MINISTRY OF LANDS, PUBLIC WORKS, HOUSING AND URBAN DEVELOPMENT

State Department for Housing and Urban Development

KENYA INFORMAL SETTLEMENT IMPROVEMENT PROJECT (KISIP 2)

CONSULTANCY SERVICES FOR ENGINEERING DESIGN REVIEW, REPACKAGING OF DETAILED ENGINEERING DESIGN AND PREPARATION OF PROCUREMENT DOCUMENTS: UPDATING OF RAP AND ESIA REPORTS; AND SUPERVISION OF THE PROPOSED INFRASTRUCTURES IMPROVEMENT WORKS IN SELECTED INFORMAL SETTLEMENTS IN THE COUNTIES OF NAIROBI AND NAKURU. (8 NO.

FINAL ESIA REPORT – KARAGITA (NAKURU COUNTY)

SUMMARY PROJECT REPORT

Tertiary Consulting Engineers Limited

In JV with

GA CONSULTANTS LTD

OCTOBER 2023

The Ministry of Lands, Public Works, Housing and Urban Development

REPUBLIC OF KENYA

CONSULTANCY SERVICES FOR ENGINEERING DESIGN REVIEW, REPACKAGING OF DETAILED ENGINEERING DESIGN AND PREPARATION OF PROCUREMENT DOCUMENTS: UPDATING OF RAP AND ESIA REPORTS; AND SUPERVISION OF THE PROPOSED INFRASTRUCTURES IMPROVEMENT WORKS IN SELECTED INFORMAL SETTLEMENTS IN THE COUNTIES OF NAIROBI AND NAKURU. (8 NO. SETTLEMENTS): CONTRACT NO. KE-MOTI-214833-CS-QCBS)

Final Environment and Social Impact Assessment (ESIA) Report: Nakuru County Informal Settlements (KARAGITA SETTLEMENT)

SUMMARY PROJECT REPORT

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LIST OF ABBREVIATIONS

AFD	Agence Française de Dévelopement
AIDS	Acquired Immunodeficiency Syndrome
ARAP	Abbreviated Resettlement Action Plan
CIDP	County Integrated Development Plan
CLO	Community Liaison Officer
CPCTs	County Project Coordinating Team
CPMC	Community Project Management Committee
CSOs	Civil Society Organization
dB	Decibels
DOSH	Directorate Of Occupational Safety And Health SERVICES.
EHS	Environment Health and Safety
EIA	Environmental Impact Assessment
EHS	Environment Health and Safety
EMCA	Environmental Management & Coordination Act
EMMP	Environmental Management and Monitoring Plan
EMP	Environmental Management Plan
ESIA	Environmental and Social Impact Assessment
ESMF	Environment and Social Management Framework
ESMMP	Environmental and Social Management and Monitoring Plan
GDP	Gross Domestic Product
HDPE	High-Density Polyethylene
HIV	Human Immunodeficiency Virus
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IFC	International Finance Corporation
ILO	International Labour Organization
KeNHA	Kenya National Highways Authority
KeRRA	Kenya Rural Roads Authority
KISIP	Kenya Informal Settlements Improvement Project
KURA	Kenya Urban Roads Authority
LPDP	Local Physical Development Plan
MLPWHUD	Ministry of Lands, Public Works, Housing and Urban Development
MOALF	Ministry of Agriculture, Livestock & Fisheries
MWS&I	Ministry of Water, Sanitation and Irrigation
NAIVAWASCO	Naivasha Water and Sanitation Company
NEAP	National Environmental Action Plan
NEMA	National Environment Management Authority
NEP	National Environment Policy

NGO	Non-Governmental Organization
NIP	Naivasha Industrial Park
OP	Operations Policy
OSHA	Occupational Health and Safety Act
PAP	Project Affected Person
PDP	Physical Development Plan
PPEs	Personal Protective Equipment
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
SDGs	Sustainable Development Goals
SEF	Stakeholder Engagement Framework
SGPs	Small Grants Program
SH	Social Health
SPSS	Statistical Package for the Social Sciences
STD	Sexually Transmitted Diseases
SUP	Social Upgrading Project
TORs	Terms of References
UN	United Nations
U-PCV	Unplasticized polyvinyl chloride
VMG	Vulnerable and Marginalized Groups
VMGF	Vulnerable and Marginalized Groups Framework
WB	World Bank
WIBA	Workplace Injuries and Benefits Act
WRA	Water Resources Authority
WSP	Water Service Provider

EXECUTIVE SUMMARY

E1: Introduction and project background

The Ministry of Lands, Public Works, Housing and Urban Development, Government of Kenya is implementing the Kenya Informal Settlements Improvement Project (KISIP) in two Counties of Nairobi City and Nakuru. In NaKuru County, Naivasha Sub-county, y, KISIP has proposed to build a 200mm pipeline from Police line to Karagita Tank a distance of 5.2 km and buid two de-fluoridation units reduce the amount of fluorides in water.

This consultancy service contract is being undertaken by a Joint Venture between TCE and G A Consultants Ltd. The contract is for the following activities; engineering design review, repackaging of detailed engineering designs, and preparation of procurement documents; updating of Resettlement Action Plan (RAP) and Environmental and Social Impact Assessment (ESIA) reports; and supervision of the proposed infrastructures improvement works in Karagita informal settlements in Naivasha Town, Nakuru County. The contract is under the KISIP Phase II framework, funded by credit from the World Bank though International Development Association (IDA), French Agency for Development (AFD) and through the Government of the Republic of Kenya(GoK) at the County Level. .

The overall objective of the consultancy contract is to ensure that the proposed infrastructure improvement works in Karagita Settlement are implemented to the required specification with the aim of improving the living condition of the inhabitants, who are the direct beneficiaries. Specifically, the study will review all engineering designs for the above items, prepare the Environmental and Social Impact Assessment (ESIA), Resettlement Action Plan (RAP), repackage tender documents as per stakeholder agreements within the budgets, advise client on value for money (feasibility) for each works item and prepare design review reports.

In the site validation surveys (site case analysis) the study team through discipline-based coordination conducted confirmatory studies to evaluate the design report contents. This was done for the entire investment menu. The socio- economic studies, feasibility studies, and the conceptual designs have been completed under the same consultancy. This Report therefore presents findings of Environmental and Social Assessment undertaken for the Proposed Projects, the report presents potential environment and social risks that are likely to be triggered by the Project, appropriate mitigation measures have also been provided in this assessment.

E 2: Scope of ESIA

This Environmental and Social Impact Assessment (ESIA) report has been prepared for the proposed infrastructure upgrading of Karagita informal settlement in Nakuru County. It gives an overview of the project, details of the project components, detailed description of the project area, possible impacts of the project as well as recommending mitigation measures for the identified negative impacts. This Environmental & Social Impact Assessment (ESIA) is expected to achieve the following objectives;

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

The ESIA study was carried out based on desk review, field assessments and consultations with relevant County and National Government institutions. The exercise began with a scoping process that involved identification of significant environmental and social issues associated with the proposed Works. ESIA Scoping was achieved through reviews of the secondary Documents and available data supported with field evaluations. The scoping the assessment enabled the team to determine the Project potential risks to Biophysical, Social, Health and Safety of the receptor environment around the proposed Project site. This was followed by a thorough review of the available literature. This involved review of project documents, architectural drawings, site layouts, past ESIAs, relevant policy, legal and institutional frameworks. Documents containing climatic, demographic, and hydrological data on Nakuru County with details to specific settlement were also reviewed in order to gain deeper understanding of the project area.

The physical evaluation of the Project area was carried out within the month of January 2023 with specific focus on the environmental and social issues; in particular, the potential environmental and social impacts of the project. The field assessment involved, Household survey, focused group discussions, observation and key informant interview. As detailed in the report, a range of stakeholders were consulted during the assessment of the potential environmental and social impacts of the project. Stakeholder consultations were very vital in deciding project component for the informal settlement.

In addition, a range of policies that guides the environmental and social assessments in the country were reviewed. The policies reviewed include; the Kenya Vision 2030, Constitution of Kenya, National environmental policy and many other policies for specific environmental and social attributes.

E3: Project Description

The proposed project in Karagita informal settlement in Naivasha town is as summarized in the table below;

Table 0-1 Summary of proposed projects in Karagita settlement

Settlement	Scope of Works	Area
Karagita Settlement		4100 square meters
	Component 1: Ø200mm HDPE pipe, 7800 m long water supply pipeline Component 2: Building of 2 De-Fluoridation buildings of capacity 37m3/hr and 27M3/hr	

E4: Project Categorization;

According to Environmental Impact Assessment and Audit (Amendment) regulations 2019, EMCA (amended 2019) Second Schedule, Legal notice number 31, it presents three-risk category i.e. (Low, Medium and High) on various project under implementation. Based on the schedule; the project lies under Medium Risk Project that requires Summary Project Report in form of ESIA.

E5: Project Cost;

In total the Karagita Settlement project will cost a total of Ksh 125,261,354.16 (Kenyan shillings One Hundred and Twenty Five Million, Two Hundred and Sixty One Thousands, Three Hundred and Fifty Four Shillings and Sixteen Cents). The Tables 0-2 bellow shows the bills in summary.

Table 0-2 Summary of proposed projects cost in Karagita settlement

Settlement	Bill 1	Water Supply Works	Dayworks	Bill 28 (E&S)	10% Contigency	Total Inc. 16% VAT
Karagita	13,915,855.45	80,609,105.00	87,245.00	3,555,000.00	9,816,720.55	125,261,354.16
Percentage Share	11.1%	64.4%	0.1%	2.8%	7.8%	100.0%

E 6: Amount to Pay to NEMA

The law requires the proponent to pay 0.1% of the project cost as NEMA license processing fee. In this aspect, Ksh 125,261.35 (Kenyan shillings One Hundred and Twenty Five Thousands, Two Hundred and Sixty One Shillings and Thirty Five Cents only) shall be paid to NEMA by the proponent for NEMA Licensing process.

E 7: Analysis of Alternatives

The Alternatives for pipes to be utilized for the project was carried out and High Density Polyvinyl Chloride pipes were chosen due to their local applicability and ease of use over pipes of steel. Source of power was evaluated over the solar and grid power of which solar was dropped due to vandalism in the area. Then the YES project and the NO project alternative was evaluated and it was the yes project alternative that was chosen to deliver the adequate water to Karagita Settlement.

E8: Baseline information of the settlement

Detailed description of the baseline information of Karagita settlement; biological, physical environment and the results of a socioeconomic survey undertaken in the area indicates that; casual employment, formal employment and business are the main income generating activities for the residents. The settlement has relatively higher education levels as over 50% of household heads having attained secondary education and above. Being an informal settlement, majority of residents do not own the land where they stay. The settlement is characterized with low quality houses close to each other. Sanitation, water scarcity, poor accessibility as a result of poor roods and insecurity due to lack of street lighting are some of the main challenges faced by the settlement.

E9: Policy, Legal and Institutional Framework

This chapter looks at the laws, policies, rules and regulations, guidelines as well as the institutional setup for environmental and social impact assessment. The chapter presents all the Kenyan context policies and institutional framework, International policies on social and environmental protection as well as the world Bank's safeguards policies.

Among others, the key policies and laws reviewed under this study includes; the constitution of Kenya 2010, Kenya's vision 2030, Kenya environmental sanitation and hygiene policy (2016-2030), Environmental Management and coordination Act (1999 reviewed in 2015), The occupational safety and Health act 2007. Under the World Bank Environmental and Social Safeguards, the policies reviewed include; OP/BP 4.01 (Environmental Assessment) and OP/BP 4.12 (Involuntary Resettlement). Key institutions include; the County Government of Nakuru, NEMA, MLPWHUD, NAIVAWASCO, WRA and KURA.

E10: Stakeholder Engagement and Public Consultation

The assessment involved consultations with relevant stakeholders in the target settlement within Nakuru County. The aim of stakeholder consultations was to give a platform for information sharing and opinion gathering in relation to the proposed Project. Consultations were done in form of public meetings and key informant interviews. The issues were than analyzed and presented to design team for finalization of Project designs and planning on how best to implement the Project.

Key among the stakeholders consulted include; the ministry of water, county government of Nakuru, interest groups in the area, local administrators as well as the community with the informal settlement.

Table 0-3 Summary of consultations in Karagita settlement

NO	ISSUE	RESPONSE
1	Remaining allocated Funds after completion of KISIP 2.	The team informed residents that the objective of world bank was to improve the quality of life in the settlement and if such objectives have been met then only the remaining needs can be addressed. Thus, the remaining funds, if any, would be discussed by the financier and implementing agency for KISIP for proper relocation.
2	Details of design review and	The consultant was to focus on the scope that remained from KISIP I for the works that remained incomplete from the previous

NO	ISSUE	RESPONSE
	incorporation of link roads.	priorities and hence no new priority would be introduced in the design.
3	Clarity on remaining priorities detailed in KISIP 2.	✓ Members of Karagita were informed that one water pipeline would be done.
4	Labour and Workforce from the Settlements	EIA team informed residents that during construction the contractor will source some responsible youth from the area as casuals to supplement his permanent staff. Residents with relevant skills and training can also present their certificates through the SEC to be considered for employment opportunities if need arises
6	Clarity on remaining priorities in the settlements that aren't incorporated in the design.	The team informed residents that KISIP is continuous and the remaining needs would still be considered in subsequent KISIP phases. It was stressed that the objective at the time was to finish the remaining works from KISIP I first.
7	Possibility of a meeting with KISIP Head Office to discuss reallocation of funds.	The team informed residents that as far as public participation was concerned, the team that was on the ground from the consultant was sufficient to collect and report the views of the community regarding the project and that every concern would be raised and reported for action.
8	Affected properties	The team informed the residents that the project will be on road reserves and no property shall be affected. In case of of any possible impact, an abbreviated Resettlement Action plan shall be developed to facilitate the affected.

E11: Environmental and Social Impacts Assessment and Mitigation Measures

E11-1: Summary of Project Benefits

The Project has an overall positive impact on the informal settlements as it will improve the living conditions of people living and working in the informal settlements, through improving accessibility, drainage, waste, and security.

- Creation of employment to people living within the informal settlements through improved access.
- Improved living standard of people within the settlement through improved road infrastructure
- Providing a linkage of the settlement to other parts of the city.
- Provides alternative route to access the settlement, could be used during disaster times example by ambulances and fire engines.
- Enhanced access to social amenities like schools and health facilities within he settlement.
- Improved road side drainage hence reduced risks of flooding.
- The Project will improve the living standard and well-being of the local economy through provision of road and street lighting within the settlements.
- The sewerage Project will lead to improved status of drainage system within the settlement, this will reduce incidences of flooding and stagnant water normally experienced during rain seasons.
- Reduced Water and Sanitation Burden to Women
- The water projects will lead to Improved Accessibility to Clean and Reliable Water Supply
- Water and sewerage will Improve Hygiene and Sanitation in the Project Areas
- Reduced Cases of Water Related Diseases
- Reduced Pollution of drainage channels within the project areas by Raw Sewerage.
- Increased Land Values in the Project Area
- The flood lights will lead to Improved Security within the settlement due to provision of floods within the settlement.
- Improving the roads and street lighting infrastructure within the settlement will result to development of associate social services for example health facilities, learning institutions and recreational centre's which will eventually benefit the community.

E11-2: Summary of Negative Impacts

The Project does not have significant and potentially irreversible negative impacts on the environment and people. The few identified negative impacts associated with construction Projects can easily be mitigated, and an Environmental and Social Impact Management Plan has been prepared as part of this report, whose implementation will be monitored to ensure compliance and protection of the environment. A monitoring plan to ensure this happens has also been developed.

Table 0-4: Summary of Impacts and their mitigation.

Impacts	Proposed Mitigation Measures
Destruction of Vegetation in the Project Areas	• Site Clearance and Construction activities will be limited to available reserves within the settlements, Projects will be implemented within existing reserves and wayleaves minimize destruction to vegetation cover • Reinstatement of the project sites to their original state to be carried out once construction works are completed to allow growth of vegetation. • Replant eco-friendly grass and trees along the projects after completion of the civil works. We recommend that fruit trees be planted in the public facilities such as schools, health centres and in the vicinity in collaboration with Nakuru County Government (NCG) approved Community Based Organizations (CBOs).
Contamination of Surface Water Sources by Effluents from Construction Plant and Equipment	• Ensure Construction Equipment is well maintained and serviced according to manufacturers' specifications to prevent oil leaks. • Cleaning / repair of Construction Plant and Equipment to be carried out at designated yards • Contractor to have designated storage areas for oils, fuels etc. that is protected from rain water and away from nearby surface water courses
Soil Erosion resulting to loss of top soil	• The risk of Soil Erosion will be lowered through provision of soil Erosion prevention structures i.e. gabions in areas susceptible to Soil Erosion especially at the Banks where the topography slopes if any.
Solid Wastes Generation from Construction Activities	• Construction wastes (residual earth, debris and scrap materials) to be collected at designated points and Contractor to dispose to designated Solid Waste Dumping Sites approved by the Nakuru County Government • Contractor's Camps and Construction Sites to have designated waste collection points, • Environmental Management, Health and Safety Training Programmes to be conducted for Contractor's Staff to create awareness on proper solid wastes management

Impacts	Proposed Mitigation Measures
Noise and Excessive Vibrations.	• Contractor will comply with provisions of EMCA 2015 (Noise and Excessive Vibrations Regulations of 2009) • The Contractor will keep noise level within acceptable limits (60 Decibels during the day and 35 Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas • Hospitals and other noise sensitive areas such as schools shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity
Air Pollution and Dust Generation.	• The contractor will comply to the provisions of EMCA 2015 (Air Quality Regulations 2014) • Workers shall be trained on management of air pollution from vehicles and machinery. All construction machinery shall be maintained and serviced in accordance with the contractor's specifications • Water sprays shall be used on all earthworks areas within 200 metres of human settlement especially during the dry season.
Risk of Accidents at Work Sites	• Contractor to provide a Healthy and Safety Plan prior to the commencement of works to be approved by the Supervising Engineer. • Provide Personal Protective Equipment including gloves, gum boots, overalls and helmets to workers. Use of PPE to be enforced by the Supervising Engineer. • Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles • Proper anchoring of sides to prevent collapse • Safety tapes to protect excavated areas • Excavated areas to be backfilled immediately through working on small sections.
Risk of Traffic Accidents along the Pipeline Route	• Strict use of warning signage and tapes where the trenches are open and at other active construction sites • Contractor to Employ and train Road Safety Marshalls who will be responsible for management of traffic on site • Contractor to provide a Traffic Management Plan during construction to be approved by the Supervising Engineer
Loss of Temporal Assets and Sources of Livelihood	• Prepare a detailed Resettlement Action Plan (RAP) report which documents the nature and magnitude of project impact to people's assets and sources of livelihood, the report should also propose adequate compensation and livelihood restoration measures to affected Project Persons.

Impacts	Proposed Mitigation Measures
Disruption of Public Utilities	• Contractor to carry out piloting to locate services such as pipes and cables along the Pipeline Route before commencing excavation works. • The relevant Services Providers and Agencies to be notified prior to commencement of Works so that any relocation works can be carried out before the Pipeline Construction Works begin. • Length of excavation to be restricted to sections that can be reinstated within the shortest period possible to minimize time of disruption of services
Increased Transmission of HIV / AIDS	• HIV / AIDS Awareness Program to be instituted and implemented as part of the Contractor's Health and Safety Management Plan to be enforced by the Supervising. This will involve periodic HIV / AIDS Awareness Workshops for Contractor's Staff • Access to Contractor's Workforce Camps by outsiders to be controlled • Contractor to provide standard quality condoms to personnel on site and within public places in the project sites.
Labour Influx and sexual offences	• Effective community engagement and strong grievance mechanisms on matters related to labour. • Effective contractual obligations for the contractor to adhere to the mitigation of risks against labour influx • Proper records of labour force on site while avoiding child and forced labour • Fair treatment, non-discrimination, and equal opportunity of workers. • Comply to provisions of WIBA 2007 and IFC PS 2 on labour and Working Conditions, and ILO Conventions 87, 98, 29,105,138,182,100,111 • Develop and implement a children Protection Strategy
Human Rights and gender inclusivity	• Mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2 / 3 gender rule. • Protecting Human Risk areas Associated with, Disadvantaged Groups, Interfering with Participation Rights, and interfering with Labour Rights
Increased Crime and Insecurity	• Contractor and Supervision Team to liaise regularly with the Local Administration and Police Service to address any security and crime arising during project implementation. • Contractor to provide 24 hours security to Workforce Camps, Yards, Stores and to the Supervising Team's Offices

Impacts	Proposed Mitigation Measures
Local Employment	• Prioritize hire of locals for all unskilled labour. • Implement a local recruitment plan that is fair and transparent (including recruitment processes that ensure inclusivity of both men and women, vulnerable individuals, minority clans, ethnic groups etc. • Adhere to labour laws, and labour management practices (timely renumeration, equitable compensation for both genders for equal work etc.) • Create awareness to workers and the community on worker and project grievance redress mechanisms.
Local Sourcing	• Source materials from local businesses / communities. • As applicable, give opportunities to businesses owned or operated by vulnerable individuals.
Inadequate stakeholder Engagement	• Share project information widely and in a timely manner through diverse, feasible and accessible channels of communication e.g., public forums.
Exclusion of Gender, disadvantaged and vulnerable groups	• Introduce measures for affirmative action that would ensure especially persons with disability, the elderly and women have access to job opportunities. • Undertake recruitment transparently, while ensuring the inclusion of disadvantaged groups. • Develop and implementation of a stakeholder engagement plan. • Engage stakeholders throughout the project phase as guided by the approved stakeholder engagement plan
Child Exploitation and Abuse	• Develop and implement a plan to manage the risk of SEA / SH. • Map the GBV referral pathways and create awareness among women and men on the risk of SEA / SH. • Ensure the GRM is SEA / SH-responsive. • Ensure all those with physical presence on site sign and understand the Code of Conduct. • Put in place measures for monitoring GBV / sexual harassment.
Gender-Based Violence Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)	• Develop and implement a plan to manage the risk of SEA / SH. • Map the GBV referral pathways and create awareness among women and men on the risk of SEA / SH. • Ensure the GRM is SEA / SH-responsive. • Ensure all those with physical presence on site sign and understand the Code of Conduct. • Put in place measures for monitoring GBV / sexual harassment.

Impacts	Proposed Mitigation Measures
Ineffective Grievance Management	• Constitute a Local Grievances Committee in consultation with all community segments and incorporate the existing local dispute resolution mechanisms. • Implement a workers grievances mechanism. • Create awareness on the culturally appropriate and accessible GRM to all community segments including vulnerable individuals and households and CSOs . • Log, date, process, resolve, and close-out all reported grievances in a timely manner. • Ensure proportionate representation of disadvantaged persons in the local grievances committee. • Enable the GRM to provide for confidential reporting of particularly sensitive social aspects such as GBV, as well as anonymity.

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

Table 0-5: Summary of RAP for Karagita Settlement.

