

Uganda National Roads Authority

Environmental & Social Impact Assessment for Widening of Northern Bypass, Uganda.

(Project Ref: 11-03-31-CT-105-KNB-PD-Environment)



Prepared for:

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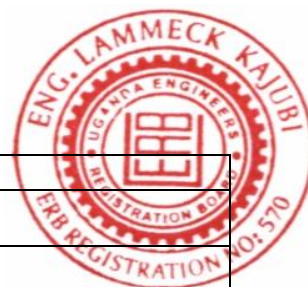
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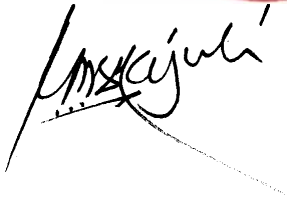

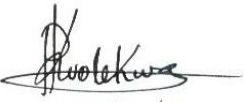
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¹ In conformity to NEMA (Uganda) requirements and regulations: *The National Environment (Conduct and Certification of Environmental Practitioners) Regulations, 2003*, this ESIA was prepared under Air Water Earth's EIA partnership "AWE Environmental Engineers".

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ACRONYMS AND DEFINITIONS

Acronyms

ARAP:	Abbreviated Resettlement Action Plan
EIS:	Environmental Impact Study
ESIA:	Environmental and Social Impact Assessment
ESIS:	Environmental and Social Impact Statement
ESMP:	Environmental and Social Management Plan
EU:	European Union
GOU:	Government of Uganda
IUCN:	International Union for Conservation of Nature
LC:	Local Council
NB:	Northern Bypass
NEMA:	National Environment Management Authority
OHS:	Occupational Health and Safety
PCDP:	Public Consultation and Disclosure Plan
ToR:	Terms of Reference

Definitions:

Carriageway:	Area of road used by vehicles. It is bounded on either side by road shoulder.
Murram:	Refers to gravel suitable for road building.
Maintenance:	Activities undertaken to prevent deterioration of the road pavement during its serviceable lifetime. Such activities may include clearing of side ditches, desilting of culverts, repairing of potholes, ravelled surfaces and deformations, clearing of vegetation on verges and restoration of road furniture and markings. The activities are categorised as <i>routine</i> , <i>recurrent</i> or <i>periodic</i> , depending on extent of work or, plant used, frequency and cost.
Pavement:	A structure composed of layers of increasing rigidity and strength and of varying thickness, designed to carry traffic loads on natural soil formations, typically comprising subgrade, sub-base and base layers.
Rehabilitation:	An enhanced period of maintenance intended to restore the road to its original condition. Structural defects are repaired without major changes to alignment and width standards as would be implemented in a reconstruction.
Road reserve:	Area of land typically extending from the centre line of the road, owned by the road and within which the roads authority has rights to extend the road and place associated infrastructure. This area can also be used for placing surface or subsurface utilities (water mains, electricity, telephone cables etc).
Shoulder:	Area of road (typically 1.5 m wide), between the carriageway and ditch, often used by pedestrians and cyclists, may or may not be sealed.

EXECUTIVE SUMMARY

0.1 Introduction

The Government of Uganda (GOU), represented by the Uganda National Roads Authority (UNRA) intends to expand the existing Kampala Northern Bypass to create a double carriageway along its entire 21 km length from Busega Roundabout to Jinja Road intersection in Kireka. 3.5 km of the 21 km between *Hoima Road* and *Gayaza Road* Junctions were completed with dual carriageway during the first phase of the project. The project activities for expansion will focus on the other 17.5 km. The Bypass traverses two districts of Kampala and Wakiso and these areas will be the focus of the ESIA study.

This non-technical executive summary of the proposed project presents a description of the proposed project and its justification, policy and legal framework within which the socio-environmental assessment was conducted, baseline along project road, project alternatives, outline of project impacts and mitigation actions proposed, environmental hazards management, complementary initiatives on resettlement.

0.2 Project Description

The route of the Northern Bypass begins at Busega–Masaka Road Roundabout and proceeds for about 200 m north along the Mityana Road. It heads north-east and follows the edge of the Lubigi Swamp, skirting north of Lubya Hill and crossing Hoima Road at Nnamungoona. The alignment then passes Kawaala Hill behind Makerere Hill, before reaching Bombo Road at a junction with Sir Apollo Kagwa Road. The route then runs through Bwaise and south of Kyebando Hill before crossing the swamp again to Bukoto, Kigoowa and Nsimbi Ziwoome, to the south of Kkulambiro Hill. From Kkulambiro, the Kampala Northern Bypass crosses to Kiwatule, Kamidi before joining Jinja Road at Ntebettebe opposite Nelson Mandela National Stadium at Nambole. The existing alignment traverses swamps and streams, and roundabouts have been constructed in the following locations (where the alignment crosses other existing roads):

- Roundabout on Mityana Road;
- Roundabout on Sentema Road;
- Roundabout on Hoima Road;
- Grade-separated roundabout on the connection of Bombo Road and Sir Apollo Kagwa Road (situated on existing dual section so exempt from this scheme);
- Roundabout on Gayaza Road;
- Roundabout on Bukoto-Kyebando road;
- Roundabout on Nitinda Road;
- Roundabout on Naalya Road; and,
- Jinja Road Interchange.

Development of the Kampala Northern Bypass has been implemented in a staged approach comprising of construction of 21 km of road of which 17.5 km is single carriageway road and 3.5 km is dual carriageway road between Hoima Road and Gayaza Road. For this Scheme the 17.5 km single carriageway section will be expanded to a dual carriageway.

The proposed carriageway will add an additional 19 m width to the existing 11 m roadway, creating an overall roadway width of 30 m. The exact cross-section will vary along the length depending on the super elevation and location of new drainage channels, which may be required within the central median.

The construction strategy detailed in Chapter 2 was developed to assist the initial assessment of construction related issues. The components of the strategy include detailing the pavement specifications, proposed construction period and working hours, traffic management, excavation of materials, construction principles and related highway impact.

0.3 Project Justification

The Kampala Northern Bypass is intended to relieve the city of its current severe traffic congestion and also serve as part of a wider programme to reduce transportation constraints along the northern corridor for both national and regional roads. The existing alignment has only 3.5km of dual carriageway, with the remaining 17.5 km being single carriageway. Without the proposed development, the Kampala Northern Bypass would not have the capacity to adequately evacuate heavy traffic volumes from the city, which is the original objective of the bypass.

0.4 Policy, Legal and Administrative Framework

The ESIA was conducted under the following national policy, legal and institutional framework, international conventions and the European union Environmental Assessment Guidelines.

Box ES1: Applicable Ugandan policies, regulations and international conventions

POLICY FRAMEWORK

- THE NATIONAL ENVIRONMENT MANAGEMENT POLICY, 1994
- NATIONAL WATER POLICY, 1999
- WETLANDS POLICY, 1995
- MINISTRY OF WORKS & TRANSPORT POLICIES (GENDER, HIV/AIDS, OHS) 2008

LEGAL FRAMEWORK

- CONSTITUTION OF THE REPUBLIC OF UGANDA, 1995
- NATIONAL ENVIRONMENT ACT, CAP 153
- WATER ACT, CAP 152
- LAND ACT, CAP 227
- ROAD ACT, CAP 358
- TOWN AND COUNTRY PLANNING ACT, CAP 246
- LOCAL GOVERNMENTS ACT, CAP 243
- PUBLIC HEALTH ACT, CAP 281
- NATIONAL ENVIRONMENT (WETLANDS, RIVER BANKS & LAKESHORES MANAGEMENT) REGULATIONS, 2000
- NATIONAL ENVIRONMENT (STANDARDS FOR DISCHARGE OF EFFLUENT INTO WATER OR ON LAND) REGULATIONS, 1999
- NATIONAL ENVIRONMENT (WASTE MANAGEMENT) REGULATIONS, 1999
- NATIONAL ENVIRONMENT (NOISE STANDARDS AND CONTROL) REGULATIONS, 2003
- DRAFT NATIONAL AIR QUALITY STANDARDS, 2006
- EMPLOYMENT ACT, CAP 219
- ACCESS TO ROADS ACT, CAP 350
- NATIONAL ENVIRONMENT (HILLY AND MOUNTAINOUS AREAS MANAGEMENT) REGULATIONS, 2000
- NATIONAL ENVIRONMENT (CONTROL OF SMOKING IN PUBLIC PLACES) REGULATIONS, 2004
- HISTORICAL MONUMENTS, CAP 46
- PETROLEUM SUPPLY ACT, 2003
- ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS, 1998
- NATIONAL (ENVIRONMENTAL AUDIT) REGULATIONS, 2006
- OCCUPATIONAL SAFETY AND HEALTH ACT, 2006
- WORKERS COMPENSATION ACT, CAP 225
- INTERNATIONAL AGREEMENTS AND CONVENTIONS
 - a) THE CONVENTION ON BIOLOGICAL DIVERSITY (CBD)

- b) CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES (CITES)
- c) STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS (POPS)
- d) STRATEGIC APPROACH TO INTERNATIONAL CHEMICALS MANAGEMENT (SAICM)
- e) EUROPEAN UNION ENVIRONMENTAL ASSESSMENT GUIDELINES

INSTITUTIONAL FRAMEWORK

- NATIONAL ENVIRONMENTAL MANAGEMENT AUTHORITY (NEMA)
- MINISTRY OF WATER AND ENVIRONMENT (MOWE)
- MINISTRY OF GENDER LABOUR & SOCIAL DEVELOPMENT
- DISTRICT LAND BOARDS
- TOWN AND COUNTRY PLANNING BOARD
- LOCAL ADMINISTRATION STRUCTURES AND ROAD COMMITTEES
- MINISTRY OF TOURISM, WILDLIFE AND HERITAGE

The Northern By-pass will be partially funded with a loan from the European Investment Bank (EIB). The EIB's approach to financing projects is based on the "precautionary principle", preventative action rather than curative treatment should be taken, environmental damage should be rectified at source and the polluter should pay, according to the "Treaty Establishing the European Community". All projects financed by the EIB are the subject of an Environmental Assessment to assess the requirements for an EIA according to the EU EIA Directive. The EIB's categorisation of projects for purposes of environmental assessment are detailed in Chapter 4.

0.5 Existing/baseline conditions in the project area

The Bypass traverses two districts of Kampala and Wakiso in an area that is considered a suburb of the capital city, Kampala. The route follows the edge of the Lubigi Swamp that is part of a larger wetland system in Kampala District.

a) Geographical location

Kampala is located on the northern shores of Lake Victoria in the South East of Uganda and is bordered by Wakiso District to the North, East, West and South-west, covering an area of 195 km². It is situated at an average altitude of 3910 ft (1120 m) above sea level, and on 24 low flat topped hills that are surrounded by wetland valleys.

Wakiso District encircles Kampala District and is located in the central region of the country, bordering with districts of Luwero and Nakaseke in the North, Mukono and Kampala in the East, Mpigi and Mityana in the West and Kalangala near Lake Victoria (the largest fresh water lake in Africa covering 69,490 sq km).

b) Biophysical conditions

i) Climate and Hydrology

Kampala features a tropical wet and dry climate with two distinct wet seasons. However, due to city's higher altitudes, average temperatures are noticeably cooler than is typical for other cities with this type of climate. Kampala seldom gets very hot during the course of the year, the warmest month being January. The average temperature for Kampala is 21.9°C, with an annual range of 2.4°C with relative humidity of about 53 to 89%.

Wakiso District features a tropical rainforest climate with relatively constant temperatures throughout the year. It has noticeably wetter and drier months, with January being the driest month and a drier period from July through September. However, since average monthly precipitation in each of these months is above 60mm, Wakiso district has no true dry season and therefore falls under the tropical rainforest climate category.

Since some sections of the Bypass route are located between the edge of the swamp and catchment area slopes, the flow of surface and groundwater is impeded to some extent. As a result the flooding risk of property in poorly drained areas is enhanced. Ponding and flooding of property after rains has been widely reported along the existing Bypass.

ii) Flora

The natural vegetation of Kampala is of forests with swamp vegetation in the valleys. Rapid urbanization has destroyed these forests and currently, the only natural areas within Kampala District are limited to a few swamps. Along the roads and around homesteads are trees that have been planted for both shade and ornamental purposes. The most common species are: *Cassia Agnes*, *Markhania platycalys*, *cassia gradus* and *Jacaranda mimosifolia*. Other plant species include *Bougainvillea spp*, *Acalypha spp* and grasses such as *Brachiaria spp*, *Hyparrhenia spp* etc. Kampala District has numerous wetlands covering 16% of the district (Wetland Newsletter, 1996). Long sections traversed by the Northern Bypass routes are occupied by permanent wetlands and urban structures. The wetlands are already experiencing anthropogenic pressures of various types partly due to the suburban location as well as the ease of accessibility as a result of constructed road.

ii) Fauna

A total of 34 species were recorded during site surveys, of which 10 are associated with water or confined to wetlands. A detailed assessment of fauna (and flora) is given in Appendix I, which describes the results of the surveys. No Red Data species were recorded, but two are regionally listed as species of conservation concern. One of these is the Goliath Heron, and the other the Grey Crowned Crane, Uganda's National Bird but which has declined hugely in the past 30 years.

Appendix I provides a full record of the surveys that have been undertaken for the Scheme, as well as an assessment of the potential impacts upon the flora and fauna of the route corridor. Measures to mitigate these impacts are also identified within Appendix I.

c) Socio-economic and cultural conditions

i) Kampala District

According to the 2002 national census figures, Kampala District then had a population of approximately 1,189,100. The Uganda Bureau of Statistics estimated the population of Kampala at 1,420,200 in 2008. It is estimated that the population of Kampala District in 2009 is approximately 1,491,000.

The principle land use in Kampala City is dominated by residential use and small-scale agriculture. Small-scale peri-urban agriculture is widely distributed in existing residential areas as well as periphery areas, which may not have been transformed into other uses. According to the Uganda First Urban Project, 1993, Kampala Urban Study, agricultural land occupied 41.2% of the land while residential occupied 32.3%, both of which formed the major uses in the city. In terms of distribution by agricultural land, Nakawa Division occupies 35% followed by Makindye with 24.5% and Kawempe by 20.6%.

Water sources of piped, water boreholes and protected springs are considered safe water sources, and as a result, approximately 97.6% of Kampala population have access to safe water (2002 Census Report & 2008 Statistical Abstract). However, a study in 1999 (Sanitation Quality Gap), revealed that most of the wells/springs are being contaminated and thus puts safe water coverage at about 55%. Approximately 8% of Kampala City has a sewer

connection. Some communities along the Northern Bypass use wetlands, natural springs and protected springs as water sources for domestic purposes. Adequate drainage will be required to prevent back ponding of the stormwater into these community water sources.

ii) Wakiso District

According to the 2002 Population and Housing Census, the population of Wakiso district stood at 907,988 people with a growth rate of 4.1% compared to 562,209 people and a growth rate of 3.7% in 1991. Wakiso was ranked third in population size after Mbarara and Kampala. The population density has currently reached 323 persons per square kilometer. Population in the district is unevenly distributed with Makindye-Ssabagabo having the largest number of people (136,300) compared to Wakiso Town Council with the lowest number of persons (14,600). About 53% of the population were children below age of 18 years while 17% of the total population were orphans. The ethnic groups in Wakiso include Baganda, Basoga, Bafumbira, Batoro, Bakiga, Alur, Bagisu, Banyoro, Iteso and Acholi.

The vulnerable groups in the Scheme area include female and child-headed households, households dependent on a single source of income, children, disabled people and the elderly. Construction of the current Northern Bypass attracted and induced upscale real estate development in the swampy areas that it traverses. Before this however, these marginal marshy and flood-prone areas were the cheap places where poor city dwellers could afford to purchase small land plots for settlement. Indeed, many sections of the bypass are still adjoined by low-income settlements. As the occupants of this land own small land plots, partial loss of their holdings could imply significant social cost to affected persons.

The main income sources for Wakiso District include fishing on Lake Victoria, poultry feeds, agriculture with the emphasis on food crops such as sweet potatoes, beans, cassava, ground-nuts, Irish potatoes and soy beans. Fruits and vegetable are also widely grown, such as tomatoes, onions and cabbage. Retail trading is an important source of income for many households.

Despite existence of large watercourses and numerous springs, access to potable water is low in Wakiso District due to pollution and groundwater contamination. Common water sources are from boreholes, shallow wells and protected springs. Lack of proper supply of safe drinking water results in people being vulnerable to water borne diseases like diarrhoea and cholera, and outbreaks have in the past been common in flood areas of Bwaise and Kalerwe traversed by the Northern Bypass.

d) Baseline noise and air quality

The noise and air quality measurements taken at randomly selected receptors along the Northern Bypass on 16th June 2011 are presented in Table ES1. Generally, the highest noise levels were predicted on the Bukoto-Ntinda stretch of the Bypass consistent with the highest current and predicted traffic volumes in future. Using the traffic survey data for 2010 as representative of the current scenario, the traffic contributes 70 dB to noise within 10 m from the center line, 61.7 dB within 30 meters from the centerline, 53.3 dB within 100m from the centerline and 45.0 dB beyond 100m from the centerline. These figures are borne out by the L_{Aeq} baseline of 61.5 dB measured about 20m from the current bypass's centerline in Ntinda along the Bukoto-Ntinda stretch. A detailed noise assessment is presented in Appendix II, and provides detailed information regarding noise impacts during construction and operation, as well as suggested measures to mitigate these impacts.

Table ES1: Baseline noise levels and air quality.

UTM Coordinates	TSP readings ($\mu\text{g}/\text{m}^3$)	Noise readings	Toxic gas presence	Notes
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Eastings	Northings	Maximum	Average	(dBA)		(ppm)		
				L _{AMax}	L _{Aeq}	SO ₂	NO ₂	
461296	39045	54	50	77.8	57.2	0	0	Namboole, homestead. Crying child
460181	40751	88	49	85.3	58.4	0	0	Naalya, homestead, climbing vehicular traffic
455836	40617	78	53	74.8	61.5	0	0	Ntinda, concrete/stone workshop.
453940	38953	258	57	86.7	61.9	0	0	Kalerwe, vending kiosks, motorcycle traffic, radio playing. About, 2 m lower than carriageway level.
448918	38382	54	53	87.4	51.5	0	0	Namungoona, homestead, grazing livestock, human conversation. About 1 m lower than carriageway level.
446541	35282	54	54	86.6	49.6	0	0	Namungoona - Busega. Vehicular traffic.
446110	34668	93	54	81.4	55.1	0	0	Busega, Betna real Estates & Property Consultants

0.5 Project Alternatives

i) “No Project” Scenario

The existing alignment has only 3.5 km of dual carriageway, with the remaining 17.5 km being single carriageway. Without the proposed development, the Kampala Northern Bypass would not have the capacity to adequately evacuate heavy traffic volumes from the city, which is the original objective of the bypass. The “No Project” Scenario would therefore result in increased traffic congestion within the city and its suburbs as vehicle numbers grow.

ii) Alternatives Considered

Alternative junction arrangements for the roundabouts are currently being investigated for the Scheme. The options include:

- Option 1: At-grade widening of all entries from one to two lanes or two to three lanes, with free-flow left turn lanes provided. When modelled, the at-grade improvements did not noticeably increase capacity.
- Option 2: A grade separated design with the mainline at-grade and the junction elevated in a similar design to Gayaza Junction. Although the Northern Bypass will benefit from the elevated roundabout, the junction is still not able to cope with 2015 predicted traffic levels at all junctions. Land-acquisition beyond the existing road reserved under the ownership of UNRA would be required for the grade separated design. If this option is to be pursued, a resettlement Action Plan or Abbreviated Resettlement Action Plan is likely to be required.

In addition to the alternative junction arrangements, alternative options for lighting the Scheme are currently being investigated. At present, lighting is only provided at the junctions on the existing Northern Bypass. It is understood from local residents and Police that this lighting is often not lit for various reasons and that the lighting installation has suffered from

theft of cables and other components. During the Feasibility Design Presentation the following three options were presented to UNRA:

- Option 1: Links remain unlit but lighting provided at junctions. This satisfies the Ugandan Geometric Design Manual Section 12.8 but keeps lighting costs to a minimum.
- Option 2: Links and junctions are lit using conventionally mains powered street lighting.
- Option 3: Links and junctions are lit using solar powered street lighting. UNRA expressed a desire to light both the links and junctions and were particularly keen for a solar system to be investigated.

0.6 Potential Impacts and Mitigation/Enhancement Measures

Several possible negative impacts of improving the road are not significant, while others will be less severe when recommended mitigation measures are implemented. Some land and structures will be permanently lost during road junctions' widening.

Considerable quantities of gravel, rock and embankment fill material will be required during road construction. Borrow pits and quarries might have a variety of impacts. These include temporary or permanent land take, access road requirements, dust and noise as well as operational effects of blasting, haul road traffic, and visual impact. Land will also be required for temporary diversions (detours) during road construction. During construction, any form of excavation could present risk of soil erosion and this is likely to occur around borrow pits, steep slopes, along drainage channels and at stormwater or runoff discharge sinks. Proper reinstatement of slopes will significantly reduce the possibility of soil erosion and this is particularly necessary for the road section hilly terrain. Construction activities pose a possibility of contaminating land and watercourses from bitumen, fuel or oil spillage from construction vehicles.

Traffic that will be generated by road construction will be significant, particularly close to borrow areas. This will give rise to increased noise and dust nuisance and possibly increased road accident risk, especially through settlements and trading centres. Women, children and elderly people will particularly be at risk of construction traffic accidents. In addition, without proper control, construction vehicles may destroy crops and cause other problems while travelling off road to borrow areas.

When the road is upgraded to bitumen standard, its routine maintenance will have negligible environmental impacts. During post-construction phase, the improved road could increase population along the route. This induced growth could increase pressure on social services. Compared to socio-economic benefits of the road project, many of the negative impacts will be insignificant as long as the mitigation actions are implemented.

Table ES2 outlines key positive and negative impacts of the project and their characterization.

Table ES2: Summary of key potential impacts.

Component Activity	Issues/Impacts/Risks	Preliminary assessment of significance
Phase: Construction		
Land-take	<ul style="list-style-type: none"> ▪ Loss of wetland/ swamp area 	Negative: MODERATE significance
Sourcing of road construction materials	<ul style="list-style-type: none"> ▪ Income for quarry land owners and construction material suppliers. 	POSITIVE
	<ul style="list-style-type: none"> ▪ If quarry or borrow sites not restored they could be an eyesore (aesthetic impacts) and a risk to children and animals. ▪ Unrestored pits may also impound water hence a potential breeding ground for mosquitoes and other vectors – therefore health-related risks. ▪ Landuse changes. 	Negative: MINOR-MODERATE significance
Transportation of materials	<ul style="list-style-type: none"> ▪ Haulage traffic impacts (e.g. accidents) in local communities. 	Negative: MODERATE significance
	<ul style="list-style-type: none"> ▪ Dust, noise and vibration impacts due to traffic – potential air pollution and health impacts. 	Negative: MINOR-MODERATE significance
Storage of construction materials.	Pollution risk from potential spillage of fuel, bitumen, etc at construction site if standard (best) site management practices not observed.	Negative: MINOR-MODERATE significance
Site preparation	<ul style="list-style-type: none"> ▪ Land take for access roads and road right of way. ▪ Excessive vegetation stripping hence soil erosion. 	Negative: MODERATE significance
Impact of equipment yard	<ul style="list-style-type: none"> ▪ Occupational risks soil compaction. ▪ Localized soil contamination with fuel/oil spills or waste bitumen left on site Improper restoration upon site closure. 	Negative: MINOR-MODERATE significance
Employment	Employment opportunities for skilled and unskilled labour.	POSITIVE
Influx of construction workers.	<ul style="list-style-type: none"> ▪ Accident risk. 	Negative: MODERATE significance
	<ul style="list-style-type: none"> ▪ Pressure on local infrastructure and services. 	Negative: MODERATE significance
Phase: Operation		
Improved traffic capacity of the Bypass	A dual carriageway bypass will have considerably high capacity to divert large traffic volumes from the city, preventing traffic clog-ups.	POSITIVE
Increased road safety	<ul style="list-style-type: none"> ▪ Design will provide vandal-proof road safety signage. ▪ Design will provide safe motorcyclists, pedestrian walkways and crossings. ▪ Foot bridges shall be gender-sensitive to allow acceptance and use by women, elderly and disabled travellers. ▪ Lighting will be provided and directed onto the carriageway to minimise offsite light 	POSITIVE

Component Activity	Issues/Impacts/Risks	Preliminary assessment of significance
	pollution and glare for motorists.	
Traffic noise pollution	Dwellings adjoining the road will experience higher traffic noise levels.	Negative: MODERATE significance
Improper disposal of Road construction waste (waste bitumen, oil/fuel spills, lime bags, etc)	Improperly disposed waste poses potential for environmental contamination	Negative: MINOR- MODERATE significance
Employment during scheme operation (for road / signage maintenance, grass cutting gin road reserve, road cleaning, etc)	<ul style="list-style-type: none"> ▪ Maintenance contracts present economic benefit. ▪ Road cleaning and maintenance of the road reserve greenery has often provided employment opportunities for women. 	POSITIVE
Drainage impairment hence localised flooding	Blockage of drains would pose flood risk.	Negative: MODERATE significance
Induced development	<ul style="list-style-type: none"> ▪ The bypass might attract more residential and commercial development along its route. 	POSITIVE
	<ul style="list-style-type: none"> ▪ Prices of land may increase, making it unaffordable for low-income people, in the only areas where they could afford land. 	Negative: MINOR- MODERATE significance
	<ul style="list-style-type: none"> ▪ Increased pressure on social infrastructure especially sanitation services including solid waste collection. 	Negative: MODERATE significance

0.7 Environmental Hazard Management

Road construction could entail occupational hazards/risks and accidents especially involving motorised road construction equipment, asphalt plant, stone quarries and slope failure.

The following measures are proposed to control this risk:

- a) **Accidents from equipment:** Only trained/ certified operators will operate motorised equipment.
- b) **Blasting explosives safety:** During road construction, the Contractor will ensure the following:
 - Stone blasting should only be undertaken by licensed blasters.
 - All explosives are delivered to quarry sites (under police escort as Uganda's security requirements demand) on the day of blasting and any remnants returned into police custody after blasting. After each blast, site inspection will be conducted for un-detonated explosives.
 - Advance warning is given to local communities near quarry sites before blasting.
 - After each blasting incident, inspection is conducted in communities around quarry sites to identify any offsite damage to private property, which should be duly and equitably compensated.
 - All workers should be adequately protected from risk of fly rock and blasting noise through the provision of appropriate Personal Protective Equipment.
- c) **Risk of burns/scolds at asphalt plant:** This risk will be averted by Contractors using only licensed operators following stringent safety guidelines and operation procedures.
- d) **Fire safety:** Fire safety equipment and personnel will be provided in workers camp.
- e) **Slope failure:** Best construction practices will be used when constructing the road in steep/hilly sections along the Bypass.
- f) **Medical emergency response:** The Contractor will have a medical clinic and a standby vehicle to immediately ambulate any accident victims to emergency medical care facility. First Aid facilities will be provided on construction sites and in camps.

0.8 Monitoring Program

a) Institutional Arrangements

The Contractor will be required to prepare a standalone ESMP linking environmental and social activities associated with the road works in line with guidance issued by UNRA.

The primary oversight to ensure mitigation actions are implemented will rest with UNRA's Directorate of Projects working with Safeguards Unit under Directorate of Planning but District Environmental Officers of Kampala and Wakiso have regulatory supervisory and monitoring roles on behalf of NEMA.

UNRA shall require contractors to comply with this ESMP and assign a fulltime staff (Environmental Officer) to undertake environmental supervision during construction.

UNRA appoints full mandate to supervising engineering (SE) consultants to supervise the road project on a day to day basis. SE oversees all the work of the Contractor through an intermittent (not full-time) environmental specialist, undertaking site inspections. This specialist should guide the Contractor's full time Environmental Officer in undertaking his/ her own responsibilities, including reporting.

b) Monitoring and Reporting Arrangements – Regulatory Responsibilities

Monitoring will verify if predicted impacts have actually occurred and check that mitigation actions recommended in the ESIA are implemented and their effectiveness. Monitoring will also identify any unforeseen impacts that might arise from project implementation.

Who monitors and how: Monitoring will be undertaken by UNRA (Directorate of Projects) and Environmental Officers who represent NEMA at local administrative. Monitoring by NEMA is “third party monitoring” but this is its regulatory mandate according to Sections 6 and 7 of the *National Environment Act* (Cap 135) and no funding is expected from UNRA.

Another government agency that may undertake “third party monitoring” is the Occupational Health & Safety Department in Ministry of Gender, Labour & Social Development (MGLSD). This unit has authority to inspect any facility for compliance with national requirements on safety in workplaces. The project shall make no funding to MGLSD since this is provided for in its annual budget.

Monitoring will be undertaken through site inspection, review of grievances logged by stakeholders and *ad hoc* discussions with potentially affected persons. For each monitoring visit, a discussion with a chairperson of environment committee of the area's local council (LC) could provide insight into views and grievances a given community has about the project.

Frequency: Monitoring will be undertaken monthly over the construction period.

Reporting: Detailed monthly monitoring reports shall be compiled by the Contractor's environmental officer under oversight of the supervising engineer (SE). The reports will be based on records kept as per requirements of the General Specifications of the Road & Bridge Works (pg 1000-38), Section 77 of the *National Environment Act Cap 153* and guidance issued by UNRA. These detailed reports with evidence of compliance shall be prepared and appended to summary monthly reports.

c) Contractor obligations

The road construction contractor is required to develop a Contractors Environmental & Social management Plan (CSEMP). UNRA enforces implementation of provisions of the CSEMP through the SE and Contractor. In addition to monitoring the implementation of environmental provisions by the SE's Environmental personnel, UNRA's Environmental Specialist, Sociologist and Land Acquisition Specialist will oversee effective implementation of measures suggested through the Engineer and Contractor. A specialist agency tasked with implementation of HIV/AIDS sensitisation and control will be procured through the Contractor. At field level, the Contractors' *Environmental and Health and Safety Officer* will be responsible for implementing the CSEMP.

0.9 Public Consultations

During conduct of the ESIA, consultations were made with local communities traversed by the road and relevant government agencies. At the beginning of the study, proposed project design and activities were presented to stakeholders in meetings and attendant issues discussed leading to development of a scoping report whose findings were subsequently utilised in detailed ESIA study. Some of stakeholder provided construction-phase guidance such as need for permits from Water Resources Management Directorate (WRMD). Key findings and outcomes of public consultations are outlined in Table ES3:

Table ES3: Summary of key potential impacts.

Issue		Key concerns/ suggestions
1	Degradation of wetlands	Loss of wetland cover, inducing uncontrolled access to wetlands, sediment and silt deposition, loss of biodiversity habitat
2	<i>Flooding risk</i>	Increased flooding area and peak flood stage, poorly designed and installed culverts,
3	<i>Local labour</i>	Local communities preferred to be given first priority when recruiting road construction labour.
4	<i>Environmental contamination</i>	There is need to protect drinking water sources and surface watercourses along the road from pollution during construction.
5	Traffic management	Increased traffic delays during construction, poor signing and marking construction equipment
6	<i>Landscaping for erosion control</i>	Planting trees and grasses close to the road should help to stop risk of erosion that would deposit soil onto the road during its use (post-construction phase).
7	<i>Dust control</i>	Control of dust during construction activities is essential especially in trading centres to minimise spoilage of goods in shops such sugars, salt and four.
8	<i>Noise and vibration</i>	Working beyond daytime hours, cracking of structure resulting from equipment vibrations

10.0 Conclusion

Given the location of Bypass, ESIA findings indicate that flooding risk and degrading the wetland system are key impacts of the Scheme. Direct negative impacts will include soil erosion, scouring of the landscape due to opening of borrow pits, inadequate revegetation, dust, noise and vibrations during road construction, increased sediment loads to wetland system, and occupational safety hazards, traffic diversion and accidents. In addition, an improved road (as has been observed with the existing road) is likely to increase access to illegal or excessive exploitation of the wetlands. However, positive impacts from road improvement activities will occur and indeed justify this project. Secondary beneficial impacts include improved accessibility, reduced public transport costs, road safety, improved access to social services, improved local economies and induced development. Other benefits include stimulation and development of roadside economic activities, increased social mobility and access to social services especially health.

1 INTRODUCTION

The Government of Uganda (GOU), represented by the Uganda National Roads Authority (UNRA) intends to expand the existing Kampala Northern Bypass to create a double carriageway along its entire 21 km length from Busega Roundabout to Jinja Road intersection in Kireka. The bypass traverses two districts of Kampala and Wakiso and these areas will be the focus of the ESIA study.

In February 2010, UNRA contracted Mott MacDonald Uganda Limited, and Kagga and Partners to carry out the full engineering and environmental design for the construction of the Kampala Northern Bypass. *Air Water Earth (AWE)* was subcontracted to undertake Environmental and Social Impact Assessment (ESIA) for the Scheme and an Abbreviated Resettlement Action Plan (ARAP) where additional land shall be required as a result of the new design.

Currently, only a 3.5 km stretch of the Northern Bypass between *Hoima Road* and *Gayaza Road* is dual carriageway and remaining 17.5 km is single carriageway. Therefore, ESIA associated with this project focuses on capacity improvements of the 17.5km section by upgrading it to a dual carriageway.

The goal of upgrading the Kampala Northern Bypass to a dual carriageway is to ensure that it has adequate capacity to quickly evacuate present and future traffic volumes away from the city. The bypass, thus, provides an alternative route for the heavy traffic heading to the western parts of the country.

It is anticipated that the Northern Bypass widening project and development induced by it, will stimulate and uplift economic conditions and increase demand for infrastructure services along areas it traverses. However, project activities may also bear social-environment changes that could directly or indirectly affect communities traversed by project, hence the justification for this ESIA.

According to the *Third Schedule of National Environment Act, Cap 150*, "Section 3(a) All major roads", the proposed project fits among the 13 categories of projects that should undertake full Environmental Impact Assessment (EIA) before implementation. In addition, the National Environmental Act Cap 153 (Section 3a & b) requires any major repairs, extensions or routine maintenance of roads and all roads in "scenic, wooded or mountainous areas" to undertake an EIA. Thus, the objective of the study was to assess potential environmental and social impacts of the project. The ESIA process in Uganda comprises steps presented in Figure 1.1.

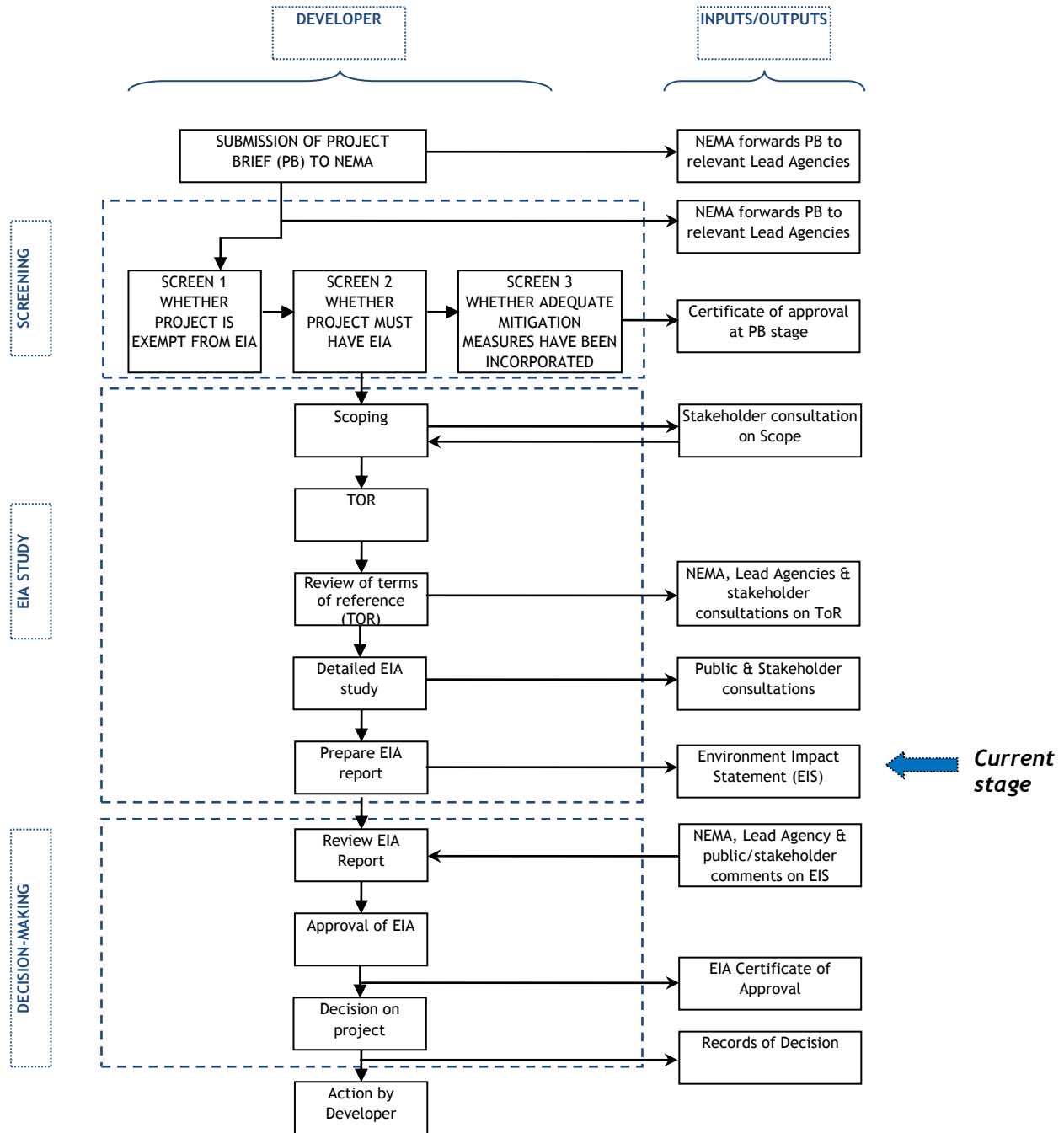


Figure 1.1: EIA Process in Uganda¹

¹ Source: Appendix C (EIA Process in Uganda) of EIA Reference Manual, NEMA, June 2002

The analysis of environmental and social impacts of the Project is presented within this report and arranged in the following chapters:

- Chapter 1: Introduction.
- Chapter 2: Provides project description.
- Chapter 3: Assessment methodology.
- Chapter 4: Policy, legal and institutional framework.
- Chapter 5: Socio-economic & environmental baseline.
- Chapter 6: Result of scoping and stakeholder engagement.
- Chapter 7: Potential impacts & mitigation recommendation.
- Chapter 8: Impact monitoring & management plan.
- Chapter 9: Conclusions.

2 PROJECT DESCRIPTION

2.1 THE SCHEME

The Kampala Northern Bypass is intended to relieve the city of its current severe traffic congestion and also serve as part of a wider programme to reduce transportation constraints along the northern corridor for both national and regional roads.

The location of the Kampala Northern Bypass route is presented in Figures 2.1 – 2.3. The alignment begins at Busega–Masaka Road Roundabout and proceeds for about 200 m north along the Mityana Road. It heads north-east and follows the edge of the Lubigi Swamp, skirting north of Luby Hill and crossing Hoima Road at Nnamungoona. The alignment then passes Kawaala Hill behind Makerere Hill, before reaching Bombo Road at a junction with Sir Apollo Kagwa Road. The route then runs through Bwaise and south of Kyebanda Hill before crossing the swamp again to Bukoto, Kigoowa and Nsimbi Ziwoome, to the south of Kkulambiro Hill. From Kkulambiro, the Kampala Northern Bypass crosses to Kiwatule, Kamidi before joining Jinja Road at Ntebettebe opposite Nelson Mandela National Stadium at Nambole. The existing alignment traverses swamps and streams, and roundabouts have been constructed in the following locations (where the alignment crosses other existing roads):

- Roundabout on Mityana Road;
- Roundabout on Sentema Road;
- Roundabout on Hoima Road;
- Grade-separated roundabout on the connection of Bombo Road and Sir Apollo Kagwa Road (situated on existing dual section so exempt from this scheme);
- Roundabout on Gayaza Road;
- Roundabout on Bukoto-Kyebando road;
- Roundabout on Nitinda Road;
- Roundabout on Naalya Road; and,
- Jinja Road Interchange.

Development of the Kampala Northern Bypass has been implemented in a staged approach comprising of construction of 21km of road of which 17.5km is single carriageway road and 3.5km is dual carriageway road between Hoima Road and Gayaza Road. For this Scheme the 17.5km single carriageway section will be expanded to a dual carriageway.

The proposed carriageway will add an additional 19m width to the existing 11m roadway, creating an overall roadway width of 30m. The exact cross-section will vary along the length depending on the super elevation and location of new drainage channels, which may be required within the central median. The proposed carriageway will consist of:

- 2 lanes each 3.5m wide;
- 2 hard shoulders each 2m wide;
- 1 median of 6 meters; and,

- Drainage ditches of varying size adjacent to the road and within the central median (existing drainage consists of culverts and there are pipes and gully systems at the road junctions).

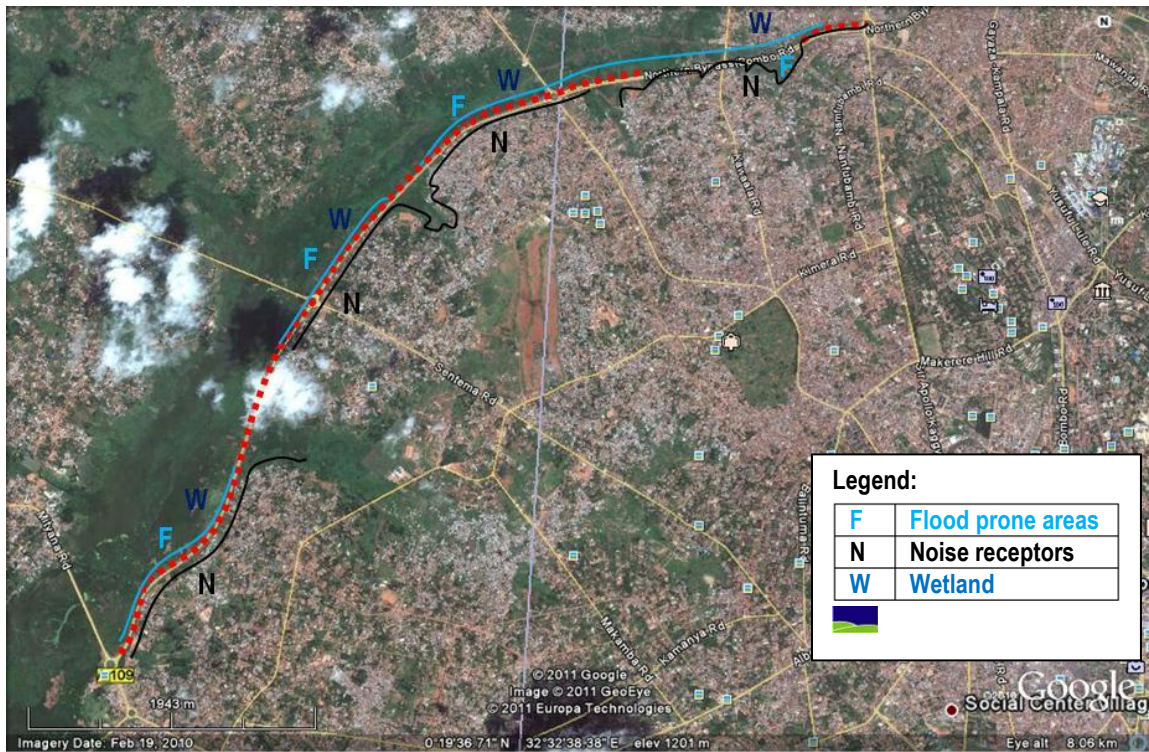


Plate 2.1: Location of the western end of the Northern Bypass showing the flood prone areas, noise receptors and wetland system.

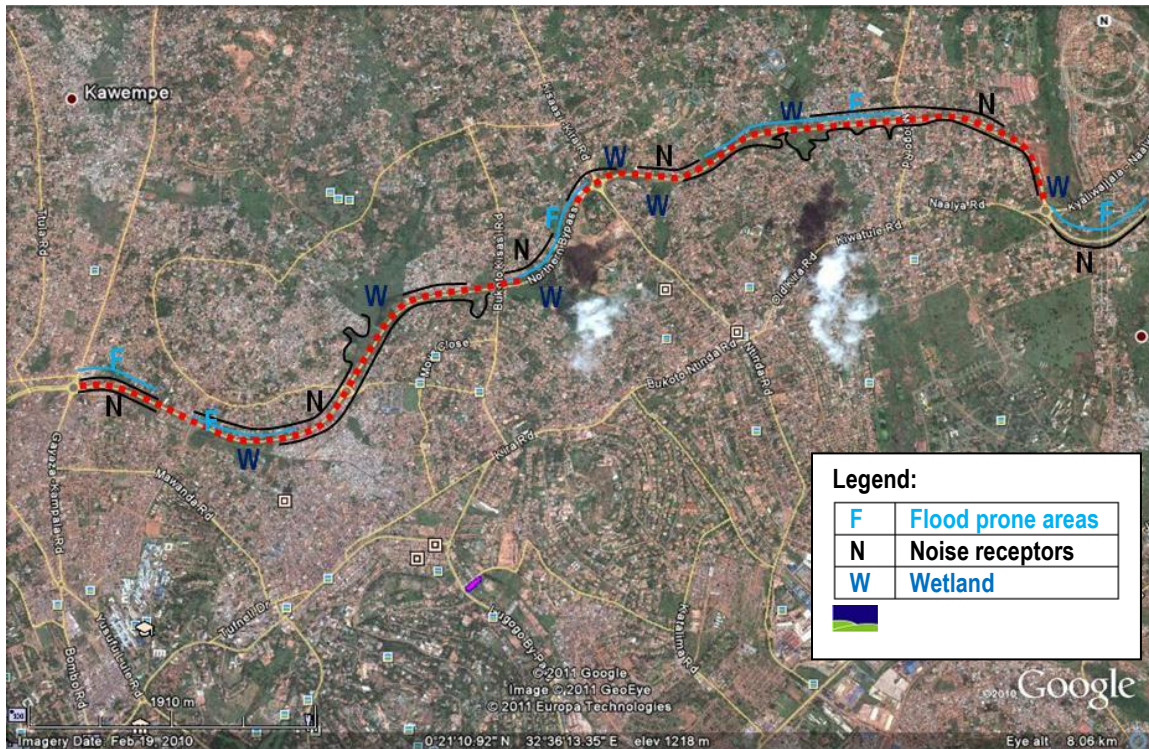


Plate 2.2: Location of the mid-section of the Northern Bypass showing the flood prone areas, noise receptors and wetland system.

