landmark Office Suites | 4th Floor | Laiibani Centre Lenana
Road | Kilimani
PO Box 100760-00029 | Nairobi | Kenya
T +254 20 49 38 113/4 | www.erm.com
The world’s leading sustainability consultancy

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
<th>Designation</th>
<th>Email Address</th>
<th>Telephone No</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Martha Njage</td>
<td>Interior</td>
<td>Personnel</td>
<td>Vacation@...</td>
<td>0724478650</td>
<td></td>
</tr>
<tr>
<td>Gideon Aninga</td>
<td>ERM</td>
<td>Consultant</td>
<td>gideon...@...</td>
<td>0721422104</td>
<td></td>
</tr>
</tbody>
</table>

---

© Copyright 2019 by ERM Worldwide Group Limited and/or its affiliates (‘ERM’). All Rights Reserved. No part of this work may be reproduced or transmitted in any form or by any means, without prior written permission of ERM.
MEETING MINUTES

<table>
<thead>
<tr>
<th>Stakeholder Consulted</th>
<th>NEMA County Director of Environment (CDE) - Muranga.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject/Project</td>
<td>Development of 2,000 km of roads supporting primary growth sectors through contractor facilitated financing mechanism (Phase 1); Tender No. KURA/PPP/240/2014-2015 (Lot 15 Ndikwe-Kiria Road (3.9km) and Mucunguca-Kiangage Road (5.10km).</td>
</tr>
<tr>
<td>Project Number</td>
<td>0410731.</td>
</tr>
<tr>
<td>Venue</td>
<td>NEMA Offices- Muranga.</td>
</tr>
<tr>
<td>Date of Meeting</td>
<td>23rd August 2019.</td>
</tr>
<tr>
<td>Participants/Attendance</td>
<td>Refer to the Attendance Register attached.</td>
</tr>
<tr>
<td>Minutes by</td>
<td>Gideon Owaga.</td>
</tr>
<tr>
<td>Distribution</td>
<td>To be included in the ESIA Project Report.</td>
</tr>
</tbody>
</table>

1. Introduction

The one on one meeting began at 9:00 AM with the NEMA County Director of Environment (CDE) Mr. Jackson Mutoro welcoming Gideon Owaga, the project team member from ERM.

In his introductory remarks, Gideon stated that ERM is an environmental and social consultancy firm in over 40 countries and 160 offices worldwide and have been appointed by Mota Engil to undertake the Environmental and Social Impact assessment for the proposed project. He further introduced the proponent Mota Engil, a Portuguese engineering and construction company currently present in fourteen African Countries including Nairobi. Kenya Urban Roads Authority (KURA) had identified a number of roads in different counties that need to be upgraded to tarmac from the current marram and as well as construct the walkway and drainage.

2. Project Description

The Government of the Republic of Kenya through the Ministry of Transport and Infrastructure represented by the Kenya Urban Roads Authority (KURA) has appointed a consortium comprising of Lee Construction Ltd, Cape Consult and, Mota Engenharia and Construcaco Africa (hereafter referred to as the Developer) to design, construct (upgrade to paved standards) and maintain 2,000 km of urban roads in the Kenya Roads Annuity Programme, Lots 15 and 18. The selected roads aim at supporting primary growth sectors of commerce, tourism, agriculture and rural production and extractives industry. The construction activities are planned to last for a period of two years and the maintenance period is planned to last for eight years after which the consortium will fully hand over the roads to KURA. The commencement of the construction phase activities is dependent on the completion and approval of the road designs as well as obtaining of all the relevant permits, including the Environmental and Social Impact Assessment (ESIA) Certificates of Approval.
The roads in Lots 15 and 18 are spread in 10 counties; however, the purpose of this meeting is to discuss the Ndikwe-Kiria Road (3.9km) and Mucunguca-Kiangage Road (5.10km).

3. Environmental and Social Impact Assessment (ESIA) Process

The ESIA process is guided by Environmental Management and Coordination Act (EMCA) of 1999 (reviewed in 2012) and the 2015 amendments and the associated Environmental (Impact Assessment and Audit) Regulations of 2003 (and the amendments of 2016). Reference is also made to Good International Industry Practice (GIIP) guidelines and the lender requirements, particularly, the IFC Performance Standards on environmental and social sustainability. As part of the ESIA process, stakeholder engagement and consultation is a paramount step to:

- Inform the stakeholders of the proposed project, associated impacts and identified measures to manage their significance to acceptable levels;
- Obtain stakeholders’ views on the proposed project to inform its design and implementation, and gain stakeholder support/social license to operate; and
- Open communication channels for use through the lifecycle of the project.

