Kampala-Jinja Expressway PPP Project
Phase 1
Environmental and Social Impact Assessment

Volume D: Environmental and Social Management and Monitoring Plan

prepared for

Uganda National Roads Authority (UNRA)

by

Earth Systems and Atacama Consulting

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ACRONYMS / ABBREVIATIONS

Acronym	Full Term
AfDB	African Development Bank
BAP	Biodiversity Action Plan
BOD	Biological Oxygen Demand
CEMP	Construction Environmental Management Plan
CO	Carbon monoxide
CO_2	Carbon dioxide
COD	Chemical Oxygen Demand
DO	Dissolved oxygen
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
ESMMP	Environmental and Social Management and Monitoring Plan
HIV / AIDS	Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome
IFC	International Finance Corporation
IFC PS	International Finance Corporation Performance Standard
KJE	Kampala Jinja Expressway
km	kilometres
L	litres
M	metres
MSDS	Materials Safety Data Sheets
Mt/y	Million tonnes per year
NEMA	National Environment Management Authority
NGO	Non-governmental Organisation
NO_2	Nitrogen dioxide
NOx	Nitrogen oxides
OHS&E	Occupational Health, Safety and Environment
ORP	Oxidation Reduction Potential
PM	Particulate Matter
ppm	Parts per million
RLRP	Resettlement and Livelihood Restoration Plan
ROW	Right-of-way
SO_2	Sulphur dioxide
SOP	Standard Operating Procedure
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UNRA	Uganda National Roads Authority
VOCs	Volatile Organic Compounds
WHO	World Health Organisation

1. INTRODUCTION

1.1 Overview

This Environmental and Social Management and Monitoring Plan (ESMMP) for Phase 1 of the Kampala-Jinja Expressway (KJE) PPP Project (hereafter 'the Project') has been prepared by Earth Systems and Atacama Consulting for the Uganda National Roads Authority (UNRA). It forms part of the Environmental and Social Impact Assessment (ESIA) documents for the Project.

The ESMMP incorporates the key findings and environmental and social management, mitigation, and monitoring measures and strategies of the ESIA Report (Volume B) based on currently available Project information for pre-construction, construction, construction decommissioning, and operations.

The ESMMP will be a dynamic document and should be reviewed and updated by UNRA as required to incorporate any significant changes (i.e. to Project activities, commitments, environmental and social conditions, regulatory requirements, and potential optimisation of best management practices) or at least annually during the life of the Project.

This ESMMP is prepared in line with the Final Draft Environmental Impact Assessment (EIA) Guidelines for Road Projects (Ugandan Ministry of Works, Housing and Communications, 2004) and relevant international standards for the Project.

1.2 Project Overview

The Project that this ESMMP covers is Phase 1 of the overall Kampala-Jinja Expressway (KJE) PPP Project (Figure 1-1). As part of the overall project, UNRA is proposing to construct a limited access 76 km tolled expressway between Kampala and Jinja to relieve the current congestion and reliance issues on the radial routes out of Kampala city and on the existing Kampala to Jinja highway to cater for future growth. This infrastructure development is part of the Northern Corridor – a vital international highway connecting the port of Mombasa in Kenya to the landlocked countries of Uganda, Rwanda, Burundi and the Democratic Republic of Congo.

The Project also includes the Kampala Southern Bypass which will provide a bypass to the capital city of Kampala, linking to the Kampala Entebbe expressway and the Northern Bypass to form a complete ring road around the city. The overall KJE Project is planned to be undertaken in two phases as follows:

- **Phase 1** (covered in this ESMMP) – development of the first section (35 km) of the Kampala-Jinja Expressway (KJE) from Kampala to Namagunga and the Kampala Southern Bypass (KSB) (18 km) which is expected to be completed by 2023; and
- **Phase 2** - development of the second section of the Kampala-Jinja Expressway (KJE) from Namagunga to Njeru (41 km) at the new Nile bridge. Works for the second phase are anticipated to be completed by 2030.

The overall KJE Project is currently planned for a 30-year term, inclusive of the construction period, after which Project facilities will be transferred to UNRA. The KJE Project is expected to generate up to 1,500 jobs during construction and 250 jobs during operations, most of which will be taken up by Ugandans. Once operational, the expressway is expected to save up to 70 minutes of journey time between Kampala and Jinja.

Further details regarding the Project description are provided in Chapter 3 of the ESIA Report (Volume B).

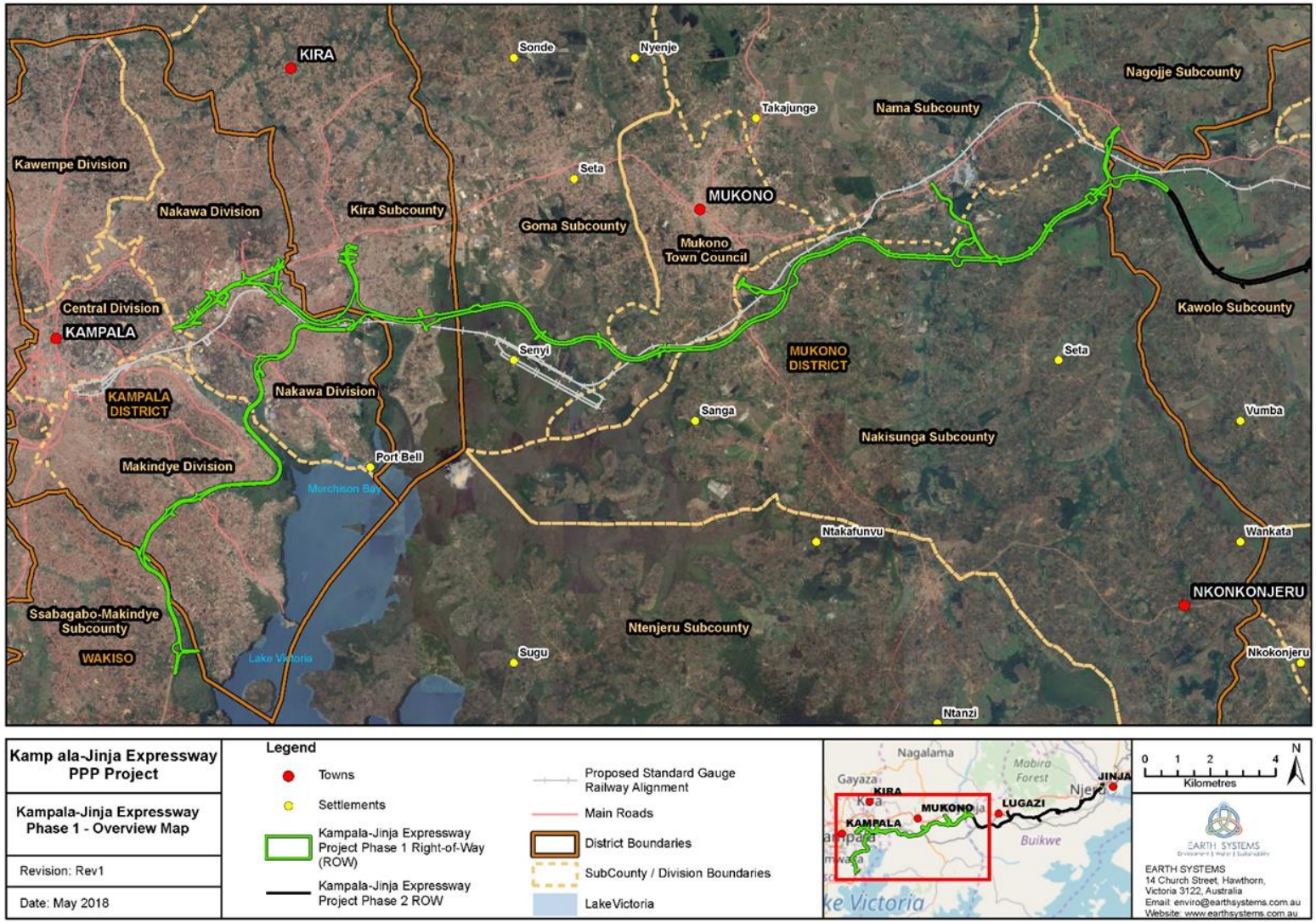

Figure 1-1: Overview of the Phase I of the Kampala-Jinja Expressway (KJE) Project

1.3 Objectives of the ESMMP

The ESMMP details the environmental and social commitments, management and monitoring requirements that will need to be carried out by UNRA and its contractors throughout the life of the Project in order to achieve the following objectives:

1. Strive to prevent or mitigate potentially adverse environmental or social impact that may result from Project implementation;
2. To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment;
3. Maximise beneficial impacts and minimise unavoidable residual impacts to an acceptable level for the receiving environment and communities;
4. Meet environmental and social commitments and measures outlined in the ESIA Report (Volume B) as well as relevant policies and environmental management systems; and
5. Comply with national legislation as well as relevant international environmental and social standards.

2. LEGISLATIVE AND REGULATORY FRAMEWORK

2.1 Ugandan Legislative Framework

The Ugandan EIA Guidelines (NEMA, 1997) and Final Draft EIA Guidelines for Road Projects (Ugandan Ministry of Works, Housing and Communications, 2004) require the preparation of an ESMMP as part of the ESIA process. The latter stipulates that the ESMMP summarise the anticipated environmental impacts of projects; provide details on the measures, responsibilities and scheduling to mitigate these impacts; and the costs of mitigation, monitoring and supervision. The ESMMP has been prepared in accordance with these requirements and the Terms of Reference for the Project ESIA.

The Project will comply with Ugandan legislative and regulatory requirements outlined in the ESIA. Project discharge standards of relevance to environmental monitoring are presented in Section 2.5.

2.2 International Standards and Guidelines

2.3 IFC's Sustainability Framework

The IFC is the private lending arm of the World Bank Group and the largest multilateral source of loan and equity financing for private sector projects in developing nations. The environmental and social policies and procedures of the World Bank are widely regarded as de facto international standards for the environmental and social management of resource development projects in countries with developing or absent regulatory frameworks.

The IFC Performance Standards were introduced to provide guidance for IFC clients to manage and improve their environmental and social performance through a risk and outcomes based approach. Direction to IFC's clients and staff on the application of the Performance Standards is provided in the IFC Guidance Notes, a companion document to the Policy on Environmental and Social Sustainability. The updated IFC Performance Standards (2012) (PS) comprise the following:

- PS 1: Assessment and Management of Environmental and Social Risks and Impacts;
- PS 2: Labour and Working Conditions;
- PS 3: Resource Efficiency and Pollution Reduction;
- PS 4: Community Health, Safety and Security;
- PS 5: Land Acquisition and Involuntary Resettlement;
- PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources;
- PS 7: Indigenous Peoples; and
- PS 8: Cultural Heritage.

Implications of the above performance standards for the Project are discussed in the ESIA Report (Chapter 2, Volume B).

2.3.1 AfDB Integrated Safeguard System

The African Development Bank's Integrated Safeguard System (2013) sets out five Operational Safeguards supported by Environmental and social Assessment Procedures and Integrated Environmental and Social Impact Assessment Guidance Notes, which contain provisions for environmental and social safeguards and compliance aspects. The Operational Safeguards consist of:

- Operational safeguard 1: Environmental and social assessment
- Operational safeguard 2: Involuntary resettlement: land acquisition, population displacement and compensation
- Operational safeguard 3: Biodiversity, renewable resources and ecosystem services
- Operational safeguard 4: Pollution prevention and control, hazardous materials and resource efficiency
- Operational safeguard 5: Labour conditions, health and safety.

The Integrated Safeguards System Policy Statement and Operational Safeguards (2013) is a tool for identifying risks, reducing development costs and improving project sustainability, thus benefiting affected communities and helping to preserve the environment. The Safeguards promote best practices and encourages greater transparency and accountability, especially for the most vulnerable communities, to express their views by providing project-level grievance and redress mechanisms.

Of relevance to the KJE Project is the ESAPs and IESIA Guidance Notes providing technical guidance on standards regarding roads and highways, and the Operational Safeguards.

2.4 UNRA Environmental Commitments and Policies

UNRA is committed to international standards of good practice in the areas of environmental protection, social development, and health safety and security. In support of this commitment, UNRA has developed an Environmental and Social Safeguards Policy (2016), as part of its Environmental and Social Management System, which governs UNRA's operations. The ESMMP has been developed consistent with this policy.

Specifically, UNRA is committed to:

- Avoiding, preventing, reducing and mitigating environmental and social impacts of its activities, including road development, maintenance, and rehabilitation activities and wherever possible, to enhancing the positive impact, to the environment and people; and
- Integration of Good International Industry Practice with respect to the environment and social requirements in all its operation, including in the planning, design, construction, and maintenance of roads, bridges and ferries. The Authority will seek to involve communities in project activities to enhance sustainable development, including activities such as tree planting, wetlands restoration and environment awareness campaigns for communities.

The Environmental and Social Safeguards Policy (2016) focuses on:

- Assessment and management of environmental and social impacts;
- Occupational and community health and safety;
- Gender, vulnerable people (including those with disabilities);
- HIV/ AIDS awareness and prevention;
- Stakeholder engagement and disclosure of information;
- Grievance redress mechanism;
- Labour and working conditions;
- Sensitive ecosystems and the sustainable development of the environment;
- Climate change;
- Land acquisition and involuntary resettlement; and

- Cultural Resources.

2.5 Project Discharge Standards

The Project will consider and comply with:

- Discharge / emissions guidelines for off-site releases of water, waste and potential airborne contaminants; and
- Ambient guidelines for the protection of beneficial uses and environmental values (e.g. aquatic fauna / fisheries protection, drinking water protection, etc.).

A list of relevant national and international standards is presented in Table 2-1. Where standards or limits do not exist in Ugandan Law, guidelines, standards or limits used by other countries (e.g. EU, USEPA, UK, Australia) or organisations (e.g. IFC, WHO) are adopted in lieu.

Table 2-1 Relevant air quality, noise and water quality standards and guidelines for the Project

Source	Relevant Guidelines	Year
WASTE / WASTEWATER DISCHARGE AND MONITORING		
Uganda	National Environment (Standards for Discharge of Effluent into Water or on Land) Regulations	1999
	National Environment (Waste Management) Regulations	1999
IFC	Environmental Health and Safety Guidelines – General – Environmental	2007
	General EHS Guidelines: Wastewater and Ambient Water Quality.	2007
AIR QUALITY		
Uganda	Draft Ambient Air Quality Standards (UNRA)	2006 (draft)
IFC	General EHS Guidelines: Air Emissions and Ambient Air Quality.	2007
WHO	Air Quality Guidelines – Global Update	2005
SOIL QUALITY		
UK	Soil Guideline Value	2009
AQUATIC FAUNA / FRESH WATERS		
United States	National recommended water quality criteria; republication. United States Environmental Protection Agency (USEPA)	2009
European Union	Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council.	2008
European Union	Directive 2006/44/EC of the European Parliament and of the Council of 6 September 2006 on the quality of fresh waters needing protection or improvement in order to support fish life (E.U., 2006).	2006
DRINKING WATER		
Uganda	Potable water — Specification (US EAS 12)	2014
WHO	Guidelines for Drinking Water Quality, fourth edition	2017
European Union	Council directive 9883/EC of November 1998 on the quality of water intended for human consumption.	1998
NOISE AND VIBRATION		
Uganda	Uganda National Environment (Noise Standards and Control) Regulations	2003
Australia	Australian Standard (AS 2187.2 App. J Ground Vibration and Airblast Overpressure) based on the US Bureau of Mines USBM RI-8507 and British Standards (vibration) BS 6472:2008, 4866:2010 and 7385-2:1993	2006
WHO	Guidelines for community noise	1999

Source	Relevant Guidelines	Year
IFC	Environmental Health and Safety Guidelines for Toll Roads	2007
	Environmental Health and Safety Guidelines: Noise Management	2007

3. ESMMP FRAMEWORK

3.1 Environmental Management Systems

3.1.1 Overview

UNRA is committed to international standards of good practice in the areas of environmental protection, social development, and health safety and security. In support of this commitment, UNRA has developed an Environmental and Social Management System, governed by an Environmental and Social Safeguards Policy (2016). The management system provides UNRA with a procedural framework for implementing, achieving, reviewing and maintaining its environmental and community policies and all environmental and social management targets.

This ESMMP provides a link between policy and implementation, essentially, acting as a planning document, summarising environmental and social commitments for the Project and presenting the management measures and monitoring programs to be undertaken to achieve these commitments. The ESMMP provides a framework for developing flexible and readily updateable environmental management procedures within a formal EMS. This function of the ESMMP is represented schematically in Figure 3-1.

Other key plans produced for the Project which will form part of the management system are contained in Volume D of the ESIA and include:

- Resettlement and Livelihood Restoration Plan;
- Stakeholder Engagement Plan;
- Water Management Plan;
- Biodiversity Action Plan; and
- Revegetation Plan.

Prior to construction, the construction contractor/concessionaire will be required to prepare the following plans/sub-plans to support the implementation of the management and monitoring program:

- Construction Environmental Management Plan (CEMP);
- Emergency Preparedness and Response Plan;
- Blasting Plan;
- Transport Management Plans;
- Air Quality Management Plan; and
- Noise and Vibration Management Plan.

As part of the CEMP to be prepared by the construction contractor / concessionaire, detailed plans for implementation of monitoring activities should be developed including specific indicators, targets, criteria, schedules, equipment and parameters.

An Operations Environmental Management Plan (OEMP) will also need to be prepared by the contractor/concessionaire prior to the Operations Phase.

The implementation of the ESMMP, CEMP and OEMP and other management plans for the Project will need to be supported by a number of Standard Operating Procedures (SOPs) which will be important for environmental and social management, such as the Chance Finds Procedure (provided in Volume C of the ESIA). Additional SOPs will need to be prepared as required as part of the CEMP and OEMP for the Project.

Key relevant existing UNRA procedures as outlined in UNRA's *Environmental and Social Management System: First and Priority Set of Procedures* (2017) that will support the implementation of the ESMMP include:

- Procedure for Including Special Conditions on Environmental and Social Requirements into Works Contracts;
- Guideline for Mainstreaming Gender, HIV/AIDS and Needs of Vulnerable Groups in UNRA Projects;
- Procedure for obtaining a suitable Environmental and Social Implementation Plan;
- Guidelines for the Preparation of Environmental and Social Implementation Plan;
- Procedure for Preparation of Contractor's and the Supervising Consultant's Codes of Conduct;
- Procedure for Considering Environmental and Social Requirements in Design Change;
- Procedure for Supervision of Environmental and Social Requirements in Works Contracts;
- Procedure for Reporting on Environment and Social Performance;
- Works Completion and Site Restoration Procedure; and
- Procedure for Training on Environmental and Social Requirements.

The effective implementation and regular updating of these plans and procedures in response to changing needs will ensure that environmental and social impacts attributable to the Project are minimised and potential environmental and social benefits are maximised. Ongoing consultation with the Government of Uganda, local communities and other stakeholders will also be important to ensure consideration of stakeholder interests in the planning and development of the Project.

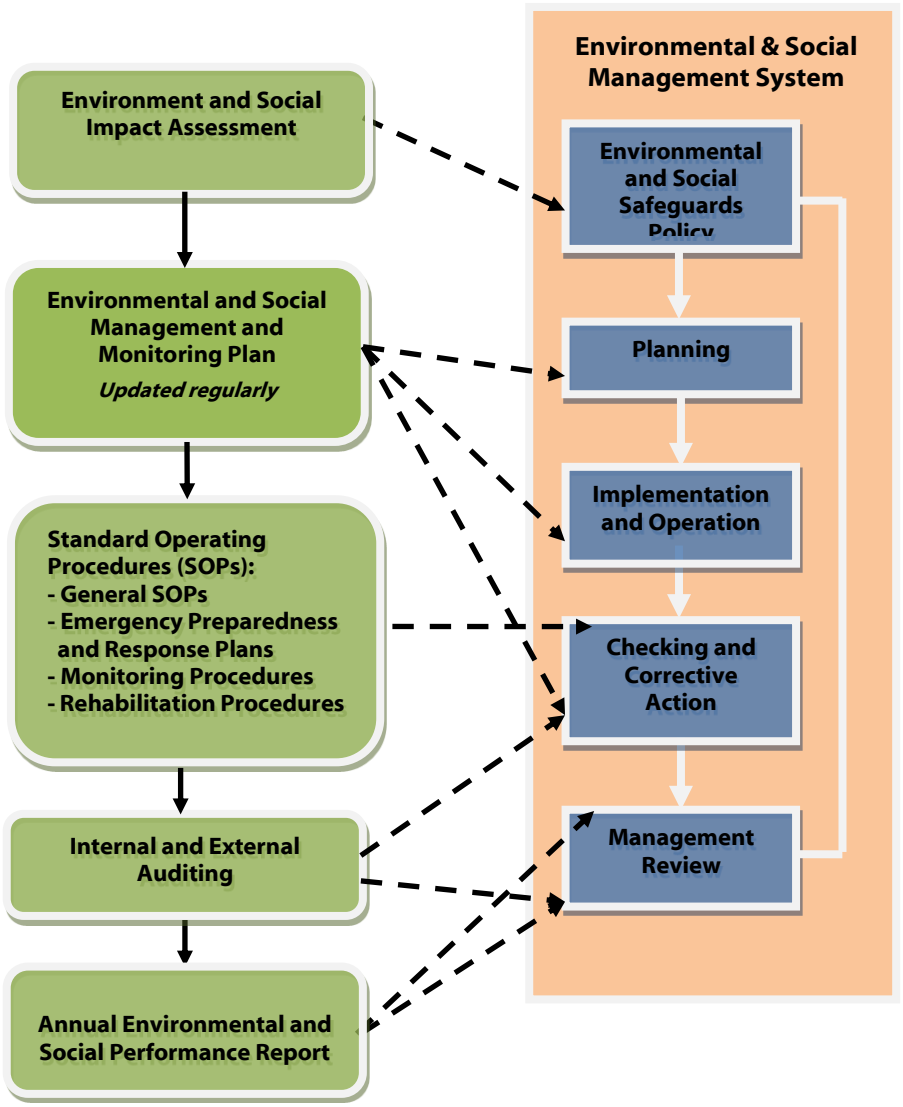

Figure 3-1: Schematic diagram of the ESMMP framework

3.2 Responsibilities and Human Resources

Implementation of the ESMMP will require appropriate staff, financial resources, equipment and support systems. UNRA and the construction contractor/concessionaire will be responsible for engaging a suitably skilled and experienced team to implement the ESMMP for the Project. It is the responsibility of all Project staff and contractors to comply with the requirements set out in the ESMMP. The responsibilities and duties of Project staff, contractors and suppliers will need to be defined through standard terms and conditions of contracts that are consistent with the commitments of the ESMMP.

UNRA staff and Project contractors are recommended to undertake internal training and education activities to ensure that Project expectations regarding environmental and social performance are achieved and maintain training records. This would include building upon the outcomes of the UNRA Capacity Building Assessment on environmental and social safeguards commissioned by the EU, which identified a number of key areas for UNRA training and future needs applicable for the Project (AECOM International Development Europe, 2017). UNRA is recommended to implement a Competency Based Training Scheme to act as the benchmark for its staff and contractors to improve their levels of competency in their fields.

The recommended key roles and responsibilities for the implementation of the Project ESMMP are outlined below. Figure 3-2 shows the proposed organisational structure for the Project ESMMP implementation.

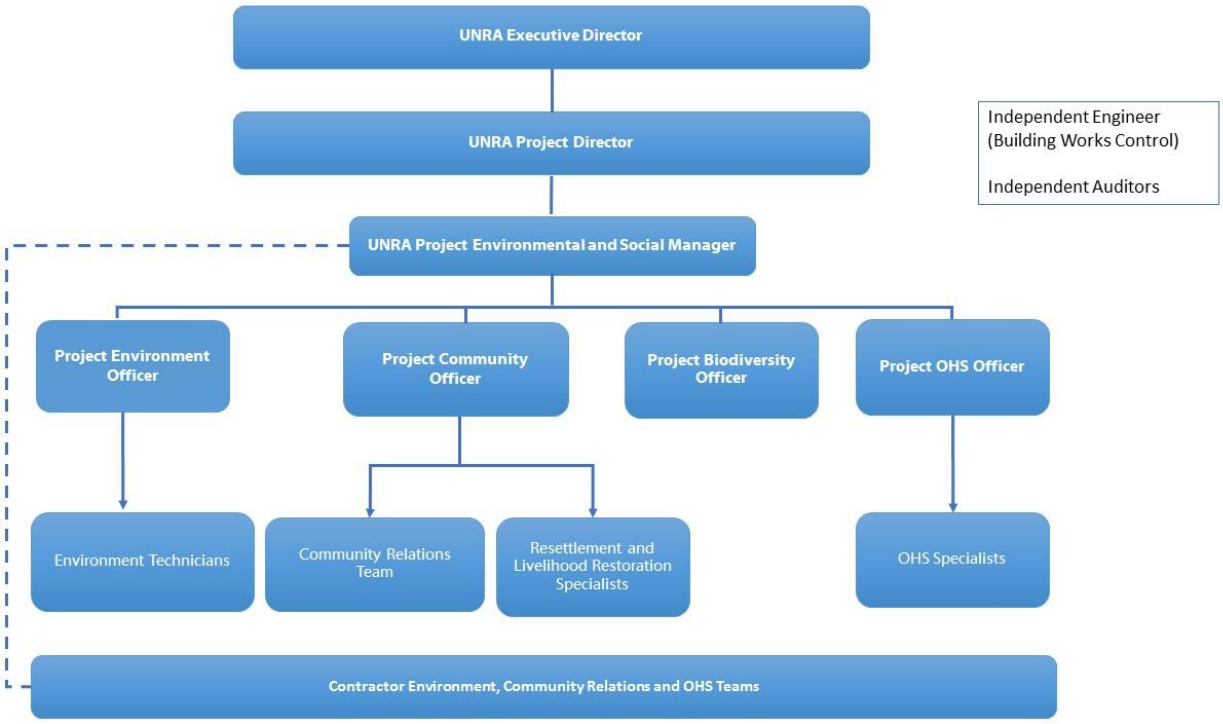

Figure 3-2: Proposed organisational structure for ESMMP implementation

3.2.1 UNRA Project Director

The UNRA Project Director would:

- Have overall responsibility of project technical development as well as environmental and social compliance.
- Ensure that appropriate resources are allocated to the environmental and social management of the Project, including budget and human resources.
- Review and approve the Construction Environmental Management Plan (CEMP) and Operations Environmental Management Plan (OEMP) prepared for the Project by the primary contractor/concessionaire, and any major revisions to the ESMMP.
- Ensure that UNRA staff are appropriately trained in environmental, social and safety awareness.
- Sign off close-out of any Project incidents and grievances.
- Ensure the effective implementation of UNRA policies, programs and procedures.