No	PAP Category	Settlements Karagita
1	Structure owners	18
2	Tenants	2
3	Number of female PAPs	10
4	Number of male PAPs	10
5	Vulnerable persons	0
	Total	20
Settlement	PAPs	Implementation Budget (Kshs)
Karagita	20	566,600.00
Structures affected are timber / wood vendor kiosks		

Conclusion

The proposed project will provide the much-needed service infrastructure aligned to the Kenyan development agenda. The activities for the proposed projects are not likely to interfere with the existence of the neighborhood significantly. The project has been planned in full cognizance of

the requirements of the neighborhood where it is to be implemented and all standard planning considerations have been considered and given the attention they deserve. The mechanisms to ensure that the environmental and human effects are maintained to acceptable levels have been outlined in the EMMP and the time period and cost to carry out these provided for. It is thus our consideration that the project be allowed to go ahead with the implementation; provided the outlined mitigation measures are adhered to.

i) The Project has an overall positive impact on the informal settlements as it will improve the living conditions of people living and working in the informal settlements, through improving accessibility, drainage, waste, and security.
ii) The Project does not have significant and potentially irreversible negative impacts on the environment and people. The few identified negative impacts associated with construction Projects can easily be mitigated, and an Environmental and Social Impact Management Plan has been prepared as part of this report, whose implementation will be monitored to ensure compliance and protection of the environment. A monitoring plan to ensure this happens has also been developed.
iii) The Project will not lead to displacement of people as the roads are designed to follow the designated road reserves on the physical development plans (PDPs). However, there are encroachments on the road reserves mostly of temporal structures for informal traders. A RAP has been prepared to mitigate against this to ensure that their livelihoods are not negatively impacted upon.
iv) The EMP should be fully implemented and should form part of the contract with the selected contractors who will undertake the works. The implementation of the EMP should be monitored in accordance with the monitoring plan in this report. The Resident engineer should supervise and report on the implementation regularly as provided.
v) The RAP will be fully implemented before the commencement of the Project civil works
vi) Construction activities should commence only when NEMA issues an approval / license.
vii) Adhere to all the recommendations in the EIA license and Environmental Management and Monitoring Plan during all the project phases.
viii) Obtain all necessary trade permits from the Nairobi County Government during construction.

CHAPTER 1. INTRODUCTION

1.1. Background Information

The Kenya Informal Settlements Improvement Project (KISIP II) is five-year project with the objective improving living conditions of residents in Kenya's urban informal settlements. The Project Development Objective (PDO) is 'to improve living conditions of people living in informal settlements in selected Counties in Kenya.' The Project goals are consistent with Kenya's Vision 2030 goal of 'a well housed population living in an environmentally secure urban environment'. The Project is jointly financed by the World Bank though International Development Association (IDA), French Agency for Development (AFD) through the Government of the Republic of Kenya(GoK) at the County Level. The Ministry of Lands, Public Works, Housing and Urban Development (MLPWHUD) of Government of Kenya is the implementing arm of the Government. The Project's specific interventions include enhancing tenure security, settlement level planning, infrastructure services provision, and planning for future urban growth to prevent the growth of informal settlements.

KISIP I became effective from 2011 and November 2019 was implemented in selected towns across 14 counties in Kenya. Among the municipalities targeted included Nairobi, Mombasa, Kisumu, Eldoret, Naivasha, Machakos, Malindi-Kilifi, Kakamega, Nyeri, Thika, Kericho, Kitui, Garissa and Embu.

In order to consolidate the gains made under KISIP I and enhance the benefits of the project to more people in informal settlements, the second phase of the KISIP programs, dubbed KISIP II was initiated by the Government of Kenya in conjunction with the World Bank. KISIP II has been structured to build on the successes and lessons learnt from KISIP I, and introduce new interventions to deepen its overall impact. It aims to support the interventions that have been successful under KISIP I, namely: tenure regularisation, infrastructure upgrading, and institutional strengthening. Unlike KISIP I, however, the new project also aims to include new approaches and new activities to strengthen its impact on the participating communities.

KISIP II is open to all Counties participation, based on select criterion. Among its opening activities include the implementation of the upgrading plans for 39 settlements in six counties

(Nairobi, Kilifi, Kakamega, Kisumu, Nakuru, Mombasa) which had detailed designs and bidding documents prepared under the KISIP I umbrella.

The contract, "Consultancy services for engineering design review, repackaging of detailed engineering designs, and preparation of procurement documents; updating of RAP and ESIA reports; and supervision of the proposed infrastructures improvement works in selected informal settlements in the counties of Nairobi and Nakuru" therefore targets to review and supervise implementation of infrastructure improvement select settlements in Nairobi and Nakuru Counties that were designed in the KISIP I program.

The project has the following four components:

- Component 1: Integrated settlement Planning (Tenure regularization, planning for infrastructure upgrading and socio-economic inclusion activities): This is pursued as a first step in preparing settlements to be ready for infrastructure upgrading. Three main interventions under this component will include: planning for tenure regularization; planning for infrastructure upgrading; and social / economic inclusion planning. Settlements will benefit from one, two or all three interventions depending on the initial condition of the settlement. And while the first 2 main interventions are carry-ons from KISIP I, KISIP II interventions also seek to improve the lives of residents through interventions towards social and economic inclusion.
- Component 2: Infrastructure Upgrading focuses on investment in settlement level infrastructure, and, where necessary, extension of trunk infrastructure to settlements.
- Component 3: Institutionalizing slum upgrading: KISIP II will support institutional and policy development at national and county levels. This will include the operationalization of the National Slum Upgrading and Prevention Policy and Strategy, supporting the development of county specific slum upgrading and prevention policies, strategies to plan for urban growth, prevent crime and violence and to ensure adoptive planning in informal settlements, social protection strategies.
- Component 4: Project Management and Capacity Building: KISIP 2 will support technical assistance, training, workshops and learning events, experience sharing and peer-learning activities with other counties, and other capacity building activities aimed at enhancing the ability of national, county, and community teams to exercise

their roles and responsibilities. Fiduciary and contract management capacity building/support will also be provided.

To ensure that environmental and social issues are adequately identified and addressed in all its project interventions, an Environment and Social Management Framework (ESMF), Resettlement Policy Framework (RPF), Stakeholder Engagement Framework (SEF) and Vulnerable and Marginalized Groups Framework (VMGF) were prepared. They were approved and disclosed at the Ministry and WB websites prior to the commencement of the project and formed part of the financing agreement. The ESMF provided guidance on the identification, integration, and management of environmental issues throughout the project design cycle; while the RPF provided guidance on mitigating the likely impacts associated with land acquisition and displacement.

This ESIA has been prepared for the proposed infrastructure upgrading of Karagita informal settlement in Naivasha town as a deliverable under Component 3 of Investing in settlement restructuring and infrastructure.

Documents

The Bank performed well in project identification, preparation, and appraisal of KISIP. At the time of presentation to the Board, the relevant tools and documents had been prepared such as Project Appraisal document (PAD), Resettlement Policy Framework (RPF), Environmental and Social Management Framework (ESMF), and Project Operations Manual (POM) to guide the project kick off.

The ESMF is intended to serve as a practical tool to guide identification and mitigation of potential environmental and social impacts of proposed investments and as a platform for consultations with stakeholders and potential project beneficiaries. The ESMF identifies the policy triggers for the project, the screening criteria of sub-projects, the likely environmental and social impacts of the sub-projects and the mitigation measures to mitigate the identified risks, assessment of the institutional capacity and measures for capacity-filling gaps.

1.2. Objectives of the EIA study

This ESIA assessment has been conducted in compliance with the Environmental Impact

Assessment Regulation as outlined under the Gazette Notice No. 56 of 2003 of the Environmental Management and Coordination Act (EMCA 1999) amended 2015 well as the World Bank OP 4.01 on Environmental Assessment. The Environmental & Social Impact Assessment (ESIA) is expected to achieve the following objectives discussed in box 1-1 below

Box 1-1: EIA Objectives

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

Under this Comprehensive Project Report (CPR), the ESIA was prepared considering the Medium-Risk Category. Special issue, Kenya gazette supplement No. 62, Legislative supplement No. 16, Legal notice No 31, The Environmental Management Coordination Act (EMCA), no 8 of 1999 has been referred to. It places this project in Medium-Risk Category where the issue characterizes transportation, urban development and water resources developments under medium risk category. The linkages between Environmental and Social Impact Assessment (ESIA) types, risk categories, and informal settlement projects are significant and play a crucial role in determining how this project will be planned, executed, and managed. For Medium-Risk Projects where Karagita Informal settlement falls into, this category has moderate environmental and social risks. This thus underwent an ESIA process to identify and address potential issues.

1.3. ESIA Assessment Methodology

The ESIA study was carried out based on desk review, field assessments and consultations with relevant County and National Government institutions as summarized below;

1.3.1. Environment and Social Scoping

The scoping process involved identification of significant environmental and social issues associated with the proposed Works. ESIA Scoping was achieved through reviews of the secondary Documents and available data supported with field evaluations and expertise on scoping.

The process enabled the assessment team determine the Project potential risks to Biophysical, Social, Health and Safety of the receptor environment around the proposed Project site. The impacts were determined to less significant and also the geographic scope of the impact was also determined to be less expansive, details of the impacts are discussed in chapter 7 and 8 of this report.

1.3.2. Desk Reviews

A desktop review was conducted prior to site visit. Documents were reviewed to obtain information on the baseline information in general. This involved review of project documents, architectural drawings, site layouts, past ESIAs, relevant policy, legal and institutional frameworks. Documents containing climatic, demographic, and hydrological data on Nakuru County with details to specific to Karagita settlement were used to understand the project.

1.3.3. Field Assessment

The physical evaluation of the Project area was carried out within the month of January 2023 with specific focus on the environmental and social issues. The environmental issues assessed include,

(i) Biophysical environment (air, water, land)
(ii) Human health and safety
(iii) Traffic Management on Site

(iv) Social issues, including;

- ✓ Labour Influx Management,
- ✓ HIV and other Communicable Diseases Management.
- ✓ Gender and Youth Inclusivity and Empowerment,
- ✓ Human Right Protection and Grievance Redress Mechanism:

1.3.4. Stakeholder Consultations

Public and stakeholder consultation is required under the Amended Environmental Management and Coordination Act (EMCA 1999) amended 2015 as well as the Environmental Impact Assessment and Audit Regulations (2003). Public and stakeholder consultation is useful for gathering environmental and socio-economic information, understanding likely impacts, determining community as well as individual preferences. Through this process, stakeholders have an opportunity to contribute to the overall project design by making recommendations and raising concerns. In addition, the process creates a sense of responsibility, commitment and local ownership for smooth implementation of the project.

Effective public participation requires the availability of adequate information in public inputs. The latter involves various values, critiques, questions, information, suggestions and other inputs, which are expressed by individuals, groups or organizations among the general public in an attempt to influence decision-making. Public consultations with Interested and Affected Parties (IAPs) were done in order to:

- inform the local people, leaders and other stakeholders about the proposed project and its objectives;
- initiate public involvement processes, in a bid to induce and cultivate a sense of peoples' belongingness to the project;
- suggest and facilitate the peoples' roles in the project's sustainability, in terms of management, maintenance and productivity;
- Seek views, concerns and opinions of people in the area concerning the project.
- Establish if the local people foresee any positive or negative environmental effects from the project and if so, how they would wish the perceived impacts to be addressed;

- Find out if there are issues or places of cultural / or religious importance to the local communities that could be negatively impacted upon by the project and its infrastructure.

Public Participation Methodology

Public participation was mainly achieved through direct interviews, observations, questionnaire administration, focused group discussions and key informant interviews. The ESIA team began the public consultation process by holding preparatory meetings to strategize on how to engage the stakeholders in the ESIA process. This was done in consultation with the County officials, the County Administration including chiefs, who helped in the process of identification of the significant stakeholders who could provide data relevant to the proposed project. The following is a detailed discussion of public consultation methodology used by the ESIA team.

Key Informant Interviews

Issues of concern regarding the projects often revolve about matters such as pollution, biodiversity loss, community safety, communicable diseases and employment and trade opportunities. Efforts were made to contact all with the information on the following issues;

- ✓ Assessment of the baseline environmental and social conditions.
- ✓ Consideration of feasible and environmentally & socially preferable alternatives.
- ✓ Requirements under Kenya country laws and regulations, and World Bank Guidelines.
- ✓ Protection of human rights and community health, safety and security (including risks, impacts and management of project's use of security personnel).
- ✓ Protection and conservation of biodiversity.
- ✓ Sustainable management and use of renewable natural resources (including sustainable resource management through appropriate independent certification systems).
- ✓ Use and management of dangerous substances and major hazards assessment.
- ✓ Labour issues (including the four core labour standards), and occupational health and safety.
- ✓ Socio-economic impacts & fire prevention and life safety.
- ✓ Impacts on affected communities, and disadvantaged or vulnerable groups.

- ✓ Cumulative impacts of existing projects, the proposed project, and anticipated future projects.
- ✓ Consultation and participation of affected parties in the design, review and implementation of the project.
- ✓ Efficient production, delivery and use of energy.
- ✓ Pollution prevention and waste minimization, pollution controls (liquid effluents and air emissions) and solid and chemical waste management.

Details of stakeholder consultations are presented in Chapter 6 of this Report and evidence of minutes and attendance list annexed.

1.3.5. Social Infrastructure Mapping

Social mapping was undertaken while doing the community survey using full participation from the local administration and community. The focus of the process was to help in the depiction of location boundaries, roads, drainage systems, schools, drinking water facilities, source of drinking water, community infrastructure, etc. It focused on the spatial dimension of the people's realities as expressed in their background information. This process done to help in charting the various aspects related to land use and command areas, water bodies, rivers, drainage and health **A detailed Socio-Economic Survey Report is presented as a separate report to this Project*

1.3.6. Secondary Socio-Economic Data

This information was largely drawn from the Kenya National Bureau of Statistics (KNBS) reports (Volume II, III and IV) of the 2019 Kenya Population and Housing Census (KPHC), Nakuru County Integrated Development Plan (CDIP) 2018-2022 of 2018 and findings from field survey undertaken during Environmental and Social Impact Assessment (ESIA) process within the month of December 2022.

1.4. Environment and Social Screening Findings

This Chapter presents an assessment of the issues likely to arise as a result of implementation of the proposed Projects in respective informal settlements.

The screening assessment was adopted from the Environmental and Social Screening Report (ESSR) prepared for the Project in December 2022. The report provides that, to identify the impacts, the screening exercise adopted the standard Environmental and social screening template provided in the KISIP EMSF. The screening template was used to assess potential KISIP projects impacts to natural and human environment within the settlements.

Annex 1 of this report provides summary of the Environmental and Social Screening findings for Karagita settlement

1.5. Definition and Classification of Environmental and Social Impact

An environmental or social impact is any change to the existing condition of the environment caused by human activity or an external influence. Impacts may be:

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

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

For each issue, the analysis is based on its nature, the predicted impact, extent, duration, intensity and probability, and the stakeholders and/or values affected. In accordance with best practice, the analysis includes issues relating to the Project's environmental and social sustainability. Appropriate Impact Rating has been presented for the situation without mitigation.

1.6. Impact Scoring and Rating Criteria

The potential impacts associated with the proposed development in the informal settlements have been preliminary assessed as presented in the matrix below. Precautionary principle was used to establish the significance of impacts and their management and

mitigation i.e. where there is uncertainty or insufficient information, the Environmentalist opted to err on the side of caution.

Table 1-1 below summarizes the Impact Rating Criteria adopted in the preliminary screening exercise.

Table 1-1: Environment and Social Impact Rating Criteria

Extent		Duration		Intensity		Probability		Weighting Factor (WF)		Significance Rating (SR)		Mitigation efficiency		Significance following Mitigation (SFM)	
Foot print	1	Short term	1	Low	1	Probable	1	Low	1	Low	0-19	High	0,2	High	0-19
Site	2	Short to medium	2			Possible	2	Low to Medium	2	Low to Medium	20-30	Medium to High	0,4	Medium to High	20-30
Regional	3	Medium term	3	Medium	3	Likely	3	Medium	3	medium	40-59	medium	0,6	medium	40-59
National	4	Long term	4			Highly likely	4	Medium to high	4	Medium to high	60-79	Low to medium	0,8	Low to medium	60-79
International	5	Permanent	5	High	5	High	5	High	5	High	80-100	low	1,0	low	80-100

Definition of Terms in the Table

Extent: An area of influence covered by the impact. In this sense, if the action produces a much-localized effect within the space, it is considered that the impact is low (1). If, however, the effect does not support a precise location within the project environment, having a pervasive influence beyond the project footprint, the impact will be at location level (3) or could be County (5)

Timing: Refers to the moment of occurrence, the time lag between the onset of action and effect on the appearance of the corresponding factor. We consider five categories according to this time period is zero, up to 1 year (short term), or more than two years, which are called respectively medium term (3), long-term (4), and permanent (5).

Intensity: refers to the degree of impact on the factor, in the specific area in which it operates, ranked from low (1) to high (5).

Probability: Refers to the likelihood of the impact occurring during the project implementation, this is also ranked as Probable (1) to highly probable

1.7. Project justification

1.7.1. Justification for Choice of Karagita Settlement

The preference for the Karagita Informal Settlement, as a site for the KISIP II (Karagita Informal Settlement Improvement Project Phase II) can be attributed to several decisions and project justifications. These decisions are based on a combination of social, economic, environmental, and developmental factors. Here's a breakdown of the key factors that led to this preference:

1. Identification of Need: A thorough analysis of the needs in the area served as the foundation for the decision to concentrate on the Karagita Informal Settlement. Inadequate infrastructure, basic services, and housing are frequently found in informal settlements, which can cause a number of social and health issues. Karagita's inclusion as a KISIP II sub-project indicates a desire to effectively meet these demands.
2. Population Density and Vulnerability: Due to its high population density and the

vulnerability of its residents, Karagita Informal Settlement was chosen. The community is frequently distinguished by a dense population that endures poor living circumstances. The project's objective, which is in line with KISIP II's overarching objectives, is to make living conditions better for these vulnerable citizens.

3. Integration with National Objectives: KISIP II is a national project, and the decision to focus on Karagita Informal Settlement is part of a larger strategy to fulfill national development objectives. Improving informal settlements aligns with broader goals of poverty reduction, infrastructure development, and equitable urban growth, contributing to the overall development of the country.
4. Environmental and Social Impact: Site-specific Environmental and Social Impact Assessment (ESIA) played a significant role in the decision-making process. The project planners assessed the potential environmental and social impacts of the proposed interventions in Karagita. This assessment identified the settlement's unique challenges and opportunities for improvement.
5. Community Engagement and Participation: The preference for Karagita emerged from community engagement and participation efforts. The involvement of local residents and stakeholders in the decision-making process highlighted the pressing issues within Karagita and the willingness of the community to collaborate on improvements.
6. Infrastructure and Service Accessibility: The feasibility of implementing improvements in Karagita, including infrastructure and basic services like water, sanitation, and electricity, were factored into the decision. The settlement's existing infrastructure and its potential for enhancement were the key considerations.
7. Potential for Replicability and Scalability: Karagita's selection also stemmed from its potential to serve as a model for similar informal settlement improvement projects across the country. Successful implementation in Karagita will pave the way for replicating similar interventions in other informal settlements.

1.7.2. Justification for specific intervention for Karagita Settlement

Currently, Karagita settlement is served water with a line that serves the Industrial parks. The line is inadequate to supply the required quanities of water required by the residents. At the same time, with the ever increasing demand for water by the industrial park, water

will be unavailable for the people of Karagita in the near future. This has necessitated the design and construction of a direct line of 200mm diameter pipeline of high Density polyvinyl Chloride materials from police line through Kihoto to Karagita tanks to safeguard the interests of people of Karagita and improve on the availability of water within the settlement.

At the same time , Water quality Analysis was carried out for the boreholes in Kihoto and that in Police Line which NAIVAWASCO uses as their sources of water for domestic distribution. The results show that Police line boreholes has all the parameters ranging below the maximum required levels by the NEMA standards/World Health organization Standards apart from fluorides that has a high value of 7.84mg/l against the required standard of 1.5mg/l.

The same applies to Kihoto borehole whose fluorine levels is at 6.4mg/l against the required standard of 1.5mg/l. With this high level of fluorine in water supply, it will lead to fluorosis a situation of browning of teeth to the people consuming the water. This necessitates the building of 2 de-fluoridation units to treat the water to the required standard. This will protect the people from the browning of teeth that can be a social problem due to body shaming incidences that might happen.

In summary, the decision to prioritize the Karagita Informal Settlement within the KISIP II project resulted from a combination of factors such as the settlement's unique challenges, alignment with national development goals, social and environmental considerations, and potential for impact. The ESIA process would further refine this decision by identifying specific site-specific challenges and opportunities and ensuring that the chosen interventions are both effective and sustainable.

1.7.3. Justification in Compliance with Environmental Regulations

The construction project proposed within Karagita settlement seeks to address critical infrastructural needs while adhering to the Environmental Management and Coordination (Environmental Impact Assessment and Audits) Regulations 2003 and their amendment regulations in 2019.

Environmental Impact Assessment (EIA) Compliance:

1. Project Context and Scope: The proposed construction project aims to enhance essential infrastructure, such as roads, drainage systems, water pipelines, and

sanitation facilities, within the informal settlement. These improvements will directly contribute to the well-being and quality of life of residents.

2. Amendment Regulations 2019: The project design takes into account the 2019 amendment regulations, ensuring that environmental impact assessments are comprehensive and updated in accordance with evolving environmental standards and practices.
3. EIA Process: The project will undergo a rigorous EIA process as required by the regulations. The assessment will evaluate potential environmental impacts, propose mitigation measures, and ensure that the project adheres to regulatory guidelines.

Sustainable Development and Mitigation Measures:

1. Community Engagement: The project prioritizes community engagement, involving local residents, leaders, and stakeholders. This approach aligns with the regulations' emphasis on participatory processes, ensuring that the project meets the actual needs and concerns of the informal settlement's population.
2. Infrastructure Improvements: The construction project aligns with the regulations' objective of enhancing environmental sustainability. Proper drainage systems and water pipelines will mitigate flooding, reduce soil erosion, and improve sanitation, positively impacting the settlement's environmental conditions.

Resilience and Future Preparedness:

1. Climate Resilience: The regulations advocate for projects that consider climate change impacts. The construction project will incorporate climate-resilient designs and materials, reducing vulnerability to extreme weather events and enhancing long-term project sustainability.
2. Disaster Risk Reduction: The project's focus on improved infrastructure aligns with disaster risk reduction principles, ensuring that the informal settlement is better equipped to handle emergencies and safeguard its residents.

The proposed construction project within the Karagita settlement demonstrates a strong alignment with the Environmental Management and Coordination (Environmental Impact Assessment and Audits) Regulations 2003 and their amendment regulations in 2019. By adhering to the regulations, the project ensures thorough environmental assessments,

community engagement, sustainability, and resilience. Ultimately, the project aims to enhance the settlement's infrastructure while minimizing negative environmental impacts, in line with the spirit of the regulations.

1.8. Arrangement of the report;

The report is organized into Ten(10) chapters with an executive summary. Chapter one covers introduction while Chapter two presents Project Description. Chapter 3 covers the analysis of project alternatives While Chapter Four gives the environmental baseline condition. Chapter Five highlights the legal and institutional framework related to this project before Chapter six detailing on the stakeholder engagement, public participation process and updates on the status of RAP. Chapter Seven gives the anticipated impacts and mitigation measure while chapter Eight brings out the Environmental and Social Management and Monitoring Plan (ESMMP) before chapter Nine giving the conclusion and recommendation. The references is presented as chapter 10 and annexes come at the end of the report.

CHAPTER 2. PROJECT DESCRIPTION

2.1. Project Context

This chapter presents Project Interventions in the target Informal Settlement of Karagita in Naivasha town, Nakuru County. The Environment and social screening was therefore based on Project components discussed under this chapter. The infrastructure Project components discussed were based on the prioritized interventions in the inception report (TCE/GA December 2022) considering the community consultations carried out at the preliminary designs of this project.

2.2. Project Location

This study covers Karagita Settlement in Naivasha town, Nakuru County. The location of the county in respect to Kenyan Map and its sub-counties are presented in Figures 2.1 below.