4. Discussion

<table>
<thead>
<tr>
<th>Comment/ Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>The CDE advised that KURA should ensure comprehensive public participation with the locals. There should be community Barazas in the Project Area.</td>
<td>Point was noted.</td>
</tr>
<tr>
<td>The CDE pointed out that there have been many controversial projects in the County in which the approval process was done procedurally. As a result the regulatory institutions are more cautious when it comes to approving projects without due process.</td>
<td>Point was noted.</td>
</tr>
<tr>
<td>The CDE pointed out that he was not comfortable signing the attendance form as this might latter be misconstrued as public participation by other stakeholders. He was of the opinion that registration sheets should only be signed during public forums/barazas¹.</td>
<td>Point was noted.</td>
</tr>
</tbody>
</table>

5. Way forward/ Conclusion/ General feedback from stakeholder consulted

KURA to ensure on-going and well documented stakeholder engagement.

6. Closure

Gideon thanked the County Commissioner for his time and there being no other business, the meeting ended at 1:00 PM.

---

¹ Because of past negative experiences in the County, most of those consulted shared information and contact details but were not willing to sign the registration forms.
# Attendance Register

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
<th>Designation</th>
<th>Email Address</th>
<th>Telephone No</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>JACOB MUTAI</td>
<td>NEMA-MURANGA</td>
<td>CEO</td>
<td><a href="mailto:jmutai@gmail.com">jmutai@gmail.com</a></td>
<td>0722072816</td>
<td></td>
</tr>
<tr>
<td>GIDEON BURHA</td>
<td>ERM</td>
<td>CONSULTANT</td>
<td><a href="mailto:gburha@ERM.com">gburha@ERM.com</a></td>
<td>0721928164</td>
<td></td>
</tr>
</tbody>
</table>
MEETING MINUTES

<table>
<thead>
<tr>
<th>Stakeholder Consulted</th>
<th>Public Baraza</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject/Project</td>
<td>Development of 2,000 km of roads supporting primary growth sectors through contractor facilitated financing mechanism (Phase 1); Tender No. KURA/PPP/240/2014-2015 (Lot 15 Ndikwe-Kiria (3.9 km and Mucunguca-Kiangage 5.1 km)</td>
</tr>
<tr>
<td>Project Number</td>
<td>0410731</td>
</tr>
<tr>
<td>Venue</td>
<td>Ndikwe Police Post</td>
</tr>
<tr>
<td>Date of Meeting</td>
<td>12th September 2019</td>
</tr>
<tr>
<td>Participants/Attendance</td>
<td>Refer to the Attendance Register attached</td>
</tr>
<tr>
<td>Minutes by</td>
<td>Gideon Owaga</td>
</tr>
<tr>
<td>Distribution</td>
<td>To be included in the ESIA Project Report</td>
</tr>
</tbody>
</table>

1. Introduction

The meeting began at 3:25 pm with opening remarks from the Area Chief, Hiungu who welcomed the project team and all others present.

Gideon Owaga from ERM stated that ERM is an environmental and social consultancy firm in over 40 countries and 160 offices worldwide and have been appointed by Mota Engil to undertake the Environmental and Social Impact Assessment (ESIA) for the proposed project. He further stated that Mota Engil is a Portuguese engineering and construction company currently present in fourteen African Countries including Nairobi. Kenya Urban Roads Authority (KURA) had identified a number of roads in different counties that need to be upgraded to tarmac from the current marram and well as construct the walkway and drainage.

2. Project Description (Mr. Kiilu-KURA)

The Government of the Republic of Kenya through the Ministry of Transport and Infrastructure represented by the Kenya Urban Roads Authority (KURA) has appointed a consortium comprising of Lee Construction Ltd, Cape Consult and, Mota Engenharia and Construcao Africa (hereafter referred to as the Developer) to design, construct (upgrade to paved standards) and maintain 2,000 km of urban roads in the Kenya Roads Annuity Programme, Lots 15 and 18. The selected roads aim at supporting primary growth sectors of commerce, tourism, agriculture and rural production and extractives industry. The construction activities are planned to last for a period of two years and the maintenance period is planned to last for eight years after which the consortium will fully hand over the roads to KURA. The commencement of the construction phase activities is dependent on the completion and approval of the road designs as well as obtaining of all the relevant permits, including the Environmental and Social Impact Assessment (ESIA) Certificates of Approval.
The roads in Lots 15 and 18 are spread in 10 counties; however, the purpose of this meeting is to discuss the road in Muranga Ndikwe-Kiria (3.9 km and Mucunguca-Kiangage 5.1 km).