3.2.2 UNRA Project Environmental and Social Manager

The UNRA Project Environmental and Social Manager would be in charge of overseeing the implementation and continued improvement of the ESMMP and related management plans. The UNRA Project Environmental and Social Manager should be supported by Environment, Community Relations and OHS teams. Key responsibilities of the UNRA Project Environmental and Social Manager should include:

- Ensure that the required environmental and social management and monitoring measures identified in the ESMMP, *Resettlement and Livelihood Restoration Plan* (RLRP) and related management plans are undertaken.
- Ensure that the ESMMP, CEMP, OEMP and environmental, social and OHS risk assessment are regularly reviewed and updated as required.
- Ensure compliance is achieved with relevant national and international legislative and policy requirements and other Project environmental and social commitments (e.g. UNRA policies, standards or commitments).
- Oversee the coordination and conduct of community consultation / environmental and social / OHS activities, resettlement and compensation processes, and management of Project grievances and incidents through the UNRA management systems.
- Hold the Project Environmental, Social and OHS staff (see below) responsible for the effective implementation and continued improvement of environmental and social policies, procedures, and management plans.
- Ensure all necessary permits for UNRA are obtained.

3.2.3 UNRA Project Environmental, Social and OHS Staff

UNRA should employ qualified and experienced Environment, Social and OHS staff for the Project comprised of a Project Environment Officer, Project Biodiversity Officer, Project Community Officer and Project OHS Officer. These Officers should be supported as needed by a team of professional specialists and technicians. Key responsibilities of these Officers would include:

- Ensure that the requirements in the ESMMP, ESIA, RLRP and related management plans commitments as well as national and international standard requirements are incorporated into the contract specifications for construction.
- Check that contractors fulfil the requirements of the ESMMP and related plans and contract specifications (i.e. through the contractor's CEMP/OEMP, OHS Plan), including for monitoring, surveillance and auditing requirements.
- Approval of relevant contractor's documents, new ancillary sites' opening, building plans for water management, etc. as needed for the Project.
- Ensure community consultation activities, resettlement and compensation processes, community initiatives, managing grievances are conducted in accordance with the Stakeholder Engagement Plan (SEP) and RLRP.
- Log, manage and investigate Project incidents and grievances through UNRA's incident reporting and grievance management systems as needed.
- Prepare surveillance plans for each construction contract and complete regular assessment/review of the environmental, social and OHS risks and amend the surveillance plan as necessary to reflect the risks.
- Undertake regular on-site inspections / audits of work to check compliance and performance with the contract specifications and the contractor's CEMP/OEMP/OHS Plan.
- Review and report environmental and social data regarding the progress of implementation, effectiveness of management measures and monitoring data, and recommended actions or modifications required for non-compliance and continual improvements concerning ESMMP and related management plans implementation.

- Report to the appropriate regulatory authorities on significant reportable incidences and other Project reporting commitments (i.e. NEMA) as per regulations.
- Provide specialist advice on environmental, social and OHS management strategies, as required, to the contractor.
- Plan and carry out as needed environmental and social training programs for Project contractors.
- Work with contractor for development and implementation of appropriate community sensitisation programs for health and safety.
- Work with contractor for development and implementation of appropriate workers code of conduct and gender-based violence prevention programs.

The Project Environment Officer would be responsible for the operational and day to day implementation of the environmental components of the ESMMP and related management plans as well as management of environmental technicians (if applicable) while reporting, supporting and assisting the UNRA Project Environmental and Social Manager.

The Project Biodiversity Officer would be responsible for the operational implementation of the Biodiversity Action Plan (BAP) with details of key duties and responsibilities specified in the BAP.

The Project Community Officer would be responsible for the operational and day to day implementation of stakeholder engagement activities as well as social, resettlement and livelihood components of the ESMMP and related management plans (i.e. RLRP, SEP) as well as management of the Community Relations Team and Resettlement and Livelihood Restoration Specialists while reporting, supporting and assisting the UNRA Project Environmental and Social Manager.

The Project OHS Officer would be responsible for the operational and day to day implementation of the OHS components of the ESMMP and related management plans (i.e. OHS Plan) and management of OHS Specialists (if applicable) while reporting, supporting and assisting the UNRA Project Environmental and Social Manager.

3.2.4 Contractors

The lead construction contractor/concessionaire is expected to have appropriately qualified and experienced staff to implement the requirements of the ESMMP. This would be expected to include a dedicated Project Sustainability Manager (or equivalent) as well as appropriately resourced Environment Team, Community Relations Team and OHS Team.

The primary contractor/concessionaire for the Project (hereafter referred to as 'Contractor') would:

- Develop a CEMP in line with this ESMMP prior to construction, providing greater detail to meet environmental and social management requirements, and to the satisfaction of UNRA's Project Director. Prior to the Operations Phase, an OEMP will also need to be developed and approved by UNRA's Project Director.
- Effectively implement and manage the CEMP and OEMP to the satisfaction of UNRA's Project Director.
- Monitor, record, audit and conduct surveillance of the implementation and effectiveness of the CEMP/OEMP and report their effectiveness to UNRA's Project Director / Project Environmental and Social Manager.
- Report regularly to UNRA's Project Environmental and Social Manager regarding environmental and social performance.
- Engage an independent, suitably qualified and experienced auditor to conduct audits of implementation of the contract specification.

- Engage specialist environmental advice where required.
- Engage a qualified ecologist to demarcate ecological 'No-go zones' on-site.
- Check that all contractual commitments are honoured.
- Report incidents and grievances to UNRA's Project Director / Project Environmental and Social Manager and relevant government lead agencies. Document and follow actions taken to rectify the situation.
- Check that all other requirements as described in the contract specification are met.
- Inform UNRA's Project Director / Project Environmental and Social Manager of any queries from government lead agencies and respond accordingly.
- Review and update the CEMP/OEMP during construction/operations annually or if any significant changes occur.
- Check that Contractor's staff and subcontractors have been appropriately trained in environmental awareness, are fully informed of the CEMP/OEMP and understand the required measures for environmental and social compliance and performance.

3.2.5 Public and Government Agency Involvement

The participation of external parties in the monitoring programme of the Project will be the subject of consultation and will be agreed between UNRA, the Contractor and other Government agencies. Monitoring is expected to involve at least the following Government authorities:

- National Environment Management Authority (NEMA)
- Ministry of Water and Environment (MWE)
- Ministry of Works and Transport - Environment Liaison Unit (ELU)
- Ministry of Lands, Housing and Urban Development (MLHUD)
- Ministry of Tourism, Wildlife and Antiques (MTWA)
- Ministry of Gender, Labour and Social Developments (MGLSD)
- Department of Occupational Safety and Health
- Uganda Wildlife Authority (UWA)
- Directorate of Water Resources Management (DWRM)
- National Forest Authority (NFA)
- Wetlands Management Department (WMD)
- Department of Museums and Monuments
- Department of Disaster Preparedness.

Communities should also be involved in monitoring where possible, through relevant groups such as Local Environment Committees and/or Road Committees.

3.3 Monitoring Systems

The implementation of an appropriate monitoring strategy as part of the ESMMP is important to ensure that existing management measures are effective, and to identify the need for improved or additional measures. The objectives of the Project environmental and social monitoring programme are to:

- Detect and analyse environmental and social trends or changes to develop an appropriate response, where required;
- Ensure relevant environmental legislation and licensing commitments of the Project are complied with;
- Measure the performance of environmental and social management measures to ensure impacts remain at an acceptable level and there is ongoing improvement of Project's operations; and
- Provide early warning of potential impacts, determine the extent of anticipated impacts and identify any unforeseen impacts associated with Project activities.

The environmental and social monitoring programme for the construction and operation phases includes the following main categories of monitoring, which are further specified throughout this ESMMP:

- **Construction and Operations monitoring**: Routine construction monitoring including visual inspections and 'toolbox' meetings with Project personnel to ensure management measures are employed adequately during construction works and during operations.
- **Discharge (emission) monitoring**: The monitoring of potential contaminants discharged or emitted from the Project to the environment, measured at or near the point of discharge (e.g. discharge from sewage treatment plant at the accommodation camp).
- **Ambient monitoring**: The monitoring of background conditions and the receiving environments that may be affected by Project activities. Ambient monitoring should be undertaken in upstream and downstream surface waters, along with ambient dust and noise monitoring at nearby villages. While operational and discharge monitoring will determine if environmentally significant releases have occurred, effects on sensitive receptors within the receiving environment can only be determined by ambient monitoring.
- **Social monitoring**: The monitoring of socio-economic indicators and feedback from Project affected communities, to identify and quantify the direct and indirect impacts of the Project on the surrounding community.

A further category, **investigation monitoring**, should also be carried out when necessary, to determine the occurrence, nature and extent of impacts following an environmental incident (oil leakage, etc.) from the Project, or to verify/refute third-party claims of environmental / social impact.

During the construction decommissioning phase, **closure monitoring** should be undertaken to assess progress in achieving closure completion criteria for temporary work sites such as decommissioned borrow pits or accommodation camps.

During the Pre-Construction and Construction phase, monitoring will be required to ensure that the following aspects to be developed for the Project undergo due diligence environmental and social studies by the contractor (or concessionaire) to the satisfaction of NEMA and in accordance with international standards (e.g. IFC Performance Standards and AfDB's Operational Safeguards) to ensure potential impacts are avoided and minimised where possible:

- Any new drainage channels required for the Project outside the ROW;
- Associated service stations/rest areas along expressway;

- Plant equipment storage areas;
- Accommodation camp sites;
- Any new quarries and borrow pits; and
- Asphalt plant site.

UNRA should ensure accredited external laboratories are used for analysis of parameters that cannot be routinely analysed on-site. UNRA should also require the use of portable monitoring equipment on-site, where possible, for field measurements such as surface water quality analysis (e.g. refer to the Water Management Plan) and gas monitoring (i.e. SO_2, NO_x, CO). Other recommended monitoring equipment listed in this ESMMP include noise and vibration loggers, continuous aerosol monitoring device (e.g. DustTrack), dust deposition gauges/collectors. SOPs are expected to be developed to ensure that appropriate monitoring methods, equipment and controls (if required) are used to properly meet the ESMMP objectives.

All relevant employees involved in monitoring activities (particularly for field monitoring) should be given appropriate training, where required, by a competent person in the use of:

- Monitoring techniques, including: use, calibration and maintenance of field monitoring equipment, sample collection, labelling and transport;
- Review and interpretation of field and laboratory monitoring results; and
- Record keeping and reporting procedures, including using standard forms and databases.

Relevant environmental and social monitoring programmes for each Project component are detailed in Chapters 5 to 24 of this ESMMP. These monitoring programmes should be revised as appropriate when Project activities or conditions change significantly.

3.3.1 Data Management

Relevant Project environmental management documentation will be established on a web-based platform readily accessible to employees, contractors and consultants. The platform should be linked to a GIS database maintained up to date. Key documents for inclusion are the Project ESIA Report, ESMMP, associated management plans, SOPs, registers, forms, and relevant legislation, guidelines and discharge standards.

In addition, computer-based databases will be developed and maintained to capture and analyse Project related information collected from the environmental and social monitoring programmes. The databases should be capable of generating summary information (including statistics) on the performance of the Project where required. Databases to be developed for the Project should include:

- Environmental management databases comprising of the following information:
  - Relevant legislation, regulations and guidelines for Project compliance as well as progress in meeting its obligations and environmental and social commitments;
  - Field sampling information, including monitoring locations, description and map reference; sampling frequency, date and time; measurement parameters and unit of measure; monitoring results and comparison with relevant guidelines and standards; and quality assurance / quality control information;
  - Non-compliances and reported incidents/issues with corrective action required and implementation data, and outcome of corrective actions;

- Waste inventory, including the quantities, locations and types of materials (e.g. hazardous wastes and non-hazardous waste) for environmental management and rehabilitation/disposal purposes;
- Hazardous materials and dangerous goods inventory, including type, source, quantity, storage location and physical state of stored materials, relevant Material Safety Data Sheets (MSDS), and transport records);
- Cultural heritage register;
- Contaminated soil and spill inventory;
- Soil stockpile inventory, including location of temporary and long-term stockpiles and approximate volume of material; and
- Project workforce induction and training records.

► Stakeholder management databases to document information on:

- Information obtained from Project stakeholder engagement activities;
- Contact details of Project affected people and other stakeholders;
- Logged community complaints and grievances through the Project grievance management process;
- Outcome of investigations and agreed outcomes/actions with affected parties;
- Requests for community support and funding; and
- Compensation and resettlement information for each Project affected person.

Supporting forms and templates used to capture relevant information for database recording will be prepared to ensure data is captured consistently, accurately, and meaningfully.

3.4 Risk Management Systems

3.4.1 Risk Monitoring and Review

In accordance with the requirements of IFC Performance Standard 1 - Assessment and Management of Environmental and Social Risks and Impacts (2012), UNRA is required prior to construction commencing to "establish and maintain a process for identifying the environmental and social risks and impacts of the project".

Periodic risk monitoring and review are critical to managing environmental and social risks effectively throughout the Project life, and feed into all steps in the risk management process (refer Figure 3-3).

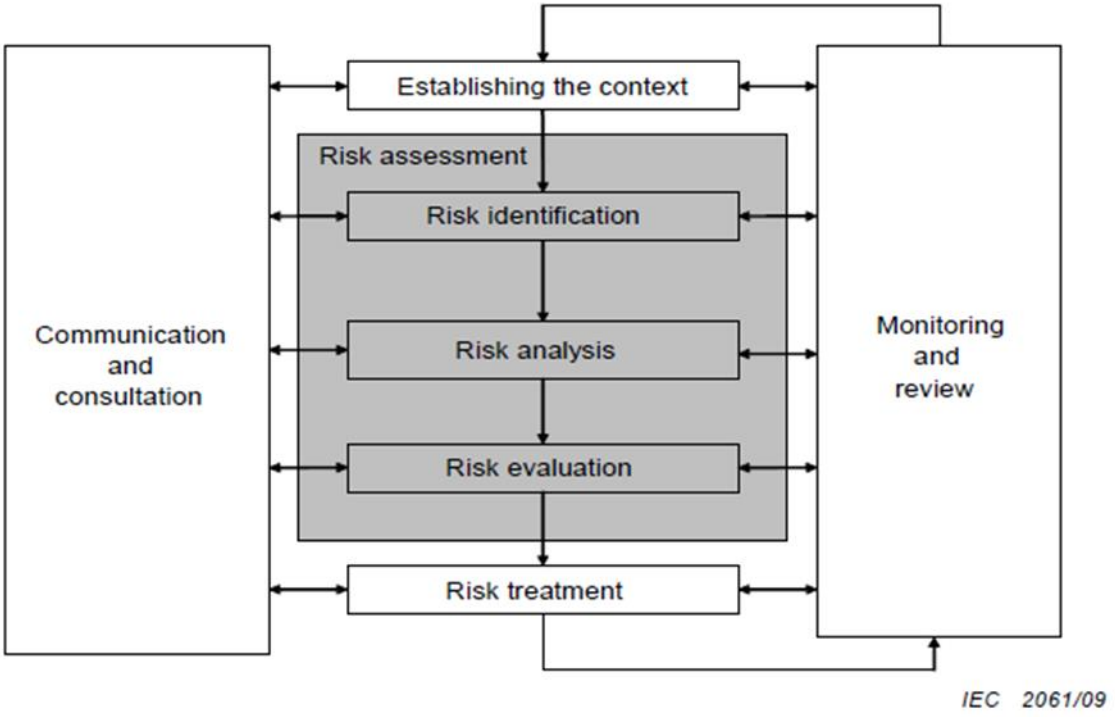

Figure 3-3: Risk Assessment Process (shaded) with the overall Risk Management Framework (ISO 31010)

UNRA is committed to developing a risk management system for the Project consistent with ISO 31000 Risk Management — Principles and Guidelines (2009). This will need to include:

- Ensuring there is accountability, authority and appropriate competence for managing risk;
- Development of an organisation-wide Risk Management Plan to ensure that risk management is embedded in all of the Authority's practices and processes;
- Allocation of appropriate resources for risk management;
- Establishment of appropriate internal and external communication and reporting mechanisms; and
- Monitoring and review of the risk management framework.

3.4.2 Risk Management Framework

Key elements of the risk management framework will consist of:

- Risk hierarchy;
- Risk governance and accountabilities; and
- Risk system.

To ensure the risk management framework is effective and continues to support the improvement of environmental and social management for the Project, it is recommended that UNRA:

- Regularly assess the quality of risk management processes to identify opportunities for improvement;

- Measure risk management performance for the Project against indicators, which are periodically reviewed for appropriateness;
- Periodically measure progress against, and deviation from, a Project-specific risk management plan;
- Periodically review whether the risk management framework, policy and plan are still appropriate for the Project, given the organisations' external and internal context (i.e. for the construction phase and during operations);
- Report on risk, progress with the risk management plan and how well the risk management policy is being followed; and
- Review the effectiveness of the risk management framework.

Decisions relating to the improvement of the risk management framework, policy and plans need to be based on the results of monitoring and reviews. These decisions will aim to improve the organisation's management of risk and its risk management culture.

UNRA should periodically monitor and review the risk assessment conducted for the Project to:

- Ensure controls are effective and efficient in both design, construction and operation;
- Obtain further information to improve risk assessment as needed;
- Analyse and learn lessons from events (including near-misses), changes, trends, successes and failures;
- Detect changes in the external and internal context, including changes to risk criteria and the risk itself which can require revision of risk treatments and priorities; and
- Identify emerging risks.

Progress in implementing risk treatment measures and plans provides a performance measure. The results of the monitoring and review processes need to be incorporated into the overall performance management, measurement, and external and internal reporting activities.

The results of monitoring and review need to be recorded and reported internally and externally as appropriate, and also be used as an input to the review of the risk management framework.

3.4.3 Risk Management Records

UNRA will need to ensure that systems are in place prior to construction commencing to ensure that sustainability related records are established and maintained, accurate, legible, identifiable, securely stored, and have established retention times based on legal requirements. All environmental and social risk assessments conducted for construction and operations, and associated documentation, need to be recorded and stored in the UNRA Project environmental and community files. These records may include:

- Internal risk assessments;
- External risk assessments;
- Risk and Opportunity Register;
- Relevant Company procedures, standards, policies and plans;
- Relevant international guidelines and standards;
- Audit results; and
- Incident reports.

3.5 Project Reporting

Templates should be developed and used as needed from the web-based platform to ensure reporting obligations are met.

The Contractor should be required to prepare regular reports (monthly, quarterly, and annual) on environmental, social, health and safety performance.

On an annual basis, UNRA should prepare a summary report on Project environmental and social performance in accordance with the ESMMP. The Global Reporting Initiative (GRI) Sustainability Reporting Guidelines may be used to guide the preparation of the report, where appropriate. However, the report should focus on providing key information and data required to determine compliance with the requirements of the ESMMP, national legislation and international performance standards (IFC, AfDB).

Periodic reports on environmental and social sustainability should be made publicly available (e.g. on the UNRA website).

3.5.1 Incident and Project Grievances Reporting

An incident is any event that impacts on, or may potentially impact on the safety, health, environment or community, or any activity resulting in regulatory non-compliance or breach of UNRA policies, standards or commitments. Project grievances include any complaints or disputes raised by local communities regarding Project activities.

To assist with the management and reporting of environmental and community incidents, UNRA should utilise a computer-based event management system (e.g. INX InControl). These systems are designed for the efficient and effective management and reporting of environmental and social-related incidents. The system will also allow for a reporting scheme that includes:

- Description of the incident and its causes;
- Risk rating of the incident;
- Description of corrective and preventative actions;
- Description of repairs, clean-up or other remedial measures; and
- Actual or estimated costs of repair, clean-up or other remedial measures.

The following situations will constitute an incident:

- Confirmed or likely violation of any law or international agreement;
- Injury or property damage;
- Near miss or hazard;
- Chemical spills;
- Spills of fuel or oil outside of primary containment areas greater than 50 L (environmental incident);
- Non-contained fires within operational areas;
- Uncontrolled gas emissions;
- Biodiversity incidents - e.g. injured or dead animals;
- Employment incidents e.g. collective termination of workers, workers' strikes; and
- Community incidents - primarily related to community grievances, uncontrolled access within blast exclusion zones.

The UNRA Project Environmental and Social Manager should be notified immediately for any significant reportable incidents or community grievances. Incidents should be classified according to their actual and potential safety, environmental or social impact using a standard consequence matrix to ensure consistency. Incidents and significant near misses should be reported by the Contractor OHS Manager (or equivalent) within 24 hours of the occurrence of the incident, and discussed at the first management meeting following the incident, unless the severity of the incident (dependent on the risk ranking of the event) requires immediate notification.

For community grievances, a separate management system will be implemented by the Contractor compatible with UNRA's grievance management system in place. All logged community grievances filed will be recorded and addressed at management meetings and summaries of grievance-related information will be prepared on a regular basis for public disclosure. UNRA already has an online based grievance mechanism where grievances from affected persons and other stakeholders can be submitted and addressed appropriately. This includes an online messaging service, complaints log and FAQs to provide affected people with relevant information.

More information on incident response procedures are provided in Section 3.7 Emergency Preparedness and Response.

3.6 Auditing and Facility Inspections

Regular audits of the Project ESMMP and associated management systems will be required. The audits should assess:

- Adequacy of the ESMMP and associated plans with respect to the scale and nature of anticipated impacts and current development stage of the Project;
- Workforce awareness, competence and compliance with the ESMMP and associated plans and procedures;
- Performance of managers and operators in implementing, maintaining and enforcing the ESMMP and associated plans; and
- Suitability of allocated resources, equipment and budget for implementation of the ESMMP.

Corrective actions will require documentation including reporting of progress towards their completion.

Internal audits of ESMMP implementation should be conducted by the primary contractor/concessionaire on a quarterly basis during construction, and at least annually during operations. After the concession period, UNRA should continue these internal audits annually in line with their current audits of their ESMS.

Independent external audits will need to be conducted during the construction phase and on an annual basis (over the 5 years of construction). The first external audit should be conducted at the commencement of construction to ensure all required environmental management and monitoring plans and procedures are established. The frequency of subsequent operational audits will be based on the recommendations from the initial audits ensuring they are in line with the environmental audit regulatory regime in Uganda.

In addition, site inspections of all Project facilities should be required on a routine basis using a visual inspection form to record observations onsite. It is expected these site inspections would be conducted by dedicated environment staff from both UNRA and the contractor/concessionaire. The frequency of inspection should be informed by risk but will typically be on at least a weekly basis during the construction phase. Key Performance Indicators (KPIs) should be developed to enable environmental performance to be assessed objectively and quantitatively across the operation.

3.7 Emergency Preparedness and Response

3.7.1 Assessment of Risk and Priority

Where an event takes place that impacts on or may potentially impact on the environment, or triggers the specific conditions or limitations of a license or permit to be exceeded, the event is classified as an environmental incident. The following situations are environmental incidents which require an emergency response for the Project:

- All hazardous chemical spills;
- All spills of fuel or oil greater than 50 litres within construction areas of vehicle/equipment storage areas;
- All spills of fuel or oil outside of primary containment areas greater than 10 litres;
- All non-contained fires within operational areas;
- All uncontrolled gas emissions; and
- Accidents or natural hazards.

Emergency response to an incident prioritises actions undertaken according to the following sequence:

1. Protection and rescue of human life;
2. Minimisation of the area impacted by the incident;
3. Protection of the environment and property;
4. Rendering the area safe in which the emergency has occurred;
5. Restoration of all disrupted services; and
6. Decontamination and rehabilitation of the incident scene and surrounding area (if applicable).

Routine environmental and social risk assessments should be conducted on a regular basis to review potential emergency situations that may arise from the Project. The methodology to be used for the periodic risk assessments should be consistent with that outlined in the ESIA and below.

Depending upon the severity of an environmental incident, emergency response may also involve using or notifying external agencies and groups, including the police, ambulances and medical clinics, government authorities (e.g. Department of Disaster Preparedness, Ministry of Defence), and nominated representatives within the local community.

3.7.2 Emergency Preparedness and Response Planning

An Emergency Preparedness and Response Plan (EPRP), based on the risks identified in the ESIA, will need to be developed for the Project prior to the Construction phase. The Project risk assessment should be reviewed on an annual basis to identify potential environmental emergency situations that may arise.

Key elements of the EPRP should include:

- Emergency response procedures:
  - Informing the public and emergency response agencies;
  - Taking emergency response actions; and
  - Reviewing and updating the emergency response plans to reflect changes, and ensuring that employees are informed of such changes.

- Communication procedure;
- Functions and responsibilities;
- Evacuation and shutdown procedures;
- Risk management;
- Emergency response equipment – procedures should be prepared for using, inspecting, testing and maintaining the emergency response equipment; and
- Emergency Response Training – employees and contractors should be trained on emergency response procedures.

Detailed procedures for managing chemical spills should be prepared as part of the CEMP and OEMP for the Project.

3.8 Continuous Improvement

Continuous improvement of various management systems in place will be an ongoing effort to ensure the Project is implemented appropriately and effectively. These efforts can seek 'incremental' improvement over time or 'breakthrough' improvement all at once.

Continuous improvement of social, environment, and health, safety and security matters associated with the Project will be based the 'Plan-Do-Check-Act' model (Figure 3-4). The model broadly follows an iterative process for continuous improvement as follows:

- ***Plan***: Identify an opportunity and plan for change.
- ***Do***: Implement the change on a small scale.
- ***Check***: Use data to analyse the results of the change and determine whether it made a difference.
- ***Act***: If the change was successful, implement it on a wider scale and continuously assess your results. If the change did not work, begin the cycle again.