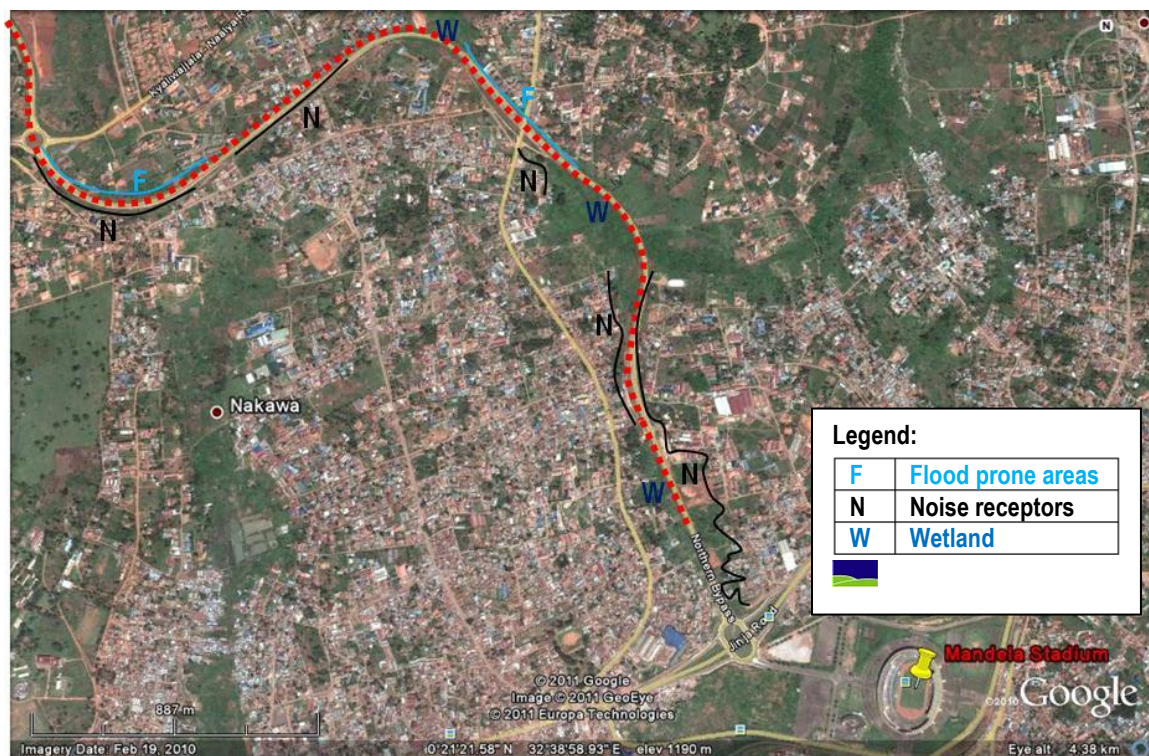


Plate 2.3: Location of the mid-section of the Northern Bypass showing the flood prone areas, noise receptors and wetland system.

Ancillary features will consist of traffic signs, guardrails, vehicle restraint system, road markings, reflecting road studs, kerbing, footpaths, street lighting at junctions and interchanges, and landscaping. The full details of these features may alter as the Scheme design progresses.

2.2 CONSTRUCTION STRATEGY

This section sets out the construction activities for the proposed Kampala Northern Bypass Capacity Improvements. This Construction Strategy aims to assist the initial assessment of construction related issues. The Contractor, who is commissioned to undertake the Works, may choose different methods of working and an alternative programme. The following information is therefore approximate and for guidance only.

2.2.1 PAVEMENT SPECIFICATIONS

The pavement construction of the Kampala Northern Bypass shall be assumed to be:

- 150 mm Surface course;
- 220 mm Base course;
- 400 mm Sub-base; and,
- 550 mm Capping layer where CBR <15%.

The pavement construction of the footpath shall be:

- 20mm Wearing course;
- 40mm Base course; and,
- 150mm Sub-base.

2.2.2 CONSTRUCTION PERIOD

The programme will show a construction period of at least two years for the main Civil Engineering works. This is likely to commence in 2015.

2.2.3 WORKS STRATEGY

Space for storage and haul roads is likely to be limited throughout the length of the corridor. Towards the western end, Section 1, although only a few buildings exist adjacent to the road however the ground is predominantly swampy making it difficult to utilise.

Towards the eastern end of the scheme there are numerous properties along the length of the corridor which will also make haul roads and storage problematic.

2.2.4 TRAFFIC MANAGEMENT

The Kampala Northern Bypass will be kept open to traffic during the construction stages. Where improvements are taking place to the junctions, a staged approach will be introduced to ensure the junction remains open.

Delays to traffic during the construction stage will be inevitable, but warnings will be publicised widely in the local media and clear local signing and traffic management in place.

2.2.5 SITE COMPOUNDS AND ACCESS

The location of the site compound is yet to be determined, but it would be sensible to establish the compound in Section 1 due to the increased available space. Based on local knowledge adjacent to Hoima junction (North-west corner) may be a good location as this is the furthest point east on section 1 and a settlement has recently being demolished suggesting competent ground.

2.2.6 WORKING HOURS

The site working hours will need to be agreed with Kampala City Council (KCC) but it would be advisable to only work in daylight hours for health and safety reasons and in particularly for security reasons.

- Monday Friday - 0700 hours – 1900 hours;
- Saturday 0800 hours – 1700 hours; and,
- Sunday No works.

2.2.7 METHOD OF WORKING: EXCAVATION OF MATERIALS – SURPLUS, SORTING AND CATEGORISATION

It is not possible to achieve an earthworks balance due to the existing road alignment and site limitations. However, an effort has been made to reduce and amount of earthworks required where possible including a proposed split level carriageway in places.

2.2.8 WORKING ALONG THE LENGTH OF THE CORRIDOR

Due to land constraints, the Contractor may choose to combine various activities, such as installing drainage, preparing formation and laying capping materials for permanent works whilst undertaking topsoil excavations and placing of fill. This will help reduce traffic movements.

2.2.9 KEY TRANSPORT RELATED CONSTRUCTION PRINCIPLES

The following principles have been defined in relation to transport issues during construction.

- Construction Time Constraints;
 - Construction activity will be undertaken between 0700 and 1900; and,
 - HGV movements associated with construction may be restricted to between 0930 and 1600 to avoid the peak traffic.
- Construction Staff Access;
 - Construction workers are unlikely to drive private vehicles and will typically arrive at site by matatu.
- Construction Materials/Plant Access;
 - It is likely the least disruptive route for HGVs and plant will be to travel along the Northern Bypass. Smaller access roads are likely to easily become blocked by HGVs and some are totally unsuitable for this type of vehicle.
- Removal of Waste material;

- HGV movements will generally be restricted to the Kampala Northern Bypass. Suitable routes to and from site will be defined and HGVs must stick to these.

2.2.10 CONSTRUCTION STAGES AND PREDICTED RELATED HIGHWAY IMPACT

It is intended to keep the existing carriageway fully functional during the construction of the proposed carriageway. Disruption will be experienced at the junctions and during the footbridge construction stages. This will be well publicised and temporary traffic management will be in place to mitigate any delays and disruption as much as possible.

An overall traffic management plan is likely to be necessary to ensure that the local roads do not unduly suffer from localised congestion as a result of the works.

It is recognised that the local highway network is already at/over capacity during the peak hour periods and that high number of vehicles simply travel north to south across the bypass at a junction.

2.3 ANALYSIS OF ALTERNATIVES

2.3.1 'NO PROJECT' SCENARIO

The existing alignment has only 3.5km of dual carriageway, with the remaining 17.5 km being single carriageway. Without the proposed development, the Kampala Northern Bypass would not have the capacity to adequately evacuate heavy traffic volumes from the city, which is the original objective of the bypass. The "No Project" Scenario would therefore result in increased traffic congestion within the city and its suburbs as vehicle numbers grow.

2.3.2 ALTERNATIVES CONSIDERED

Alternative junction arrangements for the roundabouts are currently being investigated for the Scheme. The options include:

- Option 1: At-grade widening of all entries from one to two lanes or two to three lanes, with free-flow left turn lanes provided. When modelled, the at-grade improvements did not noticeably increase capacity.
- Option 2: A grade separated design with the mainline at-grade and the junction elevated in a similar design to Gayaza Junction. Although the Northern Bypass will benefit from the elevated roundabout, the junction is still not able to cope with 2015 predicted traffic levels at all junctions. Land-acquisition beyond the existing road reserved currently under the ownership of UNRA would be required for the grade separated design. If this option is to be pursued, a resettlement Action Plan or Abbreviated Resettlement Action Plan is likely to be required.

In addition to the alternative junction arrangements, alternative options for lighting the Scheme are currently being investigated. At present, lighting is only provided at the junctions on the existing Northern Bypass. It is understood from local residents and Police that this lighting is often not lit for various reasons and that the lighting installation has suffered from theft of cables

and other components. During the Feasibility Design Presentation the following three options were presented to UNRA:

- Option 1: Links remain unlit but lighting provided at junctions. This satisfies the Ugandan Geometric Design Manual Section 12.8 but keeps lighting costs to a minimum.
- Option 2: Links and junctions are lit using conventionally mains powered street lighting.
- Option 3: Links and junctions are lit using solar powered street lighting. UNRA expressed a desire to light both the links and junctions and were particularly keen for a solar system to be investigated.

3 ASSESSMENT METHODOLOGY

This Chapter presents the Methodology applied throughout this ESIA in undertaking environmental and social surveys along the route alignment, and in determining the significance of environmental and social impacts.

3.1 BASIS OF THE ASSESSMENT

The environmental and social impacts of Kampala Northern Bypass was predicted within this ESIA in relation to environmental and social receptors. That is, people (e.g. residents of villages and settlements, land use and domestic animals *etc*), and natural resources (e.g. wetlands traversed). This was undertaken by comparing baseline conditions (i.e. the situation without the Scheme) with conditions that would prevail if the Scheme is to be implemented.

Following initial site investigations undertaken for the Environmental Inception Report in November and December 2010, and for the Scoping Report (March 2011) which has been approved by NEMA, a series of additional assessments within areas of Kampala and Wakiso District have been undertaken as part of this ESIA, as well as consultations with local communities along the road, national agencies and stakeholder groups such as the World Wildlife Fund (WWF) and International Union for the Conservation of Nature (IUCN).

3.2 METHODOLOGY

3.2.1 DOCUMENT REVIEW AND DESCRIBING THE PROPOSED SCHEME

Details of project have been established through liaison with the design team. This is an on-going and iterative process and enables the parameters which could give rise to social or environmental impacts during both widening and subsequent use of the Bypass to be defined. Further details regarding the Project Description and Construction Activities are provided within Chapter 2 (Project Description).

3.2.2 BASELINE TECHNICAL STUDIES

Baseline assays have been undertaken to establish pre-project socio-environmental conditions including topography; soils; climate; air quality; traffic noise, ground and surface water; terrestrial ecology including vegetation and protected species; aquatic environment in swamps; primary and secondary production; religious and cultural background; population and demographics; ethnic groups; historical resources if any along bypass; aesthetics and tourism; infrastructure; education; land tenure; land use; fisheries; employment; agriculture and public health. Baseline information is presented in Chapter 5 of this report, with further information provided within Appendices I and II for the Biological, Noise surveys that have been undertaken and used to establish the existing condition.

3.2.3 IMPACT ASSESSMENT

Prediction and evaluation of potential impacts (both positive and negative) of the Scheme was undertaken using relevant methods and criteria detailed below. This Methodology was agreed with NEMA through the submission of the ESIA Scoping Report (March 2011). As with any development, it is vital that decision-making about environmental aspects of the Bypass to

the ESIA is based on a comprehensive analysis of possible impacts. To aid this process, the Consultant drew on its in-house tools that advance the management of impacts beyond the current industry norm. This is especially the case for linear developments where impacts can be spatially widespread. For example, noise modelling has been undertaken which has been utilised to suggest suitable locations to consider for placement of noise barriers or noise fencing which would mitigate for noise impacts along the route alignment. These measures may be included within the current design or for future upgrades of the Bypass.

It is important to consider impacts at all stages of the Scheme development and also to include possible induced or cumulative effects. The methodology applied ensures that cumulative effects are 'captured' within the impact assessment process, and ensures that the relative contribution of the Scheme can be ascertained in cases where significant adverse effects are likely. Examples include how the new Bypass will impact upon localised flooding where this already occurs as a result of the existing road, and what impact the Scheme would have on accidents at road crossings. Both of these issues are considered as cumulative for the Scheme, in conjunction with the existing situation.

While there is no statutory definition of what constitutes a significant impact, it is clear that the preliminary purpose of identifying the significant impacts of a project is to provide the decision-maker (in this case, NEMA) with sufficient information to enable them to make an informed and robust consent decision. On this basis, a significant impact is defined as an impact that, either in isolation or combination with others, should be taken into account in the decision-making process.

The approach to assigning impact significance will rely on reasoned argument, professional judgement and advice of relevant lead agencies and other stakeholder organisations. Determining significance of environmental impacts will include the following, as illustrated within Table 3.1:

- Assigning environmental value;
- Assigning magnitude of impact;
- Assigning significance; and,
- Cumulative effects.

Table 3.1: Determining Impact Significance.

	Magnitude of impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Source: Adapted from the UK Design Manual for Roads and Bridges; Volume 11 Environmental Assessment

3.2.4 CONSULTATION

Stakeholders and community groups have been engaged through a series of meetings, phone interviews, and emails. The aim has been to inform, and seek feedback in the simplest, quickest and convenient way for various stakeholder categories.

Consultation with relevant organisations and people are fundamentally important throughout the ESIA process, both from the point of view of informing them about the direction of the study and in ensuring that all interested parties are made aware of these findings. Further information regarding stakeholder engagement is provided in Chapter 6. Parties that have been consulted include:

- National Environment Management Authority (NEMA);
- Wetlands Management Department (WMD);
- Division police stations where the Bypass crosses will be consulted to obtain accident data and their causes so as to mitigate likelihood of these happening in future;
- Kampala City Council (KCC);
- Local Communities at Kawempe and Wakiso;
- The World Wildlife Fund (WWF);
- The International Union for the Conservation of Nature (IUCN); and,
- Petroleum Supplies Department (PSD).

3.2.5 TRAFFIC NOISE MODELING

Baseline noise monitoring was undertaken by AWE engineers in July 2011 at seven representative receptors close to the existing single carriageway. It has been undertaken so as to enable a quantitative assessment of road traffic noise impacts along the Bypass. An Extech 407730 digital noise logger used was set to record for a sample period of 10 minutes at each potential receptor. The receptor locations are given in Table AII.1 of Appendix II with their corresponding measured noise levels. Weather affected noise data were excluded from the results. The predominant noise source at the noise monitoring locations was road traffic noise.

3.2.6 AIR QUALITY SURVEYS

The baseline for air quality assessment was quantified through the following activities:

- Review of national policies and laws/regulations;
- Measurement of dust was undertaken with Casella MicroDust (Plate 3.1) portable instrument whereas air quality was measured with MX60 multi-gas meter; and
- Randomly selected points along the route were selected for the air quality baseline survey.



Plate 3.1: Dust (TSP and PM_{2.5}) measurement was undertaken using a *CASELLA MicroDust*.

3.2.7 FLORA AND FAUNA (BIRDS)

A reconnaissance drive-through was initially undertaken to identify sampling areas for flora and fauna along the route corridor. All sections of the existing road were assessed from the Busega round-about in the extreme west to Bweyogerere round-about at the eastern end. Section 3 (Nansana Round-about to Bwaise Round-about) was missed as this was already a dual-carriage-way and outside of the zone of influence for the Scheme. Four sampling sites were then selected, to include sites with relatively intact and natural vegetation as well as altered areas. Additionally, sample sites were selected to cover all the remaining main vegetation types. These sample sites were all geo-referenced, for possible location in the future. The project area was characterized from the floristic and landscape features observed in the different habitat types. For logistical and practical purposes only the flora and birds were surveyed.

Further information on the flora and fauna surveys and the results of the surveys is provided within Appendix I. This information has been used to inform the impact assessment and make recommendations for mitigating any impacts identified.

3.2.8 HYDROLOGY

A study of the hydrological environment has been undertaken for the Scheme by Kagga and Partners (September 2010). The Hydrological Report describes the hydrological study undertaken for the Scheme, and involved the following activities:

- Culvert / Bridge inspection and assessment;
- GIS analysis; and,
- Hydrology and hydraulic analysis.

The Hydrological Report has been used to inform this ESIA and the assessment of impacts upon the water environment.

3.2.9 SOCIAL ECONOMIC ASSESSMENT AND SURVEYS

3.2.9.1 Assessment Rationale

The social and economic assessment identified the potential impacts arising as a result of the proposed upgrade. Emphasis of the analysis was put on events that would be experienced by people as changes in one or all of the following:

- People's way of life – how they live, work, play and interact with one another on a day to day basis.
- Their culture – shared beliefs, customs and values.
- Their community – its cohesion, stability, character, services and facilities.

3.2.9.2 Social Surveys

Social surveys were conducted through the following methodologies:

- Structured questionnaire;

- Interviews;
- Focus group discussions; and,
- Public meetings in villages and trading centres along the road.

3.2.10 MITIGATION/ENHANCEMENTS

Where potential negative impacts are predicted, practical and cost-effective mitigation or compensation options which minimise such effects to acceptable levels are identified. Similarly, where appropriate opportunities for enhancement exist, these are identified and recommended.

Mitigation will be considered from the outset of the assessment process, and this will require continued close communication between the design team. This coordinated approach will ensure delivery of realistic and successful mitigation that can be achieved as an ongoing process.

3.2.11 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Mitigation and management measures are clearly specified in the Environmental Management Plan (EMP). This identifies specific measures for addressing impacts including who is to be involved and how these should be implemented and monitored. The EMP should be incorporated in the Contract Documents for the Scheme.

Environmental monitoring will ensure that impacts as a result of the Scheme and mitigation effectiveness are monitored, and in some cases will enable the prevention of impacts from early intervention. Recognising that mitigation should be supported by the appropriate resources and capacity to implement them, the EMP includes cost estimates where applicable and issues such as capacity required by implementing agencies.

4 POLICY, LEGAL & INSTITUTIONAL FRAMEWORK

In this chapter, the policy, legal and institutional framework within which the ESIA was conducted are discussed. National regulations are discussed along with relevant international agreements and conventions to which Uganda is a party.

Road development may have serious impacts on the environment from two perspectives: first, effects of construction/improvement itself and the resulting disturbance of ecological and social systems especially impacts on property rights; and secondly, after the road has been constructed/improved, the economic activities it creates may have both negative and positive impacts on the environment and social setting of the areas it traverses. These environmental and social effects must be managed within a legal framework.

Uganda has various laws, policies and institutional set up governing the management of its natural environment as discussed in the following sub-sections.

4.1 POLICY FRAMEWORK

4.1.1 THE NATIONAL ENVIRONMENT MANAGEMENT POLICY, 1994

This policy aims to promote sustainable economic and social development mindful of the needs of future generations and EIA is one of the vital tools it considers necessary to ensure environmental quality and resource productivity on long-term basis. It calls for integration of environmental concerns into development policies, plans and projects at national, district and local levels. Hence, the policy requires projects or policies likely to have significant adverse ecological or social impacts to undertake an ESIA before implementation. This is also reaffirmed in the National Environment Act, Cap 153 which makes ESIA a requirement for eligible projects including roads.

4.1.2 NATIONAL WATER POLICY, 1999

A key objective of this policy is to guide development and management of water resources in Uganda following integrated and sustainability concept so as to secure and provide water of adequate quantity and quality for all social and economic needs, with full participation of all stakeholders and mindful of the needs of future generations. The policy was set to:

- Promote rational use of water.
- Promote provision of safe water supply for domestic use.
- Promote orderly development and use of water resources for purposes other than domestic including transport or navigation.
- Control pollution and promote the safe storage, treatment and disposal of waste, which could pollute water and impact public health.

The policy is relevant where project development could impact quantity or quality of groundwater and surface water resources. The proposed project traverses a numbers of water resources (rivers, streams and wetlands).

4.1.3 WETLANDS POLICY, 1995

The National Policy on conservation and management of wetland resources aims at curtailing pollution and loss of wetland resources. Relevance of this policy lies in the fact that the proposed road will cross some wetlands.

4.1.4 MINISTRY OF WORKS & TRANSPORT POLICIES (GENDER, HIV/AIDS, OHS) 2008

a) Gender policy

Overall objective of this Policy is to strengthen contribution of roads to poverty eradication through providing an enabling environment where women and men participate in, and benefit from, developments in the sub-sector in an equitable manner. The purpose of the Policy is to institutionalize a gender perspective in road institutions and their operational and regulatory frameworks.

The specific objectives of the Gender Policy are to:

- Promote gender-responsive sub-sector policies, programmes and plans;
- Promote gender-responsive service delivery;
- Enhance equality of opportunities between women/girls and men/boys in the sub-sector;
- Commit adequate resources to gender-responsive activities in the sub-sector; and,
- Strengthen capacities of sub-sector institutions, partners and service providers to mainstream gender.

b) HIV/AIDS policy

The Uganda National HIV/AIDS Policy (2004) requires all Government Ministries to develop specific policies for guiding the process of mainstreaming HIV/AIDS activities in respective sectors. MoWT developed the HIV/AIDS policy for the road sector based on the premise that whereas some road-sector activities have been proved to be major conduits for transmission of HIV/AIDS, others directly and indirectly contribute to the fight against the pandemic. For instance, good roads and transport services can be used to enhance access to HIV/AIDS prevention services and care. On the other hand, some sector activities and good road networks have proved to be a good conduit for increased spread of the pandemic and examples include prostitution associated with long-distance truck drivers and road construction works.

The goal of this is to guide mainstreaming of HIV/AIDS activities so as to reduce prevalence of HIV infection, provide care and support to infected and affected persons and to mitigate effects of HIV/AIDS in the sub-sector. Specific objectives of the policy are to:

- Reduce vulnerability and risk of HIV transmission in the roads sub-sector;
- Mitigate effects of HIV/AIDS in the roads sub-sector; and;
- Improve road sector's capacity to respond to HIV/AIDS pandemic.

c) OHS policy

The policy seeks to:

- Provide and maintain a healthy working environment.
- Institutionalise OHS in the road-sector policies, programmes and plans.
- Promote efficient road safety management practices.
- Contribute towards safeguarding the physical environment.

The OHS Policy Statement is guided by the Constitution of the Republic of Uganda and other global, national and sectoral regulations and policies. The Statement also takes into recognition of the Transport Sector Policy and Strategy Paper, and the Health Sector Strategic Plan, all of which aim to improve the quality of life for all Ugandans in their living and work settings.

4.2 LEGAL FRAMEWORK

4.2.1 CONSTITUTION OF THE REPUBLIC OF UGANDA, 1995

The 1995 Uganda Constitution provides that every person has a right to own property [Section 26(1)] and that no person shall be compulsorily deprived of property or any interest in or right over property without prompt payment of fair and adequate compensation, prior to the taking of possession or acquisition of the property.

Article 237 (a) on landownership indicates that government or a local government may, subject to article 26, acquire land in public interest. Article 237(b) entrusts the central government or local government with the responsibility to hold in trust for the people and protect, natural lakes, rivers, wetlands, forest reserves and any resources to be reserved for ecological and tourism purposes for the common good of the Ugandan people. Article 39 of the Constitution gives every Ugandan a right to a clean and healthy environment.

The constitution is the mother law from which all laws discussed below and those governing environmental protection are derived.

4.2.2 NATIONAL ENVIRONMENT ACT, CAP 153

The National Environment Act (Chapter 153) establishes and defines functions and authority of the National Environment Management Authority as a body responsible for management, monitoring and supervision of all environmental conservation activities (Section 4).

This act provides for various strategies and tools for environment management, which also includes the ESIA (Section 19) for projects likely to have significant environmental impacts. NEMA sets multimedia environmental standards (Sections 24-32) to prevent contamination of air, water and soil resources. Sections 34 (a) and (b) outline restrictions on use of rivers stating that no person shall, in relation to a river use, erect, reconstruct, place, alter, extend, remove or demolish any structure or part of any structure in, on, under or over the bed or excavate, drill, tunnel or disturb the bed without due authorisation of the Authority (or NEMA). Section 56 prohibits discharge of hazardous substances, chemicals, oil, etc into the environment except in accordance with guidelines prescribed by NEMA.

The Act also mandates NEMA with responsibility for *in-situ* and *ex-situ* conservation of biological fauna and flora resources either on land or in water (Sections 42 and 43). Section 45 provides for guidelines and measures to protect and manage forests. Section 48 provides powers to NEMA, the district environment committee and local environment committees to be responsible for monitoring implementation of local land-use plans, which shall be in conformity with the national land-use plan. Section 106 outlines provisions to enable compliance with obligations of international conventions on the environment.

The Act requires that the central government collaborates with the local governments in the following areas:

- Management of lakes and rivers,
- Management of lakeshores and riverbanks,
- Management of wetlands
- Management of hilltops, hill-sides, and mountainous areas,
- Conservation of biological resources,
- Management of forests,
- Planting of woodlots,
- Management of range lands,
- Land use planning.

This Act prescribes projects for which EIA is mandatory, and road projects are one of these (Section 3 in Third Schedule of the Act).

4.2.3 WATER ACT, CAP 152

The objective of the Act is to enable equitable and sustainable management, use, and protection of water resources of Uganda through supervision and coordination of public and private activities that may impact water quantity and quality.

Section 18 requires that before constructing or operation of any water works, a person should obtain a permit from Water Resources Management Directorate (WRMD). Construction works is herein defined to include alteration, improvement, maintenance and repair of works partly or wholly situated within or on the bed or bank of any water course and therefore this provision is relevant to bridges. The Act also aims to control pollution of water resources (Sections 20 and 31).

The foregoing notwithstanding, Section 19 provides that subject to guidelines established by the Minister from time to time, the Director (of Water Resources Management) *may* exempt a public authority or a class of persons or works from requirements in Section 18 on such conditions as he or she may deem fit. UNRA is mandated to develop such infrastructure on national roads from time to time and as a Public Authority under national laws including the Water Act could, therefore, benefit from this provision.

4.2.4 LAND ACT, CAP 227

The Act addresses four issues namely, *holding*, *control*, *management* and *dispute resolution* related to land ownership. As regards tenure, the Act repeats in Section 3 provisions of Article

237 of the Constitution which vests all land in the citizens of Uganda, to be held under *customary, freehold, mailo* and *leasehold* tenure systems. It then defines the incidence of each tenure regime (section 4); provides mechanisms of acquisition of certificates of customary ownership (sections 5-9); the conversion of customary tenure to freehold (sections 10-15), or collective management of land held under customary law (sections 16-27); the protection of the rights of women, children and persons with disability (sections 28); the conversion of leasehold into freehold (section 29) and the security of tenure for ‘tenants by occupancy’ (sections 30-39).

Provisions regarding land administration (referred to in the Act as “management”) are adequately detailed in the Act which also creates a series of land administration institutions consisting of *Parish Land Committees, District Land Boards* and *Uganda Land Commission* (ULC). Each of these entities is largely autonomous of one another and is entrusted with functions that range from the holding of lands not subject to private ownership, management of land thus held, processing applications for various grants and certificates, registration and transfer of interest in land (sections 47-74).

The Land Act provides for a decentralized system to resolve land disputes in Uganda (sections 75-90) through establishment of Land Tribunals at all levels of local government and that they should first arbitrate land disputes before resorting to legal courts of law. No other organ, except informal traditional authority mediators (section 89) will henceforth have jurisdiction over land disputes (section 98). Therefore, the Act favours local landowners by advancing a process that is both localized and free from costs and formalities associated with formal judicial courts.

Section 70 “Water rights” of the Act states that subject to section 44, all rights in the water of any natural spring, river, stream, watercourse, pond, or lake on or under land, whether alienated or unalienated, shall be reserved to the Government; and no such water shall be obstructed, dammed, diverted, polluted or otherwise interfered with, directly or indirectly, except in pursuance of permission in writing granted by the Minister responsible for water or natural resources in accordance with the Water Act.

This is the key Act in respect to land acquisition and compensation during project implementation.

4.2.5 ROAD ACT, CAP 358

The Road Act (Cap 358 of the Laws of Uganda) provides for the establishment of road reserves and for the maintenance of roads by empowering the responsible Minister of Works and Transport to declare road reserves by Statutory Instrument. The need for Government to maintain basic control over developments along the road is to ensure that basic necessities of maintaining road geometry and engineering needs such as sight lines, horizontal curvatures, sight distances and road safety considerations. Also, it is in road reserves that utilities (electricity transmission lines and water mains) are installed. However, this control is exercised with flexibility in order to minimise social-economic consequences arising from use of road reserves for cultivation by rural communities.

4.2.6 TOWN AND COUNTRY PLANNING ACT, CAP 246

Uganda’s 1995 Constitution provides that government may, pursuant to laws made by parliament and government policies, regulate the use of land. The principal law on land use and

land planning in urban and rural areas is the Town and Country Planning Act. The Act establishes the Town and Country Board charged with the duty of planning and orderly development of towns and rural areas. The board advises the minister and local authorities in its duties. Local Planning Committees may be formed, to which the board may delegate duties. The Act established guidelines for developing planning schemes, acquisition of land and compensation for acquired lands. The Second Schedule to the Act outlines measures designed to safeguard the natural environment. Any land in the planning area required for road, open space gardens, schools, places of religious worship and recreation may be acquired on the advice of the board in relation to provisions of the law relating to compulsory acquisition. The Act also prescribes sites of new roads connecting to an existing road or the site of a proposed road.

4.2.7 LOCAL GOVERNMENTS ACT, CAP 243

This Act provides for decentralised governance and devolution of central government functions, powers and services to local governments that have own political and administrative set-ups. Districts have powers to oversee implementation of development activities. They also have units such as District Land Tribunals responsible for solving complaints that arise from land valuations, acquisition and compensation payments. According to Section 9 of the Act, a local government is the highest political and administrative authority in its area of jurisdiction and shall exercise both legislative and executive powers in accordance with the Constitution. District Local government of Kampala and Wakiso will have stakeholder and institutional responsibility over the proposed road project.

The Local Governments Act provides for a system of local governments which is based on the district. Under the district administration there are lower local governments and administrative units. This system provides for elected councils for which executive committee of each council is nominated by the chairman. Functions of this committee include:

- Initiating and formulating policy for approval of council;
- Overseeing the implementation of the government and councils' policies,
- Monitoring and coordinating activities of non-government organisations in the district; and,
- Receiving and solving disputes forwarded to it from lower local governments.

The Act provides for a decentralized system of government in which certain services have been made the responsibility of the central government, while others have been made the responsibility of the local governments. With regard to road services, the mandate to construct or maintain roads is shared between the central and district local governments, hence relevancy of this Act to the project.

4.2.8 PUBLIC HEALTH ACT, CAP 281

This Act aims at avoiding pollution of environmental resources that support health and livelihoods of communities. The Act gives local administrative units authority (Section 103) to prevent pollution of watercourses in interest of public good.

This Act will not only be relevant in regard to several watercourses along the road but also land where workers camps, equipment yards and quarries will be located.

4.2.9 NATIONAL ENVIRONMENT (WETLANDS, RIVER BANKS & LAKESHORES MANAGEMENT) REGULATIONS, 2000

These regulations provide principles for sustainable use and conservation of wetlands, and riverbanks. The relevance of these regulations to the ESIA study is embedded in the following requirements:

- ESIA is mandatory for all major activities on riverbanks and lakeshores (e.g. bridges); and,
- Measures such as preventing soil erosion, siltation and water pollution, should be put in place for protection of riverbanks.

4.2.10 NATIONAL ENVIRONMENT (STANDARDS FOR DISCHARGE OF EFFLUENT INTO WATER OR ON LAND) REGULATIONS, 1999

Section 6 (2) details maximum permissible discharge limits for 54 contaminants, that must not be exceeded before effluent is discharged into water or on land. Through limits on over 54 pollutants, these regulations control discharges in surface watercourses. Examples of some of the regulated pollutants are given in Table 4.1.

These regulations are important considering that the Bypass will cross several wetlands.

Table 4.1: National discharge standards for selected pollutants.

Parameter	National discharge standards
BOD ₅ (mg/l)	50
Suspended solids (mg/l)	100
Faecal coliforms	10,000 counts/ 100ml
Chlorine residual (mg/l)	1 mg/l
pH	6-8
Phenols (µg/l)	0.2 mg/l
Oil and grease (mg/l)	10 mg/l
Total Phosphorus (mg/l)	10 mg/l
Temperature	20-35°C

Source: *The National Environment (Standards for Discharge of Effluent into Water or on Land) Regulations, 1999.*

Section 4 of this regulation requires facilities to install pollution control equipment for onsite management of waste, effluent and emissions.

These regulations will influence management of effluent generated at workers camps and equipment yards.

4.2.11 NATIONAL ENVIRONMENT (WASTE MANAGEMENT) REGULATIONS, 1999

These regulations require waste disposal in a way that would not contaminate water, soil, air or impact public health. This is in relation to onsite storage, haulage and final disposal. According to the regulations, waste haulage and disposal should be done by licensed entities.

These regulations call for cleaner operations and good housekeeping entailing deliberate effort to reuse, recycle waste and site reclamation.

The regulations will influence management of solid waste at workers camps, equipment yards and road construction site.

4.2.12 NATIONAL ENVIRONMENT (NOISE STANDARDS AND CONTROL) REGULATIONS, 2003

Part III Section 8 (1) requires machinery operators, to use the best practicable means to ensure that the emission of noise does not exceed the permissible noise levels. The regulations require that persons to be exposed to occupational noise exceeding 85 dBA for 8 hours should be provided with requisite ear protection. The regulatory noise limits at construction sites are presented in Table 4.2.

Table 4.2: Regulatory noise limits (Uganda).

Facility	Noise limits dB (A) (Leq)	
	Day*	Night*
Construction sites	75	65

*Time frame: Day 6.00a.m -10.00 p.m; Night 10.00 p.m. - 6.00 a.m.

Source: *The National Environment (Noise Standards and Control) Regulations, 2003.*

These regulations would be specifically important at stone quarry sites where offsite noise impacts from blasting will ensure and in regard to protection of construction crews from excessive noise.

4.2.13 DRAFT NATIONAL AIR QUALITY STANDARDS, 2006

Considering that construction equipment and machinery are powered by diesel/ gasoline engines, pollutants such as CO₂, NO_x, SO_x, VOC and particulates are expected to be emitted. The draft national air quality standards provide the following regulatory limits for these emissions (Table 4.3).

Table 4.3: Regulatory air quality standards for selected pollutants.

Pollutant	Averaging time for ambient air	Standard for ambient air
Carbon dioxide (CO ₂)	8 hr	9.0 ppm
Carbon monoxide (CO)	8 hr	9.0 ppm
Hydrocarbons	24 hr	5 mgm ⁻³
Nitrogen oxides (NO _x)	24 hr, 1 year arithmetic mean	0.10 ppm
Smoke	Not to exceed 5 minutes in any one hour	Ringlemann scale No.2 or 40% observed at 6m or more
Soot	24 hr	500 µg/Nm ⁻³
Sulphur dioxide (SO ₂)	24 hr	0.15 ppm
Sulphur trioxide (SO ₃)	24 hr	200 µg/Nm ⁻³

Note: ppm = parts per million; "N" in µg/Nm⁻³ connotes normal atmospheric conditions of pressure and temperature (25°C and 1 atmosphere).

These standards will be important at worksites, quarries, equipment yards and workers' camps to ensure minimal impact on local air quality.

4.2.14 EMPLOYMENT ACT, CAP 219

Employment Act, 2006 repeals Employment Act (Cap 219) enacted in 2000 and it is the principal legislation that seeks to harmonise relationships between employees and employers, protect workers' interests and welfare and safeguard their occupational health and safety through:

- Prohibiting forced labour, discrimination and sexual harassment at workplaces (Part II; Part IV).
- Providing for labour inspection by the relevant ministry (Part III).
- Stipulating rights and duties in employment (weekly rest, working hours, annual leave, maternity and paternity leaves, sick pay, etc. (Part VI).
- Continuity of employment (continuous service, seasonal employment, etc (Part VIII).

The Act should guide the relationship between the contractor and road construction workers.

4.2.15 ACCESS TO ROADS ACT, CAP 350

The Access to Roads Act seeks to ensure that a private land owner who has no reasonable means of access to public highway may apply for leave to construct a road of access to a public high way. This law also establishes a mechanism of applying for such a road. It also establishes a legal regime to ensure the safety of the neighbouring environment.

The Act permits the owner of any land who is unable through negotiations to obtain leave from adjoining land owners to construct a road of access to the public highway, to apply to a magistrate for leave to construct a road of access over any land lying between his land and the public highway. This law also provides for means by which an order for construction of an access road can be revoked (Section 3). The Act further provides for payment of compensation in respect of the use of the land, the destruction of crops or trees and such other property [(Sections 8(l) and 3(3)]. Although there is a provision for compensation for destruction of trees and crops under the Act, this provision is not enough to provide for environmental protection where this occurs during construction of such a road.

This Act may be applicable where, in pursuit of safe road design, property owners or certain sections of trading centres previously adjoining the road are cut off when the new road alignment shifts to another location. Not to lose business and property value, owners of especially commercial properties might seek to construct access roads connecting to the new road, hence invoking this law.

4.2.16 NATIONAL ENVIRONMENT (HILLY AND MOUNTAINOUS AREAS MANAGEMENT) REGULATIONS, 2000

Section 16(5) requires protection of soil against erosion during development or implementation of projects. This Act is relevant in so far as the proposed road traverses hilly areas.

4.2.17 NATIONAL ENVIRONMENT (CONTROL OF SMOKING IN PUBLIC PLACES) REGULATIONS, 2004

Second hand smoke (SHS) also known as environmental tobacco smoke, is a complex mixture of more than 4,800 chemical compounds, including 69 known carcinogens. The World Health Organisation (WHO) indicates “scientific evidence has unequivocally established that exposure to tobacco smoke causes death, disease and disability”. According WHO, SHS is a human carcinogen for which there is no “safe” level of exposure¹

To avoid public health risk from SHS, Uganda enacted a law: *National Environment (Control of Smoking in Public Places) Regulations 2004* to avoid smoking in public places. Under this law, a public place is defined as, “any place to which members of the general public or segments of the general public ordinarily have access by express or implied invitation and includes any indoor part of a place specified in this schedule” and these places include, office buildings, work places, eating areas, toilets and public service vehicles. The regulations task owners of such places to designate “NO SMOKING” and “SMOKING AREAS” in premises.

Specifically in regard to proposed road project, these regulations will apply to areas communally used by construction workers such as site offices, eating areas in camps and workers transport vehicles. Requirements of these regulations should be fulfilled to avoid exposure of workers to tobacco SHS and attendant health risks.

¹ World Health Organization. International Consultation on Environmental Tobacco Smoke (ETS) and Child Health. January 11-14, 1999 (WHO/NCD/TFI/99.10).

4.2.18 HISTORICAL MONUMENTS, Cap 46

Assented to on 21st October, 1967 and came into force on 15th May 1968, this Act provides for the preservation and protection of historical monuments and objects of archaeological, palaeontological, ethnographical and traditional interest. According to this Act, the responsible Minister may, by statutory instrument, declare any object of archaeological, palaeontological, ethnographical, traditional or historical interest to be a protected object. Once thus declared, the Act adds, no person whether owner or not shall do any of the following:

- Cultivate or plough soil so as to affect to its detriment any object declared to be preserved or protected; and,
- Make alteration, addition to, or repair, destroy, deface or injure any object declared to be preserved or protected.

Sub-section 12(1) requires that any portable object discovered in the course of an excavation shall be surrendered to the Minister who shall deposit it in the Museum. However, the Act adds that, notwithstanding provisions of the subsection, where any object is discovered in a protected site, place, or monument, the owner of the protected site, place, or monument shall be entitled to reasonable compensation.

Since the road already exists and no deep excavations are anticipated along its existing alignment except at quarry sites, this Act relates more relevantly to “chance finds”¹ that could be made during earthworks at borrow sites.

Excerpts of the Act relevant to this project are presented below:

11) Any person who discovers any object which may reasonably be considered to be of archaeological, palaeontological, ethnographical, historical or traditional interest shall, within fourteen days, report to the inspector of monuments or a district authorities or the curator of the Museum.

Any person who discovers any such object shall take reasonable measures for its protection.

Every district authorities or the curator of the Museum to whom a discovery of any object or a report is made, under the provisions of subsection (1) of this section, shall forthwith report the discovery in writing to the inspector of monuments.

Where any object discovered, is a part habitation or occupation, the inspector of monuments shall give the owner or occupier of the land on which the object is discovered, reasonable notice of his intention to enter and inspect the site or place of the discovery.

Where the inspector of monuments is satisfied that any object discovered is an object of archaeological, palaeontological, ethnographical, traditional or historical interest, he shall report the discovery of the object to the Minister who, for the purposes of this Act, may, by statutory instrument, declare it to be a preserved or protected object.

The Minister may, for the purposes of excavation, issue a license under this section. Unless a person is authorised by a license issued by the Minister, under the provisions of the preceding subsection, no person shall whether on his own land or elsewhere, excavate, any object of archaeological, palaeontological, ethnographical, or traditional interest; or remove any object hitherto undiscovered from any site, place or monument or collect or remove any object which he

¹ **Chance finds** are unanticipated discovery of material remains of archaeological or historical significance.

knows or has reasonable cause to believe is an object of archaeological, ethnographical, historical, or traditional interest.

The Minister shall, before issuing a license under this section, satisfy himself that the applicant for a license, is competent by both training and experience to carry out satisfactorily an excavation in accordance with the most recent scientific methods;

- has sufficient personnel and financial resources to enable him to carry out an excavation;
- is able to arrange for the proper scientific study of any object discovered;
- has, in the case of a protected object, had in writing the permission of the owner or a person beneficially entitled thereto; and
- has not been convicted of an offence under this Act or has not been convicted of any other offence involving fraud or dishonesty at any time in Uganda or elsewhere.

12. (1) Any portable object discovered in the course of an excavation shall be surrendered to the Minister who shall deposit it in the Museum.

Notwithstanding the provisions of the preceding subsection, where any object is discovered in a protected site, place, or monument, the owner of the protected site, place, or monument shall be entitled to a reasonable compensation.

4.2.19 PETROLEUM SUPPLY ACT, 2003

In relation to this proposed road project, this Act provides for the supervision and monitoring of transportation, supply, storage and distribution of petroleum products by road construction contractors. The Act regulates licensing and control of activities and petroleum installations for protection of public health and safety and control of environmental pollution.

According to this Act, “petroleum products” induces asphalts and bitumen, oils as well as conventional petroleum fuel.

This Act will apply to management (construction, operation and decommissioning) of fuel handling facilities during road construction including fuel transportation, constructing and operation of storage tanks and consumption of petroleum products.

Section 17(1) prohibits constructing a petroleum products installation without having obtained a petroleum construction permit. Section 18 provides guidance on process leading to securing this permit.

Section 32(1) requires owners of fuel facilities to comply with local and international public health and safety and environmental obligations prescribed by Uganda National Bureau of Standards (UNBS) and NEMA. In this regard, provision of impervious bunds around tank farms would be a standard obligation at fuel storage areas. Such bunds should have capacity enough to hold 100% volume of the largest tank in case of spill emergency. The bunds should be constructed such as to prevent soil contamination. By interpretation of this clause, fire safety at storage areas would also be a regulatory requirement. Of equal importance would be remediation of any contaminated areas on site, in interest of public health and contravention of all foregoing constitutes offences according to Sections 37 and 39 of the Act.

4.2.20 ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS, 1998

These regulations require projects to undertake post assessment environmental audits to assure that predictions made during the assessment are properly managed. The regulations

provide for self-auditing by the project owners (Section 31) and by NEMA (Section 32). The regulations require a project to undertake first audit not less than 12 months but not later than 36 months from project commencement, and submit findings thereof to NEMA. In this sense the EIA regulations reflect requirement of Section 8 of National (Environmental Audit) Regulations, 2006 which demands establishment of an Environmental Management System (EMS). The road construction contractor should hence develop an EMS, as a contractual obligation.

4.2.21 NATIONAL (ENVIRONMENTAL AUDIT) REGULATIONS, 2006

Section 8 of National (Environmental Audit) Regulations, 2006 which demands establishment of an Environmental Management System (EMS). The road construction contractor should hence develop an EMS, as a contractual obligation.

4.2.22 OCCUPATIONAL SAFETY AND HEALTH ACT, 2006

This Act provides for the safety and health of workers where hazardous conditions may occur. It covers and protects persons who may be legitimately present in the place of work at the time of work and so may be exposed to injury or disease. It also covers the general public in the “area under the influence” of the undertaking and defines it as:

“area under the influence of” includes any area where the fall of a contaminant released directly or indirectly from the undertaking may come to rest or be present and cause its deleterious effect whether in its original form or in a chemically modified form through natural processes having been carried there by prevailing wind, rain water run-off or by any other natural agent and any area where dangerous levels of the contaminant may be present and cause its effects having been taken there through the effluent or other waste disposal methods used at the undertaking;”

The Act (Section 13) puts responsibility of protection of workers and the general environment on the employer and he or she must take all measures to protect workers and the general public from dangerous aspects of his or her undertaking.

“18. (1) Where there is major handling of chemicals and such dangerous substances which are liable to be airborne or released into rivers lakes or soil and are a danger to the animal and plant life, it shall be the duty of the employer to arrange for equipment and apparatus used to monitor the air, soil, and water pollution and arrange for actual monitoring of these areas, with a view to render them safe from the dangerous undertaking.

(2) Records of such monitoring mentioned in sub-section (1) shall be kept and made available to the Inspector.”

In Section 95, the Act requires employers to take preventive measures including administrative and technical actions to prevent or reduce contamination of working environment. Section 96 requires provision of material safety datasheets (MSDS) containing essential information regarding identity of chemicals, their hazards, safety precautions and emergency procedures. In section 97 an employer is required to ensure that containers of hazardous chemicals are labelled and appropriate chemical data sheets are available in the workplace.