3. **Environmental and Social Impact Assessment (ESIA) Process**

The ESIA process is guided by Environmental Management and Coordination Act (EMCA) of 1999 (reviewed in 2012) and the 2015 amendments and the associated Environmental (Impact Assessment and Audit) Regulations of 2003 (and the amendments of 2016). Reference is also made to Good International Industry Practice (GIIP) guidelines and the lender requirements, particularly, the IFC Performance Standards on environmental and social sustainability. As part of the ESIA process, stakeholder engagement and consultation is a paramount step to:

- Inform the stakeholders of the proposed project, associated impacts and identified measures to manage their significance to acceptable levels;
- Obtain stakeholders’ views on the proposed project to inform its design and implementation, and gain stakeholder support/s social license to operate; and
- Open communication channels for use through the lifecycle of the project.

4. **Discussion**

<table>
<thead>
<tr>
<th>Comment/ Question</th>
<th>Response from KURA/ERM</th>
</tr>
</thead>
<tbody>
<tr>
<td>One of the village members asked whether they will be given priority on employment opportunities.</td>
<td>The KURA representative pointed out that the contractor will ensure the first priority will be given to the locals. He further stated that the contractor will work closely with the chief’s office to ensure that information about the jobs is disseminated.</td>
</tr>
<tr>
<td>The area MCA pointed out that there are water lines along the Project Road and the contractor should ensure they are not damaged or water supply to the community is not affected.</td>
<td>This was noted.</td>
</tr>
<tr>
<td>One of the village members wanted to know the measures that will be put in place to reduce accidents along the road.</td>
<td>The ERM representative pointed out that the contractor will be required to have a traffic management plan for the construction and operation phase which includes implementing measures such as speed bumps and road signs among others.</td>
</tr>
<tr>
<td>One of the village members asked when the project will commence</td>
<td>The KURA representative pointed out that once all approvals are in place the project.</td>
</tr>
<tr>
<td>One of the village members asked whether the disabled will be considered for the job opportunities</td>
<td>The KURA representative pointed out that there will be no discrimination in the allocation of jobs.</td>
</tr>
<tr>
<td>One of the community members whether they will be compensated for loss of crops.</td>
<td>The KURA representative pointed out that those who will have property within the road reserve will be facilitated and not compensated. They will also be given ample time and notice to relocate.</td>
</tr>
<tr>
<td>One of the community members asked what will be done to ensure the accessibility to</td>
<td>The KURA representative pointed out that the contractor is obligated to provide</td>
</tr>
</tbody>
</table>
their homes and businesses is not affected during the road construction

alternative access routes for the community during construction.

5. Way forward/ Conclusion/ General feedback from stakeholder consulted

- The Deputy Officer Commanding Station (OCS) pointed out that insecurity is a key issue in the area and encouraged the parents to ensure their children attend school to reduce idleness.
- The OCS pointed out that alcoholism was rampant in the area because of scrupulous businessmen who collude with the licencing authorities in the county to licence bars and restaurants to operate at unacceptable hours.
- The MCA pointed out that the local community should take advantage of business opportunities during the construction phase such as supplying of materials.
- The MCA thanked the Proponent for ensuring the community is well informed before commencement of the project.
- The Deputy County Commissioner (DCC) pointed out that parents should ensure their children go to school to reduce the crime rate in the area.
- The DCC noted that there was an increase in destruction of public property and action will be taken against those found culpable.