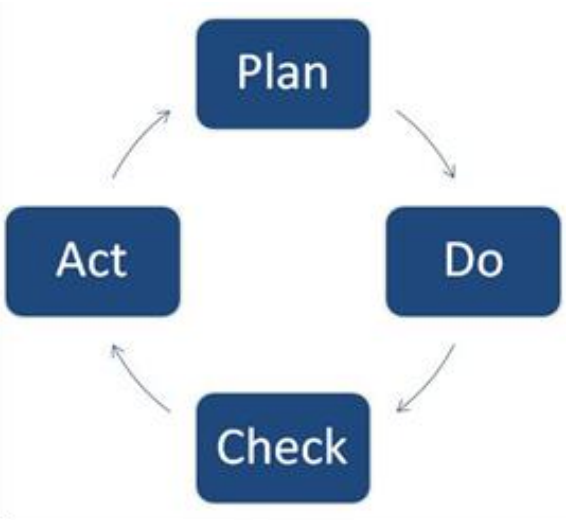

Figure 3-4: Plan-do-check-act cycle

A continual improvement plan should be developed and maintained over the Project life which lists identified information gaps and non-conformances as well as recommended improvement actions including estimated timing and cost for trial and implementation. Each item will be prioritised according to their level of risk rating and assigned to a responsible person for implementing and reviewing corrective actions within an agreed timeframe. Key performance indicators (KPIs) will be developed following the SMART principles of continual improvement plans, which are "Specific, Measurable, Achievable, Realistic and Timely". KPIs should be reviewed and adapted as the Project progresses.

3.9 Environmental Management System Measures

The following tables summarise the key EMS measures and commitments, including indicators and responsibilities for each task, to be undertaken over the life of the Project.

Table 3-1 Register of Environmental Management System Measures

Aspect / Impact	Phase		Management Measure / Commitment	Monitoring Indicators	Responsible for Implementation & Monitoring / Enforcement
	C	O			
Project Staff Responsibilities	✓	✓	UNRA will appoint suitably qualified and experienced staff to implement the Project ESMMP, including personnel responsible for security, health and safety, environment and community, emergency response, human resources, and logistics.	Verification of implementation	UNRA Project Director / *NEMA*
Project Capacity Budget	✓	✓	The Project Environmental and Social Management and Monitoring Budget will need to be continually reviewed, updated, and funded appropriately.	Verification of implementation	UNRA Project Environmental and Social Manager / *NEMA*
CEMP	✓		The Construction Environmental Management Plan (CEMP) should be prepared and approved by the UNRA Project Director prior to construction. CEMP to contain detailed procedures for the implementation of all measures outlined in this ESMMP.	Verification of preparation and implementation	Contractor Environment, Community Relations and OHS Management Staff / UNRA Project Director
OEMP	✓		The Operations Environmental Management Plan (OEMP) should be prepared and approved by the UNRA Project Director prior to operations. CEMP to contain detailed procedures for the implementation of all measures outlined in this ESMMP.	Verification of preparation and implementation	Contractor Environment, Community Relations and OHS Management Staff / UNRA Project Director
Emergency Preparedness and Response	✓	✓	A Project specific Emergency Preparedness and Response Plan should be developed prior to the start of construction, including appropriate spill prevention and response procedures in line with industry best practice, IFC General EHS Guidelines.	Verification of preparation and implementation	Contractor Environment, Community Relations and OHS Management Staff / UNRA Project Environmental and Social Manager
Risk Assessment	✓	✓	A Project risk register should be established and will need to be reviewed on an annual basis including review potential emergency situations that may arise from the Project.	Records of risk workshops Up-to-date Project risk register Risk audits, job safety analysis, etc.	Contractor Environment, Community Relations and OHS Management Staff / UNRA Project Environmental and Social Manager
Internal audits	✓	✓	Internal audits to be conducted quarterly during construction and annually during operations.	Verification of implementation Audit reports	Contractor Environment, Community Relations and OHS Management Staff / UNRA Project Environmental and Social Manager
External audits	✓	✓	External audits to be conducted annually during construction.	Verification of implementation Audit reports	Contractor Environment, Community Relations and OHS Management Staff / UNRA Project Environmental and Social Manager

Aspect / Impact	Phase		Management Measure / Commitment	Monitoring Indicators	Responsible for Implementation & Monitoring / Enforcement
	C	O			
			Frequency of operations audits to be determined based on outcomes of construction audits.		
Site inspections	✓	✓	Environment staff will undertake a site inspection of all Project facilities weekly using a visual inspection form to record observations onsite. KPIs will be developed to enable environmental performance to be assessed objectively and quantitatively.	Verification of implementation Site inspection reports	Contractor Environment, Community Relations and OHS Management Staff / UNRA Project Environment, Biodiversity, Community and OHS Officers
Non Compliance / Incident / Grievances	✓	✓	Non-compliance reports should be filed to the web-based platform as they occur. Incident reports should be filed via the online incident management system in place. Community grievances should be logged according to the UNRA grievance management system in place.	Number of Non-Compliance / Incident Reports / Grievances logged	Contractor Environment, Community Relations and OHS Management Staff / UNRA Project Environment, Biodiversity, Community and OHS Officers
Performance Reporting (Contractor)	✓	✓	Regular reports (monthly, quarterly, and annual) to be prepared and submitted to UNRA on environmental, social, health and safety performance. Reporting should use approved templates as needed uploaded to the web platform for ease of access.	Reports prepared and delivered on schedule	Contractor Environment, Community Relations and OHS Management Staff / UNRA Project Environmental and Social Manager
Annual Reporting (UNRA)	✓	✓	On an annual basis, UNRA should prepare a summary report on Project environmental and social performance. The report should focus on providing key information and data required to determine compliance with the requirements of the ESMMP, national legislation and international performance standards (IFC, AfDB). Reporting should use approved templates as needed uploaded to the web platform for ease of access.	Reports prepared and delivered on schedule	UNRA Project Environment, Biodiversity, Community and OHS Officers / UNRA Project Environmental and Social Manager

Table notes: C=Construction, O=Operations.

4. LAND CLEARANCE

4.1 Objectives

Land clearance will be conducted in accordance with the following objectives:

- Impacts on regional habitat, flora, and fauna will be minimised;
- Impacts on sites of social or historical value will be avoided or minimised;
- Site preparation / clearance will be compliant with national regulations and international standards; and
- Topsoil will be removed and stored appropriately to maintain soil quality for future rehabilitation works.

4.2 Context

Major land use activities along the Project ROW include settlement areas (residential and institutional), industrial areas, agricultural land (plantations, peri-urban agriculture and subsistence agriculture), transport corridors (e.g. existing roads), water bodies (rivers, wetlands), and undeveloped areas (covered by woodland, scrubland and grassland). Residential urban land dominates areas near Kampala. Much of the Project footprint and surrounds outside of Kampala city has already been cleared of natural habitat, undergrowth, shrubs and trees, and is generally an open mosaic of agriculture and modified habitat of scattered trees and shrubs.

Establishment of the ROW will require land acquisition (refer Chapter 16) and clearance of structures, vegetation and topsoil within the ROW. Small areas of land will also need to be cleared outside of the ROW for any new borrow pits or quarries (refer Chapter 12) or ancillary facilities such as accommodation camps and asphalt plant(s) (refer Chapters 13 and 23).

4.3 Management and Mitigation Measures

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Land clearance	Plan topsoil stripping, stockpiling and earthworks for dry seasons.	Design / Construction	Contractor	UNRA
Land clearance	Minimise clearance activities to within the ROW and respect limits of ROW.	Design / Construction	UNRA / Contractor	UNRA
Earthworks	Balance cut and fill where possible i.e. utilising material excavated from some sections of the ROW in sections that will require filling material. A plan should be developed in advance with maps of sites and quantity, and submitted for approval.	Design / Construction	UNRA / Contractor	UNRA
Land clearance	UNRA will compensate for all lost trees according to a standard compensation rate approved by the Chief Government Valuer.	Pre-Construction	UNRA / Forest Authority	Forest Authority
Land clearance	Inform Project affected persons before the beginning of the cropping season (likely January) about the working calendar to facilitate their cultivation choices.	Pre-Construction	UNRA / Contractor	UNRA
Land clearance	Temporary land disturbance (e.g. for construction laydown areas, site access, material stockpiles, equipment storage areas) will be carried out in previously disturbed areas, where possible. Where stockpiles are required, sites should be authorised in advance by UNRA.	Construction	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Land Clearance	Follow all relevant compensation measures detailed in the Resettlement and Livelihood Restoration Plan.	All phases	UNRA	UNRA
Land clearance	Vegetation and topsoil removal will be minimised to the extent practicable by: • Areas to be cleared to be clearly demarcated prior to clearance. • Retaining trees and vegetation or clipping tree branches rather than complete removal of trees surrounding the Project footprint. • If possible, retain roots in the ground to reduce erosion and to facilitate rapid revegetation. • Consider use of a 'clearance permit' system where clearance of each parcel of land requires a permit to be signed off by the site supervisor and UNRA Project Environmental and Social Manager prior to works commencing. • Salvage of timber from ROW to be overseen by NFA.	Construction	Contractor	UNRA
Loss of agricultural land	Minimise the disturbance associated with land clearance through: • Restrict clearance of land to only the land required for Project components. Clearance of buffer zones around Project infrastructure will need to be minimized, where possible. • Implement appropriate erosion control and drainage management measures to minimise the potential land and water quality impacts associated with land clearance (as per the Water Management Plan).	Pre-Construction / Construction	Contractor	UNRA
Biodiversity	Follow all relevant biodiversity management measures for land clearance detailed in the BAP.	Construction	Contractor	UNRA
Land clearance	Progressive clearing of vegetation in a controlled manner (to allow mobile fauna to move away from clearance areas) giving priority to manual clearing near sensitive vegetation, steep terrain, and along local waterways.	Construction	Contractor	UNRA
Archaeological or cultural values	Pre-identify any physical signs of possible archaeological or cultural values prior to clearance, for both ROW and other clearance zones. Where appropriate, follow the measures outlined in Section 16.3.	Pre-Construction / Construction	Contractor	UNRA
Soil storage	Soil stockpiles will be constructed and managed following the below procedure, as appropriate: • Stockpiles will be located within designated soil stockpile areas where movement of vehicles and equipment are excluded and up-slope (at least 20 m away) from local waterways and flood inundation areas; • Soil stockpiles will be formed with as little compaction as possible in mounds generally no more than 2 m high (for topsoil) and 5 m high (for subsoil) to minimise losses to erosion. • Soil seed bank in the topsoil will be preserved for future rehabilitation, to maintain local genetic diversity; • Location of soil stockpiles and batters will be geo-referenced and mapped in a GIS database with details on type of material and duration of stockpiling recorded; and • Stockpiles to be placed in visually unobtrusive locations, where possible.	Construction	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Restoration / Rehabilitation	Progressively rehabilitate landforms (including wetlands) from temporarily impacted areas that will not be required at a later stage, in accordance with the Revegetation Plan.	Construction / Construction Decommissioning	Contractor	UNRA
Restoration / Rehabilitation	Stabilise any cleared areas in areas prone to erosion (e.g. steep terrain, road embankments, near waterways or wetlands) as a priority by covering with wood chippings or grass matting. Revegetation should also be prioritised in these areas.	Construction	Contractor	UNRA
Training / Awareness	Provide employee training and awareness programmes for all Project staff and contractors (e.g. through staff inductions) focusing on improving their understanding of the importance of (threatened) fauna, flora and ecosystems near the Project footprint. Communicate restrictions on harvesting and collecting forest resources (including timber and non-timber forest products) and hunting within and surrounding the Project footprint.	Construction / Operation	Contractor	UNRA
Invasive species	Invasive weed spread will be minimised by implementing the following preventative controls: • Use of local non-invasive plant species for revegetation purposes; and • Compliance with the washdown procedures for vehicles and equipment entering worksites and site access control	Construction / Operation	Contractor	UNRA
Restoration / Rehabilitation	Disturbed areas will be progressively rehabilitated as soon as practicable after completion of works, with rehabilitation and revegetation undertaken in accordance with the Revegetation Plan.	Construction / Construction Decommissioning	Contractor	UNRA
Vegetation maintenance	Use of specific herbicides (for weed control) will need to be pre-authorised, and usage instructions strictly followed. Application of herbicides will not be permitted during or just before rain events. Mechanical clearing or thinning will generally be preferred to the use of herbicides for vegetation maintenance in sensitive locations because it is less likely to damage regenerating vegetation and soil seed banks. No controlled burning will be allowed for vegetation maintenance.	Operations	Contractor	UNRA

Plate 4-1: Blasting area and material removal during the construction of the Kampala-Entebbe Expressway

4.4 Monitoring Measures

Aspect / Impact	Monitoring Measure	Construction	Operations	Method	Parameters	Frequency	Location
Land clearance	Monitoring land clearance area			Site inspection	Physical demarcation of ROW; Construction works and land clearance remain within ROW	Weekly during clearance activities	Construction sites
Land clearance	Stockpile monitoring			Site inspection	Stockpile location, size/height; Presence/ absence of sediment & erosion control structures	Monthly	Stockpile sites
Land clearance	Invasive species monitoring			Site inspection	Presence/ absence of invasive species; Respect of washdown procedures	Monthly	Construction sites
Land clearance	Revegetation monitoring			Monitor rehabilitated / revegetated areas as per the Revegetation Plan to ensure effectiveness of planting and landscaping	Area revegetated; Number of plants planted; Plant survival rate; Presence/absence of invasive species	Monthly initially then quarterly	Entire ROW
Land clearance	Grievance monitoring			Grievance Register	No of complaints; % of complaints resolved within appropriate delay	Monthly	N/A

5. EROSION AND SEDIMENT CONTROL

5.1 Objectives

Management and monitoring of erosion and sedimentation will be based on the following objectives:

- Erosion will be prevented and minimised where possible;
- Impacts on downstream water uses and environmental values will be avoided or minimised; and
- Topsoil will be removed and stored appropriately to maintain soil quality for future rehabilitation works.

5.2 Context

The key potential impacts related to surface water hydrology, water quality and, erosion and sediment control for the KJE Project are as follows:

- The roadway will act as an obstruction to existing hydrology and groundwater interaction, causing a potential change of perennial and/or ephemeral flow both upstream and downstream of raised and cutting roadway sections;
- The introduction of new structures such as culverts, bridges and crossings to existing drainage networks could result in changes to existing pathways of hydrology and groundwater interactions leading to new undesired pathways;
- The alteration of the water table because of the change in hydrological and/or groundwater interaction can lead to localised flooding and may also activate acid sulphate soils, or contaminated groundwater plumes;
- The roadway has the potential to be flooded during significant rainfall events, which can endanger road users and result in damage to infrastructure;
- The roadway will introduce new materials sourced from external sites and has the potential to affect the water quality and can further result in possible failures of structural aspects of the project;
- Road and vehicle derived pollutants such as copper, lead, zinc, hydrocarbons, oils and sediment can be transported by surface runoff into surface waters and infiltrate into the groundwater which can contaminate both surface and groundwater;
- Construction area pollutants such as spills or leaks of hydrocarbons, oils, greases, tar, asphalt, material waste and human rubbish can be transported by surface runoff into surface waters and infiltrate into the groundwater which can contaminate both surface and groundwater;
- Temporary disturbance and erosion of soils in the broader right of way during construction may contribute to the disruption of waterways and possibly reduce the capacity of existing drainage structures; and
- The roadway will have an adverse effect on the water point sources and piped network sources, causing a potential change in the accessibility, quality and overall supply to the communities with the ROW and further in the district.

Soil erosion is a key issue for the Project and robust management is required to ensure downstream water quality and water users are protected. Due to the combination of high intensity rains in the rainy season, varying topography, and the need to clear vegetation for ROW establishment, soils will be susceptible to erosion, and sedimentation input into neighbouring surface waters is possible. The cumulative impacts of erosion, suspended

sediment and sediment deposition may include degraded aquatic habitats, impacts to beneficial uses of water, and loss of topsoil / soil quality.

In the absence of suitable management and mitigation, water quality downstream of the road alignment and construction sites may be impacted by discharge of hazardous materials following an accidental spill with potential consequences for aquatic biodiversity / beneficial uses of water. Significant sediment loading (as above) presents a less acute, but moderate level impact for aquatic habitat and water use.

5.3 Management and Mitigation Measures

Detailed management and mitigation measures for erosion and sediment control are provided in the separate Water Management Plan (Volume D).

5.4 Monitoring Measures

Monitoring measures for erosion and sediment control are provided in the separate Water Management Plan (Volume D).

6. WATER MANAGEMENT

6.1 Objectives

Project water management objectives include:

- Minimise water use;
- Sourcing of water for construction purposes in a manner that minimises environmental and social impacts;
- Provision of adequate controls and monitoring to ensure that the quality of water discharged from Project areas is compliant with applicable legislative, licensing and financing commitments;
- Development of mitigation measures that avoid, minimise and mitigate potential impacts on downstream water quality, groundwater resources and associated impacts to the receiving environment; and
- Protection of aquatic habitat, aquatic and terrestrial fauna, and beneficial uses of water.

6.2 Context

Almost one sixth of Kampala, or 31 km^2, is covered by wetlands (Mafabi *et al*., 1998) associated with Lake Victoria. A number of rivers also pass through the Project Area. Rivers near the KJE alignment include: Kinawataka, Nakivubo channel and Sezibwa Rivers. The KSB section of the Phase 1 KJE route crosses and runs alongside a number of wetlands, some of which are in the process of being gazetted. These wetlands include the Kinawataka, Nakivubo and Kansanga wetlands. Wetlands are also passed by the KJE mainline expressway which passes the Kinawataka, Namanve and Kasala wetlands. The wetlands surrounding Kampala receive much of the wastewater from the city and help remove pollutants from the water before it enters Lake Victoria. The Mutungo, Makindye and Mbuya hills are also sources of water that support downstream communities (ICS, 2015). The wetlands and rivers drains to Lake Victoria.

The Kampala District is drained by eight main drainage systems. Rapid population growth, industrialisation and inadequate provision of waste and sewer management services have led to an increased volume of urban waste entering the water environment in and around Kampala. Uncollected solid waste and most pit latrines in slums drain into the stormwater system (Oyoo, 2011). Wetlands have previously served as a natural filter prior to drainage to Lake Victoria, however, the efficiency of wetlands to treat wastewater has been tremendously lowered due to large scale draining of wetlands over the years for agriculture or settlement (Kansiime and Van Bruggen, 2001).

The water table in the wetlands is relatively high. Boreholes, spring wells, tube wells and shallow wells have been drilled to harvest water for domestic supply. Communities in rural Uganda depend on surface and groundwater for a range of beneficial uses (e.g. drinking and washing water, livestock drinking water, irrigation water, etc.) and surface waters support a host of aquatic species that are important from an ecological perspective and are an important source of animal protein for communities in the region.

In the absence of suitable management and mitigation, surface and groundwater quality downstream of the road alignment and construction sites may be impacted by discharge of hazardous materials following an accidental spill with potential consequences for aquatic biodiversity / beneficial uses of water. Significant sediment loading presents a less acute, but moderate level impact for aquatic habitat and water use.

Robust management is required to ensure downstream surface and groundwater quality and water users are protected.

6.3 Management and Mitigation Measures

Detailed management and mitigation measures for surface and ground water management are provided in the separate Water Management Plan (Volume D).

6.4 Monitoring Measures

A combination of visual inspections, field measurements and laboratory testing will be required to monitor water management throughout construction and operational phases. Details of monitoring measures for surface and ground water management are provided in the separate Water Management Plan (Volume D).

7. HAZARDOUS MATERIALS AND WASTE MANAGEMENT

7.1 Objectives

The key general hazardous material and waste management objectives for the Project are:

- Ensure applicable international and national standards and requirements for the management and disposal of Project wastes, including hazardous waste, are met;
- Minimise the use of hazardous materials and seek safer alternatives where possible;
- Efficiently select, use and conserve resources to reduce the need for waste management and raw materials; and
- Implement waste management measures in accordance with best practice to reduce and manage Project waste generation effectively, including associated potential health and environmental risks.

7.2 Context

Hazardous materials to be used by the Project include herbicides, bitumen, explosives, fuel, oils, batteries, and paints. These will be used in both the construction and, to a lesser extent, the operation phases and will generate hazardous wastes that will need to be appropriately managed. Accidental release of hydrocarbons would potentially impact receiving waters (ground and surface water) and soil quality. Hydrocarbons are also a fire hazard, which threatens occupational health and safety as well as air quality.

Solid waste will be generated during construction and maintenance of the road and associated structures. Significant quantities of rock and soil materials may be generated from earth moving during construction activities. Land clearance will produce vegetation waste and building demolition wastes (concrete etc.). General waste materials at the Project will result from administration, procurement, accommodation camps etc.

Solid waste generation during operation and maintenance activities may include road resurfacing waste (e.g. removal of the old road surface material), road litter, or general solid waste from rest areas, animal carcasses, vegetation waste from ROW maintenance, and sediment and sludge from stormwater drainage system maintenance.

Hazardous wastes will include solid wastes such as old batteries and medical wastes and liquid wastes such as used oils and sewage. Paint waste may also be generated from road and bridge maintenance (e.g. removal of paint from bridges prior to re-painting). Liquid waste from the cement plant, and processing waste from the asphalt plant are also another potential source of hazardous waste.

Waste that is improperly stored or disposed of may lead to adverse effects on human health, habitat and biodiversity. District landfill sites will be used for the disposal of general Project wastes. Hazardous wastes will be disposed of in the appropriate manner according to waste type. Disposal sites should be pre-approved by UNRA's Project Environmental and Social Manager, and then submitted to NEMA for confirmation.

7.3 Management and Mitigation Measures

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
General Waste Management	Apply the waste management hierarchy (in decreasing order of preference):	Construction / Operation	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	1. Minimise the production of waste 2. Maximise waste recycling and reuse 3. Treatment of waste 4. Ensure safe waste disposal.			
General Waste Management	Establish a waste management system and comprehensive waste inventory that identifies, tracks and quantifies major waste streams generated at the Project. The following information will be recorded: • Composition and waste type according to different waste streams • Quantity and storage location • Transport and disposal methods (e.g. safe disposal certificates) • Final destination, including amount of each waste type that has been recycled or reused.	Construction / Operation	Contractor	UNRA
General Waste Management	Collect and segregate solid waste into the following categories: • Biodegradable materials, e.g. cleared vegetation and food scraps; • Recyclable materials, e.g. scrap metal, hard plastic, glass, paper and cardboard, batteries, and tyres; and • Non-hazardous residue waste, e.g. excess concrete, non-recyclable plastics, bricks, etc.	Construction / Operation	Contractor	UNRA
General Waste Management	Install colour-coded bins with weatherproof lids and appropriate signage at designated locations around the Project site (e.g. workforce accommodation camps, construction sites) for collection and segregation of waste. Waste collection to occur frequently to avoid overflowing of bins.	Construction	Contractor	UNRA
Sustainable management of resources	Develop a resource management strategy. This can include measures such as: • Use available project cutting material and verge material for the construction of embankments and verge within that section to the extent that it is suitable. • Project sections with a deficit in material should import surplus material from other project sections in preference to external sources. • Any unsuitable material for road construction should be used for landscaping or disposed of within each project section, either for batter flattening or noise mounds or placed in stockpile. • Transportation distances for wastes should be minimised to reduce greenhouse gas emissions from the Project, through selecting waste management sites close to the source of the wastes where practicable.	Construction	Contractor	UNRA
Reduce impacts on landfill through minimisation of construction waste	Develop a strategy to minimise waste during construction including: • Develop measures for each waste type to avoid, minimise, re-use, recycle, treat or dispose of waste streams during construction and address transport and disposal arrangements, such as:	Construction	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	• Demolition waste - - Harvest millable timber for re-use off site, use mulch for revegetation, landscaping or erosion and sedimentation control; Provide local communities with opportunity to salvage timber resources; liaise with recycling facilities for the recycling/re-processing of bricks, concrete, scrap metal etc. - Carefully dismantle and remove structures (in the urban section of the road) that then can be reused at smaller roads within Kampala and neighbouring districts. - Where metals recovered from these structures cannot be re-used, provide them to recycling companies for processing into steel productions - Remove metals within concrete culverts and send these for recycling. Concrete parts should be re-used to fill up used borrow pits. • Construction waste – left over materials should be re-used by Project where possible or re-processed. e.g. use sediments onsite for landscaping etc, waste from asphalt production could be used for non-structural elements such as minor roads.			
Construction Wastes	• Materials to be stockpiled should be stored at designated material stockpile locations. • Access roads into wetland areas should be dismantled after the completion of viaduct construction. • Any waste construction materials (e.g. borrow / gravel / rocks) should be removed from the construction site following completion of the road section. The use of these materials by the local communities should be prohibited for the infilling of wetlands. • Monitor construction areas to avoid community use of materials.	Construction	Contractor	UNRA
Sewerage / Wastewater Waste	• Install mobile pit toilets at construction sites. Pits to be backfilled and trees/vegetation planted on surface once three-quarters full. • Wastewater from camp toilets will be treated and monitored prior to discharge.	Construction	Contractor	UNRA
Hazardous Materials	• Hazardous materials will be managed in compliance with all relevant Ugandan statutory obligations, licenses and other requirements; • An up-to-date register of hazardous materials and dangerous goods stored on site will be compiled and maintained on-site. The register will include the types, quantities, location and current Material Safety Data Sheets (MSDS). • Provide and enforce use of appropriate personal protective clothing and equipment (i.e. gloves, plastic coveralls, safety glasses and self-contained respirators), emergency information posters, and clean-up spill kits at strategic	Construction / Operation	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	locations where hazardous chemicals are handled. • Develop work safety procedures, instructions and emergency response procedures on how to safely handle, store and dispose of hazardous materials as well as for adequate emergency communication capability with potentially impacted communities, governments and nominated emergency response teams within a timely manner. • Use licensed contractors for the transportation of hazardous materials and waste. • Explosives to be stored in a magazine that meets relevant national and international standards. • Suitable drainage within and around long-term hazardous materials containment should be constructed including rainfall protection.			
Hazardous Materials and Waste Management	Construct appropriately designed and marked hazardous material delivery, transfer and storage areas as follows: • Compliant with applicable building, fire safety and hazardous materials/dangerous goods code requirements; • At least 100 m away from natural streams, wetlands, flood prone areas and sensitive areas; • Clear labelling of the type of hazardous materials handled or stored with relevant Material Safety Data Sheets (MSDS) displayed; • A primary containment system comprised of concrete slabs, bund (that can contain at least 110% of the volume of hazardous material stored onsite) and sump to recover spilled material and rain from slabs (if applicable); • Weatherproof shelters to prevent collection of rainfall within the bunded area.	Construction / Operation	Contractor	UNRA
Hazardous Waste Management	Manage hazardous wastes using the following procedure, where appropriate: • Separate hazardous and non-hazardous waste streams, while considering the use of less hazardous substitutes for hazardous materials wherever possible. Keep hazardous wastes separate to prevent potential for chemical reactions. Consider recycling useful hazardous wastes such as oil or water-based paint; • Prohibit disposal of hazardous wastes (e.g. solvents, used oils, paints, cracked batteries) in general waste bins; • Hazardous chemicals should be stored in drums or bags stored on pallets; • Store cracked batteries in a non-leaking container even if the acid appears to have been drained out; and • Schedule periodic waste collection to prevent overflow of containers / facilities.	Construction / Operation	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Road Maintenance	• Provide appropriate waste and recycling facilities at rest areas and heavy vehicle checking stations. • Install 'No littering' signs along roadway and provide waste bins at rest areas.	Construction / Operation	Contractor	UNRA
General Waste Management	Install drainage litter traps along the ROW	Design / Construction	Contractor	UNRA
Earthworks	• Develop an earthworks balance to minimise surplus spoil material. • Balance cut and fill where possible to minimise surplus spoil material. • Surplus spoil material will be used to restore decommissioned borrow pits where possible	Design / Construction / Construction Decommissioning	Contractor	UNRA
Wastewater	• Infrastructure and procedures for the treatment and disposal of sewage to be in place. • Sewage treatment system to be operational and include disinfection. • Relevant discharge requirements should be adhered to for all discharges off-site. • Waste Log to be maintained to record waste management practices. • Ensure other measures described in the Water Management Plan (Volume D) are adhered to.	Construction	Contractor	UNRA
General Waste Management	Collect and appropriately dispose of dead animals (road kill) and road litter in a timely manner. Weekly patrols for roadkill will need to be conducted in accordance with the BAP.	Operation	Contractor	UNRA
Construction Wastes	Material stockpile areas should be fenced off and communities should be prevented from accessing stockpiled materials and construction waste.	Construction	Contractor	UNRA
Construction Wastes	All areas of stockpiled excess material (e.g. gravel, soil, rocks) should be removed from the Project sites following the completion of construction to prevent communities utilising the material for the continued infilling of wetlands.	Construction	Contractor	UNRA
General Waste Management	Educate staff and contractors on waste minimisation and management during inductions.	Construction / Operation	Contractor	UNRA
Waste Disposal	• For disposal areas: detailed procedures should be developed with location map and building plan (if applicable) and pre-approved by UNRA and submitted to NEMA for confirmation. • Where waste cannot be re-used or recycled, district landfill sites will be used for the disposal of general Project wastes. Hazardous wastes will be disposed of in the appropriate manner according to waste type. • Burial of hazardous wastes, liquid or semi-solid wastes (including sewage slurry, grey water, sewage treatment sludge, medical waste, hydrocarbon products, hydrocarbon or chemical contaminated soils) is only allowed if there is no other viable alternative such as treatment / disposal, recycling, reprocessing or composting. Disposal of these wastes will comply with	Construction / Operation	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	statutory obligations and will not adversely impact human health or the environment. • Monitor to ensure appropriate waste disposal.			
Hazardous Waste Management	During demolition activities, any hazardous materials (e.g. asbestos) identified will be removed by licensed waste contractors.	Construction	Contractor	UNRA
Hazardous Materials and Waste Management	Train workers responsible for hazardous materials handling, storage and use of hazardous materials as well as comprehensive emergency response training.	Construction / Operation	Contractor	UNRA
Road maintenance	The following road maintenance measures should be applied to minimise water quality impacts of spills from transport accidents or from contaminated run-off, as part of a regular program: • Inspect barriers, fences, erosion and sediment control devices; • Maintain retaining walls to minimise cracks and water damage; • Repair pot-holes and shoulder erosion to minimise risk of vehicle accidents; • Maintain stormwater energy dissipaters and velocity controls on open drains to lower runoff velocity and control soil erosion; • Dispose of accumulated sediment and litter collected from detention ponds, drainage systems, and pollution control structures, and any wastes generated during maintenance operations in accordance with appropriate government requirements; • Use techniques during bridge maintenance such as suspended tarpaulins, vacuum collection or booms to prevent paint spills, solvents and scrapings from becoming waterborne pollutants; • Keep drainage ditches free from accumulated debris.	Operations	Contractor	UNRA
Road maintenance	• Collect green waste from highway maintenance activities and recycle where possible (e.g. for mulch within vegetation areas along the road) • Conduct regular litter collection activities along the roadside and embankments to prevent the accumulation of domestic waste (e.g. water bottles, packaging, vehicle waste (e.g. tyre material, wheel hub caps)	Operation	Contractor	UNRA
Road Maintenance wastes	• Maximize the rate of recycling of road resurfacing waste. • Manage herbicide and paint inventories to avoid having to dispose of large quantities of unused product. Obsolete product should be managed as a hazardous waste. • Consider composting of vegetation waste for reuse as a landscaping fertilizer. • Manage sediment and sludge removed from storm drainage systems maintenance activities as a hazardous or non-hazardous waste based on an assessment of its characteristics.	Operations	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	• Grinding of removed, old road surface material and re-use in paving, or stockpiling the reclaim for road bed or other uses. Old, removed asphalt may contain tar and polycyclic aromatic hydrocarbons and may require management as a hazardous waste			