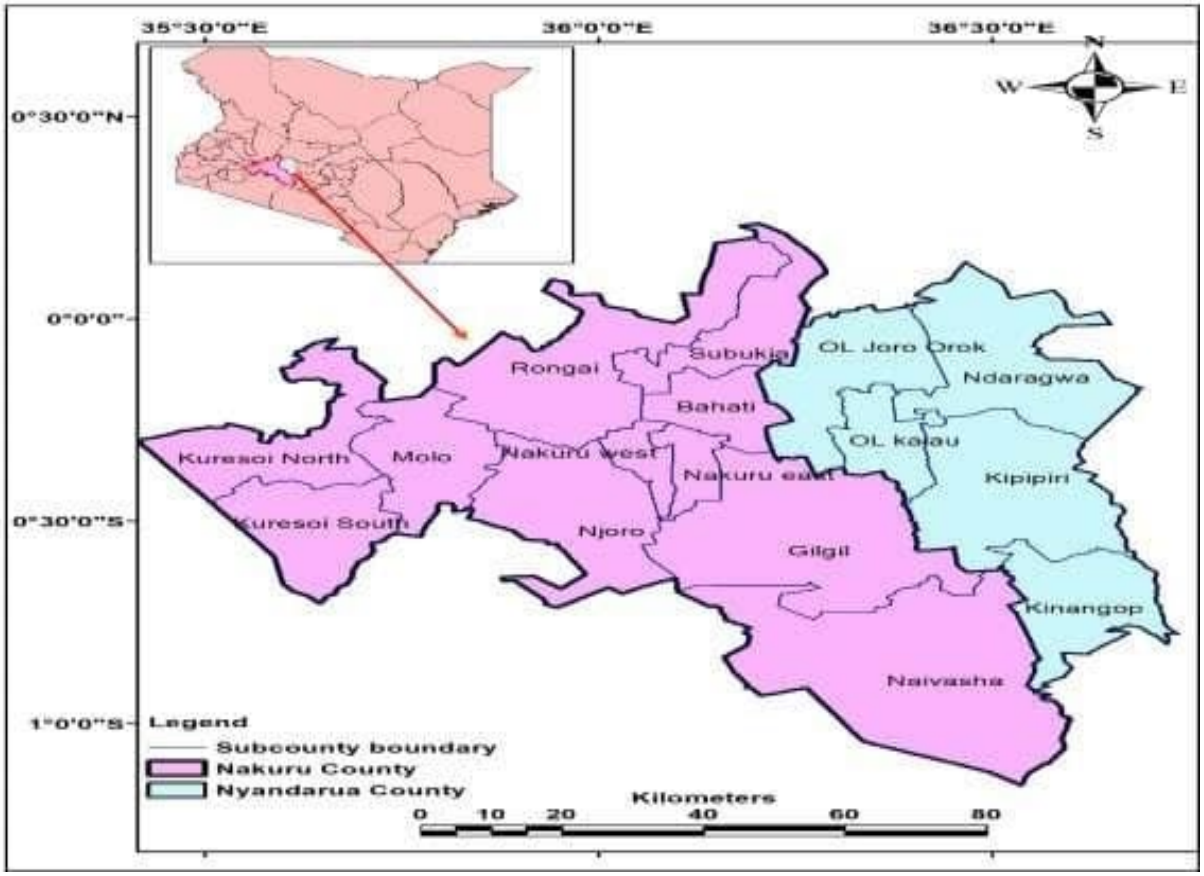


Figure 2-1: Nakuru County Elective and Administrative Boundaries

2.3. The Location Map for Karagita Settlement;

The Location Map for Karagita Settlement is as provided in the figure below:

Figure 2-2: Location Map for Karagita Settlement in Naivasha Town

2.4. Prioritized interventions

Based upon the priorities defined previously by communities; our discussions with the County Government; our analysis of the existing situation; as well as interrelations between infrastructure components, we now propose in this chapter the direction to our design works as well as the key issues to be addressed during the next design phase.

The Conceptual Design for Karagita shall focus on the following priorities:

1. Water supply: Evaluating the need to reinforce the existing network and improving household connections.
2. Defluoridation Plants: Due to high fluorides in water in Naivasha which has an impact on browning of people's teeth, there is the proposal of implementing 2 Defluoridation systems to treat water to the required levels of fluorine by NEMA standards.

The Project scope of works as presented in the Project Design Report is summarized in Table 2.1 below

Table 2-1: Project Scope of works for Karagita Settlement

Settlement	Proposed Infrastructure	Code on Map	Infrastructure Details	Length (metres)	Area (square metres)
Karagita	Water Supply Pipeline from Naivasha Police Line to Karagita Tank	W1	Ø200 mm HDPE pipe, PN 16	7800	3900
	De-fluoridation units at Police Line Tank	De-fluoridation unit 1	5.5 m3/hr output reverse osmosis plant	1 Nr	100
	De-fluoridation units at Khoto Borehole	De-fluoridation unit 2	5.5 m3/hr output reverse osmosis plant	1 Nr	100
	Total Water Pipeline Length			7800	3900
	Total Number of De-fluoridation Plants			2 Nr	200
	TOTAL AREA (Square Meters)				4100

2.5. The Design

Water Supply;

Current situation: - Currently, the pipeline is yet to be implemented. Karagita are using a line that supplies another area making it inadequate. Thus need is evident to provide another line direct to Karagita elevated tank.

From the situation currently, The Naivasha Industrial Park(NIP) booster station will not be able to supply water to the Karagita settlement due to increasing Demand for water from the developing industries.

A direct line from the police line of diameter 200mm HDPE of length 7,800 m shall be laid to convey water to Karagita Tanks. Also two Defluoridation systems one with capacity of 37 m^3/hr and the other with 27 m^3/hr have been proposed, one in police line and another in Kihoto Borehole.

The wayleave is public land and is available for construction of the pipe and auxiliary project components.

2.5.1. Population, demographic data and planning horizons

In the design, the 2019 KNBS population and housing census data was used as the Base Year and projected using geometric progression formula in accordance to the guidelines provided in the Ministry of Water and Irrigation's Practice Manual for Water Supply Services (2005 edition). The Initial Year was set at 2025, Future Year set at 2035 (10 years from the initial year), and the Ultimate Year set for 2045 (20 years from the initial year). Growth rates for the applicable wards will be used. Data obtained from the desktop studies will be subject to confirmation by the Settlement Executive Committees.

$$\boldsymbol{P_n = P_0(1 + r)^n}$$

Where: $\boldsymbol{P_0} = Initial\ Population$

$\boldsymbol{P_n} = Population\ \boldsymbol{n}\ years\ later$

$\boldsymbol{r} = Growth\ rate$

2.5.2. Service Type – individual (IC) and non-individual (NC) connections

Level of service for the consumption estimates was based on the Manual's directive as shown below. The settlement was classified as Urban Areas Low Class Housing.

Table 2-2: Water supply service type[1]

	IC%			NC%		
	Initial	Future	Ultimate	Initial	Future	Ultimate
Urban Areas						
High and Medium Class Housing	100	100	100	0	0	0
Low Class Housing	10	30	50	90	70	50
Rural Areas						
High potential	20	40	80	80	60	20
Medium potential	10	20	40	90	80	60
Low potential	5	10	20	95	90	80

2.5.3. Demand computations

Water demand components to be considered included domestic demand, institutional demand, commercial and industrial demand, and other demands such as firefighting. The Manual's rate of consumption table shown below will be used for computations.

Table 2-3: Table of water consumption rates[2]

Consumer	Unit	RURAL AREAS			URBAN AREAS		
		High Potential	Medium Potential	Low Potential	High Class Housing	Medium Class Housing	Low Class Housing
People with individual connection	1/head/day	60	50	40	250	150	75
People without connections	1/head/day	20	15	10	-	-	20

1 Ministry of Water and Irrigation Practice Manual for Water Supply

2 Ministry of Water and Irrigation Practice Manual for Water Supply

Consumer	Unit	RURAL AREAS			URBAN AREAS		
		High Potential	Medium Potential	Low Potential	High Class Housing	Medium Class Housing	Low Class Housing
Livestock unit	1/head/day	50			-		
Boarding schools	1/head/day	50					
Day schools with WC Without WC	1/head/day	25 5					
Hospitals Regional District Other	1/bed/day	400 200 100			+ 20 1 per outpatient and day (minimum 5000 1/day)		
Dispensary and Health Centre	1/day	5000					
Hotels High Class Medium Class Low Class	1/bed/day	600 300 50					
Administrative Offices	1/head/day	25					
Bars	1/day	500					
Shops	1/day	100					
Unspecified Industry	1/ha/day				20,000		
Coffee pulping factories	1/kg coffee	25 when re-circulation of water is used)					

2.5.4. Supply sources and their capacities

The scope of the review project covered upgrade of water augmentation and distribution infrastructure only. The consultant therefore did not include assessment for water sources construction works. The available supply infrastructure system and their adequacy were

assessed. The service providers responsible for water distribution services in the respective settlements were also mapped out and liaison established throughout the project implementation period.

2.5.5. Augmentation needs

Rehabilitation, extension and introduction of additional water supply pipelines, construction and rehabilitation of water storage facilities, and introduction of pumping stations where necessary were all considered. Augmentation needs were assessed from community participations as well as the review of technical engineering parameters, that is the capacity and quality of supplied water compared to the demand.

2.5.6. Supply system design

Pipelines

Estimated velocity of 2 m/s was adopted for gravity mains while an optimum velocity of 0.8 m/s was adopted for pumping mains for review as recommended by the Ministry of Water's practice manual. Pressure ratings incorporated dynamic pressures for all pipelines. Trench designs were prepared using the method given in National Annex NA to BS EN 1295-1:1998, using the following limiting deflections: 2% for steel pipes with elastomeric joints or with mortar linings; and 6% for welded steel pipes with flexible coatings and linings.

The Colebrook-White formula was recommended to be used in the hydraulic calculations to obtain frictional factor through iteration for pumping mains while Hazen Williams formula excel spreadsheets will be used in the design of gravity mains.

The selection of pipe material was based on the analysis of steel pipes, glass reinforced polyester (GRP) unplasticised polyvinyl chloride (uPVC) and high-density polyethylene (HDPE). Need for corrosion protection, hydraulic characteristics, jointing, ease of handling, market availability, pressure rating, standards compliance, cost, and hazard classification were all analysed for prudent selection. Steel pipes used in the project were recommended to have both internal protections in form of cement coating and external protection in form of epoxy coating.

The minimum pressure at design flow is be 1 bar (10-metre water head) in pipe sections to which there may be made consumer connections and 0.4 bar (4m) in other cases. The static pressure in pipes with consumer connections is not more than 6 bar (60m). Higher pressure than 6 bars will require pressure relief valves for the consumer connections.

Water pipelines are positioned 3.00m to the right or left of a right of way centreline, or, where possible, in a dedicated utility corridor. Water pipelines located in a right of way were designed in the location authorised by a water county council / municipal engineer or planner, unless the location is precluded by the existence of other extenuating circumstances. Pipelines in road reserves are designed to be located whenever possible 1.5m from the edge of the road way.

Valves

Single orifice and double orifice Air relief valves will be used to permit release of air which accumulated at high points and to prevent negative pressures from building up when lines are drained or to permit air flow into the systems when filling up.

In the design, Washouts are placed only at accentuated low points on raw water and clear water mains of inside diameter 80mm or larger. In this context, it may be considered that a low point is accentuated if the succeeding major high point is situated on a 10m higher level. All dead-end pipelines will have a blow-off valve assembly type flushing device.

Valve chambers are at least 1200 x 1200mm internally (or larger for larger pipes), made of reinforced concrete. The cover shall be lockable. The chamber shall be drained through the floor or through a drain pipe.

Appurtenances

Anchor or thrust blocks of appropriate detail as shown on the MoWI, 2005 Water Design Manual, and shall be provided for horizontal and vertical bends, capped ends, change of size and tees and for pipes laid in steep slopes. Number 25mm diameter outlet pipes will be used to channel water to the consumers, with commensurate stop corks used to cut-off flows.

Standpipes will be positioned within secure institutions, fitted on 25mm steel pipe and lockable taps. The point will be concreted so as to clamp the standpipe and improve on sanitation. Similar to the kiosks, soak away pit, a soak away trench, or extension to road side drains will be put in place for drainage improvement.

Defluoridation Units;

Because of the high fluorides of water in both the Kihoto boreholes and Police line borehole that is at 6.4mg/l and 7.5mg/l respectively beyond the required NEMA standard of 1.5mg/l as shown in the Water results below. This necessitated the need to come up with two()2 Defluoridation systems one with capacity of 37 m3/hr and the other with 27 m3/hr have been proposed, one in police line and another in Kihoto Borehole.

The Design of Defluoridation unit

They are designed to treat 37 m3/hr and 27 m3/hr of water respectively which will be able to bring the fluorides levels to the required NEMA standards. The building structures are presented in the figure 2-13.

Water Supply Designs and Layouts

The designs and Layouts of water supply in Karagita are presented in the figures below:

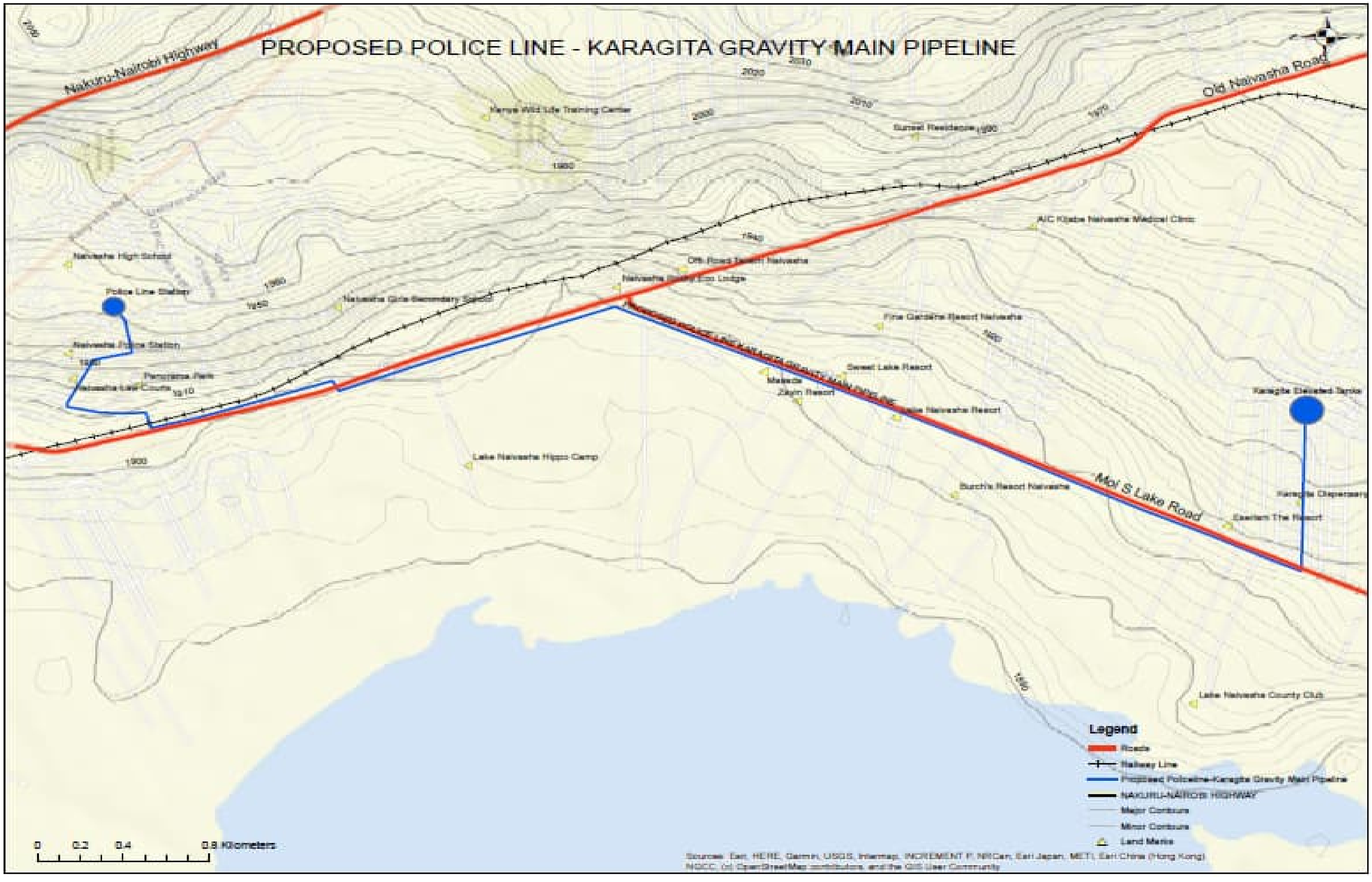


Figure 2-3: Karagita Layout Plan

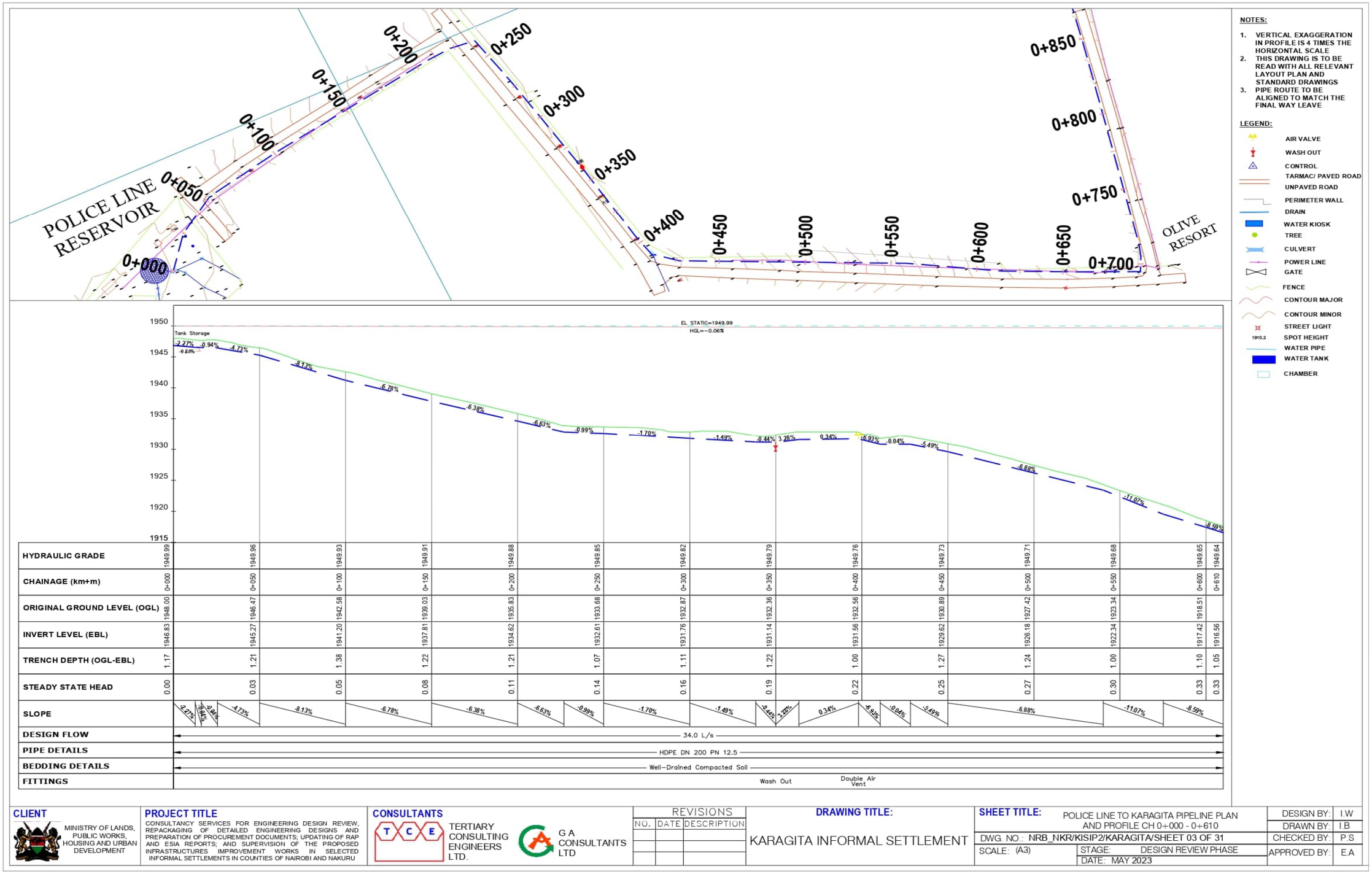


Figure 2-4 Karagita Design Engineering Layout Plan (1)

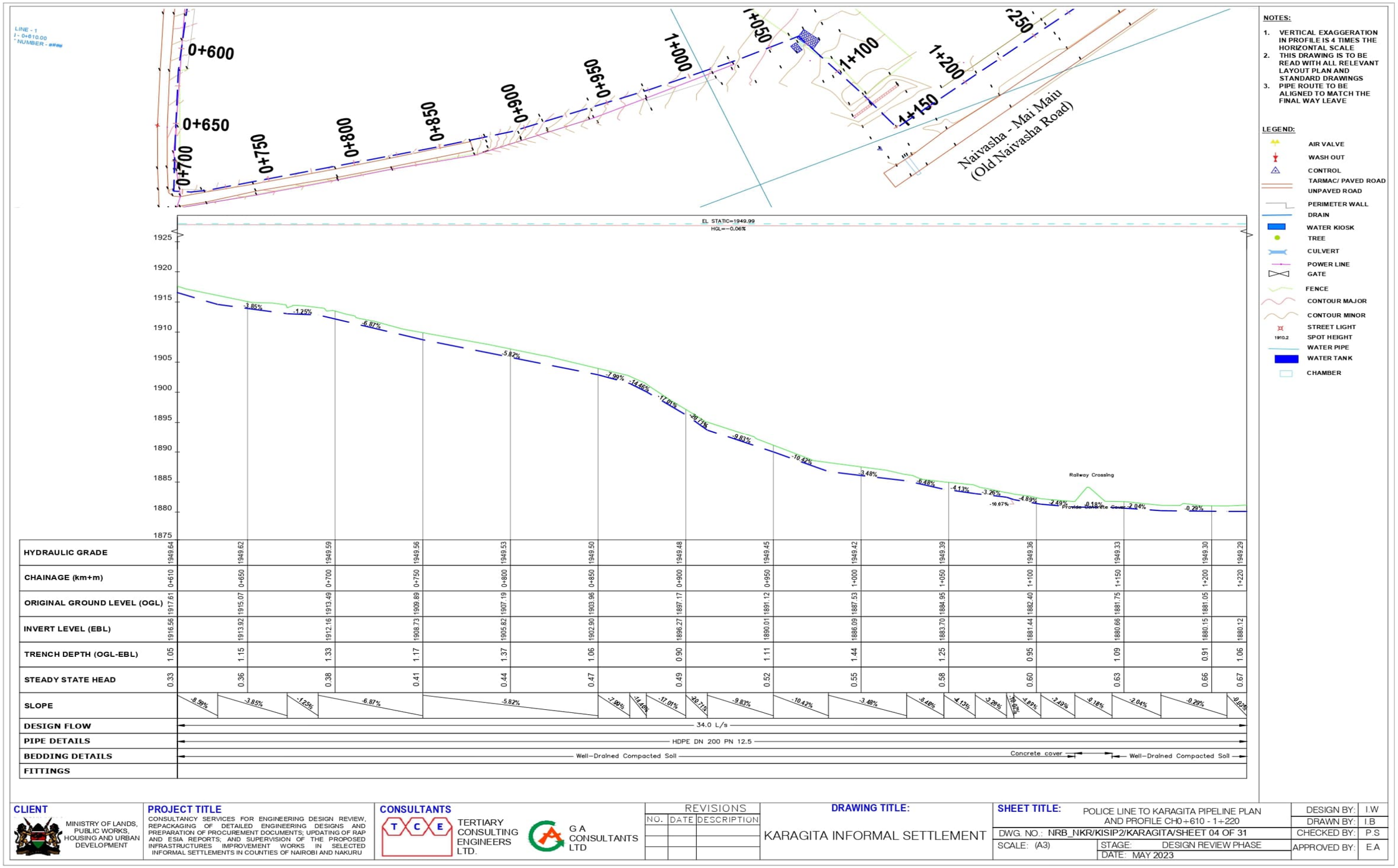


Figure 2-5 Karagita Design Engineering Layout Plan (2)