6. Closure

The project team thanked all present for their time and there being no other business, the meeting ended at 4:30 pm.
7. Photos

The OCS giving his remark

Mr. Josiah Wandarua from KURA giving his remarks

Area MCA giving his remarks

The DCC giving his remarks
8. Attendance Register

<table>
<thead>
<tr>
<th>Name</th>
<th>Sex (M/F)</th>
<th>Location</th>
<th>Telephone No.</th>
<th>ID No</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREDrick M. KUNDI</td>
<td>F</td>
<td>GIKANDU</td>
<td>0720439796</td>
<td>26505943</td>
<td></td>
</tr>
<tr>
<td>KEN K. GACHOCHI</td>
<td>M</td>
<td>GIKANDU</td>
<td>0723373659</td>
<td>79976769</td>
<td></td>
</tr>
<tr>
<td>TONY K. KUNGLICH</td>
<td>M</td>
<td>NAIROBI</td>
<td>0725768389</td>
<td>93379879</td>
<td></td>
</tr>
<tr>
<td>AMOS K. KUNGLICH</td>
<td>M</td>
<td>KIAMBNI</td>
<td>0725738672</td>
<td>73578769</td>
<td></td>
</tr>
<tr>
<td>JOHN N. KARUKO</td>
<td>M</td>
<td>MOI</td>
<td>0723967428</td>
<td>18787964</td>
<td></td>
</tr>
<tr>
<td>AMOS K. KIBAU</td>
<td>M</td>
<td>KIAMBNI</td>
<td>0725900047</td>
<td>26627959</td>
<td></td>
</tr>
<tr>
<td>DOROTHY M. MUIRUI</td>
<td>M</td>
<td>KIAMBNI</td>
<td>0723403362</td>
<td>26687626</td>
<td></td>
</tr>
<tr>
<td>ジョH N. KARUKO</td>
<td>M</td>
<td>NAIROBI</td>
<td>0728688240</td>
<td>26646979</td>
<td></td>
</tr>
<tr>
<td>JOSEPH KOMBE</td>
<td>M</td>
<td>MAARAGI</td>
<td>0726774727</td>
<td>26687779</td>
<td></td>
</tr>
<tr>
<td>EMMA MUIRUI</td>
<td>M</td>
<td>KIAMBNI</td>
<td>0726937732</td>
<td>02636769</td>
<td></td>
</tr>
<tr>
<td>SAS DAY M. WANDA</td>
<td>M</td>
<td>GIKANDU</td>
<td>0719567651</td>
<td>02679967</td>
<td></td>
</tr>
<tr>
<td>CHRIST M. IRWIN</td>
<td>M</td>
<td>GIKANDU</td>
<td>0727468303</td>
<td>26674099</td>
<td></td>
</tr>
</tbody>
</table>

**PUBLIC MEETING REGISTER**

- **Client:** PUBLIC BARAZA - MURANGA
- **Project:** LOT 5 - MURANGA - KIAMBNI (2.5HA)
- **Date:** 12th September 2019
- **Venu:** NEAR KIAMBNI POLICE POST
- **Time Started:** 10:00 AM
- **Time Ended:** 12:00 NOON
- **Name:** JOSEPH WANDA (as above)
- **Sex (M/F):** M
- **Location:** KIAMBNI
- **Telephone No.:** 0723437304
- **ID No.:** 26505943
- **Signature:**

---

**PUBLIC MEETING REGISTER**

- **Client:** PUBLIC BARAZA - MURANGA
- **Project:** LOT 5 - MURANGA - KIAMBNI (2.5HA)
- **Date:** 12th September 2019
- **Venu:** NEAR KIAMBNI POLICE POST
- **Time Started:** 10:00 AM
- **Time Ended:** 12:00 NOON
- **Name:** JOHN M. WANDA (as above)
- **Sex (M/F):** M
- **Location:** KIAMBNI
- **Telephone No.:** 0726615693
- **ID No.:** 26505943
- **Signature:**

---

© Copyright 2019 by ERM Worldwide Group Limited and/or its affiliates (‘ERM’). All Rights Reserved. No part of this work may be reproduced or transmitted in any form or by any means, without prior written permission of ERM.
## PUBLIC MEETING REGISTER