7.4 Monitoring Measures

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
General and hazardous waste	Waste monitoring			Audit of waste documentation in place	Evidence of contract with NEMA licensed company, waste management system in place with maps and quantity of waste to be disposed of, resource management strategy with quantity flow, etc.	Quarterly	Across site
General waste	Waste monitoring			Audits	Waste volume; % of waste reused/recycled; Implementation of all related measures	Internal audit prior to construction, then quarterly during construction, then annually during operations. External audits annually.	Across site
General waste	Waste monitoring			Site inspections	Use of appropriate waste bins, leakage/seepage from hazmat storage areas; Implementation of all site measures	Monthly	Construction areas, ancillary facilities, operational infrastructure
Wastewater	Discharge monitoring			Refer WMP			
General and hazardous waste	Incident monitoring			Record and resolve all waste-related incidents	No of waste-related incidents; Response time	As required	As required
General and hazardous waste	Investigative monitoring			Investigative monitoring for waste related complaints through the Project Grievance management system	As required	As required	As required

8. AIR EMISSIONS

8.1 Objectives

The Project objectives for emissions and dust control includes:

- Minimisation of exhaust emissions and dust generation near sensitive receptors (e.g. villages);
- Avoidance of potential health impacts associated with dust generation and air quality impacts; and
- Compliance with national regulations, international standards and other requirements related to emissions and dust.

8.2 Context

The Project ranges from the highly-populated Kampala city to rural areas near Namagunga. Land use varies from agricultural land, sugarcane plantations, business parks, industrial area and forest land, among others. Ambient air quality conditions therefore reflect both anthropogenic and natural sources in these areas. Naturally occurring particulates include dust, smoke particles, pollen grains and fungal spores. Smoke due to burning activities in the region can be a major source of particulates.

Ambient air quality in Kampala has deteriorated significantly in the past two decades due primarily to the heavy reliance on wood and charcoal for cooking and the increase in the number of motor vehicles, particularly high emission vehicles such as motorcycles (boda bodas) (World Bank, 2015). Studies show that high levels of particulate matter (PM) air pollution is prevalent in urban and suburban areas in Uganda, with $PM_{2.5}$ concentrations above 100 µg/m³ in multiple locations in Kampala. Re-suspended dust and vehicular emissions are believed to be the primary sources of $PM_{2.5}$ in Kampala and Jinja. Concentrations of NO_2, SO_2 and O_3 were below WHO guideline levels (200 µg/m³ one-hour mean, 20 µg/m³ 24-hour mean and 100 µg/m³ eight-hour mean, respectively).

The principal air emissions from the Project are anticipated to include Particulate Matter PM, NO_x, SO_2 and CO. Other potential emissions include volatile organic compounds (VOCs) from fuels, laying of bitumous surface and other hydrocarbons. Villages and habitat adjacent to the ROW are key sensitive receptors for the Project. Air emissions and dust generation will be primarily associated with construction vehicle movements and earthworks in the construction phase. and vehicle emissions once the road has been commissioned.

8.3 Management and Mitigation Measures

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Air quality	Development and implementation of a detailed Air Quality Management Plan as part of standard operating procedures for the Project. This should include detailed plans and procedures for how noise measures will be implemented for the Project.	Pre-Construction	Contractor	UNRA
Design	Consideration of design options for the reduction of traffic congestion and associated vehicle emissions, including: • Automated toll charging systems; • Availability of high-occupancy vehicle lanes, minimising grade changes; • Design of roadway to shed water; or	Pre-Construction	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	• Design maintenance regimes of the road surface to preserve surface characteristics (e.g. texture and roughness).			
Construction and clearing (Fugitive dust emissions)	For management of fugitive dust emissions during construction and clearing: • Disturb only the minimum area necessary for construction, or areas flagged for immediate use. • Apply water or chemical dust suppressants on exposed rock, soil and ground. • Monitor PM10, PM2.5 and dust deposition. • Progressively rehabilitate/revegetate cleared areas as soon as practicable.	Construction	Contractor	UNRA
Disposal of waste (Smoke and VOCs)	For management of smoke and VOCs related to disposal of waste: • Restrict open burning of cleared vegetation, waste and hydrocarbons – recycle, compost, re-use or remove wastes from site where available. • Hazardous waste to be disposed of according to manufacturer's specifications and be stored in sealed drums before transportation. • Separate bins for recyclable materials and implement recycling procedures. • Any burning of vegetation, if unavoidable, must be conducted at a small scale to limit smoke production.	Construction	Contractor	UNRA
Quarries (Fugitive dust)	For management of fugitive dust related to quarries: • Locate loading/dumping stations in areas sheltered from wind. • Maintain rock-handing in moist condition using water carts to prevent dust. • Prevent overloading of trucks.	Construction	Contractor	UNRA
Site roads (Fugitive dust)	For management of fugitive dust related to site roads: • All unsealed roads and trafficked areas to be watered using water carts to minimise the generation of dust – typically once per day (do not use community water sources). • Dust suppressants may be used to conserve water. • All site roads to have edges clearly defined with marker posts or equivalent to control their locations, especially when crossing large emplacement areas. • Define locations of and limit use of minor roads to local villages.	Construction	Contractor	UNRA
Transport for Project activities	Tarps/covers should be used on trucks for all Project-related transport to avoid dust and debris on roads.	Construction, Operations	Contractor	UNRA
Power generation and general equipment (PM, NOx, SO2, CO & VOCs)	For management of air emissions related to power generation and general equipment: • Use local electrical power where possible. • Place generators away from buildings to allow exhaust dispersion (reduce building wakes and near-source confluence). • Source low-emission equipment where available and feasible. • Use low sulphur fuel where technically feasible.	Construction	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	• Promote dispersion of emissions where practical.			
Laying of bituminous surface (VOCs)	For bitumen laying: • Restrict bitumen laying to daylight hours if feasible. • Inform local residents and schools of health impacts.	Construction	Contractor	UNRA
Air emissions from traffic on expressway (PM, NOx, SO2, CO & VOCs, fugitive dust)	For management of air emissions related to traffic on expressway: • Place highway at greater distance from sensitive receptors. • Use low emissions fuels. • Introduce/encourage use of modern, efficient vehicles. • Replace minibuses (matatus) with larger modern buses (e.g. Bus Rapid Transit). • Do not overload heavy trucks. • Maintain highway surface. • Maintain current Kampala-Jinja Road with speed limit. • Implement an air quality public liaison and complaints procedure. • Regularly monitor air quality.	Operations	Contractor	UNRA

8.4 Monitoring Measures

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
General air quality	Implementation monitoring			Site inspection	Check all management measures implemented	Monthly	ROW and other Project Footprint areas
Dust	Dust monitoring			Establish monitoring stations at key sensitive receptors. Particulate monitoring using a continuous aerosol monitoring device (e.g. DustTrack). Dust deposition gauges/collectors left permanently at sites. Establish sites prior construction commencing to ensure baseline for specific sites established.	$PM_{2.5}$ and PM_{10}, Dust deposition rates	$PM_{2.5}$ and PM_{10}: 7 days continuous monitoring conducted at each monitoring site monthly during Construction. Dust deposition rates to be recorded monthly.	Near key sensitive receptors. Minimum 5 sites along alignment. Sites should be moved progressively along alignment as construction progresses. Sites should include receptors near quarries and borrow pits.
Dust	Dust monitoring			Visual checks for visible dust Establish sites prior construction commencing to ensure baseline for specific sites established.	Dust deposition (visual inspection)	Monthly inspections	Construction area
Gases	Gas monitoring			Gas monitoring using portable gas monitor.	SO_2, NOx, CO	Monthly	Near sensitive receptors. Minimum 5 sites along alignment

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
				Establish sites prior construction to ensure baseline for specific sites established.			(can link sites to dust monitoring).
Gases	Investigative monitoring			Where appropriate, investigative dust and air quality monitoring at key locations in response to applicable complaints received through the Project grievance management system. Provide additional mitigation if required.	As required.	As required	As required

9. NOISE AND VIBRATION

9.1 Objectives

The Project objectives for noise management include:

- Minimising noise impacts to sensitive receptors in proximity to the Project in all Project phases;
- Avoiding occupational health and safety impacts associated with high noise emissions; and
- Ensuring compliance with applicable national regulations and international standards.

9.2 Context

The Project ranges from the highly-populated Kampala city to rural areas near Namagunga. Land use varies from agricultural land, sugarcane plantations, business parks, industrial area and forest land, among others. Ambient noise and vibration conditions therefore reflect both anthropogenic and natural sources in these areas.

The predominant noise and vibration sources during construction will be generated from sources such as vehicle traffic / earthmoving equipment, pile drivers, excavators, hauling of construction materials, and blasting. Construction phase noise emissions from sections of the ROW will be temporary, localised in nature, and short-term. However, noise emissions from the quarry and borrow pit sites will likely last for an extended period in the construction phase. During operations, noise emissions from road traffic will be long-term and will be affected by the volume of traffic, the speed and the composition of traffic. Generally, heavier traffic volumes, higher speeds and a larger number of heavy vehicles results in more traffic noise.

9.3 Management and Mitigation Measures

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Noise and Vibration	Development and implementation of a detailed Noise and Vibration Management Plan as part of standard operating procedures for the Project. This should include detailed plans and procedures for how noise measures will be implemented for the Project.	Pre-Construction	Contractor	UNRA
Design	Ensure the Project design includes appropriate berms, barriers and/or vegetation between expressway and sensitive receptors (refer to Section 9.3.1 below).	Pre-Construction	UNRA / Contractor	UNRA
Clearing and construction	• Limit the hours of operation of noisy activities to daylight where practical (e.g. tree felling, saws, grinding). • Maintain unpaved access roads to prevent vehicle vibrations from surface rutting. • Ensure broadband alarms are used instead of tonal reversing beepers on all construction vehicles. This should be enforced as a mandatory requirement. • Construction workers to use appropriate hearing protection, vibration gloves and PPE (refer Chapter 21). • Educate construction workers and staff regarding exposure risks and reduction of noise and vibration.	Construction	Contractor	UNRA
Power generation and general equipment	• Select equipment with lower noise and vibration levels where practical.	Construction	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	• Limit the operation of noisy equipment to daylight hours where practical. • Place generators away from buildings to reduce noise and vibration impacts. • Place generators or machinery in enclosures to reduce noise levels. • Locate mobile noise sources in less sensitive areas to take advantage of distance and shielding. • Maintain equipment – worn or faulty tools will emit more noise and vibrations.			
Quarries (Blasting)	• Conduct blasting during daylight hours only. • Conduct blasting at regular timings. • Conduct blasting at times/weather appropriate to local conditions e.g. not in high winds. • Workers must wear personal hearing protectors. • Use electronic detonation. • Cover blast holes to reduce rifling. • Inform public of blast times. • Conduct periodic auditing of noise and vibration levels.	Construction	Contractor	UNRA
Laying of road surface	• Conduct laying and vibration rolling during daylight hours if feasible. • Inform local residents.	Construction	Contractor	UNRA
Noise and vibration emissions from traffic	• Place expressway at greater distance from sensitive receptors where practicable. • Place berms, barriers and/or vegetation between expressway and sensitive receptors (see Section 9.3.1 below). • Install modern acoustic enclosures or acoustic fencing along expressway which absorb noise. • Offer incentives for shutters or double-glazed windows for affected roadside receptors. • Introduce modern, efficient vehicles. • Replace minibuses (matatus) with larger modern buses (e.g. Bus Rapid Transit). • Do not overload heavy trucks. • Maintain expressway surface. • Prohibit use of truck hydraulic braking in community areas. • Implement a noise and vibration public liaison and complaints procedure. • Regularly monitor noise and vibration.	Operations	UNRA / Contractor	UNRA

9.3.1 Physical Noise Barriers

Model simulations of noise attenuation suggested that traditional physical barriers (berms or walls) of up to 5 m would be an effective single method of meeting WHO and Ugandan noise guidelines for roadside receptors in residential areas during peak hour traffic by controlling the transmission path (see Figure 9-1 below). Though, smaller barriers (3 m) would be acceptable for receptors at greater distances. In urban regions with lower densities or surrounding wetlands it is recommended that noise barriers 2 – 4m tall (low) will be installed. For open areas it

is expected that noise barriers will not be necessary, therefore either fences or natural borders are acceptable. The locations of the respective barriers along the Phase 1 ROW are outlined in Figure 9-2. It is predicted that approximately 57 km of high noise barriers, 10 km of low noise barriers, and 69 km of fencing or natural borders will be needed for Phase 1 of the Project. Vegetation only provides a very small reduction in noise levels. Alternative modern technologies include acoustic enclosures or acoustic fencing, which absorb or deflect highway noise by up to 85%, and are particularly suitable for flyovers, road cuts and populated areas. The closer and higher the barrier or acoustic fencing is to the expressway the more effective is the outcome.

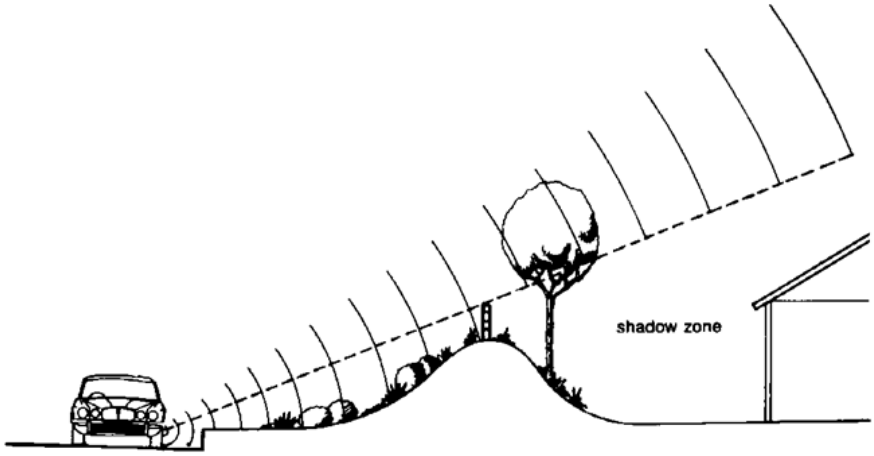

Figure 9-1: Controlling traffic noise along the transmission path (DPTI SA, 2016)

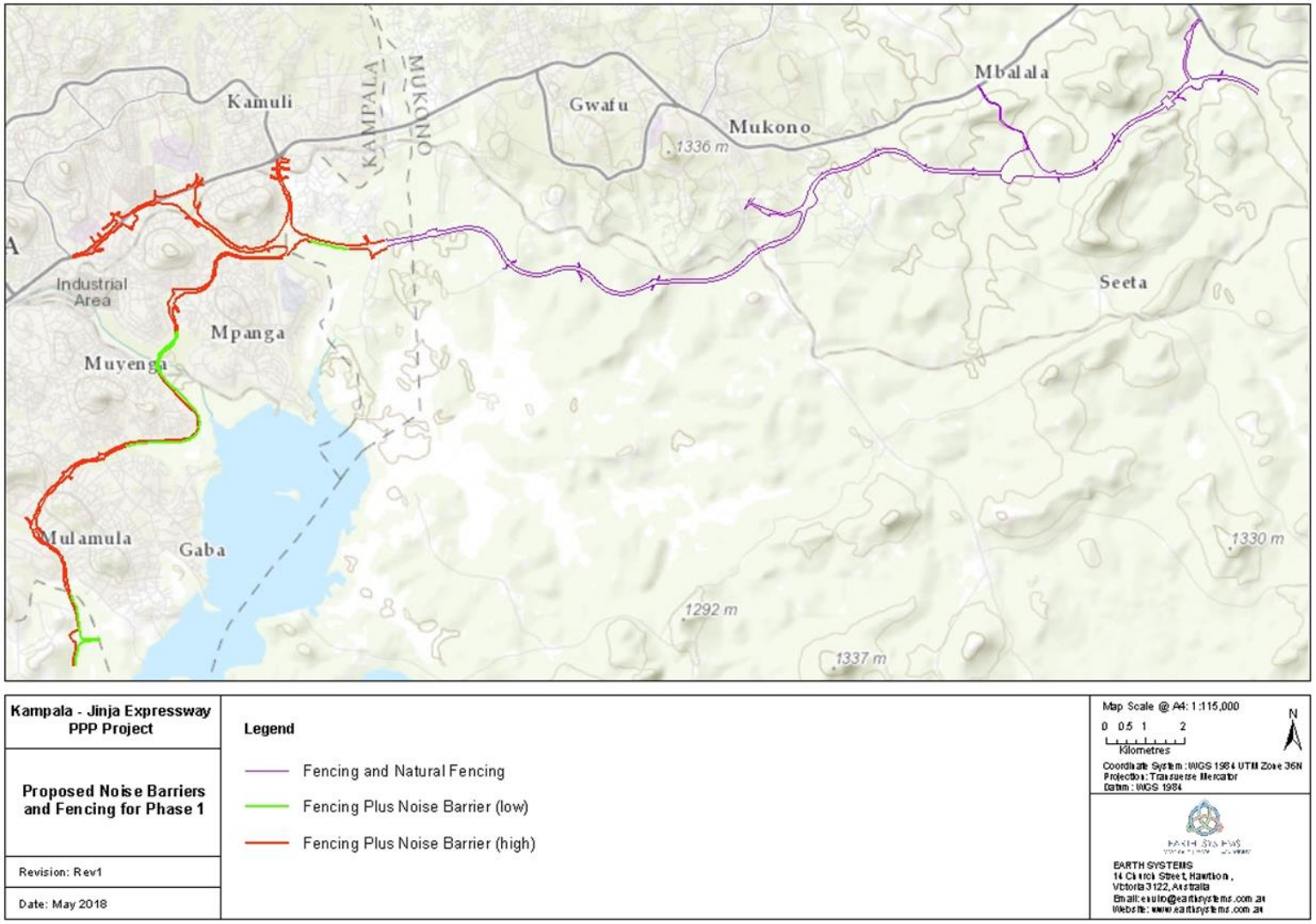

Figure 9-2: Proposed locations of noise barriers along the Phase 1 alignment

9.4 Monitoring Measures

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
Noise and vibration	Implementation monitoring			Site inspection	Check all management measures implemented	Monthly	ROW and other Project Footprint areas
Noise and vibration	Noise and vibration monitoring			Noise and vibration loggers Establish sites prior construction commencing to ensure baseline for specific sites established.	Noise levels in dB(A) LAeq (daytime and night-time), Airblast dB(L), Ground vibration peak particle velocity (PPV)	Monthly during Construction. Once in first year of operations and then depending on results	Near key sensitive receptors. Minimum 5 sites along alignment. Sites should be moved progressively along alignment as construction progresses. Sites should include receptors near quarries and borrow pits.
Noise and vibration	Investigative monitoring			Where appropriate, investigative noise and vibration monitoring at key locations in response to applicable complaints received through the Project grievance management system. Provide additional mitigation if required.	As required	As required	As required

10. GREENHOUSE GASES AND CLIMATE CHANGE

10.1 Objectives

Climate and greenhouse gases (GHG) management for the Project is based on the following key objectives:

- Ensuring the Project is designed and constructed to accommodate for local climate conditions;
- Minimising GHG emissions derived from the Project through implementation of industry best practice; and
- Conserving energy usage by integrating energy efficiency and optimisation principles in the Project.

10.2 Context

The Project is expected to produce Scope 1 (direct) greenhouse gas emissions from the following main sources:

- Fuel used for construction and operational activities;
- Blasting activities at quarries and along the ROW;
- Supplies transportation to site; and
- Vegetation clearance.

There is not expected to be any significant Scope 2 (indirect) emissions from the consumption of electricity from the grid during construction as most power on site is expected to be produced by generators or solar power. During operations, electricity use from roadway lighting will produce Scope 2 emissions.

Scope 3 emissions are indirect GHG emissions which occur as a result of sources not owned or controlled by UNRA in relation to the Project, for example embodied emissions from material use in the Project, emissions from equipment delivery to site, and travel emissions of employees to site.

The principal GHG emissions from the Project are anticipated to include NOx, SO_2 and CO_2 from vehicles. Other potential emissions include volatile organic compounds (VOCs) from fuels, laying of bitumous surface and other hydrocarbons.

The main greenhouse gases produced by the Project are likely to include:

- Carbon dioxide (CO_2);
- Methane (CH_4);
- Nitrous oxide (N_2O);
- Sulphur dioxide (SO_2); and
- Volatile organic compounds (VOCs).