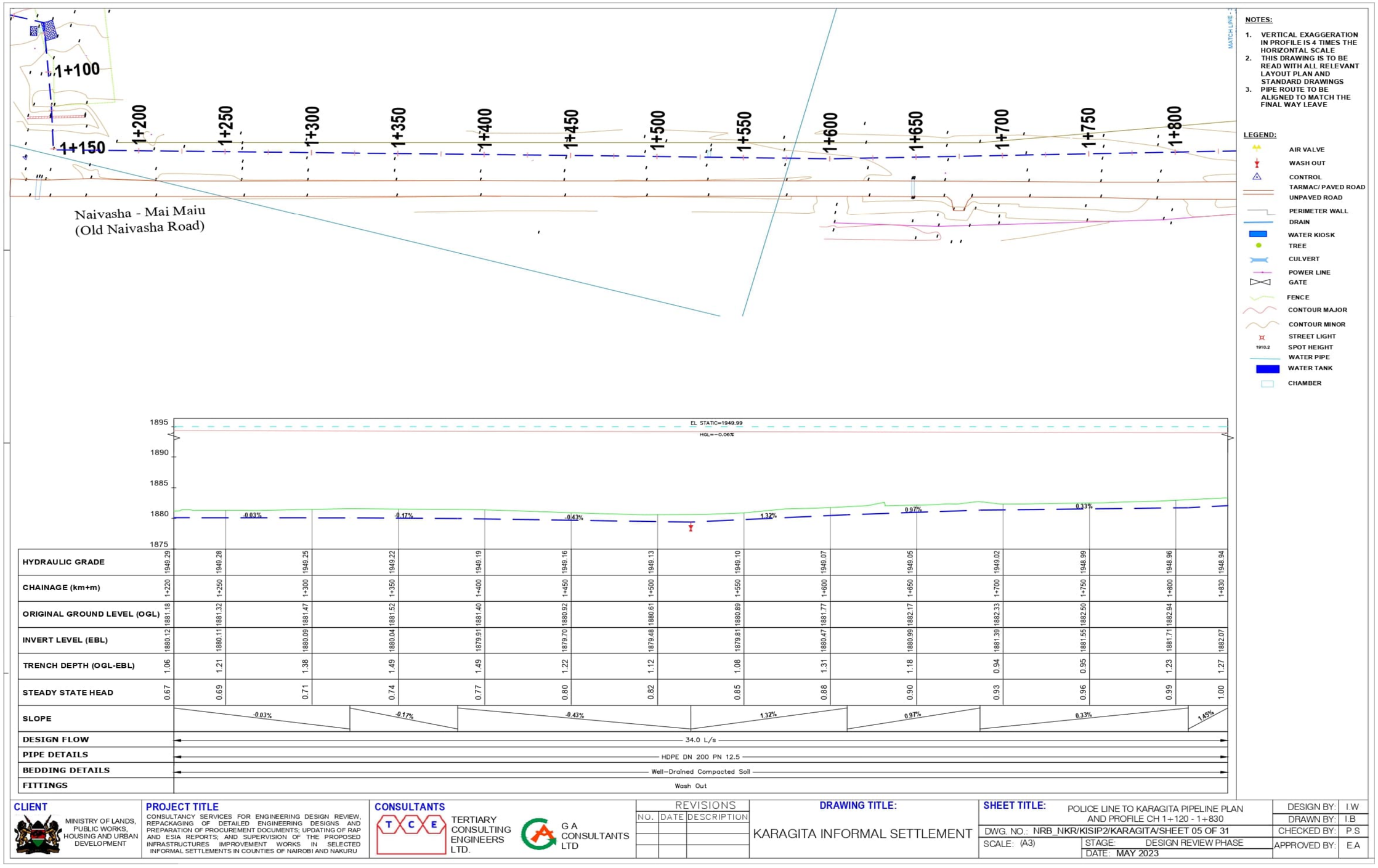


Figure 2-6 Karagita Design Engineering Layout Plan (3)

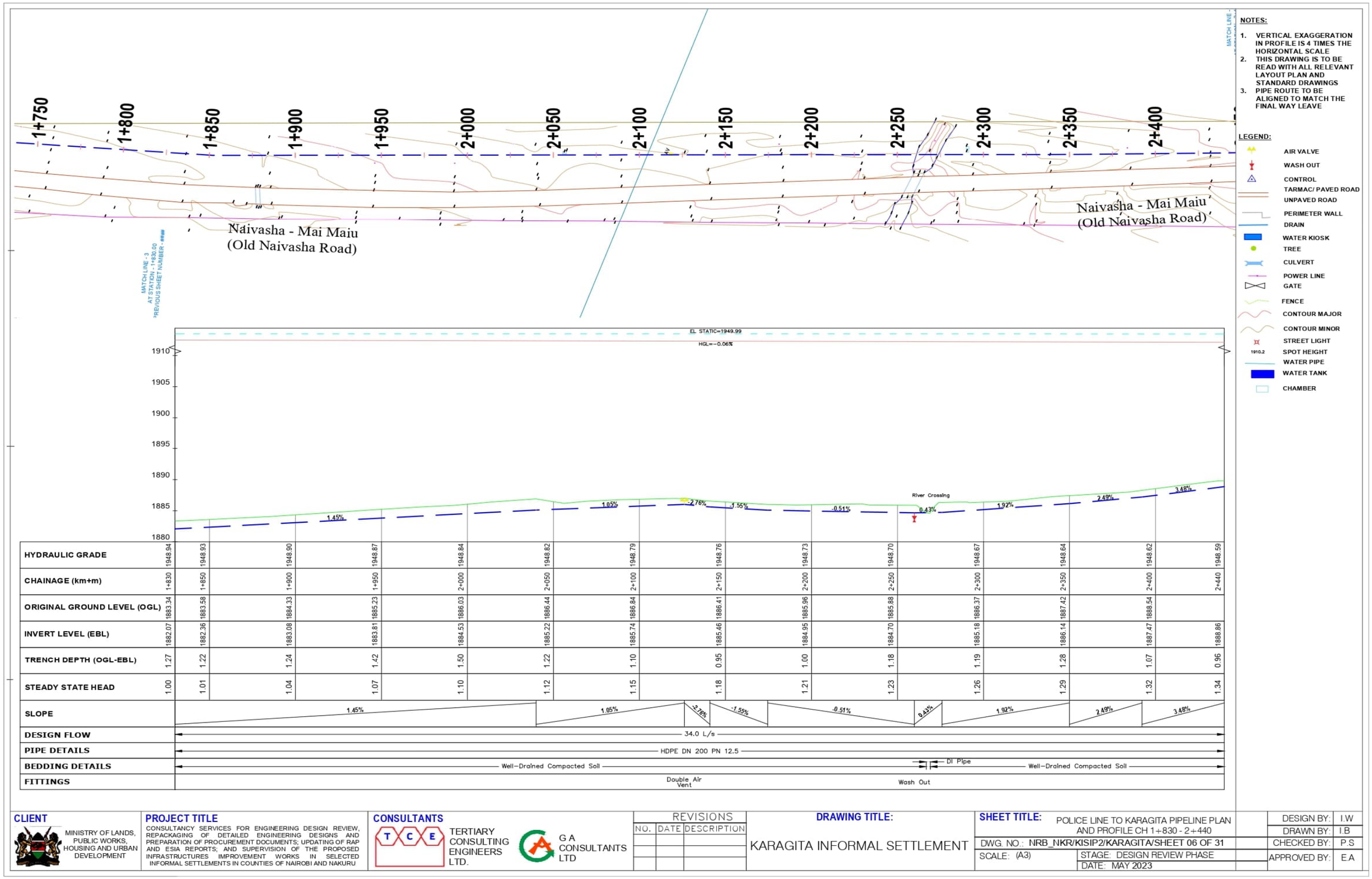


Figure 2-7 Karagita Design Engineering Layout Plan (4)

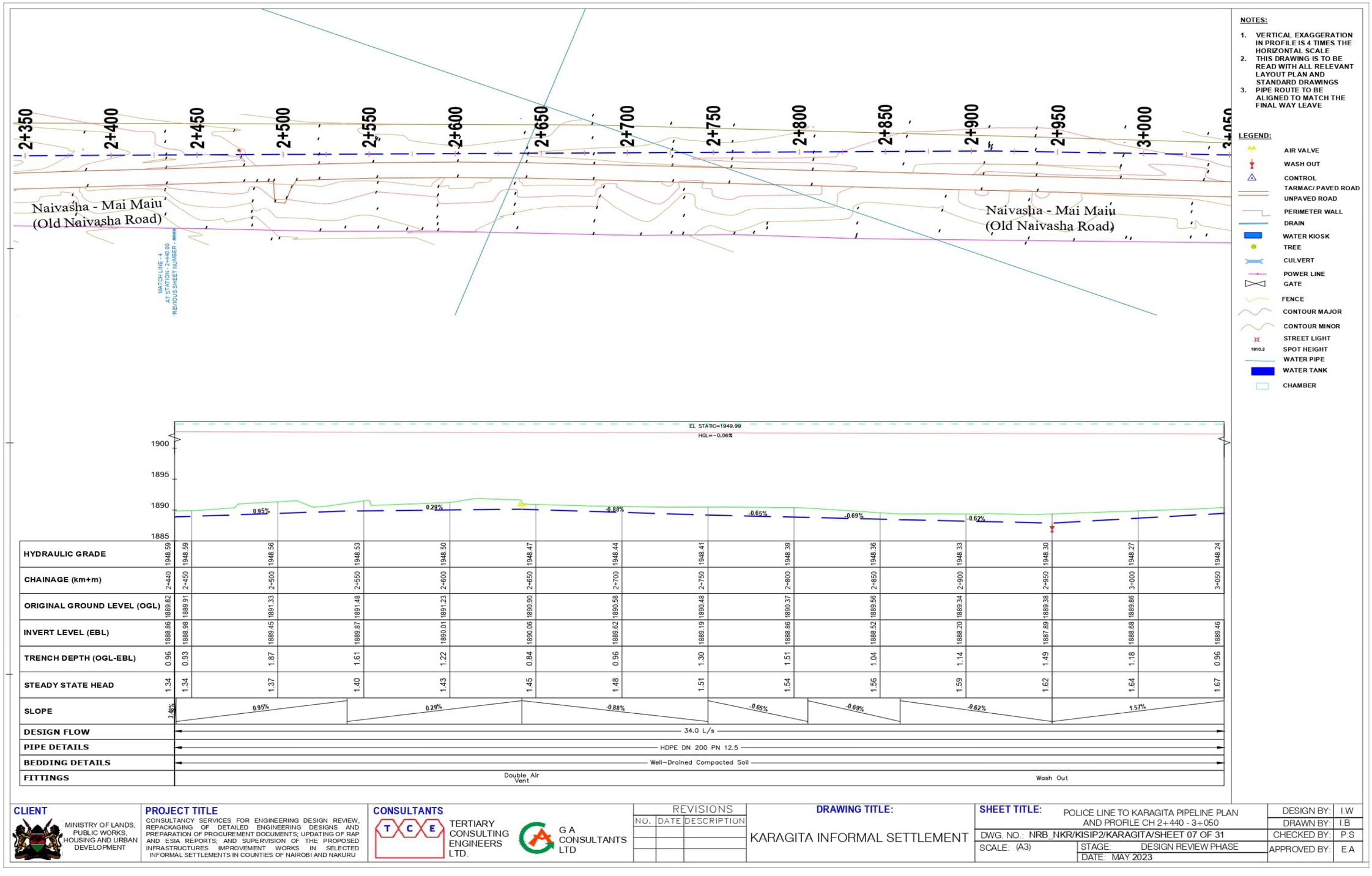


Figure 2-8 Karagita Design Engineering Layout Plan (5)

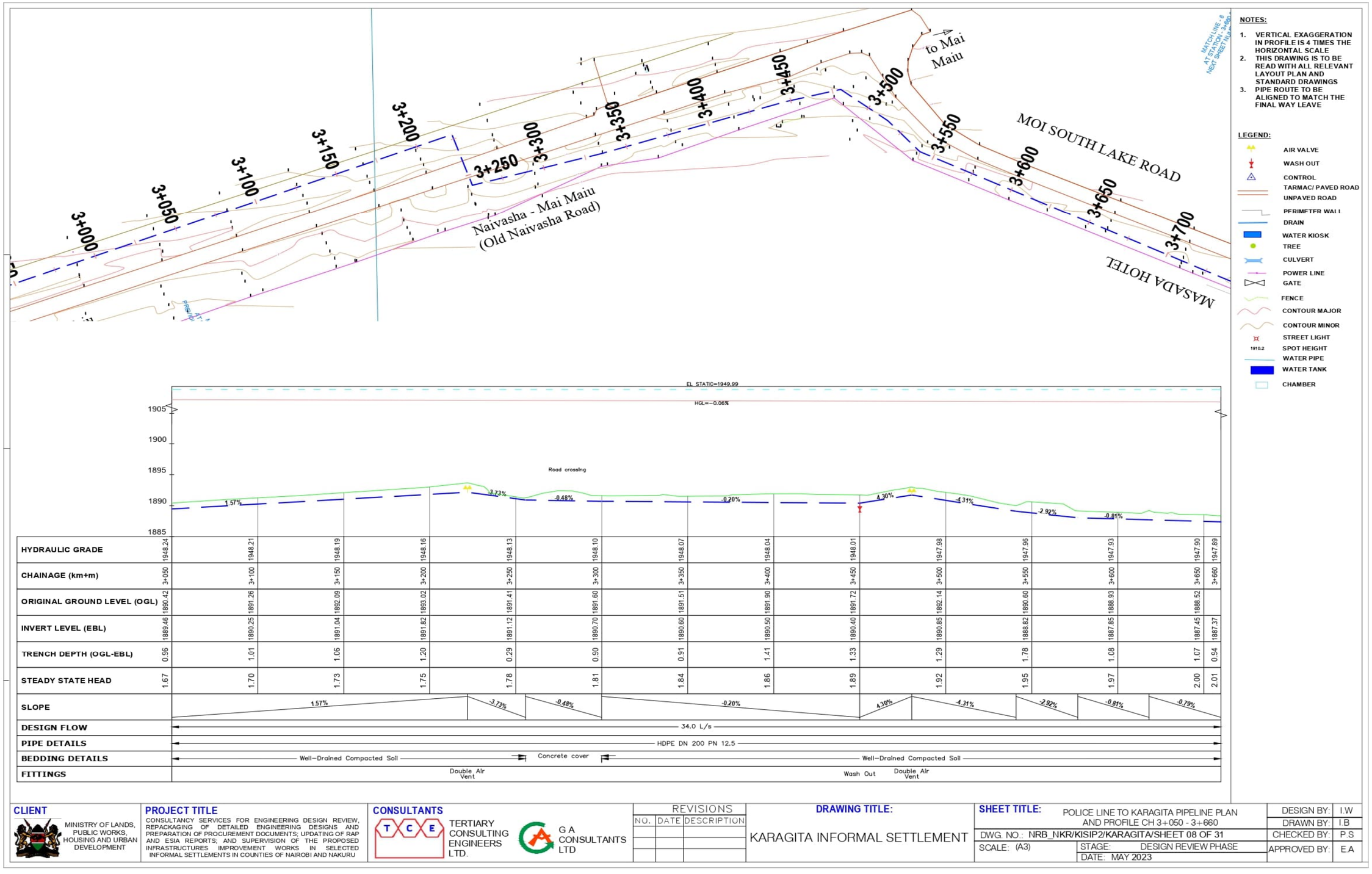
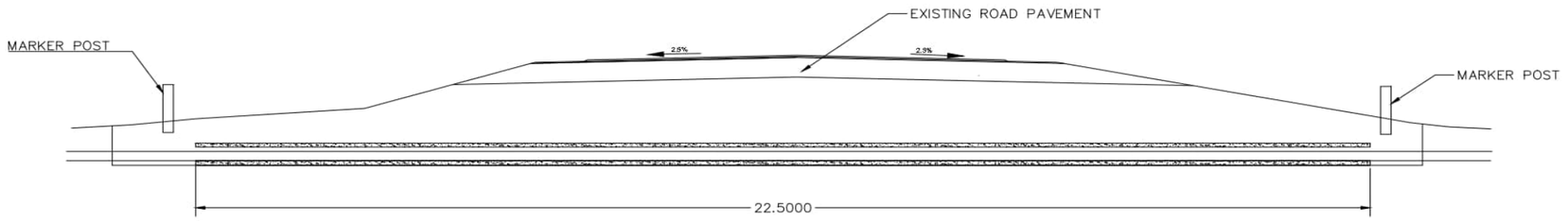
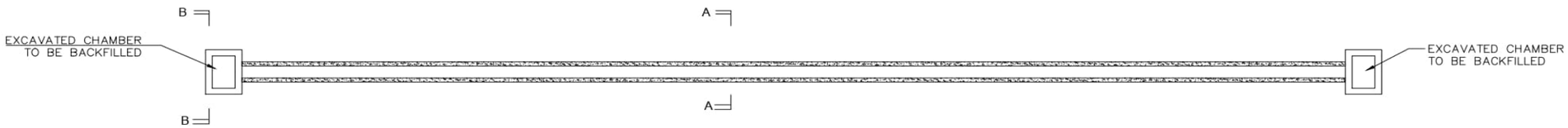


Figure 2-9 Karagita Design Engineering Layout Plan (6)

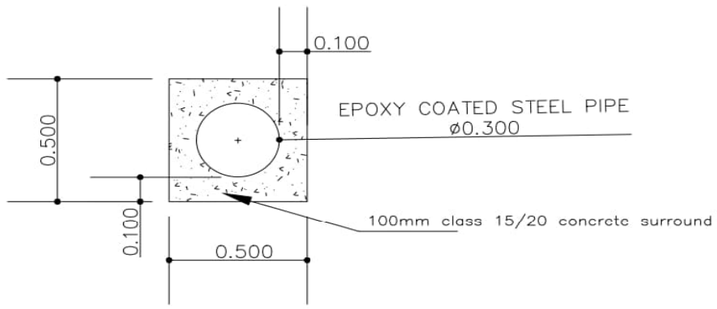


SCALE: 1:100

TYPICAL SECTION SHOWING LOCATION OF SERVICE DUCT



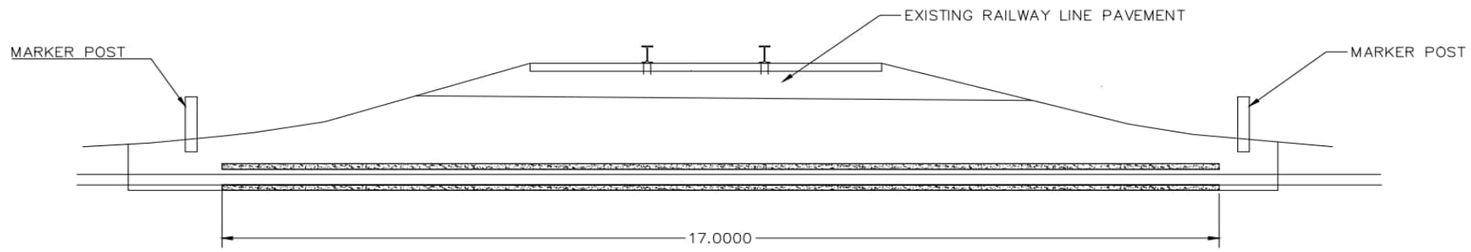
SERVICE DUCT LAYOUT



SECTION A—A

CLIENT MINISTRY OF LANDS, PUBLIC WORKS, HOUSING AND URBAN DEVELOPMENT	**PROJECT TITLE** CONSULTANCY SERVICES FOR ENGINEERING DESIGN REVIEW, REPACKAGING OF DETAILED ENGINEERING DESIGNS AND PREPARATION OF PROCUREMENT DOCUMENTS; UPDATING OF RAP AND ESIA REPORTS; AND SUPERVISION OF THE PROPOSED INFRASTRUCTURES IMPROVEMENT WORKS IN SELECTED INFORMAL SETTLEMENTS IN COUNTIES OF NAIROBI AND NAKURU	**CONSULTANTS** TERTIARY CONSULTING ENGINEERS LTD. / G A CONSULTANTS LTD	REVISIONS (NO. / DATE / DESCRIPTION)	**DRAWING TITLE:** KARAGITA INFORMAL SETTLEMENT	**SHEET TITLE:** STANDARD DETAILS FOR KARAGITA PIPELINE SERVICE DUCT DETAILS ACROSS EXISTING ROAD DWG. NO.: NRB_NKR/KISIP2/KARAGITA/SHEET 27 OF 31 SCALE: (A3) STAGE: DESIGN REVIEW PHASE DATE: MAY 2023	DESIGN BY: I.W DRAWN BY: I.B CHECKED BY: P.S APPROVED BY: E.A

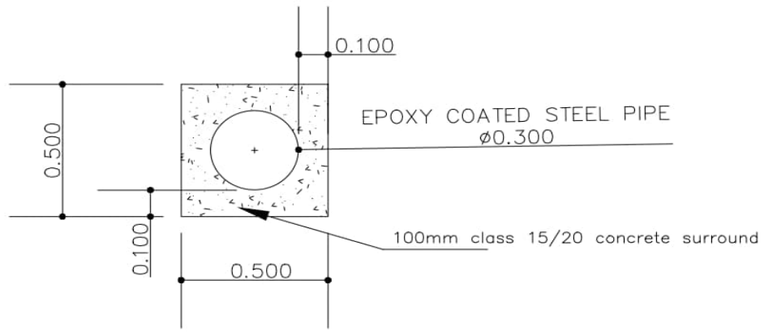
Figure 2-10 Karagita Design Cross-sections (1)



SCALE: 1:100

TYPICAL SECTION SHOWING LOCATION OF SERVICE DUCT

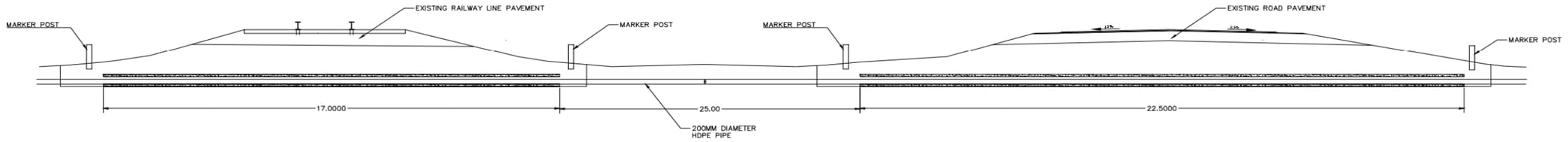
SERVICE DUCT LAYOUT



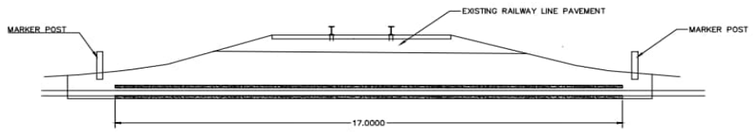
SECTION A—A

CLIENT: MINISTRY OF LANDS, PUBLIC WORKS, HOUSING AND URBAN DEVELOPMENT	**PROJECT TITLE**: CONSULTANCY SERVICES FOR ENGINEERING DESIGN REVIEW, REPACKAGING OF DETAILED ENGINEERING DESIGNS AND PREPARATION OF PROCUREMENT DOCUMENTS; UPDATING OF RAP AND ESIA REPORTS; AND SUPERVISION OF THE PROPOSED INFRASTRUCTURES IMPROVEMENT WORKS IN SELECTED INFORMAL SETTLEMENTS IN COUNTIES OF NAIROBI AND NAKURU	**CONSULTANTS**: TERTIARY CONSULTING ENGINEERS LTD. / G A CONSULTANTS LTD	REVISIONS (NO. / DATE / DESCRIPTION)	**DRAWING TITLE**: KARAGITA INFORMAL SETTLEMENT	**SHEET TITLE**: STANDARD DETAILS FOR KARAGITA PIPELINE SERVICE DUCT DETAILS ACROSS EXISTING RAILWAY LINE; DWG. NO.: NRB_NKR/KISIP2/KARAGITA/SHEET 28 OF 31; SCALE: (A3); STAGE: DESIGN REVIEW PHASE; DATE: MAY 2023	DESIGN BY: I.W; DRAWN BY: I.B; CHECKED BY: P.S; APPROVED BY: E.A