<table>
<thead>
<tr>
<th>Name</th>
<th>Sex</th>
<th>Location</th>
<th>Telephone No.</th>
<th>ID No.</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>NELUMONGA MUTHA</td>
<td>M</td>
<td>Gikanda</td>
<td>0723292806</td>
<td>3571619</td>
<td>09-20-19</td>
</tr>
<tr>
<td>Kiboko/wisoe muthoni</td>
<td>M</td>
<td>Gikanda</td>
<td>0718120378</td>
<td>3187400</td>
<td>09-20-19</td>
</tr>
<tr>
<td>Susan Munday</td>
<td>F</td>
<td>Kirby</td>
<td>0723292806</td>
<td>3571619</td>
<td>09-20-19</td>
</tr>
<tr>
<td>NELUMONGA MUTHA</td>
<td>M</td>
<td>Gikanda</td>
<td>0723292806</td>
<td>3571619</td>
<td>09-20-19</td>
</tr>
<tr>
<td>UNICE MUGENDI MWANGI</td>
<td>F</td>
<td>Gikanda</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mary Muungu</td>
<td>F</td>
<td>Gikanda</td>
<td>13743646</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mary Kiboko</td>
<td>F</td>
<td>Gikanda</td>
<td>13743646</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nancy Muungu</td>
<td>F</td>
<td>Gikanda</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mung’o Muungu</td>
<td>M</td>
<td>Gikanda</td>
<td>13743646</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Samuel Muungu</td>
<td>M</td>
<td>Korpia</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paul Kiboko</td>
<td>M</td>
<td>Gikanda</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patrick Muungu</td>
<td>M</td>
<td>Gikanda</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frances Muungu</td>
<td>F</td>
<td>Gikanda</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Robert Muungu</td>
<td>M</td>
<td>Gikanda</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

## PUBLIC MEETING REGISTER

<table>
<thead>
<tr>
<th>Name</th>
<th>Sex</th>
<th>Location</th>
<th>Telephone No.</th>
<th>ID No.</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fred R. Mwai</td>
<td>M</td>
<td>Gikanda</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRANKLIN K. WANGARA</td>
<td>M</td>
<td>Gikanda</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>James Mwai</td>
<td>M</td>
<td>Gikanda</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wilson Mwai</td>
<td>M</td>
<td>Gikanda</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peter Kiboko</td>
<td>M</td>
<td>Korpia</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joseph Mwai</td>
<td>M</td>
<td>Gikanda</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Samuel Mwai</td>
<td>M</td>
<td>Gikanda</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Robert Mwai</td>
<td>M</td>
<td>Gikanda</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joseph Mwai</td>
<td>M</td>
<td>Korpia</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>John Mwai</td>
<td>M</td>
<td>Gikanda</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mwai Mwai</td>
<td>M</td>
<td>Gikanda</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mwai Mwai</td>
<td>F</td>
<td>Gikanda</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hanana Mwai</td>
<td>F</td>
<td>Gikanda</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mwai Mwai</td>
<td>F</td>
<td>Gikanda</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solomon Mwai</td>
<td>F</td>
<td>Gikanda</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mwai Mwai</td>
<td>F</td>
<td>Gikanda</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lawrence Mwai</td>
<td>F</td>
<td>Gikanda</td>
<td>0723292806</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ERM has over 160 offices across the following countries and territories worldwide

<table>
<thead>
<tr>
<th>Argentina</th>
<th>The Netherlands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>New Zealand</td>
</tr>
<tr>
<td>Belgium</td>
<td>Norway</td>
</tr>
<tr>
<td>Brazil</td>
<td>Panama</td>
</tr>
<tr>
<td>Canada</td>
<td>Peru</td>
</tr>
<tr>
<td>Chile</td>
<td>Poland</td>
</tr>
<tr>
<td>China</td>
<td>Portugal</td>
</tr>
<tr>
<td>Colombia</td>
<td>Puerto Rico</td>
</tr>
<tr>
<td>France</td>
<td>Romania</td>
</tr>
<tr>
<td>Germany</td>
<td>Russia</td>
</tr>
<tr>
<td>Guyana</td>
<td>Singapore</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>South Africa</td>
</tr>
<tr>
<td>India</td>
<td>South Korea</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Spain</td>
</tr>
<tr>
<td>Ireland</td>
<td>Sweden</td>
</tr>
<tr>
<td>Italy</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Japan</td>
<td>Taiwan</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>Tanzania</td>
</tr>
<tr>
<td>Kenya</td>
<td>Thailand</td>
</tr>
<tr>
<td>Malaysia</td>
<td>UK</td>
</tr>
<tr>
<td>Mexico</td>
<td>US</td>
</tr>
<tr>
<td>Mozambique</td>
<td>Vietnam</td>
</tr>
<tr>
<td>Myanmar</td>
<td></td>
</tr>
</tbody>
</table>

**ERM’s Nairobi Office**

Senteu Plaza  
1st Floor, Cnr of Lenana and Galana Roads, Kilimani  
Nairobi, Kenya  
T: +254 740 861 650/1  
F: 254 71 265 0516

www.erm.com