Clearly this law will apply to occupational health and fire safety risks associated with management of fuel at storage sites, bitumen and road marking paints.

4.2.23 WORKERS COMPENSATION ACT, CAP 225

This law provides for compensation to workers for injuries suffered in course of their employment. Under the Act:

- i. An employee is entitled to compensation for any personal injury from an accident or disease arising out of and in the course of his or her employment even if the injury or disease resulted from the negligence of the employee.
- ii. The Employer is immediately required to report to the Labour Officer of the area the accident causing injury or death of a worker. It is an offence to fail to report an accident. (A written report of the accident is made using a standard form - The Labour Department LD. Form 31 - otherwise the original report may be made by telephone or telegram as the urgency demands).
- iii. Employers are obliged to insure and keep themselves insured against any liability, which they may incur to any of their employees under the Act. It is an offence to fail to insure against such liability.
- iv. Under this Act, compensation is automatically paid by the employer whether the worker was injured as a result of his or her own negligence, mistake, omission or commission.

The Act would be applicable to any injuries or fatalities involving road construction workers.

4.2.24 INTERNATIONAL AGREEMENTS AND CONVENTIONS

Uganda is party to several international and regional environmental conventions and relevant to the road project as described below:

4.2.26.1 The Convention on Biological Diversity (CBD)

A major objective of which is *in-situ* and *ex-situ* conservation of biological diversity. Parties to this convention are required to undertake ESIA for projects likely to have significant adverse effects on biodiversity and are required to develop national plans and programmes for the conservation and sustainable use of biodiversity.

4.2.26.2 Convention on International Trade in Endangered Species (CITES)

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) seeks to ensure that international trade in species of wild fauna and flora does not threaten their survival in wilderness. Species on the CITES lists are considered of conservation concern.

4.2.26.3 Stockholm Convention on Persistent Organic Pollutants (POPS)

The Stockholm Convention on Persistent Organic Pollutants (POPs) is a global treaty adopted in 22 May 2001 and entered into force on 17 May 2004. It seeks to protect human health and the environment from POPs: organic (carbon-based) compounds that resist degradation in environment, have low water but high fat solubility and bioaccumulate in fatty tissues. Examples include dioxins and furans, PCBs and are toxic to humans and wildlife.

This Convention requires Parties to take measures to eliminate or reduce the release of POPs into the environment. The Convention has 5 major aims: (i) to eliminate dangerous POPs

starting with the 12 worst (the dirt dozens) among them DDT, PCBs, dioxins and other POPs pesticides); (ii) support the transition to safer alternatives; (iii) target additional POPs for action; (iv) clean-up stockpiles of POP's and equipment containing PCBs; and (v) to cooperate with other Parties for a POPs free future.

Uganda acceded to the Convention on the 20th July 2004, and was obligated to develop a National Implementation Plan (NIP) for managing the POPs. In fulfilment of Article 7 of the Stockholm Convention, Uganda developed and transmitted her NIP to the Conference of parties in January 2009. Today, various implementation activities are going on in the country in line with priority areas identifies in the NIP.

In respect to the proposed road project, POPs would arise from open-air combustion of waste especially if this is done at workers camp. At workers camps and other sites during road construction, open-air combustion of waste therefore should be avoided.

4.2.26.4 Strategic Approach to International Chemicals Management (SAICM)

The Strategic Approach to International Chemicals Management (SAICM)¹ is a landmark initiative in international cooperation to protect human health and the environment. Its development was endorsed by Heads of State and Government at summits in Johannesburg in 2002 and in New York in 2005.

The Strategic Approach provides a policy framework to guide efforts to achieve the Johannesburg Plan of Implementation goal that, by 2020, chemicals will be produced and used in ways that minimize significant adverse impacts on environment and human health.

SAICM comprises the Dubai Declaration on International Chemicals Management, expressing high-level political commitment to SAICM, and an Overarching Policy Strategy which sets out its scope, needs, objectives, financial considerations underlying principles and approaches and implementation and review arrangements. Objectives are grouped under five themes: risk reduction; knowledge and information; governance; capacity-building and technical cooperation; and illegal international traffic.

For this road project, SAICM would predominantly apply to management of road marking paints to avoid risk to public and environmental health and its key objectives directly applicable to this project are:

- To minimize risks to human health, including that of workers, and to the environment throughout the life cycle of chemicals;
- To ensure that humans and ecosystems and their constituent parts that are especially vulnerable or especially subject to exposure to chemicals that may pose a risk are taken into account and protected in making decisions on chemicals;
- To reduce the generation of hazardous waste, both in quantity and toxicity, and to ensure the environmentally sound management of hazardous waste, including its storage, treatment and disposal; and,

¹ UNEP 2006, *Strategic Approach to International Chemicals Management (SAICM texts and resolutions of the International Conference on Chemicals Management.*

- To promote the environmentally sound recovery and recycling of hazardous materials and waste.

4.2.25 EUROPEAN UNION ENVIRONMENTAL ASSESSMENT GUIDELINES

The Northern By-pass will be partially funded with a loan from the European Investment Bank (EIB). The EIB's approach to financing projects is based on the "precautionary principle", preventative action rather than curative treatment should be taken, environmental damage should be rectified at source and the polluter should pay, according to the "Treaty Establishing the European Community". All projects financed by the EIB are the subject of an Environmental Assessment to assess the requirements for an EIA according to the EU EIA Directive. Projects are screened into four categories based on these directives:

- Category A – those for which an EIA is mandatory (Annex 1 of the Directive);
- Category B – those for which the competent authority determines the need for an EIA according to specified criteria (Annex II of the Directive, with ref. to Annex III);
- Category C – those for which a limited environmental assessment is required according to any likely adverse environmental impacts of the project (projects outside the scope of the Directive); and,
- Category D – no environmental assessment required.

The Northern By-pass has been classified as a Category A project, and as such, an ESIA has been prepared. The EIA process requires appropriate public consultation and information disclosure. Verification that this has been/will be undertaken forms an integral part of the EIB's due diligence process.

In a similar manner to the EIB's procedures for EIA, projects that will be subject to European Development Fund (EDF) aid are required to undergo EIA Screening and Assessment in accordance with national legislation and procedures, and based on EC criteria which classifies Projects as category A to D (see above). The Northern By-pass will partially be funded by EDF aid, and as a result, this ESIA must satisfy the requirements of ESIA by the EDF, as well as the EIB and all relevant Ugandan legislation. EDF criteria includes:

"A baseline study describes the initial state of the environment within the selected boundaries of the study area. It also includes the description of the "no project" scenario, based on assumptions regarding future changes. Another important step is the identification and evaluation of environmental impacts. The impacts are the differences between the situation with, and the situation without the project. The identification and evaluation of impacts are necessary for all alternatives under study, in order to compare them and provide recommendations on the selection of the most environmentally sound alternative. It may be decided to undertake a more detailed assessment of a preferred alternative. The last part of the study provides recommendations, mitigation/optimisation measures and the Environmental Management Plan (EMP). Measures should be proposed to mitigate negative impacts (mitigation measures), as well as to optimise positive effects. The EIA recommendations must be organised in an Environmental Management Plan (EMP), specifying the way the proposed measures should be implemented, and a monitoring plan" (Environmental Integration Handbook for EC Development Co-operation, December 2006).

4.3 INSTITUTIONAL FRAMEWORK

4.3.1 NATIONAL ENVIRONMENTAL MANAGEMENT AUTHORITY (NEMA)

The National Environmental Act provides for the establishment of NEMA as the principal agency responsible for coordination, monitoring and supervision of environmental conservation activities. NEMA is under the Ministry of Water and Environment (MoWE) but has a cross-sectoral mandate to oversee the conduct of ESIA through issuance of ESIA guidelines, regulations and registration of practitioners. It reviews and approves environmental impact statements (EIS) in consultation with any relevant lead agencies.

NEMA works with District Environment Officers and local environment committees at local government levels who also undertake inspection, monitoring and enforce compliance on its behalf. In Government ministries, NEMA works with Environmental Liaison Units to ensure that they effectively incorporate environmental issues in their activities, policies and programs.

4.3.2 MINISTRY OF WATER AND ENVIRONMENT (MOWE)

Through its technical arm (Water Resources Management Directorate - WRMD), MoWE has a responsibility to regulate quality and quantity of water resources in the country. The Directorate is responsible for the full range of integrated water resources management (IWRM) activities including monitoring, assessing, planning, allocating and regulating water resources. Specifically, the Water Resources Planning Department is responsible for water regulation through issuance of permits for water abstraction and wastewater discharge.

The Wetlands Management Department in this Ministry is responsible for monitoring of wetland conservation in Uganda including projects through wetlands of conservation value.

4.3.3 MINISTRY OF GENDER LABOUR & SOCIAL DEVELOPMENT

The Ministry is enjoined to operationalise Chapter 4 of the Constitution (Articles 31-42), which focus on affirmative action and promotion of fundamental human rights of the people of Uganda. The Department of *Occupational Safety and Health* in this Ministry is responsible for inspection of quality of workplace environment to safeguard occupational safety, rights of workers and gender equity.

4.3.4 DISTRICT LAND BOARDS

The district land board is responsible for land allocation at local government level. District land boards set compensation rates for crops and structures. In each District, compensation will be deduced utilising rates developed by Kampala and Wakiso Districts.

4.3.5 TOWN AND COUNTRY PLANNING BOARD

Constitution of the Republic of Uganda provides for the formation of the Town and Country Planning Board that should plan and oversee orderly progressive development of land in towns and rural areas.

4.3.6 LOCAL ADMINISTRATION STRUCTURES AND ROAD COMMITTEES

The proposed project road falls within jurisdiction of Kampala and Wakiso Districts. A district is headed by a Chairman Local Council Five (LC5) who is the political head and Chief Administration Officer, the technical head of district administration. Technical District personnel directly involved with the project include Environmental Officer, District Planner, Community Development Officer, District Director of Health Services, Wetlands Officer, Agricultural Officer, District Water Officer and District Engineer.

In addition, under MoWT there are established local road committees that will be engaged to support community awareness and sensitisation about the project, sensitize communities about benefits of the road project and also to participate in compensation matters and grievances, environmental monitoring and HIV/AIDS awareness.

4.3.7 MINISTRY OF TOURISM, WILDLIFE AND HERITAGE

No cultural or heritage site will be affected by proposed Northern Bypass expansion, but this institution may be relevant for any chance finds that might be encountered by project activities. Under this Ministry, the department of museum and monuments is responsible for policy formulation, planning and coordination of conservation and development of museums and cultural heritage in Uganda. The main functions of the department are to:

- i) Initiate, formulate, and implement policies, plans, legislation, regulations, guidelines and strategies on cultural heritage;
- ii) Formulate and coordinate implementation of regulations on international conventions, treaties and agreements under the Museums and Monuments;
- iii) Collect, analyse and disseminate data and information on cultural heritage;
- iv) Foster Public Private Partnership in preservation, presentation and sustainable development of cultural heritage;
- v) Develop skills for preservation, and sustainable development of cultural heritage; and
- vi) Monitor and evaluate the implementation of the policies, legislation, plans and guidelines on development of cultural resources.

4.4 PERMITS AND LICENSES

Below is indicated a list of permits and licences necessary for execution of the project.

Table 4.6: Permits required by proposed development.

	Permit	Issuing agency	Use	Responsibility
1	Environmental approval ESIA certificate	NEMA	Approval commencement of the EIA study	UNRA
2	Petroleum construction permit and petroleum operating licence	Petroleum Supply Department, Ministry of Energy & Mineral Development	Transport, onsite storage and dispensing petroleum fuel during road construction	Contractor
3	Hazardous waste storage licence	NEMA	Onsite storage of hazardous waste (e.g. used oil)	Contractor

5 SOCIO-ECONOMIC AND ENVIRONMENTAL BASELINE

This chapter provides an overview of the Environmental and Social baseline for Kampala and Wakiso districts, as well as a summary of the existing conditions along the route of the Kampala Northern Bypass.

5.1 KAMPALA DISTRICT

Kampala is located on the northern shores of Lake Victoria in the South East of Uganda and is bordered by Wakiso District to the North, East, West and South-west, covering an area of 195 km². It is situated at an average altitude of 3910 ft (1120 m) above sea level, and on 24 low flat topped hills that are surrounded by wetland valleys. Figure 5.1 identifies Kampala's location and all other districts within Uganda.

Kampala is the Capital City of the Republic of Uganda and its history can be traced back to the 1600s when it was established as the Capital (or *Kibuga*) of Buganda Kingdom. It served as a political and administrative capital until 1893, when the British declared Uganda their protectorate and transferred the capital to Entebbe, but returned as capital city in 1962 at Uganda's independence. Kampala means a "hill of Impalas" derived from a *luganda* word (Mpala), a type of antelope (*Aepyceros melampus*). These animals were common in a place today known as Old Kampala. Some have traced Kampala's planning as early as the 1600s, but the first modern urban planning scheme for Kampala was undertaken in 1912, covering Nakasero and Old Kampala hills. It comprised of 567 ha of development and accounted for a population of approximately 2850 people. This was followed by additional planning schemes undertaken in 1919, 1930, 1951, 1968, 1972 and the latest one in 1994. In 1993, Kampala became a District under the Decentralization Act.

Kampala District is situated at the centre of Uganda's "urbanised" corridor. Kampala is the only district in Uganda which is entirely designated as an urban municipality. Kampala City is administratively divided into the five divisions of *Kampala Central*, *Kawempe*, *Makindye*, *Rubaga* and *Nakawa*. The Kampala Northern bypass traverses all these Divisions except Makindye.

Kampala District is relatively more developed in terms of infrastructure, urbanisation, industrialisation, commerce and trade than other districts within Uganda. However, in its drive for greater industrialisation and urbanisation, the district is experiencing environmental stresses which include habitat destruction, pollution, occupational health risks, deforestation and wetland destruction.

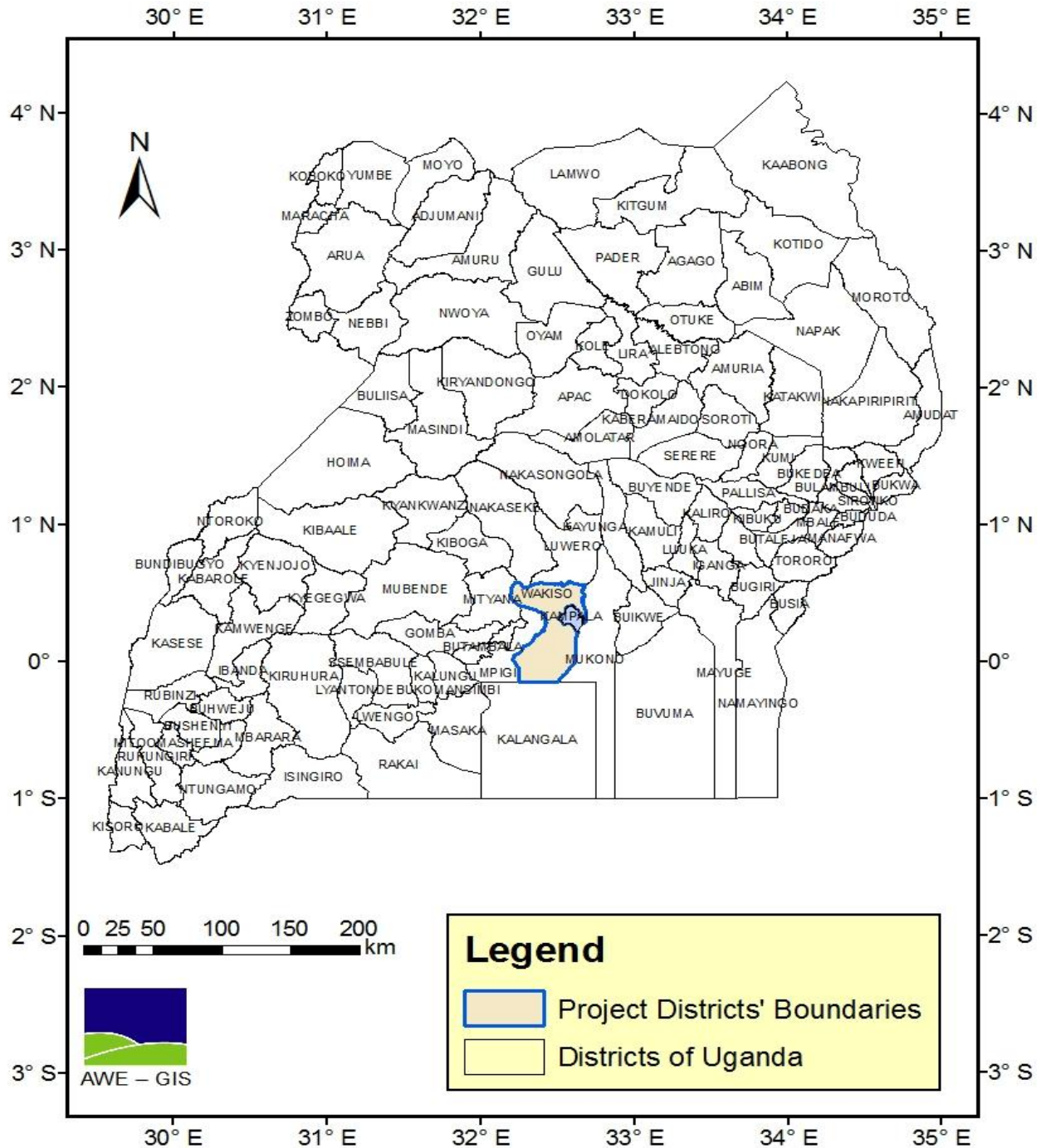


Figure 5.1: Districts of Uganda

Source: Districts of Uganda, 2010

5.1.1 TOPOGRAPHY

Kampala is located 3,910 ft (1120m) above sea level within a series of hills of flat summits and undulating slopes ending into broad valleys dissected by perennial streams/channels.

5.1.2 PHYSICAL PLANNING

The physical expansion of Kampala has been guided by the different physical planning schemes as detailed above (in 1912, 1919, 1930, 1972 and 1994). However, housing has continued to be haphazard, unplanned and located outside planned areas and Kampala is at times referred to as “the rich man’s slum”.

5.1.3 GEOLOGY AND SOILS

Kampala city is underlain by pre-Cambrian rock systems of undifferentiated genesis and granite. The Kampala soils are ferralitic soils with no minerals and mainly Buganda Catena, and Kabira/katena and kaku series.

5.1.4 CLIMATE

Kampala features a tropical wet and dry climate. However, due to city’s higher altitudes, average temperatures are noticeably cooler than is typical for other cities with this type of climate. Kampala seldom gets very hot during the course of the year, the warmest month being January. The average temperature for Kampala is 21.9°C, with an annual range of 2.4°C with relative humidity of about 53 to 89%.

Another facet of Kampala’s weather is that it features two distinct wet seasons. There is a lengthy rainy season from August to December and another shorter rainy season that begins in February and lasts until June. However, the shorter rainy season sees substantially heavier rainfall per month, with the month of April typically seeing the heaviest amount of precipitation with a monthly average of around 175mm. Annual rainfall amounts to between 1750mm and 2000mm/year.

5.1.5 VEGETATION

The natural vegetation of Kampala consists of forests with swamp vegetation in the valleys. Rapid urbanization has destroyed these forests and currently, the only natural areas within Kampala District are limited to a few swamps. Along the roads and around homesteads are trees that have been planted for both shade and ornamental purposes. The most common species are: Cassia Agnes, Markhania platycalys, cassia gradus and Jacaranda mimosifolia. Other plant species include Bougainvillaea spp, Acalypha spp and grasses such as Brachiaria spp, Hyparrhenia spp etc. A flora survey (Appendix I) was undertaken to establish abundance of each species. In addition the survey was intended to identify the unique, threatened, rare species and other cases of conservation concern and habitats known to occur in the areas along the proposed Northern Bypass upgrade.

5.1.6 BUSH, THICKETS AND SCRUBS

This kind of vegetation is found in most divisions of Kampala District with an average height of less than 4 m. The bushes, scrubs and thickets grow together as an entity. This vegetation also occurs on abandoned farmland in form of late fallow with rapid re-growth of mainly *Lantana camara*.

5.1.7 WETLAND VEGETATION

Kampala District has numerous wetlands covering 16% of the district (Wetland Newsletter, 1996). The major wetlands are associated with Lake Victoria and Kyoga drainage systems. They include Lubigi, Kiwembo, Nakivubo, Nsooba-Bulyera, Nalukolongo, Mayanja, Nabisasiro, Kansanga, Walufumba-Nalubega and Kirombe swamp systems. Many wetlands around Kampala city have been drained and turned into agricultural areas or developed for commercial, industrial and sometimes residential purposes. The unclaimed swamps around Kampala city are covered by both grasses and sedges. The most common species are papyrus including, *Miscanthidium violeceum*, *Phragmites mauritianus*, *Cyperus latifolius* and *Typha australis*. Appendix I provides a detailed baseline survey of the wetland system linked to the Northern Bypass. The extent of wetlands along the Northern Bypass are shown in Figure 5.2.

5.1.8 WOODLAND TREES AND SHRUBS

This vegetation represents the majority of wooded areas where trees and shrubs are the predominant cover. These are mostly of an average height of 4 m, and are mainly found in parts of Nakawa division (Kireka). Wet woodland communities occur along wetlands (riverine forest) and the dry woodlands appear on the dry grass covered areas. Deciduous trees are also common. They include eucalyptus species planted under the peri-urban tree plantation program of Forestry Department, Musizi and *Markhamia platycalyx*.

5.1.9 GROUNDWATER

The urban poor in Kampala, like elsewhere in developing countries, are faced with inadequate basic services caused by a combination of institutional, legal and socio-economic issues. Field surveys undertaken for the Scheme have identified that excreta disposal systems, solid waste and grey water are major contributors to widespread shallow groundwater contamination in Kampala District. Field measurements taken by UN Habitat for City Development Strategy, 2002 revealed that the water table responds rapidly to short rains (48 hours) due to the relatively high permeability (10×10^{-5} – 10×10^{-3} m/s) and shallow (<1 mbgl) vadose zone, which consists of foreign material (due to land reclamation). This anthropogenically influenced vadose zone has a limited contaminant attenuation capacity resulting in water quality deterioration following rains.

5.1.10 DEMOGRAPHICS

According to the 2002 national census figures, Kampala District then had a population of approximately 1,189,100. The Uganda Bureau of Statistics estimated the population of Kampala at 1,420,200 in 2008. It is estimated that the population of Kampala District in 2009 is approximately 1,491,000. Table 5.1 provides a break-down of this population by administrative division.

Table 5.1: Kampala District Population by Division and Sex.

Division	House hold	Male Population	Female Population	Total
Kampala District	306,178	569,075	620,067	1,189,142
Central Division	22,774	44,001	44,093	88,094
Kawempe Division	68,952	123,502	138,663	262,165

Division	House hold	Male Population	Female Population	Total
Makindye Division	78,623	145,556	157,615	303,171
Nakawa Division	59,117	118,098	122,526	240,624
Rubaga Division	76,712	137,918	157,170	295,088

Source: Uganda Bureau of Statistics, 2002

5.1.11 ADMINISTRATIVE INSTITUTION

Kampala District is divided into five administrative divisions of Central, Nakawa, Makindye, Kawempe, and Rubaga Divisions. The five divisions are further subdivided into form 99 parishes and 802 villages/cells.

Kampala City, which has a district status, has a City Council Authority (Kampala City Council Authority – KCCA) comprising of 30 councillors with the Executive Director as the accounting officer and chaired by the Lord Mayor, who is the political head of the District.

5.1.12 LAND USE AND TENURE

The principle land use in Kampala City is dominated by residential use and small-scale agriculture. Small-scale peri-urban agriculture is widely distributed in exiting residential areas as well periphery areas, which may not have been transformed into other uses. According to the Uganda First Urban Project, 1993, Kampala Urban Study, agricultural land occupied 41.2% of the land while residential occupied 32.3%, both of which formed the major uses in the city. In terms of distribution by agricultural land, Nakawa Division occupies 35% followed by Makindye with 24.5% and Kawempe by 20.6% as shown in Table 5.2. These three Divisions have historically had the largest areas of agricultural land because they formed the bigger part of the peri-urban Kampala, which was still largely semi-rural. Land ownership and rights over land are variable within the City. Further details of the different land tenure systems within Uganda are provided in Table 5.3.

Table 5.2: Kampala Land-use Distribution.

Land Use	Percentage	Land Use	Percentage
Residential	32.3	Institutional	6.4
Agricultural	41.2	Industrial	2.0
Water	5.3	Wetlands	3.8
Forests	2.8	Recreational	0.9
Mixed-Use	3.0	Transportation	1.0
Commercial	1.3		

Source: Uganda First Urban Project, 1993, Kampala Urban Study

Kampala has experienced rapid growth, and this has had a big influence on housing conditions. A total of 54% of the population live in tenements, while 12% live in stores and garages. Of these, 65% rent their accommodation.

Table 5.3: Land tenure system.

Land tenure systems in Uganda

a) Customary tenure:

This is the most dominant and widespread system throughout, where rights over land are regulated by the local custom. Under this system crop production and livestock, farming is mainly of a subsistence nature. Since there is sub-division of land by occupants, development is hard to realise. In addition, the individual occupants are often afraid of forfeiting their developments should the landlord disposes off the land.

b) Freehold:

This is where land is owned by a private individual or organization at no cost of acquisition.

c) Mailo land:

This is the type of land ownership that was introduced by the British in 1900. Prior to the 1975 Land Reform Decree, mailo land was owned in perpetuity by individuals and by the Kabaka's government. Persons who lived on this land as well as new entrants with the consent of the land lords were legally protected to live on and use the land, but they were obliged to pay certain taxes. The 1975 Land Reform Decree abolished mailo land and the rights of customary tenants on such lands, but the decree has not been effectively implemented except in so far as the customary tenants ceased to pay taxes to the landlords.

A number of institutions such as Protestant and Catholic Churches/Missions used this system to set a foundation for their activities in the District. As a result such institutions were granted freehold titles. Under freehold, a certificate is issued and interest in land goes on in perpetuity.

d) Leasehold:

This is based on an agreement between the lessor (Government) and the lessee (the developer), normally leased out for developmental purposes. After the declaration of Independence, all land that had not been given out as mailo or freehold and had remained under the control of the Protectorate Government as Crownland, and land formerly referred to as the Kabaka's Official mailo, became public land and was invested in the Uganda Land Commission (ULC). The Commission then granted land in leaseholds to individuals and organisations, and retained some for conservation purposes.

This category covers areas presently occupied by civic centres like the District Headquarters (Town Council), county headquarters, government schools, forest reserves, and other areas outside mailo land where individuals have been able to apply for leaseholds from the Uganda Land Commission. The statutory leases are provided under the Public Lands Act of 1969 (Sections 22 and 23) with laid down standard provisions. Leases on public land are given for a definite period 45 years in the rural places and 99 years in urban authorities. The advantage with this system is that it is easier and possible for government to attach user environmental conditions to the lease, and to specify how a given land holding could be developed. Government also retains the right to cancel the lease in case of misuse.

e) Public land:

After Independence, all land shared out to the Colonial Government and the Crownland, became public land that was later brought under the Land Commission. This includes forest reserves, wetlands and any other land outside mailo land.

5.1.13 HEALTH AND SANITATION

Health facilities within Kampala City are presented in Table 5.4a. Besides these, Kampala City has 140 static health delivery points distributed among the five divisions.

Table 5.4b present information relating to typical health indicators for Kampala and nationally, as well as common diseases found within the District.

Table 5.4a: Health facilities within Kampala City.

Health Facilities						
Category of Health Facilities						
Division	Hospital	KCC	Health Center	Maternity Center	Nursing Home	Private Clinic
Central	5	3	6	-	108	104
Kawempe	1	2	-	-	169	75
Makindye	2	1	-	-	186	72
Nakawa	5	2	10	-	121	100

Table 5.4b: Health indicators.

Health Indicators	Kampala	National
Total fertility rate	5.21	6.9
Teenage pregnancy rate	18.5	16.6
Below 5 years mortality ratio	129.0	147.0
Infant mortality ratio	83.0	97.0
Total fertility rate	5.21	
Crude death rate	17.3 per population per year	
Life expectancy rate	56.4 years	43 years
Mother mortality rate		
Cause for specific mortality rates.	Malaria 15%	Diarrhoea Diseases 12.3%
	Respiratory Tract Infections 9.9%, AIDS 8.1%	

5.1.14 WATER

Water sources of piped, water boreholes and protected springs are considered safe water sources, and as a result, approximately 97.6% of Kampala population have access to safe water (2002 Census Report & 2008 Statistical Abstract). However, a study in 1999 (Sanitation Quality Gap), revealed that most of the wells/springs are being contaminated and thus puts safe water coverage at about 55%. Approximately 8% of Kampala City has a sewer connection. Some communities along the Northern Bypass use wetlands, natural springs and protected springs as water sources (Plates 5.1 – 5.4) for domestic purposes. Adequate drainage will be required to prevent back ponding of the stormwater into these community water sources.



Plate 5.1: A natural spring flowing from foundations of structures next to the Northern Bypass.

Source AWE; July 2011



Plate 5.2: A natural spring flowing from the front yard of house next to the Northern Bypass.

Source AWE; July 2011



Plate 5.3: A protected spring serving as a community water source.

Source AWE; July 2011



Plate 5.4: Children gathering at a protected spring that serves as a community water source.

Source AWE; July 2011

5.1.15 SOLID WASTE MANAGEMENT

In a study by UN Habitat Urban Development Programme/Kampala City Development Strategy (2002) the key urban environmental challenges, initiatives and hotspots that needed rapid intervention within Kampala District were identified. Hotspots included waste management and improving infrastructure in unplanned settlements, with waste streams identified within Table 5.5 below. This is an important consideration for the Scheme since the project area is currently associated with poor waste disposal and residents commonly dump solid waste on the road shoulders (Plates 5.5 – 5.7). It is therefore important that the expansion road design appropriately considers improper waste disposal practices along the Kampala Northern Bypass and provides for collection points in the road design. It is from these points that waste will be collected and transported to Kampala's landfill at Kiteezi (near Mpererwe) 12 km North of Kampala City.



Plate 5.5: A UNRA “No dumping” sign at an area with garbage.

Source AWE; July 2011



Plate 5.6: A waste pile beside the road and an open channel with some waste separated by an exposed improvised side pathway.

Source AWE; July 2011



Plate 5.7: A waste pile beside the road.

Source AWE; July 2011

Table 5.5: Waste streams within Kampala.

Waste Composition Material	%Weight
Vegetable	73.0
Paper	5.4
Tree cuttings	8.0
Others	13.6
Daily waste generated	960 tones
Collection rate:	55%
Total skips:	520 skips
Disposal system	Landfill (Kiteezi)
Private sector contribution to collection:	25%

5.1.16 EDUCATION

Kampala District has had its number of primary school pupils triple since Government introduced Universal Primary Education (UPE) in 1997. In 1995 there were 2.63 million pupils in primary schools rising to 7.41 million in 2007, according to the Education Information Management System, and these figures show almost equal representation of boys and girls.

Kampala District has different types of education institutions that include:

- Government-aided Primary schools and Secondary schools;
- Private schools (both Primary and Secondary); and,
- Community schools, which include specialist institutions such as schools for Special Needs Education.

Table 5.6 presents the number of each of these schools within various Divisions of Kampala District, whilst Table 5.7 identifies the number of pupils enrolled within each of these institutions.

Table 5.6: Number of the Different categories of schools per Division.

Division	Pre-Primary Schools	Primary Schools	Secondary Schools	Tertiary School	Schools For SNE	Total
Lubaga	201	273	83	13	04	574
Makindye	173	213	65	04	-	455
Kawempe	194	217	40	-	01	452
Central	37	50	27	08	-	122
Nakawa	115	119	33	-	-	267
Total	720	872	248	25	05	1870

Source: District Development Plan 2007/08 – 2009/10

Table 5.7: School enrolment in Kampala District by institutions.

Category	Male	Female	TOTAL
Pre- Primary	25862	27980	53,842
Primary	116,824	130,860	247,684
Secondary	39,280	40,005	79,285
Total	206,123	221,217	380,811

Source: District Development Plan 2007/08 – 2009/10

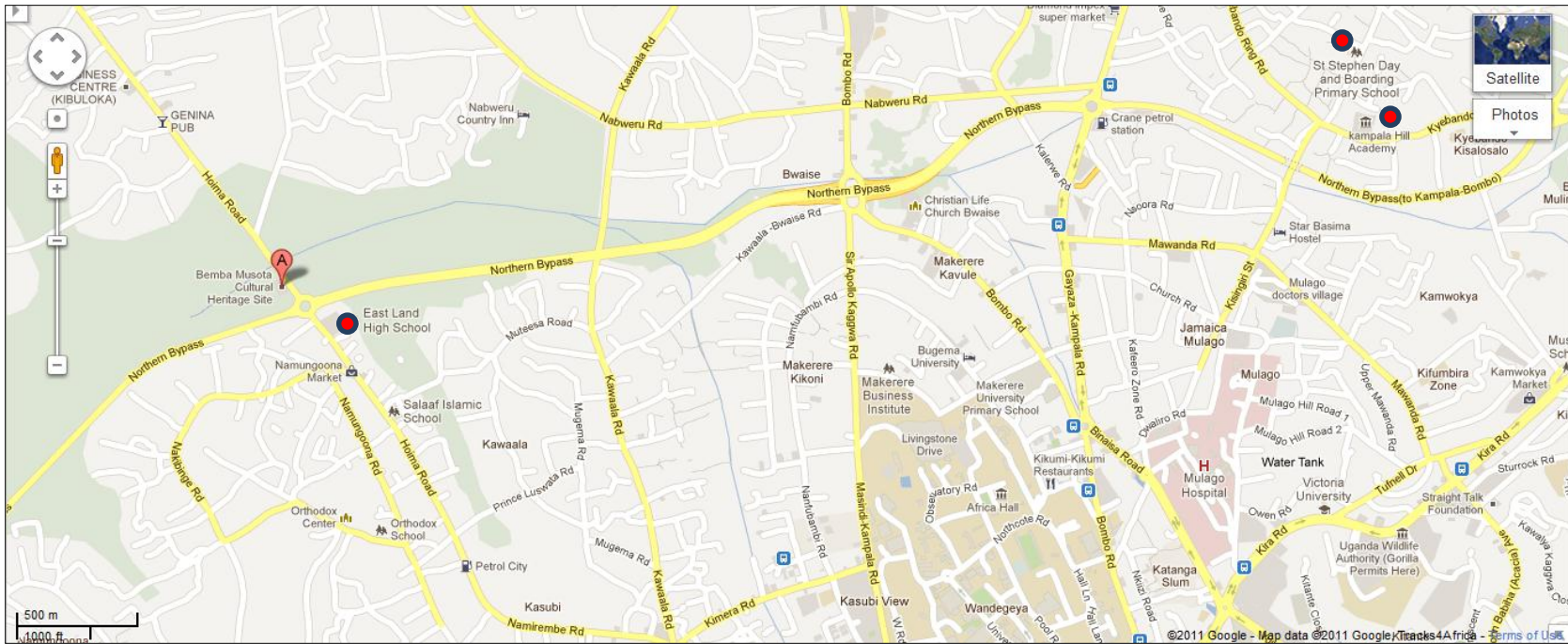
The location of schools along (within 500 meters) the Northern Bypass are identified on Figure 5.3a, Figure 5.3b and Figure 5.3c. Plates 5.8 and 5.9 show photographs of Bethany High School and Cleveland Primary School along the Bypass.



Plate 5.8: Bethany High School building (background) close to the location of the proposed new carriageway.
Source AWE; July 2011

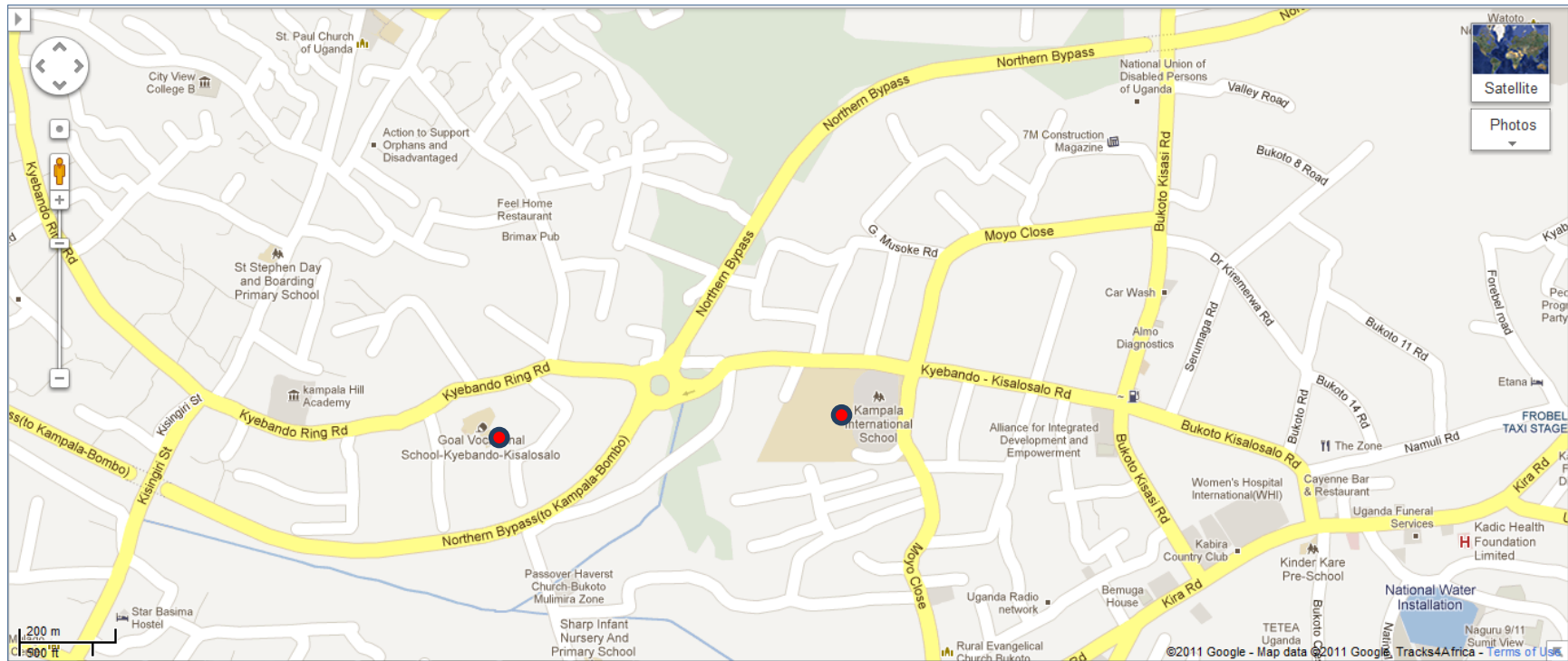


Plate 5.9: Cleveland Primary School near the existing carriageway.
Source AWE; July 2011



● School

Figure 5.3a: Schools along Kampala Northern Bypass (between Hoima Roda and Kisingiri Street).



● School

Figure 5.3b: Schools along Kampala Northern Bypass (between Kisingiri St. and Bukoto-Kisasi Road).

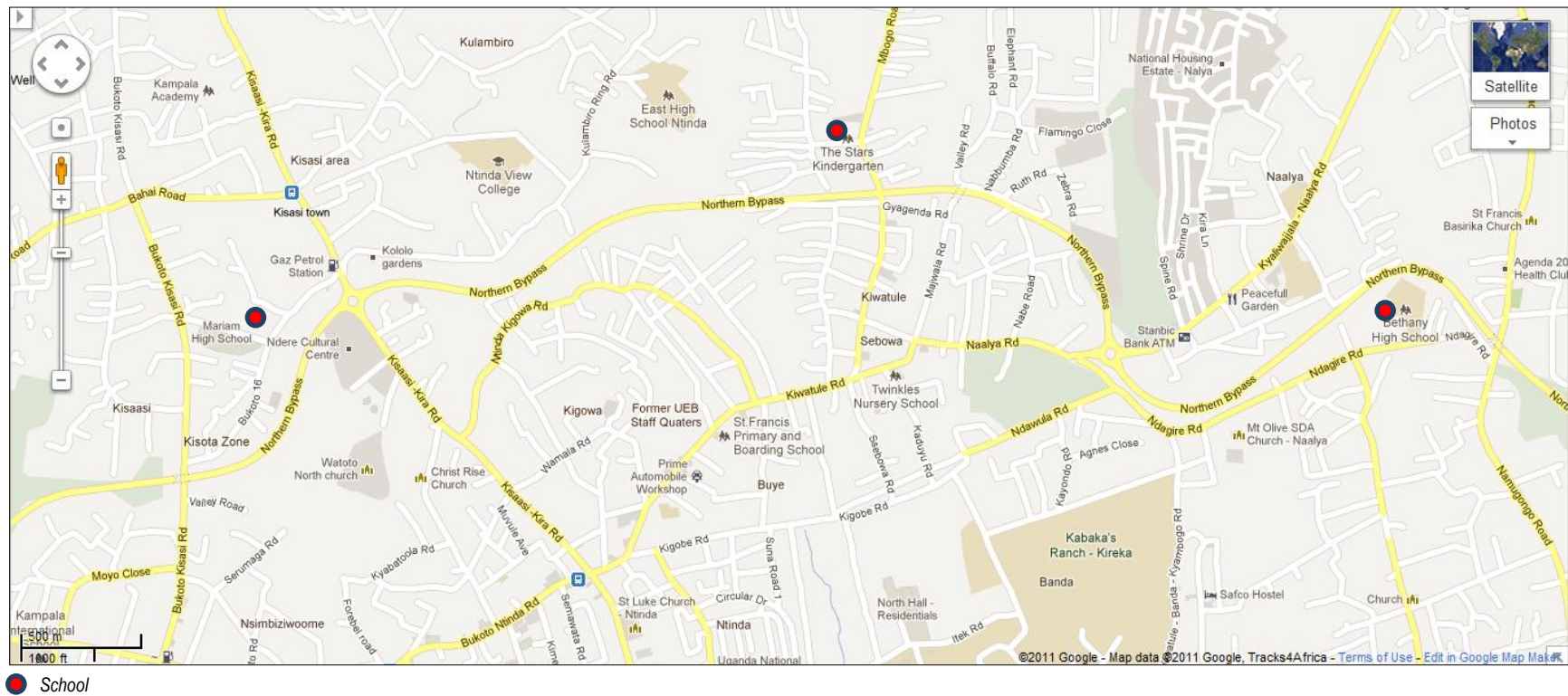


Figure 5.3c: Schools along Kampala Northern Bypass (between Bukoto-Kisasi Rd and Namugongo Road).

5.1.17 ARCHAEOLOGICAL AND CULTURAL RESOURCES

Archaeological and cultural resources identified near to but not within immediate area of influence of the project are the *Bahai Temple* on Kikaya Hill and *Bemba Musota Cultural Heritage* site located on Hoima Road in Lubigi swamp (Plate 5.10a) near the Bypa.ss. The location of these sites are illustrated in Figures 5.4a and 5.4b Bemba Musota is considered by the Baganda (the inhabitants and predominant tribe in Kampala) as the great grandfather and founder of Kkobe Clan.



Plate 5.10a: Site where Bemba Musota Cultural Heritage was located

It is however noted that *Bemba Musota Cultural Heritage* site was removed by NEMA in 2009 on the account that it had been constructed in a *Lubigi* wetland. Plate 5.10b taken at time of preparing this report, shows the empty site (dotted boundary) where *Bemba Musota Cultural Heritage* had been constructed.