10.3 Management and Mitigation Measures

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Climate and Greenhouse Gases - Design	• Consider the use of renewable energy (e.g. solar powered lights, biodiesel, etc.).	Pre-Construction	UNRA / Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	• Establish energy conservation targets for the Project for measuring improvement in greenhouse intensity of road construction in accordance with good international industry practices. • Integrate energy efficiency principles in building or facility design. • Use best available technology to minimise greenhouse gas emissions at site and processing facility (e.g. asphalt plant).			
Climate and Greenhouse Gases – fuel and energy use	• Maximise efficiency of energy use (type of fuel, lighting, etc.). • Follow international industry practices for minimising Project related greenhouse gas emissions, particularly for major emission sources (e.g. asphalt plant). • Apply appropriate greenhouse gas management measures to all Project-related transport activities. • Minimise vehicle / equipment idling time to increase efficiency and reduce emissions.	Construction	UNRA / Contractor	UNRA
Climate and Greenhouse Gases – Vegetation Clearing	• Minimise land clearance to reduce carbon loss. • Mulch and chip cleared vegetation rather than burn and re-use in rehabilitation. • Maximise absorption/offset of greenhouse gases through revegetation of land during and after construction. • Progressively rehabilitate cleared land during construction to ensure that land is revegetated as soon as possible after construction is completed. • Appropriate implementation of a revegetation scheme.	Construction	Contractor	UNRA
Climate and Greenhouse Gases – Vegetation Clearing	• Establish roadside vegetation where appropriate. • Progressively rehabilitating cleared land during the Construction and Operations phases to ensure that land is revegetated as soon as possible.	Construction / Operations	Contractor	UNRA
Climate and Greenhouse Gases - Heavy equipment and vehicles	• Where possible, select the most fuel-efficient vehicles and equipment viable for use on site for maintenance activities. • Support policies for the introduction of fuel efficient vehicles to Uganda, e.g. electric vehicles powered by renewable energy sources. • Minimise idle time of equipment and vehicles. • Introduce eco-driving strategies for maintenance vehicles to reduce fuel consumption and emissions, including (Eco Driver, 2009): - Keeping a steady speed on a highway; - Using overdrive at high speeds to save fuel and reduce engine wear; - Travel light if possible (i.e. don't carry excessive weight); - Ensure tyre pressure is appropriate to avoid increased fuel consumption due to under-inflated tires; - Clogged air filter can increase fuel usage by up to 10% because insufficient air make it to the combustion chambers; - Ensure maintenance is up to date (i.e. using worn-out / wrong grade of oil can increase fuel	Operations	UNRA / Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	consumption by up to 2%, regular vehicle tune ups can reduce fuel consumption by up to 15%, etc.).			
Climate and Greenhouse Gases - Energy Usage	• Consider the use of renewable energy (e.g. solar powered lights) to substitute or augment fossil fuel usage for electricity generation (e.g. street lights, toll booths operation). • If possible, consider fuel switching to renewable fuel (e.g. use biodiesel).	Operations	UNRA / Contractor	UNRA

10.4 Monitoring Measures

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
Greenhouse Gas Measures	Implementation of all management measures			Inspections	Check all management measures implemented	Monthly	All sites
Emissions monitoring	Fuel/energy use			Keep log of fuel use/purchases for all construction/operations vehicles and equipment, track electricity use (ensure asphalt energy use plant included in monitoring)	Fuel use (by fuel type) Electricity use Solar energy generation	Monthly (collate data)	All sites
Transport	Vehicle maintenance			Monitor routine vehicle maintenance for all construction vehicles	Number of vehicles overdue for maintenance/servicing	Reported monthly	All sites

11. BORROW PITS AND QUARRIES

11.1 Objectives

Key management objectives related to borrow areas and quarries for the Project will include:

- Complying with legal requirements and environmental and social standards and guidelines;
- Minimising potential impacts of quarry and borrow area operations; and
- Meeting safety requirements of quarry and borrow area operations.

11.2 Context

The Project will require gravel, fill, rock and sand as construction material for the road. Where possible, fill materials will be obtained from 'cutting' operations as part of the road earthworks. Where additional fill and other aggregate material is required, this will be preferentially sourced from existing borrow areas and quarries in proximity to the ROW. Extra material required will be sourced from new borrow pits or quarries. Care should be taken to source material away from sensitive receptors such as wetlands.

UNRA has undertaken an initial site evaluation and preliminary testing of a number of existing and potential borrow pits and quarry sites situated near the ROW. The actual sites used will depend on the cost and availability of materials from the sites at the time of construction. UNRA will conduct further investigations of the raw materials required and suitability of materials available.

Borrow pits and quarries should be managed in accordance with the IFC *EHS Guidelines for Construction Materials Extraction* (2007) and the IFC *General EHS Guidelines* (2007).

Plate 11-1: Sand extraction taking place near the proposed KSB Alignment (not Project-related)

11.3 Management and Mitigation Measures

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Land clearance	As far as possible, use existing quarries/borrow pits to source materials for the roads construction.	Design / Construction	Contractor	UNRA
Environmental assessment	Any new quarries and borrow pits established for the Project to undergo due diligence environmental and social studies by the contractor (or concessionaire) to the satisfaction of UNRA before submission to NEMA for approval in accordance with national legislation and international standards (e.g. IFC Performance Standards and AfDB's Operational Safeguards)	Prior to use of new quarries or borrow pits	Contractor	UNRA
Land clearance	If required, new locations for borrow pits and quarries will be identified in accordance with the following site selection criteria: • As close to the Project and accessible to existing transport infrastructure as possible; • Avoidance of environmentally sensitive areas (e,g, wetlands, waterways), known cultural heritage or archaeology sites, residential areas and productive agricultural land (cultivated or fallow), where possible; • No closer than 500 m from an existing dwelling / structure unless a shorter distance is agreed through community consultation; and • No closer than 50 m from a watercourse or wetland.	Design / Construction	Contractor	UNRA
Land clearance	Apply measures in Section 4.3 referring to land clearance.	Design / Construction	Contractor	UNRA
Community consultation	Follow the Stakeholder Engagement Plan as appropriate.	Construction	Contractor	UNRA
Land acquisition / compensation	Apply measures detailed in the RLRP as appropriate.	Construction	Contractor	UNRA
Biodiversity	Apply measures detailed in the BAP as appropriate.	Construction	Contractor	UNRA
Erosion and sediment control / Water management	Adequate drainage, erosion and sediment control devices will be installed to reduce sediment-laden runoff into the receiving environment and topsoil will be appropriately stored. Apply measures in Section 5.3 referring to erosion and sediment control and the Water Management Plan.	Design / Construction	Contractor	UNRA
Blasting	Develop and implement a Blasting Plan. Best practice safety measures for blasting to be implemented as per Section 21.3 (Occupational Health and Safety).	Construction	Contractor	UNRA
Blasting	Crushing plant operation and blasting will be conducted during daytime only, to avoid potential night-time disturbance.	Construction	Contractor	UNRA
Blasting safety	Establish a blasting exclusion zone to restrict and control access and ensure community safety during all blasting activity (to prevent flyrock injury).	Construction	Contractor	UNRA
Health and safety	Apply measures in Section 20.3 (Community Health and Safety) and Section 21.3 (Occupational Health and Safety).	Construction	Contractor	UNRA
Hazardous materials and waste management	Apply measures in Section 7.3 referring to hazardous materials and waste management.	Construction	Contractor	UNRA
Noise and vibration	Apply measures in Section 9.3 referring to noise and vibration management.	Construction	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Air quality	Apply measures in Section 8.3 referring to air quality management.	Construction	Contractor	UNRA
Greenhouse gas	Apply measures in Section 10.3 referring to greenhouse gas management	Construction	Contractor	UNRA
Archaeology and Cultural Heritage	Apply measures in Section 16.3 referring to archaeology and cultural heritage management.	Construction	Contractor	UNRA
Visual amenity	Apply measures in Section 19.3 referring to visual amenity.	Construction	Contractor	UNRA
Rehabilitation	• Development of a closure and rehabilitation strategy for each quarry/borrow area prior to quarrying, including provisions for progressive rehabilitation where practical. This should be consistent with the Project Revegetation Plan.	Pre-Construction	Contractor	UNRA
Restoration / Rehabilitation	When use of borrow pits and quarries will be discontinued: • Remove all structures at the site; • Progressively rehabilitate as soon as possible to final natural landform that takes into account pre-disturbance state, public and wildlife safety, and community consultation outcomes; • Adequate site drainage should be installed to avoid water quality issues and erosion.	Construction Decommissioning	Contractor	UNRA
Revegetation	Apply measures detailed in the Revegetation Plan for progressive rehabilitation / revegetation.	Construction	Contractor	UNRA
Emergency response	Apply measures in Section 24.3 referring to emergency response.	Construction	Contractor	UNRA

11.4 Monitoring Measures

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
Community health and safety	Blast monitoring			Monitor blasting as per Section 21.4			
General	Implementation of management measures			Inspections	Check implementation of all management measures	Monthly	All borrow pits and quarries
Water quality	Routine water quality monitoring			Surface water sampling and recording of field measurements	Key parameters: Turbidity, TSS, DO, temperature, electrical conductivity (EC), and pH Visual checks for sedimentation, oils and grease	Monthly	Discharge points at quarries/borrow pits
Quarry and borrow pit	Routine safety monitoring			Regular visual inspections of the borrow pits and quarries	Project compliance	Daily (by site supervisor)	Actively used borrow areas

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
safety and integrity				for safety and structural integrity	Inspection records for geotechnical and landform stability Verification of security practices Verification of safety controls and inspection records		and quarry sites
Air quality	Dust monitoring			Visual check for excessive dust and implementation of Project Grievance mechanism	Project compliance Logged dust complaints	Monthly	At sensitive receptors, e.g. residences near all quarry sites
Noise	Investigative monitoring of nuisance noise			Noise monitoring and Project Grievance mechanism	Project compliance Logged noise complaints	As required	At sensitive receptors, e.g. residences near all quarry sites

12. ANCILLARY FACILITIES

12.1 Objectives

The objectives of ancillary facility management for the Project are to:

- Identify design controls and management measures to minimise risks associated with hazardous materials and general waste and avoid potential associated impacts to environmental and social receptors;
- Ensure the staff are appropriately equipped and trained to minimise occupational health and safety risk and community health and safety risk; and
- Ensure ancillary facilities are appropriately rehabilitated at construction decommissioning.

12.2 Context

Ancillary facilities for the Project will include asphalt plant(s). Asphalt plants consist of aggregate storage, crushing units, batching units, water supply infrastructure, asphalt storage and vehicle parking. Borrow pits and quarries are discussed in Chapter 11. Accommodation camps are discussed in Chapter 22.

Hazardous materials (e.g. asphalt, fuel) storage, general waste storage, sewage / wastewater facilities, etc. require design controls and management measures to prevent contamination of soil, surface and groundwater and associated potential impacts to biodiversity, occupational health and safety, and community health and safety.

12.3 Management and Mitigation Measures

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Environmental assessment	New ancillary facilities established for the Project to undergo due diligence environmental and social studies by the contractor (or concessionaire) to the satisfaction of UNRA before submission to NEMA for approval in accordance with national legislation and international standards (e.g. IFC Performance Standards and AfDB's Operational Safeguards)	Prior to use of new quarries or borrow pits	Contractor	UNRA
Land clearance	If required, new locations for ancillary facilities will be identified in accordance with the following site selection criteria: • As close to the Project and accessible to existing transport infrastructure as possible; • Avoidance of environmentally sensitive areas (e.g. wetlands), known cultural heritage or archaeology sites, residential areas and productive agricultural land (cultivated or fallow), where possible; • No closer than 500 m from an existing dwelling / structure unless a shorter distance is agreed through community consultation; and • No closer than 50 m from a watercourse or wetland.	Design / Construction	Contractor	UNRA
Land clearance	Apply measures in Section 4.3 referring to land clearance.	Design / Construction	Contractor	UNRA
Community consultation	Follow the Stakeholder Engagement Plan as appropriate.	Pre-Construction / Construction	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Land acquisition / compensation	Apply measures detailed in the RLRP as appropriate.	Pre-Construction / Construction	Contractor	UNRA
Biodiversity	Apply measures detailed in the BAP as appropriate.	Pre-Construction / Construction	Contractor	UNRA
Erosion and sediment control / Water management	Apply measures in Section 6.3 referring to erosion and sediment control and the Water Management Plan.	Design / Construction	Contractor	UNRA
Hazardous Materials and Waste	Hazardous materials utilised in ancillary facilities such as bitumen drums will be stored on a raised, impermeable surface in a bunded, covered area.	Construction	Contractor	UNRA
Emergency Preparedness and Response	Develop an appropriate Emergency Response Plan with communication protocols for emergencies, phone numbers posted in the plan and storage areas. Apply measures in Section 24.3 referring to emergency response.	Pre-Construction / Construction	Contractor	UNRA
Hazardous Materials and Waste	Vehicle maintenance bays, equipment laydown areas and re-fuelling stations are to be constructed on impervious surfaces and any potentially oily runoff from these areas is to be contained by perimeter bunding or interception drains.	Construction	Contractor	UNRA
Hazardous Materials and Waste	Watertight receptacles shall be provided for waste oil, oily rags, spent oil filters, solvents and oily containers.	Construction	Contractor	UNRA
Hazardous Materials and Waste	Provide suitable clean-up materials to contain and treat spillage (e.g. Sorbex).	Construction	Contractor	UNRA
Hazardous Materials and Waste	Maintenance and refuelling areas will be sited more than 100 m from the surface waters.	Construction	Contractor	UNRA
Hazardous Materials and Waste	Asphalt plants will be equipped with adequate sanitary facilities and appropriate wastewater treatment units.	Construction	Contractor	UNRA
Hazardous materials and waste management	Apply measures in Section 7.3 referring to hazardous materials and waste management.	Construction	Contractor	UNRA
Noise and vibration	Apply measures in Section 9.3 referring to noise and vibration management.	Construction	Contractor	UNRA
Air quality	Apply measures in Section 8.3 referring to air quality management.	Construction	Contractor	UNRA
Greenhouse gases	Apply measures in Section 10.3 referring to greenhouse gas management.	Construction	Contractor	UNRA
Archaeology and Cultural Heritage	Apply measures in Section 16.3 referring to archaeology and cultural heritage management.	Construction	Contractor	UNRA
Health and safety	Ensure workers have access to potable drinking water at work sites. Apply measures in Section 20.3 (Community Health and Safety) and Section 21.3 (Occupational Health and Safety).	Construction	Contractor	UNRA
Visual amenity	Apply measures in Section 19.3 referring to visual amenity.	Construction	Contractor	UNRA
Restoration / Rehabilitation	When use of ancillary facilities will be discontinued: • Remove all structures at the site;	Construction Decommissioning	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	• Dispose of all hazardous and general waste appropriately; • Progressively rehabilitate as soon as possible to final natural landform that takes into account pre-disturbance state, public and wildlife safety, and community consultation outcomes; • Revegetation schemes should be implemented wherever possible. These schemes should use native vegetation for restoration; • Adequate site drainage to avoid water quality issues and erosion.			
Revegetation	Apply measures detailed in the Revegetation Plan for progressive rehabilitation / revegetation.	Construction	Contractor	UNRA

12.4 Monitoring Measures

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
General	Implementation of management measures			Inspections	Check implementation of all management measures	Monthly	All borrow pits and quarries
Water quality	Routine water quality monitoring			Surface water sampling and recording of field measurements	Key parameters: Turbidity, TSS, DO, temperature, electrical conductivity (EC), and pH Visual checks for sedimentation, oils and grease	Monthly	Discharge points at quarries/borrow pits
Air quality	Dust monitoring			Visual check for excessive dust and implementation of Project Grievance mechanism	Project compliance Logged dust complaints	Monthly	At sensitive receptors, e.g. residences near all sites
Noise	Investigative monitoring of nuisance noise			Noise monitoring and Project Grievance mechanism	Project compliance Logged noise complaints	As required	At sensitive receptors, e.g. residences near ancillary infrastructure
Hydrocarbon leakage / spillage	Routine inspection for potential leakage or seepage of hydrocarbons			Visual check for visible leakage or seepage	Project compliance	Regular (e.g. daily)	Active construction areas

13. BIODIVERSITY MANAGEMENT

13.1 Objectives

The objective of biodiversity and conservation management at the Project is to:

- Minimise impacts on habitat, flora, and fauna;
- Ensure biodiversity mitigation and management measures are successfully implemented, while monitoring local biodiversity; and
- Ensure compliance with local regulations and international standards.

13.2 Context

The Project is situated in an area that has mostly been modified from natural habitats, with only a few remnant patches of natural habitat remaining. However, several threatened species have been found close to the preferred Project alignment and these have been able to use the modified habitat to maintain viable populations (e.g. Grey Crowned Crane, *Balearica regulorum*). Phase 1 of the Project intersects the Namanve Central Forest Reserve and several wetlands (e.g. Kasanga, Nakivubo, Kasala, Mayanja).

The alignment passes through the Namanve Central Forest Reserve which was originally planned to be an urban forest that would help meet the need of the growing urban population in Kampala and the surrounding towns (ICS, 2015). The Reserve has been degraded and over-harvested over time, with parts being leased to private developers for eucalyptus plantations and others for the development of Namanve business park. A large proportion of the area enclosed by the Reserve's boundaries is wetland habitat dominated by Papyrus vegetation. The habitat forms a permanent wetland of high quality. Around the edges of swampy areas, sand exploitation and brick manufacturing are common activities (ICS, 2015). It is likely that the wetland provides habitat for several wetland specialist bird species. No other reserves or protected areas are directly impacted by the proposed Project. Very few signs of mammals have been observed along the alignment. Although several generalist mammal species possibly inhabit agricultural landscapes and forest patches passed by the alignment.

Terrestrial biodiversity (e.g. flora, avifauna) associated with habitats along the alignment, including wetlands, will be affected by the direct loss, degradation and fragmentation of habitat. The road will create a significant barrier for movement of some species through the creation of a physical barrier, extensive vehicle movement and noise pollution. Flora species will also potentially be impacted by air and dust emissions which will need to be carefully managed. There is also a risk that Project activities such as vehicle movements and human activities may spread invasive species. Accidental death and injury of fauna along the alignment may also be caused by collisions with vehicles or machinery.

13.3 Management and Mitigation Measures

Detailed management and mitigation measures for biodiversity management are provided in the separate Biodiversity Action Plan (Volume D).

13.4 Monitoring Measures

Detailed monitoring measures for biodiversity management are provided in the separate Biodiversity Action Plan (Volume D).

14. ECOSYSTEM SERVICES

14.1 Objectives

The objective of ecosystem services management at the Project is to:

- Minimise impacts on provisioning, regulating, supporting and cultural ecosystem services;
- Ensure mitigation and management measures are successfully implemented, while monitoring local biodiversity; and
- Ensure compliance with local regulations and international standards.

14.2 Context

Ecosystems provide the resources needed for material welfare and livelihoods, support all life and regulating natural systems, and provide health and cultural benefits to people through services including the goods produced by the environment, the results of environmental processes, cultural benefits and supportive services.

Communities living in, and surrounding the Project Area rely on the environment for several provisioning services provided by the local ecosystems, including agricultural production, brick manufacturing, Papyrus harvesting, hunting and fishing. These services provided by the environment are more prominent in the easterly areas of the alignment in more rural areas. Areas near Kampala and along much of the KSB alignment are heavily populated meaning much of the land passed by the line is urbanised, severely degraded and of less importance for provisioning services.

Key regulating services provided by the ecosystems along the alignment include water purification by wetlands and regulation of soil erosion. A variety of supporting services are provided by ecosystems in the Project area, from nutrient recycling to pollination and seed dispersal. These are less easy to quantify than provisioning services, but are nonetheless important for agricultural production and local livelihoods. The ecosystems, landscapes and biodiversity in the Project area also have important cultural values for the local and global communities.

Wetlands provide the most important ecosystem services along the alignment and potential impacts to these will need to be carefully managed.

14.3 Management and Mitigation Measures

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Land clearance	Apply measures in Section 4.3 referring to land clearance.	Design / Construction	Contractor	UNRA
Regulating Services – Water purification and regulation of soil erosion	Apply measures in Section 5.3 referring to erosion and sediment control.	Construction / Operation	Contractor	UNRA
Regulating Services - Water Resources	Apply measures in Section 6.3 referring to water management.	Design / Construction / Operation	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Provisioning Services - Biodiversity	Apply measures in Section 13.3 referring to biodiversity management.	Construction / Operation	Contractor	UNRA
Visual Amenity	Apply measures in Section 19.3 referring to visual amenity.	Construction	Contractor	UNRA
Noise and vibration	Apply measures in Section 9.3 referring to noise and vibration management.	Construction	Contractor	UNRA
Regulating Services – Air Quality	Apply measures in Section 8.3 referring to air quality management.	Construction	Contractor	UNRA
Land Acquisition and Compensation	Apply measures in Section 15.3 referring to land acquisition and compensation.	Construction	Contractor	UNRA
Cultural Services	Apply measures in Section 16.3 referring to archaeology and cultural heritage management.	Construction	Contractor	UNRA

14.4 Monitoring Measures

As ecosystem services combine discussion of various environmental and social aspects of the Project area, refer to the following sections for monitoring measures applicable to ecosystem services:

- Section 4.4 Land clearance.
- Section 5.4 Erosion and sediment control.
- Section 6.4 Water management.
- Section 8.4 Air quality management.
- Section 9.4 Noise and vibration management.
- Section 13.4 Biodiversity management.
- Section 15.4 Land acquisition, resettlement and compensation.
- Section 16.4 Archaeology and cultural heritage management.
- Section 19.4 Visual Amenity.

15. RESETTLEMENT AND SOCIOECONOMIC CONDITIONS

15.1 Objectives

The objectives of resettlement (inclusive of land acquisition, compensation and livelihood restoration) as well as management of socioeconomic conditions for the Project are to:

- Ensure that all persons that will be physically displaced by the land acquisition process are provided adequate compensation, resettlement assistance and livelihood restoration options to enable them to maintain an equivalent or better pre-Project standard of living and income / revenue earning capacity;
- Minimise adverse impacts on socioeconomic conditions for people affected by the Project, and maximise potential benefits;
- Minimise disruption and other effects to social infrastructure, land use and people during construction;
- Facilitate the provision of adequate information for villages, government and other stakeholders so that they can make informed decisions and provide meaningful input into design of the compensation, livelihood restoration and resettlement strategies;
- Minimise disputes which may arise during the land acquisition process.

Specific objectives for land acquisition, compensation and livelihood restoration are presented in the *Resettlement and Livelihood Restoration Plan* (RLRP) for the Project.

15.2 Context

Phase 1 of the Project traverses densely populated areas in and round Kampala and Wakiso Districts, including several informal settlements. Heading east from Kampala, the land use varies from agricultural land, sugarcane plantations, aquaculture and forest land, among others. Several existing and proposed business parks, industrial areas, markets and small to large independent businesses are also present along the alignment.

Land acquisition for the Project ROW will result in a land loss of approximately 592.2 ha, including 476.4 ha as a result of the KJE alignment from Kampala to Namagunga and 115.9 ha as a result of the KSB alignment. A significant number of assets and structures (including residential, outbuilding and industrial structures) are expected to be impacted by the Project.

15.3 Management and Mitigation Measures

Detailed management and mitigation measures for land acquisition, compensation, resettlement and livelihood restoration are presented in the separate RLRP (Volume D) for the Project. The proposed resettlement and livelihood restoration measures have been developed in consultation with key Project stakeholders identified for the RLRP. An Entitlement Matrix has also been prepared detailing specific measures for each category of impact.

A summary of key mitigation measures to manage potential social impacts are presented below.

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Loss of housing and residential areas, industrial facilities, businesses and	• Provide compensation to affected people as per the RLRP. This should include special measures to assist vulnerable persons. • Lack of formal legal rights to assets lost will not deprive any Affected Person from receiving compensation and	Pre-Construction / Construction	UNRA / Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
community infrastructure	entitlements. Distinctions will not be made between Affected Persons "with" and "without" formal legal land titles. • For severely impacted residences where it is not feasible to establish pedestrian or vehicle crossings, provide compensation as per the Resettlement and Livelihood Restoration Plan.			
Socioeconomic impacts from loss of housing, structures, and physical displacement	• Avoidance of settlement areas to the extent possible. • Where displacement is unavoidable, follow measures described in the Resettlement and Livelihood Restoration Plan, including compensation at full replacement cost and a disturbance allowance (15%). • Where resettlement is preferred by vulnerable person, assist finding new residence. • Provide livelihood restoration measures as appropriate. • Assist in securing tenure. • Implementation of Grievance Mechanism and monitoring.	Pre-Construction / Construction	UNRA / Contractor	UNRA
Socioeconomic impacts from loss of business properties	• Follow measures described in the Resettlement and Livelihood Restoration Plan, including compensation for re-establishing commercial activities elsewhere, lost net income during transition period, cost for transfer and reinstallation of the structure / equipment. • Livelihood restoration measures for vulnerable persons. • Implementation of Grievance Mechanism.	Pre-Construction / Construction	UNRA / Contractor	UNRA
Socioeconomic impacts from loss of community and social infrastructure	• Conduct ongoing consultation and engagement with affected communities. • Relocation of community structures e.g. churches, mosques. • Implementation of Grievance Mechanism.	Pre-Construction / Construction	UNRA / Contractor	UNRA
Socioeconomic impacts from loss of agro-pastoral land	• Cash compensation at market value of land of equal productive use, compensation for improvements on the land including irrigation structures, disturbance allowance etc. • Salvage of all crops on land, prior to expropriation. • Livelihood restoration (e.g. training) with special consideration of vulnerable groups. • Implementation of Grievance Mechanism.	Pre-Construction / Construction	UNRA / Contractor	UNRA
Loss of infrastructure and utilities	Measures recommended to avoid potential impacts on infrastructure and utilities include: • Carefully conduct construction activities to ensure existing infrastructure and utilities are not unnecessarily disturbed. • Where removal / relocation is inevitable, consult and collaborate with service provider during the removal/relocation process and provide advance notice (at least a few months). Provide compensation as per the Resettlement and Livelihood Restoration Plan (in advance and in a phased manner to reduce potential impacts on end users avoid disruption to civil works and service provision).	Pre-Construction / Construction	UNRA / Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	• Where possible, ensure road design accounts for major infrastructure (such as transmission lines) to avoid the requirement for relocation. • To avoid damage to signposts and road furniture, work with the contractor and owners to ensure their carefully removal, storage and relocation to a safe site. • Compensate and assist Nakawa market vendors as per the Resettlement and Livelihood Restoration Plan. This includes assistance for the relocation of stalls or the provision of alternative livelihood opportunities, where relocation is not possible. Consider working with authorities to temporarily waiver market related taxes during the time of relocation, to avoid further impacts on livelihoods.			
Livelihood restoration	Implement livelihood restoration measures as outlined in the Resettlement and Livelihood Restoration Plan	Pre-Construction / Construction	UNRA / Contractor	UNRA
Gender measures	Gender based practical measures will consider: • Ensuring that land titles and compensation entitlements are issued in the name of both spouses; • Reducing women's workloads by supporting development of basic community infrastructure such as water delivery; • Improving access to health and supporting educational programs such as family planning advice and water supply and sanitation training; • Improving family services by supporting the provision of immunisations, elementary schools, inputs for food-crop production and housing; and • Increasing incomes by setting up credit groups and providing small business / skills training and improving access to markets.	Pre-Construction / Construction	UNRA / Contractor	UNRA
Strategic gender initiatives	Strategic gender initiatives include: • Improving educational opportunities (providing literacy and numeracy training, promoting girls' education); • Improving access to productive assets (e.g. credit); • Improving participation in decision-making (support for women's interest groups); and • Promoting equal opportunity for women's employment.	Pre-Construction / Construction	UNRA / Contractor	UNRA
Vulnerable groups assistance	Special assistance to vulnerable groups may include: • Ensuring they rightfully receive their compensation; • Protection from opportunistic relatives; • Open bank accounts; • Special support for widows and children from female headed households to access support from the Administrator Generals office or designated representative at the district and sub-county levels so as to enable them to process their entitlements • Financial literacy training; • Find new land and / or accommodation; and • Securing land tenure in new location.	Pre-Construction / Construction	UNRA / Contractor	UNRA
Water Resource Use	• Implement mitigation measures in the Water Management Plan, including Project design features to	Pre-Construction /	UNRA / Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	ensure impacts on downstream water uses are minimised. • Ensure water supplies in resettlement areas are sufficient to provide adequate access to water for AP who are displaced, and provide additional services where required as part of the Resettlement and Livelihood Restoration Plan.	Construction / Operations		
Economic Development	• Continue to implement the Resettlement and Livelihood Restoration Plan. • Require construction contractors to implement a local procurement policy to maximise economic benefits for local businesses • Implement measures in Section 18.3 (Traffic and accessibility) to minimise impacts on accessibility for local businesses. • Implement measures to maximise employment benefits (see below)	Pre-Construction / Construction / Operations	UNRA / Contractor	UNRA
Business Activities and Value Chain	• Where applicable, ensure impacted companies inform clients and suppliers in advance about possible limitations / disruption to their activities due to the Project.	Pre-Construction / Construction / Operations	UNRA / Contractor	UNRA
Employment	• As part of the livelihood development strategies in the Resettlement and Livelihood Restoration Plan, provide financial and technical support to existing or new small businesses that can provide goods and services to the Project. • Ensure construction contractors are required to implement a 'locals first' hiring policy which preferentially provides employment to people directly impacted by the Project. This should include training and employing affected people for skilled labour opportunities where possible. • Ensure construction contractors are required to develop contracts for casual labourers. These should specify labour requirements, wages, working conditions, workers' rights and Company obligations.	Pre-Construction / Construction / Operations	UNRA / Contractor	UNRA
Social impact monitoring	• Develop a detailed methodology for the social impact monitoring program to identify and quantify the direct and indirect impacts of the Project on the surrounding community. This should include a monitoring manual and procedures as needed. Refer Section 15.4.	Pre-Construction	UNRA / Contractor	UNRA

15.4 Monitoring Measures

Details of monitoring measures for resettlement and livelihood restoration are provided in the separate RLRP (Volume D). Additional social impact monitoring measures are outlined below.