Figure 2-11 Karagita Design Cross-sections (2)



TYPICAL SECTION SHOWING LOCATION OF SERVICE DUCTS



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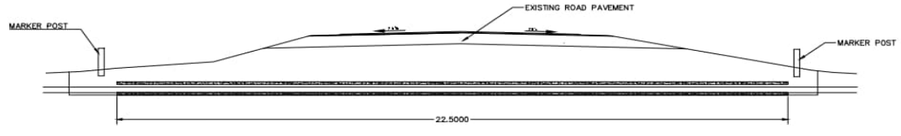
TYPICAL SECTION SHOWING LOCATION OF SERVICE DUCT

SERVICE DUCT LAYOUT



SCALE: 1:100

TYPICAL SECTION SHOWING LOCATION OF SERVICE DUCT

SERVICE DUCT LAYOUT

CLIENT MINISTRY OF LANDS, PUBLIC WORKS, HOUSING AND URBAN DEVELOPMENT	**PROJECT TITLE** CONSULTANCY SERVICES FOR ENGINEERING DESIGN REVIEW, REPACKAGING OF DETAILED ENGINEERING DESIGNS AND PREPARATION OF PROCUREMENT DOCUMENTS; UPDATING OF RAP AND ESIA REPORTS; AND SUPERVISION OF THE PROPOSED INFRASTRUCTURES IMPROVEMENT WORKS IN SELECTED INFORMAL SETTLEMENTS IN COUNTIES OF NAIROBI AND NAKURU	**CONSULTANTS** TERTIARY CONSULTING ENGINEERS LTD. / G A CONSULTANTS LTD	REVISIONS: NO. / DATE / DESCRIPTION
DRAWING TITLE: KARAGITA INFORMAL SETTLEMENT	**SHEET TITLE:** STANDARD DETAILS FOR KARAGITA PIPELINE SERVICE DUCT DETAILS	DWG. NO.: NRB_NKR/KISIP2/KARAGITA/SHEET 29 OF 31	SCALE: (A3) / STAGE: DESIGN REVIEW PHASE / DATE: MAY 2023
DESIGN BY: I.W	DRAWN BY: I.B	CHECKED BY: P.S	APPROVED BY: E.A

Figure 2-12 Karagita Design Cross-section (3)

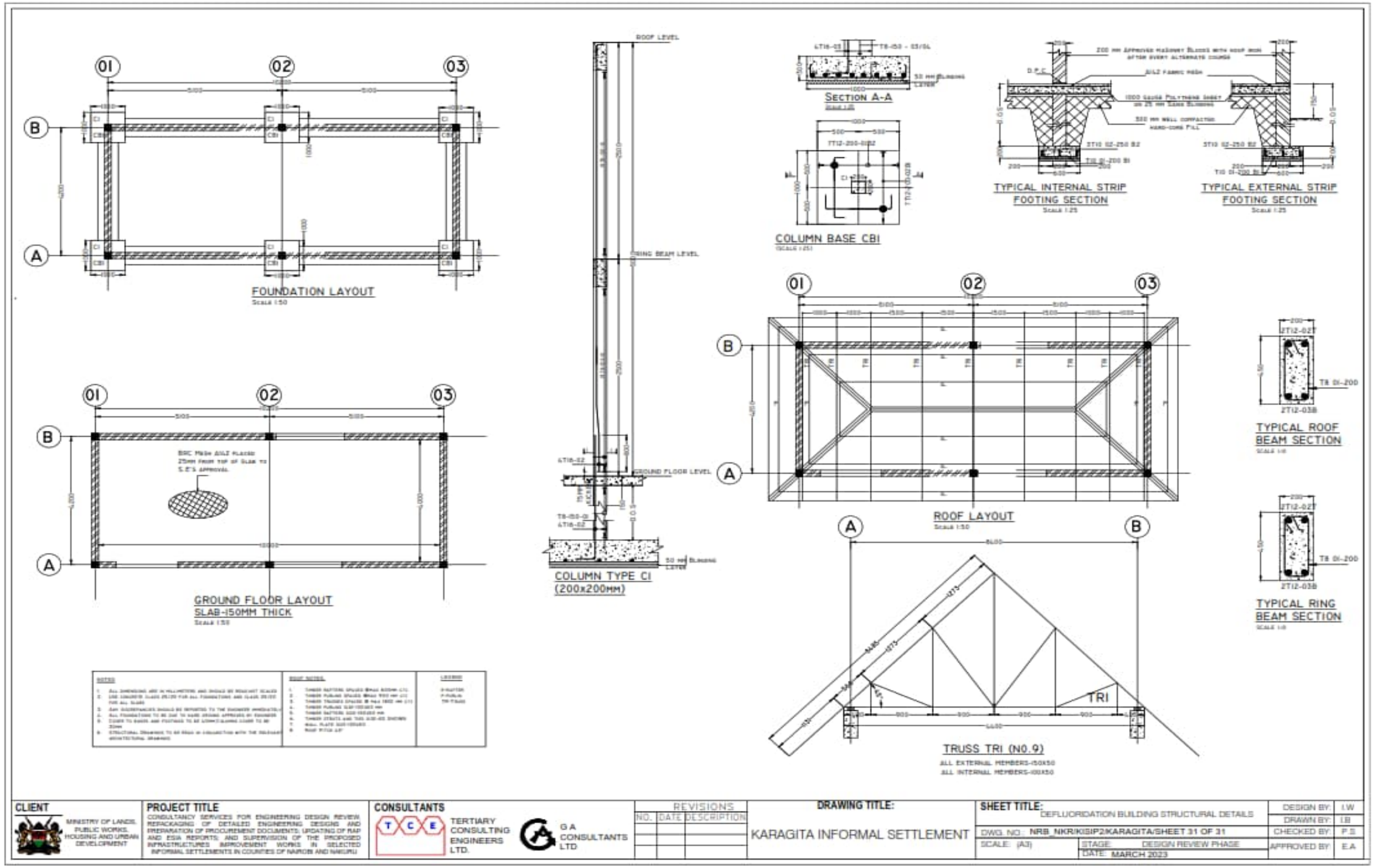


Figure 2-13 Karagita Defluoridation Building structural details

2.6. Materials for Construction

Water Supply

The Materials to be used for Water supply is High Density Polyvinyl Ethylene (HDPE) pipes of 200mm diameters. Also steel pipes shall be used on crossings.

Defluoridation Units

The unit shall have a housing made of natural blocks procured within the Nakuru City. The materials required shall be cement, sand, concrete, steel bars, construction timber for roofing. Roofing iron sheet shall be reuired. Steel doors and windows shall be required too. The system for defluoridation shall be procured to be housed in the building.

2.7. Project infrastructure component activities

Here's an outline of the potential infrastructure components and activities that Wii be undertaken during the construction, operation, and decommissioning phases of a pipeline project in the Karagita Informal Settlement:

Construction Phase:

1. Site Preparation and Access Roads:
    - Clearing the construction site.
    - Establishing access roads to facilitate equipment and material transport.
2. Pipeline Installation:
    - Excavating trenches for the pipeline installation.
    - Laying and welding sections of the pipeline.
    - Backfilling and compacting the trenches.
3. Infrastructure Construction:
    - Building pump stations or pressure regulation stations if required.
    - Installing metering stations and control systems.
    - Constructing storage facilities or tanks for the transported material.
4. Environmental Mitigation:
    - Implementing erosion control measures.
    - Restoring disturbed areas to their original state.
5. Safety Measures:
    - Implementing safety protocols for workers and the surrounding community.

Operation Phase:

1. Pipeline Monitoring and Maintenance:
    - Regularly inspecting the pipeline for leaks, corrosion, and other issues.
    - Conducting routine maintenance activities such as cleaning and repairs.
2. Pump Stations and Control Systems:
    - Monitoring pump stations and pressure regulation to ensure smooth flow.
    - Managing control systems for maintaining desired pressure and flow rates.
3. Defluoridation Plant operations
    - Managing control systems for maintaining desired pressure and flow rates within the plants.
    - Backwashing and cleaning system for efficiency
    - Disposal of waste water generated from the system.
4. Emergency Response Planning:
    - Establishing protocols for addressing leaks, spills, and other emergencies.
    - Conducting regular emergency response drills.
5. Community Engagement:
    - Engaging with the local community to address any concerns and provide information about the project's operation.

Decommissioning Phase:

1. Pipeline Shutdown:
    - Gradually shutting down the pipeline operations if the project reaches the end of its operational life.
2. Site Rehabilitation:
    - Removing pipeline infrastructure and equipment.
    - Restoring the area to its natural state or as agreed upon with local authorities.
3. Environmental Cleanup:
    - Ensuring proper cleanup of any potential contamination or spills.
    - Mitigating any environmental impact resulting from the decommissioning process.
4. Community Engagement:
    - Informing the community about the decommissioning process and its impacts.
    - Addressing any questions or concerns from local residents.

5. Regulatory Compliance:
    - Ensuring compliance with all regulatory requirements for decommissioning activities.

It's important to note that the specifics of the pipeline project's infrastructure components and activities will depend on factors such as the type of material being transported, the length of the pipeline, local regulations, and community engagement efforts.

Materials and Sources:

Here's an overview of the materials, products, byproducts, and waste, as well as methods of disposal:

1. Aggregates:
    - Sources: Quarries or gravel pits.
    - Used for road base, sub-base, and concrete production.
2. Concrete:
    - Asphalt: Derived from crude oil.
    - Concrete: Comprised of cement, aggregates, and water.
    - Use of natural stones for construction
3. Steel:
    - Source: Steel mills.
    - Used for structural elements, including bridges and high mast floodlight structures.
4. Pipes and Culverts:
    - Source: Pipe manufacturing plants.
    - Used for drainage and sewer systems.
5. Electrical Components:
    - Sources: Electrical equipment manufacturers.
    - Used for high mast floodlights and other electrical installations.
6. Landscaping Materials:
    - Sources: Nurseries and landscaping suppliers.
    - Used for planting vegetation, creating green spaces, and installing amenities.
7. Geo-textiles and Geogrids:
    - Source: Specialty suppliers.

- Used for erosion control, soil stabilization, and drainage.

8. Roofing materials
    - Timber for roofing shall be sourced locally
    - Roofing iron sheets to be sourced locally

Waste Generation and Disposal:

1. Construction Waste:
    - Waste generated during construction, including excess concrete, steel cuttings, packaging materials, etc.
    - Disposal Method: Segregate waste into recyclable and non-recyclable categories. Recycle where possible, and dispose of non-recyclable waste in designated landfills.
2. Excavated Soil and Rock:
    - Generated during earthworks and excavation.
    - Disposal Method: Properly manage and store on-site, reuse if suitable, or dispose of according to local regulations.
3. Demolition Debris:
    - Generated during the decommissioning phase.
    - Disposal Method: Segregate and recycle materials like concrete and steel. Dispose of non-recyclable waste in landfills.
4. E-Waste:
    - Generated from old electrical components and fixtures.
    - Disposal Method: Properly recycle and dispose of e-waste through certified e-waste recycling centers.
5. Hazardous Materials:
    - Chemicals and substances like paints, solvents, and oils used during construction.
    - Disposal Method: Handle and dispose of hazardous materials in accordance with local regulations and guidelines.
6. Sediment and Erosion Control Measures:
    - Generated during construction activities.
    - Disposal Method: Properly manage sediment and erosion control measures on-site, preventing soil runoff into water bodies.

7. Unused or Damaged Materials:
    - Excess or damaged materials that aren't used in the project.
    - Disposal Method: Return unused materials to suppliers if possible. Dispose of damaged materials according to regulations.

Labor requirements

1. Skilled and Unskilled Labor:
    - Skilled Labor: Skilled workers are essential for tasks such as pipe laying, welding (if applicable), equipment operation, and plumbing connections. Skilled labor will include plumbers, pipefitters, equipment operators, and welders.
    - Unskilled Labor: Unskilled labor is needed for tasks like trench excavation, backfilling, general labor, and carrying materials. Local community members will provide this labor, helping to create employment opportunities within the informal settlement.
2. Construction Crews:
    - Pipe Installation Crew: This crew is responsible for laying and joining pipes, ensuring proper alignment and connections.
    - Trenching Crew: This crew excavates trenches for the pipes, making sure they are at the correct depth and slope.
    - Backfilling Crew: After pipes are installed and inspected, another crew backfills the trenches with appropriate materials to secure the pipes.
    - Concrete Work Crew: For concrete structures like manholes, a crew skilled in concrete work will be required.
    - Maintenance and Inspection Team: Once the pipes are in place, a team is needed to inspect the system, identify any issues, and carry out necessary repairs or adjustments.
3. Supervisory Roles:
    - Project Manager: Oversees the entire project, including scheduling, budgeting, and quality control.
    - Site Supervisor: Manages day-to-day operations, coordinates labor, and ensures safety and quality standards are met.
4. Community Engagement and Outreach:

- Community Liaison: Facilitates communication between the construction team and the informal settlement's residents. Helps address concerns and ensures community participation and buy-in.

5. Health and Safety Personnel:
    - Safety Officer: Ensures compliance with safety regulations, conducts safety briefings, and responds to any safety incidents.
6. Surveyors and Engineers:
    - Land Surveyors: Survey the settlement to plan the pipe route and ensure accurate alignment.
    - Civil Engineers: Provide technical expertise in design, ensuring the system meets engineering standards and is suited to the terrain.
7. Environmental and Social Specialists:
    - Environmental Experts: Will Assess and mitigate environmental impacts, such as preventing contamination of water sources.
    - Social Specialists: Will Address social aspects, including community engagement and addressing potential disruptions caused by the construction.
8. Support Staff:
    - Administrative Personnel: Handle project documentation, permits, and logistics.
    - Logistics and Procurement: Manage the procurement of construction materials and equipment.
9. Training and Capacity Building:
    - Training Facilitators: If local residents are involved in the labor force, trainers may be needed to build their skills in construction tasks and safety procedures.
10. Contractors and Subcontractors:
    - Depending on the project's scale and complexity, various contractors and subcontractors may be involved, each with their own specialized labor requirements.

2.8. Project Costing;

Table 2-4: Karagita settlement Water Supply project costing

Settlement	Bill 1	Water Supply Works	Dayworks	Bill 28 (E&S)	10% Contigency	Total Inc. 16% VAT
Karagita	13,915,855.45	80,609,105.00	87,245.00	3,555,000.00	9,816,720.55	125,261,354.16
Percentage Share	11.1%	64.4%	0.1%	2.8%	7.8%	100.0%

2.9. Amount to Pay to NEMA

The law requires the proponent to pay 0.1% of the project cost as NEMA license processing fee. In this aspect, Ksh 125,261.35 (Kenyan shillings One Hundred and Twenty Five Thousands, Two Hundred and Sixty One Shillings and Thirty Five Cents only) shall be paid to NEMA by the proponent for NEMA Licensing process.

2.10. Implementation Periods

The project is intended to be implemented in a period of 12 months then a period of another 12 months to cover the phase of defects and liability period.

2.11. Project Categorization

According to Environmental Impact Assessment and Audit (Amendment) regulations 2019, EMCA (amended 2019) Second Schedule, Legal notice number 31, it presents three-risk category i.e. (Low, Medium and High) on various project under implementation. Based on the schedule; the project lies under Medium Risk Project because it lies under the following categories of projects under medium risk projects as described in the box below.

(2) Transportation including—

(a) construction and rehabilitation of roads including collectors and access roads;

(b) construction of a light rail transit;

(c) construction of jetties, marinas, piers and pontoons;

(d) rehabilitation works of airports and airstrips;

(e) helipads;

(f) parking facilities; and

(g) construction of bridges.

(3) Water resources and infrastructure, including—

(a) drilling for purposes of utilizing ground water resources and related infrastructure;

(b) water abstraction works; and

(c) water supply and distribution infrastructures.

According to Environmental Impact Assessment and Audit (Amendment) regulations 2019, all low risk and medium risk projects require Summary Project report of the likely environmental effect of the project be submitted to NEMA for approval before implementation.

The proposed project of Construction of the proposed facilities in the Lake view settlement are classified as class B project in accordance to The World Bank categorization of projects on Risk Category and is expected to have moderate impact to the people and the environment. The project construction phases and other civil associated works are anticipated to have environmental and social impacts that would require to be mitigated for sustainability of the project. This project therefore require an ESIA Report presented as a Summary Project Report.

2.12. Conformity with Existing Land Use Zoning

Conforming to existing land use zoning regulations can be a complex challenge when undertaking construction projects in informal settlements. Informal settlements often lack proper planning and infrastructure, making it crucial to carefully navigate land use regulations while considering the unique circumstances of these communities. Here's how the conformity with existing land use zoning in Karagita settlement was approached:

1. Understanding Local Context:

- Gained a deep understanding of Karagita's demographics, culture, needs, and historical context. Each settlement had specific considerations that influence land use.

2. Engaging with Community:
    - Engaged local residents, community leaders, and stakeholders to understand their priorities and concerns. Involved them in the decision-making process and seek their input on project design.
3. Assessment of Zoning Regulations:
    - Reviewed existing zoning regulations and land use plans.
4. Zoning Variances or Exceptions:
    - Sort zoning variances or exceptions.
5. Transitional Zoning:
    - Considered implementing transitional zoning that acknowledges the existing land use but allowed for incremental improvements over time.
6. Participatory Planning:
    - Involved residents in the planning process. This ensured that the project aligned with their needs and priorities and reduces the likelihood of resistance.
7. Incremental Development:
    - Recognized that informal settlements often develop incrementally. Planned the Karagita project in a way that accommodates these incremental changes and respects the existing community layout.
8. Mixed-Use Spaces:
    - Designed the project to accommodate the mixed-use nature of informal settlements, where residential, commercial, and communal activities often coexist.
9. Flexible Design:

- Designed the project with flexibility in mind. Structures that can be adapted or expanded over time were considered.

11. Regularization Processes:

- Collaborated with local authorities to explore regularization processes that bring Karagita into the formal planning framework.

15. Legal Support:

- Sort legal advice from experts familiar with Karagita's issues and land use regulations.

CHAPTER 3. ANALYSIS OF ALTERNATIVES

3.1. Introduction to Project Alternatives

This chapter describes and examines the various alternatives considered during the design of the Project. The consideration of alternatives is one of the proactive sides of environmental and social assessment required to enhance Project design. This is achieved through examining options instead of only focusing on the more defensive task of reducing adverse impacts of a single design option.

Analysis of Project Alternatives requires comparison of feasible alternatives for the proposed Project in terms of: Project site, Project technology, Potential Environmental and Social Impacts, capital and recurrent costs, suitability under local conditions, and acceptability by neighboring land users. The sub chapter below presents the considerations that were analyzed in determining feasible alternatives for the proposed Project as listed below.

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

No alternative sites are analyzed for informal settlement improvement construction projects according to Legal Notice No. 101 The Environmental (Impact Assessment and Audit) Regulations, 2003 _in regulation 16(b) which states that "identify and analyze alternatives to the proposed project "Identifying construction project alternatives in informal settlements can indeed be challenging due to the unique characteristics of these settlements.

1. Limited Available Space: Informal settlements are often densely populated with limited open space. Finding suitable alternative sites that can accommodate the project's requirements while avoiding displacement or disruption can be challenging.
2. Informal Land Tenure: Land ownership in informal settlements is often complex and informal, making it difficult to identify alternative sites with clear ownership and legal status. This can lead to potential conflicts and uncertainties.
3. Socioeconomic Factors: Informal settlements are often established due to economic and social reasons. Relocating residents can disrupt their livelihoods, access to services, and social networks, making it challenging to find alternative sites that balance these factors.
4. Community Resistance: Residents of informal settlements are often deeply connected to their communities and may resist relocation. Identifying alternative sites that are acceptable to the community and address their concerns can be challenging.
5. Lack of Infrastructure: Alternative sites might lack basic infrastructure such as water, sanitation, and electricity, necessitating significant additional investment to make them viable for construction projects.
6. Environmental Considerations: Identifying sites that have minimal negative impact on the environment and nearby ecosystems can be challenging due to limited available land and the informal settlement's proximity to sensitive areas.
7. Cultural and Social Context: Informal settlements often have rich cultural histories and social dynamics. Identifying alternative sites that respect these cultural contexts and maintain social cohesion can be difficult.
8. Financial Constraints: Identifying viable alternative sites might require financial resources for land acquisition, infrastructure development, and community support. Funding limitations can constrain the feasibility of these alternatives.
9. Incremental Development: Informal settlements tend to develop incrementally over time. Finding alternative sites that can accommodate this gradual expansion and align with the settlement's existing layout can be complicated.

10. Regulatory Hurdles: Navigating existing zoning and regulatory frameworks to identify alternative sites that comply with regulations can be challenging, especially when these settlements often exist outside formal planning processes.
11. Political and Administrative Challenges: In some cases, political considerations and administrative challenges can hinder the identification and selection of alternative sites for construction projects.

Addressing these difficulties requires a holistic and community-centered approach. Community engagement, participatory planning, and collaboration with local stakeholders are essential to identify viable alternatives that minimize negative impacts while aligning with the settlement's unique characteristics and needs. It's crucial to approach these challenges with sensitivity and an understanding of the complex socio-economic dynamics of informal settlements.

However, design and technical aspects were considered for the project alternatives as follows:

1. Proposed Site:
   - Location: The site that is accessible and strategically located to cater to the intended user base while considering traffic patterns and future growth.
   - Soil and Topography: Soil analysis to determine soil stability and suitability for road and infrastructure construction. Consideration of the site's topography for proper grading and drainage.
   - Environmental Considerations: Evaluation of the potential impact of construction on the surrounding environment. Implement erosion control measures to prevent soil runoff during construction.
2. Water Pipelines:
   - System Design: Designed a reliable water distribution network that provides consistent water pressure and flow to users. Planned for emergency shut-off valves and maintenance access points.
   - Water Quality: Ensured water pipeline materials are suitable for maintaining water quality and minimizing corrosion or contamination risks.

3.2. KISIP 2 Investments Identification

In the case of KISIP 2, identification and selection of investments, was a reflection of the community felt needs, as guided by given the following principles:

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

3.3. Considered Alternatives for the Project

3.3.1. The Yes Project Alternatives

This project alternative means implementing the project components in accordance to the designs proposed in the report.

For Water supply, this project will supply water to the community of Karagita settlement and stop overlying on a line that supplies water to the industrial park which might be disconnected due to their rising water demand.