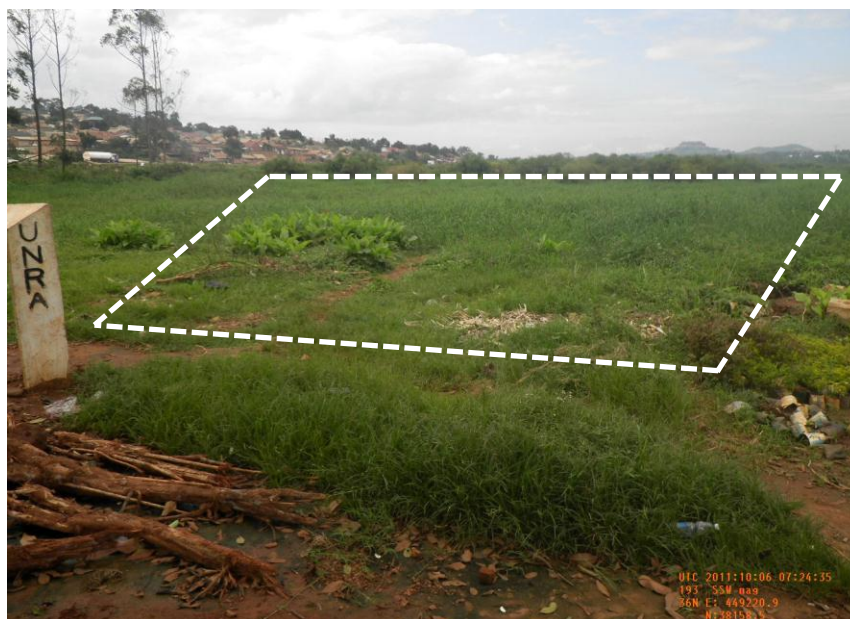
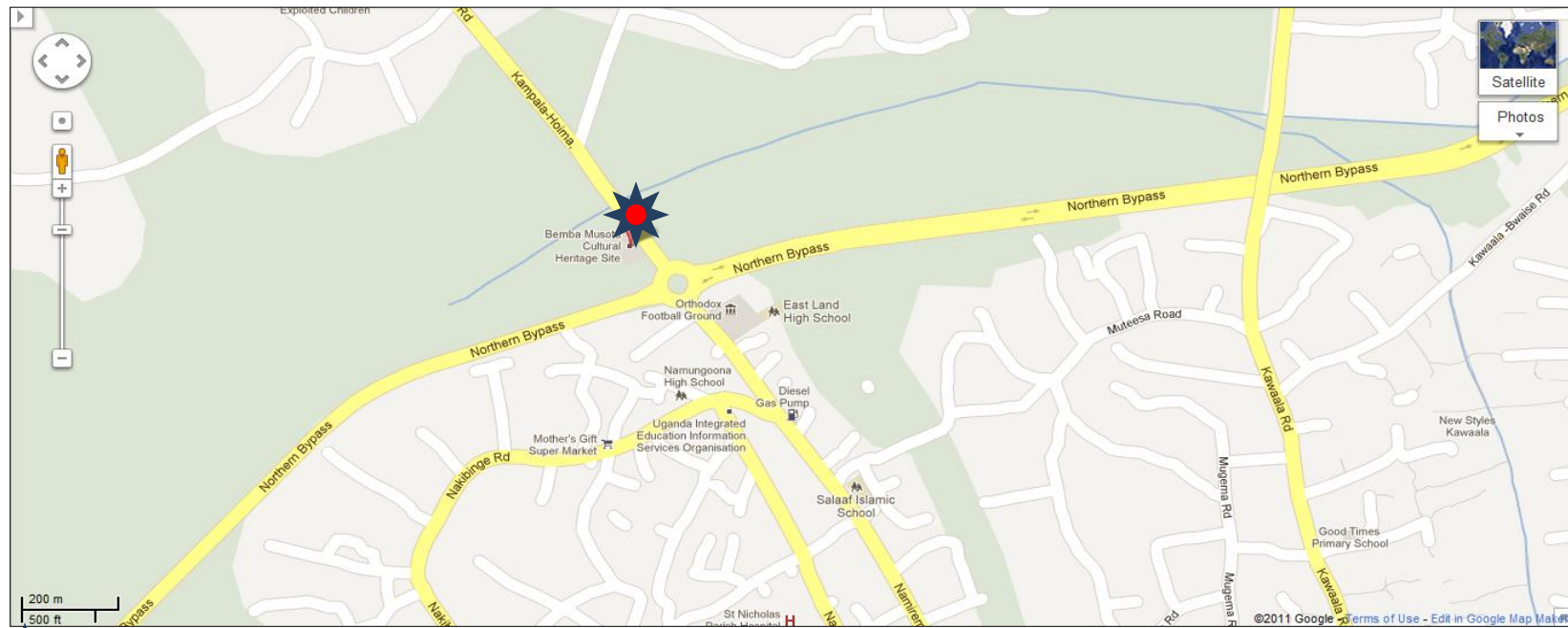


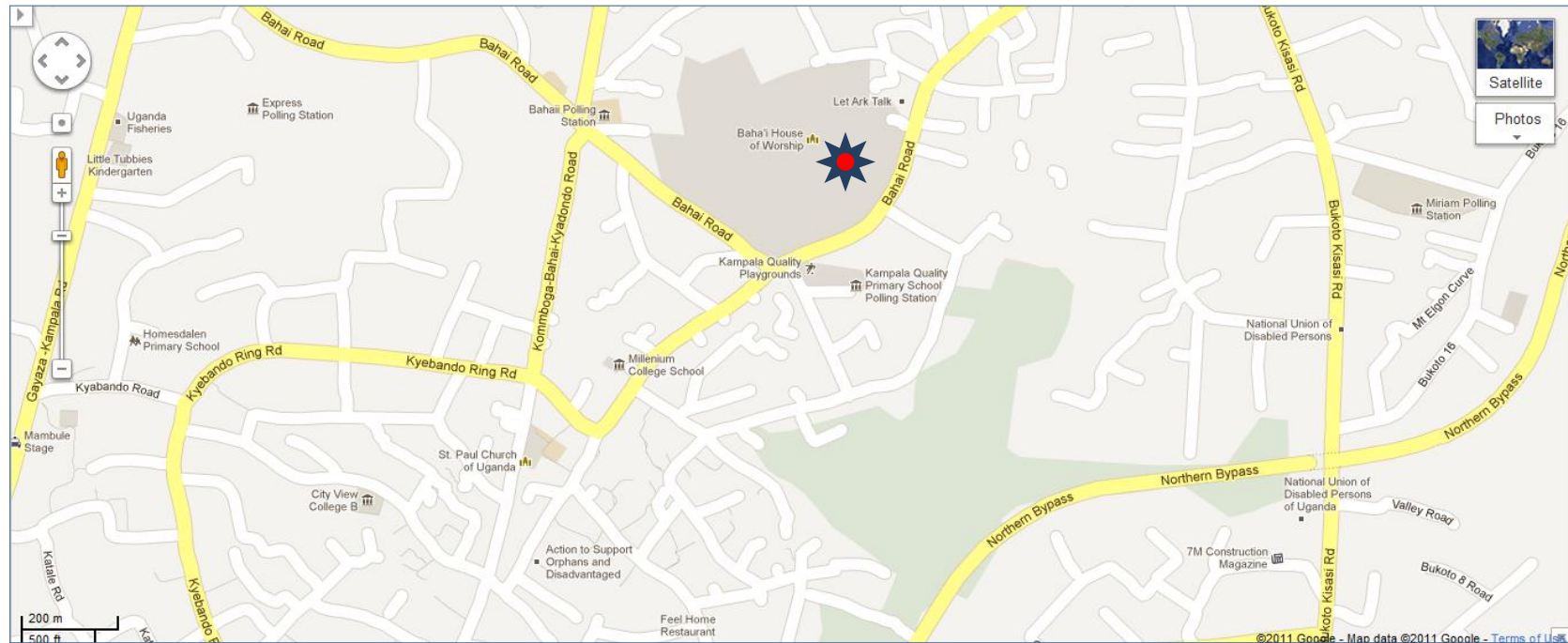
Plate 5.10b: Empty location (E:449220.9, N:38158.5) where Bemba Musota Cultural Heritage site existed

Source AWE; June 2011



 Cultural site.

Figure 5.4a: Cultural site (Bemba Musota) along Kampala Northern Bypass.




 Cultural site. Source: Google Map © 2011

Figure 5.4b: Bahai Temple 800m from Kampala Northern Bypass.

5.1.18 INFRASTRUCTURE ROADS

KCC plans to construct a total of 14.42 km of roads under the Kampala Institutional and Infrastructure Development Programmed (KIIDP). Among roads to be upgraded are Bukoto-Kisasi, Kalerwe, Kawempe-Mpererwe, Kimera, Makerere Hill, Soweto and Salaama. According to the mid-term review report presented by the Project coordinator Tamale Kiggundu in KCC recently, the roads would be upgraded from gravel to bitumen standard (New Vision, 30 November 2010). This will reduce strain of the Kampala Northern Bypass.

5.1.19 ECONOMIC ACTIVITIES

Table 5.8 shows that Kampala's main source of income is through employment, trading in non-agricultural products and agricultural produce with the lowest income from animal rearing and fishing. The district has vibrant telecommunication and banking sectors.

Table 5.8: Kampala's Main Economic Activities.

CATEGORIES	PERCENTAGE
Animal Rearing	0.1
Crop Farming	1.6
Fishing	1
Employment Income	64.3
Trading in Agricultural Produce	9.2
Trading in non-agricultural products	19.4
Others	4.2
Total	100

Source: 2002 Census Report

5.2 WAKISO DISTRICT

5.2.1 GEOGRAPHICAL ORIENTATION

Wakiso District encircles Kampala District and is located in the central region of the country, bordering with districts of Luwero and Nakaseke in the North, Mukono and Kampala in the East, Mpigi and Mityana in the West and Kalangala near Lake Victoria (the largest fresh water lake in Africa covering 69,490 sq km). The district is named after the town of Wakiso, where its headquarters are located.

5.2.2 CLIMATE

Wakiso District features a tropical rainforest climate with relatively constant temperatures throughout the year. It has noticeably wetter and drier months, with January being the driest month and a drier period from July through September. However, since average monthly precipitation in each of these months is above 60mm, Wakiso district has no true dry season and therefore falls under the tropical rainforest climate category.

5.2.3 DEMOGRAPHICS

According to the 2002 Population and Housing Census, the population of Wakiso district stood at 907,988 people with a growth rate of 4.1% compared to 562,209 people and a growth rate of 3.7% in 1991. Wakiso was ranked third in population size after Mbarara and Kampala. The population density has currently reached 323 persons per square kilometer. Population in the district is unevenly distributed with Makindye-Ssabagabo having the largest number of people

(136,300) compared to Wakiso Town Council with the lowest number of persons (14,600). Population density per county within Wakiso District is presented within Table 5.9.

Table 5.9: Population density of Wakiso population by county.

County	House hold	Male Population	Female Population	Total
Busiro	88,562	180,420	184,886	365,306
Entebbe Municipality	14,216	27,135	27,951	55,086
Kyadondo	115,364	232,979	254,617	487,596
Total Wakiso	218,142	440,534	467,454	907,988

Source: Profile of the Higher Local Government May 2009, UBOS

5.2.4 DEMOGRAPHIC STRUCTURE

Wakiso District has a population of 907,988, making it the third-most populated district in the country. In 2002 census report and 2008 Statistical Abstract reported that 53% of the population were children below age of 18 years while 17% of the total population were orphans.

5.2.5 ETHNICITY

In Wakiso district the main language spoken is Luganda, alongside English and Swahili. Apart from Baganda, there are other large ethnic groups that include Basoga, Bafumbira, Batoro, Bakiga, Alur, Bagisu, Banyoro, Iteso and Acholi.

5.2.6 VULNERABLE GROUPS

Initial observations indicate that vulnerable groups in the Scheme area include female and child-headed households, households dependent on a single source of income, children, disabled people and the elderly. Construction of the current Northern Bypass attracted and induced upscale real estate development in the swampy areas that it traverses. Before this however, these marginal marshy and flood-prone areas were the cheap places where poor city dwellers could afford to purchase small land plots for settlement. Indeed, many sections of the bypass are still adjoined by low-income settlements. As the occupants of this land own small land plots, partial loss of their holdings could imply significant social cost to affected persons.

5.2.7 ADMINISTRATIVE INSTITUTIONS

Wakiso District is divided into 13 sub-counties, four town councils (Kira, Nansana, Kakiri and Wakiso) and two Municipal Divisions. It has a total of 139 parishes and 688 villages of which some are semi-urban. The administration headquarter is located in Wakiso Town Council, 16 km along Hoima Road from Kampala. There is a proposal to form more town councils and town boards in the District.

5.2.8 EMPLOYMENT, LIVELIHOODS AND NATURAL RESOURCE USE

The main income sources for Wakiso District include fishing on Lake Victoria, poultry feeds, agriculture with the emphasis on food crops such as sweet potatoes, beans, cassava, ground-nuts, Irish potatoes and soy beans. Fruits and vegetable are also widely grown, such as tomatoes, onions and cabbage. Retail trading is an important source of income for many households.

5.2.9 EDUCATION

Wakiso District has a total of 567 primary schools with 246 government, 257 private and 64 community schools. For secondary schools, the District has over 139 schools, of which 18 are government-owned, 73 privately-owned and 48 owned by community-based organisations. The District also has one teacher training college, two Technical Institutes, Nkumba University, a Meteorological School and a Fisheries Training Institute (vocational institute). School enrolment figures are presented in Table 5.10.

Table 5.10: School enrolment by gender.

	Male	Female	Total
Primary School Enrolment	89,157	94,133	183,290
Secondary School Enrolment	38,770	42,368	81,138
Total	127,927	136,501	264,428

Source: Profiles of the Higher Local Government, 2009

5.2.10 HEALTH AND SANITATION

Wakiso district has 36 Government dispensaries, 22 health centres, 1 hospital and 39 private dispensaries, run by Non-Governmental Organisations (NGOs). About 85% of the population can access health facilities within 5 km of their dwellings.

5.2.11 INFRASTRUCTURE

Wakiso District's roads are in poor condition due to age and inconsistent maintenance. The District has identified an increase in pavement deterioration along Nakawuka-Kasajje road, which has increased traffic accidents in this locality. Entebbe municipality has a fair network of roads with tarmac within the town and the road to Entebbe International Airport. However, this is not common within the District, and upgrading the roads is of high importance for the development of the region and the population.

5.2.12 WATER SUPPLY

Although Wakiso District has large watercourses and numerous springs, access to potable water is low. This is primarily due to pollution and groundwater contamination. Common water sources are from boreholes, shallow wells and protected springs. Lack of proper supply of safe drinking water results in people being vulnerable to water borne diseases like diarrhoea and cholera, and outbreaks have in the past been common in flood areas of Bwaise and Kalerwe traversed by the Northern Bypass.

5.2.13 AMBIENT NOISE LEVELS AND AIR QUALITY

The noise and air quality measurements taken at randomly selected receptors along the Northern Bypass on 16th June 2011 are presented in Table 5.11. Measurements were taken in decibels for noise (dBA), and for total suspended particulate matter (TSP), sulphur dioxide (SO₂) and Nitrogen Dioxide (NO₂). Detailed baseline and assessment of noise quality is given in Appendix II. Plate 5.10 shows quantification of noise received at a house near Kampala Northern Bypass.

Table 5.11: Ambient noise levels and air quality along the Northern Bypass.

UTM Coordinates		TSP readings ($\mu\text{g}/\text{m}^3$)		Noise readings (dBA)		Toxic gas presence (ppm)		Notes
Eastings	Northings	Maximum	Average	L _{AMax}	L _{Aeq}	SO ₂	NO ₂	
461296	39045	54	50	77.8	57.2	0	0	Namboole, homestead. Crying child
460181	40751	88	49	85.3	58.4	0	0	Naalya, homestead, climbing vehicular traffic
455836	40617	78	53	74.8	61.5	0	0	Ntinda, concrete/stone workshop.
453940	38953	258	57	86.7	61.9	0	0	Kalerwe, vending kiosks, motorcycle traffic, radio playing. About, 2 m lower than carriageway level.
448918	38382	54	53	87.4	51.5	0	0	Namungoona, homestead, grazing livestock, human conversation. About 1 m lower than carriageway level.
446541	35282	54	54	86.6	49.6	0	0	Namungoona - Busega. Vehicular traffic.
446110	34668	93	54	81.4	55.1	0	0	Busega, Betna real Estates & Property Consultants



Plate 5.11: Noise measurement at a home near the existing carriageway.

Source AWE; June 2011

6 SCOPING FINDINGS AND RECORD OF STAKEHOLDER ENGAGEMENT

The ESIA process started with a scoping exercise aimed identifying relevant issues to form focus of the ESIA study and refine the terms of reference provided by the project proponent. These terms of reference are presented in Appendix IV. This chapter presents a summary of this Scoping exercise, and also presents the results of stakeholder engagement activities undertaken during May and June 2011, during the scoping stage and for the final ESIA.

6.1 OBJECTIVES OF CONSULTATION AND DISCLOSURE

Stakeholder consultation aimed to achieve the following:

- Generate a good understanding of the project.
- Understand people and agency expectations about the project (from construction through to road use).
- Understand and characterise potential environmental, socio-economic impacts of the Scheme.
- Developing effective mitigation measures and management plans.
- Enhance local benefits from the road project.
- Enable affected communities to provide views hence participating in or refining project design, where applicable.

6.2 STANDARDS FOR CONSULTATION

The public consultation was guided by Ugandan guidelines summarized in Box 6.1.

Box 6.1: Uganda Guidelines Relating to Public Consultation.

Although no regulations exist for public consultation, national guidelines for EIA in Uganda require that the public is given full opportunity for involvement and participation throughout the EIA process. People including individuals, or groups of local communities who may be directly affected by a proposed project should be a focus for public involvement.

Since identification of the “public” likely to be indirectly affected by the proposed activity is often more difficult, it is required to exercise care in deciding who participates to ensure that a fair and balanced representation of views is obtained and views of minority groups are not overshadowed by more influential members of the public.

The public may appropriately be involved in the EIA process through:

- Informing them about the proposed project;
- Participation in scoping exercise;
- Open public meetings/hearings on the projects;
- Inviting written comments on proposed project;
- Use of community representatives;
- Comment and review of the Environmental Impact Statements; and,
- Making relevant documents available to any interested members of the public in specified places or at the cost of reproduction.

Three stages for public involvement in the EIA process are spelt out:

a) Public consultation before EIA is done

If after receiving and screening/reviewing the developer’s project brief, the Authority (NEMA), in consultation with the Lead Agency, decides that it is necessary to consult and seek public comment, it shall, within four weeks from submission of the project brief and/or notice of intent to develop, publish the developer’s notification and other supporting documents or their summary in a public media. It is required that objections and comments from the public and other stakeholders shall be submitted to the Authority and to the Lead Agency within 21 days from the publication of notice.

b) Public consultation during the EIA

The team conducting the EIA shall consult and seek public opinion/views on social and environmental aspects of the project. Such public involvement shall be during scoping and any other appropriate stages during the conduct of the study.

c) Public consultation after EIA (EIA Review)

The EIS shall be a public document and may be inspected at any reasonable time by any person. Considering the scale and level of influences likely to result from the operation of a project, the Authority, in consultation with the Lead agency, shall decide regions where it is necessary to display the EIA report to the general public.

6.3 STAKEHOLDER IDENTIFICATION

In order to develop an effective consultation programme it was necessary to determine exactly who the stakeholders were, basing on the definition that a stakeholder is “any individual or group who is potentially affected by a project or can themselves affect a project”. A list of stakeholders that were consulted during the ESIA process is given in Table 6.1.

Table 6.1: Stakeholder Categories.

Category	Stakeholder
Government – National	Wetlands Management Department
	Water Resources Management Directorate (WRMD) in Ministry of Water & Environment
	Ministry of Works & Transport, MoWT
	Petroleum Supply Department in Ministry of Energy & Mineral Development
	Rural Electrification Agency , REA
	Occupational Health & Safety Department in Ministry of Gender, Labour & Social Development
	UNRA
	Forestry Sector Support Department
	Department responsible for museum and monuments in Ministry of Tourism, Trade & Industry.
Government – Local	Kampala and Wakiso District Local Governments
	Local Council Leaders (LC I, II, III) – Rubaga, Nakawa, Kawempe Division, Mukalazi zone, Busega Community
Local Communities along road	Communities along entire road (meetings were held in trading centres and villages)
Vulnerable Groups	These included the elderly, women, or people who admitted being terminally ill (especially of HIV/AIDS)
Institutions, NGOs, CBOs	WWF, IUCN, Central Police Station,

6.4 APPROACH FOR CONSULTATION

The following methods were used to conduct consultations:

- Individual interviews with stakeholders.
- Focus group discussions with women vulnerable groups.
- Public/village meetings in villages and trading centres along the road.

A detailed record of stakeholder consultations is presented in Appendix III.

6.5 SCOPING ENGAGEMENT ACTIVITIES

Scoping consultations were undertaken from 27th September–24th November 2010 to disclose the project, seek stakeholder views and generate a master list of entities to be consulted. Local communities and officials of District Local Governments (Kampala and Wakiso) were consulted and their views carried forth into detailed the ESIA study.

Key issues identified during the scoping process include:

- Wetlands degradation:** Wetlands along the Bypass need to be protected.
- Flooding:** The expansion activities should include to drainage review so as to minimize the flooding risk along the Northern Bypass.

- iii) **Environmental contamination:** The need to protect water sources and surface watercourses along the road from pollution.
- iv) **Project awareness and sensitisation:** During consultation meetings, communities should be sensitised about negative consequences that come with development such as HIV/AIDS or other sexually transmitted diseases prior to commencement of construction activities.
- v) **Employment during road construction:** People from local community should be given first priority especially in regard to unskilled labour.
- vi) **Landscaping for erosion and landslides control:** Planting trees and grasses on steep embankments and hillsides close to road should help to stop risk erosion that would deposit soil onto road and the wetland.
- vii) **Dust control:** Control of dust during construction activities is essential especially in trading centres to minimise spoilage of goods in shops such as sugars, salt and flour.

6.6 RESPONSES FROM ESIA ENGAGEMENT ACTIVITIES

ESIA consultations were undertaken to disclose scoping findings and seek stakeholders' views on potential impacts, and their proposals on mitigation actions. Stakeholders consulted during ESIA comprised national and local government authorities, lead agencies responsible for wetlands, local communities and Central Police Station.

Table 6.2: Summary of key issues and responses from stakeholders.

	Issue	Key concerns/ suggestions
1	Degradation of wetlands	Loss of wetland cover, inducing uncontrolled access to wetlands, sediment and silt deposition, loss of biodiversity habitat.
2	<i>Flooding risk</i>	Increased flooding area and peak flood stage, poorly designed and installed culverts.
3	<i>Local labour</i>	Local communities preferred to be given first priority when recruiting road construction labour.
4	<i>Environmental contamination</i>	There is need to protect drinking water sources and surface watercourses along the road from pollution during construction.
5	Traffic management	Increased traffic delays during construction, poor signing and marking construction equipment.
6	<i>Landscaping for erosion control</i>	Planting trees and grasses close to the road should help to stop risk of erosion that would deposit soil onto the road during its use (post-construction phase).
7	<i>Dust control</i>	Control of dust during construction activities is essential especially in trading centres to minimise spoilage of goods in shops such sugars, salt and four.
8	<i>Noise and vibration</i>	Working beyond daytime hours, cracking of structure resulting from equipment vibrations.

These responses and other aspects from past experience and professional judgment formed the basis of ESIA study as shown in terms of reference (Appendix IV).

7 POTENTIAL IMPACTS & MITIGATION RECOMMENDATIONS

Key environmental and social impacts that have been identified for the Scheme area following site inspections undertaken from November 2010 to July 2011 are presented in this chapter.

Impact have been analysed in themes below:

- Impacts associated with the route;
- Socio-economic impacts;
- Impact on wildlife aquatic ecosystems (wetlands);
- Impact on soil;
- Impact on local hydrology;
- Impact on ambient noise (due to traffic noise);
- Impact on local air quality; and,
- Visual impacts.

In all or some of the above mentioned themes, impacts may arise at the construction stage, or from the road use (operation) stage, and will be addressed within this Chapter accordingly. In addition, anticipated socio-environmental impacts can be grouped into four categories. They are:

- Long-term and short term impacts;
- Direct and indirect impacts;
- Positive and negative impacts; and
- Reversible and irreversible.

For each impact identified within this Chapter, a matrix is used to show predicted impact significance in a coloured cell. Impact significance is based on the likely magnitude of the impact and the sensitivity of the receptor, as described in Chapter 3.

It should be noted that the majority of impacts identified and analysed for this ESIA are not new impacts, but were identified during the construction of the existing carriageway which has been operational since November 2009. Impacts associated with the current Scheme are therefore on the whole, cumulative impacts, in conjunction with the existing road

7.1 IMPACT ON WETLANDS

7.1.1 LOSS OF WETLAND COVER

Along most of its length, the Kampala Northern Bypass traverses sections of wetlands. Construction of the second carriageway will lead to additional loss of wetland cover along these sections. For example, Westwards after Bwaise roundabout, the Northern Bypass follows the southern fringe of *Lubigi-Mayanja* wetland system whereas to the East it gradually rises through low hills with limited swamp cover. Construction activities will therefore lead to loss or drainage

impairment of some wetland sections where the dual carriageway will be constructed.

Although there were no sensitive fauna or flora of conservation significance identified during the surveys undertaken along the route, loss of wetland cover is anticipated to reduce eco-systems services derived from the wetlands, such as localised small-scale harvesting of papyrus by some peri-urban communities, or use of their edges for growing tree and flower nurseries. Loss of additional strips of wetlands could impair spatial and temporal storage of stormwater.

Siltation of wetlands, and road crossings poses a risk of localised ponding that has public health impacts and risk to buildings adjoining the Bypass.

Full information regarding species and habitat surveys undertaken for the Scheme and in support of this ESIA are provided within Appendix I. A discussion of potential impacts upon species and habitats (predominately wetlands), as well as potential measures to mitigate for these impacts is presented within this Appendix and has been used to inform the Environmental Management Plan provided in Chapter 8. Additional information for the Contractor's stand-alone ESMP (refer to Chapter 8) is also provided within Appendix I in the form of detailed mitigation recommendations.

Impact characterisation:

The impact upon wetland habitats will be long-term, its magnitude is moderate and receptor sensitivity medium, especially in peri-urban areas such as *Bwaise-III* and *Kisenyi-I* where low-income communities are found. Impact significance is therefore "moderate".

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Impact receptors: Wetland stretches along the road.

Mitigation:

- i) Road design will ensure adequate drainage as per national road design standards.
- ii) Marking the boundary of the construction area will mean that the Contractor will avoid additional and unnecessary wetland destruction and clearance outside of the project works footprint.
- iii) Contractor should erect erosion protection measures e.g. scour checks, lining of drains and stepped drains in areas of steep gradient.
- iv) No waste or overburden should be dumped in the wetlands during construction – the Contractor should implement a Construction Waste Management Plan to ensure that

waste is handled and disposed of in the appropriate manner.

Residual Impact: After mitigation, the significance of residual impact of additional wetland loss will be Moderate. This is taking into consideration the size of the area to be impacted by the Scheme in comparison to the overall size of wetlands of which the Scheme traverses, but acknowledging that the affected areas are linked to this wider habitat and therefore, there are potential indirect impacts to the larger wetland ecosystem.

7.1.2 IMPROPER MANAGEMENT OF CUT TO SPOIL DURING CONSTRUCTION

Earthworks associated with site preparation may generate considerable quantities of cut to spoil. Management of large volumes of cut to spoil can constitute a major disposal challenge when improperly planned. Illegal dumping of excessive spoil within the wetlands has been known to occur during the previous stages of development of the northern by-pass, and care must be taken to avoid this occurring during the construction of the widening element.

Impact characterisation

If waste material is improperly managed and disposed of during construction of the Scheme, the impact duration would be short to medium term. The extent of the impact would be local and limited to the immediate neighbourhood of disposal sites on land, but might also have considerable spatial extent downstream of deposition site in a wetland. Impact magnitude can therefore be considered major and receptor (wetlands) sensitivity high. Therefore impact significance is Large or Very Large and significant.

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Impact receptors: Watercourses and communities where spoil is improperly dumped.

Impact mitigation: As a priority, cut to spoil materials shall be used in restoration of quarry and burrow sites. The Contractor shall implement a Construction Waste Management Plan to ensure the correct handling and management of waste spoil and materials.

Under no circumstances must the Contractor accept request from persons who wish to use cut-to spoil (stripped overburden) to illegally reclaim wetlands.

Residual Impact: Following proper mitigation, the residual impact will be of Neutral or Slight significance.

7.2 IMPACTS ON HUMAN HEALTH

As discussed within the sections below, impacts on human health are considered to be ones arising from:

- Public health effects of road construction; and,
- Occupational health and safety (OHS) effects.

7.2.1 IMPROPER CONSTRUCTION WASTE MANAGEMENT

There is the potential for road construction waste such as overburden and waste bitumen to be dumped in undesignated places such as wetlands adjoining the bypass, causing aesthetic impacts and or environmental contamination.

Impact characterisation:

Improper waste management would have negative but short/ medium-term but reversible impacts. Dumping of waste in watercourses would cause drainage impairment and localised flooding, creating breeding grounds for disease vectors. Impact magnitude is expected to be minor with good construction practices and supervision of the contractor. Receptor sensitivity is high, implying a slight or moderate significance.

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Impact receptors: Settlements along the bypass.

Mitigation: The Contractor will implement a Construction Waste Management Plan (CWMP) for proper waste management.

Residual Impact: After mitigation, the significance of residual impact would be Neutral.

7.2.2 CONTAMINATION OF ROAD-SIDE SPRING WELLS

Construction waste and overburden dumped in road-side spring wells pose public health risks to communities. In addition, this has the potential to cause water scarcity in some peri-urban

communities which may not have alternative sources of water.

Impact characterisation:

Contamination of spring wells poses a risk of causing water scarcity and public health impacts in communities without alternative water sources. The magnitude of this impact is however minor considering that there are few wells to be impacted. However, for settlements without alternative sources, receptor sensitivity is high, hence “slight or moderate” significance.

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Impact receptors: Settlements along the bypass, which depend on spring wells for domestic water.

Mitigation: The Contractor will follow good construction practices to avoid impact to local water sources.

Residual Impact: After mitigation, the significance of residual impact would be Neutral.

7.2.3 DUST PLUMES FROM CONSTRUCTION OPERATIONS

Earthworks (excavation, grading, shaping), haulage and dumping of soil will generate dust plumes causing localised air quality deterioration.

Impact characterisation:

Dust will degrade local air quality and possibly lead to short-term respiratory health effects. The magnitude of this impact is expected to be moderate, however in communities with high-income dwellings; receptor sensitivity is likely to be high. Impact significance is therefore predicted to be Moderate or Large.

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or

						Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Impact receptors: Settlements close to the bypass.

Mitigation: The Contractor will make all reasonable effort to suppress dust during earthworks and specific actions will include continually watering dusty construction areas with a water bowser.

Residual Impact: After mitigation, the significance of residual impact would be Neutral.

7.2.4 CONTAMINATION AT EQUIPMENT YARD

A yard will be necessary for storage of materials, equipment and refuelling during construction of the Bypass. The equipment yard will require land, temporarily altering landuse in this location. Their operation will generate domestic and hazardous waste (waste oil) which if improperly managed will contaminated local environmental resources (soil, water) and pose public health risks. Un-restored camp and yard sites would cause aesthetic blight and remnant contamination from fuel, oil or unused bitumen. These are negative social-environmental impacts.

Other potential impacts from equipment yard include light pollution when floodlights are not directional. Derelict equipment left by contractors at improperly restored equipment yard pose environmental and public health risks.

Impact characterisation:

Site contamination will be a short- to medium-term impact unless the yard site is quickly and properly restored. Safety risks from fires at fuel storage areas could have irreversible impacts such as loss of life. Injuries and accidents at the yard could lead to long-term effects including permanent disability. These effects notwithstanding, impact magnitude is expected to be moderate due to a small footprint to be occupied by the yard. Receptor sensitivity is anticipated to be high since the yard site would eventually be used for settlement or other human-related functions, therefore impact significance is Moderate or Large.

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Impact receptors:

- Landowner(s) of yard site left contaminated.

- Soil and wetlands near equipment yard.
- Communities near yard site.
- Road construction crews (in case of OHS accidents and fire outbreak at fuel tanks).

Mitigation:

- i) The Contractor shall develop a CWMP as a contractual obligation.

The CWMP should present likely sources of waste, their type (liquid, solid, domestic etc) and quantity estimates based on the proposed equipment and workers. Based on the type of wastes generated, treatment and disposal mechanisms should be presented. Measures for waste reduction, treatment and disposal should be implemented. Record of all disposal locations and potential disposal locations which require approval of the Supervising Engineer are to be presented. These should necessarily include details of:

- Disposal of cut-to-spoil indicating quantity generated, disposal and disposal locations / potential locations with photographs;
 - Trees cut during the progress of clearing and grubbing or other activities should be presented;
 - Waste concrete, bitumen, lime and lime bags indicating quantity expected to be generated and disposed;
 - Waste oils from service bay and oil spills as well as oil from cleaning of service bay;
 - Oil and grease from vehicle washing bays; and,
 - Sanitary waste management.
- ii) The Contractor shall sensitise workers about potential for environmental contamination due to improper waste management practices.
- iii) The Contractor shall ensure waste types (organics, inorganic, hazardous, medical etc) are segregated and responsibly disposed of. Containers should be provided for safe onsite waste containment and segregation before final disposal.

In the waste disposal strategy, recycling shall be emphasised and all recyclable waste properly sorted and delivered or properly stored for pick up by recyclers.

- iv) The yard shall have adequate sanitation facilities (latrines) that are gender friendly. Living quarters should be gender friendly as well.
- v) The Contractor shall provide clean water at camp, ensuring that water abstraction is permitted by WRMD.
- vi) The Contractor shall not dump waste oil in watercourses, drains or on land but collected and sent for recycling or reuse.
- vii) Onsite combustion of waste shall not be done at the construction yard.
- viii) Smoking in communal areas (e.g. offices), near fuel storage areas shall be prohibited and signs to this effect posted in visible areas.
- ix) On completion of the project, the Contractor shall remove structures and sites restored to pre-project condition or give them to local communities/ land owners for use. Exposed areas should be replanted with indigenous tree or vegetation species.
- x) For fire safety, contractor shall provide fire extinguishers and signage at the yard and especially, at refuelling areas.

- xi) The Contractor shall ensure that potentially contaminated runoff from storage areas should be drained through oil traps.
- xii) At end of the road construction period, the yard site shall be remediated and all waste carried away for disposal by NEMA-licensed entities. This is especially in regard to:
 - Waste tyres;
 - Containers originally containing bitumen; and,
 - Containers originally containing road marking paints.
- xiii) Waste engine oil should be collected and stored in a facility licensed by NEMA. Similarly, transport and disposal of used oil should be done by a NEMA-licensed contractor.

Residual Impact: Following mitigation, the residual impact of equipment yard will be of Slight to Moderate significance.

7.2.5 OCCUPATIONAL HEALTH & SAFETY IMPACTS

Construction activities will have the following occupational health and safety risks with potential to cause serious injuries to workers:

- Burns (handling hot bitumen);
- Electrocuting; and,
- Noise and body vibration from equipment.

Examples of typical road construction machinery and their sound levels (in dBA, measured 15 meters away) include the following:

- Power saw- 110;
- Dump truck- 88;
- Portable air compressor- 81;
- Concrete mixer- 85;
- Bull dozer- 87;
- Rock drill- 98; and,
- Pneumatic tools- 85.

Construction noise is a major source of environmental noise pollution and a cluster of equipment at a road construction site can produce a steady roar throughout the day.

Lack of hand wash water and mobile toilet facilities at work sites could also pose considerable inconvenience and health risk to workers (or local communities traversed).

OHS impacts will potentially occur at any point during road construction and while some accidents could be minor, others might be grave leading to permanent disability or loss of life of construction workers.

Ugandan regulations require that workers exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day wear hearing protection. Related OHS safeguards are comprised in (Uganda's) Occupational Safety & Health Act (2006) and Employment Act, 2006.

Impact characterisation

Duration of the impact will be short-term occurring only during the construction phase, but the magnitude in terms of potential number of workers affected would be classified as major. The extent of the impact will be local or national depending on origin of construction workers. The likelihood of the impact occurring is high considering the usually low level of safety at construction sites in Uganda and receptor sensitivity is high considering the potentially grave consequences of occupational accidents. Significance of this impact is therefore predicted to be Large or Very Large.

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Impact receptors: Construction workers

Impact mitigation

- The Contractor shall provide all workers with requisite protective gear (see Table below).
- The Contractor shall provide onsite toilet and washing water for workers.
- The Contractor shall provide “No smoking” signs in office, communal places construction camps as well as high risk areas prone to fire hazards e.g. near fuel tanks.
- The Contractor shall provide signage reminding workers of use of PPE at appropriate locations in the project area including ancillary work sites.

Hearing protection of *single number rating* (SNR) of 37 dBA will adequately protect workers from machine noise as high as 118 dBC. BS EN 458:2004 recommends selecting a hearing protector that reduces noise exposure to at least below 85 dBA (ideally between 80 and 75 dBA) at the ear.

Besides the foregoing, the “*General Specifications for Road and Bridge Works 2005*” (Series 1000- General, Section 1800, pg 1000-43) require contractors to comply with national byelaws related to HIV/AIDS, OHS, gender equity as follows:

- OHS- Public Health Act, Workers Compensation Act, Employment Decree;
- HIV/AIDS: National Multi-sectoral HIV/AIDS Policy; and,
- Gender equity: National Gender Policy.

The specifications require contractors to ensure the following:

- i. Safe constructional plant, equipment and work methods;
- ii. Safe handling, storage, transport and disposal of materials in a way that avoids risk to workers;
- iii. Provision of protective gear;
- iv. Hiring a full time “accident prevention officer” or safety officer;
- v. Conducting safety awareness among all workers;
- vi. Control harmful insects/ vectors (including mosquitoes and houseflies);
- vii. Reporting accidents to supervising engineer and police;
- viii. Control contagious diseases (e.g. Cholera) through proper sanitation and awareness;
- ix. Control occupational hazards related to:
 - physical hazards (noise, vibrations, high temperature);
 - chemical hazards;
 - mechanical hazards (moving equipment);
 - electrical/ explosion hazards;
 - ergonomic injuries (poor working postures, heavy loads, etc); and
 - poor sanitation in workplace or living environment of workers.
- x. Contractors shall develop OHS, HIV/AIDS and gender management plans.

Residual Impact: Following mitigation such as that listed above, the residual impact will be of Neutral significance.

Impact management

Project supervising engineers shall inspect The Contractors’ compliance with safety precautions during construction.

7.2.6 IMPACTS RELATED TO MATERIAL SOURCING

7.2.6.1 Opening and use of quarries and borrow sites

Construction of the road will require materials below:

- Earth fill: 73,509 m³;
- Stabilised gravel base: 30,000 m³;
- Crushed aggregate: 30,000 m³;
- 900 mm culverts: 2,237 m;
and,
- Steel guard rails: 5,200.

The base (crushed aggregate) is the load bearing layer laid directly beneath the bituminous surface. The sub-base (gravel base) supports the road base.

It will be a responsibility of the Contractor to identify sources (location/ sites) of aforementioned earth materials that meet design specifications. It is desirable that materials are obtained from existing quarries and borrow pits since the method of their extraction, haulage and state in which source sites are left upon project completion all have the potential for socio-environmental impacts. Potential impacts include:

- Direct and secondary effects (noise, vibrations, dust, fly rock injuries) associated with stone/ rock quarrying and excavation of gravel can pose negative and sometimes irreversible social impacts. Noise would affect local communities and quarry workers. Vibrations may crack structures and affect health of especially elderly people. Local communities commonly report low livestock productivity (milk and egg yields) due to blasting noise and vibrations around stone quarries. Fly rock damages crops, structures or injures people and livestock;
- Clearing of vegetation to create access to material sources;
- Accident risks and road dust from haulage traffic;
- Quarry and borrow sites are also associated with scenic blight, and public health impacts if not properly restored, such as turning into breeding grounds for diseases vectors (especially mosquitoes);
- Quarrying of earth materials may have potential to destroy artefacts or other resources of archaeological and cultural significance; and,
- Gaping pits due to un-restored pits cause long-term visual blight and scarring of landscapes besides posing public health and safety risks.

Impact characterisation:

Some secondary impacts of stone blasting and quarrying such as injury or death caused by fly rock are irreversible. Damage to dwellings near quarries would be a considerable social impact in rural poor communities. Leaving un-restored quarry sites is a common practice in Uganda and likelihood of this impact occurring is high unless a firm contractual commitment is made by the Contractor. Impact severity is medium (or even low) except when quarries are located close to communities, which is an unlikely situation unless alternative sites cannot be found. Impact significance is therefore Moderate.

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Impact receptors:

- Quarry workers;
- Local community (and their structures, crops, livestock, health and safety);
- Local communities near un-restored or improperly rehabilitated quarry or borrow sites which pond water and harbour disease vectors e.g. mosquitoes; and,
- Physical cultural resources.

Mitigation:

As a first option the Contractor will utilise existing sites rather than open new borrow and quarry sites. Any new stone quarry sites will be subjected to a standalone EIA by the Contractor while borrow pits will undertake a “Project Brief”, as required by Third Schedule of *National Environment Act, Cap 299*.

It should be a contractual requirement for the Contractor to integrate quarry restoration plans in the general project implementation. Hence, the Contractor shall ensure:

- i) That site restoration is undertaken concurrently as road construction progresses so that cut to spoil is used to fill up quarry sites.
- ii) Height and orientation of the quarry face will be controlled for effective reinstatement.
- iii) Excess soil (overburden) from excavations shall be stockpiled at quarry sites to be used during site restoration.
- iv) Access roads to quarries if not needed by local community shall be scarified and re-vegetated.
- v) Site restoration shall utilise native vegetation species and replanting undertaken during rainy season to ensure high re-vegetation success.
- vi) Rock blasting shall utilise licensed blasters and all explosives handled as per national security requirements.
- vii) Quarry operators shall warn local communities before scheduled blasts by using sirens or drive-by announcements.
- viii) After a day’s blasting operations, the quarry operator shall assess any property damage in neighbouring communities and commit to effecting equitable compensation.

Specific mitigation actions for contractors to undertake against cultural heritage impacts are:

- i) The first two days of excavation of quarry sites shall be witnessed by an official (archaeologist) from the Department responsible for museum and monuments. During this time, bulk earthworks and excavations must be monitored by a professional archaeologist. Archaeological monitoring is an important component of conserving and managing archaeological chance finds encountered at borrow sites.
- ii) Should any human remains be disturbed, exposed or uncovered during excavations and earthworks, these should immediately be reported to the archaeologist. Burial remains should not be disturbed or removed until inspected by the archaeologist.
- iii) Once identified, all proposed borrow pits should be investigated for archaeological remains.
- iv) Prohibit collection of archaeological artefacts by road construction crews.
- v) Avoid undue disturbance to areas outside approved construction areas.
- vi) Limit worker access to construction areas only.
- vii) Limit vehicle access to construction areas only.

Impact management:

- Existing gravel and stone quarries can be used if meeting required material specifications to avoid opening new ones.
- Compensate any accidents to people or injurious damage to structures due to fly rock from

stone/ rock blasting.

- Resident Engineer should not issue completion certificate to contractor or payments withheld until quarry sites are satisfactorily rehabilitated.
- Any unsuccessful vegetation re-growth should be replaced during contractor's defect liability period.
- Workers should be provided with protective gear (muffs, hard hats, overalls, foot protection).
- Control dust by good housekeeping practices and process control.
- Physical cultural resources along the Bypass are outlined below and shown in Figure 5.4:

a) Bemba Musota Cultural Site: 200 meters from the Bypass; and,

b) Bahai Temple: 800 meters from the Bypass.

Although these are safely distant from the Bypass, all due diligence shall be undertaken by the Contractor to avoid their damage.

Residual Impact: Following mitigation, the residual impact of quarry activities will be neutral and of low significance. Further assessment in the form of a stand-alone EIA for any proposed new quarry sites may be required, which would assess the individual and specific impacts associated with any new sites.

7.2.6.2 Haulage of road construction materials

Road construction will necessitate transportation of materials from sources to worksites. Haulage of gravel (murrum) and crushed stone (aggregate) from sources to road construction work site will be associated with the following impacts:

- Staining of dwellings and trade goods in roadside shops by dust;
- Traffic accidents involving people and livestock; and,
- Traffic noise.

Heavy loads associated with material haulage traffic have in some occasions damaged local roads. Spillage of gravel or aggregate on paved roads often leads to localised road dust effects. Flying stones from aggregate spilt on paved roads pose risk of road accidents, especially to motorcyclists. On highways, flying stones have often shattered windscreens posing a risk to road safety.

Impact characterisation:

Although never compensated, staining of trade commodities in shops (especially foodstuffs: salt, sugar, flour, etc) with dust translates into a financial loss for local business owners. Excessive dust in dwellings poses a short-term health impact. Unless speeds are controlled, material haulage poses a risk of road accidents. Haulage traffic noise can be a significant impact except near schools and health centres.

These negative impacts will be of moderate magnitude, short-term and reversible. Sensitivity of communities to these impacts is often high due to associated often grave results (e.g. death in case of accidents or non-compensation of victims). Impact significance is therefore predicted to

be moderate or large.

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Impact receptors: Receptors will be local communities along haulage routes and other road users.

Mitigation:

- i) The Contractor shall suppress dust by watering wherever necessary.
- ii) The Contractor shall provide temporary road signage during construction and ensure drivers observe speed limits.
- iii) The Contractor shall deploy traffic guides warning signs where necessary, such as at approach to trading centres.
- iv) The Contractor shall provide temporary and permanent speed reducing devices e.g. humps.
- v) The Contractor shall prohibit haulage activities at night to avoid accidents in high population settled areas and trading centres.
- vi) The Contractor shall erect temporary signs along routes used by haulage trucks.
- vii) The Contractor shall station traffic guides at potentially high accident risk locations to warn / guide road users.
- viii) To avoid excessive haulage traffic noise at sensitive facilities, the Contractor shall not install temporary speed reduction features (humps) adjacent to schools or healthcare centres. This would avoid noise associated with high speed deceleration and acceleration at humps.

Residual Impact: After mitigation, the significance of residual impact would be Neutral or Slight.

7.2.6.3 Social impacts of improper storage of construction materials

Improper storage of road construction material including fuel, gravel, lime and aggregate could have environmental and social impacts resulting from localised contamination and pollution of soils and watercourses, and fire risk. If gravel stockpiles are eroded by stormwater for example, materials deposited and stored in wetlands would impair drainage and may result in localised ponding, which often turns into breeding areas for disease vectors. Improper material storage would have negative but short-term reversible impacts.

Impact characterisation:

These negative impacts will be of moderate magnitude, short-term and reversible. Receptor sensitivity to these impacts is expected to be medium. Impact significance is therefore predicted to be Moderate.

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Impact receptors: Receptors of this impact will be communities within close proximity of material storage yards.

Mitigation:

- Fuel storage areas will be bunded to safely contain spill risk;
- Safety signage (e.g. “No Smoking” near fuel tanks) will be provided wherever necessary; and,
- Material stockpiles will be protected from stormwater erosion.

Residual Impact: After mitigation such as by applying the measures listed above, the significance of residual impact due to improper material storage will be neutral.

7.2.6.4 Land-acquisition prior to construction

Construction of the second carriageway will be entirely contained within the road reserve corridor that was acquired for the project during the first phase of construction. Therefore no new land acquisition is anticipated at present. This situation may be altered if the design option of widening at-grade roundabouts instead of using grade-separated junctions is adopted.

Some temporary structures such as kiosks by the road side may need to be relocated during site preparation prior to commencing construction. Temporary structures within the current road corridor owned by UNRA, shall not be compensated. However, for any new land acquisition required, compensation shall be made for loss of livelihood and property affected by the project. This would be discussed and implemented through a Resettlement Action Plan or Abbreviated Resettlement Action Plan if required.

Impact characterisation:

Land-acquisition will have localised negative social impacts of loss of property (land and buildings) and livelihood (in case of commercial structures). Although likely to affect a few owners, land-acquisition would be a medium-term impact of major magnitude, but reversible with equitable compensation. Receptor sensitivity is expected to be high considering that

persons to be affected were probably also affected when the first carriageway was constructed (2004 – 2009). Impact significance is therefore predicted to be Large or Very Large.

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Impact receptors: Receptors of this impact will be property owners adjoining roundabouts.

Mitigation:

- All construction activities will remain within existing corridor that has previously been acquired and owned by UNRA.
- Compensation will be paid to all affected persons.

Residual Impact: After mitigation, significance of residual impact would be Slight.