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
General	Implementation of management measures			Inspections/verification of implementation of measures	Check implementation of all management measures	Monthly	All sites
Social impact monitoring	Socioeconomic Conditions			Implement social impact monitoring program to identify and quantify the direct and indirect impacts of the Project on the surrounding communities.	Local workforce statistics (including employment by contractors); Local procurement of goods and services; General socio-economic parameters in Project affected villages including livelihood, income, expenditure, business activities, cost of living, access to infrastructure and services, demographic trends and access to land and water; Road accidents; Number of complaints/grievances Attitudes towards Project	2-yearly (Construction Phase) 5-yearly (Operations Phase)	Communities, services and businesses adjacent to the ROW and other Project facilities
Grievance monitoring	Complaints			Investigate any complaints received through the Project grievance mechanism. Provide or adapt additional mitigation if required.	Complaints received	As required	As required

16. ARCHAEOLOGY AND CULTURAL HERITAGE

16.1 Objectives

The key objectives of archaeology and cultural heritage management for the Project will be to:

- Minimise Project impacts on sites of archaeological and cultural significance, and relocate or provide adequate compensation for sites where disturbance is unavoidable;
- Ensure chance finds are managed in consultation with local communities; and
- Comply with Ugandan legislation and regulatory requirements related to the conservation and preservation of archaeological and cultural heritage.

16.2 Context

Due to previous developments in the Kampala urban area, most of the archaeological contexts have been disturbed. However, there are many pre- and post-colonial buildings of religious and cultural value and burial sites within or close to the ROW e.g. churches, shrines, cemeteries. Due to the importance of religion in Uganda's socio-economic fabric and the sensitive nature of relocating religious buildings and graves, cultural heritage is a significant aspect of the KJE.

Any relocation of burial sites requires close consultation and appropriate measures to be taken according to the cultural practices of the community concerned. The implementation of a Chance Finds Procedure for construction activities will also minimise the risk of disturbance to sites or artefacts that have not yet been identified within the Project Footprint.

16.3 Management and Mitigation Measures

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Training/induction	• Ensure that inductions and training regarding the protection of cultural heritage values will be conducted for all staff and contractors on site, as relevant to their role and responsibilities. This will include training in the use of the Chance Find Procedure.	Pre-Construction	UNRA / Contractor	UNRA
Grievances	• Ensure Grievance Mechanism established so that any significant concerns regarding impacts on cultural heritage can be reported by local villagers and responded to appropriately.	Pre-Construction	UNRA / Contractor	UNRA
Direct loss of culturally important buildings (e.g. churches), including full or partial loss	• The Project footprint should avoid areas of cultural significance wherever possible. • The management hierarchy for archaeological and cultural heritage sites should be applied in line with IFC PS 8. • Compensation at full replacement cost for the loss of such structures and assistance with the development of new buildings/infrastructure at new locations where required. • Where necessary, signage and fencing will be installed to protect known heritage sites close to construction areas (e.g. cemeteries/grave sites).	Pre-Construction	UNRA / Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Direct loss of grave and cemetery sites under the Project footprint	• Any relocation of burials grounds requires close and ongoing consultation with the communities associated with the graves, to ensure the appropriate cultural practices are followed. • The compensation for relocation of graves is recommended to be valued at full replacement costs. This includes cost of materials, labour, transport to relocation site and the payments to religious practitioners who conduct prayers for the relocation exercise and associated rituals. • An appropriately qualified cultural heritage expert or anthropologist should be employed to coordinate the relocation of cultural sites such as graves and cemeteries and to ensure the appropriate cultural practices are followed. • Grave relocations should be handled in accordance with the cultural norms of the local community in consultation with both the elders and local leaders.	Pre-Construction	Contractor	UNRA
Impact on unknown sites and artefacts during land clearance and earthwork activities	• Implement the Chance Finds Procedure for the Project for all land clearance and earthworks (see Chance Finds Procedure in Volume C) • All contractors hired by UNRA/concessionaire to construct the expressway should have on board supervisory staff that have undergone cultural heritage awareness training. • UNRA to engage an archaeologist to inspect all major excavations as they occur to ensure all artefacts encountered are retrieved and appropriately documented. • A pre-visit by section before the start of working activities is also recommended to identify possible traces of cultural sites to avoid degradation.	Construction	UNRA / Contractor	UNRA
Noise, vibration and air quality impacts on important cultural sites	• Implement mitigation measures outlined in Section 8.3 (Air Quality) • Implement mitigation measures outlined in Section 9.3 (Noise and Vibration) • Establish noise barriers at locations close to churches and other places of worship (e.g. within 50m of expressway), or provide full compensation for the relocation of sites.	Operations	Contractor	UNRA
Accessibility impacts on cultural sites	Implement mitigation measures in Section 18.3 (Traffic, Transport and Accessibility).	Operations	Contractor	UNRA
Archaeology and Cultural Heritage	If places of cultural importance are encountered, they will be reported to the Department of Museums and Monuments who will handle them in accordance with the established procedures	Construction	Contractor	UNRA

16.4 Monitoring Measures

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
Archaeology and Cultural Heritage	Implementation monitoring			Site inspections	Check all management measures implemented	Monthly	ROW and other Project Footprint areas

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
Archaeology and Cultural Heritage	Training records			Review of training register	No. of staff members involved in cultural heritage trainings/ inductions. Number of staff that have not completed training.	Monthly	N/A
Archaeology and Cultural Heritage	Chance finds			Record all chance finds identified during Project implementation in accordance with Chance Finds Procedure and report all finds to the relevant authorities	Number of chance finds; finds reported to relevant authorities.	Monthly	Active construction sites
Archaeology and Cultural Heritage	Grievance monitoring			Grievance Register	No of complaints; % of complaints resolved within appropriate timeframe	Monthly	N/A

17. STAKEHOLDER ENGAGEMENT

17.1 Objectives

The objectives of the stakeholder engagement strategy will encompass:

- Ensuring that community members are not just fully informed but also comprehend the issues / activities involved in road projects along with their potential impacts and mitigation measures;
- Actively seeking and engaging community input in consultation sessions with respect to Project activities, environmental performance and community initiatives for improvement purposes; and
- Implementing mitigation measures to address community concerns or grievances, or if there are no feasible measures, provide appropriate compensation to affected community members.

17.2 Context

UNRA is committed to continuing formal and informal consultation with stakeholders as the Project progresses. Consultations have been conducted for the Project since the inception of the Project in 2011. These consultations have been conducted at a range of levels. Key categories of stakeholder for the Project include:

- Affected communities / persons
- Host and surrounding communities
- Affected businesses
- Affected community infrastructure owners
- Affected utility/infrastructure owners
- Nearby development proponents/owners
- Local level governments
- Lower local governments (e.g. sub-counties, divisions, wards, cells and parishes)
- Regulatory authorities
- National government
- Committees for grievances, compensation and resettlement
- Non-government organisations (NGOs)
- Civil Society organisations.

Key social issues relevant to consultations for the Project include:

- Land acquisition;
- Loss of assets, farmland and income;
- Resettlement provision;
- Provision of fair and adequate compensation;
- Severance impacts;
- Impacts on hydrology and flood risk; and
- Noise and dust nuisance (including blasting operations).

17.3 Management and Mitigation Measures

Detailed measures for management and mitigation as well as a grievance mechanism for the KJE Project are presented in the Stakeholder Engagement Plan (Volume D).

17.4 Monitoring Measures

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
Effectiveness of the Project Grievance Mechanism	Review of records Informal discussion			Review of grievance register and records	Response times on claims; Satisfaction levels - gauged via consultations	Quarterly (during construction)	Project affected villages
Implementation of community engagement activities	Review of consultation records			Review of the stakeholder engagement activities to date	Key stakeholders consulted as per the Stakeholder Engagement Plan; Number of consultations conducted; Records (i.e. attendance sheets, photos, material used, etc.) of local community attendance	Quarterly; and Update each time information is produced or disseminated	Project affected villages, businesses, services and other stakeholders

18. TRAFFIC AND ACCESSIBILITY

18.1 Objectives

The traffic and accessibility related objectives for the Project include:

- Minimise traffic and accessibility impacts during the Construction phase;
- Minimise the adverse impacts of Project traffic on local communities and the environment;
- Minimise congestion at expressway intersections/junctions at Operations;
- Maximise benefits on increased accessibility of the Project.

18.2 Context

Kampala has developed significantly over recent years, with the Greater Kampala Urban area now encompassing the surrounding towns of Mukono, Entebbe, Mpigi and Bombo. However, the road system across Kampala is poor and heavy traffic is a daily occurrence across most of the city. The paved roads in Kampala form a radial system that directs all national and international traffic into the city centre. Road traffic incidents are a serious concern in Uganda, with the country's rate of road traffic incidents being one of the highest in the African region (WHO, 2015).

The existing Kampala-Jinja Road is the only major road link between the two cities and the most prominent access route for goods and other vehicles travelling between Nairobi (Kenya) and Kampala (Uganda). It is the most heavily utilised national road in Uganda with some sections experiencing up to 70,000 vehicles per day in a single direction (EDF, 2016). The road is characterised by a number of factors that impede traffic flow, such as encroachment of the right-of-way by vendors and small businesses right up to the edge of carriageway, and lack of formally demarcated pedestrian rights of way. As a consequence, the road is heavily congested at many locations between the two cities including in central Kampala, Namanve, Seeta, Mukuno and in Jinja.

Traffic generated by the construction of the Project would predominately be associated with the transport of construction machinery, equipment and materials to site. The addition of construction traffic to the road network as a result of Kampala Jinja expressway to Namagunga is expected to have a minor impact as the majority of the Project comprises of a new alignment where road construction activities would be closed off to minimise any disruptions.

The Project is expected to have a significant positive impact on relieving traffic congestion between Kampala and Namataba through the diversion of traffic to the proposed expressway, and it may also lead to reduced traffic accidents.

Severance impacts will occur for vehicular traffic and pedestrians utilising existing roads and tracks that will be cut by the proposed road alignment. However, these impacts are being mitigated through the provision of underpasses and overpasses at the majority of major roads cut by the proposed alignment. Despite this there will still be accessibility impacts in areas where pedestrian access routes or local roads will be blocked. The Project plans to establish additional pedestrian crossings to help minimise impacts on accessibility.

18.3 Management and Mitigation Measures

Aspect	Construction	Operations	Mitigation Action	Schedule / Frequency	Responsibility	
					Implementation	Checking / Monitoring
Road user safety			Safe road design and construction including safety signage and speed limits.	Design / Construction	Contractor	UNRA
Pedestrian paths design			• Ensure light coverage for safety of pedestrians are adequate. • The design of pedestrian crossings should consider expectations for people with difficulties to walk (ramps to be provided where possible)	Design / Construction / Operations	Contractor	UNRA
Improvement in regional accessibility and connectivity			Implement appropriate signage on the expressway for towns bypassed by the Project to identify these towns as stop-overs for fuel supplies, accommodation etc and to support the demand for goods and services in these areas.	Construction / Operations	Contractor	UNRA
Disruption or loss of access routes, both temporary and permanent, as a result of the Project (including current vehicle access routes and pedestrian footpaths)			• Incorporate design measures to maintain access to side roads and properties where feasible, including: 1) the construction of vehicular overbridges and underpasses; and 2) the construction of pedestrian bridges where appropriate. • For severely impacted residences where it is not feasible to provide alternative access, provide compensation as per the RLRP. • Conduct ongoing consultation and engagement with affected communities and persons to identify if further mitigation is required.	Pre-Construction / Construction	Contractor	UNRA
Changed road conditions during construction impacting on efficiency of travel modes and potential road safety			• Develop and implement Traffic Management Plans (TMPs) for construction. • Conduct early consultation with affected communities during construction to allow planning for potential changes in trip patterns. • Ensure appropriate signage is installed regarding diversions or alternative access routes.	Pre-Construction / Construction	Contractor	UNRA
Road user safety			Enforce requirements for Project staff to obey speed limits and other road laws	Construction/ Operations	Contractor	UNRA
Traffic accidents			Record all traffic accidents related to Project activities (date, time, location, persons involved, and any response required or action taken) and update monthly.	Construction / Operation	Contractor	UNRA

18.3.1 Pedestrian Crossings

The severance impacts of the Project will need to be mitigated through the provision of pedestrian crossings along the alignment. Potential chainage locations where pedestrian crossings may reduce impacts are outlined in Table 18-1 below. These locations are preliminary and finalised locations (including, if necessary, other potential sites not listed below) should be discussed with all relevant communities before construction of the road begins. Figure 18-1 shows the potential sites for pedestrian crossings along the Phase 1 alignment. The pedestrian crossings are located in the highly dense regions of the Phase 1 ROW approximately 1 km apart. In additional cases of existing road connections between urban regions that would be affected by the alignment or in locations where access to churches, medical facilities or schools would be affected by the ROW, additional pedestrian crossings were added.

Table 18-1 Potential Locations for Pedestrian Access Routes along the Alignment.

Potential Chainage Location(s)	Location	Justification
KSB Chainage 1 + 000 – 2 + 000	North of Mutungo Hill	A densely populated settlement area is passed by the line at this location. Pedestrian access would reduce severance impacts along this section.
KSB Chainage 2 + 000 – 3 + 000	North of Mutungo Hill	A densely populated settlement area is passed by the line at this location. Pedestrian access would reduce severance impacts along this section.
KSB Chainage 6 + 500 – 7 + 000	Bukasa / Nakivubo wetland	The ROW in this location crosses a railway line and cuts off several settlements and access to agricultural land. A pedestrian crossing in this location would reduce severance impacts.
KSB Chainage 8 + 700 – 8 + 900	Agricultural land near Kasanga	The road will cut off access to agricultural land from settlements near Muyenga hill in this section.
KSB Chainage 10 + 500	Makindye (near Ggaba Road)	Settlements to the immediate south of the alignment in this section will be cut off from other settlement areas to the North. To the south they will be bordered by wetland and a river channel. A pedestrian bridge in this location could reduce some severance impacts.
KSB Chainage 11 + 900 – 12 + 500	Lukuli Rd	Between these locations, the ROW crosses a densely populated settlement area and is surrounded by schools, commercial buildings etc. A pedestrian crossing in this location would reduce severance impacts.
KSB Chainage 12 + 500 – 13 + 700	Konge Hill + Salama Rd,	Between these locations, the ROW crosses a densely populated settlement area and is surrounded by schools, commercial buildings, health clinics etc. Several pedestrian crossing in this location would reduce severance impacts.
KSB Chainage 16 + 000 – 17 + 000	Munyonyo Spur	Settlements to the East of the proposed ROW will be completely cut off by the Project. These settlements will be surrounded by wetland areas and agricultural land on all other sides. A pedestrian crossing in this location would reduce severance impacts.
KJE Chainage 1 + 000	Nakawa	A market is located along the current Kampala-Jinja Road. Pedestrians regularly cross the road to access utilities on both sides of the alignment.
KJE Chainage 3 + 700 – 4 + 500	Kinawataka	Kinawataka settlement area is cut across by the alignment and few overpasses/underpasses are planned in this section. Pedestrian access would reduce severance impacts along this section.
KJE Chainage 4 + 800	Kinawataka	An existing track is present at the location.
KJE Chainage 5 + 600	Kasokoso	Although vehicular crossings are provided in this location, there are a large number of settlements cut off by the line. A pedestrian bridge would improve access to this area.
KJE Chainage 6 + 200	Kasokoso	A small area of settlements south of the proposed Butabika junction will be cut off as they are surrounded by the Kinawataka Channel on one side and the KJE alignment on the other. Pedestrian access would reduce severance impacts.
KJE Chainage 7 + 500 – 8 + 300	South of Kirinya	An area of settlements is completely cut off south of the road alignment. The road alignment also crosses through several existing tracks. These settlements are surrounded by wetland areas on all

Potential Chainage Location(s)	Location	Justification
		other sides. Although crossings for vehicles are planned in this section, they are a large distance from some of the settlements (approx. 1km), a pedestrian crossing between the chainage locations would reduce severance impacts.
KJE Chainage 11 + 500	East of Namanve wetland area.	Small tracks are crossed by the alignment in this location, although a crossing is being planned at KJE Chainage 12 + 650 which may mitigate this impact.
KJE Chainage 20 + 100	Near the Mukono Interchange.	Small tracks are crossed by the alignment in this location and settlements and their access may be cut off due to the Project.

Plate 18-1: Pedestrian footbridge on the existing Kampala-Jinja Road.

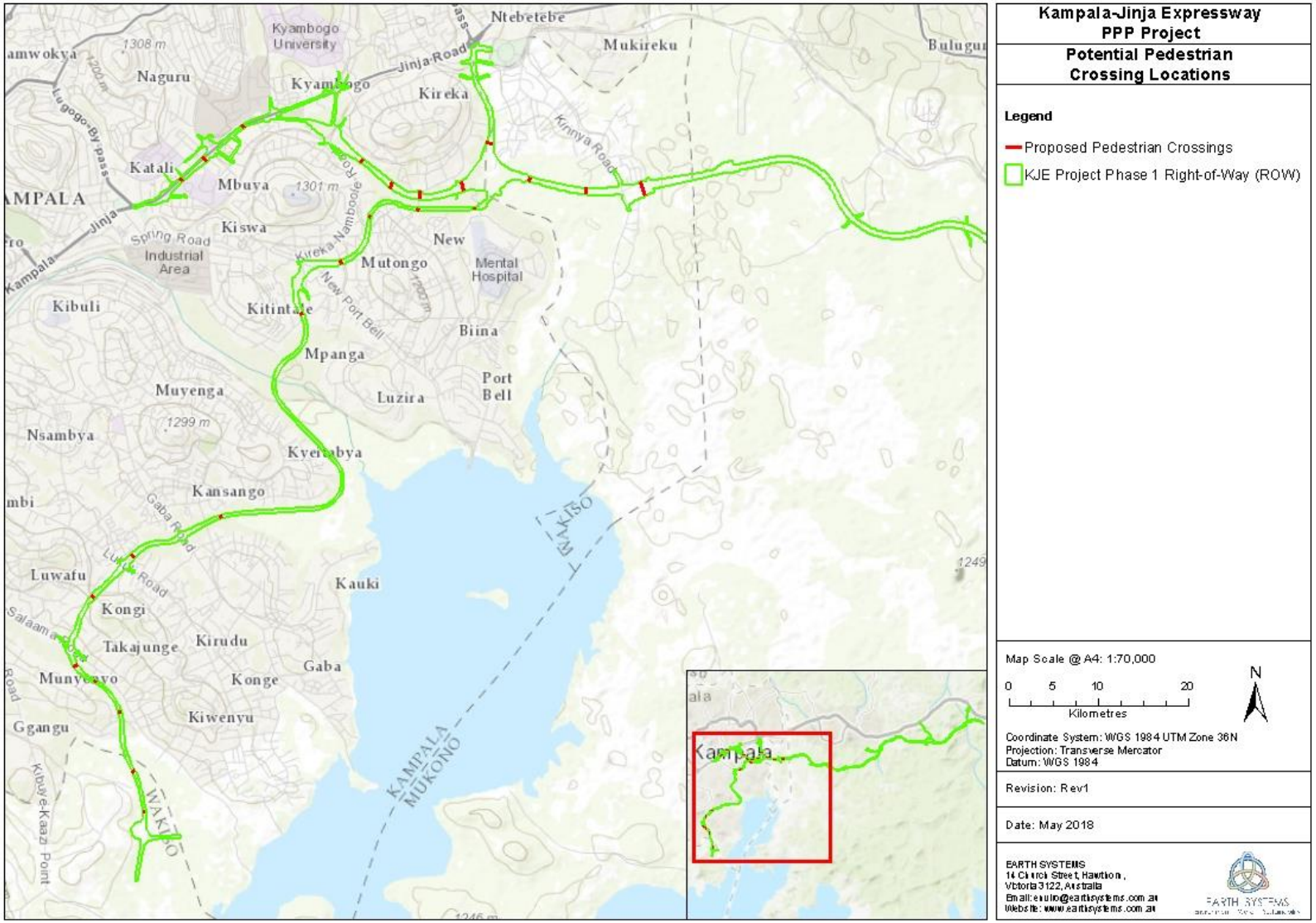

Figure 18-1: Potential pedestrian crossing locations for the Project

18.4 Monitoring Measures

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
General	Implementation monitoring			Site inspections	Check all site management measures implemented	Monthly	ROW and access routes
Community Safety	Consultation monitoring			Traffic safety consultations and training conducted with community members	Number of community traffic safety consultations, trainings conducted; Number of community members involved in traffic safety consultation, trainings.	As required	As required
Occupational Safety	Consultation monitoring			Traffic safety consultations and trainings conducted with workers	Number of worker traffic safety trainings conducted; Number of workers completed training / gaining accreditation	As required	As required
Traffic Safety	Vehicle maintenance			Monitor routine vehicle maintenance for all construction vehicles	Number of vehicles overdue for maintenance/servicing	Reported monthly	All sites
Accessibility	Monitoring of severance impacts			Grievance mechanism. Record all accessibility complaints and outcomes. Site visits to ensure the appropriate construction of vehicular and pedestrian crossings.	No of complaints; % of complaints resolved within appropriate timeframe Number of pedestrian crossings established	Routine	As required
Traffic Accidents	Traffic incident monitoring			Traffic accident register	Number of traffic safety related grievances / claims reported / resolved by Project stakeholders; Number and type of incidents/accidents involving Project vehicles; Number of hazardous materials related incidents for transportation	Monthly	N/A

19. VISUAL AMENITY

19.1 Objectives

Management of potential impacts to visual amenity from the Project is based on the following key objectives:

- Avoid and minimise impacts on visual aspects on surrounding environment and communities; and
- Develop appropriate strategies for revegetation and rehabilitation to reduce long-term visual impacts experienced within the Project viewshed.

19.2 Context

While the sections of the Project alignment will be visible from nearby areas, potential impacts on visual amenity within the Kampala area are expected to be low due to the modified urban landscape surrounding the alignment. However in rural areas in the eastern part of the mainline alignment, visual amenity impacts are expected to be larger. At chainage KJE 9 + 200, a 1.5 km viaduct will be constructed over the Namanve wetland. This viaduct is expected to have moderate to high impacts on landscape character.

From approximately chainage KJE 11 + 000, the alignment is mainly characterised by rural landscapes with modified land uses and habitat including degraded forest habitat, subsistence agriculture and small settlement areas. Moderate impacts on visual amenity and landscape character are likely to occur where deep cutting is required in the hillside and where dwellings in settlement areas have direct views of the expressway.

Artificial lighting will be used during pre-construction and construction works for the Project. The expressway is planned to be lit for the entire length of the alignment. Light spill impacts for local communities will need to be managed appropriately.