On de-fluoridation plant, it will treat water to the required standards for fluorides that will reduce the incidence of browning of teeth.

Land Requirements

The projects have been designed to only utilize the road reserves as designated on the Physical Development Plans (PDPs) developed by KISIP 2 component for the targeted settlements. No private land will be acquired for the project. This has significantly minimized displacement of populations and livelihoods as a result of the Project and the need to carry out resettlement. A separate RAP was prepared for the Project components which have an impact to people's assets and sources of livelihood.

3.3.2. Alternative Water Sources

The supply is currently from boreholes in the area. However, the sources are insufficient and cannot sustain the proposed domestic water supply in the area. This problem worsens during prolonged dry spells and water rationing. The other possible alternative water sources are from nearby river but it is polluted due to agricultural activities upstream the treatment areas.

Underground water abstraction

Advantages

- It will provide reliable water supply to the proponent.
- Operational and maintenance costs are low
- No time will be used for drilling as the boreholes already exist

Disadvantages

- It is expensive to drill the borehole and equip it apart from high cost of power

Rainwater harvesting

Advantages:

- It is cheaper than the proposed project
- Encourages water storage and conservation
- It will be easier to construct and manage
- It will serve individual users directly
- It is water of good quality if harnessed properly.

Disadvantages:

- Water harvesting is limited to the rainy season therefore they are an unreliable source of water supply to the proponent
- Rainwater collected would not be sufficient
- It needs a larger roof catchment before adequate water is collected
- Quality of rain water is easily affected by weather and agricultural activities in the project area

Surface water from the river through dam

There is Naivasha river that passes through the town which is a potential for water abstraction.

Advantages;

- It will provide reliable water supply to the project.
- Operational and maintenance costs are low

Disadvantages;

- Quality of rain water is easily affected by weather and agricultural activities in the project area
- Need large investment to build the dam
- Can carry unwanted pathogens like dead animals and high silt filling up the water pans

3.3.3. Alternative to materials for Water line

There are different pipe materials for use in water supply. The choice of pipe can be HDPE or Steel pipes. HDPE pipes were chosen because of their cheap cost compared with steel pipes. HDPE pipes also can work well in Naivasha and their flexibility plays part in their choice. Steel pipes are prone to vandalism. HDPE was considered as the best option.

3.3.4. Alternatives for crossing facilities

When crossing facilities there will be an option of catting through the roads to the surface then lay our pipelines of carrying out micro-turnelling to pass the service areas. Micro turnelling was chosen because of the availability of services and minimal disruption to the services being crossed.

3.3.5. Power source alternatives;

Solar powered alternative

The 2 defluoridation plants need power sources to operate and light up at nights. The option of solar power will require solars and batteries for storage of power during the day and be used up at night. The initial cost is high but operation wise, it is sustainable as you are utilizing the renewable energy. It is however prone wear and tear as the time goes by.

In addition, they are prone to vandalism. This is the reason why the option was not chosen considered to be utilised.

Electricity Grid alternative

This option involves connecting the system to electricity from the grid. This option was chosen because of the already existing power sources within the project areas.

Hybrid system alternative

This alternative involves connecting the street lights to the Kenyan grid together with solar power alternative. This alternative has a backing in that it utilizes also the renewable energies and also the system can work when there is power blackout in the settlement. However, the alternative was not adopted due to vandalism of solar and their batteries that will render the system un-functional.

3.3.6. Water Treatment of fluoride options

There are different methods of removing fluorides in water. They include Coagulation &precipitation, Membrane process, Iron exchange process, Electro-coagulation process and Adsorption process. The process to be utilised in the treatment of water in Karagita will be Iron exchange process through the use of resin.

3.3.7. No Project Alternative

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

i) There will be no improved water accessibility within the settlements.
ii) There will be no improved living standard / well-being, employment and local economy in the target settlements.
iii) There will be no creation of employment both during construction and operation phases of the projects.
iv) There will be no increased Land Value within the settlements.
v) There will be no improved Access to Social Services within the settlements.

On the part of defluoridation systems, it means the peole of Karagita will continue using water with high fluorides affecting their teeth to brown colour which can be a social issue interms of body shaming.

From the analysis above, it becomes apparent that the No Project alternative is not preferred by the community. The proposed works including the pipeline supersede the No Project alternative

CHAPTER 4. BASELINE INFORMATION OF TARGET SETTLEMENT

4.1. General Information

The Project target upgrading of infrastructure in Karagita settlements in Nakuru County.The county is divided into nine administrative Sub-Counties namely; Naivasha, Gilgil, Nakuru, Rongai, Nakuru North, Subukia, Njoro, Molo, and Kuresoi. Njoro and Kuresoi were hived off from Molo Sub-County, Gilgil from Naivasha, Rongai from Nakuru Town, and Subukia from Nakuru North.

Karagita settlement specifically is in Karagita Location, Karagita sub-location, Naivasha Sub-County.

4.2. Physical Environment

4.2.1. Climate

Being in a semi-arid region, the settlement experiences a challenging climate characterized by limited and erratic rainfall. The temperatures can be quite extreme, with hot days and cooler nights. This arid climate can lead to water scarcity issues, making the lake a critical water source for both the settlement's residents and local wildlife.

Karagita has predictable weather patterns with temperatures ranging between 10°C during the cold months (July and August) and 20°C during the hot months (January to March). Maximum daytime temperature: 25 degrees Celsius; Minimum nighttime temperature: 15 degrees Celsius. Maximum daytime temperature: 26 degrees Celsius; Minimum nighttime temperature: 14 degrees Celsius. The area receives between 700mm and 1200mm of rainfall annually, with average annual rainfall being an approximated 800mm. The area has two rainy seasons; April, May and August (long rains) and October and December (short rains).

Climate Change Risks for Informal Settlements in general and Nakuru County:

1. Increased Flooding: Informal settlements are often located in low-lying areas or near water bodies. With climate change, there's an increased risk of heavy rainfall events leading to flooding, which can cause displacement, property damage, and health hazards.
2. Heatwaves: Informal settlements with inadequate access to shade, green spaces, and proper ventilation are more susceptible to extreme heat events, which can lead to heat-

related illnesses and discomfort.

3. Water Scarcity: Climate change can affect water availability, making it harder for informal settlements to access clean and sufficient water for daily needs.
4. Health Impacts: Climate change can exacerbate health issues in informal settlements due to increased exposure to disease vectors, inadequate sanitation, and limited access to healthcare.

Furthermore, according to Climate Risk Profile Nakuru County, Nakuru is a diversified County in terms of climate, people and livelihoods. Agriculture is the main sector providing food, income, employment creation and raw materials for industries pursuing processing. The sector provides about 48% of the household income and employs over 60% of the employed population. However, climate change is a major factor affecting the sector. Drought, intense rains, floods, and high temperatures already challenge productivity, incomes and food security in the County and are expected to pose even greater challenges in the future. Looking to the future in the years 2021-2065, prolonged moisture stress is projected to occur across both seasons of the year analysed and consecutive days of moisture stress are projected to more than double in the first wet season from approximately 35 days to over 70 days on average. While only small changes in intense precipitation are expected to occur, precipitation is projected to increase by 0.3% in the first wet season, and 6% in the second wet season. These all indicate the need of preparing agricultural systems to expected increased incidence of droughts and floods in the future.

4.2.2. Topography

Karagita is situated on relatively flat terrain, with occasional low hills or ridges providing some variation in the landscape. The salty water lake of Naivasha plays a central role in the ecosystem, influencing both the local climate and the availability of water resources. The lake has varying levels of salinity, affecting the types of plants and animals that can thrive in and around it.

Karagita specifically lies in a raised portion of the eastern branch of the Great Rift Valley surrounded by high mountain ranges of geologically recent volcanic origin characterized by sharp topography and great altitude.

4.2.3. Soils and Geology

The soil pattern in Karagita settlement presents a complex distribution with three main classifications that have been influenced by climatic conditions, volcanic activities and underlying rock type. These main soil classifications include:

Latosolic soils; are the well-drained red volcanic soils and imperfectly drained loam with dark brown subsoil covers with fertility ranging from moderate to high. The main crops supported by these soils are wheat, Maize, pyrethrum, sunflower, finger millet potatoes, pigeon peas, vegetables and beans and peas.

Planosolic Soils; these comprises of poorly drained dark brown clay soils with highly developed textured top soils as well as well drained humic lawns with dark brown sub soils. These soils are classified as fertile. The main agriculture activities in these areas include sheep rearing, dairy farming, wheat, barley, potatoes, pyrethrum and vegetables farming.

Alluvial and Lacustrine Deposits; these are shallow soils resulting from volcanic ash sediments as well as other sources. They occupy the Rift Valley bed in Lake Naivasha as well as the adjacent areas to these features. Their fertility ranges from low to moderate. Livestock keeping is the most notable social economic activity in these types of area.

4.2.4. Hydrology

Karagita is adjacent to Lake Naivasha on the floor of the Rift Valley with a few of the permanent rivers and streams in the county drain into it. There is no river that cuts the Karagita settlement.

4.3. Biological Environment

4.3.1. Vegetation and Flora

Flora: The flora of the informal settlement consists of drought-tolerant plant species adapted to the semi-arid conditions. Plants like acacia trees, thorny shrubs, and succulents dominates the landscape. Near the lake, salt-tolerant vegetation such as halophytes could thrive, forming unique plant communities along the shoreline.

4.3.2. Fauna

The fauna in this environment is highly adapted to the arid conditions and they include a mix of small mammals, reptiles, and avian species. Common mammals might include rodents like gerbils and small carnivores like foxes and mongooses. Reptiles such as lizards and snakes are also present, taking advantage of the diverse microhabitats offered by the rocky terrain and vegetation.

Given the proximity to a game reserve, there is occasional wildlife interactions between the informal settlement and the reserve. Larger mammals seldom venture closer to the settlement in search of water during dry periods, creating opportunities for both human-wildlife conflict and coexistence.

An Accordance with World Bank OP 4.04: Natural habitats, it refers to land and water areas where (i) the ecosystems' bio-logical communities are formed largely by native plant and animal species, and (ii) human activity has not essentially modified the area's primary ecological functions. All natural habitats have important biological, social, economic, and existence value. Important natural habitats may occur in tropical humid, dry, and cloud forests; temperate and boreal forests; mediterranean-type shrub lands; natural arid and semi-arid lands; mangrove swamps, coastal marshes, and other wetlands; estuaries; sea grass beds; coral reefs; freshwater lakes and rivers; alpine and sub alpine environments, including herb fields, grasslands, and paramos; and tropical and temperate grasslands.

Critical Natural Habitats are

(i) existing protected areas and areas officially proposed by governments as protected areas (e.g., reserves that meet the criteria of the World Conservation Union [IUCN] classifications2), areas initially recognized as protected by traditional local communities (e.g., sacred groves), and sites that maintain conditions vital for the viability of these protected areas (as determined by the environ-mental assessment process3); or

(ii) sites identified on supplementary lists prepared by the Bank or an authoritative source determined by the Regional environment sector unit (RESU). Such sites may include areas recognized by traditional local communities (e.g., sacred groves); areas with known high suitability for bio-diversity conservation; and sites that are critical for rare, vulnerable, migratory, or endangered species.4 Listings are based on systematic evaluations of such factors

as species richness; the degree of endemism, rarity, and vulnerability of component species; representativeness; and integrity of ecosystem processes.

It was noted that Karagita is not a natural habitat and is an already buit environment with buildings and the surrounding areas of agricultural activities. There shall be no wildlife of plants that are endangered that will be affected by the project.

Part VI Schedule of the Wildlife Conservation and Management Act, 2013 brings out the management of sustainable land use, declaration of protected area, declaration of nation parks, conservation and management of wetlands, variation of boundaries for national park or marine parks and Protection of endangered and threatened ecosystems among other many issues. Of all of them, *Karagita is not affected by them as it is not near a national park nor a marine park*.

4.4. Socio – Economic Environment

The socio economic environment covers the social and economic conditions, factors and influences that collectively shape the wellbeing, and quality of life of individuals and the community at large. This section highlights the socio-economic characteristics of Karagita settlement.

4.4.1. Employment

Majority of wage earners are in the private sector mainly in the flower, tea and coffee farms, construction, academic institutions, public transport, wholesale and retail trade, hotels and restaurants and *jua kali* sectors mostly comprise of the youth. The estimates for the 2019 Kenya Population and Housing Census (KPHC)indicate that on average, 14 per cent of the area population (12 per cent urban and 16 per cent rural) are self-employed.

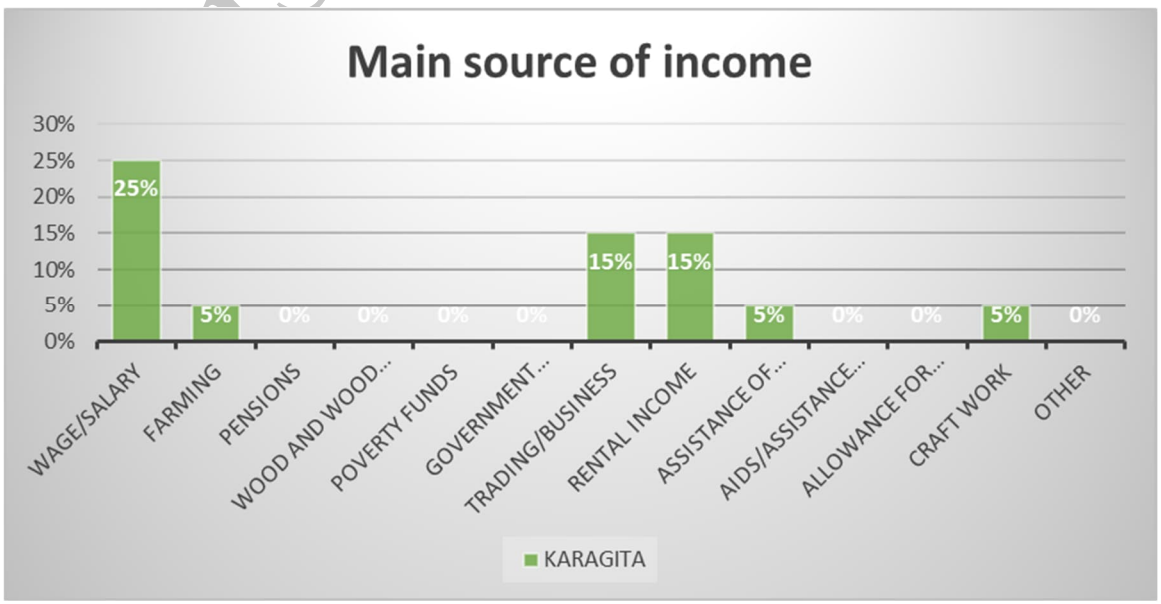


Figure 4-1: Income sources for Karagita informal settlement

4.4.2. Housing

Due to rapid urbanization and failure of the formal sector to supply adequate houses especially for the low-income segment of the society, there has been proliferation of informal settlements to meet the housing gap. This is manifested by the slums and squatter settlements and other form of shanty developments. The major informal settlements are in Nakuru East (Bondeni, Manyani, and Lakeview), Nakuru West (Ronda, Kaptembwo, and Gituima), Gilgil (Kampi Somali, Maina, and Makaburi), Naivasha (Lakeview, Kihoto), Molo (Casino, Kasarani), Njoro (Industrial area, Juakali, Jewathu, Bondeni). However, the County has made significant investments in selected informal settlements in Naivasha and Nakuru through Kenya Informal Settlement Improvement Project (KISIP). The figures below illustrate the common housing materials used in creating structures in the informal settlements.

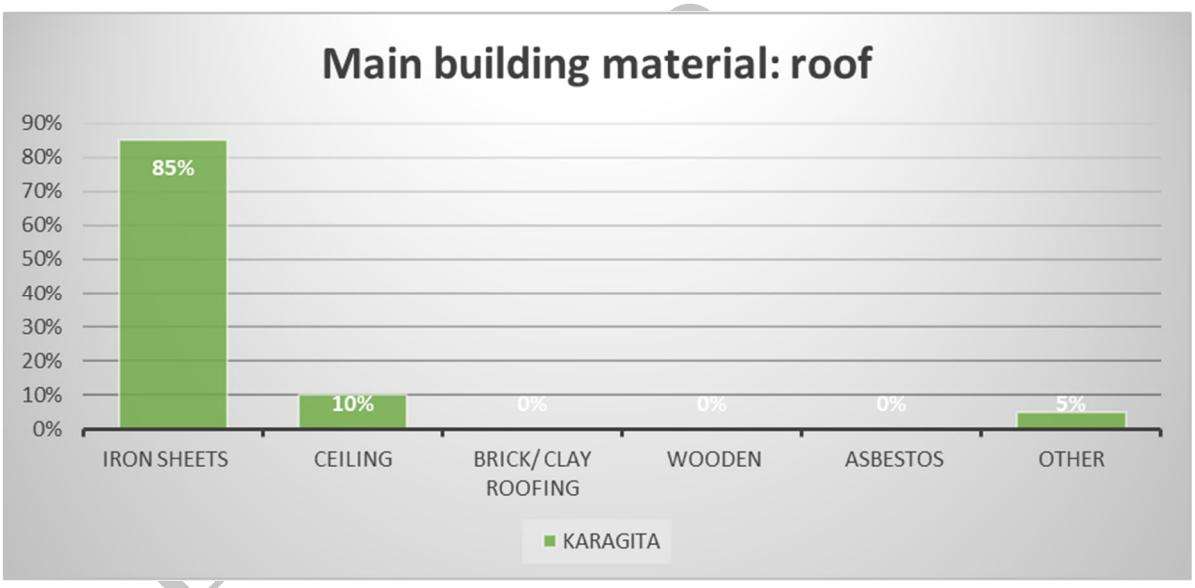


Figure 4-2: House roofing materials for Karagita informal settlement

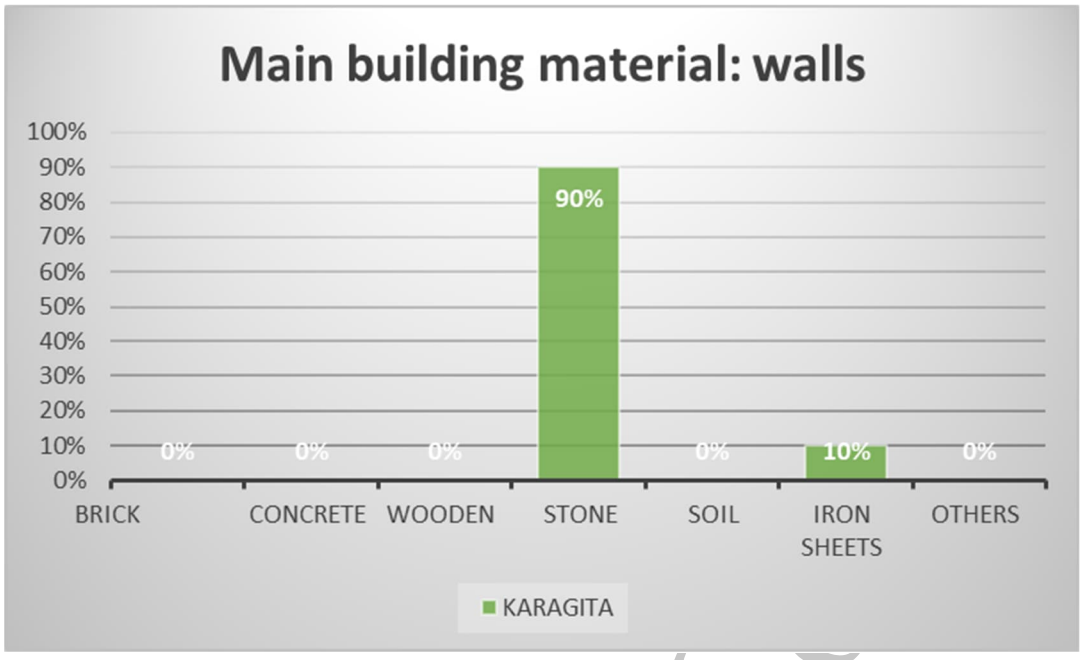


Figure 4-3: Structure material used for Karagita informal settlement

4.4.3. Land Use

Land is the main source of livelihood for many people in Nakuru County. All socio-economic activities depend largely on land hence, rights of land ownership and land use are critical in influencing growth in all sectors.

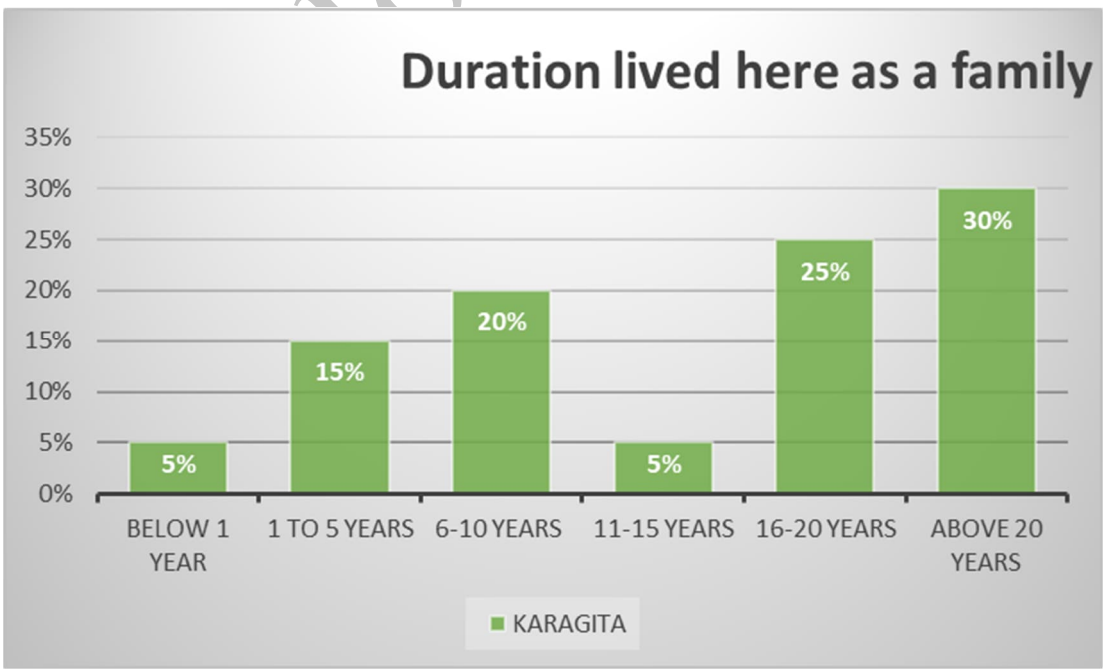


Figure 4-4: Land ownership duration in Karagita informal settlement

In Karagita, land ownership is complex and informal, often lacking proper documentation and legal recognition. It's not uncommon for informal settlements to have issues related to land tenure, where residents might not have formal title deeds or legal ownership of the land they inhabit.

Karagiga is characterised under the Management zone VII: Urban and settlement Zone. The zone is important for housing, communication , trade and development. Sustainable land use practices are permited although you need to abide by all legislations requiring duty of care for the environment.

4.4.4. Energy Access

Electricity is the main source of energy for lighting in the County at 55.4 percent whereas firewood and charcoal are the major sources of energy for cooking at 42.6 percent and 30.7 percent respectively (KIHBS 2015-16). Electricity coverage in the County stands at 80 percent with most of these connections in urban areas. Other renewable sources like wind, solar and biogas account for less than 3 percent.