7.2.6.5 Influx of people seeking construction jobs

With prevailing high unemployment among youths in peri-urban areas of Kampala City through which the second carriageway of the Bypass will be constructed, project construction may lead to influx of youths seeking job opportunities. Although the provision of jobs would be a positive impact of the Scheme, such in-migration does have some negative effects, as discussed below.

Impact characterisation:

Any influx of people at the construction sites or equipment yards may have a risk for personal injury, a negative and possibly irreversible impact. Due to potential irreversibility of accidents, impact magnitude is categorised “major” and sensitivity high.

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Impact receptors: Job seekers.

Mitigation: The Contractor shall publicise recruitment programmes and work with offices of local leaders when hiring local labour.

Residual Impact: After mitigation, significance of residual impact would be Neutral.

7.2.6.6 Traffic flow impacts during construction

Traffic flow impairment is expected on the Bypass during construction of the second carriageway, with potentially significant impacts during the morning and afternoon rush hours. Temporary traffic flow impairment may also occur due to diversions or detours.

Impact characterisation:

Traffic flow impacts will be short-term and manageable with good planning via a proper traffic management plan by the Contractor. The social cost of traffic delays (longer travel time and higher fuel consumption) will affect a considerable number of travellers. However the short project length (17.5 km), means that the impact is likely to be of moderate magnitude rather than major. Sensitivity of receptors (motorists and travellers) to this impact is expected to be medium as traffic congestion is a common occurrence in Kampala City. Impact significance is therefore Moderate.

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Mitigation:

- Advance notice shall be provided to local communities about the schedule of construction activities;
- Traffic guidelines such as speed limits shall be instituted throughout the construction phase; and,
- Traffic warning signs, temporary traffic lights or traffic control personnel where construction and associated traffic has created significant impacts.

Residual Impact: After mitigation, the significance of residual impact would be Neutral.

7.2.6.7 Social ills of construction labour & HIV/AIDS

In local communities, construction workers will be seen as being richer with ready income to

spend. Alongside the influx of workers, typically young males seeking road construction job opportunities (as discussed above), this could lead to an increase in social pathologies such as alcohol or illicit drug abuse and prostitution. The risks include contraction of communicable diseases including HIV/AIDS.

Impact characterisation:

Unless adequate sensitisation of all workers is undertaken by Contractor, impact magnitude is moderate. This is because there is some level of awareness among the general population regarding communicable diseases and the risk of drug and alcohol abuse, and the fact that there will be no workers camp during the project construction. Duration of the above-mentioned social ills will be short-term ending with completion of road construction but associated social and health effects are long-term and irreversible. Receptor sensitivity is high considering the irreversible effects of HIV/AIDS. This results in an overall impact significance of Moderate or Large.

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Impact receptors: Road construction workers and the local community.

Mitigation:

- The Contractor shall involve local (LC) leaders in labour recruitment to ensure people hired have no criminal record.
- Contractor shall provide condoms and HIV/AIDS posters to workers in privately convenient places such as toilets.

Impact management:

- As a contractual obligation, the Contractor should have an HIV/AIDS Policy and action plan for this project.
- Through posters, flyers or weekly sensitisation sessions, the Contractor will continually provide HIV/AIDS awareness to road construction workers.

Residual Impact: Following mitigation, the residual impact will be of Neutral to Slight significance.

7.3 IMPACT ON LOCAL WATER RESOURCES AND HYDROLOGY

7.3.1 SOIL EROSION AND DRAINAGE IMPACTS

Soil erosion is most likely to occur during the construction period due to excavation, dredging, cutting and filling, removal of vegetation cover and unplanned temporary storage of gravel and overburden on the roadsides. This negative impact is temporary and can be reversible with proper erosion control practices. During roadworks, culverts may be replaced along some sections of the bypass and this could alter surface water hydrology especially during rainy seasons, leading to localised floods or ponding.

Impact characterisation:

Impact magnitude is expected to be moderate and receptor sensitivity medium because drainage impacts have been prevalent in these swampy areas even before the Northern Bypass was constructed. Therefore impact significance is Moderate.

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Impact receptors:

- Wetlands close to the bypass; and,
- Buildings close to the carriageway.

Mitigation:

- Through good construction practices and erosion control measures, the Contractor will ensure that construction practices do not impair local drainage;
- Unnecessary vegetation clearance will be avoided;
- For civil works undertaken during rainy periods, silt traps and interceptor drains shall be provided on site;
- Site specific soil erosion control measures shall be implemented;
- Where necessary, alternative drainage shall be created to avoid localised floods;
- Overburden or other construction materials shall not be stored or dumped near marshes;
- When construction is undertaken during rainy periods, the free flow of water shall be maintained using sludge pumps or flexible hoses to bypass the construction site without stagnating and contaminating the water; and,
- Appropriate engineering designs and standards shall be adopted to maintain

appropriate diameters, openings and strength of the hydraulic structures.

Residual Impact: After mitigation, the significance of residual impact would be Neutral.

7.3.2 EXCESSIVE WATER DEMAND

Considerable quantity of water will be required during road construction. Although this is not expected to result in stress to water supplies in Kampala, due caution should be taken to ensure efficient use and equitable access wherever water is abstracted from.

Impact characterisation:

Impact magnitude is expected to be minor and receptor sensitivity low if water is drawn from permitted surface watercourses. Therefore impact significance is Neutral or Slight.

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Impact receptors:

- Watercourses along to the bypass;
- Any other water source where construction water is obtained; and,
- Downstream water uses on watercourses where water is drawn.

Mitigation:

- The Contractor shall secure a permit from the Water Resources Management Directorate (WRMD) for water abstraction;
- Water shall be used efficiently and abstraction will be undertaken with a full understanding of the needs of public users who share the same sources; and,
- Activities such washing of vehicles and machinery which might lead to water pollution shall not be undertaken adjacent to water sources.

Residual Impact: After mitigation, significance of residual impact would be Neutral.

7.3.3 DAMAGE TO ROADSIDE WATER SOURCES

There are water sources (springs) close to the road which if damaged by construction activities, would pose a social impact on communities that depend on them.

Impact characterisation:

Impact magnitude is expected to be moderate (due to small number of users) but receptor sensitivity will be high unless the Contractor provides alternative sources. Therefore impact significance is of Moderate or Large significance.

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Impact receptors:

- Communities that depend on roadside water resources.

Mitigation:

- The Contractor shall immediately provide alternative water sources (boreholes, protected springs, boreholes) wherever and existing one is damaged during construction.
- The Contractor shall take all due care to avoid damage to public water sources.

Residual Impact: After mitigation, significance of residual impact would be Neutral.

7.4 IMPACT ON AMBIENT NOISE DURING BYPASS CONSTRUCTION AND OPERATION

It is anticipated that construction of the second carriageway will lead to increment in existing noise baseline levels during the operation of the Scheme. In addition, construction impacts and mitigation measures have been identified, and are fully discussed within the Noise Technical Report provided in Appendix II of this report.

Full details of the noise assessment undertaken for the Scheme are provided in Appendix II. However, in summary, impact modelling, based on traffic studies conducted by Mott MacDonald, indicated that generally, the highest noise levels will manifest along Bukoto-Ntinda, which is consistent with the highest current and predicted future traffic volumes. Using the traffic survey data for 2010 as representative of the current scenario, vehicular traffic contributes 70 dB to noise within 10 m from the center line, 61.7 dB within 30 meters from the centerline, 53.3 dB within 100m from the centerline and 45.0 dB beyond 100m from the centerline. These figures are borne out by the L_{Aeq} baseline of 61.5 dB measured about 20m from the current bypass's centerline in Ntinda along the Bukoto-Ntinda stretch.

In 2020, the noise levels were predicted to increase to 75 dB within 10m of the centerline, 66.7dB within 30m of the centerline, 58.3 dB within 100m of the centerline and 50 dB beyond 100m from the centerline. In 2034, the noise levels were predicted to increase to 77.5 dB, 69.2 dB, 60.8 dB and 52.5 dB, respectively.

A comparison of the baseline noise measurements to permissible noise levels shows that receptors closest to the road are currently exposed to noise levels that are higher than the permissible limits for residential areas. However, the baseline noise levels were comparable to permissible noise levels for area zoned as “*mixed residential (with some residential and entertainment)*” but lower than those for buildings located in areas zoned as “*residential and industry or small scale production and commerce areas*”.

Factors that lead to increased noise levels include but are not limited to:

- Increase in traffic (vehicles passing per day);
- Increase in the percentage of heavy vehicles as a fraction of the total number of vehicles passing per day; and,
- Road curves lead to increased noise levels on the concave (inward) side of the road.

Impact characterisation:

Impact magnitude is expected to be moderate and sensitivity medium considering the already elevated noise levels along existing carriageway. Therefore impact significance is Moderate.

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Impact receptors: Dwellings along the Bypass.

Mitigation:

- UNRA should consider erection of sound barrier between the road and receptors, especially to shield schools and dense settlements.
- Preference will be to use low-noise surface the Bypass.

Residual Impact: If the above measures are implemented, the significance of the residual impact would be reduced to Neutral.

7.5 IMPACT ON LOCAL AIR QUALITY DURING BYPASS OPERATION

Higher traffic volume plying the Northern Bypass might lead to deterioration of local airshed especially on rising gradients of the carriageways. Exhaust emissions at these locations might elevate local levels of exhaust particulates (soot), oxides of sulphur (SO_x), oxides of nitrogen (NO_x), ground level ozone and unburnt fuel emissions or volatile organic carbons (VOCs), all of which can exacerbate various respiratory ailments especially in elderly people and children.

Impact characterisation:

Impact magnitude is expected moderate and sensitivity medium because this is a prevalent impact everywhere else in Uganda. Therefore impact significance is Moderate.

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Impact receptors: Dwellings along Bypass.

Mitigation: It is expected that government controls on the age of used vehicles will continue to reduce polluting automobiles on national roads, including the Northern Bypass.

Residual Impact: If the vehicle fleet using all Ugandan roads continues to be upgraded so that vehicles become increasingly less polluting, then the significance of residual impact would be reduced to Slight on the long-term.

7.6 ENVIRONMENTAL HAZARD MANAGEMENT

Construction of the Bypass could entail occupational hazards/ risks and accidents especially involving motorised road construction equipment, operations at the asphalt plant, stone quarries and slope failure.

The following measures are proposed to control this risk:

- a) **Accidents from equipment:** Only trained/ certified operators will operate motorised equipment.
- b) **Blasting explosives safety:** During road construction, the Contractor will ensure the following:
 - Stone blasting is only undertaken by licensed blasters.
 - All explosives are delivered to quarry sites (under police escort as Uganda's security requirements demand) on the day of blasting and any remnants returned into police

- custody after blasting. After each blast, site inspection will be conducted for un-detonated explosives.
 - Advanced warning is given to local communities near quarry sites before blasting.
 - After each blasting incident, inspection is conducted in communities around quarry sites to identify any offsite damage to private property, which should be duly and equitably compensated.
 - All workers should be adequately protected from risk of fly rock and blasting noise through adequate personal protective equipment (PPE).
- c) **Risk of burns/ scolds at asphalt plant:** This risk will be managed through the appointment of licensed operators only, following stringent safety guidelines and operation procedures.
- d) **Environmental and social risks associated with set up and operation of asphalt plant**
 - It is planned that construction of the Bypass will procure asphalt from the several existing suppliers in Kampala. In this case there would be no need for the Bypass project to set up a plant specifically associated with the widening of the road. This option has no associated social environmental risks in so far as suppliers have proof of compliance with NEMA annual environmental audit requirements.
 - However, if the Contractor determines that the project is requires a new asphalt plant, its set up should comply with NEMA EIA requirements as stipulated in *Environmental Impact Assessment Regulations, 1998*.
- e) **Fire safety:** Fire safety equipment and personnel will be provided in workers camp.
- f) **Medical emergency response:** The Contractor will have a medical clinic and a standby vehicle to immediately ambulate any accident victims to emergency medical care facility. First Aid facilities will be provided on construction sites and in camps.

7.7 CLIMATE CHANGE IMPACTS

The primary aim of Kampala Northern Bypass is to relieve the current severe traffic congestion in Kampala City. As a result, it is anticipated that there would be a reduction in vehicle emissions from the existing situation with improved traffic flows and reduced journey time. This would result in a positive Local Air Quality and global Climate Change impact once the Scheme is operational as reduced journey times will result in lower vehicle emissions of greenhouse gasses such as carbon dioxide and nitrous oxide. However, it should also be noted that the expanded Kampala Northern By-Pass may result in additional traffic using the by-pass. This would result in a negative impact on local air quality and potentially global Climate Change.

Embodied carbon associated with construction of the Scheme would also to some extent have Climate Change effect. Embodied carbon refers to energy consumed and resultant carbon emissions associated with production of materials used in construction of the proposed road, including extraction and transport of raw materials. Construction of the Scheme will therefore inevitably result in some level of negative Climate Change impact from embodied carbon of the materials used.

A lack of local emission factors means that the expected increment in greenhouse gases associated with use of the Bypass cannot be estimated at this time. However, an appraisal of potential Climate Change risks associated with the proposed Kampala Northern Bypass project is outlined below:

- i) Heavy storms may increase the risk of road damage in sections through wetlands including both temporary and permanent flooding of the carriageway.
- ii) Flooding from increasingly intense downpours may increase the risk of disruptions and delays in road transportation, and damage in some areas. Localised flooding has been reported in several sections of the Bypass, such as Kalerwe-Bwaise section.
- iii) Increase in extreme heat may cause pavement damage.
- iv) Increased intensity of strong rains might wash away shoulders or carriageway causing infrastructure damage / failure, and transport disruptions.
- v) Strong rains may also increase embankment erosion leading to landslides onto carriageway or increase maintenance cost.
- vi) Luxuriant vegetation: Climate Change may result in an increased need and higher cost for vegetation management (slashing) along the Bypass due to increased rains/ water that induce luxuriant vegetation growth.

Climate Change Mitigation:

a) Drainage

A crucial factor in planning and designing the Bypass was a consideration of Climate change impacts in relation to flood risk from increased frequency and intensity of rainfall which would result in flooding and drainage issues.

The design of the road places the Bypass higher than the flood level of the wetlands and with an improved drainage system to handle the projected large storms. While this can entail additional capital costs for drainage, the accumulated costs, including repairs and maintenance, would be lower in the future, equating to a good rate of return on investment.

Minor drainage structures were designed to carry a 10-year flood and consisted of kerbs, gutters, inlets, and pipes. Major drainage structures were evaluated for a 25-100 year storm and included all the natural and man-made drainage facilities in an entire watershed. Uganda's Road Design Manual recommends 25 and 50 years as return periods for flows for culverts on paved Class 1A roads. The 25 year recurrence interval is applicable for culvert spans of less than 2m, while the 50 year return period is for culvert spans between 2- 6 meters.

Culverts were designed to carry the design storm and limit head water depth to no higher than the shoulder or 0.5m below the edge of the shoulder.

b) Use of existing material sources

The Kampala Northern By-pass is a road widening Scheme rather than a new transport corridor, and as such, there are measures that will be applied to reduce the overall embodied carbon as a result of the Scheme. For example, use of existing borrow pits opened during construction of the original by-pass rather than opening new sites will reduce embodied carbon associated with sourcing and processing aggregates. Similarly, using existing infrastructure will result in reduced carbon emissions associated with transportation of materials to and from these sites. In addition, the structures spanning the Scheme have already been constructed to accommodate the widened element, so there will be no additional emissions resulting from demolition and re-

construction of the bridges/ overpasses for example. Sustainable procurement and construction choices will be made during the design and implementation stage so as to ensure that the overall greenhouse gas emissions associated with the entire life cycle of the Scheme are as low as possible.

c) Tree planting along the Bypass

Another mitigation measure recommended for the operational phase of the Bypass is planting trees along the Bypass, which would in part be undertaken for carbon sequestration, as well as to mitigation for the visual impacts of the road (refer to Section 7.11 below).

Trees and shrub planting will be required to be species of local provenance, that will be suitable for the local climate and not susceptible to impacts from vehicle emissions and that require little maintenance. Opportunities for planting trees along the route will be required to be investigated. It is highly recommended that UNRA procures professional services for tree planting to ensure that the right species are planted.

Residual Impact: Even with foregoing design provisions, there is expected to be residual climate change impacts associated with construction and use of the bypass.

7.8 IMPACT ON PHYSICAL CULTURAL RESOURCES

Physical cultural resources along the Bypass are outlined below:

- a) Bemba Musota Cultural Heritage Site: 200 meters from the Bypass,
- b) Bahai Temple: 800 meters from the Bypass.

These two resources were described in Section 5.1.17.

Mitigation:

These two cultural resources are safely distant from the Bypass and no impact on them is envisaged. However all due diligence shall be undertaken by the Contractor to avoid their damage.

7.9 VISUAL BLIGHT AND CONTAMINATION DUE TO IMPROPER DECOMMISSIONING

Improper decommissioning of project sites upon completion of construction activities would lead to scenic blight and remnant contamination in some project areas such as equipment yards. Such contamination may be due to waste oil spills, waste left on site, unused asphalt or discarded bitumen.

Leaving disused equipment on site could also pose contamination and visual impact. Undertaking improper or no restoration of vegetation on sites would leave them prone to soil erosion.

Mitigation:

The Contractor will commence proper restoration of all project sites not later than 3 months after

completion of construction.

7.10 GENDER AND DISABILITY IMPACTS OF THE BYPASS

Consultations and observations during the ESIA study identified some impacts that are gender specific within the current design of the Bypass:

- Women avoid the use of existing foot bridges to cross the carriageway. This is due to the design of the footbridges which makes it possible for men standing beneath the bridge to look up at women walking along the bridges.
- Elderly men, and women with a phobia for height fear to cross the road using the existing foot bridges.
- There is no disability access for the existing footbridges so those that are unable to climb steps, are unable to use the foot bridges.

These attributes contribute to an increased risk of accidents as a large number of people consistently cross the Bypass at carriageway level rather than using footbridges. Accident numbers are currently high, with many incidents resulting in pedestrian and cyclist fatalities.

Impact characterisation:

Impact magnitude is major and sensitivity high because human life lost is irreplaceable. Therefore impact significance is “Large or Very Large”.

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Impact receptors: Pedestrian and cyclists crossing the Bypass.

Mitigation:

- Footbridges will be designed to provide necessary privacy to women;
- Ramps will be provided to enable for disabled access; and,
- The design will be considerate to those with a fear of heights, so that a sense of safety is created.

Residual Impact: There may still be a residual impact and accident risk even when above-mentioned safe crossing provisions are made, if people are not adequately and continually sensitised about road safety and the requirement for people to use footbridges to cross the high-speed carriageway.

7.11 VISUAL OR SCENIC IMPACTS OF THE BYPASS

The visual resource of the Bypass landscape is the stimuli upon which actual visual experiences are based. The Bypass might alter visual experience by changing the visual resource base.

To this end, the construction and operation of the bypass may result in visual impacts, especially for properties near to or adjoining the project area. Visual impact during construction will be temporary and reversible, resulting from construction plant, storage of materials and waste, but post-construction impact would be permanent and irreversible. However, the Scheme is a widening project, and as such, it is to be constructed within the confines of an existing transport corridor. The presence of the existing carriageway within the local landscape means that the widening element is not anticipated to significantly alter the visual impression of the Bypass.

Impact characterisation:

Impact magnitude is moderate, but the sensitivity is low since the existing carriageway has not generated complaint about visual impacts since it was opened to traffic in 2009. Therefore, the impact significance is "Slight". This is also supported by the fact that most property owners were attracted to this area by the Bypass, rendering impact sensitivity low.

Impact significance:

	Magnitude if impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (Sensitivity)	Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Impact receptors: Property owners near the Bypass.

Mitigation:

- Expansion will utilize similar material, design and colour themes as existing carriageway.

Residual Impact: There is expected a residual visual impact due to the physical nature and permanent presence of the Bypass.

8 Environmental & Social Impact Monitoring & Management Plan

This Chapter presents the outline environmental and social impact monitoring and management requirements for the Kampala Northern Bypass. Table 8.1 specifies environmental and social aspects that should be managed and monitored for the duration of the project. It identifies parties responsible for monitoring actions, associated costs, indicators and training or capacity building needs and reporting systems, and will form the basis for the more detailed stand-alone Environmental and Social Management Plan (ESMP) to be prepared by the Contractor.

8.1 INSTITUTIONAL ARRANGEMENTS

Institutional strengthening is essential in areas such as solid waste management, monitoring, strengthening of road committees and training UNRA staff and lead agencies. The primary oversight to ensure that mitigation actions are implemented will rest with UNRA's Directorate of Projects working with Safeguards Unit under Directorate of Planning. In addition, the District Environmental Officers of Kampala and Wakiso have regulatory, supervisory and monitoring roles on behalf of NEMA.

The Contractor will be required to prepare a stand-alone ESMP linking environmental and social activities for the road works in line with guidance issued by UNRA. UNRA shall require the Contractors to comply with this ESMP and assign a fulltime staff member (Environmental Officer) to undertake environmental supervision and coordination during construction.

UNRA awards full mandate to the Supervising Engineering (SE) consultants to supervise the road project on a day to day basis. The SE will employ an Environmental Specialist to oversee the work of the Contractor through intermittent (not full-time) environmental inspections. This specialist should guide the Contractor's fulltime Environmental Officer in undertaking his/ her own responsibilities, to include reporting.

Samples and guidance on terms of reference or roles expected of Contractor's Environmental Officer are provided in Appendix V. Proposed duties of the supervising consultant's environmental specialist are presented in Appendix VI.

8.2 MONITORING AND REPORTING ARRANGEMENTS – REGULATORY AUTHORITY RESPONSIBILITIES

Monitoring will verify if predicted impacts have actually occurred and check that mitigation actions recommended in the ESIA are implemented by the Contractor and document their effectiveness. Monitoring will also identify any unforeseen impacts that might arise from project implementation.

Who monitors and how: Monitoring will be undertaken by UNRA (Directorate of Projects) and

Environmental Officers who represent NEMA at local administrative level. Monitoring by NEMA is “third party monitoring” but this is its regulatory mandate according to Sections 6 and 7 of the *National Environment Act* (Cap 135) and no funding is expected from UNRA.

Another government agency that may undertake “third party monitoring” is the Occupational Health & Safety Department in Ministry of Gender, Labour & Social Development (MGLSD). This unit has authority to inspect any facility for compliance with national requirements on safety in workplaces. The project shall make no funding to MGLSD since this is provided for in its annual budget.

Monitoring will undertaken through site inspection, review of grievances logged by stakeholders and *ad hoc* discussions with potentially affected persons. For each monitoring visit, a discussion with a chairperson of environment committee of the area’s local council (LC) could provide insight into views and grievances a given community has about the project. It would be beneficial for the Contractor’s Environmental Officer and the SE’s Environmental Specialist to attend regular meetings with the Regulatory authorities to provide an update on environmental monitoring on site and to maintain communication channels.

Frequency: Monitoring information will be acquired by the Contractor’s Environmental Officer on a daily basis over the construction period. The monitoring frequency undertaken by the consultant’s environmental officer will correspond to the agreed supervising schedule over the construction period.

Reporting: Detailed monthly monitoring reports shall be compiled by the Contractor’s environmental officer under oversight of the SE. The reports will be based on records kept as per requirements of the General Specifications of the Road & Bridge Works (pg. 1000-38), Section 77 of the *National Environment Act Cap 153* and guidance issued by UNRA. These detailed reports with evidence of compliance shall be prepared and appended to summary monthly reports.

8.3 OBLIGATIONS OF THE CONTRACTOR

The road construction Contractor is required to develop a Contractors Environmental & Social management Plan (CSEMP). UNRA enforces implementation of provisions of the CSEMP through the SE and Contractor. In addition to monitoring of implementation of environmental provisions by the SE’s Environmental personnel, UNRA’s Environmental Specialist, Sociologist and Land Acquisition Specialist will oversee effective implementation of measures suggested through the Engineer and Contractor. A specialist agency tasked with implementation of HIV/AIDS sensitisation and control will be procured through the Contractor. At field level, the Contractors’ *Environmental and Health and Safety Officer* will be responsible for implementing the CSEMP.

Table 8.1 specifies environmental and social aspects that should be managed and monitored for the duration of the project. This Table is not exhaustive, and the stand-alone ESMP to be prepared by the Contractor will provide additional information. The stand-alone ESMP will identify specific mitigation that has been identified within this ESIA, as well as industry Best Practice methodologies. The stand-alone ESMP will be prepared as a live document, to be updated as the Project progresses.

Table 8.1: Socio-Environmental Monitoring & Management Plan.

Ref. Sec.	Impact and Mitigation/Enhancement commitments	Desired Outcomes	Monitoring: Performance Indicators/Targets or Acceptance Criteria	Timing	Responsibility	Incremental Costs (USD)	Capacity Building and Training Requirements
7.1	IMPACT ON WETLANDS						
7.1.1	Loss of wetland cover						
	Construction of the second carriageway will lead to additional loss of wetland cover	Minimal loss of wetland cover and functions	Acreage of wetlands lost due to project activities	Before and during commencement of construction	UNRA and Contractor	Negligible	None
	Adequate drainage designs, erosion protection	Wetland hydrology is not affected	Wetland water quality and flow regime characteristics	Before and during construction	UNRA and Contractor	Negligible	None
7.1.2	Improper management of cut to spoil						
	Illegal dumping of excessive spoil within the wetlands compromises their functions	No use of cut-to spoil (stripped overburden) to illegally reclaim wetlands	All cut-to spoil material removed from the project sites	During construction	UNRA and Contractor	Negligible	None
	Proper waste management to be documented and recorded within a, Earthworks and Construction Waste Management Plan (CWMP). Reuse for quarry restoration.	Cut-to spoil material disposed of properly	Quarries restored with cut-to spoil material	During construction	UNRA and Contractor	Negligible	None
7.2	IMPACT ON HUMAN HEALTH						
7.2.1	Improper waste management						
	Seek guidance of local environmental officers to identify acceptable disposal sites. A CWMP should be prepared for the Scheme to identify management, handling and disposal streams.	Contractor has records of proper waste disposal indicating quantities dumped and location of dumping site.	No complaints of unauthorised dumping of overburden on private property or in rivers/streams and swamps	Throughout construction	UNRA ; Contractor; District Environmental Officer.	Negligible	None

Ref. Sec.	Impact and Mitigation/Enhancement commitments	Desired Outcomes	Monitoring: Performance Indicators/Targets or Acceptance Criteria	Timing	Responsibility	Incremental Costs (USD)	Capacity Building and Training Requirements
	Contractors should undertake waste segregation at source to separate hazardous from non-hazardous waste. To be documented through a Site Waste Management Plan.	Hazardous waste separated from non-hazardous waste on site and each waste stream disposed of according to NEMA requirements in designated sites.	Separate containers on site for hazardous and non-hazardous waste on site	Throughout construction	UNRA ; Contractor; District Environmental Officer.	Negligible	Likely hazardous and non-hazardous construction waste
	Waste (such as metal scrap or wood waste) that can be reused/ recycled may be given to local people.	Amount of waste disposed of minimized by reuse, wherever feasible	Record of material types and estimated quantity diverted for reuse	Throughout construction	Contractor	Negligible	-
	Seek guidance of local environmental officers to identify acceptable disposal sites.	Waste disposed of at designated sites	No complaint of waste dumped illegally in non-designated sites	Throughout construction	Local Environmental Officer.	Negligible	-
7.2.2	Contamination of road-side spring wells						
	Contamination of road-side spring wells due to waste from project activities pose public health risks to communities	Community water sources are not contaminated by waste from project activities	No community water sources is contaminated by waste from project activities	Throughout construction	Contractor	Negligible	-
	Follow good construction practices to avoid contamination of water sources, to be detailed within the Contractor's ESMP. Water quality monitoring to be	Contractor following good construction practices	Documented guidelines to protect water sources and evidence that they are being followed	Throughout construction	UNRA ; Contractor; Local Environmental Officer.	Negligible	-

Ref. Sec.	Impact and Mitigation/Enhancement commitments	Desired Outcomes	Monitoring: Performance Indicators/Targets or Acceptance Criteria	Timing	Responsibility	Incremental Costs (USD)	Capacity Building and Training Requirements
	undertaken by the Contractor.						
7.2.3	Dust plumes from construction operation						
	Contractors should use dust suppression methods such as water sprays.	No excessive dust emissions from roads and quarries	No complaints from public or business owners about excessive dust from road (this should be verified by perusal of records in complaints log)	During construction	UNRA and Contractor	Comprised in contractor's bid	None
7.2.4	Contamination at equipment yard						
	Oily waste, excessive lighting and improper equipment storage can result in environmental contamination and occupational risk	Equipment yard site and surrounding not contaminated by waste from project activities	Number of complaints about environment degradation from neighbours of equipment camp site	Throughout construction	UNRA ; Contractor; Local Environmental Officer.	Negligible	-
	The contractor should develop and implement a Construction Waste Management Plan (CWMP) that includes management of oily waste.	An operational CWMP	Documentation associated with implementation of the CWMP	Throughout construction	UNRA ; Contractor; Local Environmental Officer.	Negligible	-
7.2.5	Occupational health and safety impacts						
	Contractor should provide Personal Protective Equipment (PPE) to all workers	Reduce health and safety risks to construction workers	Zero injuries in any month of construction phase	Before construction commences	UNRA and Contractor	\$10000 for a team of 100 workers	Application of various types of PPE and their proper use.

Ref. Sec.	Impact and Mitigation/Enhancement commitments	Desired Outcomes	Monitoring: Performance Indicators/Targets or Acceptance Criteria	Timing	Responsibility	Incremental Costs (USD)	Capacity Building and Training Requirements
	Contractor should provide adequate onsite toilet and washing water for workers. In addition, facilities for the storage of personal items during working hours and rest areas should be made.	Workers have adequate sanitary provisions that are located with privacy in consideration. Workers are able to safely store personal belongings during working hours, and have a designated area for required rest periods and during adverse weather conditions.	Ablution facilities exist on site; designated rest areas	During construction	UNRA and the Contractor	Negligible (should be part of contractor's bid)	None
7.2.6	Impacts related to material sourcing						
7.2.6.1	Opening and use of quarries and borrow pits						
	Site restoration to be undertaken in accordance with an approved plan of restoration (with NEMA)	Sites properly restored (camp, yard, quarries and borrow pits)	All sites properly rested leaving no visual blight	3 months after completing construction	Contractor (approved by UNRA and NEMA)	Part of contractor bid	None
	Secondary impacts of stone blasting and quarrying	No injuries resulting from blasting and quarrying operation	No complaints incidences registered	Before construction commences	UNRA and Contractor	\$70,000 for repair of any structural damages to property	Application of various types of PPE and their proper use.
7.2.6.2	Haulage of construction materials						
	Road dust should be controlled through bowing or speed control	No excessive dust spills on roads during material haulage	No complains about dust along haulage routes	Throughout construction	UNRA ; Contractor; Police	Negligible (this should be part of contractor's bid)	None

Ref. Sec.	Impact and Mitigation/Enhancement commitments	Desired Outcomes	Monitoring: Performance Indicators/Targets or Acceptance Criteria	Timing	Responsibility	Incremental Costs (USD)	Capacity Building and Training Requirements
	Ensure drivers respect speed limits along the roads, near schools populous settlements.	No road accident by project traffic	No accident occurs in each month of construction duration	During construction	UNRA and Contractor	Negligible	Contractor needs speed awareness through built areas and urban areas
	Employ safe traffic control measures, including temporary road signs and flag persons to warn of dangerous conditions and children crossings All of the above measures should be included within a Traffic Management Plan to be prepared by the Contractor for the duration of the Construction period.	No road accident by project traffic	No accident occurs in each month of construction duration	During construction	UNRA and Contractor	Cost of temporary signage during road construction part of contractors bid	None
7.2.6.4	Land acquisition prior to construction						
	The probable re-design of the junction may lead to acquisition of land for the project	No loss of livelihood and equitable compensation for property affected by the project	No complaints from the property owners affected by land acquisition	Throughout the project lifecycle	UNRA	Cost of land, property compensation and livelihood restoration to be determined during ARAP development	Affected people sensitization of about ARAP process
7.2.6.5	Influx of people seeking construction jobs						

Ref. Sec.	Impact and Mitigation/Enhancement commitments	Desired Outcomes	Monitoring: Performance Indicators/Targets or Acceptance Criteria	Timing	Responsibility	Incremental Costs (USD)	Capacity Building and Training Requirements
	Migrant workers may be associated with the risk of social disruption and are prone to injury	Harmonised untroubled integration of the migrant workers with community.	Number of social disruptions involving migrant workers.	Throughout construction period.	UNRA and Contractor	Negligible	Sensitization about the dangers of promiscuity (i.e. transfer of communicable diseases). Adequate training in the use of construction equipment for all construction personnel.
7.2.6.6	Traffic flow impacts during construction						
	Traffic flow impairment is expected on the Bypass during construction especially during the morning and afternoon rush hours. A Traffic Management Plan should be prepared by the Contractor for the duration of the Construction period. The Traffic Management Plan should address construction traffic, as well as pedestrian and cyclist activity within the project area.	Minimal disruption in traffic flow during construction activities	Extent of traffic delays related to construction activities	Throughout construction period.	UNRA and Contractor	\$10000 for sensitization of the public about the expected delays.	Training for a Traffic Officer role to be undertaken by the Contractor.
7.2.6.7	Social ill of construction labour and HIV/AIDS						

Ref. Sec.	Impact and Mitigation/Enhancement commitments	Desired Outcomes	Monitoring: Performance Indicators/Targets or Acceptance Criteria	Timing	Responsibility	Incremental Costs (USD)	Capacity Building and Training Requirements
	As a contractual obligation, Contractors should have an HIV/AIDS policy and a framework (responsible staff, action plan, etc.) to implement it during execution of this project.	No illicit sexual relationships among construction workers and local community	All construction workers are aware of HIV/AIDS risk and responsible living. All construction workers living in a camp adhere to a “No fraternization” and comply with latest entry time into camp (6PM).	Throughout construction	UNRA	\$2000 for HIV/AIDS posters/fliers and free condoms	Awareness training on HIV/AIDS should be provided to construction workers
7.3	IMPACT ON LOCAL WATER RESOURCES						
7.3.1	Soil erosion and drainage impacts						
	Ensure no excessive soil erosion due to erosive stormwater from, excavation, dredging, cutting and filling, storage of gravel and overburden, paved road, leading to gullies. An Emergency Preparedness plan should be prepared for unforeseen storm events.	No community complaints about erosive runoff from construction activities and the finished road into private property	No gullies originating at stormwater ways Flooded areas along the road after rain storms	Every rain season for five years	UNRA	\$20,000 for data collection and documentation during the five years	None
7.3.2, 7.3.3	Excessive water demand and damage to water sources						
	Considerable quantity of water will be required during road construction	Communities along the route are not denied access to water sources	All residents along the road route access water during construction Water use is properly managed to avoid wastage	Throughout construction period.	UNRA and Contractor	Negligible	None

Ref. Sec.	Impact and Mitigation/Enhancement commitments	Desired Outcomes	Monitoring: Performance Indicators/Targets or Acceptance Criteria	Timing	Responsibility	Incremental Costs (USD)	Capacity Building and Training Requirements
7.4	IMPACT ON AMBIENT NOISE DURING BYPASS OPERATION						
	<p>Construction of the second carriageway will lead to increment in existing noise baseline levels especially along climbing sections.</p> <p>Detailed Mitigation is provided within Appendix III of this ESIA (Section 4.1).</p>	Increment in ambient noise levels to be within acceptable limits at receptor locations	Number of complaints of noise increment during operation	Throughout operation period.	UNRA and Contractor	Cost of noise barriers and low-noise surface should be part of contractor's bid	None
7.5	IMPACT ON LOCAL AIR QUALITY DURING BYPASS CONSTRUCTION AND OPERATION						
	<p>Contractors should use dust suppression methods such as water spray, as well as providing covers for all trucks carrying materials and wastes, wheel washing facilities for vehicles leaving the construction site and adequate maintenance of vehicles.</p> <p>Government controls on the age of used vehicles will continue to reduce polluting automobiles on national roads</p>	No excessive dust emissions from roads and quarries	<p>No complaints from public or business owners about excessive dust from road (this should be verified by perusal of records in complaints log)</p> <p>Trend of air quality along the Northern bypass</p>	During construction	UNRA and Contractor	<p>Comprised in contractor's bid</p> <p>\$10,000 for annual air quality audit</p>	None
7.7	CLIMATE CHANGE IMPACTS						
	Positive and negative impacts of the Northern Bypass exist which need to be enhanced and minimised, respectively	Overall the Northern Bypass has a positive impact on climate change	<p>Climate proofing design incorporated and are effective against changes</p> <p>Shortest most optimum routes are identified for material sourcing</p>	Throughout construction and operation period.	UNRA and Contractor	Cost of climate proofing should be part of contractor's bid	None

Ref. Sec.	Impact and Mitigation/Enhancement commitments	Desired Outcomes	Monitoring: Performance Indicators/Targets or Acceptance Criteria	Timing	Responsibility	Incremental Costs (USD)	Capacity Building and Training Requirements
7.9	<i>VISUAL BLIGHT AND CONTAMINATION DUE TO IMPROPER DECOMMISSIONING</i>						
	Improper decommissioning of project sites upon completion of construction activities would lead to scenic blight and remnant contamination	All project related working sites properly decommissioned Disused equipment removed from storage areas and restoration undertaken	No project equipment left at storage sites All project sites restored to as close as possible to original state after decommissioning	3 months after the construction period and project life time for decommissioning	UNRA and Contractor	\$100,000	None
8	INSTITUTIONAL INVOLVEMENT / STRENGTHENING						
	Utilise local road committees to support community awareness and sensitisation about project benefits and also to participate resolving compensation grievances, environmental monitoring and HIV/AIDS awareness.	Road committees support project implementation	Number of committee members involved in the project, their specific activities and meetings records	All throughout project implementation	UNRA	\$30,000	None
TOTAL COST						\$272000	

9 SUMMARY AND CONCLUSION

Given the location of Bypass, ESIA findings indicate that flooding risk and degrading the wetland system are key impacts of the expansion project. Direct negative impacts will include soil erosion, scouring of the landscape due to opening of borrow pits, inadequate revegetation, dust, noise and vibrations during road construction, increased sediment loads to wetland system, and occupational safety hazards, traffic diversion and accidents. There are also envisaged climate change impacts (Section 7.7), visual and gender related impacts associated with the design and use of the Bypass. Secondary beneficial impacts include improved accessibility, reduced public transport costs, road safety, improved access to social services, improved local economies and induced development. An improved road, as has been observed with the existing road, increases access to illegal or excessive exploitation of the wetlands. Positive impacts from road improvement activities will occur and indeed justify this project. Other benefits include stimulation and development of roadside economic activities, increased social mobility and access to social services especially health.

Considering that the one carriageway of the Bypass has been in use since 2009, predicted impacts will not be new but cumulative and of low significance largely because receptor sensitivity is low. Low receptor sensitivity is also attributed to the fact that most developments and properties along the Bypass were actually attracted to the area by the Bypass project.

Largely, all predicted project impacts can be mitigated with good design and due care during construction. Design mitigation measures include:

- Provision for good drainage in the wetland section to avoid localized flooding;
- Provision of suitably designed footbridges along the Scheme;
- Landscape design to include tree and shrub planting along the Scheme corridor; and,
- Provision of lighting and crash barriers along the Scheme.

Construction measures require proper construction practices and monitoring. The Contractor will be required to prepare a stand-alone Environmental Management Plan (EMP) to cover all environmental management requirements for the duration of the Scheme (to include decommissioning and operational management and maintenance), and a Construction Environmental Management Plan (CEMP) that specifically addressed construction activities. Additional, detailed management plans which would include specific method statements for certain activities would also be required to be produced by the Contractor, such as relating to construction waste, labour, occupational safety, HIV/AIDS, and traffic management among others.

Operational measures include maintenance to ensure that road infrastructure (e.g. safety signs) is functional. It was also noted that there is a need for UNRA to procure professional services for tree planting and maintenance. Traffic noise may in future, with increase in traffic volume, become a considerable impact for settlement adjoining the Bypass, necessitating control measures such as noise barriers in some locations.

Table 9.1 provides a summary of the key potential impacts associated with the Kampala Northern Bypass as identified through this ESIA. With good construction practices, supervision and monitoring all key predicted impacts of widening Kampala Northern Bypass can be mitigated to manageable levels.

Table 9.1: Summary of key potential impacts.

Component Activity	Issues/Impacts/Risks	Preliminary assessment of significance
Phase: Construction		
Land-take	<ul style="list-style-type: none"> Loss of wetland/ swamp area 	Negative: MODERATE significance
Sourcing of road construction materials	<ul style="list-style-type: none"> Income for quarry land owners and construction material suppliers. 	POSITIVE
	<ul style="list-style-type: none"> If quarry or borrow sites not restored they could be an eyesore (aesthetic impacts) and a risk to children and animals. Unrestored pits may also impound water hence a potential breeding ground for mosquitoes and other vectors – therefore health-related risks. Landuse changes. 	Negative: MINOR-MODERATE significance
Transportation of materials	<ul style="list-style-type: none"> Haulage traffic impacts (e.g. accidents) in local communities. 	Negative: MODERATE significance
	<ul style="list-style-type: none"> Dust, noise and vibration impacts due to traffic – potential air pollution and health impacts. 	Negative: MINOR-MODERATE significance
Storage of construction materials.	Pollution risk from potential spillage of fuel, bitumen, etc at construction site if standard (best) site management practices not observed.	Negative: MINOR-MODERATE significance
Site preparation	<ul style="list-style-type: none"> Land take for access roads and road right of way. Excessive vegetation stripping hence soil erosion. 	Negative: MODERATE significance
Impact of equipment yard	<ul style="list-style-type: none"> Occupational risks soil compaction. Localized soil contamination with fuel/oil spills or waste bitumen left on site Improper restoration upon site closure. 	Negative: MINOR-MODERATE significance
Employment	Employment opportunities for skilled and unskilled labour.	POSITIVE
Influx of construction workers.	<ul style="list-style-type: none"> Accident risk. 	Negative: MODERATE significance
	<ul style="list-style-type: none"> Pressure on local infrastructure and services. 	Negative: MODERATE significance
Phase: Operation		
Improved traffic capacity of the Bypass	A dual carriageway bypass will have considerably high capacity to divert large traffic volumes from the city, preventing traffic clog-ups.	POSITIVE
Increased road safety	<ul style="list-style-type: none"> Design will provide vandal-proof road safety signage. Design will provide safe motorcyclists, pedestrian walkways and crossings. Foot bridges shall be gender-sensitive to allow acceptance and use by women, elderly and disabled travellers. 	POSITIVE

Component Activity	Issues/Impacts/Risks	Preliminary assessment of significance
	<ul style="list-style-type: none"> ▪ Lighting will be provided and directed onto the carriageway to minimise offsite light pollution and glare for motorists. 	
Traffic noise pollution	Dwellings adjoining the road will experience higher traffic noise levels.	Negative: MODERATE significance
Improper disposal of Road construction waste (waste bitumen, oil/fuel spills, lime bags, etc)	Improperly disposed waste poses potential for environmental contamination	Negative: MINOR- MODERATE significance
Employment during scheme operation (for road / signage maintenance, grass cutting in road reserve, road cleaning, etc)	<ul style="list-style-type: none"> ▪ Maintenance contracts present economic benefit. ▪ Road cleaning and maintenance of the road reserve greenery has often provided employment opportunities for women. 	POSITIVE
Drainage impairment hence localised flooding	Blockage of drains would pose flood risk.	Negative: MODERATE significance
Induced development	<ul style="list-style-type: none"> ▪ The bypass might attract more residential and commercial development along its route. 	POSITIVE
	<ul style="list-style-type: none"> ▪ Prices of land may increase, making it unaffordable for low-income people, in the only areas where they could afford land. 	Negative: MINOR- MODERATE significance
	<ul style="list-style-type: none"> ▪ Increased pressure on social infrastructure especially sanitation services including solid waste collection. 	Negative: MODERATE significance

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APPENDICES

Appendix I: Biological and ecological observations and impact statement for the Northern by pass Project

1. BACKGROUND

A number of wetlands in the Lake Victoria Basin of East Africa have been surveyed for their plant diversity e.g. Chapman *et al.* (2001), Gichuki *et al.* (2001), Ssegawa (2003), Kalema (2005a & b), Katende *et al.* 2005; Lye & Namaganda (2005), Namaganda (2005) Kalema (2006, 2008). Although the total number of plant species from the Ugandan Lake Victoria basin is not known, the richness of some particular wetlands was provided by Kalema (2005a) for example 216 for Lutembe, 184 for Lutoboka, 304 for Nabugabo, 184 for Doho, and 240 for Mabamba. Whereas most of these are common species (except for Nabugabo which even has endemic plants), it is their total assemblage that enables these wetlands to provide their important ecological services. It is partly for this reason that Lutembe, Mabamba, Lutoboka and Nabugabo were designated Ramsar Sites (wetlands of international importance), in recognition of their essential biodiversity and ecosystem service.

Uganda is also known for its rich diversity of bird species (Pomeroy 1993) and the greater Kampala area alone has 550 recorded (Carswell 1986), a little over half the total for the whole country and a quarter of the total for the whole of Africa, whilst the few square kilometres of Makerere hill – which has no wetland – has a list of 202 species, probably the highest of any university campus in Africa (unpubl data). For its size, Uganda has high numbers of species (Pomeroy, 1993) with currently, over 1,040 bird species have been recorded (Carswell *et al.*, 2005, R Skeen, pers comm), making the country one of the most species-rich in Africa, attracting increasing number of birders as tourists.

The wetlands along the Bypass is part of a larger wetland system in Kampala District running through the areas of Kinawataka, Lubigi, Nalukolongo, Nsooba, Kiyanja, and others in the system (Kalema 2009). This wetland system provides invaluable ecosystem services for humankind welfare and conservation of biodiversity. According to the National Wetland Conservation and Management Programme (1996) valuation of the Nakivubo wetland, its financial contribution is up to US\$ 1.7 million a year. This exemplifies the role of wetlands in the Ugandan economy where part of the population depend much directly on resources from the wetland for their livelihood. Although, most of this value is attributed to water treatment and purification services, approximately US\$ 100,000 is estimated to accrue from wetland resources through crop cultivation, papyrus harvesting, brick-making, and fish-farming.