19.3 Management and Mitigation Measures

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Light spill (from construction site lighting)	• Lighting design will incorporate the minimum wattage required for a safe working environment. • Lights pointed downward and toward operational areas, minimising light egress.	Pre-Construction (Design)/ Construction	UNRA / Contractor	UNRA
General visual amenity impacts as a result of general construction activities (e.g. ancillary facilities, construction sites)	• Revegetate disturbed areas and establish roadside vegetation in accordance with the Revegetation Plan • Where possible, retain existing roadside vegetation. • Maintain fencing on roadsides to protect roadside vegetation. • Construction sites well maintained and kept tidy. • Providing screen planting where required to minimise visual impact and disturbance. • Establish a Grievance Mechanism so that any significant concerns regarding impacts on visual amenity can be reported by local villagers and responded to appropriately.	Construction	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Visual amenity impacts on tourist sites	Ensure establishment of roadside vegetation is prioritised in the vicinity of Sezibwa Falls to minimise the visibility of the expressway from the approach to the Falls area.	Construction / Operations	Contractor	UNRA
Visual impacts on nearby dwellings	• Vegetation clearance restricted to the minimum extent practicable for Project construction. Where possible, retain existing roadside vegetation. • Consider protective fencing treatments if required. • Where possible, establish screening vegetation in areas with views from affected dwellings. • Where appropriate, use grasses on fill embankments to provide consistency with surrounding landscape (e.g. in rural areas).	Operations	Contractor	UNRA
Impacts on landscape character as a result of the Project e.g. wetland landscapes	• Implementation of comprehensive erosion and sediment measures as outlined in the Water Management Plan • Construction of vegetated swales where practical to attenuate flow velocities and minimise erosion. • Progressive habitat restoration and enhancement.	Operations	Contractor	UNRA
Impacts from lighting on expressway and interchanges	• Lighting design will incorporate the minimum wattage required for road safety. • Lights pointed downward and toward operational areas, minimising light egress. • Shielded lighting utilised in built up areas to minimise night-time light egress from operational areas and skyglow. • Minimise the use of artificial lighting in ecologically sensitive areas (e.g. Namanve Wetland, Sezibwa Forest). • Establish screening vegetation in areas with views from affected dwellings.	Construction / Operations	Contractor	UNRA

19.4 Monitoring Measures

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
Visual amenity	Site inspections			Routine inspections of construction areas and revegetation activities	Check appropriate lighting installed Tree planting records Visual observation of littering Check all visual amenity measures implemented	Monthly	Construction sites, ROW
Visual amenity	Visual amenity complaints			Investigate any complaints received through the Project grievance mechanism. Provide or adapt mitigation measures if required.	As required	As required	As required

20. COMMUNITY HEALTH AND SAFETY

20.1 Objectives

The Project's key objective for community health and safety is to minimise health and safety risks for local communities from Project activities.

Measures related to community health and safety measures are also presented in Sections 5.4, 5.5, 5.6 and 5.15. Occupational health and safety is addressed in Section 5.18.

20.2 Context

In the absence of mitigation, a key community safety issue associated with the addition of Project vehicles to the road network, is the increased risk of vehicle collisions from vehicle to vehicle, vehicle-pedestrian or single vehicle interactions. Elevated levels of air pollution can affect human health by exacerbating existing health conditions, such Acute Respiratory Infections (ARIs), asthma, cardiovascular diseases and other respiratory symptoms. Construction activities could also result in a moderate temporary noise impact at sensitive receptors such as residences, businesses and community facilities (e.g. schools) particularly in urban areas. Communities likely to be affected by noise include those near construction sites such as the locations of bridges and flyovers, major cut and fill sites, borrow pits and ancillary facilities.

In-migration of the Project workforce could result in health risks for the local population (e.g. increased spread of STIs). In addition, the Project will result in full or partial loss of land, residences and businesses, which may result in temporary short-term increases in mental stress and anxiety among the resettled population. Land acquisition for the Project may also result in reduced access to health services if not managed effectively due to loss of health service infrastructure. The potential social and health impacts of a spill of hazardous materials could be significant if an incident occurred in the vicinity of urban areas, wetland, a waterway or other ecologically sensitive areas.

20.3 Management and Mitigation Measures

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Stress and anxiety from relocation of displaced households and businesses	Implement a transparent and participatory resettlement and livelihood restoration process as per the RLRP (Volume D). Ensure appropriate consultation and engagement is conducted with affected villages and households.	Pre-Construction	UNRA / Contractor	UNRA
Increased frequency of accidents along access routes due to additional traffic from Project vehicles	• Carryout road safety campaigns in schools which are close to the ROW. • Develop, maintain and disseminate an Occupational Health & Safety (OHS) Plan for the Project, which should be prepared prior to construction. • Ensure an Emergency Preparedness and Response Plan (EPRP) is developed prior to the Construction phase.	Pre-Construction / Construction	Contractor	UNRA
Increased frequency of accidents along access routes due to additional traffic from Project vehicles	• Develop and implement Traffic Management Plans during construction to identify and minimise potential impacts on road operations. • During construction works, ensure access routes are in good condition. • Prevent members of the public from accessing construction areas through appropriate fencing and	Construction	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	barriers. Signage should also be used to deter unauthorised entry. • Implement speed controls and provide access traffic with appropriate signalling and direction around construction areas. • Regular consultation with roadside residents to confirm the effectiveness of mitigation measures and any necessary improvements. • Distribute the Highway Code to schools and the local community and conduct awareness raising campaigns on road safety.			
Safety risks to Project workers and the public during construction activities	• Develop a Transportation Management Plan for road works that includes measures to ensure work zone safety for construction workers and the traveling public. • Reduction of maximum vehicle speeds in work zones. • Provide alternate access routes for vehicles and pedestrians during construction activities (refer to Section 18.3). • Ensure Project workers are adequately briefed and trained regarding the required safety precautions for specific construction activities. • Ensure that plants and vehicle operators are properly licensed and trained. • Quarry operations and roadway excavations, particularly blasting should be carried out and supervised by trained personnel. • Best practice safety measures for blasting to be implemented. • Explosives for the project activities should be stored in a secure location in a proper way and all due precautions should be taken to ensure that blasting does not induce any unnecessary rock falls. • Ensure provision and proper implementation of PPE. • Ensure provision of first aid facilities, readily available trained paramedical personnel and emergency transport facilities to nearest hospital. • Conduct an awareness program regarding personal safety of the workers and general public around construction sites.	Construction	Contractor	UNRA
Impact on community due to dust generation from construction activities and vehicle emissions from Project transportation	• Implement the measures outlined in Section 8.3 (Air Quality), including dust suppression techniques, construction scheduling and ongoing monitoring. • Conduct consultation with potentially affected communities. • Implement a grievance mechanism to record and respond to community complaints.	Construction	Contractor	UNRA
Noise impacts on community due to noise generated from construction activities	• Implement the measures outlined in Section 9.3 on Noise and Vibration, including construction timetabling to minimise noise impact (e.g. restricting activities to daylight hours where possible), informing sensitive receptors ahead of construction schedule, and use quieter construction methods where possible. • Restrict truck movements to haulage routes and the routes outlined in the Traffic Management Plans. Where	Construction	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	reasonable and feasible, locate routes as far away from sensitive receptors as possible. • Develop and implement a Blasting Management Plan. • Implement a grievance mechanism to record and respond to community complaints.			
Risk of community exposure to hazardous substances in the event of an accidental spill during construction activities	• Consider relevant design features to reduce the probability of potential spills on the expressway such as geometric design, shoulders and barriers. • Implement the hazardous materials management measures as per Section 7.3 (Hazardous Materials and Waste Management).	Construction / Operations	Contractor	UNRA
Reduced access to health facilities as a result of land acquisition for the Project	• Where health facilities are directly impacted by the ROW, comparable health services should be re-established to ensure there is no overall reduction in availability of health services in the region. • Re-establishment of impacted community sanitation facilities should include proper design considerations to ensure gender requirements are fulfilled, such as provision of separate male / female toilets, where appropriate. • Compensation for impacts on infrastructure should be provided in accordance with the Resettlement and Livelihood Restoration Plan (Volume D). • Implement the accessibility measures for the construction period as per Section 18.3 (Traffic and Accessibility), including implementation of Traffic Management Plans and provision of alternative access routes where required.	Construction	Contractor	UNRA
Introduction and spread of diseases	• To reduce risks associated with malaria and other vector borne diseases: - Provide education concerning malarial risk and prevention to all employees, including construction contractor employees. - Support existing malaria prevention strategies in Project districts. - Minimise areas of standing water by providing effective drainage in construction areas (refer Section 6.3). - Provide culverts for all newly constructed access roads to prevent disruption to natural drainage. - Provide all the staff at construction camps with impregnated mosquito nets. • To reduce risks associated with the introduction or spread of HIV/AIDS and other STIs: - The prevention and management of HIV/AIDS and other STIs should be a major priority of the Project construction employee and community health programs. The Project should develop policies and programs to limit the threat of STI spread (especially HIV/AIDS), ensuring that prevention and control programs are sensitive to cultural practices and taboos. Contractors should also be required to follow these policies. - UNRA and construction contractors should conduct health training for all staff members involved in the Project, focussing particularly on issues of sexual health and preventative behaviours. This should be supported by the implementation of a 'Code of Conduct' to be adhered to by all Project staff and	Construction	UNRA / Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	contractors as a contractual requirement. The Code of Conduct should take into consideration key aspects such as sexual harassment, gender based violence, inappropriate behaviour, drug and alcohol consumption etc. - Work with local health centres and district health offices to ensure that the broader community is educated on sexual health and risk prevention behaviours. Practical measures, such as the establishment of peer health educator schemes within the workforce, the introduction of condom distribution schemes, and the establishment of a confidential voluntary counselling and HIV testing facility, should also be considered. - Provision of adequate health care facilities including an HIV/AIDS and STIs education post and first aid facilities at the construction accommodation camps; - Site, construct and manage camps to minimize impacts including sanitary and waste management facilities. • Consider supporting improvements to existing health care services and facilities, particularly for resettlement areas. • Implementation of rodent control programs in construction accommodation camps and in the villages close to the camps. • Consider supporting Government or NGO initiatives aimed at improving family planning, contraceptive use and education, particularly for young women and reproductive health for adolescents. • Appropriate indicators of health status amongst the construction workforce and local community should be developed (e.g. STI rates) and regularly monitored to ensure that the impacts of construction (both positive and negative) are identified and appropriate management and mitigation measures can be implemented and refined			
Impact on emergency services	• Undertake early and ongoing engagement and consultation with emergency services to allow planning for potential changes to response patterns and to provide input on Project design.	Construction / Operations	UNRA / Contractor	UNRA
Impact on community from air emissions due to vehicular traffic on the expressway	• Implement mitigation measures outlined in Section 8.3 (Air Quality).	Operations	Contractor	UNRA
Community safety and changed traffic conditions	• Ensure the Project design includes barriers along the expressway where required, particularly in busy urban areas. Ensure barriers are high enough to discourage individuals from climbing over. • Ensure accessibility impacts are minimised through provision of pedestrian crossings and alternate routes for vehicles where required (refer mitigation measures in Section 18.3). • Conduct community education campaigns to raise awareness regarding the safety practices in the Highway Code to help improve road safety behaviours.	Construction / Operations	Contractor	UNRA
Traffic related noise impacts on communities	• Implement the mitigation measures outlined in Section 9.3 (Noise and Vibration), including the construction of noise barriers and retrofitting of housing where required to reduce noise pollution.	Operations	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	• Conduct operational noise monitoring within a year of operations to compare the actual noise performance of the Project against predicted noise performance and review model and management measures if required. This should also include a review of the grievance register for any noise complaints.			
Introduction and spread of diseases	• Implement mitigation measures for 'Introduction and spread of diseases' from the Construction Phase, where applicable.	Operations	Contractor	UNRA
Risk of community exposure to hazardous substances in the event of accidental spill on the expressway	• Implement the hazardous materials management measures as per Section 7.3 (Hazardous Materials and Waste Management). • Ensure an Emergency Preparedness and Response Plan (EPRP) is maintained during Operations.	Operations	Contractor	UNRA
Gender based violence	The Project should enhance the provision of prevention programs and response services for those at risk of sexual violence in the Project area. Activities should include: • Community campaigns to reduce social tolerance of gender based violence, • Enhancing systems of support for victims of gender based violence (i.e., coordinating health, police, justice services), and • Strengthening community support system capacity to respond to gender based violence, including village health teams, local council leaders, and religious and cultural leaders.	Construction / Operations	Contractor	UNRA
Community Health and Safety	• Implement a grievance mechanism to record and respond to community complaints.	Construction / Operations	Contractor	UNRA

20.4 Monitoring Measures

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
Community health and safety	Introduction / increased transmission of disease (e.g. malaria, STIs, etc.)			HIV/AIDS awareness / prevention programme for both workers and neighbouring community members	Number of community and worker sessions conducted; Number of community members involved in programme.	Conducted as part of inductions for all new staff, then as required	At each Camp site and neighbouring communities
Community health and safety	Health survey			Monitoring of health status in the local community (e.g. for malaria, STIs, etc) Can be conducted in conjunction with the social impact monitoring program (see Section 15.4)	Health indicators for the local communities to be developed (e.g. STI rates)	2-yearly (Construction Phase) 5-yearly (Operations Phase)	Sample of communities adjacent to Project areas
Community health and safety	Gender based violence			Monitoring of incidences of gender based violence to	Incidences of gender based violence	At least every 6 months	At each Camp site and neighbouring communities;

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
				identify if any further mitigation measures are required			communities adjacent to construction areas; and resettlement areas / host communities
Community health	Health awareness monitoring			HIV/AIDS Awareness/prevention programme trainings conducted with community members	Number of community trainings conducted; Number of community members involved in programme.	As required	As required
Community safety	Blast monitoring			Check blast exclusion zone prior to blasting activity	Presence/absence of people in the exclusion zone	Prior to blasting activity	500 m around blasting area
Community health and safety	Air quality monitoring			Conduct air quality monitoring as per Section 8.4			
Community health and safety	Noise monitoring			Conduct noise monitoring as per Section 9.4			
Community health and safety	Community health and safety complaints			Investigate any complaints received through the Project grievance mechanism. Provide or adapt additional mitigation if required.	Complaints received	As required	As required

21. OCCUPATIONAL HEALTH AND SAFETY

21.1 Objectives

The objectives for occupational health and safety (OHS) management for the Project include:

- Avoid or minimise potential OHS risks to personnel and contractors of the Project; and
- Comply with applicable Ugandan law and align with international standards and guidelines regarding OHS.

21.2 Context

UNRA is committed to building a workforce that is motivated, healthy and has a good working ability, and to creating healthy and safe workplaces that are free from accidents and work-related disease, in compliance with the Ugandan Occupational Safety and Health Act (2006). The OHS program for the Project will also take into account the IFC *Environmental Health and Safety Guidelines for Toll Roads* (2007).

Workers on the Project will be exposed to a number of risks from dust, noise, blasting activities, traffic, and handling of hazardous materials. Appropriate precautions will need to be taken to avoid work-related accidents, injuries or illness. UNRA and the Contractor will work to (i) identify potential hazards to workers, particularly those that may be life threatening; (ii) provide preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances; (iii) train workers; (iv) document and report occupational accidents, diseases, and incidents; and (v) organise for emergency prevention, preparedness, and response.

21.3 Management and Mitigation Measures

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Occupational Health and Safety	Develop, maintain and disseminate a detailed standalone OHS Plan for the Project, incorporating management measures listed below and site-specific information (e.g. names of OHS officers and representatives, communication protocols). The OHS Plan will be prepared consistent with the Ugandan Occupational Safety and Health Act (2006) and the IFC *Environmental Health and Safety Guidelines for Toll Roads* (2007) and other relevant guidelines.	Prior to Construction	Contractor	UNRA
Occupational Health and Safety	A first aid kit should be provided at every active working site and in every staff vehicle.	Commencement of Construction	Contractor	UNRA
Training / Awareness	Training of workers in safety issues specific to their activities, such as hazards working around equipment and vehicles; and safe practices for working at night and in low-visibility conditions, including use of high-visibility safety apparel and proper illumination for the work space (while controlling glare so as not to blind workers and passing motorists).	Prior to Construction / Construction	Contractor	UNRA
Training / Awareness	Identify appropriate staff to attend a certified first-aid training session, with annual refresher courses.	Prior to Construction / Construction	Contractor	UNRA
Occupational Health and Safety	A pre-medical examination should be conducted for workers and this should be followed by routine medical examinations during construction works.	Prior to Construction / Construction	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Occupational Health and Safety	Establish and staff a medical clinic/team to attend to any occupational injuries/cases.	Prior to Construction / Construction	Contractor	UNRA
Emergency Preparedness	Develop and maintain a medical emergency response plan as part of the EPRP (see Chapter 22).	Prior to Construction	Contractor	UNRA
Occupational Health and Safety	Use of appropriate Personal Protection Equipment (PPE) (including masks, hard hats, boots, reflective vests and gloves) by the Project workforce should be mandatory and checked by site supervisors for compliance.	Construction	Contractor	UNRA
Occupational Health and Safety	Visitors to the worksite should be required to use PPE in order to be allowed on work sites. The contractor should keep a set of PPE for use by visitors to the construction sites, quarry sites and ancillary facilities.	Construction	Contractor	UNRA
Occupational Health and Safety	A competent, qualified designated OHS officer will be appointed fulltime on the Project during construction.	Construction	Contractor	UNRA
Occupational Health and Safety	The use of child labour on any of the working sites will be strictly prohibited.	Construction	Contractor	UNRA
Traffic Safety	• Development of a Traffic Management Plan that includes measures to ensure work zone safety for construction workers and the traveling public (refer Chapter 18). • Careful traffic planning. • Reduction of maximum vehicle speeds in work zones. • Enforcement of reduced speed limits in villages and settlement areas. • Provision of traffic signs. • Drivers operating within assigned skill level. • Incident reporting procedure.	Construction	Contractor	UNRA
Traffic Safety	Establishment of work zones to separate workers on foot from traffic and equipment by: • Routing of traffic to alternative roads when possible. • Closure of lanes and diversion of traffic to the remaining lanes if the road is wide enough (e.g. rerouting of all traffic to one side of a multi-lane highway). • Where worker exposure to traffic cannot be completely eliminated, use of protective barriers to shield workers from traffic vehicles, or installation of channelling devices (e.g. traffic cones and barrels) to clearly delineate the work zone. • Regulation of traffic flow by warning lights / vehicles, avoiding the use of flaggers if possible. • Design of the work space to eliminate or decrease blind spots.	Construction	Contractor	UNRA
Blasting	Develop and implement a Blasting Management Plan. Best practice safety measures for blasting to be implemented, including: • Ensure national legislation and relevant international standards are met for blasting activities during construction; • Establish and maintain a fly rock Exclusion Zone around the blast site during blasting;	Construction	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	• On days when blasting is required, ensure local communities are notified at least 24 hours prior to blasting; • Prior to blasting, ensure that the exclusion zone is clear by patrolling the zone; • Prior to blasting, implement access controls along roads in the vicinity of blasting zones, to assist in ensuring that no unauthorised vehicles or pedestrians are present in the exclusion zone; • Blasting may only be conducted during the daytime between 09:00 and 17:00, and preferably during favourable weather conditions; • Visually monitor fly rock and noise to confirm that the exclusion zone adequately protects community and worker safety, and continually re-assess the adequacy of blast design controls in reducing the generation of fly rock; and • Provide training for Project staff on flyrock safety and conduct a public education program regarding community safety issues associated with blasting in areas close to blasting sites.			
Traffic Safety / Air Quality / Noise	Develop and implement a maintenance program for the vehicle fleet including consideration of the following issues: • General condition and safety of vehicles • Vehicle brakes and tires • Vehicle exhaust emissions and controls • Vehicle noise emissions and controls	Construction	Contractor	UNRA
Traffic Safety	Ensure all drivers hold appropriate licenses and have completed transport safety and safe driver training.	Construction	Contractor	UNRA
Occupational Health and Safety	Prohibit the use of drugs and alcohol for workers during work hours, including prescription medication labelled as unsafe for driving.	Construction	Contractor	UNRA
OHS and Hazardous Materials	Driver safety training, enforcement of speed limits, emergency response procedures and response kits (spill kits).	Construction	Contractor	UNRA
Sanitation, health and accommodation facilities	Provide appropriate mobile sanitation facilities (pit toilets) at work sites as needed. All sanitation, health and accommodation facilities should include proper design considerations to ensure gender requirements are fulfilled, such as provision of separate male / female toilets, where appropriate.	Construction	Contractor	UNRA
Drinking water	Ensure workers have access to potable drinking water at camp and work sites.	Construction / Operation	Contractor	UNRA
Air quality	• Use of millers and pavers with exhaust ventilation systems and proper maintenance of such systems to maintain worker exposure to crystalline silica (millers and grinders) and asphalt fumes (pavers) below applicable occupational exposure levels. • Use of the correct asphalt product for each specific application, and ensuring application at the correct temperature to reduce the fuming of bitumen during normal handling. • Reduction of engine idling time at construction sites.	Construction / Operation	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	• Use of extenders or other means to direct diesel exhaust away from the operator. • Ventilation of indoor areas where vehicles or engines are operated, or use of exhaust extractor hose attachments to divert exhaust outside. • Installation of tollbooth ventilation and air filtration systems. • Use of protective clothing when working with cutbacks (a mixture of asphalt and solvents for the repair of pavement), diesel fuel, or other solvents. • Use of dustless sanding and blasting equipment and special containment measures for paint removal activities. • Avoid the use of lead-containing paint and use appropriate respiratory protection when removing paints (including those containing lead in older installations) or when cutting galvanized steel.			
Fall protection	• Implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers, among others. • Establishment of criteria for use of 100% fall protection (typically when working over 2 m above the working surface, but also extend to 7 m depending on the activity). The fall protection system should be appropriate for the structure and necessary movements, including ascent, descent, and moving from point to point. • Installation of fixtures on bridge components to facilitate the use of fall protection systems. • Safety belts should be not less than 16 mm (5/8 inch) two-in-one nylon or material of equivalent strength. Rope safety belts should be replaced before signs of aging or fraying of fibres become evident. • When operating power tools at height, workers should use a second (backup) safety strap. • The area around which elevated work is taking place should be barricaded to prevent unauthorized access. Working under personnel on elevated structures should be avoided.	Construction	Contractor	UNRA
Hoisting and Lifting	• Hoisting and lifting equipment should be rated and properly maintained, and operators should be trained in their use. • Elevating platforms should be maintained and operated according to established safety procedures including use of fall protection measures (e.g. railings); equipment movement protocols (e.g. movement only when the lift is in a retracted position); repair by qualified individuals; and installation of locks to avoid unauthorized use by untrained individuals.	Construction	Contractor	UNRA

Plate 21-1: Speed restriction measures being implemented on the Kampala-Entebbe Expressway construction site.

21.4 Monitoring Measures

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
Occupational Health and Safety	PPE Monitoring			Maintain PPE records including: • Type of equipment given • The date and time it is supplied; • The person to whom it is given (he/she will sign for it); • The next time the PPE will be inspected; • When are the replacement times (e.g. for elements, etc)	Procurement records of PPE; Records of workers issued with PPE	Weekly	Entire site
Occupational Health and Safety	PPE Monitoring			Site inspections to check availability and use of PPE	Inspection records	Weekly	Entire site
Occupational Health and Safety	Site inspections			Site inspections	Confirm implementation of all measures in OHS Plan. Presence/absence of fire extinguishers, spill kits, MSDS etc. Hazmat storage practices etc.	Monthly	Entire site
Occupational Health and Safety	Audit			Conduct an audit of emergency preparedness	Training, Registers, Procedures/Plans	Annual	Entire site
Occupational Health and Safety	Incident investigations			Conduct post incident investigation and evaluation and monitor implementation of any corrective actions that arise, including	As required	Post-emergency	As required

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
				measures to minimise risk of recurrence			
Occupational Health and Safety	Incident investigations			Review OHS incident register for any trends	No of incidents, Causes of incidents etc.	Monthly	Entire site
Occupational Health and Safety	Introduction / increased transmission of disease (e.g. malaria, STIs, etc.)			HIV/AIDS awareness / prevention programme for workers	Number of community and worker sessions conducted; Number of community members involved in programme.	Conducted as part of inductions for all new staff, then as required	At each Camp site and neighbouring communities
Occupational Health and Safety	Health monitoring			Monitoring of health status in the workforce (e.g. for malaria, STIs, etc)	Health indicators for the construction workforce to be developed (e.g. STI rates, malaria rates)	Every 3 months during construction	At each Accomodation Camp site, staff health facilities

22. ACCOMMODATION CAMPS

22.1 Objectives

Key management objectives related to temporary construction accommodation camps for the Project include:

- Complying with legal requirements and relevant environmental and social standards and guidelines;
- Manage the construction and operation of the camps to minimise potential environmental impacts; and
- Minimise potential adverse impacts to the surrounding communities.

22.2 Context

During the construction phase, the Project will require the accommodation of workers and storage of plant equipment in temporary camps along sections of the Project Footprint. The camps will be constructed before the main construction workforce move to the construction areas. The locations and details of these sites will be confirmed in the detailed design phase of the Project. Once details are confirmed, the construction contractor / concessionaire will be required to undertake site-specific due diligence environmental and social studies of each camp site to the satisfaction of UNRA prior to submission to NEMA for approval and in accordance with international standards (e.g. IFC Performance Standards and AfDB's Operational Safeguards) to ensure potential impacts are adequately avoided and minimised. This will include preparation of a site-specific Environmental and Social Management Plans (ESMP) for each camp site.

Accommodation camps will be constructed and operated in accordance with the IFC *General EHS Guidelines* (2007). The camps will include housing areas, catering areas and waste disposal facilities. Necessary sanitation and hygienic facilities will be provided to workers including drinking water, ablution facilities (chemical toilets, washing facilities, etc.), and toilet paper. Workers should be required to follow proper waste collection and disposal practices in compliance with relevant waste legislation and best practice. Appropriate security measures should also be applied to the accommodation camps where required (e.g. fencing, restrictions on visitor access).

The prevention and management of malaria, HIV/AIDS and other STIs will be key priorities in accommodation camps for the Project. In addition, the management approach implemented at accommodation camps should be designed to minimise health and safety risks associated with drug and alcohol abuse, gambling, exploitation of women and children, domestic violence and other unacceptable disturbances to local communities.