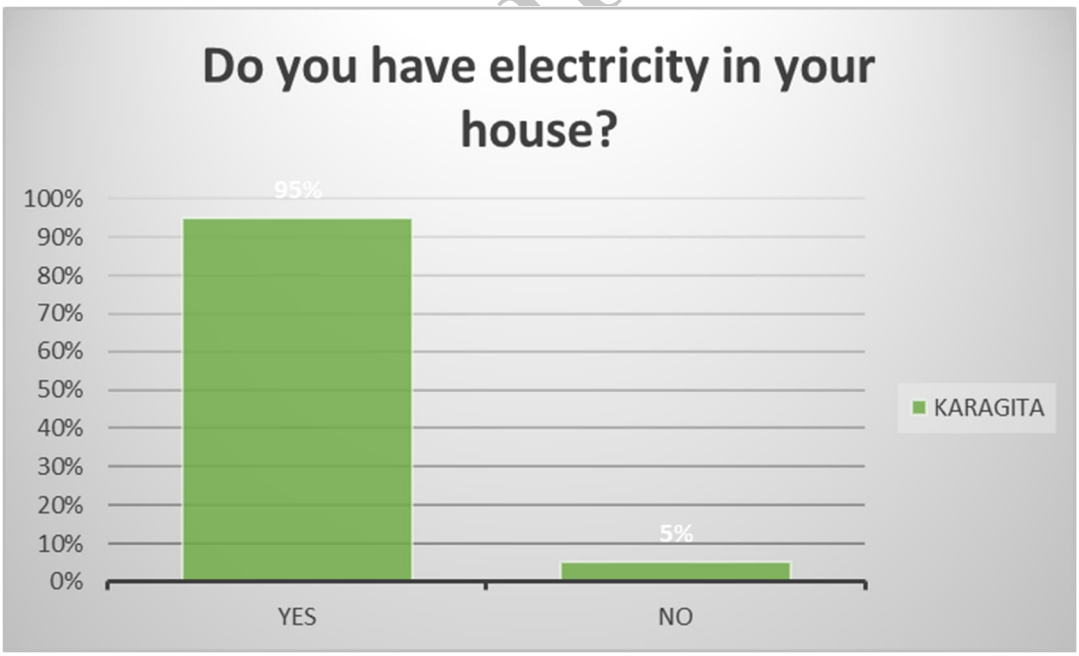


Figure 4-5: Electricity access in Karagita informal settlement

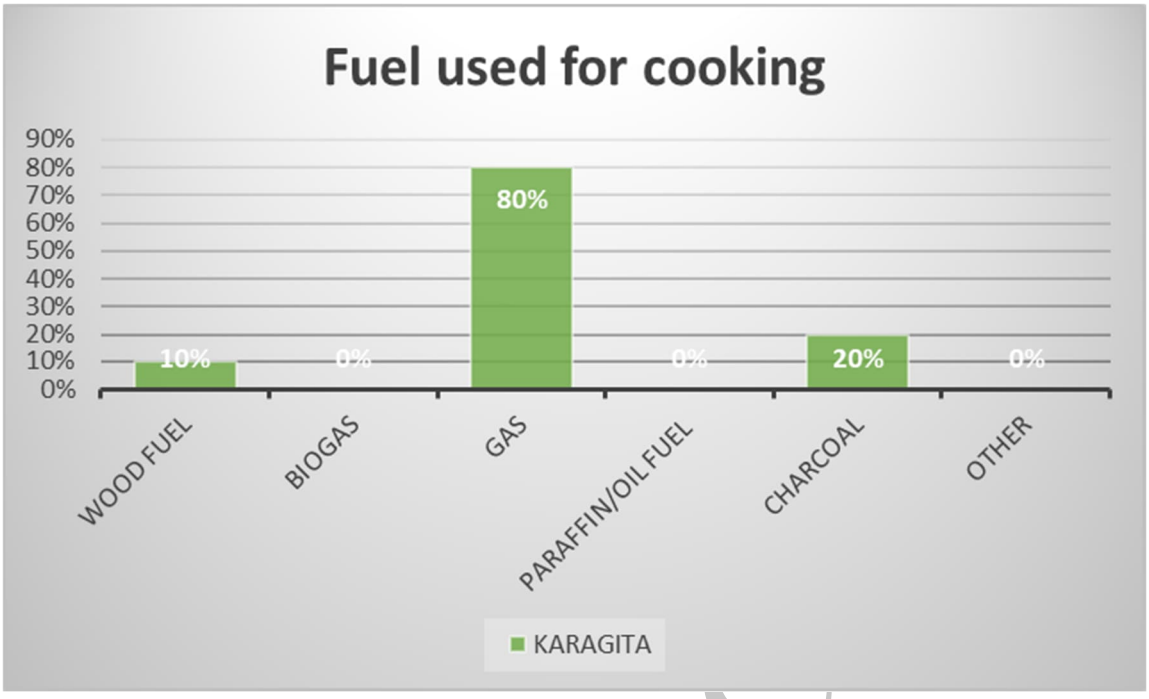


Figure 4-6: Types of fuel used in Karagita informal settlement

4.4.5. Water & Sanitation

Nakuru County is supplied with water by various schemes. These include; public water companies, community water supply schemes and private water vendors. The County department of Water estimates 63 percent of the population in Nakuru County have access to improved treated water which is either piped, rain water, borehole, protected well and protected spring. The 49.5 percent of HH access piped water although the highest percentage is among the urban dwellers.

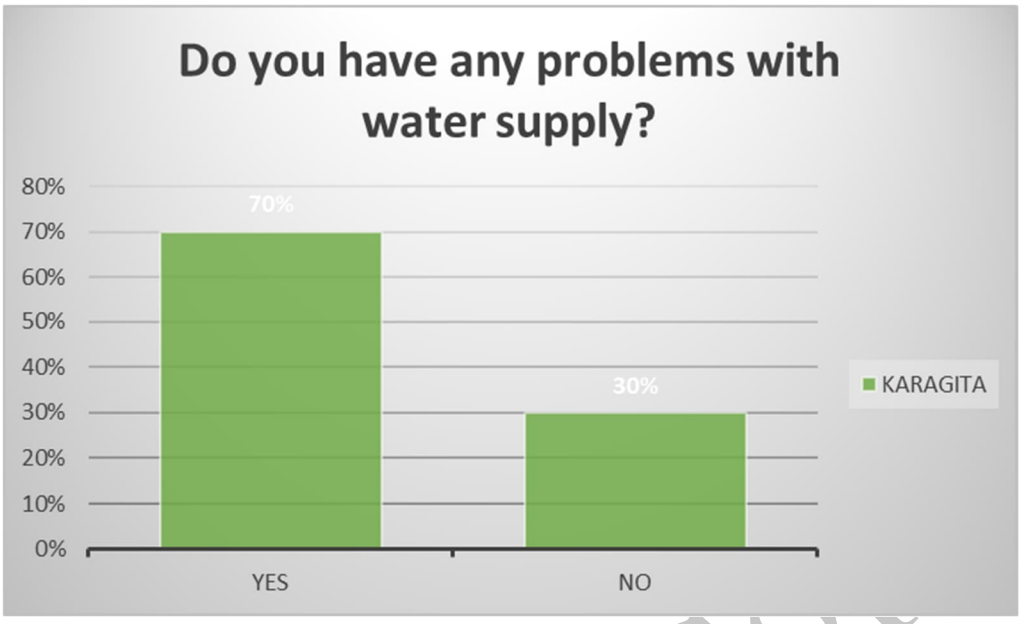


Figure 4-7: Water supply access in Karagita informal settlement

According to KIHBS 2015-16 most of the residents of Nakuru County dispose human waste through pit latrine which are covered which is at 76.9 percent. Only 15.3 percent of the HH are connected to the main sewer. However, the number of HH with a place for hand washing near the toilet facility is at 18.6 percent. This poses a great danger that can lead to outbreak of water borne diseases.

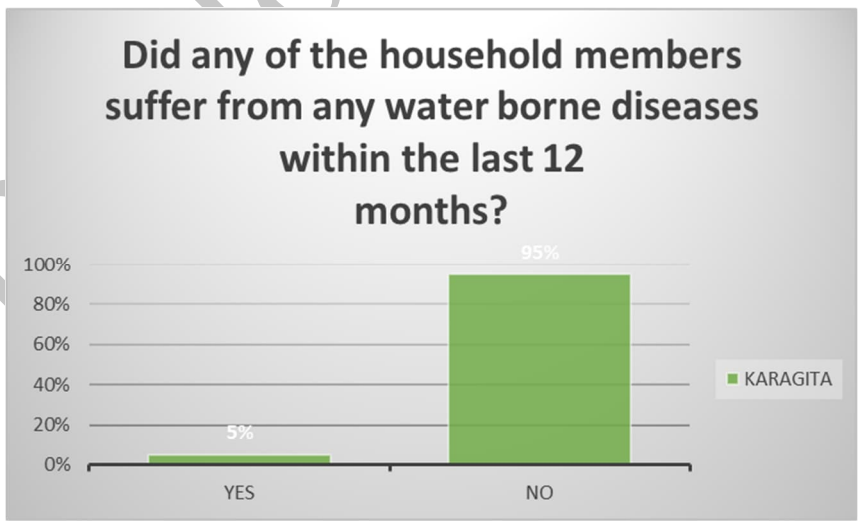


Figure 4-8: Waterborne disease outbreak in Karagita informal settlement

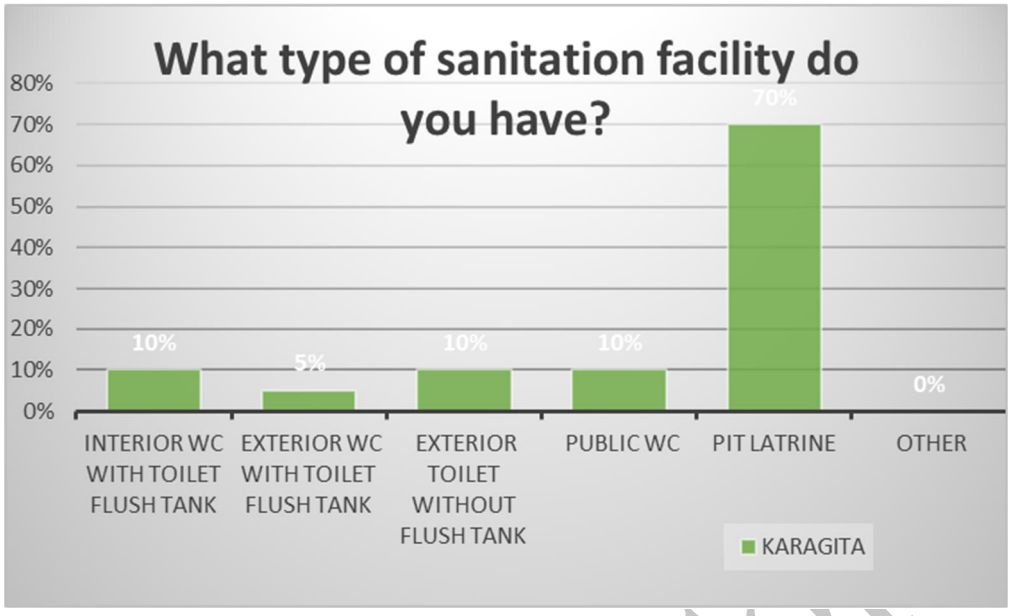


Figure 4-9: Sanitation Facilities in Karagita informal settlement

4.4.6. Health Services

Among many health centers within and without but nearest to Karagita settlement are Naivasha Sub-County Hospital, The Karen Hospital Naivasha, Nairobi Women Hospital (Naivasha Branch)and small private and public health centers within the settlement.

Within Karagita also there is Naivasha Quality Health Care Services LTD (Karagita) which is a Private Practice – Nurse / Midwifery medical clinic located in Hellsgate (Karagita Centre, Located Near The Bus Stage Near Petro Station) Naivasha in Nakuru County. As of 2021, the facility was fully operational with a capacity of 15 beds. It is regulated by Nursing Council of Kenya (Private Practice) under registration number 23080.

The services offered by hospitals include but not limited to;

- ✓ TT toxoid for Pregnant Women
- ✓ Short Term Family Planning Services
- ✓ EMTCT-Elimination of Mother to Child Transmission of HIV
- ✓ Postnatal care services
- ✓ Outpatient Curative Services
- ✓ Natural Family Planning Services
- ✓ Long Term Family Planning Services
- ✓ Integrated Child Immunization
- ✓ Inpatient
- ✓ HIV Testing Services

- ✓ Focused Antenatal Care
- ✓ Condom Distribution & STI Prevention
- ✓ Class A Laboratory Services
- ✓ Basic Obstetric Care (BMOC)

The above activities are offered by almost all the hospitals described above.

4.5. Target Settlements Assessment

KISIP II target upgrading of infrastructure in Karagita in Naivasha. Detailed assessment of the settlement is presented in sub chapters below.

4.5.1. Karagita Informal Settlement

See photo plate 3-4below.

Figure 4-10: Photos of Karagita Informal Settlement

Footpath

Water Infrastructure in the area

Road Infrastructure in the area

Situation of trader kiosks

4.6. Water Quality in Naivasha boreholes;

Water quality Analysis was carried out for the boreholes in Kihoto and that in Police Line. The results show that Police line boreholes has all the parameters ranging below the maxmum

required levels by the NEMA standards/World Health organization Standards apart from fluorides that has a value of 7.84mg/l against the required standard of 1.5mg/l.

The same applies to Kihoto borehole whose fluorine is at 6.4mg/l against the required standard of 1.5mg/l. With this high level of fluorine in water supply, it will lead to fluorosis a situation of browning of teeth to the people consuming the water. This necessitates the building of 2 de-fluoridation units to treat the water to the required standard. This will protect the people from the browning of teeth that can be a social problem due to body shaming incidences that might happen. The detailed water quality results are provided as the last attachment of the report.

CHAPTER 5. POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

5.1. Introduction

Kenya Government has a wide range of policy, institutional and legislative framework to address the major causes of environmental degradation on ecosystems emanating from industrial and economic development programmers. However, they are spread over several sectors. In spite of this, the Kenya legal and institutional framework is currently undergoing several changes to be aligned with the requirement of the new constitution. The literature reviewed in this section puts into consideration the anticipated changes and the current laws that govern natural resource sharing, management, utilization and protection. The review also covered policies that seeks to address social attributes in the society.

5.2. Legal framework

5.2.1. Kenyan Legislations

5.2.1.1. The Constitution of Kenya, 2010

Environmental management and natural resources utilization is enshrined in the Kenya constitution 2010 under several articles. The constitution in article 42 emphasizes the need for a clean and healthy environment through management of substances that may pollute the environment or cause harm to human health. The right to a clean environment is further enforced by article 70. Article 186 and the fourth schedule allocate functions of natural resources management and environmental protection to both the national and county governments. In article 2 of the fourth schedule, the national government governs the use of international waters and water resources. The national government is required to protect the environment and natural resources with a view of establishing a durable and sustainable system as stated in article 22 of the fourth schedule.

The county government on the other hand shall Control air pollution, noise pollution and other public nuisances as stipulated in article 3 of the fourth schedule and in article 10, the county government shall implement specific National government policies on natural resources and environmental conservation. Some of the development impacts will be a concern to the County Government hence need for collaboration between Client, the contractor and the County government of Nakuru

The principles of land policy that ensure land is held, used and managed in a manner that is equitable, efficient, productive and sustainable is set out in article 60 of the constitution. MWS&I intend to relocate and upgrade the roads/sewer network within the project areas. Proper land management by regulating the use of any land, or any interest in or right over any land, in the interest of defending, public safety, public order, public morality, public health, or land use planning is ensured by the constitution in article 66.

In regard to environmental protection and natural resources management, article 62 sub-article 1 stipulates what constitutes public land. These include water courses and high flood areas that are common in the project area. The public land areas are held by the national government in trust for the people of Kenya and shall be administered on their behalf by the National Land Commission as stated in article 62 sub-article 3. The land commission shall also monitor and have oversight responsibilities over land use planning throughout the country regardless of the classification as stated in article 67-2(h).

The relevance/applicability of this reviewed frameworks (policies, Acts and regulations).
Since this proposed project will utilize natural resources in the settlements and also enhance land use in a manner that is equitable, efficient, productive and sustainable, this framework duly applies.

5.2.1.2. Vision 2030

Vision 2030 is a government development strategy that is aimed at steering Kenya to a middle income country by the year 2030. It is based on the 3 pillars of political, social and economic advancement and it aims to create a society in which every citizen enjoys a happy fulfilling lifestyle complemented by a standard of living which provides a safe and secure environment for families, and access to world class health care and education.

The relevance/applicability of this reviewed frameworks (policies, Acts and regulations).
This economic pillar seeks to improve the prosperity of all Kenyans through an economic development programme (where KISIP II falls), covering all the regions of Kenya.

5.2.1.3. Kenya Environmental Sanitation and Hygiene Policy (2016– 2030)

The Kenya Environmental Sanitation and Hygiene Policy 2016-2030 is the outcome of reviews to address limitations of the National Environmental Sanitation and Hygiene Policy published

in 2007. The policy commits the Government of the Republic of Kenya at both National and County levels to pursuing a robust strategy that will not only enable all Kenyans to enjoy their right to highest attainable standards of sanitation but also to a clean and healthy environment as guaranteed by the Constitution of Kenya 2010. The policy therefore focuses on a range of complementary strategies devoted to ensuring universal access to improved sanitation and clean and healthy environment.

The relevance/applicability of this reviewed frameworks (policies, Acts and regulations).
The KISIP II project falls into the agenda of this policy in the quest to provide improved sanitation facilities.

Gender Policy (2011)

This policy spells out an approach of Gender mainstreaming and empowerment of women and clearly states that it is the right of women, men, girls and boys to participate in and benefit equally from the development process. It provides a framework for mainstreaming gender in all policies, planning and programming in Kenya and puts in place institutional mechanisms to ensure effective implementation. The need for a national policy arose from the government's realisation that without a coherent and comprehensive overall framework for guiding gender mainstreaming within the different sectors and line ministries involved in development, enormous resources may continue to be misplaced.

The relevance/applicability of this reviewed frameworks (policies, Acts and regulations).
In implementing KISIP II, The Client is hereby mandated to ensure compliance to the requirements of this policy during labour force mobilization.

Factories and Other Places of Work (Noise Prevention and Control) Rules 2005

The rules stipulate that:

A. No worker (*a person who has entered into or works under a contract of service or apprenticeship, written or oral, express or implied, whether by way of manual labour or otherwise)* shall be exposed to noise level in excess of the;
    - continuous equivalent of ninety dB (A) in eight hours within any twenty-four hours' duration.
    - one hundred and forty dB(A) peak sound level at any given time.

B. Where noise is intermittent, noise exposure shall not exceed the sum of the partial noise exposure equivalent continuous sound level of ninety dB (A) in eight hours' duration within any twenty-four hours' duration. (4) It shall be the duty of the occupier to ensure that noise transmitted from the workplace to the community shall not exceed fifty-five dB (A) during daytime and forty-five dB (A) at night time.

The relevance / applicability of this reviewed frameworks (policies, Acts and regulations).
In implementing KISIP II, The Client shall ensure that all contractors comply fully to the requirements of these rules as well as during Operation and Maintenance(O&M).

5.2.2. Environmental Legal Framework

Environment Management & Coordination Act, 1999 reviewed 2015).

According to the Environmental Management and Coordination Act [EMCA] 1999 Part VI Section 58(1), any person, being a proponent of a project, shall, before financing, commencing, proceeding with, carrying out, executing, conducting or causing to be financed, commenced, proceeded with, carried out, executed or conducted by another person any undertaking specified in the Second Schedule to this Act, submit a Summary project report in form of ESIA to the Authority, in the prescribed form, giving the prescribed information and which shall be accompanied by the prescribed fee. *This therefore justifies the reason why KISIP II has carried out ESIA report Being presented as a Summary Project Report*.

In spite of this, Part III of EMCA, 1999 established subsidiary Regulations to guide proper management and utilization of natural resources in order to achieve sustainable development. Some of the regulations include but are not limited to the following.

The Environmental (Impact Assessment and Audit) PART II Regulations, 2003.

The environmental impact assessment guidelines, Part II requires that a study be conducted in accordance with the issues and general guidelines spelt out in the second and third schedules of the regulations. These include coverage of the issues on schedule 2 (ecological, social, landscape, land use and water considerations) and general guidelines on schedule 3 (impacts and their sources, project details, national legislation, mitigation measures, a management plan and environmental auditing schedules and procedures. The Act further

stipulates that No licensing authority under any law in force in Kenya shall issue a license for any development project for which an environmental impact assessment is required under the Act unless the applicant produces to the licensing authority a license of environmental impact assessment issued by the NEMA.

The relevance/applicability of this reviewed frameworks (policies, Acts and regulations).
It is in this spirit that the Client initiated the development of this Comprehensive Project Report.

The Environmental Management and Co-ordination (wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations, 2009

The regulations provide for the conservation and sustainable use of wetlands and their Resources. It further in part III provides for the sustainable utilization and conservation of resources on river banks, lake shores, and on the seashore by and for the benefit of the people and community living in such areas. To achieve the intended aim, the regulations enshrine community participation in the management of such designated riparian resources to prevent pollution and siltation. The wetlands, River Banks, Lake Shores and Sea Shore Management Regulations in part II and III has set principles that should be adhered to, to manage wetlands and that EIA/EA is mandatory for all Activities that are likely to affect the wetlands.

The minister (now Cabinet secretary under the new constitution) for environment can declare an area a protected wetland depending on its significance. Therefore, Activities in such a protected area will be controlled in accordance to such wetland's management plan.

NEMA for that matter in consultation with other lead agencies is obligated to develop a wetland management inventory nationally. But regardless of the ownership of the wetland, the regulations stipulate that the land owner or users have an obligation to observe the integrity of the wetland. The regulations further in part III articulate that special measures should be taken to prevent soil erosion siltation and pollution for management of river banks, lake shores and sea shore.

The relevance/applicability of this reviewed frameworks (policies, Acts and regulations).
The regulations are relevant to the improvement project as it is anticipated that the roads and sewer

networks within the project area may affect the rivers within the project and there is need to establish a balance between conservation and sustainable utilization.

Water Quality Management Regulations, 2006 (Legal Notice No. 120)

In accordance with the regulations, every person shall refrain from Acts that could directly or indirectly cause immediate or subsequent water pollution and no one should throw or cause to flow into water resources any materials such as to contaminate the water. The regulation also provides for protection of springs, streams and other water sources from pollution. The rules further provide standards for different water uses including domestic and agricultural water sources. The regulations were drawn from several articles of the Environmental Management and Coordination Act 1999. Cap. 387 provide rules relative to the use and discharge of water for domestic, agricultural and industrial purposes, make provision for the protection of water resources from pollution and define water quality standards whereas the Third Schedule of these Regulations provide standards for effluent discharge to the environment. Such article includes but not limited to; Part VIII article 72 of the Act prohibits discharging or applying poisonous, toxic, noxious or obstructing matter, radioactive or any other pollutants into aquatic environment. Article 73 states that operators of projects which discharges effluent or other pollutants into the environment to submit to NEMA accurate information about the quantity and quality of the effluent. Article 74 on the other hand stipulates that all effluent generated from point sources be discharged only into the existing sewerage system upon issuance of prescribed permit from the local authorities or from the licensee. Whereas article 75 requires that parties operating a waste water system obtain a discharge license from NEMA to discharge any effluent or pollutant into the environment.

Water Quality Regulations apply to water used for domestic, industrial, agricultural and recreational purposes; water used for fisheries and wildlife purposes; and water used for any other purposes. Different standards apply to different uses. These regulations provide for the protection of lakes, rivers, streams springs, wells and other sources. The overriding objective of the regulations is to protect human health and the environment. Proper enforcement of the regulations can lead to marked reduction in water-borne diseases. The regulations provide guidelines and standards for the discharge of poisons, toxins, radioactive and other pollutants into the aquatic environment. Standards have also been set for discharge of effluent into the

sewer and aquatic environment. The National Environment Management Authority regulates discharge into the aquatic environment.