The northern by-pass is due for expansion to make it a dual carriage-way throughout its length. Westwards after the Bwaise roundabout, the road follows the southern edge of the Lubigi-Mayanja wetland system whereas to the east it gradually rises through low hills with only limited areas of swamp. Road works are proposed to be undertaken in areas that are presently single carriage-ways. The construction activities will inevitably affect the wetland traversed by the road in the sections to be made into a double carriage-way. This is bound to cause habitat loss and therefore reduction as well as degradation. The biodiversity in this wetland will accordingly be affected as a result of habitat loss or reduction, and decline in its quality. An update was therefore necessary to take stock of the biodiversity elements in the wetland, identify key ecological services that may be compromised or lost, and propose possible mitigation measures to minimize the loss.

Surveys were undertaken along whole route of the by-pass, but focussed on the areas expected to be affected by the addition of a second carriage-way, which is to the north of sections 1 and 2

(see Table AI.1, proceeding from west to east), and to the south for sections 4 to 7 (section 3 is already dual carriageway). The swamp adjacent to section 1 is the most extensive and least degraded Plate 1, whilst that adjacent to section 2 is nearly as good.



Plate 1: Various vegetation species in the intact wetland areas along section 1 and 2 of the Northern Bypass.

Source AWE

Between the Masanafu to Busega roundabouts, fairly good extensive stands of wetland vegetation survive, with varied vegetation structure. These fairly intact vegetation formations, continue to provide suitable habitats inhabited by a large variety of birds, invertebrates, amphibians and reptiles and a few surviving mammals.

Sections 4 to 7 all have some areas of swamp, but those alongside 4 and 5 are small and appear to have little significance from a biodiversity point-of-view. The remaining areas that are expected to be lost are mainly grassy embankments, cuttings and verges which again have little or no importance for biodiversity (except in the sense that all green areas are relevant to carbon sequestration, so all work areas should finally be grassed once the work is complete. Uganda is a signatory to several relevant conventions, including that on Biological Diversity, and the Ramsar Convention for the wise use of wetlands.

Uganda's once extensive wetlands are under constant threat, and any loss is to be regretted. A previous study (*NatureUganda*, 2010) documented the value of the Lubigi-Mayanja wetland system, although unfortunately that did not prevent the construction of a waste water treatment plant at that site. Occasionally, however, wetland areas are protected or restored (Plate 2). Where loss is inevitable, then mitigating measures are necessary.



Plate 2: A recent Monitor Newspaper (19 July 2011) update on Lubigi wetland.

1.1 SELECTION OF SAMPLE SITES

There are seven sections to the Bypass, separated by roundabouts (Table AI.1). A reconnaissance drive-through was used to identify sampling areas (Table AI.2). All sections were assessed from the Busega round-about in the extreme west to Bweyogerere round-about at the eastern end. Section 3 (Nansana Round-about to Bwaise Round-about) was skipped as this was already a dual-carriage-way. The sampling sites were selected to include those with relatively intact and natural vegetation as well as altered areas. Additionally, sample sites were selected to cover all the remaining main vegetation types. These sample sites were all geo-

referenced, for possible location in the future. The project area was characterized from the floristic and landscape features observed in the different habitat types.

Table AI.1: Current activities on habitats along the Northern By-pass to be affected due to construction of the second carriage-way. Sections ascending from West to East.

Section Number	Name	Amounts of Swamp in areas of second carriage way	Current uses/activities in same areas						
			Grazing-cows/goats	Brick-making	Plants for sale	Papyrus uses	Crops - maize etc	Car-washing	Rubbish-dumping
1	Masanafu – Nansana	Extensive			x	x		x	x
2	Nansana – Busenga	Extensive	x	x	x	xx	x	x	x
3	Busenga – Bwaise – Kalerwe ^a	Was extensive ^b							x
4	Kalerwe – Bukoto	Little ^{c,d}	x						x
5	Bukoto – Kisasi	Little ^c	x				x		x
6	Kisasi – Naalya	c 400 m ^c	x	xx			x		x
7	Naalya – Bweyogerere	c 500 m ^c	x	x					x

Notes: a - dual carriage-way, no new developments planned; b - new being converted to Sewage Treatment; c - mainly grass in area of new carriage-way; d - partly occupied by temporary buildings

Four sites were selected and sampled represent all the main swamp areas (swamp being the only important habitat along the route) to survey flora and birds. Coordinates of the general areas in which the surveys for this report were conducted are those shown in Table AI.2. For logistical and practical purposes only the flora and birds were surveyed.

Table AI.2: GPS coordinates for the sampling sites.

Section	Busega– Masanafu	Masanafu– Nansana	Kisaasi– Bukoto	Bweyogerere– Naalya
Coordinates	00° 18' 55"N; 33° 31' 5.2" E	00° 20' 19.7"N; 32° 31' 56.2"E	00° 21' 39.5"N; 32° 36' 8.9"E	00° 21' 35.1"N; 32° 39' 4.9"E
Altitude (m)	1164	1166	1191	1175

1.2 LANDSCAPE SETTING

Long sections traversed by the Northern Bypass routes are occupied by permanent wetlands and urban structures. The wetlands are already experiencing anthropogenic pressures of

various types partly due to the suburban location as well as the ease of accessibility as a result of constructed road. For example an area in Lubigi wetland along the Northern By-pass had been besieged by local people for development of a market (Plate 2). By the time the survey was undertaken vegetation had started to grow back during the restoration process.

In other parts of the wetlands the existent impacts are of lesser extent in nature but with considerable cumulative impacts. For example an un-gazeted garbage area was found in the wetlands (Plate 3) and several brick making areas were observed along the route (Plate 4). The observed garbage was mostly un-biodegradable plastics some of which get carried by the wind and scattered over wider areas. The brick making operations on the other hand, result in many deep ponds that are filled with standing water with likely implications for the wetland hydrology.



Plate 3: Refuse dumped in a wetland along the bypass.

Source AWE



Plate 4: Brick making activities in wetlands along the Northern Bypass.

Source AWE

Wetlands along the Northern Bypass are sources of income to the local communities through extractive uses such as papyrus extraction and water source for nurseries. Plate 5 shows small scale papyrus extraction while in Plate 6, nurseries watered by the water from the wetlands are

shown. Although the demand of papyrus products is on the rise, papyrus could be a sustainable extractive use method of resource access in the wetland.



Plate 5: Papyrus harvested from wetlands along the Northern Bypass.

Source AWE



Plate 6: Flower nurseries irrigated by water from wetlands along the Northern Bypass.

Source AWE

The growing of nursery plants for sale may have minor direct impacts on the wetland. The activity only depends on the wetland for water and perhaps some soil, but could result in the introduction of non-native plants to change the general ecology. Cases of outright clearance/drainage of the wetland were not many along the route traversed by the By-pass. Some sections however, (Plates 7 and 8) showed evidence of such impactation on the wetland ecosystem.



Plate 7: Wetlands along the Northern Bypass reclaimed for subsistence farming.
Source AWE



Plate 8: Brick making and papyrus harvesting in a reclaimed wetland area along the Northern Bypass.
Source AWE

Other features or activities that may pose a potential risk for introduction of polluting agents such as oils, lubricants and other substances include road accidents and car washing (Plate 9) which is at the present done by the roadside using water from the wetland. In this particular instance, this car washing location was in the road area reserve that will be built up for the road expansion.



Plate 9: Car washing in an area for the proposed carriageway of Northern Bypass.

Source AWE

2. FLORA

2.1 SURVEY OF THE FLORA

The available literature about the vegetation, flora, and their conservation status was reviewed to identify the unique, threatened, rare and other cases of conservation concern species and habitats known to occur in the areas of the proposed road construction. At each sample site, a 300 m transect was used for field data collection. All species of plant encountered were identified and recorded. The relative abundance of each species was assessed and scored on a DAFOR scale. D=Dominant; A=Abundant; F=Frequent; O=occasional; R=Rare. The plants that could not easily be identified in the field were collected as vouchers for subsequent identification and deposition in the Makerere University Herbarium (MHU). Geographical coordinates and altitude were recorded at every point of sampling.

2.2 RESULTS

2.2.1 VEGETATION TYPES

Most of the section proposed for development is covered in permanent papyrus swamp described by Langdale-Brown *et al.* (1964) as X1: *Cyperus papyrus* swamp. The dominant species of plant in this kind of vegetation is *Cyperus papyrus*, a tall sedge to 5 m high with culms triangular in transverse section. *Typha domingensis* and *Cyperus nitidus* are common co-dominant species in the wetland. Often, there are various herbaceous climbers such as *Cissampelos mucronata*, *Zenheria* spp., *Mikania cordata*. There are also forbs, sometimes forming nearly pure localized patches e.g. of the common fern, *Dryopteris striata*, *Persicaria setosula*, *Persicaria madagascariensis*. *Leersia hexandra* is a vicious common grass interspersed with other species in places with plenty of water. In a few areas, for example around 00° 20' 05" N; 32° 36' 55" E, dense, near-pure stands of *Phragmites mauritanus*, a tall reed grass to 5 m high were established. But this was on the side of the road not planned for expansion. The cover of woody species in this area is sparse. Common woody species include *Bridelia micrantha*, *Hibiscus diversifolius*, *Sesbania* spp., *Ficus* ssp., *Phoenix reclinata*, *Triumfetta macrophylla*. In more disturbed areas, *Acanthus polystachius* gets more prominent, owing to edge effects and reduction in water levels as a result of drainage.

2.2.2 FLORA AND SPECIES RICHNESS

The naturalness and level of intactness of the wetland ecosystem is highest on the western side of the By-pass, having a more extensive cover of swamps. This dwindles in size and level of naturalness towards the eastern side of the By-pass. The more intact and extensive section in the western part of the wetland system along the Bypass registered higher levels of plant species richness. There was a progressive decline in naturalness and coverage of the natural habitat from the west to the east (Table AI.3). The four surveyed sites yielded a total of 146 plant species in 113 genera and 42 families in the sampled areas altogether. Kalema (2005) recorded a total of 216 plant species from Lutembe wetland which is larger and more intact. The richest sites were from the section between the Masanafu and Busega roundabouts (Table AI.3). The woody species that occurred in most parts of the wetland were *Bridelia micrantha*, *Ficus vallis-choudae*, *Phoenix reclinata*, *Triumfetta macrophylla* and *Acanthus polystachius*. Non-woody species that spanned most areas included: *Centella* sp., *Cissampelos mucronata* and most species of *Cyperus*. The majority of the plant species are forbs (Table AI.4, Table AI.7).

Table AI.3: The sites surveyed along the proposed expansion on the Northern By-Pass.

Section	Busega– Masanafu	Masanafu– Nansana	Kisaasi– Bukoto	Bweyogerere– Naalya
Species richness	97	61	51	38

Table AI.4: Relative richness of plant life forms in the Northern By-pass wetland system.

Life form	Percentage
Forbs	44.2
Grasses	15.2
Climbers	11.7
Shrubs	17.2
Trees	11.7

2.2.3 ECOLOGICAL/ENVIRONMENTAL VALUE OF THE WETLAND SYSTEM

Wetlands serve as sources of materials for crafts, medicinal plants, soil for bricks and act as water reservoirs for communities. They have potential for agricultural production especially in dry seasons for growth of crops out of season, aquaculture and grazing of animals. Wetlands also provide suitable habitats and refuge for many animals including birds and fish and hence important for biodiversity conservation. Marginal wetland ecotones serve as breeding, nursery and feeding grounds for fish and other aquatic organisms. Wetlands offer many ecological services and play an important role in life support systems. They buffer inputs from the catchment into lakes and rivers and their presence along rivers helps control flooding. They serve as large sinks for sediments, silt, nutrients, pollutants and toxins and are used for sewage treatment. Wetlands assist in maintaining water regimes, moderating climate and conserving of soils (Aniku 1996). They also provide physical stability to the shores of lake. Wetlands are thus very productive ecosystems (Chapman *et al.* 2001) with high diversity of plants and animals. Despite this great value, wetlands in Uganda are continuing to decline in extent of coverage and quality due to intense human activity (National Wetlands Conservation and Management Programme 1996, 2000; NEMA 2007). Appreciation of this immense value of wetlands is

sometimes low, especially by politicians and decision makers because wetland valuation is usually difficult.

2.3 THREATS TO THE WETLAND

There is heavy pressure on the wetlands and their resources in the whole of Uganda, including the Lake Victoria Basin as land gets increasingly scarce for cultivation, dairy farming and other economic activities. This has led to shrinkage of the wetland estate in the country. This immense wealth of wetlands needs to be rationally managed and utilized sustainably so that the wetlands may continue providing the vital services crucial for conservation of biodiversity and community livelihoods. Along the Northern By-pass, the following threats were evident:

- i) Pollution: Dumping of organic garbage and polythene shopping bags and other plastics is one of the biggest threats to the ecological integrity of the wetland system. The entire section of the wetland is littered with these plastic materials despite the presence of notices by the UNRA not to litter.
- ii) Harvest of papyrus and palms: There is unregulated extraction of plant resources, especially papyrus and Phoenix material. The papyrus is used for making of local mats and brooms. Whereas this is still being undertaken on a small scale, it has a large potential of expanding as there is a ready market for sale of the items.
- iii) Brick making: This is the biggest cause of land degradation in the area, especially in the drier eastern part of the By-pass. The activity degrades the wetland directly by destroying vegetation and leaving large open pools of water.
- iv) Edge cultivation: there is subsistence cultivation taking place in many parts at the edge of the wetland, growing yams, sugar cane, cassava and other crops.
- v) Settlement: Human settlements are observable right to the edge of the road reserve, especially in the eastern side of the By-pass where the wetland is very thin.

It is important to note that the greater wetland system is ecologically connected to the wetland along the By-pass. There have been observations of invasive species, the most notorious being the water hyacinth (*Eichhornia crassipes*) e.g. in Lutembe and Mabamba. Disturbance and alteration of the chemical properties of the wetlands may lead to invasion of such plants.

2.4 SPECIES OF CONSERVATION CONCERN

There are no plant species of conservation concern in terms of threat, range restriction and rarity that were observed in the area. However, three invasive species of plant were recorded:

- i) *Mimosa pigra*;
- ii) *Xanthium strumarium*; and,
- iii) *Lantana camara*.

Mimosa pigra and *Lantana camara* have a large potential to expand their coverage in a short time, once disturbances are chronic (Cronk & Fuller 1995, Kalema & Bukenya-Ziraba 2005). The plants are invading many wetlands in Uganda including Sio-Siteko (Kalema 2008), Lutembe, Mabamba, Nabugabo, Bisina, Nakuwa Ramsar wetlands (Kalema 2005), all of which are now Ramsar Sites except Sio-Siteko. Wetland systems in some of the protected areas have also been invaded, for example Lake Mburo, Murchison Falls and Queen Elizabeth National Parks, as well as Ajai, Kyambura and Semliki Wildlife Reserves (Kalema 2005). *Xanthium strumarium* is steadily spreading, invading a number of places in Uganda. It was recorded from the Doho Important Bird Area by Kalema (2005a). All these species tend to grow even more prolifically with disturbance (Cronk & Fuller 1995, Duggin & Gentle 1998, Howard 2009).

3. BIRDS

3.1 INTRODUCTION

The swamps in the Kampala area, including those fringing Lake Victoria, support a large number of bird species (Carswell, 1986). A number of these species, such as Papyrus Gonolek and White-winged Warbler are more-or-less confined to papyrus swamps (Britton 1978). Most of these 'papyrus endemics' are likely to be in the swamps bordering the Bypass (in fact only three were recorded in this and a previous survey; special methods are needed for these species, including play-back of sound recordings and mist-netting). The swamps in this valley are mixed, with some areas of open water and others with a variety of smaller plant species, providing for a variety of birds and other fauna.

3.2 METHODS

The main swamp areas are listed in Table A1.2. They were surveyed on foot, using the edge of the existing road that is raised above the swamps, for good view-point. The survey involved wading slowly with frequent stops to scan all swamp sections in view, as well as the sky above. Many swamp birds, including the so-called 'papyrus endemics', live within the vegetation and are only occasionally seen flying above it. However, they also call, which calls aided in their identification. In addition, *NatureUganda* made surveys along section 3 in 2010, prior to the development of the sewage treatment works. Some species recorded in that study (*NatureUganda*, 2010) are given in the results.

3.3 RESULTS

A total of 34 species were recorded during site surveys, of which 10 are associated with water (indicated with a 'w' in Table A1.5) or confined to wetlands (W - 8 species). A few more were noted by the *NatureUganda* (2010) study, including Sacred Ibis, Purple and Squacco Herons, Malachite Kingfisher and Swamp Flycatcher. Together these indicate that the swamps are broadly typical of their type, with corresponding conservation values. The more westerly swamps, bordering sections 1 and 2, are particularly good for birds (with 22 and 10 species, respectively); section 6 had 12 species, but these were mainly 'edge' species, occurring in many other habitats as well as swamps. The significance of edge species is that it is the current edge of the swamp which will be affected by the road works; provided that the finishing of the works is undertaken carefully (sloped, preferably protected in some way – see Section 4.2 Recommendations for further information), then these species will not be affected adversely by the scheme; the future edge will be similar to the present one. The effect on the W and w species is of greater concern, since they will suffer a net loss of habitat, with probable declines in the populations, proportionately.

No Red Data species were recorded, but two are regionally listed as species of conservation concern. One of these is the Goliath Heron, and the other the Grey Crowned Crane, Uganda's National Bird but which has declined hugely in the past 30 years or so (Pomeroy and Tushabe, 2008). Amongst other notable species were Marsh Tchagra and Blue-headed Coucal. Three 'papyrus endemics' (Britton 1978) were noted (one only as 'probably' present), and for them the loss of papyrus is important. A more detailed study would undoubtedly reveal many more of the species known to characterise the Lake Victoria wetlands. The variety of wetland types is bound to be reflected in higher diversity of birds and other taxa.

Table AI.5: Birds recorded at the four large wetlands expected to be affected. An x indicates presence in the wetlands, whereas an e means that the species was recorded only at the edge of the swamp.

Species	(W, w etc)	Road Section			
		1 Busega– Masanafu	2 Masanafu– Nansana	6 Kisasi– Naalya	7 Naalya– Bweyogerere
6 LONG-TAILED CORMORANT <i>Phalacrocorax africanus</i>	W	x			
17 CATTLE EGRET <i>Bubulcus ibis</i>	G	x	x		x
22 INTERMEDIATE EGRET <i>Egretta intermedia</i>	W	x			
27 GOLIATH HERON <i>Ardea goliath</i>	R-NT,W	x			
28 HAMERKOP <i>Scopus umbretta</i>	w	x	x		
30 AFRICAN OPEN-BILLED STORK <i>Anastomus lamelligerus</i>	A,w,G			x	
36 MARABOU STORK <i>Leptoptilos crumeniferus</i>	w	x	x	x	x
39 HADADA IBIS <i>Bostrychia hagedash</i>	w	x			x
57 YELLOW-BILLED DUCK <i>Anas undulata</i>	W	x			
75 BLACK KITE <i>Milvus migrans</i>	p,A	e	e	e	
76 AFRICAN FISH EAGLE ^b <i>Haliaeetus vocifer</i>	W		x		
80 HOODED VULTURE <i>Necrosyrtes monachus</i>	f			e	
90 AFRICAN HARRIER HAWK <i>Polyboroides typus</i>	f		e		
109 LIZARD BUZZARD <i>Kaupifalco monogrammicus</i>	f		e		
122 LONG-CRESTED EAGLE ^a <i>Lophaetus occipitalis</i>	f			e	
155 SCALY FRANCOLIN <i>Francolinus squamatus</i>	F	e			
185 GREY CROWNED CRANE <i>Balearica regulorum</i>	R-NT,W,G	x			
193 AFRICAN JACANA <i>Actophilornis africana</i>	W		x		
283 RED-EYED DOVE ^c <i>Streptopelia semitorquata</i>	f	e	e		
390 WHITE-THROATED BEE-EATER ^a <i>Merops albicollis</i>	A,f,Ae			e	
562 COMMON BULBUL <i>Pycnonotus barbatus</i>	f	e		e	

Species	(W, w etc)	Road Section				
		1 Busega- Masanafu	2 Masanafu- Nansana	6 Kisasi- Naalya	7 Naalya- Bweyogerere	
578	SNOWY-HEADED ROBIN-CHAT <i>Cossypha niveicapilla</i>	F,w			e	e
638	RED-FACED CISTICOLA <i>Cisticola erythrops</i>	w	e			e
647	WINDING CISTICOLA <i>Cisticola galactotes</i>	w	e		e	e
648	CARRUTHERS' CISTICOLA ^d <i>Cisticola carruthersi</i>	W	x			
677	GREY-BACKED CAMAROPTERA <i>Camaroptera brachyura</i>	f	e		e	e
787	SCARLET-CHESTED SUNBIRD <i>Chalcomitra senegalensis</i>	f		e		
830	MARSH TCHAGRA <i>Antichromus minutus</i>	w	x			
831	BROWN-CROWNED TCHAGRA <i>Tchagra australis</i>				e	e
842	PAPYRUS GONOLEK ^d <i>Laniarius mufumbiri</i>	w	x			
872	RUPPELL'S LONG-TAILED STARLING <i>Lamprotornis purpuropter</i>	F	e			
881	GREY-HEADED SPARROW <i>Passer griseus</i>					e
910	YELLOW-BACKED WEAVER <i>Ploceus melanocephalus</i>	W	x		x	
Total numbers of -						
	W - species		6	2	-	-
	w - species		7	2	4	5
	All species		22	10	12	9
Notes	a - Perched in tall encalypts at swamp edge					
	b - An immature, soaring high					
	c - Visits swamps to drink					
	d - Probable - only heard					

4. IMPACTS IDENTIFICATION

The proposed project is to be implemented in an area already acquired and designated for road development. A number of environmental issues are already evident as noted in Section 1.2. The analysis assumed that the proposed project will be limited to the area already acquired for the road. There are a number of potential impacts envisaged that are worth considering although some may not necessarily be in the direct area of impact for the road. These include but are not limited to:

- i) Areas from which murrum, rocks and aggregates will be sourced;
- ii) Land take for junction expansion and construction camps;
- iii) Increased dust levels from the truck movement from sources of the items in (i) above;
- iv) Increased dust levels from lime and cement for the road works;
- v) Increased introduction of oils and other lubricants from road construction equipment; and,
- vi) Impacts due to traffic noise as detailed in Appendix II.

Many of these will build onto residual impacts already introduced by the road. Proper mitigation of these will require collaborative efforts from the UNRA, KCCA, NEMA and other relevant local agencies and authorities. The following sections identifies the impacts and mitigation proposals while Table AI.6 presents a summary of these with measures of extent and severity as well as identify/suggest the roles/responsibilities of different players.

4.1 ANTICIPATED SPECIFIC IMPACTS OF THE PROPOSED ROAD WORKS

- i) *Loss of habitat.* The road construction activities in the sections of the by-pass through the eastern end of the project area will cause loss of suitable habitat for plants and biodiversity as a whole. This might cause reduction in abundance of some forms of biodiversity such as birds and mammals.
- ii) *Reduction in abundance of some species of plant.* The use of some construction materials such as limestone products will alter the chemistry of the water in the substratum of the vicinity, thus rendering some species of plants such as *Cyperus nitidus*, which have a preference for neutral to slightly acidic environments, less healthy and abundant as well as reduced growth.
- iii) *Reduction in capacity of the wetland to perform its ecosystem services:* The shrinkage of the wetland naturally implies reduced capacity to store and slowly release stormwater, filter sediment and pollutants from inflowing water. This is bound to increase flooding in the affected areas and contamination of groundwater sources.
- iv) *Receding of the water level closer to nearby settlements:* Filling of the valleys and depressions with earth will cause further impediment to surface and groundwater flow, with the result of the flooding plane and level extending closer to the settlements and other physical structures constructed.
- v) *Increased use of the road:* envisaged to result in higher traffic levels resulting in increased noise levels overall. High noise levels are known to affect nesting/reproductive success for birds in which mates depend on sound for pairing and bonding. This is likely to be an adverse impact as a result of the Scheme.

4.2 RECOMMENDATIONS FOR MITIGATION OF THE IMPACTS

A recent survey of the state of Uganda's 33 Important Bird Areas (*NatureUganda*, 2011) revealed that the wetland areas are under the greatest threat, with almost no practical action from government agencies. Thus the loss of any wetland is to be regretted. The conversion of sections of the road from single to double carriage-way will certainly lead to loss of habitable

space for wildlife (flora and fauna) in the affected areas. However, this loss is not here considered heavy in terms of biodiversity value given that the area to be affected is not expected to be large and harbours mainly very common species of plants and, apparently, animals. Nonetheless, compensation for loss or decline in the ecosystem services offered by the wetland should be considered.

The total area to be lost by the planned works may be less than a km² and that of swamp – the most important habitat – is about a quarter of that – yet any loss of swampland is significant in that it is under pressure everywhere, and especially in the Kampala area. Thus it is desirable to mitigate this loss by gaining better conservation of some other swamp areas elsewhere. Several of Uganda's Ramsar sites are unprotected, and upgrading them to, for example, Wildlife Reserve status would be beneficial. In addition, some significant Important Bird Areas are also unprotected. Alternatively, the remaining areas of swamp within Kampala City could be declared Nature Reserves with appropriate actions to ensure that they are properly protected. This would be beneficial in many ways, swamps provide important ecosystem services, and further, a swamp within the city boundaries has many possible values for education. At least one well-preserved example would serve as model for the future generation.

At present, the road verges and adjacent areas are widely used, with activities ranging from papyrus use for broom-making to car-washing; rubbish dumping is particularly popular. It would be beneficial to control such things after completion of the Scheme, particularly to the north of the road in places where it is bordered by the swamp. The following measures should be considered:

- i) Restrict the activities to the gazetted road reserve to avoid unnecessary destruction or degradation of the natural wetland habitat, e.g. through alteration of the water *pH*.
- ii) Off-site compensation for loss of habitat or its degradation along the Bypass should be considered, e.g. in Lutembe or Mabamba which are also unprotected wetlands but internationally recognized. Conservation initiatives at these sites could be supported using resources provided by the developer.
- iii) The road edges should be restored to encourage coverage of the degraded areas with vegetation, preferably of indigenous species. On the drier eastern end, such species of tree as *Markhamia lutea*, *Maesopsis eminii* and others should be considered. In order to manage the invasive plants, the finished areas should be restored immediately after the works, giving them little chance to grow.
- iv) Creation of temporary work and or parking yards in the area along the road should be avoided in as far as possible since this project area is not that far from any engineering yard in Kampala areas. If it becomes absolutely necessary to have these in areas along the road, site restoration should be undertaken to return them to near an as natural status as possible.
- v) Planting native trees along the sides of the roads to provide a barrier between the road and adjacent habitats would have other beneficial pay offs. Suitable species include *Chlorophora*, *Acacia*, *Maesopsis*, *Ficus natalensis*. These when matured would provide a screen and/barrier to some level of the noise pollution as well as hold some of the dust before it settles in the wetland system.

Table AI.6: Summary of impacts on the biological environment, proposed mitigation and identification of roles.

Envisaged Impacts	Likelihood	Extent	Severity	Mitigation proposals	Responsibility	Timing
Loss of habitat						
	High	Road reserve strip all along the Nansana-Busega roundabout and Kalerwe-Bukoto roundabout sections and much of the Bukoto-Kisaasi section.	- High on the Nansana-Busega and Bukoto-Kisaasi sections. - Medium on Kalerwe-Bukoto section.	i) Restrict the activities to the gazetted road reserve to avoid unnecessary destruction or degradation of the natural wetland habitat. ii) Sensitize all the project workers to increase their awareness about the need to minimize damage to the wetland. iii) Closely monitor and supervise the operations to ensure compliance. iv) Pay for loss of this habitat by rendering support to conservation initiatives in the Lutembe and Mabamba Ramsar Sites which are ecologically connected to the Lubigi-Mayanja wetland system.	i) UNRA ii) UNRA, WMD, NEMA <i>NatureUganda</i> , Local Government iii) UNRA, NEMA, WMD iv) UNRA	i) During operation stage. ii) Before operations begin. iii) From start to end of project iv) From the start of the project to evaluation of the support..
Reduction in species abundance						
Plants	Medium	- Entire road reserve strip along the Nansana-Busega roundabout and Kalerwe-Bukoto roundabout sections. - Much of the Bukoto-Kisaasi section. - Part of the Naalya-Bweyogerere section.	In the road reserve area where road works will take place, reduction will be 100% but over a narrow strip.	i) Plant indigenous species such as <i>Phoenix reclinata</i> , <i>Kotschya africana</i> , <i>Anthoclesita schweinfurthii</i> , <i>Ficus vallis-choudae</i> , <i>Sesbania sesban</i> , <i>Macaranga schweinfurthii</i> , <i>Alchornea cordifolia</i> , closer to the road as compensation . ii) Monitor performance of the planted trees.	i)UNRA, KCCA, NFA, WMD, MAK ii) UNRA, KCCA, NFA, MAK	After completion of the project.

Envisaged Impacts	Likelihood	Extent	Severity	Mitigation proposals	Responsibility	Timing
Birds	Low	Entire stretch of the proposed project.	Low as the birds are mobile and can move further away from the concentration of the road works.	i) Plant indigenous species to provide roosting space for birds. ii) Monitor bird species abundance .	i) UNRA, KCCA, NFA, MAK ii) UNRA, WMD, MAK	i) After completion of the project ii) From start to end of project and thereafter.
Other species	Low	Entire stretch of the proposed project.	Medium since most amphibians and some reptiles have small home ranges owing to limited mobility.	i) Noise levels from machinery should not exceed the National Environment (Noise Standards and Control) Regulations 2003. ii) Where possible, place the noisy machines where they are likely to have less impacts.	i) UNRA, NEMA, KCCA ii) UNRA, NEMA	All though the project duration.
Compromise of wetland ecosystem services						
	High	All the operation sections of the road.	Moderate level if a narrow strip of the road reserve is adhered to.	i) Off-site compensation for loss of habitat or its degradation (see Loss of habitat above). ii) Evaluate the contribution of the off-site compensation.	i) UNRA, WWD, NEMA, MAK, <i>NatureUganda</i> , Local Government ii) UNRA, NFA, WMD, NEMA, MAK	i) During and after completion of the project. ii) Upon completion of the project.
Raised water ground/surface water towards areas of former seasonal impediment						
	High	Mainly in areas where settlements are very close to the road reserve.	Moderate			

Envisaged Impacts	Likelihood	Extent	Severity	Mitigation proposals	Responsibility	Timing
Pollution of wetland						
	High	Most profound in settled areas.	i) A disturbing huge challenge as plastics impede plant growth, destroy breeding grounds for Amphibians and other animals, and hinder water flow. ii) Upon completion of the project, increased traffic will greatly increase chemical pollution from motor vehicle fumes affecting biota, especially fauna.	i) Provide waste disposal areas e.g. litter bins along the road, especially in settled areas. ii) Sort waste – organic vs non-biodegradable. iii) Sensitize the communities to enhance their awareness about the dangers of littering. iv) Monitor pollution levels to avert escalation of the problem.	i) UNRA, KCCA & Local Government ii) UNRA, KCCA & Local Government iii) UNRA, KCCA & Local Government, NEMA iv) UNRA, MAK, Government Chemist, Public Health Office	i) During and after project. ii) During and after project. iii) Before, during and after project. iv) During and after project.
Increased siltation						
	Medium	All the operation sections of the road.	Moderate level if a narrow strip of the road reserve is adhered to.	Offset payment for proper management of surviving swamp.	UNRA, KCCA, NEMA & Local Government	
Reduced reproduction success in Birds, reptiles, amphibians and mammals (due to increased noise)						
	Medium	All the operation sections of the road.	Severity will be highest closer to the road, rendering nearly all large mammals and birds unable to survive there until the project	i) Noise levels from machinery should not exceed the National Environment (Noise Standards and Control) Regulations 2003. ii) Where applicable, the noisy machinery should be placed	i) UNRA, NEMA, KCCA ii) UNRA, MWD, NEMA, MAK	From start to end of project

Envisaged Impacts	Likelihood	Extent	Severity	Mitigation proposals	Responsibility	Timing
			ends.	away from critical areas such as open water channels where amphibians congregate.		
Population reduction in Amphibians (due to pollution of water in wetland)						
	Medium	- All the operation sections of the road.	- In short term, moderate levels of severity closer to the road as the impact is anticipated to be mainly in a narrow strip. - In the long-term, effects will spread with movement of water and diffusion of the pollutants.	Offsets such as payment for proper management of surviving associated wetland systems (the greater Mayanja and Lutembe Bay wetlands).	UNRA, MAK, NEMA, WMD	

KCCA=Kampala Capital City Authority

MAK=Makerere University (especially Dept. of Biology)

NEMA=National Environment Management Authority

NFA=National Forestry Authority

UNRA=Uganda National Roads Authority

WMD=Wetland Management Department

Table AI.7: Plant species occurrence and distribution in the different survey areas.

		Section	Busega-Masanafu	Masanafu-Nansana	Kisaasi-Bukoto	Bweyogerere-Naalya	Number of sites with the observed species
Family	Species	Life Form					
Phyllanthaceae	<i>Bridelia micrantha</i>	T	1	1	1	1	4
Apiaceae (Umbelliferae)	<i>Centella</i> sp.	H	1	1	1	1	4
Menispermaceae	<i>Cissampelos mucronata</i>	CL.H	1	1	1	1	4
Poaceae	<i>Cynodon dactylon</i>	G	1	1	1	1	4
Cyperaceae	<i>Cyperus distans</i>	H	1	1	1	1	4
Cyperaceae	<i>Cyperus denudatus</i>	H	1	1	1	1	4
Cyperaceae	<i>Cyperus nitidus</i>	H	1	1	1	1	4
Fabaceae (Papilionoideae)	<i>Desmodium salicifolium</i>	H	1	1	1	1	4
Moraceae	<i>Ficus vallis-choudae</i>	T	1	1	1	1	4
Convolvulaceae	<i>Ipomoea cairica</i>	CL.H	1	1	1	1	4
Poaceae	<i>Leersia hexandra</i>	G	1	1	1	1	4
Arecaceae	<i>Phoenix reclinata</i>	T	1	1	1	1	4
Menispermaceae	<i>Stephania abyssinica</i>	CL.H	1	1	1	1	4
Tiliaceae	<i>Triumfetta macrophylla</i>	SH	1	1	1	1	4
Acanthaceae	<i>Acanthus polystachius</i>	SH	1	1		1	3
Zingiberaceae	<i>Aframomum angusifolia</i>	H	1	1	1		3
Cyperaceae	<i>Cyperus papyrus</i>	H	1	1		1	3
Vitaceae	<i>Cyphostemma adenocaula</i>	CL.H	1	1	1		3
Clusiaceae	<i>Harungana madagascariensis</i>	T		1	1	1	3
Convolvulaceae	<i>Lepistemon owariensis</i>	CL.H		1	1	1	3

		Section	Busega-Masanafu	Masanafu-Nansana	Kisaasi-Bukoto	Bweyogerere-Naalya	Number of sites with the observed species
Onagraceae	<i>Ludwigia abyssinica</i>	H	1		1	1	3
Asteraceae	<i>Melanthera scandens</i>	H	1	1	1		3
Fabaceae (Mimosoideae)	<i>Mimosa pigra</i>	SH	1		1	1	3
Nymphaeaceae	<i>Nymphaea nouchalia</i> var. <i>caerulea</i>	H	1	1	1		3
Fabaceae (Papilionoideae)	<i>Sesbania seban</i>	SH	1	1	1		3
Typhaceae	<i>Typha domingensis</i>	H	1	1	1		3
Malvaceae	<i>Urena lobata</i>	SH	1		1	1	3
Cucurbitaceae	<i>Zehneria minutiflora</i>	CL.H	1	1	1		3
Asteraceae	<i>Acmella caulorrhiza</i>	H	1	1			2
Asteraceae	<i>Ageratum conyzoides</i>	H	1	1			2
Acanthaceae	<i>Asystasia gangetica</i>	H		1	1		2
Asteraceae	<i>Bidens pilosa</i>	H	1	1			2
Poaceae	<i>Brachiaria brizantha</i>	G		1	1		2
Poaceae	<i>Coix lachryma-jobi</i>	G		1	1		2
Asteraceae	<i>Crassocephalum vitellinum</i>	H	1	1			2
Asteraceae	<i>Crassocephalum picridifolium</i>	H	1				1
Fabaceae (Papilionoideae)	<i>Desmodium incinatum</i>	H	1	1			2
Fabaceae (Papilionoideae)	<i>Desmodium tortuosum</i>	H	1			1	2
Poaceae	<i>Echinochloa pyramidalis</i>	G	1	1			2
Asteraceae	<i>Eclipta alba</i>	H	1	1			2
Poaceae	<i>Eragrostis mildbraedii</i>	G	1			1	2
Poaceae	<i>Eragrostis exasperata</i>	G	1			1	2

		Section	Busega-Masanafu	Masanafu-Nansana	Kisaasi-Bukoto	Bweyogerere-Naalja	Number of sites with the observed species
Fabaceae (Papilionoideae)	<i>Eriosema parviflorum</i>	H	1		1		2
Asteraceae	<i>Erlangea tomentosa</i>	SH	1		1		2
Fabaceae (Papilionoideae)	<i>Erythrina abyssinica</i>	T		1		1	2
Myrtaceae	<i>Eucalyptus</i> sp.	T	1		1		2
Phyllanthaceae	<i>Flueggea virosa</i>	SH	1	1			2
Malvaceae	<i>Hibiscus diversifolius</i>	SH	1			1	2
Convolvulaceae	<i>Hiwittia sublobata</i>	CL.H	1	1			2
Lamiaceae	<i>Leonotis nepetifolia</i>	H	1		1		2
Euphorbiaceae	<i>Macaranga schweinfurthii</i>	T	1	1			2
Fabaceae (Mimosoideae)	<i>Mimosa pudica</i>	H	1		1		2
Poaceae	<i>Miscanthus violaceus</i>	G	1			1	2
Poaceae	<i>Pennisetum purpureum</i>	G		1	1		2
Polygonaceae	<i>Persicaria senegalensis</i> forma albo-tomentosa	H		1	1		2
Polygonaceae	<i>Persicaria setosula</i>	H	1		1		2
Polygonaceae	<i>Persicaria strigosa</i>	H	1	1			2
Poaceae	<i>Panicum maximum</i>	G		1	1		2
Poaceae	<i>Panicum trichocladum</i>	G	1		1		2
Poaceae	<i>Phragmites mauritianus</i>	G		1		1	2
Myrtaceae	<i>Psidium guajava</i>	T			1	1	2
Meliaceae	<i>Pteris</i> sp.	H	1		1		2
Solanaceae	<i>Solanum macrocarpon</i>	H	1		1		2
Asteraceae	<i>Vernonia amygdalina</i>	SH	1			1	2

		Section	Busega-Masanafu	Masanafu-Nansana	Kisaasi-Bukoto	Bweyogerere-Naalya	Number of sites with the observed species
Fabaceae (Mimosoideae)	<i>Acacia sieberiana</i>	T				1	1
Amaranthaceae	<i>Achyranthes aspera</i>	H		1			1
Passifloraceae	<i>Adenostemma viscum</i>	H	1				1
Fabaceae (Mimosoideae)	<i>Albizia grandibracteata</i>	T				1	1
Euphorbiaceae	<i>Alchornea cordifolia</i>	T	1				1
Amaranthaceae	<i>Alternanthera sessilis</i>	H		1			1
Loganiaceae	<i>Anthocleista schweinfurthii</i>	T		1			1
Acanthaceae	<i>Barleria ventricosa</i>	H	1				1
Basellaceae	<i>Basella alba</i>	CL.H			1		1
Poaceae	<i>Brachiaria scalaris</i>	G	1				1
Sapindaceae	<i>Cardiospermum halicacabum</i>	CL.H	1				1
Vitaceae	<i>Cissus quadrangularis</i>	CL.H	1				1
Asteraceae	<i>Crassocephalum crepidioides</i>	H	1				1
Fabaceae (Papilionoideae)	<i>Crotalaria incana</i> ssp. <i>purpurascens</i>	H	1				1
Fabaceae (Papilionoideae)	<i>Crotalaria spinosa</i>	H	1				1
Cyperaceae	<i>Cyperus cyperoides</i>	H	1				1
Cyperaceae	<i>Cyperus dives</i>	H				1	1
Fabaceae (Papilionoideae)	<i>Desmodium adscendens</i>	H	1				1
Fabaceae (Papilionoideae)	<i>Desmodium canum</i>	H	1				1
Fabaceae (Papilionoideae)	<i>Desmodium hirtum</i>	H	1				1
Fabaceae (Papilionoideae)	<i>Desmodium ramosissimum</i>	H	1				1
Fabaceae (Papilionoideae)	<i>Desmodium triflorum</i>	H	1				1

		Section	Busega-Masanafu	Masanafu-Nansana	Kisaasi-Bukoto	Bweyogerere-Naalya	Number of sites with the observed species
Poaceae	<i>Digitaria ternata</i>	G		1			1
Cucurbitaceae	<i>Diplocyclos palmatus</i>	CL.H	1				1
Melastomataceae	<i>Dissotis rotundifolia</i>	H		1			1
Dracaenaceae	<i>Dracaena fragrans</i>	SH		1			1
Acanthaceae	<i>Dyschoriste radicans</i>	H	1				1
Poaceae	<i>Eleusine africana</i>	G	1				1
Asteraceae	<i>Emilia coccinea</i>	H		1			1
Asteraceae	<i>Ethulia conyzoides</i>	H	1				1
Euphorbiaceae	<i>Euphorbia crotonoides</i>	H	1				1
Euphorbiaceae	<i>Euphorbia hirta</i>	H	1				1
Moraceae	<i>Ficus asperifolia</i>	SH		1			1
Malvaceae	<i>Hibiscus calyphyllus</i>	SH			1		1
Poaceae	<i>Hyparrhenia variabilis</i>	G				1	1
Lamiaceae	<i>Hyptis lanceolata</i>	H	1				1
Balsaminaceae	<i>Impatiens sp.</i>	H				1	1
Poaceae	<i>Imperata cylindrica</i>	G		1			1
Fabaceae (Papilionoideae)	<i>Indigofera arrecta</i>	SH	1				1
Acanthaceae	<i>Justicia exigua</i>	H	1				1
Fabaceae (Papilionoideae)	<i>Kotschya africana</i>	T	1				1
Cyperaceae	<i>Kyllinga elatior</i>	H	1				1
Verbenaceae	<i>Lantana camara</i>	SH			1		1
Lemnaceae	<i>Lemna minor</i>	H			1		1

		Section	Busega-Masanafu	Masanafu-Nansana	Kisaasi-Bukoto	Bweyogerere-Naalya	Number of sites with the observed species
Primulaceae (Myrsinaceae)	<i>Maesa lanceolata</i>	SH	1				1
Sterculiaceae	<i>Melochia mollis</i>	H			1		1
Polypodiaceae	<i>Microsorium punctatum</i>	H		1			1
Fabaceae (Papilionoideae)	<i>Mukia maderaspatana</i>	CL.H	1				1
Fabaceae (Papilionoideae)	<i>Neonotonia wightii</i> ssp. <i>wightii</i>	CL.H	1				1
Lamiaceae	<i>Ocimum gratissimum</i>	SH	1				1
Polygonaceae	<i>Persicaria madagascariensis</i>	H		1			1
Phyllanthaceae	<i>Phyllanthus ovalifolius</i>	SH			1		1
Phyllanthaceae	<i>Phyllanthus pseudo-niruri</i>	H	1				1
Verbenaceae	<i>Premna angolensis</i>	T				1	1
Euphorbiaceae	<i>Ricinus communis</i>	SH	1				1
Poaceae	<i>Rottboellia cochinchinensis</i>	G		1			1
Rubiaceae	<i>Rubia cordifolia</i>	CL.H	1				1
Rosaceae	<i>Rubus</i> sp.	SH			1		1
Polygonaceae	<i>Rumex usambarensis</i>	H		1			1
Fabaceae (Caesalpinoideae)	<i>Senna didymobotrya</i>	T	1				1
Fabaceae (Caesalpinoideae)	<i>Senna obtusifolia</i>	H		1			1
Fabaceae (Caesalpinoideae)	<i>Senna hirsuta</i>	SH			1		1
Poaceae	<i>Setaria pumilla</i>	G	1				1
Euphorbiaceae	<i>Shirakiopsis elliptica</i>	T	1				1
Fabaceae (Papilionoideae)	<i>Chamaecrista kirkii</i>	SH	1				1
Solanaceae	<i>Solanum mauritianum</i>	SH		1			1

		Section	Busega-Masanafu	Masanafu-Nansana	Kisaasi-Bukoto	Bweyogerere-Naalya	Number of sites with the observed species
Asteraceae	<i>Sonchus aspera</i>	H		1			1
Poaceae	<i>Sorghum arundinaceum</i>	G	1				1
Poaceae	<i>Sporobolus pyramidalis</i>	G	1				1
Verbenaceae	<i>Stachytarpheta urticifolia</i>	SH	1				1
Apocynaceae	<i>Tabernaemontana</i> sp.	T				1	1
Fabaceae (Papilionoideae)	<i>Tephrosia</i> sp.	H	1				1
Asteraceae	<i>Tithonia superba</i>	SH			1		1
Tiliaceae	<i>Triumfetta rhomboidea</i>	H	1				1
Asteraceae	<i>Vernonia lasiopus</i>	SH				1	1
Fabaceae (Papilionoideae)	<i>Vigna luteola</i>	CL.H	1				1
Fabaceae (Papilionoideae)	<i>Vigna unguiculata</i>	CL.H	1				1
Fabaceae (Papilionoideae)	<i>Vigna vexillata</i>	CL.H	1				1
Asteraceae	<i>Xanthium strumarium</i>	H		1			1
Fabaceae (Papilionoideae)	<i>Aeschynomene uniflora</i>	H					0
Amaranthaceae	<i>Amaranthus graecizans</i>	H					0
Poaceae	<i>Chloris pycnothrix</i>	G					0
Species Richness			98	61	51	38	

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Appendix II: Noise Assessment

1 INTRODUCTION

1.1 BACKGROUND

Kampala's Northern Bypass will be expanded to make it a dual carriage-way throughout its length. The route stretches from the Busega round-about in the extreme west to Bweyogerere round-about at the eastern end. The route is approximately 21 km in length.