22.3 Management and Mitigation Measures

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
General environmental and social management	Conduct site-specific due diligence environmental and social studies of the camp sites to the satisfaction of UNRA prior to submission to NEMA for approval, and in accordance with international standards (e.g. IFC Performance Standards and AfDB's Operational Safeguards).	Prior to Construction	Contractor	UNRA
General environmental and social management	Prepare and implement site-specific Environmental and Social Management Plans (ESMP) for the camps.	Prior to Construction	Contractor	UNRA
Land clearance	Avoid siting camps in or near areas of conservation value such as forest reserves, wetlands, etc.	Design	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Land clearance	Minimise vegetation clearance in camp areas to only those areas where it is absolutely necessary and clearance should be done progressively.	Construction	Contractor	UNRA
Land clearance	Apply measures in Section 4.3 referring to land clearance.	Design / Construction	Contractor	UNRA
Effluent and wastewater	Each accommodation camp site will have: • A sewage system of an industry standard that meets all local health standards to treat all effluent from the camp. This may include use of soak away pits and septic tanks for domestic waste; • Appropriate toilet / ablution facilities and toilet paper; and • Suitable waste management facilities and practices for both non-hazardous waste and hazardous waste will be implemented in accordance with best practice.	Design / Construction	Contractor	UNRA
Effluent and wastewater	Strictly prohibit workers and contractors from littering and dumping of untreated wastewater at the accommodation camps.	Construction	Contractor	UNRA
Effluent and wastewater	If effluent is discharged, routinely monitor effluent from accommodation camp sites to ensure compliance with applicable discharge standards.	Construction	Contractor	UNRA
Erosion and sediment control	Adequate drainage, erosion and sediment control devices will be installed to manage surface runoff from the camp and storage areas for plant requirement to comply with applicable discharge standards. Apply measures in Water Management Plan referring to erosion and sediment control.	Design / Construction	Contractor	UNRA
Waste Management	As part of the site-specific Environmental and Social Management Plans (ESMP) for the camps, prepare a waste management plan for the camps to ensure good hygiene and sanitation. Relevant measures given under Section 7.3 for inclusion into the waste management plan should be considered as appropriate, including: • Develop and implement an appropriate waste management strategy for the collection, separation, recycling / reuse and disposal of camp wastes. • Apply the preferred waste management hierarchy, with opportunities for waste minimisation, reuse and recycling implemented where practicable. • Organic wastes such as food scraps and kitchen wastes from the accommodation camps may be disposed of in a suitably designed on-site waste pit or at an approved local landfill. • Non-recyclable and non-hazardous solid waste will be disposed of at an approved local landfill, while recyclables will be recycled with an approved contractor, where available.	Prior to Construction	Contractor	UNRA
Waste Management	Suitable waste management and disposal facilities should be constructed and operated at each accommodation camp in accordance with local health standards and best practice.	Prior to Construction	Contractor	UNRA
Waste Management	Clearly communicate to workers that any dumping or illegal discharging of waste (e.g. raw sewage, untreated wastewater etc.) into the receiving environment is strictly prohibited: through employee training, mandatory induction, specific contract requirements, and procedures in place.	Construction	Contractor	UNRA
Waste Management	Implement an appropriate pest and rodent control program in accommodation camps and in the villages close to the camps.	Construction	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Hazardous Materials	Store and manage any potentially hazardous materials in line with best practice following procedures and measures provided in Section 7.3 as appropriate.	Construction	Contractor	UNRA
Hazardous Waste Management	Manage hazardous wastes using relevant procedures and measures provided in Section 7.3 as appropriate, including: • Separate hazardous and non-hazardous waste streams considering the use of less hazardous substitutes for hazardous materials wherever possible. • Prohibit disposal of hazardous wastes (e.g. solvents, used oils, cracked batteries) in general waste bins; • Store cracked batteries in a non-leaking container; • Hazardous chemicals should be stored in drums or bags stored on pallets; • Any hazardous spills will be cleared as soon as practicable using adequate spill kits; and • Schedule periodic waste collection to prevent overflow of containers / facilities.	Construction	Contractor	UNRA
Noise and Vibration	Apply measures in Section 9.3 referring to noise and vibration management as appropriate. For camp sites located in dense urban areas, consider enforcing quiet hours at night to prevent noise nuisance.	Construction	Contractor	UNRA
Dust	Apply measures in Section 8.3 referring to dust management.	Construction	Contractor	UNRA
Biodiversity Management	Consider use of fuel or grid electricity rather than firewood for heating and cooking at camps. If firewood must be used, it should be extracted from approved sources.	Construction	Contractor	UNRA
Restoration / Rehabilitation	Develop a decommissioning and rehabilitation strategy for each accommodation camp in consultation with surrounding communities, including provisions for rehabilitation/revegetation where appropriate.	Prior to Construction	Contractor	UNRA
Archaeology and Cultural Heritage	Conduct site-specific due diligence environmental and social studies for the accommodation camps that considers potential impact to cultural heritage and archaeology.	Prior to Construction	Contractor	UNRA
Archaeology and Cultural Heritage	Apply measures in Section 16.3 referring to archaeology and cultural heritage management.	Construction	Contractor	UNRA
Occupational Health and Safety	Develop and implement site-specific emergency procedures to respond to emergency situations such as fires as part of the site-specific Environmental and Social Management Plans (ESMP) for the camps.	Prior to Construction	Contractor	UNRA
Gender considerations	All accommodation facilities should include proper design considerations to ensure gender requirements are fulfilled, such as provision of separate male / female toilets, where appropriate.	Prior to Construction	Contractor	UNRA
Occupational Health and Safety	Equip each accommodation camp with adequate fire-fighting equipment (e.g. fire extinguishers), first aid kits, medical waste disposal facilities, and emergency alarm system in line with measures provided in Section 24.3 as appropriate.	Prior to Construction	Contractor	UNRA
Occupational Health and Safety	Nominate key staff to be provided with suitable emergency training (e.g. fire warden) in site emergency evacuation procedures.	Construction	Contractor	UNRA
Occupational Health and Safety	Clearly post fire evacuation plans at strategic locations at each camp facility.	Prior to Construction	Contractor	UNRA
Occupational Health and Safety	Strictly restrict access to the accommodation camps to Project workers and people with an authorised visitor pass.	Construction	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Occupational health and safety	Provide condoms and adequate health care facilities including an HIV/AIDS and STIs education post at the accommodation camps.	Construction	Contractor	UNRA
Occupational Health and Safety	Provide all staff at accommodation camps with impregnated mosquito nets. Further consider wire screen in bedrooms, offices and canteens as needed to prevent spread of mosquito-borne diseases.	Prior to Construction / Construction	Contractor	UNRA
Occupational Health and Safety	Provide clean drinking water compliant with WHO 2017 drinking water standards to all workers at the accommodation camp.	Construction	Contractor	UNRA
Community health and safety	Consult with surrounding communities during identification of water supply sources to minimise potential impact on local water supply.	Prior to Construction	Contractor	UNRA
Community health and safety	Conduct awareness raising campaigns sensitive to cultural practices and taboos to educate both the workforce and neighbouring communities on the risks of STD and HIV/AIDS.	Construction	Contractor	UNRA
Community health and safety	Control the social interactions between workers and the local communities including restricted entry into the camp site to prevent the spread of STDs and HIV/AIDS and other health and safety issues.	Construction	Contractor	UNRA
Community health and safety	Strictly prohibit with legal penalty any illegal or immoral activities of workers such as crime, gambling, alcohol and drug abuse, and exploitation of vulnerable groups (e.g. prostitution of women and children).	Construction	Contractor	UNRA
Community health and safety	Provide appropriate signage and fencing around plant storage areas and accommodation camps to exclude the public from these areas.	Prior to Construction / Construction	Contractor	UNRA
Stakeholder engagement	Conduct an awareness program for workers to educate about local cultural and environmental sensitivities.	Construction	Contractor	UNRA
Stakeholder engagement	Engage regularly with neighbouring communities surrounding the accommodation camps to ensure community concerns or grievances with respect to workers are appropriately addressed.	Prior to Construction / Construction	Contractor	UNRA
Stakeholder engagement	Implement a grievance mechanism to an international standard to manage any community complaints associated with the accommodation camps.	Construction	Contractor	UNRA
Transport safety	Provide a shuttle bus service for workers between accommodation camp sites and work sites to minimise transport safety risks.	Construction	Contractor	UNRA

22.4 Monitoring Measures

Weekly inspections should be conducted to ensure sites are managed in accordance with the site-specific Environmental and Social Management Plans (ESMP) prepared for the camps. Specific monitoring measures are provided below.

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
Water quality	Effluent monitoring			Routine monitoring of treated effluent and wastewater discharged from accommodation camps (if discharges occur)	Field measurements. Laboratory analyses: Total and faecal coliforms, total nitrogen, total phosphorous, COD, and BOD	Monthly	At treated effluent discharge points (Camp)
Waste	Waste monitoring			Waste audits	Waste volume; % of waste reused / recycled. Verification of measures implemented	Initial audit then quarterly during construction	Camp site and storage areas for plant equipment
Waste and Hazardous Materials	Waste and hazardous materials monitoring			Site inspections	Use of appropriate waste bins, leakage/seepage from hazmat storage areas; Verification of measures implemented.	Weekly	Camp site and storage areas for plant equipment
Hydrocarbon leakage / spillage	Routine inspection for potential leakage or seepage of hydrocarbons			Visual check for visible leakage or seepage	Project compliance	Regular (e.g. weekly)	Storage areas for plant equipment
Air quality	Dust monitoring			Visual check for excessive dust and Project Grievance mechanism	Project compliance Logged dust complaints	Daily	At sensitive receptor, e.g. residences near accommodation camp site
Noise	Investigative monitoring of nuisance noise			Project Grievance mechanism	Project compliance Logged noise complaints	As required	At sensitive receptor, e.g. residences near accommodation camp site
Safety and security	Routine safety monitoring			Regular visual inspections of the accommodation camp site for safety and security	Project compliance Verification of security practices (e.g. restricted entry, visitor log) Verification of safety controls and inspection records	Weekly	Camp site and storage areas for plant equipment
Community health and safety	Community complaints			Investigate any complaints received through the Project grievance management system. Provide or adapt additional mitigation if required.	As required	As required	At each Camp site

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
Incidents	Incident monitoring			Record and resolve all camp and plant storage areas related incidents	No of related incidents; Response time	Ongoing	Camp site and storage areas for plant equipment

23. LABOUR AND WORKING CONDITIONS

23.1 Objectives

Key management objectives related to labour and working conditions for the Project include:

- Complying with legal requirements in Uganda; and
- Complying with relevant international standards and guidelines.

23.2 Context

Before the start of the Construction phase, the contractors and workforce will need to be recruited to carry out the construction works. At the peak of the construction works it is expected that up to 1500 people will be employed by the Project. Up to 250 people will be employed during the Operations Phase.

Project employment will be consistent with UNRA employment policies and relevant international standards including:

- IFC Performance Standard 2: Labour and working conditions; and
- AfDB Operational Safeguard 5: Labour conditions, health and safety.

It is expected that prior to construction the contractor/concessionaire will prepare employment and human resources policies / procedures for the Project consistent with these requirements.

23.3 Management and Mitigation Measures

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Policies and procedures	Adopt and implement employment and human resources (HR) policies and procedures for the Project that set out its approach to managing workers consistent with the requirements of relevant international standards and Ugandan legislation.	Pre-Construction	Contractor	UNRA
Documented information	Provide workers with documented information that is clear and understandable, regarding their rights under national labour and employment law and any applicable collective agreements, including their rights related to hours of work, wages, overtime, compensation, and benefits upon beginning the working relationship and when any material changes occur.	Construction / Operations	Contractor	UNRA
Terms of employment	• Where the construction contractor/concessionaire is a party to a collective bargaining agreement with a workers' organization, such agreement will be respected. Where such agreements do not exist, or do not address working conditions and terms of employment, the client will provide reasonable working conditions and terms of employment. • As Ugandan law recognizes workers' rights to form and to join workers' organizations of their choosing without interference and to bargain collectively, the contractor/concessionaire will comply with national law. • The contractor/concessionaire will not discourage workers from electing worker representatives, forming or joining workers' organizations of their choosing, or from bargaining collectively, and will not discriminate or retaliate against workers who participate, or seek to participate, in such organizations and collective bargaining. The	Construction / Operations	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	contractor/concessionaire should engage with such workers' representatives and workers' organizations, and provide them with information needed for meaningful negotiation in a timely manner. • All employees must be signatory to a concessionaire policy of no tolerance for any form of abuse or inappropriate contact or sexual exploitation of co-workers, and likewise in respect to relations with members of communities with whom they are in contact during construction and in operational activities.			
Migrant workers	The construction contractor/concessionaire will identify migrant workers and ensure that they are engaged on substantially equivalent terms and conditions to non-migrant workers carrying out similar work.	Construction / Operations	Contractor	UNRA
Conditions in accommodation camps	For accommodation camps, the client will put in place and implement policies on the quality and management of the accommodation and provision of basic services (refer to Chapter 22 for mitigation measures regarding accommodation camps).	Construction / Operations	Contractor	UNRA
Equal opportunity and fair treatment	The contractor/concessionaire should base the employment relationship on the principle of equal opportunity and fair treatment, and should not discriminate with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices. The principles of non-discrimination apply to migrant workers.	Construction / Operations	Contractor	UNRA
Retrenchment	• Prior to implementing any collective dismissals, the contractor/concessionaire will carry out an analysis of alternatives to retrenchment. If the analysis does not identify viable alternatives to retrenchment, a retrenchment plan will be developed and implemented to reduce the adverse impacts of retrenchment on workers. • The contractor/concessionaire should ensure that all workers receive notice of dismissal and severance payments mandated by law and collective agreements in a timely manner.	Construction / Operations	Contractor	UNRA
Grievances	The contractor/concessionaire will provide a grievance mechanism for workers (and their organizations, where they exist) to raise workplace concerns (refer ESIA Report Chapter 5). The client will inform the workers of the grievance mechanism at the time of recruitment and make it easily accessible to them.	Construction / Operations	Contractor	UNRA
Child labour	• The contractor/concessionaire will not employ children in any manner that is economically exploitative, or is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development. • Children under the age of 18 will not be employed in hazardous work. All work of persons under the age of 18 will be subject to an appropriate risk assessment and regular monitoring of health, working conditions, and hours of work.	Construction / Operations	Contractor	UNRA
Forced labour	The contractor/concessionaire will not employ forced labour, which consists of any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty. The client will not employ trafficked persons.	Construction / Operations	Contractor	UNRA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
OHS	The client will provide a safe and healthy work environment (refer Section 21).	Construction / Operations	Contractor	UNRA
Workers employed by third parties	• The contractor/concessionaire will take commercially reasonable efforts to ascertain that the third parties who engage these workers are reputable and legitimate enterprises and have an appropriate ESMS (that is consistent with the requirements of IFC Performance standard 2) • The contractor/concessionaire will establish policies and procedures for managing and monitoring the performance of such third party employers. • The contractor/concessionaire will ensure that contracted workers have access to a grievance mechanism.	Construction / Operations	Contractor	UNRA

23.4 Monitoring Measures

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
Labour and Working Conditions	Audit			Internal audits	Verification of implementation of ESMMP measures, and employment policies	Quarterly	All sites

24. EMERGENCY RESPONSE FRAMEWORK

24.1 Objectives

The objectives of emergency preparedness and response planning include:

- Protecting the health and safety of Project staff and neighbouring communities;
- Protecting the environment from direct or indirect impacts;
- Ensuring contractors and staff are adequately trained to respond to emergencies appropriately and in a timely manner;
- Ensuring material supplies to manage emergency situations are readily available (e.g. firefighting equipment, spill clean-up kits, etc.; and
- Ensuring communication protocols will effectively mitigate emergency situations rapidly.

24.2 Context

There are a number of inherent risks associated with any Project, and potential impacts cannot be avoided with certainty, even with application of robust management and mitigation measures. It is therefore critically important that the Project has properly prepared for the most likely emergency situations and has a process in place for responding appropriately, safely, and in a timely manner to protect people and the environment.

The following situations are environmental incidents which require an emergency response:

- All hazardous chemical spills;
- Large oil spill greater than 500 litres within workshop areas;
- All spills of fuel or oil outside of primary containment areas greater than 50 litres;
- All non-contained fires within operational areas; and
- All uncontrolled gas emissions.

24.3 Management and Mitigation Measures

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
Accidental Events and Natural Hazards	Develop, maintain and disseminate an Emergency Preparedness and Response Plan for the Project, incorporating management measures listed below and site-specific communications / medical information. Include the following in the Plan: • Identification of potential emergency situations specific to the Project, including medical, fire, hazardous materials, traffic accident, natural hazard-related incidents; • Responsibilities of all staff and management in the event of an emergency; • Training requirements for all staff; • Best practice emergency prevention and preparedness measures; • Communication protocol for emergencies;	Prior to Construction	Contractor	UNRA / Department of Disaster Preparedness / NEMA

Aspect	Mitigation Action	Schedule / Frequency	Responsibility	
			Implementation	Checking / Monitoring
	• Specific actions for each emergency identified; • List and locations of hospitals, first-responders, etc.; • Phone numbers of hospitals, doctors.			
Accidental Events and Natural Hazards	Emergency response to an environmental incident will prioritise the actions to be undertaken according to the following sequence: • Protection and rescue of human life; • Minimisation of the area impacted by the incident; • Protection of the environment and property; • Rendering the area safe in which the emergency has occurred; • Restoration of all disrupted services; and • Decontamination and rehabilitation of the incident scene and surrounding area.	Construction / Operation	Contractor	UNRA / Department of Disaster Preparedness / NEMA
Accidental Events and Natural Hazards	Include emergency training in mandatory site inductions for employees and contractors including: • Emergency evacuation procedures; • Communication protocols for emergency response; • Firefighting responsibilities and protocols; • Spill prevention and response procedure, including evacuation and / or clean-up responsibilities; and • Communication protocols and actions for civil unrest.	Construction / Operation	Contractor	UNRA / Department of Disaster Preparedness
Training / Awareness	Ensure at least two employees are on-site at all times trained in appropriate emergency response procedures and communication and reporting procedures to be implemented in case of an incident.	Construction / Operation	Contractor	UNRA / Department of Disaster Preparedness / NEMA
Training / Awareness	Ensure all staff are suitably trained for their respective jobs to reduce the chance for accidents that lead to medical emergencies.	Construction / Operation	Contractor	UNRA / Department of Disaster Preparedness
Accidental Events and Natural Hazards	Regular environmental risk assessment will be undertaken to review potential environmental emergency situations that may arise.	Construction / Operation	Contractor	UNRA / Department of Disaster Preparedness / NEMA
Accidental Events and Natural Hazards	Develop an Incident and Accident Register to record all emergency incidents, the cause and corrective actions.	Construction / Operation	Contractor	UNRA / Department of Disaster Preparedness / NEMA

24.4 Monitoring Measures

Aspect / Impact	Monitoring Measure	Construction	Operation	Method	Parameters	Frequency	Location
Accidental Events and Natural Hazards	Site inspections			Site inspections	Presence/absence of fire extinguishers, spill kits, MSDS etc. Hazmat storage practices etc.	Monthly	Entire site
Accidental Events and Natural Hazards	Audit			Conduct routine audit of emergency preparedness	Training, Registers, Procedures/Plans	Annual	Entire site
Accidental Events and Natural Hazards	Incident investigations			Conduct post-emergency incident investigation and evaluation and monitor implementation of any corrective actions required, including controls for minimising recurrence	As required	Post-emergency	As required
Accidental Events and Natural Hazards	Incident investigations			Review incident register for any trends	No of incidents, Causes of incidents etc.	Monthly, Quarterly and Annually	Entire site

25. ESMMP BUDGET

UNRA is committed to providing sufficient resources to ensure the successful implementation of the environmental and social management and monitoring of the Project as identified in the ESMMP. UNRA will also ensure that the contractors / concessionaire include sufficient resources for the environmental and social management of their activities.

Under the Public Private Partnership (PPP) agreement between UNRA and the Concessionaire, much of the environmental and social costs will be borne by UNRA until the ROW is transferred to the Concessionaire. UNRA will then have a monitoring and auditing role to ensure that environmental and social safeguards are met during construction and operation.

The ESMMP implementation budget does not include resettlement and livelihood restoration costs which are captured in the RLRP (Volume D); nor the biodiversity related costs provided in the BAP (Volume D). These will be the most significant environmental and social costs for the KJE Project.

The implementation budget also does not cover social and environmental mitigation costs that are expected to be captured in the design specifications and operational costs of the Project, such as:

- Contractor staffing requirements (e.g. Environment Team, Community Relations Team, OHS Specialists)
- Pedestrian crossings and other accessibility requirements.
- Construction of viaducts.
- Noise barriers.
- Public safety fencing.
- Drainage structures to prevent flooding and erosion.
- Landscaping and revegetation of the expressway.
- Preparation of OHS Plan, PPE, medical supplies and medical clinic for staff.
- Rehabilitation of construction material quarries and borrow pits.

The concession for the Project is expected to be for a period of 30 years. The budget estimates are based on a 2 year pre-construction (pre-concession) period, 5 year construction period and a 25 year operational period. During the operational period, there is expected to be regular maintenance of the Expressway.

An estimate of environmental and social management costs associated with the construction and management of the KJE Project is presented in Table 25-1 below. The environmental and social costs will be highest during the pre-construction and construction period when costs will in the order of USD 1 million per year. During operations, environmental and social costs are expected to be significantly lower at approximately USD $230,000 per year.

Total costs for implementation of the ESMMP as identified in the below budget over 32 years are **USD $12,897,000** which represents an average cost of approximately USD $400,000 per year. The final design of the Expressway will also have an influence on environmental and social costs. This cost estimate will need to be reviewed and adjusted during detailed design. Detailed budgets for environmental and social management are expected to be produced as part of the development of the Concession Agreement for the Project.

Note separate budgets are provided for:

- Resettlement and livelihood restoration in the RLRP (Volume D); and
- Biodiversity management and offsetting in the Biodiversity Action Plan (Volume D).

Table 25-1 Environmental and Social Management and Monitoring Budget

Aspect	Stakeholder	Cost / Project Phase (USD)			Total
		Pre-construction	Construction	Operations	
		2 years	5 years	25 years	
Staffing					
Human Resources (Annual) - UNRA	UNRA	120,000	150,000	30,000	1,740,000
Human Resources (Annual) - Contractor	Contractor	To be determined by Contractor			-
UNRA Staff Training / Capacity Building (Annual) - UNRA to engage External Contractor	UNRA	12,000	15,000	3,000	174,000
Contractor Staff Training (Annual)	Contractor	Covered by Human Resource Allocation			-
Staff Vehicle / Transport (Annual) - UNRA	UNRA	10,000	15,000	5,000	220,000
Staff Vehicle / Transport (Annual) - Contractor	Contractor	20,000	30,000	10,000	440,000
Computing / Communications / Reporting (Annual) - UNRA	UNRA	3,750	5,000	1,000	57,500
Computing / Communications / Reporting (Annual) - Contractor	Contractor	3,750	5,000	1,000	57,500
Environmental Monitoring Equipment (Capital - once off)	UNRA	50,000	-	-	50,000
Environmental Monitoring Equipment (Capital - once off)	Contractor	100,000	-	-	100,000
Environmental Monitoring Equipment/Lab Analyses (Annual)	Contractor	40,000	70,000	20,000	930,000
Environmental and Social Management Systems					
Preparation of CEMP and associated procedures (once off)	Contractor	15,000	-	-	15,000
Preparation of OEMP (once off)	Contractor	-	-	10,000	10,000
Preparation of Blasting Management Plan (once off)	Contractor	8,000	-	-	8,000
Preparation of Traffic Management Plan (once off)	Contractor	15,000			15,000
Preparation of Emergency Preparedness and Response Plan (once off)	Contractor	15,000	-	-	15,000
Environmental assessments of quarries/borrow pits	Contractor	30,000	30,000	-	210,000
Update of ESMMP / procedures	Contractor	-	15,000	5,000	200,000
External Audits (Annual) - UNRA to engage External Contractor	UNRA	-	25,000	12,000	425,000
Environmental Management, Mitigation and Monitoring					
Road watering / dust suppression	Contractor	-	Operational cost	Operational cost	-
Noise barriers	Contractor	-	Operational cost	Operational cost	-
Drainage control and maintenance	Contractor	-	Operational cost	Operational cost	-
Implementation of Revegetation Plan	Contractor	-	Operational cost	Operational cost	-
Hydrological studies/modelling	Contractor	Operational cost	Operational cost	Operational cost	-
Water quality and flow monitoring (Annual)	Contractor	25,000	25,000	7,000	350,000

Aspect	Stakeholder	Cost / Project Phase (USD)			Total
		Pre-construction	Construction	Operations	
		2 years	5 years	25 years	
Air quality monitoring (Annual)	Contractor	20,000	20,000	20,000	640,000
Noise monitoring (Annual)	Contractor	10,000	15,000	10,000	345,000
Waste management monitoring (Annual)	Contractor	20,000	20,000	5,000	265,000
Archaeology and Cultural Heritage (Annual)	Contractor	25,000	35,000	-	225,000
Social Management, Mitigation and Monitoring					
Stakeholder and Government consultation / Community relations (Annual) - UNRA	UNRA	120,000	120,000	20,000	1,340,000
Stakeholder and Government consultation / Community relations (Annual) - Contractor	Contractor	Covered by Human Resource Allocation			-
Road safety and health education / awareness raising (Annual)	Contractor	100,000	100,000	25,000	1,325,000
Preparation of Workers Code of Conduct and conduction of gender based violence prevention programs - UNRA to engage External Contractor	UNRA	20,000	20,000	-	140,000
Socio-Economic / Community Health and Safety Monitoring (Annual)	Contractor	50,000	75,000	15,000	850,000
Grievance Management (Annual)	UNRA	75,000	250,000	10,000	1,650,000
Contingency (Annual)	**UNRA / Contractor**	**50,000**	**100,000**	**20,000**	**1,100,000**
GRAND TOTAL	-	-	-	-	**12,897,000**

Notes: The ESMMP implementation budget does not include resettlement and livelihood restoration costs which are captured in the RLRP; nor the biodiversity related costs provided in the Biodiversity Action Plan. The budget also does not cover social and environmental mitigation costs that are expected to be captured in the design specifications and operational costs of the Project, including Contractor staffing requirements (e.g. Environment Team, Community Relations Team, OHS Specialists). Costs are not adjusted for inflation.

As outlined in the ESIA (Volume B), during the Pre-Construction and Construction phase, the construction contractor will need to ensure that the following aspects to be developed for the Project undergo due diligence environmental and social studies by the contractor (or concessionaire) to the satisfaction of NEMA and in accordance with international standards (e.g. IFC Performance Standards and AfDB's Operational Safeguards) to ensure potential impacts are avoided and minimised where possible:

- Any new drainage channels required for the Project outside the ROW;
- Associated service stations/rest areas along expressway;
- Plant equipment storage areas;
- Accommodation camp sites;
- Any new quarries and borrow pits; and
- Asphalt plant site.

It is expected that the additional environmental and social assessments for these components of the Project will cumulatively cost in the order of USD $100,000 to $200,000. Costs will depend on the level of assessment required by UNRA, NEMA and Project financiers. These costs will be in addition to the ESMMP budget proposed above.

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