AWE was commissioned to provide a noise assessment for project activities. The scope of the construction/traffic noise assessment is as follows:

- Review legislation and guidance related to construction and traffic noise;
- Identification of sensitive receivers likely to be affected by construction and traffic noise;
- Quantification and modeling of noise levels likely to be associated with the Bypass traffic at nearby sensitive receptors and evaluation of the extent of resulting impacts; and,
- Consideration of the impacts that may result from the proposed works/traffic and mitigation measures to reduce adverse impacts where appropriate.

1.2 TERMINOLOGY

Following is a brief description of the terminology used in this report:

- L_{Amax} The maximum sound pressure level measured over a given period.
- L_{Amin} The minimum sound pressure level measured over a given period.
- L_{A10} The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
- L_{A90} The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).
- L_{Aeq} The equivalent constant sound pressure level measured over a given period.

1.3 CONSTRUCTION METHODOLOGY

Description of the construction works, phases and nature of expected traffic are detailed in the project description chapter. However, typical road construction equipment expected to contribute noise Dozer (fitted with ripper);

- Tracked Excavator (30 T);
- Haul Trucks;
- Excavator (30 T);
- Excavator (fitted with rock breaker);
- Crushing Machine;
- Haul Trucks; and,
- Rollers.

1.4 EXISTING NOISE LEVELS

Baseline noise monitoring was undertaken by AWE engineers in July 2011 at seven representative receptors close to the existing single carriageway. An Extech 407730 digital noise logger used was set to record for a sample period of 10 minutes at the receptors. The receptor locations are given in Table All.1 with their corresponding measured noise levels.

Weather affected noise data were excluded from the results. The predominant noise source at the noise monitoring locations was road traffic noise.

Table All.1: Baseline noise levels.

UTM Coordinates		Noise readings (dBA)		Notes
Eastings	Northings	L _{AMax}	L _{Aeq}	
461296	39045	77.8	57.2	Namboole, homestead. Crying child
460181	40751	85.3	58.4	Naalya, homestead, climbing vehicular traffic
455836	40617	74.8	61.5	Ntinda, concrete/stone workshop.
453940	38953	86.7	61.9	Kalerwe, vending kiosks, motorcycle traffic, radio playing. About, 2m lower than carriageway level.
448918	38382	87.4	51.5	Namungoona, homestead, grazing livestock, human conversation. About 1m lower than carriageway level.
446541	35282	86.6	49.6	Namungoona – Busega. Vehicular traffic.
446110	34668	81.4	55.1	Busega, Betna Real Estates & Property Consultants

1.5 CONSTRUCTION AND TRAFFIC NOISE REGULATIONS

The National Environment (Noise Standards & Control) Regulations, 2003 defines construction as any activity that includes erection, alteration, repair, dismantling demolition, structural maintenance, painting, mowing, land clearing, earth moving, grading, excavating, laying of pipes and conduits whether above or below ground level, street and highway building, concreting, installation and alteration of equipment, and the structural installation of construction components and materials in any form or for any purpose that includes any work in connection with the construction. Part I of the National Environment (Noise Standards & Control) Regulations, 2003 states the maximum permissible noise levels for the general environment as shown in Table All.2.

Table All.2: Maximum Permissible Noise Levels for the general environment.

Facility	Maximum noise level permitted (L _{eq}) in dB(A)	
	Day	Night
Any building used as a hospital, convalescence home, home for the aged, sanatorium and institutes of higher learning, conference rooms, public library, environmental or recreational sites	45	35
Residential buildings	50	35
Mixed residential (with some residential and entertainment) buildings	55	45
Residential + industry or small scale production + commerce	60	50
Industrial	70	60

Time frame: Use duration
 Day: 6.00am-10.00pm
 Night: 10.00pm-6.00am

Part IV of the National Environment (Noise Standards & Control) Regulations, 2003 states the maximum permissible noise levels for construction sites as shown in Table All.3.

Table All.3: Maximum Permissible Noise Levels for construction sites.

Facility		Maximum noise level permitted (L_{eq}) in dB(A)	
		Day	Night
(i)	Hospitals, schools, institutions of higher learning, homes for the disabled, etc	60	50
(ii)	Buildings other than those prescribed in paragraph (i) above.	75	65

2. CONSTRUCTION AND TRAFFIC ASSESSMENT NOISE ASSUMPTIONS

Construction activities at the bypass will be restricted to day time, therefore only day time permissible levels are considered with respect to construction noise. There are no permissible noise levels specific to highway traffic noise, so the permissible noise levels for the general environment will be considered with respect to traffic noise impacting receptors near the bypass.

3.0 ASSESSMENT AND RESULTS

3.1 CONSTRUCTION EQUIPMENT SOUND LEVELS

Construction activities shall be predominantly undertaken during normal working hours (7.00 am – 7.00 pm Monday to Friday and 8.00 am – 5.00 pm Saturday). Table All.4 presents the typical equipment for each phase of the Northern Bypass roadworks usage and associated sound pressure levels at 15 m.

Table All.4: Description of expected construction equipment and associated L_{A10} Sound level.

Equipment (No.)	L_{A10} at 15 m, dB(A)	% On time in any 15 minute period
Bulldozer	82	40
Haul trucks	78	25
Compressor & Pneumatic Drill rig	85	25
Tracked Excavator with Rock Breaker	82	50
Crushing plant	87	100
Tracked Excavator (30T)*	72	50

*Assumes residential grade muffler in use

3.2 TRAFFIC SOUND LEVELS

During operation of the upgraded Bypass, traffic noise is anticipated to increase with increasing traffic volumes. In March 2011, Mott MacDonald completed a preliminary design report for this project. The results of the traffic count survey on the Bypass included its current state as well as a forecast of the traffic volume trend in 2020 and 2034. AWE engineers used some of the data from Table 3.45 of the traffic count survey as inputs to model for noise increments that will result from traffic using the upgraded Bypass. 2010 was considered as the

base year and models were run for 2020 and 2034 scenarios. Table All.4 presents the traffic data used to run the model.

Table All.4: Traffic data used to run NoiseMap model.

Section	Year	Total Vehicles Passing Per Day	Percentage of heavy Vehicles (%)
Busega-Sentema	2010	12501	5.48
Busega-Sentema	2020	27504	6.72
Busega-Sentema	2034	60889	6.97
Sentema-Hoima	2010	14175	7.50
Sentema-Hoima	2020	30816	8.70
Sentema-Hoima	2034	68218	9.03
Hoima-Bwaise	2010	19314	5.36
Hoima-Bwaise	2020	41027	6.33
Hoima-Bwaise	2034	90666	6.58
Bwaise-Gayaza	2010	21020	4.01
Bwaise-Gayaza	2020	44465	4.91
Bwaise-Gayaza	2034	98241	5.10
Gayaza-Bukoto	2010	19330	4.20
Gayaza-Bukoto	2020	40921	5.20
Gayaza-Bukoto	2034	90666	6.50
Bukoto-Ntinda	2010	22481	3.60
Bukoto-Ntinda	2020	46959	4.50
Bukoto-Ntinda	2034	103765	4.76
Ntinda-Naalya	2010	12461	5.28
Ntinda-Naalya	2020	25609	6.18
Ntinda-Naalya	2034	56620	6.43
Naalya-Namboole	2010	8404	6.88
Naalya-Namboole	2020	17590	8.05
Naalya-Namboole	2034	38952	8.35

AWE engineers used NoiseMap Enterprise Version 2.6.9 software to make 18 hour L_{eq} calculations (all traffic considered to flow between 0600Hrs and midnight) to an accuracy of 0.5 dB at 1.0 meter calculating intervals. Average traffic speed was assumed to be 70 km/hr (Posted speed limit), the road characteristics were assumed to be a bitumen-surfaced dual carriageway, four lanes (not including shoulder) each 2.5 m wide and the ground type between this road and receptors assumed to be soft. The calculations were made at a 1.5 m height above local ground level (average height of ears above ground for a human receptor standing/walking upright). The route was divided into 21 modeling subsections approximately 1 km long each to account for unique topographical characteristics in different areas. Model results for one subsection along Bukoto-Ntinda stretch are presented in Plates 1 – 3.

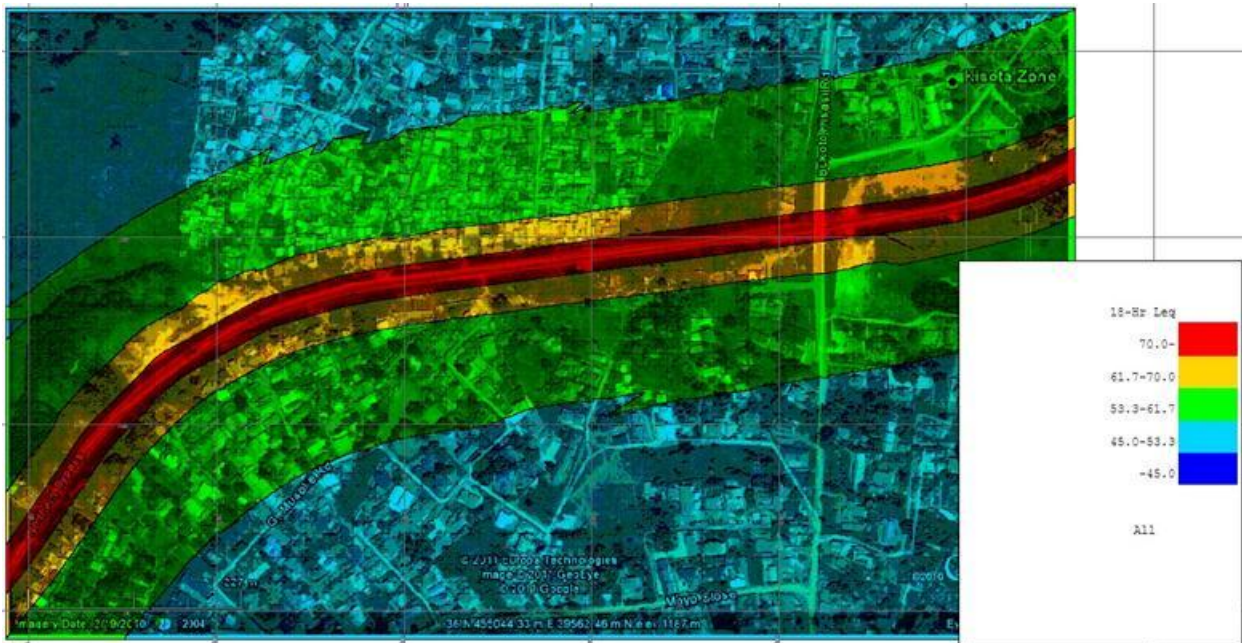


Plate 1: Modeled noise levels received at increasing distances from the centerline of the existing Northern Bypass in 2010.

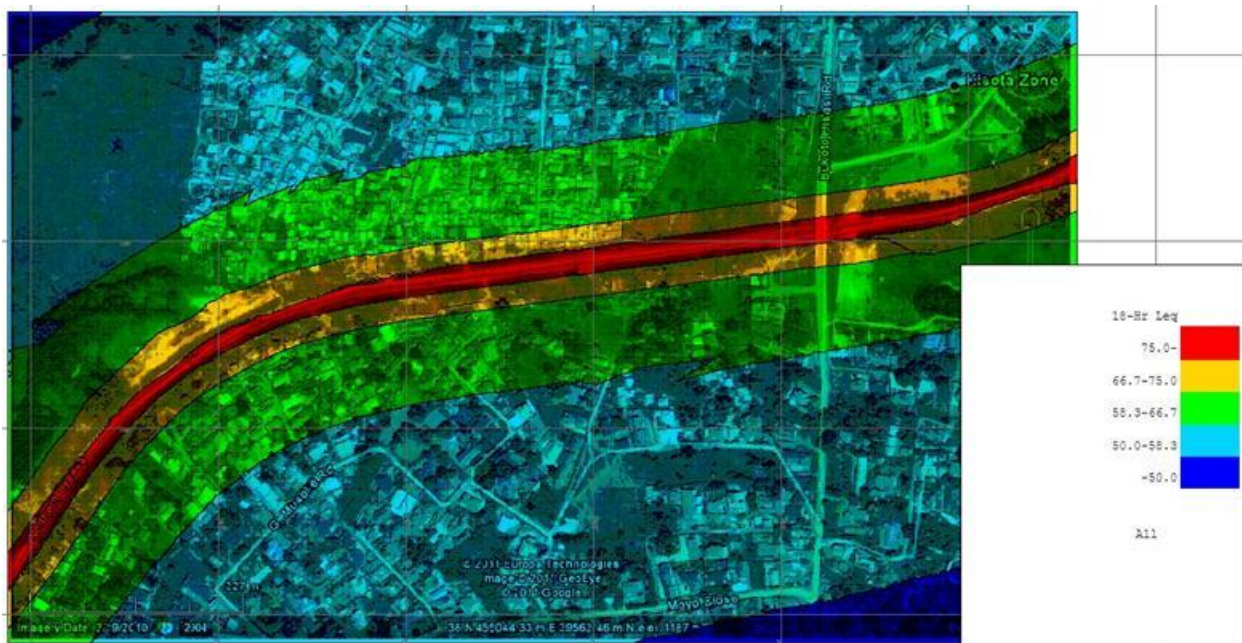


Plate 2: Modeled noise levels received at increasing distances from the centerline of the existing Northern Bypass by 2020.

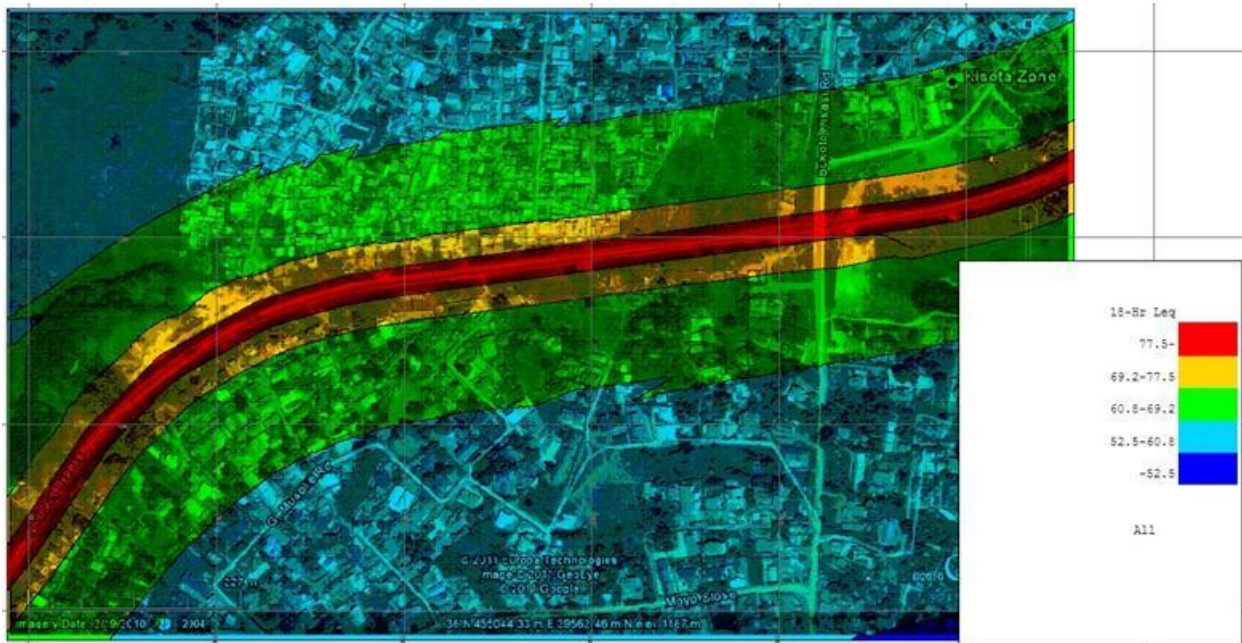


Plate 3: Modeled noise levels received at increasing distances from the centerline of the existing Northern Bypass by 2034.

Generally, the highest noise levels were predicted on the Bukoto-Ntinda stretch of the Bypass consistent with the highest current and predicted traffic volumes in future. Using the traffic survey data for 2010 as representative of the current scenario, the traffic contributes 70 dB to noise within 10 m from the center line, 61.7 dB within 30 meters from the centerline, 53.3 dB within 100m from the centerline and 45.0 dB beyond 100m from the centerline. These figures are borne out by the L_{Aeq} baseline of 61.5 dB measured about 20m from the current bypass's centerline in Ntinda along the Bukoto-Ntinda stretch.

In 2020, the noise levels were predicted to increase to 75 dB within 10m of the centerline, 66.7dB within 30m of the centerline, 58.3 dB within 100m of the centerline and 50 dB beyond 100m from the centerline. In 2034, the noise levels were predicted to increase to 77.5 dB, 69.2 dB, 60.8 dB and 52.5 dB, respectively.

A comparison of the baseline noise measurements (Table AII.1) to permissible noise levels (Table AII.2) reveals that the receptors closest to the road are currently exposed to noise levels that are higher than the permissible limits for residential buildings. The baseline noise levels were comparable to permissible noise levels for mixed residential (with some residential and entertainment) buildings and lower than those for buildings located in residential + industry or small scale production + commerce areas.

Factors that lead to increased noise levels include but are not limited to:

- Increase in traffic (vehicles passing per day).
- Increase in the percentage of heavy vehicles as a fraction of the total number of vehicles passing per day.
- Road curves lead to increased noise levels on the concave (inward) side of the road.

4.0 RECOMMENDATIONS

4.1 GENERAL MITIGATION MEASURES

The noise level emissions from construction plant and the potential annoyance to sensitive receptors will depend on the selection of equipment, the type of operation, the activity duration the maintenance schedules and the time of day it is conducted. The contractor should demonstrate best practicable means and include noise mitigation measures in the construction management plan. Generic measures to minimize the construction noise impacts are detailed below:

- Construction activities to be limited to between 7:00 am and 7:00 pm Monday to Friday and 8:00 am to 5:00 pm Saturday;
- Possible restrictions to construction hours (beyond the above hours) where noise impacts are significant;
- The contractor would be required to select and operate plant and equipment with appropriate mufflers and noise controls, and where practical, to adopt work practices which would minimize noise impacts. These measures would be implemented as part of the construction stage EMP;
- All plant items should be properly maintained and operated according to manufacturers' recommendations in such a manner as to avoid causing excessive noise;
- All pneumatic tools should be fitted with silencers or mufflers;
- Minimize requirements for vehicle movements outside normal daytime working hours;
- An information system should be developed to inform the local residents of the construction programme and time periods when noise levels could exceed the relevant goals;
- Provide induction and training to staff and sub-contractors outlining their responsibilities with regard to noise; and,
- Noise monitoring at sensitive locations as agreed with NEMA for any excessive noise or noise complaints being assessed with appropriate action taken.

The noise and mitigation measures listed above should be implemented where reasonable and feasible.

4.2 SPECIAL CONSTRUCTION NOISE MITIGATION MEASURES FOR RESIDENTIAL LOCATIONS

The contractor will, where reasonable and feasible, apply best practice noise mitigation measures including:

- Select site access points and roads away from residences;
- Apply time restrictions on noisy tonal or repetitive activities;
- Provide respite periods for any activities that result in impulsive or tonal noise generation;
- Switch off equipment during break times;
- Combine noisy activities to reduce their impact and duration;
- Maximising the offset distance between noisy plant items (e.g. crushing plant) and nearby sensitive receivers;
- Avoiding the coincidence of noisy plant items and nearby noise sensitive receivers;
- Orientating equipment away from noise sensitive areas;
- Carrying out loading and unloading away from noise sensitive areas; and,
- Use temporary barriers to screen construction activities at sensitive receptors;
- Where variable pitch reversing alarms are fitted to plant, they will be required to be set on the lowest safe level, and where practicable, endeavor to provide drive-through

facilities to minimize utilization of reverse warning devices. The use of broad-band reversing alarms should be considered.

In order to minimise noise impacts during the construction works, construction contractors should consult with NEMA on an ongoing basis and take all reasonable and feasible measures to mitigate noise effects. Pro-active management of the works, in particular adhering to the prescribed working hours and mitigating noise impacts, and maintaining good relations with the surrounding community should ensure that the impacts are minimised.

4.3 TRAFFIC NOISE RECOMMENDATIONS

Once the construction phase is completed and the upgraded Bypass commissioned, the following would help in reducing traffic noise impacting nearby receptors:

- Erection of an effective physical sound barrier between the road and the receptors.
- Strict enforcement of the speed limits.
- Using noise reducing materials to surface the road.

5.0 CONCLUSION

The assessment identifies the noise that may be generated from construction and use of the upgraded Bypass and sets out recommended mitigation measures to minimise disturbance at sensitive receptors adjacent to the scheme. The results from the assessment identify that construction impacts with mitigation measures may still cause disturbance to properties within close proximity to the works due to high levels of construction noise but that this will be temporary. Noise from traffic using the Bypass, however, is predicted to increase over the years as the number and size of users grow.

Appendix III: Record of Stakeholder Engagement

Project Title	Lot B, Kampala Northern Bypass	Division	HWY
Subject	Consultation meeting	Project no.	259292
Location	World Wildlife Fund (WWF), Kampala	Date of meeting	22/07/2011
Attendees		Time of meeting	4.30 – 5:30pm
1.	Lammeck Kajubi (LK) AWE CEO		
2.	Ritah Nabaggala (RN) AWE Environmental consultant		
3.	Thomas Otim (TO) WWF, Conservation Manager		
4.	Robert Ddamulira (RD) WWF, Energy and Climate Manager		
5.	Jacqueline Nasasira (JN) MM, Environmental Consultant		
6.	Julia Barrett (JIB) MM, Environmental Consultant		

Item	Text	Led by
Introductions	LK introduces the MM and AWE team to the WWF representatives, and begins his presentation with a broad overview of the Scheme, to include potential junction alignments (TBC). He then explains that MM are main consultant (Scheme designers), and that AWE in association with KAGGA are currently undertaking the ESIA.	LK
Potential Impacts – Construction	LK talks through potential construction related impacts such as construction dust, impacts of transporting materials to site, waste management, pollution of watercourses etc.	LK
Potential impacts – Operation	LK raises the key operational impacts, such as flooding as a result of poor drainage (he is careful to introduce the idea that this may not be a design flaw, but the result of waste disposal within the drainage channels resulting in clogged culverts), waste management (linked to flooding), visual impacts, noise and impacts upon ecology. Safety and accident risk is also a key issue. Suggestion that sensitisation of the local community is essential for the success and reduction of impacts along the by-pass (e.g. waste management, use of road by pedestrians and other NMUs). It is clarified that the biological surveys undertaken for the Scheme have not identified any species or habitats of particular sensitivity, but that there are concerns over habitat links for the wetland areas and downstream impacts.	LK
Discussion	WWF raise a number of issues that they consider should be addressed within the ESIA/ ESMP for the Scheme:	RD and TO

Item	Text	Led by
	<ol style="list-style-type: none"> 1. Training for Construction Personnel, especially those driving construction vehicles. It is felt that their actions pose a great risk to the local community as they do not drive safely when travelling to and from site. 2. Occupational health and safety needs to be addressed, so that there is a requirement (and that this is enforced) to wear and use the correct PPE for specific jobs etc. In addition, measures to reduce the impacts from construction dust and emissions from construction vehicles should be included within the ESMP – e.g no idling vehicles, construction vehicles to meet emissions standards etc. 3. The cumulative impacts of the existing by-pass and the expansion of the road needs to be addressed in terms of impacts upon wetland ecosystems. The WWF would like to see some kind of habitat restoration/ compensation included within the ESIA to offset the impacts of the Scheme upon wetland habitats. 4. Specific species should be surveyed within the wetland habitats, (e.g. bird species within the papyrus); 5. Pollution impacts from the construction of the road and from the way the road reserve is used (e.g. car washing areas etc), have degraded the ecosystem and have knock-on impacts downstream, such as siltation. Measures should be included within the ESMP and Contract for the Scheme to prevent misuse of the road verge in this way, thus reducing impacts upon downstream and adjacent habitats. 6. Health and sanitation impacts – some of the drainage channels are used as open sewers. There should be a multi-lateral process to address this. This is the same for solid waste management – i.e. there needs to be a collaborative approach from UNRA, NEMA and KCC. 7. Indirect and secondary impacts should be addressed, such as cumulative impacts upon the wetland in conjunction with other developments (e.g. the sewage treatment works). 8. Ground water impacts should be addressed – LK mentions the hydrological study that has been undertaken by KAGGA. 	
Final ESI and Report Distribution	WWF ask to see the Final ESIA once it has been produced so that they may comment on it. The current status of the report is that a Draft is to be issued to the EU as the potential funding agency by the end of July, and that this Draft would then be issued to UNRA and NEMA. AWE agree to issue WWF with the Report once it has been reviewed by NEMA (uncertainly as to whether NEMA would issue this to WWF directly).	RD, LK and JIB

Project Title	Kampala Northern Bypass	Division	HWY
Subject	Consultative meeting	Project no.	259292
Location	UNRA Office, Kampala Uganda	Date of meeting	24/10/2010
Attendees		Time of meeting	9:30 – 10:50
1	Patrick Kamanda Environmental Specialist, (PK) UNRA		
	Ann Rutebuka (AR) Sociologist, UNRA		
	Lammeck Kajubi Consultant (LK)		
	Jacqueline Nasasira Consultant (JN)		

Item	Text	Led by
1.0	<p>Current status of EIA</p> <p>PK said that the importance of the meeting was to find out the current state of the Project as far as the Project is concerned He wanted to know ;</p> <ul style="list-style-type: none"> • How far the Project has gone in compilation of the EIA? • what is currently being done on the Project; and, • What is likely to be done in achieving the report. 	PK
1.1	<p>LK gave a brief introduction of what has been done so far and what is in the pipeline as far as EIA is concerned.</p> <p>LK and JN told the meeting that the scoping report is in progress and has already looked at; the Project Description, the social environment, the accident Risks and how there can be improvements on the Road Safety.</p> <p>Consultations on why the crossing areas are not being used by pedestrians and what should be done.</p> <p>Poor use of flyovers and foot bridges and suggestions of what should be done are to be incorporated in the report.</p> <p>LK also told the members/ attendees that Mott MacDonald is aware of this and therefore changes will be incorporated in the design.</p> <p>LK Said that AWE plans to undertake 3 consultative meetings in the communities where the Bypass starts from up to where it ends, to make sure that the mistakes made during the early stages of project are not repeated in the new design.</p>	LK & JN
2.0	<p>Reports Required by UNRA</p> <p>Inception report</p> <p>PK said that UNRA expects an environmental inception report to</p>	PK

Item	Text	Led by
	<p>highlight all the milestones likely to be undertaken in the EIA report inclusive of the environmental and social impacts</p> <p>PK told the meeting that stake holder meetings will follow after an inception report is produced to find out if all stakeholders agree with the project development.</p> <p>Scoping report</p> <p>PK said that the Scoping report is necessary as part of the EIA and it is through which the Consultant should refine the TORs.</p> <p>PK said that after the Scoping report is produced by the Consultant it should be submitted to NEMA for review</p> <p>PK advised the Consultant that the right experts should be assigned the right task for the purpose of getting the right quality of the EIA reports as required by NEMA</p> <p>Mitigation Plan report</p> <p>PK said that the Consultant should produce a final mitigation plan, setting out what should be done to address the likely adverse effects.</p>	
3.0	<p>Development Partners</p> <p>PK said that relevant Development Partners guidelines should be followed while producing the EIA report. These Development Partners include IDB, EU and WB.</p> <p>PK told the meeting that the Consultant should disclose the Draft Report of the EIA to the Development Partners</p> <p>safety</p> <p>PK told the meeting that development partners want all reports to include issues of safety during operations and implementation.</p>	PK
4.0	<p>NEMA Guidelines 1997</p> <p>PK emphasised that the consultative meetings should be carried out and should be basing on the guidelines set out by NEMA in 1997</p> <p>It was noted that consultation meetings should be physically carried out, and not for the responsible officers to sit and just search from the internet and project consultations should be focussed and with a purpose</p> <p>PK added that it is important that records of consultation meetings be recorded and be booked for future reference.</p> <p>It was advised that after communities are consulted there should be a giving back programme to the community a copy of the meeting resolution is sent back to the Community.</p> <p>Consulting the relevant Development Partners before the EIA is produced should be a prerequisite for all donor funded Projects.</p> <p>Different Stakeholders need to be Consulted and among them are the following;</p>	PK

Item	Text	Led by
	<p>NEMA Uganda Police Petroleum Wetlands Department Water Resource Management Kampala City Council and Local Communities</p>	
5.0	<p>Utility Companies PK said that Utility Companies that intend to establish developments in the road reserve should consult UNRA before they produce the EIA reports, so that UNRA can advise them on the future use of the Road Reserve</p>	LK
6.0	<p>Waste Management PK advised the consultant to find out on the issue of waste management and what KCC has to say about it.</p>	PK
7.0	<p>Quality of Reports PK told the meeting that UNRA intends to have uniform and quality reports from all the consultants on UNRA Projects, as required by NEMA, the Development Partners and UNRA the client. On the issue of EIA reports, PK said that they should include lots of expertise and analysis for good quality reports, project continuity and development.</p>	PK
8.0	<p>Wetlands PK said that the Consultant should consult/liase with the Wetlands Department and get/obtain their ideas as far as the Project is concerned.</p>	PK
9.0	<p>Material Excavation PK said that the Consultant should find out what to do with borrow pits in the EIA design. Cut to spoil PK said that the Consultant should advise on the cut to spoil issue that is likely to affect the communities</p>	PK
10.0	<p>Drainage Proper drainage on the Northern Bypass should be cleared in the design</p>	PK
11.0	<p>Tree Planting PK asked the Consultant to find out who is responsible for planting the trees whom is responsible to plant the trees. To find out if .NGO's, K.C.C, or UNRA is responsible or it is a joint</p>	PK & LK

Item	Text	Led by
	<p>issue.</p> <p>He also asked local authorities and the Local people to maintain Tree Planting and Engineering department should also incorporate this in their design.</p> <p>LK and PK agreed that the road committees and the station engineers should carry out monitoring and maintenance of the planted trees.</p> <p>PK said that the consultant should have committees established on tree planting and maintenance. He said that this can be done with the help of Local Communities.</p>	
12.0	<p>Resettlement</p> <p>The resettlement issue for the affected persons was talked about and AR said that consultations are going on to find out if compensation was done or if it is to be done again AR, of UNRA is to find out on this</p>	LK & AR
13.0	<p>Monitoring</p> <p>UNRA to ensure continuous monitoring of the Project</p>	PK

Project Title	Lot B Northern Bypass, Kampala Uganda	Division	HWY
Subject	Environmental and Social Impact Assessment Consultative Meeting	Project no.	259292
Location	Wetlands Management Department Office	Date of meeting	24/11/10
Attendees		Time of meeting	11:00 – 12:30PM
1	Deo Kabaalu (DK)	Senior Wetlands Officer - WMD	
2	Joel Charles Owana (JCO)	Policy and Enforcement Officer - WMD	
3	Julius Mafumbo (JM)	Wetlands Reaserch Officer- WMD	
4	Carol Kagaba (CK)	Wetlands Assessment Officer - WMD	
5	Gilbert Ituka (GI)	Environmental Officer - WMD	
6	Richard Kyambadde (RK)	Research Assessment of Wetlands - WMD	
7	George Wamunga (GW)	Senior Wetlands Officer - WMD	
8	Jacqueline Nasasira (JN)	Mott MacDonald	
9	Robbie Mutyaba (RM)	Mott MacDonald	

Item	Text	Led by
1.0	<p>Welcome and Introductory Remarks</p> <p>Welcoming remarks were done by Mr. (DK) who introduced the team from the Wetlands Department to the Consultants and asked them to introduce themselves. The attendance list was then signed for future reference.</p> <p>RM introduced the purpose of the meeting, and the Project background to the Wetlands team. JN said the major aim of the meeting was to discuss issues from the stakeholders' side which could be used to draw the Terms of References (TORs) and would later be studied in the full ESIA.</p>	DK
2.0	<p>Issues raised</p> <p>Questions</p> <p>Why didn't the first EIA take care of the dual carriageway during the initial phase of Project development?</p> <p>What time will the construction of the said road take?</p>	GW

Item	Text	Led by
3.0	<p>Answers</p> <p>JN said that the previous EIA report that was done is to be referred to but Mott MacDonald has not yet found it.</p> <p>RM added that the client is responsible for the procurement and construction supervision project. Mott MacDonald is unable to confirm Construction start and finish; Mott MacDonald was only commissioned to prepare designs.</p>	JN & RM
4.0	<p>Issues raised</p> <p>CK said that keeping murrum by the road side has attracted many encroachers who are using it for brick making and this has increased flooding along the bypass.</p>	
	<p>She added that the culverts used along the road were of small diameter and are now heavily silted, leading to flooding of the nearby areas.</p>	CK
	<p>CK supplemented that small pockets of wetland that was encroached on during the construction of the Bypass lost her bionetwork value.</p>	
	<p>GW advised that there is need to consider the previously considered environmental issues and the lessons learned to be able to undertake the new designs and he said this can only be done with reference to the previous EIA report.</p>	GW
	<p>GI disclosed that soil backfilling that was done near Bethany High school along the Bypass does not allow for the free movement of the small creeping animals and water which has affected the biodiversity in the area and Water life. He advised that the next design should consider lifting the road up by the use of strong pillars other than soil backfilling compacting.</p>	GI
	<p>He added that the stretch between Nalya and Kireka has got a sharp corner and the cliff is high, he advised that a flyover should be considered.</p>	
	<p>The wetland encroachers should not be compensated since they are encroaching on a wetland illegally. Their compensation has made it hard for the wetlands officers to evict them and this has increased environmental degradation.</p>	
	<p>JCO asked UNRA and Mott MacDonald whether a cost benefit analysis of constructing the Bypass against any environmental loss on the wetlands and the ecosystem was carried out before commencement the Project.</p>	JCO
	<p>RK said that the hydrology of the areas around the Northern needs to be looked at in detail.</p>	RK
	<p>He added that the impact of the Northern Bypass to the people should be revisited since the construction of the current Bypass caused a lot of harm to the surrounding areas; for instance</p>	

Item	Text	Led by
	flooding and therefore advised that the forthcoming development of the dual carriageway should not affect the residents again.	
	RK said that areas of Nansana and Kisingiri were affected by flooding due to the development of the Northern Bypass which caused flooding to the surrounding area when the wetland was encroached on and the watercourse lost its way.	RK
	RK asked that a clause be drafted in the civil works contract for 20% of the contract value to only be given to the contractor upon fulfilling all project Terms of References.	RK
	<p>GI advised that the hydrologist consultant should consult DWDRM and Local Government for advice.</p> <p>The Wetlands Management Department (WMD) team asked Mott MacDonald to organise a multi-disciplinary stakeholders site visit to the Northern Bypass as a way of fully understanding the current environmental issues.</p>	GI
	In a nutshell the WMD team asked the developer to send the TORs to the stakeholders to review before the EIA is produced.	
5.0	<p>Recommendations and Conclusions</p> <p>The meeting was very informative and the issues raised will help the consultants to develop the terms of reference which will be used in the full study of the ESIA. However it was advised that the consultant refers to ESIA produced during the first phase of the project.</p>	

Project Title	Lot B Kampala Northern Bypass	Division	HWY
Subject	Stakeholder Consultative Meeting	Project no.	259292
Location	Uganda Museums	Date of meeting	17/05/2010
Attendees	Jacqueline Nyirachiza (JN) Jacqueline Nasasira (JN)	Time of meeting	3:00pm
	Archaeologist Consultant		

Item	Text	Led by
0.1	Sensitive ecological areas: JN advised that sensitive ecological areas be protected against destruction and pollution during construction. She said the destruction of cultural heritage sites in not expected. Among the Archaeological Sites; Jackie identified Bahai temple, Ndere troupe to be among the major archaeological sites known and listed on the Uganda museums chart and they are internationally recognised.	JN
0.2	Bemba Musota: She also identified Bemba Musota as a cultural heritage highly recognised by the Baganda culture and therefore need to be highly protected during the time of construction.	JN
0.3	She also advised the consultant to use the chance findings in areas where the contract will find the unusual remains of Archaeology, i.e. the antiquity that has survived from the distant past.	JN
0.4	When asked about the sources of raw materials; JN recommended that a field trip should be taken to the specified areas to verify if the planned barrow pits or quarries are sites of Archaeology or not.	JN
0.5	She asked the consultant to protect and preserve swampy zones or do minimum harm.	JN
0.6	Strip Map: she advised the EIA team to draw up a map showing the location of the available archaeological sites and their distance from the road and show whether they will be affected or not, and to what extent. She advised that the map can either be looked at during the scoping or EIA report production.	JN
0.7	Conclusions: JN promised that continuous consultation will be carried out during the production of the ESIA report and said that while using the chance findings the Archaeologist will be consulted by the contractor at any point of need.	JN

Project Title	Lot B: Kampala Northern Bypass	Division	Highways
Subject	Consultative Meeting	Project no.	259292
Location	Town Clerk Offices, Kabakanjagara Road	Date of meeting	28/09/2010
Attendees		Time of meeting	10:30 – 11:30am
1.	Robin Kayongo Town Clerk (RK)		
2.	Robbie Mutyaba Mott MacDonald (RM)		
3.	Jacqueline Nasasira Mott MacDonald (JN)		

Item	Text	Led by
	<p><u>Accident</u></p> <p>RM gave a brief background to the Northern Bypass project and said that the increased rate of accidents on this road since it was open to traffic in October 2009 was the main point of discussion. He further pointed out that UNRA and Mott MacDonald would appreciate solutions from the public that would later be incorporated in the detailed design for construction/widening.</p>	RM
	<p><u>Responses</u></p> <p>In her response RK pointed out that the major cause of accidents was due to Pedestrian crossing and that the Bwaise – Kalerwe fly over is not used by pedestrians due ignorance and culture, and therefore there is need to sensitise people about this type of road which is new to them.</p> <p>She further gave the following remarks:</p> <ul style="list-style-type: none"> • If road safety aspects are introduced to curriculum/syllabus in schools, future generations will be at a lesser accident risk on the roads. • Poor Town Planning has increased flooding in Rubaga division. • There is need to sensitise people about the difference between crossing points and Zebra crossings which seem to cause confusion to people and thus the accidents. 	RK
	JN and RM expressed concern over the increased theft of road sign and posts.	JN and RM
	RK pointed out that poor road designs as another cause of accidents giving an example of small culverts on Masaka road which are always silted and have caused flooding in Rubaga Division	RK

Item	Text	Led by
	Blocked Drainage Channels were also talked about and that there is need to improve the drainage designs to allow uninterrupted storm water flow.	JN and RM

Project Title	Lot B, Kampala Northern Bypass	Division	HWY
Subject	Consultative meeting	Project no.	259292
Location	Ministry of Gender, Labour and Social development	Date of meeting	26/05/2011
Attendees		Time of meeting	2:45 – 3:30pm
1.	Alex Asiimwe (AA) Acting Senior Safety Inspector / Advisor to the Minister		
2.	Jacqueline Nasasira (JN) Consultant		

Item	Text	Led by
0.1	<p>Safety: AA advised that most importantly the developer together with the contractor must have administrative safety and health documents in place i.e.;</p> <ul style="list-style-type: none"> • The safety policy of the developer; • The safety and health plan; • The HIV / AIDS at work place policy; and, • The risk assessment and management plan. 	AA
0.2	Management of plants and equipment; AA said that the management of plants and equipments should be examined and certified by Ministry of labour.	AA
0.3	AA added that fire safety system should be in place to control any fire break outs.	AA
0.4	He also said that there is need to include adequate sign-gages and that they should be; mandatory, prohibitive, precautionary and informative to protect workers against dangers associated with lack of the said sign gages.	AA
0.5	AA added that welfare like food, water and washing facilities should all be put in place to ensure wellbeing of the workers.	AA
0.6	When asked about health and accidents; AA said First aid services should be put in place for anyone who suffers an accident or falls sick. Addressing the same, AA added that sick bays for the sick persons should be in place.	AA, JN
0.7	While asked about hygiene at the workers camp and food safety systems, AA said that proper hygiene should be ensured to avoid diseases like diarrhoea which may claim the loss of many lives in case it happens.	JN, AA

0.8	Unionisation of workers; AA said that if well managed the unionisation of workers will lead to good working conditions and when poorly managed it will lead to uncalled for strikes. This should be in accordance with the Labour Unions Act of 2000.	AA
0.9	AA advised that safety precautions in terms of noise, dust and toxic chemicals like lead should be put in place to mitigate the impacts of these chemicals to workers.	AA
1.	When asked to advise on air pollution and dust challenges, AA said that there should be water bowsers in place to control dust effects and a filtering mechanism to ensure that there is no hazardous chemical emitted in the atmosphere, in case of any.	JN, AA
1.1	AA also advised that the Workers Compensation Act should be referred to, to assess injuries as compared to compensation.	
1.1.2	The meeting ended 3:30 with and AA promised to advise at any point of need.	AA

NEMA Scoping Meeting

Date: 3 Dec 2010

Attendees

1. Mr. Arnold Waiswa, NEMA
2. Eng. Magambo, KAGGA
3. Eng. Kajubi Lammmeck, AWE

Issues:

1. Existing N.B has created / encouraged encroachment of adjoining wetlands in Lubigi, Bwaise and Kyebando, Kisaasi encroachment is mostly for settlement and commercial value.

2. It is possible that earlier acquired corridor is encroached on, but legally road reserve was marked and encroachers deserve no compensation but could give ample time to move.

3. Drainage.

Road constructed in flood plain and experience flooding in wet seasons probably they are filling sections to keep away floods.

4. Minimise Accidents .

So design should provide general bridges especially in busy trading centres

Sign posts

Ramble strips not for uncomfortable but alerting

Gentle ramps for disabled people

5. Ensure good design and construction not to impend drainage

Overall:

Consider contractors obligation to consider effect of deposition into wetlands.

Dumping cut to spoil in wetlands is environmentally and ecologically degrading.

Project Title	Lot B: Northern Bypass	Division	Highway
Subject	Consultative Meeting	Project no.	259292
Location	Nakawa Division Office, Community Centre Kampala	Date of meeting	27/09/2010
Attendees		Time of meeting	3:45 – 4:30pm
1.	Mr. Abner Besigye(AB)	Town Clerk (T/C)	
2.	John Muiyisa (JM)	Chief Internal Auditor	
3.	Joan Muneeza (JM)	Senior Law Enforcement Officer	
4.	Robbie Mutyaba (RM)	Mott MacDonald	
5.	Jackie Nasasira (JN)	Mott MacDonald	

Item	Text	Led by
1.0	<p><u>Increased Accident Rate</u></p> <p>The meeting started off with an introduction and opening remarks from RM. He explained that one of the objectives of the meeting was to discuss measures necessary to reduce the rate of accidents that have claimed over 20 lives since the road was opened to the public in October 2009. He further reported that according to police files, most of the accidents victims registered were pedestrian and motorcyclists (Boda boda cyclists)</p> <p><u>Responses</u></p> <ul style="list-style-type: none"> • AB and JMU asked Mott MacDonald to review the lane width of the Northern Bypass. They belief that the Bypass being narrow has also contributed to the number of accidents. • AB noted that the Northern bypass is being used by many wide and heavy loaded vehicles which might have contributed to the congestion and they also become a threat to other road users. • JM pointed out the Karerwe – Kyebando junction as one of the busiest sections and most prone to accidents. 	RM
	<ul style="list-style-type: none"> • _AB requested Mott MacDonald to increase the number of speed limits on the new design and replace stolen road signs. • Both AB and JM asked UNRA and Mott MacDonald to contact them if they can be of any help in sensitising the communities along the Bypass about the benefits of such an 	

	<p>infrastructure, and how to best use it.</p> <ul style="list-style-type: none"> • AB asked UNRA and Mott MacDonald to put up signs with strict warnings to abusers of traffic laws and regulations • AB suggested that Mott MacDonald should increase the number of traffic barriers on the road and provide designated crossing points to reduce the temptation by pedestrians and cyclists to cross at any desired point along the road. 	
1.1	<p><u>Failure to use flyovers / foot bridges</u></p> <ul style="list-style-type: none"> • Both RM and JN were concerned about the beneficiaries not using the facilities put in place for their use, for instance the failure to use flyovers • JM brought to the meeting's attention that pregnant women don't want to use flyovers due to their maternal vulnerability. • Both AB and JM concurred that the design of flyovers needs to be improved. He gave an example of the Nakawa flyover which women don't want to use because men look under their skirts/dresses through the gaps. 	RM/JN
1.11	<p><u>Culture and Ignorance</u></p> <ul style="list-style-type: none"> • AB said that another major cause of accidents is the fact that the indigenous people are not used to these types of roads and some have not used flyovers before, so they prefer to cross the highway like any other road. • AB said advertisements on safeways to use roads should be put in place to sensitise the people, He gave an example of "don't drink and drive" advertisements. • AB suggested that road safety be taught in schools for instance the road code of "turn left and right, before crossing the road. 	
1.1.2	<p><u>Absence of Walkways</u></p> <p>AB suggested that Mott MacDonald and UNRA consider including walk and cycle ways for both pedestrians and cyclists respectively when designing roads.</p>	AB
1.1.3	<p><u>Trading by the road side</u></p> <ul style="list-style-type: none"> • JM said trading by the road side is another cause of accidents, the fact that it causes a lot of distraction and hence accidents. • AB advised Mott MacDonald and UNRA to enforce Trade orders to stop road side trading. 	
1.1.4	<p><u>Increased number of junctions on the highway</u></p> <ul style="list-style-type: none"> • AB suggested that many access roads to the Bypass might also be a cause of accidents and asked Mott MacDonald to look into it. 	AB

1.1.4	<p><u>Political Influence</u></p> <p>AB said City Council should raise the City Standard and do a way with political influence and try to do technical work and enforce byelaws like the urban farming and urban agriculture Byelaws to stop the habit and culture of cattle grazing in Town Centres.</p>	AB
1.1.5	<p><u>Theft of Road Marks & Signs</u></p> <ul style="list-style-type: none"> • AB and JM also suggested that encouraging Patriotism would help in reducing street furniture vandalism. • Mott MacDonald to coordinate with the Local Councils and UNRA to sensitise the locals. 	RM

Project Title	Kampala Northern Bypass (KNB)	Division	HWY
Subject	Consultative Meeting on Climate Change and Road Sector Development	Project no.	259292
Location	Kampala City Council Authority (KCCA)	Date of meeting	22/06/2011
Attendees		Time of meeting	09:00 – 10:00am
1.	Mr. Joseph (JS) Ssemambo Climate Change Management focal person - KCCA		
2.	Ms Jackie Nasasira (JN) Consultant		

Item	Text	Led by
0.1	Vegetation Encroachment: JS said that byelaws should be put to stop vegetation encroachment by the road side traders which in a log run increases global warming hence climate change.	JS
0.2	Drainage: JS added that drainage should be improved by using larger culverts which will stop the cut off of sensitive ecological areas. He said that the area surrounding Nsooba stream which serves lubigi was cut off which caused a lot of flooding during the then time of construction, and as a result there was spread of communicable diseases, displacement of persons due to flooding and dislocation of persons from their individual house holds. JS advised that in an areas when flooding is anticipated there is need to do a flood risk mapping to enable the contractor identify how much water is likely to affect deposited each house hold and know how much that can a drainage channels carry hence build larger culverts	JS
0.2	Proofing/Transient: On this JS advised that risks for dilution of road due to water and as a result of compaction and backfilling during construction, there should be more of retention walls to sink in the water to avoid flooding.	JN & JS
0.3	When asked about the Heat, JS said that impacts of climate change are increasing in Uganda and there has been recorded variation in average temperatures that correlates with an estimated increase of 1.5 °C in the next 20 years and up to 4.3°C by the 2080's, although recent scientific studies indicate the globe could warm by 4°C by 2050. He added that this call for green infrastructure and replanting of side road trees that will be cut on KNB	JS
	He added that heavy precipitation in Kampala and also was said to affect the fragile drainage which has impacted on House holds, Schools, and Roads being affected.	
0.4	JS asked the developer to coordinate with KCCA Planning	JS

	Authority who know the heavily populated areas so that there is limited affected property for compensation.	
0.6	The developer should control the activities or developments along the wetland areas of the Northern Bypass so that there is less encroachment on the wetland, especially areas surrounding Kyebando – Ntinda junction	JS
0.7	JS advised that there should be constant desilting of drainage channels to allow water movement	JS
0.8	There should be proper waste management disposal to avoid the blockage of drainage channels	JS
0.9	JS added that vehicles that are in a very Dangerous Mechanical Condition (DMCs) should be put off the road to stop emission of carbon dioxide in the atmosphere. He said this can be done by Uganda Traffic Police enforcing the laws on traffic and road use.	JS
1.0	There should be provision of shelter on bus stops in case of extreme heat and rain and Bus bays should be increased in number.	JS
1.1	The Bus stops should be lit up to avoid insecurities of theft and murder.	JS
1.2	Emergency exits should be put on the Northern Bypass in case of and disasters.	JS
1.3	There is need to design for the non-motorised by separating green modes and red modes hence safety of all road users.	JS

Project Title	Lot B, Kampala Northern Bypass	Division	Kawempe - Kampala
Subject	ESIA Consultative Meeting	Project no.	259292
Location	Town Council Offices – Kawempe	Date of meeting	22/07/2011
Attendees		Time of meeting	9:45am – 12:15pm
1.	Lammeck Kajubi (LK)	Team Leader President - AWE	
2.	Julia Barrett (JB)	Environmental Consultant Mott MacDonald	
3.	Ritah Nabaggala (RN)	Environmental Consultant AWE	
4.	Jacqueline Nasasira (JN)	Environmental Consultant Mott MacDonald	

Item	Text	Led by
Introduction	LK introduced the teams both from Mott MacDonald and AWE to the audience/ Kawempe community representatives. He also introduced the Project Area to the attendees straight from where it starts its starting point in Busega to Nelson Mandela National Stadium where it ends. He explained Gayaza to Hoima as a dual carriageway covering 3.5Kms and the remaining 17.5Kms to be expanded to a dual lane totalling to a 21Km road stretch.	LK
Objective	LK said that the social importance of the meeting is aimed at the production of Environmental and Social Impact Study (ESIA) for the Kampala Northern Bypass. He added that the major aim of the meeting was to explain to the community the intentions of Government of Uganda for the project and to seek their views on how the government should undertake the expansion of the Kampala Northern Bypass without affecting the environment as well as social wellbeing.	LK
Existing Conditions	LK took through the audience of the existing conditions of the Bypass highlighting the likely areas of poor waste disposal, theft of road furniture, increased accident rate, poor use of footbridges among others.	LK
Possible Impacts and Control / Mitigation:	LK while addressing possible impacts he grouped them in classes of Construction and Operation Impacts. Construction Phase Impacts: LK mentioned that construction impacts are anticipated at the sources of construction materials	LK

	i.e. theft during transportation and storage of construction materials, poor disposal of construction wastes, soil erosion, dust, heavy traffic flows, flooding and positive impacts like employment of local communities among others.	
Land Acquisition	LK said that most of the land where the expansion of the Bypass is to take place was bought during the first phase of construction and therefore there will be no need for acquiring more land and if it must it will only be for junctions and roundabouts.	LK
	Operation Phases Impacts included: Flooding, poor drainage, poor waste disposal, dust, lack of access roads by the neighbouring communities noise and accidents.	LK
Stakeholder views	LK said a number of stakeholders are being consulted and their views will be considered in the new design.	LK
Reactions	Hajji. M. Sentamu mentioned that surrounded Communities do not benefit from the Project. He explained that contractors employ people from very distant communities instead of employing the locals from the project area and therefore asked that the new design should emphasise this.	Hajj. Ssentamu
Compensation and Land take	Mr. Kayemba Fred (KF) Mentioned that the previous project destroyed their property and yet the compensation process took a long time to be done, he therefore appealed to the Consultant and UNRA to make sure that early notice is made to the community for those areas where land is likely to be acquired to allow early preparation of the community not loose their land.	KF
Poor Drainage	About 18 culverts were reported to have been blocked along the Bypass and one Mr Kafumba Derrick (KD) and Ms. Kyola Gladys(KG) said flooding has become rampant in the area since the construction of the first phase of the Bypass. He mentioned that due to a lot of compaction and backfilling backed by poor/ small culverts, there has been poor drainage and flooding in the area especially when it rains. He went on to explain that even when rains in areas far a way from the Bypass communities along the Bypass flood! He asked the Consultant to include larger culverts that will allow water flow and asked UNRA to establish maintenance committees at each division to clean the culverts for proper drainage and safe water flow. He said that areas affected by the floods stretch from Kalerwe to Bwaise.	KD & KG
Grievance - Redress Mechanism and Maintenance plan	Mr Ddamulila Lwanga said that during construction and operation periods the government should set up a clear communication channel independent from local councils to report and monitor the road activities and any community grievances that may arise during construction and he said these committees can be established at each division.	Mr. DL
Poor Waste Disposal	Ms Judith Namugenyi stays in Kisenyi Zone which is affected by poor waste disposal which has ended up blocking the drainage channels in that area surrounding the Bypass. She asked that Waste Management Plans be put in place for proper waste maintenance.	

Theft of Construction Materials	Mr. Kakooza Umaru (KU) said that the government should work hand in hand with the local communities to stop theft of construction materials especially at the time of construction. He said this can be done by having a community representative at the construction site that collaborates with the government official.	KU
Road side traders	Mr. Emmanuel Kasujja (EK) advised that the government should set up markets for road side traders who are currently using the road reserve to stop wetland encroachment.	EK
Accidents	Areas along Kawala and Kyebando were repeatedly mentioned to have been rampant for the occurrence of accident	Residents
Dust	The residents reported that during construction they are always affected by dust and therefore they asked the consultant to suggest dust barriers during construction.	
Diversion Road	EK said that during construction the contractor together with the developer should construct a diversion road for the current road users especially the community.	EK
Reactions on Operation Impacts	Ms Judith Namayanja (JN) ongoing design should include safety barriers to stop cars from falling off the road which has caused a lot of death and injuries.	JN
Accidents	Ben Lugayizi(BL) advised that the roundabouts should be large enough to incorporate heavy vehicle turning.	LB
Theft of Road Furniture	The road signage should be made out concrete that has got no resale value to stop theft of road furniture.	
	Mr. Noah Mukasa (NM) advised that Committees should incorporate the local person to monitor local activities and can speak for the rest of the community as well as report to the Government.	NM
AOB	Mr Henry Balilarwa said he has never received the 30 % of his previous compensation for the first phase of construction.	HB
Attendance List		
1	Ssembatya Bosco	Kawaala Road Zone
2	Nalonga Lubyayi	Kawaala Road Zone
3	Katende Frank	Kawaala Road Zone
4	David Kazibwe	Kawaala Road Zone
5	Florence Nyombi	Kawaala Road Zone
6	Mary Namakula	Kawaala Road Zone

7	Margaret Mukasa	Kawaala Road Zone
8	Haj. M Ssentamu	Kawaala Road Zone
9	Gerald Waswa	Kawaala Road Zone
10	Kyolaba Gladys	Kawaala Road Zone
11	Jane Namayanja	Kawaala Road Zone
12	Emmuanuel Kasujja	Kawaala Road Zone
13	Luzinda Nelson Paul	Bugalani Zone
14	Kayemba Fred	Kawaala Road Zone
15	Rev. Kagwa Ssentamu	Kawaala Road Zone
16	Tebusweke Patrick	Kawaala Road Zone
17	Mukiibi Joseph	Kawaala Road Zone
18	Abdu Kasule	Kawaala Road Zone
19	Mukasa Noah Salongo	Kawaala Road Zone
20	Maggulu Richad	Kawaala Road Zone
21	Mugeere Ahmad	Kibe Zone
22	Balibulala Henry	Kawaala Road Zone
23	NKatumba Derrick	Bwaise Lufula Zone
24	Nakiganda Edith	Kawaala Road Zone
25	Fred Lugolobi	Kawaala Road Zone
26	Lwere Isreal	Kawaala Road Zone
27	Lugayizi Ben	Kibe Zone
28	Haj Asuman	Kibo Zone
29	Kikawa Kizito	Kawaala Road Zone
30	Nakyobe Fatuma	Kawaala Road Zone

31	Musisi John	Kawaala Road Zone
32	Ssaka Wamala Kalyowa	Bokasa Zone
33	Kakooza Umaru	Bulagani Zone
34	Naiga Christine	Bulagani Zone
35	Chama Kalerwe Mariat	Kawaala Road Zone
36	Mpanga Kibezone	Kawaala Road Zone
37	Nyanzi Adbud	Kawaala Road Zone
38	Francis Kalule	Kawaala Road Zone
39	Mr. Ddamulira Lwanga	Kawaala Road Zone
40	Janet Ssajabi	Kawaala Road Zone

Project Title	LOT B: KAMPALA NORTHERN BYPASS	Division	Highways
Subject	Consultative Meeting	Project no.	259292
Location	Kawempe Division Office, Kawempe	Date of meeting	05/10/2010
Attendees		Time of meeting	2:30 – 3:30
	Todfrey Kisekka Town Clerk (TK)		
	Robbie Mutyaba Mott MacDonald (RM)		
	Jacqueline Nasasira Mott MacDonald (JN)		

Item	Text	Led by
	<p><u>Accidents</u></p> <p>Mott MacDonald is currently preparing preliminary designs for the widening of the Northern Bypass. Among many other things, safety of road users is one of the aspects they would like to improve.</p> <p><u>Responses</u></p> <p>TK, advised Mott MacDonald and UNRA to design roads in Kampala the same way other cities around the world have done it, for example Kigali and other western cities. He further advised that by doing so;</p> <ul style="list-style-type: none"> • drainage designs would be improved; • pedestrians walkways would be designed; and, • Cycle ways (for cyclists) would also be designed. 	RM
	He suggested that if the Police, Engineers and the Local Government worked together vandalism of road furniture wouldn't still be a problem.	Tk
	He suggested that if road designs allow the separation of the different types of road users, accidents would reduce. He gave an example of planting flowers and trees between the main carriage way and cycle or walk ways	Tk
	He also mentioned that utilities companies should be advised to reinstate roads after installing their apparatus.	Tk
	He further mentioned that if the problem is lack of adequate funds to build good quality and durable roads, government should only upgrade a few roads but to a high standard.	Tk
	On the issue of flyovers, TK advised that these should only be	Tk

	constructed at strategic places/vantage points.	
	He insisted that most accidents and chaos on the roads is caused by motor cyclists (boda bodas) and that local government intervention in the past has been blocked by central government. He believes this issue is political.	Tk
	He also touched on the issue of patriotism and gave an example of Kigali where road furniture thieves are always arrested by civilians and handed to police.	Tk
	He also mentioned the need for bylaws to stop animal grazing in the city. This he said is a matter of policy which should be resolved by politicians.	Tk
	He advised that Parish leaders should be empowered to solve some of these problems since they are closer to the people.	Tk
	On the matter of designs, he advised foreign firms to use local design manuals and standards because Ugandan conditions may be different to other countries. He gave an example of the 9 narrow and long culverts near Bwaise Church that always difficult to de-silt and thus the occasional floods in that area.	Tk

Project Title	Kampala Northern Bypass	Division	HWY
Subject	Consultative Meeting – FSSD	Project no.	259292
Location	Forestry Sector Support Department Office	Date of meeting	09/04/2011
Attendees		Time of meeting	11:00am – 12:30pm
	Bob Kazungu (BK)	Forestry Sector Support Department	
	Lammeck Kajubi (LK)	CEO – AWE/ Environmental Consultant	
	Jacqueline Nasasira	Environmental Consultant Mott MacDonald	

Item	Text	Led by
Under What Frameworks or mandate would such trees be planted?	Planting of trees along the roads is guided by Policy within the Forestry Sub-Sector and also in a number of other development frameworks like the Urban Development Planning Frameworks, EIA Regulations etc. The Uganda Forestry Policy of 2001 provides under Polict Statement 9(Page 21) for Promotion of Urban Forestry and one of the strategies for implementation of this policy statement is “Promote the Planting of road reserves through the Ministry responsible for Roads. Also Programme 5 of the newly revised National Forestry Plan, 2011 highlights the need to intergrate forestry aspects into the Urban Development Plans.	BK
Who plants and who maintains?	<p>It is important to note that who plants should be part of the who maintains. Although there could be different approaches to planting and maintaining the trees to be planted along the Northern By-Pass, three(3) scenarios are proposed:</p> <p>Scenario 1: Community or Land Owners do the planting and maintenance; Scenario 2: A private firm or company is contracted to plant and maintain; and, Scenario 3: Wakiso and/or Kampala Forestry Offices do the planting and maintenance.</p> <p>Each of the 3 scenarios has its strengths and weaknesses, but based on experience and for purposes of Sustainability, Scenario 3 is the most appropriate. What will influence its success is the nature of implementation.</p>	BK
	It is the mandate of the Local Government's District Forestry Services (National Forestry and Tree Planting Act, 2003, Part VII, Section 48, subsection 3) to to liaise with NFA and other Authorities in matters relating to Forestry, promote forestry awareness in the district, promote the planting of trees, to cause	BK

	<p>to be prosecuted, any person wilfully destroying any forest resources in contravention of this Act and others functions. The District Forestry Services will provide support in mobilising the land owners(if needed), provide needed technical guidance in planting the trees, provide support in selecting the species to be planted, periodically(if practically possible), maintain the trees(pruning, singling etc).</p>	
<p><i>What role would the Forestry Sector Support Department have in all this?</i></p>	<p>The Forestry Sector Support Department as mandated by law will play the following roles:</p> <ul style="list-style-type: none"> • Provide the Policy guidance on implementation e.g Source of seedlings, regulations and guidelines for pitting and other silvicultural operations etc • Provide Technical backstopping to the implementing body in all aspects related to forestry e.g Landscapping, tree species choices and maintenance, Community involvement in tree planting. • Guide on future plans • Initiate, Guide and contribute to the formulation of a Tree Planting policy within the EMP of the Road Construction works. • Monitoring and supervision of tree planting programmes for the road 	<p>BK</p>

Project Title	Lot B, Kampala Northern Bypass	Division	IUCN Uganda
Subject	Consultative Meeting with IUCN	Project no.	259292
Location	IUCN offices	Date of meeting	25/07/2011
Attendees		Time of meeting	4:00pm – 5:15pm
1	Barbara Nakangu Bugembe (BNB)	Head of Uganda Office / Senior Programme Officer , IUCN	
2	Robert Bagyenda (RB)	National Project Coordinator, IUCN	
3	Eng. Lammeck Kajubi (LK)	CEO–(AWE) Environmental Consultant	
4	Dr. Isa Kabenge (IK)	Environmental Consultant AWE	
5	Dr. James Kalema (JK)	Botanist AWE	
6	Julia Barrett (JB)	Environmental Consultant Mott MacDonald	
7	Jacqueline Nasasira	Environmental Consultant Mott MacDonald	

Item	Text	Led by
Introduction	The introduction was done by both JN and JB. Both teams were introduced mentioning Mott MacDonald as the major consultant and AWE as sub consultants. UNRA was introduced as a client/ developer in the same meeting.	JN & JB
Project Description	While introducing the Bypass, LK said that the major aim of the Bypass is to relieve traffic from the city.	LK
Presentation	In his presentation LK said that the presentation was aimed at addressing the ecological aspects the road especially of the single carriage way; bearing in mind that several stretches of a wetland connect to one another which is a major problem on that is likely to affect the Bypass. LK added that the biologists have visited the bypass and they noted no species of unique sensitivity.	LK
Project Impacts - Construction	While addressing the likely Project Impact – LK said that the previous Scoping Report looked at preliminary positive and	LK

Impacts and Operation Impacts	negative impacts which are likely to happen during construction and operation time. Some of the impacts included; open borrow pits, drop of gravel and stone during transportation, theft of storage materials, construction waste, employment of local communities during construction, soil erosion, flooding, post construction flooding, improved road safety, improved traffic capacity, accident risk posed by livestock on carriage way, livestock grazing, traffic noise and visual aesthetic impacts among others.	
Wetland Assessment	JK reported that he went through the whole stretch of the wetland and noted that the papyrus species in the wetland are the only ones affected. JK noted that the ecological network is of concern since the Lubigi wetland is connected to Mabamba and Butembe wetlands which are Ramsar sites and therefore much care is required!	JK
	JK asked the developer to render support to the Butembe and Mabamba Ramsar Sites.	JK
Reactions Ideas for Project to Consider	BNB advised that the project should consider showing good will to our ecological foot print. By putting in place good preservation measures.	BNB
	BNB advised that the project should try as much as possible to reduce the environmental cost of the project by recognising the projects ecological value.	BNB
	The encroachment on wetlands i.e. illegal settlement, dumping. She asked the developer to put a strategy to address the said concerns.	BNB
	She encouraged multi-sector coordination between KCCA, WMD, UNRA to ensure project management is multi-handled and a plan is made of how to implement the development with minimal environmental impacts.	BNB
	BNB encouraged planting of trees to address issues of erosion and silting.	BNB
	She added that there is need to recognise the capacity of our authority to monitor the implementation of the project and if need be IUCN is willing to support.	BNB
	BNB said that there is need to carry out a cost benefit analysis and how it can be addressed. She advised that this can be done by putting a budget catering for this plan.	BNB
	RB asked the developer to make sure that EIA paper plan is transferred to practicability with all the monitoring and management plan implemented.	RB
	Encourage independent monitoring by the developer.	RB

	The road will expose more wetlands and therefore initiative should be put to gazette the wetland for sustainability.	JK
	Ministry of Works should ensure a leading role of monitoring.	BNB
	There should be clear communication channel of what is going on and what is likely to be done.	BNB
Compensation	Compensation for the same ecological value i.e. hydrology, water recharge should be at the back of the designer's/developers mind.	BNB
Time Lag	There should be short time lag arguing that the longer the project takes the more environmental risks are likely to occur.	
Technical officers	Use of technical officers from the government by the Consultant; BNB said that these technical officers should be funded, and are able to work hand in hand with consultants when given a chance. She added that a budget catering for this should be put in place.	BNB
	A waste management plan should be put in place and should be beyond the construction time.	RB
	Critical monitoring should be done to ensure that water is not cut off from flowing i.e. by monitoring the drainage process of a project.	RB
	The design construction of foot bridges should be looked.	RB
	Prostitution and HIV aids should be a major point and sensitisation be made in time to avoid health and death risks.	RB

Project Title	Kampala Northern Bypass	Division	HWY
Subject	Community Consultative meeting to obtain scoping issues to study in detailed ESIA, especially in regard to concerns currently known associated with use and design of existing road	Project no.	259292
Location	Nakawa - Bukoto	Date of meeting	18/10/2010
Attendees		Time of meeting	2:00 – 4:00PM
	Beatrice Muwanguzi (BM)	Councillor Mukalazi Zone - Nakawa	
	Lammeck (LK)	Kajubi Team leader, Consultant	
	Jacqueline Nasasira (JN)	Consultant	

Item	Text	Led by
1.0	Opening Prayer Opening Prayer was led by Mrs Beatrice Muwanguzi	
2.0	Introduction BM welcomed the residents and the Consultant and asked the Consultant to address the meeting.	BM
	LK started by introducing the cause of the meeting, he said that Uganda National Roads Authority (UNRA) intends to dual the northern Bypass. He added that it is mandatory for every developer to draw a scoping report as the first stage in production of an EIA study. He added that this report is produced in accordance with the environmental regulations of Uganda and the laws of Uganda as stipulated in Constitution and National Environmental Act, Cap.153. He introduced the Northern Bypass to people stretching from Busega the starting point up to Bweyogerere where the project ends.	LK
	LK asked the audience to give their views on the existing road considering the following; <ul style="list-style-type: none"> • Causes of the increased accident rate as reported by the Police. • Poor waste / garbage disposal • Poor drainage • Reasons why women do not use the flyovers and foot bridges • Why pedestrians choose to cross the road 	LK JN

	<ul style="list-style-type: none"> How the community has benefited from the Road, the good side of the Project. 	
3.0	<p>Reactions</p> <p>Cut to spoil</p> <p>BM asked about the cut to spoil issue and how the Consultant is intending to manage the soil that is likely to affect the residents and block the drainage channels.</p> <p>Lack of access roads</p> <p>The residents complained of lack of access roads that is affecting their transport.</p> <p>Compensation</p> <p>The residents were concerned about the demarcating land marks which were put near people's houses, if they will require additional compensation.</p> <p>They also wanted to know whether crops planted in the road reserve will be compensated.</p> <p>The resident urged that the heavy tracks used for road construction may lead to house cracking or breaking down and if it happens will they be compensated?</p> <p>Poor drainage</p> <p>The people were also concerned about the drainage issue and the flooding that is likely to affect them for instance in Bwaise.</p> <p>Lack of Street lighting</p> <p>Residents reported that there is need for street lighting since there has been lots of crime and theft on the road.</p> <p>It was reported that land titles by UNRA processing takes a lot of time.</p> <p>Valuation of Property</p> <p>Residents reported that property was undervalued by the project valuers during the last compensation and suggested that this should not be repeated.</p> <p>Compensation takes a lot of time The residents asked the Consultant that for that land that may need to be compensated this time. There should be reduced lead time.</p> <p>Lack of Walkways</p> <p>Residents told the meeting that Pedestrians considered in the new design by providing walkways.</p> <p>Blockage of Drainage channels</p> <p>It was also reported that Brick makers are pouring a lot of clay and soil besides the road and it is this soil that is blocks the drainage channels yet UNRA does not take action on them.</p> <p>The stagnant water on the Kisasi fly over and Kyebando round about was reported.</p> <p>Road construction</p> <p>Residents wanted to know when the road is expected to be built.</p>	Residents

	<p>Road barriers</p> <p>The residents asked the Consultant to advise UNRA to put strong road barriers for strong foundation.</p>	
4.0	<p>Suggestions</p> <p>The residents suggested that the street lighting design should not face the road users but rather the road and the holder should be made of concrete.</p> <p>Flyovers should be put in sensitive areas for instance next to Primary schools and other most crossed areas.</p> <p>Flyovers should be well built and the sides be built to a certain length to make it safe and comfortable for people to cross easily.</p> <p>The Kisasi – Bukoto bridge should have a fly over connecting to the Northern Bypass.</p> <p>Kyebando section should have a bus bays.</p> <p>Need for the green space should not be left out in the new design.</p> <p>UNRA should work hand in hand with the community in clearing or maintaining the road reserve.</p> <p>The water flow from Kisasi flyover to Kyebando round about should be revisited</p>	Residents
5.0	<p>Way forward</p> <p>LK told the meeting that drainage is to be revisited by UNRA</p> <p>He said that the issue of additional compensation is not yet resolved by UNRA but assured the community that consultations are going on.</p> <p>LK advised the attendees that the Bypass is meant to divert traffic and not to slow it down and suggested that, that could be the reason why the access roads are limited on the road.</p> <p>He added that a highway is meant to be a high speed road and does not contain many access roads.</p> <p>LK advised the residents that Contractors on the road are usually equipped with injurious compensation and therefore and damages made on the road should be compensated by the Contractor and if not all matters be reported to UNRA.</p>	LK

List of Attendees

No	Name	Zone	Contact
1	Eve Nantambi	Mukalazi	075 8 275669
2	Willex Sabiifi	Ssemwogerer C/M NRM	078 3 036529
3	Christopher Beyagala	Mukalazi, Chairman	077 2 566401

4	J.M Kibuuka	C/M L.C 11 Bukoto	077 2 311881
5	Joshua Birungi	Ssemwogerere	077 2 311881
6	Sarah Kato	Ssemwogerere	078 2 392887
7	Jenifer Kwetegyeka	Ssemwogerere	078 2 650450
8	Geofrey Kategere	Ssemwogerere	078 2 760692
9	Mohammed Okweda	Ssemwogerere	075 4 010076
10	Beatrice Muwangunzi	Mukalazi	079 2 198284
11	Esther Ngabirano	Ssemwogerere	077 3 079237
12	Betty Mutembesa	Ssemwogerere	077 6 507744
13	Martin Twesigye	Ssemwogerere	077 2 490722
14	Beatrice Ssemwogerere	Mukalazi Zone	079 2 198284
15	Philip Unegiy	Ssemwogerere	
16	Hellen Onen	Ssemwogerere	077 2 928284
17	Herman Ssenyonjo.M.	Mukalazi Zone	071 2 162117
18	Emily Asimwe	Ssemwogerere	077 2 480174
19	David Muwanga		077 2 039605
20	Stacy Mpamize		077 2 498577, 071 2 249857
21	Efuransi Ssebowa	Ssemwogerere	078 7 443180
22	Mato Kakeeto	Mulimira	075 2 301283
23	Bernad Mbabazi	Mukalazi	077 2 403898

Project Title	Kampala Northern Bypass	Division	HWY
Subject	Community Consultative Meeting to obtain scoping issues to study in detailed ESIA, especially in regard to concerns currently known associated with use and design of existing road	Project no.	259292
Location	Busega - Rubaga Division	Date of meeting	29/10/2010
Attendees		Time of meeting	5:15 – 07:00PM
1.	Hajji Muhammad Kimera	Chairman Busega	L.C.11,
2.	Lammeck (LK)	Kajubi Consultant Leader)	(Team
3.	Jacqueline Nasasira (JN)	Consultant	

Item	Text	Led by
1.0	<p>Introduction</p> <p>The Community consultative meeting started with opening remarks from Hajji Kimera the L.C 11 Chairman Busega. He welcomed the Consultants and the local people, he said that the attendees were residents of Busega and they represented all the different zones in the Division. After the attendees introduced themselves the Chairman asked the Consultant to take the floor.</p>	MK
	<p>In his opening remarks LK introduced the cause of the meeting and said that the Northern Bypass is yet to be dualled and therefore it is a prerequisite for every developer to carry out a full ESIA before a project is developed. He therefore said that the cause of the meeting was to know the views of the residents as far as the extension of Northern Bypass is concerned and use them to refine the Terms of Reference in the scoping report.</p> <p>LK added that it is the first meeting of its kind and that the following one will be giving a feed back to the community after the TORs have been drawn and submitted to UNRA.</p> <p>LK explained the current status of the Bypass to the community and how it is intended to be dualled. He went ahead and said that the existing demarcations do not require land take unless on rare circumstances where they encroached on peoples land.</p> <p>Other Issues of Concern were;</p> <ul style="list-style-type: none"> • Why has there been a lot of flooding? • Why is the Bypass associated with poor drainage? • Why is the Project associated with a lot of waste? • Lack of Road furniture, and • Issues of compensation 	LK

2.0	Issues raised / Reactions	
	<p>No consent Residents said that Consent was not done during the first time of the project design.</p> <p>Long lead time The residents said that compensation period took a lot of time last time.</p> <p>Undervaluation Residents told the meeting that the evaluations made last time had loopholes. The affected property were undervalued which affected the property value hence little money was compensated.</p> <p>Poor drainage Residents said that heavy run off caused by poor drainage has increased stagnant water on the bypass and this has hindered safe crossing and has caused a lot of flooding in the area.</p> <p>Street lighting Residents told the meeting that there is limited street lighting on the road which has increased theft and poor waste disposal due to the area being in darkness.</p> <p>Bus bays The Bus bays are limited on the road for instance one is at Busega - Masanafu and Namungona.</p>	Residents
	<p>Hatred People are fed up of the Bypass due to the early designs and paper work that took a lot of their time and takes a lot of time to be implemented</p>	
	<p>Access roads Lack of Access roads on the Bypass has affected the nearby people, i.e. pregnant women and the sick. It very far to access roads to the hospital yet the Bypass is near and can not help them.</p> <p>Motor cyclists and Bicycle riders Resident asked the Consultants to consider motor cyclists and bicycle riders in the designs who were left out.</p> <p>Walk ways They added that the pedestrians should also be considered by designing walkways for them.</p>	
	Development	

	The residents said that the Bypass has affected peoples business and the nearby residents have bee denied commercial development.	
	<p>Culverts</p> <p>The residents added that the culverts were not fixed well and this has hindered water flow which hence increased flooding.</p>	
	<p>Green space</p> <p>The residents urged the Consultant to design for the green space and that it should separated from the walkway to reduce risks of snake bites and the like.</p>	
3.0	<p>Suggestions</p> <p>Flyovers</p> <p>Flyovers should be put in areas most used by the residents for instance one should be put in Busega</p> <p>Flyovers should be well designed i.e.; in favour of all sex</p> <p>Flyovers should be strong and made of concrete.</p> <p>Road signs are lacking on the Road due to theft, new designs should be in form of concrete instead of metals, glass or plastic to avoid being stolen.</p>	
4.0	<p>Questions</p> <p>Land acquisition</p> <p>Residents were concerned whether compensation shall only be for registered land owners or even those with lease ownership.</p> <p>Residents wanted to know if crops currently planted on the acquired land will be compensated.</p>	
5.0	<p>Responses</p> <p>Compensation is intended for all land owners</p> <p>LK advised that annual crops will be harvested by the residents while perennials will not be compensated.</p>	LK
6.0	<p>Closure</p> <p>The Chairman closed the meeting at 7:00pm</p>	

List of Attendees

No.	Name	Zone	Contact
1	Richard Muwamba	Zone A	071 2 199028
2	Josephine Kato	Kibumbira Busega	077 9 685708
3	Ssebrya Godfrey	Kigwanya	077 4 165382
4	Justus Mukasa	Kigwanya	077 2 357094

5	Justus L Mukasa	Kigwanya	075 2 896826
6	Ahamada Haid Kinobe	Kibumbiro B	078 2 906866
7	Edirisa Kiwanuka	Kibumbiro B	078 2 617726
8	Hosea K. Kyateera	Kibumbiro B	078 2 172651
9	Hajji M. Kimera	Chairman L .C 11	077 2 450389

Appendix IV: Kampala Northern Bypass ESIA Terms of Reference

This section describes the Terms of Reference that resulted from the scoping report and form the basis for this ESIA. This assessment considers impacts during the planning, construction, operation and decommissioning phases of geographic scales: local, regional and national.

That is, people (e.g. residents of villages and settlements, land use and domestic animals etc), and natural resources (e.g. wetlands traversed). This was undertaken by comparing baseline conditions (i.e. the situation without the Scheme) with conditions that would prevail if the Scheme is to be implemented. Mitigation measures were designed, in order to avoid, reduce, mitigate, or compensate for the adverse Environmental and Social Management Plan (ESMP). Key stakeholders were consulted throughout the assessment. Key tasks of the assignment are outlined below:

Task 1: Technical Standard

The environmental design document/EIA was produced according to Guidelines for Environmental Impact Assessment in Uganda (NEMA).

Task 2: Document Review, Preliminary Consultations and Risk Assessment

During the ESIA, the Consultant reviewed the pre-feasibility study on environmental impact assessment and identified and studied all relevant manuals and design guides. Using preliminary meetings and consultations meetings the consultant gathered views of key stakeholders affected by the project to:

- generate good understanding of the project;
- understand local expectations throughout the life of a project;
- understand and characterise the potential environmental, socio – economic and health impacts of the project;
- develop effective mitigation measures and management plans;
- optimise local benefits that can be delivered through the project; and
- ensure affected communities participate in the formulation and refinement of the project design.

A Public Consultation and Disclosure Plan (PCDP) was developed early in the assessment process, outlining the objectives and timeframe for consultation.

Task 3: Noise, Air Quality, Visual Assessment

The Consultant visited the proposed route and conducted a noise, air quality and visual survey to better understand the area, and consulted communities and local authorities. Models were run to simulate noise generated for varying traffic volumes to enhance impact analysis. Assessments of the prevailing conditions along the route were observed inclusive of;

- applicability of design standards
- major issues e.g. risk of flooding, road safety, and road access

Task 4: Data Collection and Analysis

The consultant collected and analysed all necessary supportive data required to complete the environmental design service/ ESIA, and the data had to be;

- accurate
- updated from the time it was collected
- data from other sources will be collected, and
- relatively important to the design process

Task 5: Potential Borrow Pits and Quarries

Following the preliminary identification of borrow gravel pits and quarry locations the Consultant would consult with NEMA and other authorities in regard to possible locations and legal requirements, prepare detailed proposals and plans for their opening, operation and restoration. Such plans would cover but not limited to:

1. Precise location and boundaries of each pit/rock sources
2. Land ownership, including haul roads
3. Material quantities to be extracted and their location in the road works
4. Allowable pit working times
5. Provisional extraction phases
6. Site security and safety
7. Haul road location
8. Site security and safety
9. Provisional royalty payments and other compensation and legal agreements
10. Necessary planning consents; and
11. Public roads to be used for haulage purposes and their protection
 - Condition report
 - Upgrading and maintenance proposal
 - Limits on truck size and capacity
 - Noise and dust mitigation measures
 - Draft agreement with the relevant road authorities

The Consultant had to examine existing quarries and crushing plants and their capacity to supply aggregates and granular mixes to the required specifications. The Consultant had to consult NEMA and other authorities as soon as possible should there be need for the contractor to his own quarry or quarries.

Task 6: Roadside Furniture

The Consultant consulted roadside communities and local authorities about the importance of roadside furniture and how it would best be protected from vandalism.

Task 7: Legislative and Regulatory frameworks

The Consultant based their report on existing regulations, policies and administrative framework within which the assessment was carried out. These included national the NEMA guidelines and applicable regional or international agreements.

Task 8: Description of the proposed projects

The Consultant concisely described the project and it's geographic, ecological, social and temporal context, including any related facilities that may be required. Map's showing the project site and the project's area of influence will be developed. The project description included information on; construction activities, procurement plans and timescales, facilities and services, and operational and maintenance activities. This information was principally to be sourced from UNRA from reports and interviews with UNRA staff.

Task 9: Determination of the Potential Impacts of the Project

The Consultant predicted and assessed the project's likely positive and negative impacts, in quantitative terms to the extent possible. Mitigation measures were identified, as well as any outstanding negative impacts that could not be mitigated. Opportunities for enhancement were discovered. Cumulative impacts were assessed appropriately.

The study assessed positive and negative social impacts possible from the road works and detailed mitigation measures and project management strategies and actions to reduce or avoid threats to local ecological systems, wild life areas, water catchments and the social and cultural environment. The study impacts would include geology, biological resources, aesthetics, water quality and hydrology, land use and planning, population and housing, air quality and hydrology, land use planning, population and housing, air quality, noise, public service, utilities and service systems, energy, public health and safety (including STD transmission from construction workers), hazards and risks, recreation, economic activities, transportation and traffic, cultural resources. Positive as well as negative impacts were identified. The methodology used followed relevant national and international guidelines and legislation and the consultant will adequately consult NEMA, and relevant lead agencies, the public and other stakeholders to ensure that their concerns are clearly identified and fully addressed in the ESIA.

Task 10: Analysis of Alternatives

The Consultant provided an overview of reasonable alternatives to the proposed project site, technology, design and operation in terms of: financial feasibility; suitability under local conditions; potential environmental impacts and feasibility of mitigating these impacts. Justification for the preferred options was provided.

Task 11: Development of an Environmental and Social Management Plan (ESMP)

The Consultant developed an Environmental and Social Management Plan (ESMP) to ensure good project management and maintenance. The consultant developed a robust ESMP to be annexed to the ESIA report to outline the mitigation and management measures to be taken forward during project implementation, based on an analysis of local and national capacity to implement mitigation measures. Monitoring criteria was also outlined, along with timeframes and responsibilities.

Task 12: Presentation of Environmental and Social Impact Assessment

The Consultant undertook an ESIA with and proposed safeguard and mitigation measures to be carried out during design, construction and operation of the road widening in order to minimize any negative impacts and enhance positive impacts which the of the road may have on local people and the natural/physical environment. The final product was an ESIS that conforms to requirements of NEMA as stipulated in Uganda's EIA Guidelines.

Structure of the ESIA Report

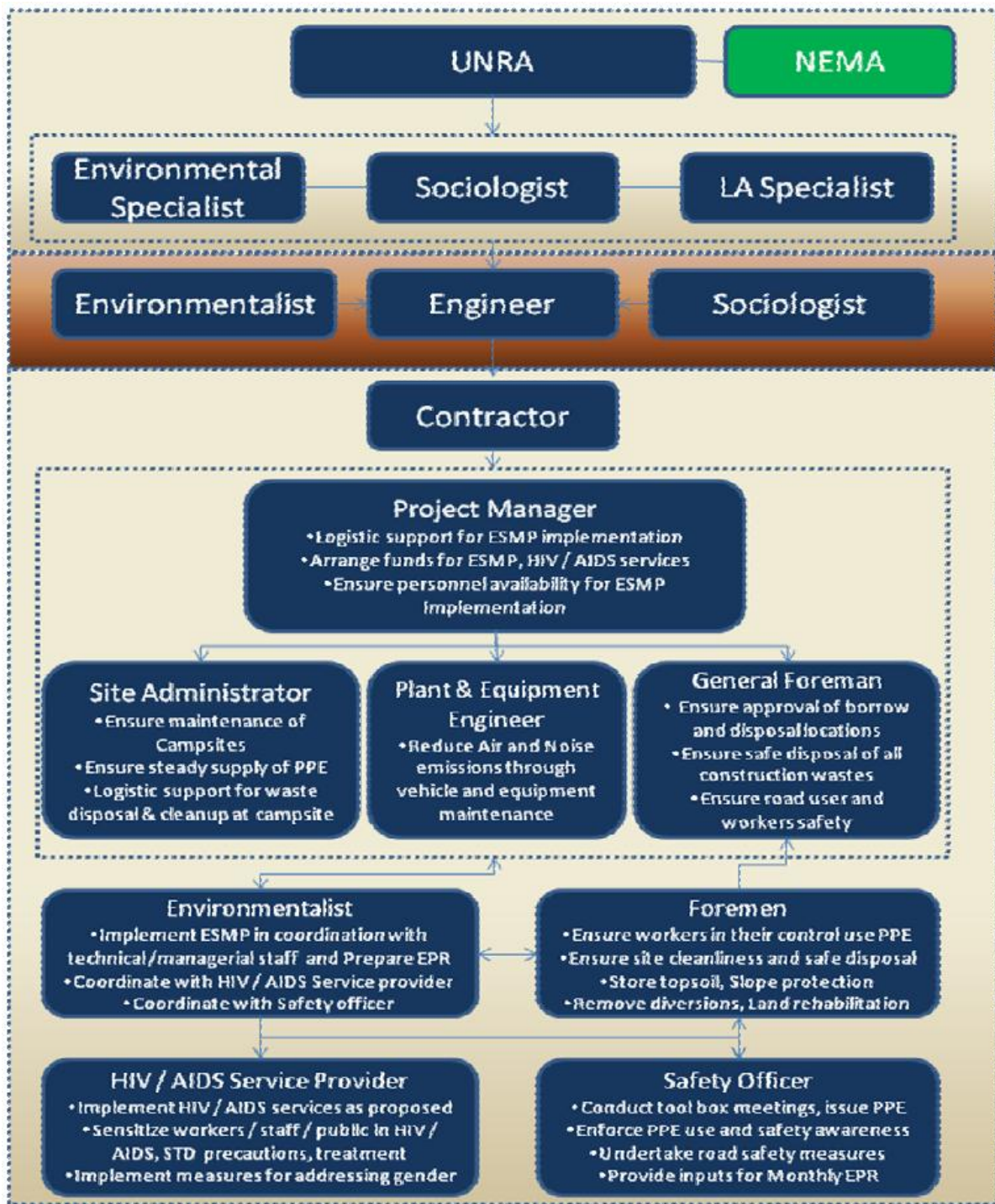
Table AIV.1 provides the structure for the main volume of the ESIA, with an explanatory note for each section provided. The content may change through the evolution of the project but is anticipated to accord broadly with the framework provided in Table A1.1.

Table A1.1 ESIA Report Structure

Contents Headings		Explanatory Note
NTS	Non-Technical Executive Summary	Providing a summary of the ESIA report in a non technical manner for the purposes of disclosure to the wider public.
1	Introduction	This chapter introduces the development and structure of the ESIA report.
2	Project Description	This chapter aims at providing a concise description of the project and its geographic, ecological, social and temporal context. It provides a site description, evolution of the scheme design, key components of the scheme, details of the construction process and operation and the changes in land use resulting from the scheme. Related third party facilities were also considered.
3	Analysis of Alternatives	The chapter compared reasonable alternatives to the proposed project site, technology, design and operation in terms of their potential environmental impacts; the feasibility of mitigating these impacts; their capital and recurrent costs; their suitability under local conditions; and their institutional, training, and monitoring requirements. It stated the basis for final design selection. A no-project scenario was also included.
4	Assessment methodology	The methods used to collect and quantify baseline conditions and applied throughout this ESIA in undertaking environmental and social surveys along the route alignment, and in determining the significance of environmental and social impacts.
5	Policy, Legal and Administrative Framework	This chapter discussed the policy, legal and institutional framework within which the ESIA was conducted. National regulations were discussed along with relevant international agreements and conventions to which Uganda is a party.
6	Baseline Data	This chapter summarises the available baseline data on physical, biological and socio-economic resources within the project area.
7	Scoping findings and record of stakeholder engagement	This chapter presented the plans and results for consultation as part of the Environmental Social Impact Assessment (ESIA). It sets out who the key stakeholders are and how they were identified as important participants.
8	Impacts Assessment and Mitigation Measures	This section summarised the predicted positive and negative impacts of the development, along with mitigation measures and any residual impacts that cannot be mitigated. Impacts and risks from associated facilities were considered, as well global, trans-boundary and cumulative impacts as appropriate. Modelling was done wherever applicable to provide a quantitative understanding of potential impacts.
9	Environmental and Social Management Plan (ESMP)	The ESMP draws together the possible mitigation measures; group them logically into components with common themes; define the specific actions required, and timetables for implementation; identify training needs, institutional roles and responsibilities for implementation; and estimate the costs of the measures.
ANNEXES		
	Terms of Reference (TOR)	This outlines for the Terms of Reference for the Study
	Consultation Disclosure Plan (CDP)	This Plan outlines the project's approach to consultation and disclosure. It listed the stakeholders to be consulted along with the methods and timescales for engagement.
	Bibliography	This contains a list for all references used during the ESIA process.

Appendix V: Terms of Reference for Contractor's Environmental Officer

1. **Preparation of a stand alone ESMP** linking environmental and social activities road works in line with guidance issued by UNRA.
2. **Monitoring** and ensuring compliance of all the Contractors workers to the requirements of the contract and this ESMP.
3. **Monitoring** and ensuring compliance to all Government of Uganda orders, rules, laws and regulations with respect to environmental and social matters.
4. **Day to day monitoring** of environmental matters – this will include wider environmental aspects including matters not directly concerned with the actual construction such as contractors camps, off-site temporary storage and temporary works areas.
5. **Working with the Contractors Health and Safety Officer** to manage community liaison issues and oversee the effective management of the project grievance mechanism as defined in Section 1800 of the special specification and the original ESIS.
6. **Working with the Contractors Health and Safety Officer** and the Clients nominated subcontractor to facilitate the successful delivery of the project HIV/AIDS programme as defined in Section 1800 of the special specification.
7. **Working closely with the Engineers Environmental Specialist** to ensure full compliance with all environmental and social aspects of this ESMP, the contract documents and any other Government of Uganda rules, regulations, orders or community requests as necessary and as required.
8. **Awareness raising and training of contractor staff** with respect to environmental issues; this will include notification of the severe penalties for non-compliance with instructions which may include dismissal.
9. **Preparation of a monthly environmental monitoring report** in a format that is to be agreed with the Supervising Engineer and the Supervising Engineers Environmental Specialist. This monthly report will be submitted to the Supervising Engineer for initial approval and will also require approval by the UNRA Environmental Specialist.
10. **Attend all monthly site meetings** and will report on their findings – problems, issues and corrective action taken – all of which will be included in the monthly report format.
11. **Any other matters or issues relating to environmental and social aspects** of the works as defined by the Supervising Engineer.
12. **Review ongoing construction plans** with regards to their potential for adverse impacts, particularly if work is being undertaken in environmentally sensitive areas. Full-time employee of the Contractor, the Environmentalist will be on site daily.
13. **Maintain a log of community complaints/ grievances related to cultural heritage** and corrective actions taken to address them.
14. **Plan environmental and social activities** to be implemented alongside road works.
15. **Ensure that planned activities are implemented, monitored and reported** to supervising engineering consultant.
16. **Ensure community concerns are addressed.**
17. **Prepare monthly reports to be submitted to UNRA indicating environmental activities that were undertaken.**



Source: UIIRA

Figure V-I: Sample institutional arrangement for EMP implementation.

Appendix VI: Terms of Reference for Consultant's Environmental Officer

- Work with UNRA's Safeguards Unit in supervising and guiding road construction contractor(s).
- Undertake scheduled site supervision to establish state of environmental compliance as documented or executed by the contractor's environmental officer.
- Any other specific duties are prescribed in terms of reference developed for the supervising consultant by UNRA.