The First and the Ninth Schedule of the Regulations stipulates standards for sources of domestic water supply and irrigation water respectively. Persons (real or legal) discharging effluent into the environment are required to submit quarterly discharge monitoring records to NEMA.

Table 5-1: Quality Standards For Sources Of Domestic Water

Parameter	**Guide Value (max allowable)**
pH	6.5 – 8.5
Suspended solids	30 (mg/L)
Nitrate-NO_3	10 (mg/L)
Ammonia –NH_3	0.5 (mg/L)
Nitrite –NO_2	3 (mg/L)
Total Dissolved Solids	1200 (mg/L)
Scientific name *(E.coli)*	Nil/100 ml
Fluoride	1.5 (mg/L)
Phenols	Nil (mg/L)
Arsenic	0.01 (mg/L)
Cadmium	0.01 (mg/L)
Lead	0.05 (mg/L)
Selenium	0.01 (mg/L)
Copper	0.05 (mg/L)
Zinc	1.5 (mg/L)
Alkyl benzyl sulphonates	0.5 (mg/L)
Permanganate value (PV)	1.0 (mg/L)

Nil means less than limit of detection using prescribed sampling and analytical methods and equipment as determined by the Authority.

The relevance/applicability of this reviewed frameworks (policies, Acts and regulations).

It is anticipated that the sub-projects will generate waste water construction and operation phase whose quality should be monitored by the relevant institutions in collaboration with the project proponent and local communities, the monitoring will be done depending on where the effluent shall be discharged or how it will be used.

In addition, it is anticipated that the project will treat water to the required standards for drinking by the World Health organization as shown in table 5-1 above.

Waste Management Regulations, 2006 (Legal Notice No. 121)

In article 87 section 1of the Environmental Management and Coordination Act 1999, no person shall discharge or dispose of any wastes, whether generated within or outside Kenya, in such a manner as to cause pollution to the environment or ill health to any person. There is need for one to acquire a license for generation, transporting or operating waste disposal facility as is provided for in article 88. Article 90 through to 100 outlines more regulations on management of hazardous and toxic substances including oils, chemicals and pesticides. Under the regulations, a waste generator is defined as any person whose activities produces waste while waste management is the administration or operation used in handling, packaging, treatment, conditioning, storage and disposal of waste. The regulations require a waste generator to collect, segregate and dispose each category of waste in such manners and facilities as provided by relevant authorities. Regarding transportation, licensed persons shall operate transportation vehicles to be approved by NEMA and will collect waste from designated areas and deliver to designated disposal sites. Waste segregation facilities are approved by the Nairobi City County Government).

The relevance/applicability of this reviewed frameworks (policies, Acts and regulations).
It is expected that waste generating Activities will result during project implementation, operation and decommissioning of the project under consideration and that such waste should be handled according to set regulations.

Noise and Excessive Vibration Pollution Control Regulations, 2009

These regulations were published as legal Notice No. 61 being a subsidiary legislation to the Environmental Management and Co-ordination Act, 1999. The regulations provide information on the following:

- Prohibition of excessive noise and vibration;
- Provisions relating to noise from certain sources;
- Provisions relating to licensing procedures for certain activities with a potential of emitting excessive noise and / or vibrations; and
- Noise and excessive vibrations mapping.

Regulation 4 prohibits any person to (a) make or cause to be made excessive vibrations that annoy, disturb, injure, or endanger the comfort, repose, health, or safety of others and the environment; or (b) cause to be made excessive vibrations that exceed 0.5 centimetres per

second beyond any source property boundary or 30 metres from any moving source. During the project implementation, the following table 5-2 shows the maximum noise levels permited within the project area as a result of project activities.

Table 5-2: Noise Level Permitted

	Facility	Maximum Noise Level Permitted in Decibels	
		Day	Night
1.	Health facilities, educational institutions, homes for disabled etc.	60	35
2.	Residential areas	60	35
3.	Areas other than 1 and 2 above	75	65

Regulation 5 further makes it an offence for any person to make, continue or cause to be made or continued any noise in excess of the noise levels set in the First Schedule to these Regulations, unless such noise is reasonably necessary to the preservation of life, health, safety or property. The First and Second schedules of the regulations have set standards for maximum permissible noise levels at construction sites and intrusive noise levels respectively.

Part II section 3(I) of these Regulations states that: no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment. Section 3(2) states that in determining whether noise is loud, unreasonable, unnecessary or unusual, the following factors may be considered;

i) Time of the day,
ii) Proximity to residential area,
iii) Whether the noise is recurrent, intermittent or constant,
iv) The level and intensity of the noise,
v) Whether the noise has been enhanced in level or range by any type of electronic or mechanical means, and
vi) Whether the noise can be controlled without much effort or expense to the person making the noise.

Part II Section 4 states that: except as otherwise provided in these Regulations, no person shall

a) make or cause to be made excessive vibrations which annoy, disturb, injure or endanger the comfort, repose, health or safety of others and the environment; or

b) cause to be made excessive vibrations which exceed 0.5 centimetres per second beyond any source property boundary or 30 metres from any moving source.

Part III, Section 11(1) states that any person wishing to (a) operate or repair any machinery, motor vehicle, construction equipment or other equipment, pump, fan, air-conditioning apparatus or similar mechanical device; or (b) engage in any commercial or industrial Activity, which is likely to emit noise or excessive vibrations shall carry out the Activity or Activities within the relevant levels prescribed in the First Schedule to these Regulations. Any person who contravenes this Regulation commits an offence.

Section 13(1) states that except for the purposes specified in sub-Regulation (2) hereunder, no person shall operate construction equipment (including but not limited to any pile driver, steam shovel, pneumatic hammer, derrick or steam or electric hoist) or perform any outside construction or repair work so as to emit noise in excess of the permissible levels as set out in the Second Schedule to these Regulations. The second Schedule provides the standards for maximum permissible noise levels for constructions sites. These purposes include emergencies, those of a domestic nature and /or public utility construction.

The relevance/applicability of this reviewed frameworks (policies, Acts and regulations).
It is expected that the regulations will be relevant to the project during implementation and constructions works or decommissioning phase where construction machinery and vehicles involved will lead to emission of noise and vibrations. The noise shall not go beyond the required nose levels set out by NEMA.

Land Act, 2012

Land in Kenya is classified as either public, private or community land. One can acquire certificate of title to land through allocation, adjudication, compulsory acquisition, transfers, transmission or lease exceeding twenty-one years. The Act further guarantees equal recognition and enforcement of land rights regardless of the type of tenure whether freehold or lease hold.

Access to land and use on the other hand plays a role in environmental management and sustainability. In recognition of this, the land commission has the obligation under the Act in section 19 to conserve land based natural resources. The commission is supposed to identify

ecologically sensitive area that has endangered or endemic species of flora and fauna, demarcate to prevent environmental degradation or climate change (section 11). In addition, the cabinet secretary ensures quality control through regulation of service providers. However, the Act is not clear on land use or management practices that are deleterious to the environment.

The commission can acquire land for public purpose or interests where need be as stipulated by the Act in part VIII. In the event of such acquisition, a just compensation is to be paid to persons with interest in the land. The Act further articulates the procedure to be followed by any party with interest in the land before compensation is paid. Any person with dispute over land matters or is not satisfied by the process of land acquisition can seek redress from the land and environment court. The court is constituted with exclusive jurisdiction to hear and determine disputes, Actions and proceedings related to land issues.

If need be, the commission has a power to create public right of way under section 143 and any institution or person has a right to execute any works, installation or structure on such way leave. For such away leave to be granted, an application can be done by state department, county government, public authority or cooperate bodies as stipulated in section 144. Section 129 gives the commission or any authorized person aright of entry to any land whereas anyone who obstructs such an officer commits an offence under the Act as articulated in section 130. The courts have power to enforce public right of way as stipulated in section 149 of the Act. However, section one 148 stipulates that compensation should be paid for the use of such a land to the lawful owner or occupier. The compensation shall be paid from a land compensation fund established under section 153. It is prohibited under the Act in section 156 for a person to wrongfully obstruct or encroach on any public right of way. In the event of such a breach, the commission can seek redress from the court.

The relevance/applicability of this reviewed frameworks (policies, Acts and regulations).

The sites of this project mostly fall on the utilities way leaves which are majorly encroached by the locals and the Client will embark on the reclamation/displacement process on need basis.

Physical and Land Use Planning Act, 2019; Section 91 Part III (Miscellaneous Provisions)

This Act makes provision for development control. The Local governments (now County

Governments) are empowered under section 29 of the Act to reserve and maintain all land planned for open spaces, parks, urban forests and green belts. The same section, therefore allows for the prohibition or control of the use and development of land and buildings in the interest of proper and orderly development of an area. In the development of any land, approval must be obtained from the relevant authority. Section 30 states that any person who carries out development without development permission will be required to restore the land to its original condition. It also states that no other licensing authority shall grant license for commercial or industrial use or occupation of any building without a development permission granted by the respective local authority.

Finally, section 36 states that if in connection with a development application, local authority is of the opinion that the proposed development Activity will have injurious impact on the environment, the application shall be required to submit together with the application an environment impact assessment EIA report. EMCA echoes the same by requiring that such an EIA is approved by NEMA and should be followed by annual environmental audits.

The relevance/applicability of this reviewed frameworks (policies, Acts and regulations).
In compliance to this regulation, the Client intuited this ESIA process.

<u>The Physical and Land Use Planning (Local Physical and Land Use Development Plan) Regulations, 2021.</u>

The Regulations provide for repurposing of land through "densification of use" which has been defined as a deliberate planning process to change and enhance the land carrying capacity in terms of population and user activities. This has been necessitated by the increase in population and consequent increase in demand for housing, utilities and services. Pursuant to this, old estates may be repurposed to high rise buildings to meet the ever increasing demand for housing especially in urban areas. By repurposing land, planning authorities may take a proactive role in meeting the objectives of development control such as promoting public health and safety.

The relevance/applicability of this reviewed frameworks (policies, Acts and regulations). Since KISIP II is an improvement project, these regulations duly apply to serve the areas that are planned to be mixed use i.e. commercial and residential areas.

5.2.3. County Government Act, 2012

The Kenya constitution 2010 provides for two tier government levels. Local area planning and development will be controlled at county government level. The county government Act provides local governance principles, guide planning and development process as well as community participation. Section 5 of the Act stipulates the functions of the county governments as provided for in the constitution.

The Act in part VIII on the other hand indicates the significance of community participation in decision making. It articulates how the local people can be involved in the management of the county government affairs and decision-making process. In Part IX and X, the Act compels the county governments to provide adequate information and public civic education as a way of capacity building to ensure meaningful participation.

To ensure integrated and sustainable development at both national and county government level, the Act in part XI states the principles of county planning and development process. Section 102 in particular outlines the principles of planning and development facilitation in the county. One of the objectives of county planning is to harmonize between national, county and sub-county spatial planning requirements as stated in section 103(a) of the Act. Section 104 in subsection 2 on the other hand states that such planning framework should integrate economic, physical, social, environmental and spatial planning.

The county planning unit is responsible of coordinating all integrated development plans within the county. However, Counties are required to prepare a five-year integrated development plan as stipulated in section 108. Such plans will be informed by among other things, all known projects, plans and programs to be implemented within the county by any organ of state (Section 108, (2b) iii). Therefore, the project proponent should liaise with the county planning unit during project implementation process to ensure the project is in line with the goals and objectives of the integrated development plan.

The relevance/applicability of this reviewed frameworks (policies, Acts and regulations).

The Client shall ensure all designs and bills of quantities are reviewed and approved by the relevant county government's physical planning unit to ensure total compliance.

5.2.4. The Occupational Safety and Health Act, 2007

The Act applies to all workplaces whether temporarily or permanently with an aim of securing safety, health and welfare of persons at work and non-workers. During project implementation, operation and decommissioning stages, the safety of people who will be hired or in constant interaction within the working area need to be ensured. The project proponent and the contractors will guarantee safety within the project area at different stages of the project cycle. The project proponent in consultation with the contractors are required to prepare a safety and health policy statement with respect to safety and health at work places of workers and any other person in the vicinity (section 7). In the event that there will be more than twenty employees at site, the project proponent or contractor should establish a safety and health committee at the workplace. In spite of this, workers on the other hand are responsible of their own safety and should bring to the attention of the person in charge any dangerous situation. Regular auditing of the workplace should also be done annually to establish the state of health and safety at site.

The Act requires that all workplaces must be registered with the director. Occupational health and safety officer on notification has power at any time to enter examine or inspect a workplace. Safety of workers therefore should be ensured at all-time including using personal protective gears. People will be hired during project implementation, operation and decommissioning stages and their safety should be ensured according to the provisions of this Act. However, it is sometimes challenging to monitor implementation of safety at workplaces and most often steps are taken after an incident.

The relevance/applicability of this reviewed frameworks (policies, Acts and regulations).

The Client shall ensure the Contractor(s) on site acquire all necessary insurance policies and conduct all requited EHS statutory trainings to curb related injuries, damages and losses.

5.2.5. The Water Act, 2016

This Act provides the guidelines for proper management of water, conservation and control

of water resources to ensure the water resources are sustainable. Under this Act waste water, storm water, sewage systems and drainages are supposed to be put in design drawings in the building plan of the project components; This Act also prohibits water pollution by a developer in his/her area of jurisdiction.

Since the project will involve construction of roads and sewer lines with diverse components, the proponent will ensure appropriate measures to prevent pollution of underground and surface water resources are implemented throughout the project cycle.

The relevance/applicability of this reviewed frameworks (policies, Acts and regulations). The proponent shall also seek the necessary approvals of sources of water supply to the proposed project site throughout the project cycle.

5.2.6. The Children (Amendment) Bill 2020.

The Bill seeks to vest equal responsibility for parental care and protection of a child in both the mother and the father whether they are married to each other or not. The Bill further provides that neither the mother or the father has superior rights or claim against the other in the exercise of the parental responsibility.

The relevance/applicability of this reviewed frameworks (policies, Acts and regulations). The Bill shall apply if by any chance an employee during the construction phase bares a child as a result of SH, SEA or any other form of relationship and tries to abscond the parental responsibility.

5.2.7. Kenya Roads Act, 2007

The Act in section 9 and 10 mandates Kenya Urban Roads Authority (KURA),Kenya Rural Roads Authority(KeRRA) and Kenya National Highways Authority (KeNHA) to manage roads in Kenya with Kenya Wildlife Services(KWS) managing park roads. Currently, the county Governments are also mandaded to maintain their roads. The roads to be implemented are all under the Nairobi City County Government and there was need for consultations with NCCG to ensure that the standards of the roads to be developed meet the requirements and also and during operation they will be managed by the same authority.

5.2.8. The Environmental Management and Coordination (Air Quality) Regulations, 2014

The objective of this regulation is to prevent, control and abate air pollution to ensure clean and healthy ambient air. It provides for the establishment of emission standards for various sources, including mobile sources such as vehicles. Regulation 5 (1) prohibits the contractor from acting in a way that directly or indirectly causes or may cause air pollution to exceed levels set out in the Second Schedule to the Regulations. Regulation 11 provides that the contractor shall not cause pollution in a controlled area as listed under the Sixth Schedule to exceed the limits stipulated under the First Schedule. It provides guidelines on mobile emission control as stipulated in the twelfth schedule on "Acceptable Mobile Emission Control Technologies".

Relevance: The contractor shall limit the trips of vehicles on the road and ensure stockpiling or storage of material is done in a manner likely not to cause air pollution. Vehicles will also be well maintained to reduce emissions while water spraying while working in dry areas will reduce the dust menace.

5.2.9. Children Act, 2022

This Act of Parliament makes provision for parental responsibility, fostering, adoption, custody, maintenance, guardianship, care, and protection of children. It also makes provision for the administration of children's institutions and gives effect to the principles of the Convention on the Rights of the Child and the African Charter on the Rights and Welfare of the Child.

Relevance:

Contractors implementing the various Project will be required to comply with provisions of the Act during Project implementation. The contractor will develop and implement a Children Protection Strategy that will ensure minors are protected against negative impacts associated with the Project including SEA. All staff of the contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behaviour.

5.2.10. Eviction Wayleave and Rehabilitation Bill, 2014

The Bill though yet passed will provide for procedures for the evictions of unauthorized occupants from private or public land and the resettlement of displaced persons coerced or involuntary displaced. The Bill's main objective is to set out appropriate procedures applicable to eviction and resettlement, the bill also has outlined principles that are intended to guide the resettlement and eviction procedures including:

- every person shall be protected from arbitrary eviction;
- the persons, affected by an eviction should not suffer detriment to their human rights; human dignity, equity, social justice, discrimination, or marginalization.
- every person has the right to administrative action that is expeditious, efficient, reasonable, and procedurally fair

The bill gives power to the cabinet secretary based on the Environmental and Social Impact Assessment Report prepared, to prepare a plan for the resettlement of the affected persons after consultation with the representatives of the affected persons.

Relevance:

The Project route has been designed to entirely utilize road reserve which implies that no person shall claim ownership of land for the trunk sewer system and roads to be constructed. The bill together with reference to OP 4.12: Involuntary Resettlement: Land Acquisition, Population Displacement, and Compensation, shall be used as a reference during the implementation of the project in case sources of livelihood are impacted.

5.2.11. Employment and Labour Relations Court Act, 2011

This is an Act of parliament that applies to all employees employed under a contract of service. It determines disputes relating to employment and labour relations and for connected purposes.

Relevance:

The Contractor will need to understand all the requirements of the Act during employment such as ensuring that employees are of the right age, entitlement to leave, and protection from discrimination and sexual harassment among others.

5.2.12. Energy Act, 2019

PART VIII provided for energy efficiency and Conservation of energy resources. the Act provides that factories and buildings and energy appliances by types, quantities of energy use, or methods of energy utilization for purposes of energy efficiency and conservation, as provided by the act safe handling of petroleum used by plant and equipment on site will be emphasized. Requirements for dealing in energy handling including safety are enforced by the Energy and Petroleum Regulatory authority (EPRA). EPRA will be instrumental in licensing the bulk storage of petroleum on site where necessary.

Relevance: The contractor shall create awareness of energy conservation and management.

5.2.13. Climate Change Act, 2016

The Acts provide for a regulatory framework for enhanced response to climate change; provide mechanisms and measures to achieve low carbon climate development, and for connected purposes.

Relevance: Mitigation measures to reduce the release of greenhouse gases shall be adhered to. The contractor shall ensure that the vehicles are well maintained to avoid air pollution.

5.2.14. The Employment (Amendments) Act, 2022

The Act declares and defines the fundamental rights of employees, provides basic conditions of employment for employees, and regulates the employment of children. The act provides the basic minimum conditions for employment to include hours of work, water (for use at the place of work), food, and medical attention. It promotes equality of opportunity in employment to eliminate discrimination in employment.

Relevance: At the construction stage, the project contractor will hire both full-time and casual staff and the prevailing basic minimum conditions of employment will have to be observed. The contractor will ensure that persons of age are employed to prevent child labour.

5.2.15. Sustainable Waste Management Act (No. 31 of 2022)

This Act provides for the establishment of a legal and institutional framework for the sustainable management of waste; for ensuring the realization of the constitutional provision on the right to a clean and healthy environment and for connected purposes.

The Act identifies the following objectives: sustainable waste management promotion; improving the health of all Kenyans by ensuring a clean and healthy environment; reduction of air, land, fresh water and marine pollution; ensuring the delivery of waste service; creating an enabling environment for employment in the green economy in waste management, recycling and recovery; circular economy practices promotion; mainstreaming resource efficiency principles in sustainable consumption; improving responsible public behavior on waste and environment.

This act of Parliament is very relevant to the project since it echoes the project objective of ensuring clean and healthy environment to all. It will also provide guidance to the project by ensuring that all wastes generated during the project implementation phase is properly management.

5.2.16. Wildlife Conservation and Management Act, 2013.

It is an Act of Parliament to provide for the protection, conservation, sustainable use and management of wildlife in Kenya and for connected purposes. The Act applies to all wildlife resources on public, community and private land, and Kenya territorial waters.

The Wildlife Conservation and Management Act, 2013, primarily focuses on the conservation and management of Kenya's wildlife and their habitats. While its main purpose is not directly related to the improvement of informal settlements, The Act requires environmental impact assessments for projects near wildlife areas. This requirement ensures that the potential environmental impact of informal settlement improvement projects is thoroughly evaluated and mitigated, contributing to more sustainable development. The act is also meant to influence land-use planning in and around informal settlements, especially if they are located in areas with wildlife corridors or habitats.

The Act is not applicable as Karagita is already a built environment and doesn't lie in the category of national parks, protected areas or marine parks.

5.2.17. Work Injury Benefits Act (WIBA), 2007

This is an ACT of Parliament to provide for compensation to employees for work related injuries and diseases contracted in the course of their employment and for connected purposes.

Part 11 section 7 of the Act states that Every employer shall obtain and maintain an insurance policy, with an insurer approved by the Minister / Cabinet secretary in respect of any liability that the employer may incur under this Act to any of his employees.

Part III section 10 of the Act states that;

1) An employee who is involved in an accident resulting in the employee's disablement or death is subject to the provisions of this Act, and entitled to the benefits provided for under this Act
2) An employer is liable to pay compensation in accordance with the provisions of this Act to an employee injured while at work.
3) An employee is not entitled to compensation if an accident, not resulting in serious disablement or death, is The Work Injury Benefits Act, 2007 11 caused by the deliberate and wilful misconduct of the employee.

Part III section 18 of the Act state that any person who threatens an employee or in any manner compels or influences an employee to do something resulting in or directed at the deprivation of that employee's right to benefits in terms accordance with this Act commits an offence.

The relevance/applicability of this reviewed frameworks (policies, Acts and regulations).
This Act is relevant in the project in that the contractor shall require to insure his employees. Also the employees shall be entitled to compensation in case they get injuries at the sites or in case of death while on duty at work.

5.2.18. National Construction Authority Act, 2011

The National Construction Authority Act, 2011, in Kenya establishes the National Construction Authority (NCA) and provides a regulatory framework for the construction industry in the country.

The National Construction Authority Act, 2011, in Kenya is primarily focused on regulating the construction industry in the country. While its main purpose is not directly related to informal settlement improvement projects, it does have several relevant aspects and implications for such projects.

While the National Construction Authority Act, 2011, primarily governs the construction industry in Kenya, its provisions related to quality control, standards, licensing, and oversight will have a significant impact on the quality and safety of construction work in informal settlement improvement projects. Ensuring compliance with NCA regulations will help enhance the overall effectiveness and sustainability of these projects and improve the living conditions of residents in informal settlements.

5.2.19. Nakuru County Waste Management Policy, 2019

The Nakuru County Waste Management Policy, 2019 sets out the protocols and strategies for sustainable waste management in the county. It operationalizes the provisions of the Sustainable Waste Management Act (No. 31 of 2022) that provides for the establishment of a legal and institutional framework for the sustainable management of waste; for ensuring the realization of the constitutional provision on the right to a clean and healthy environment and for connected purposes.

The Nakuru County Waste Management Policy, 2019, is directly applicable and highly relevant to the improvement of informal settlements in Nakuru. It offers a comprehensive framework for addressing waste management issues, which are often acute in informal settlements. By aligning informal settlement improvement projects with the principles and strategies outlined in the policy, Nakuru County can significantly improve the living conditions and environmental sustainability of these settlements. It's essential to ensure that the policy's provisions are adapted to the specific needs and contexts of the informal settlements within the county.

5.2.20. Nakuru Countywide Strategic Sanitation Plan, 2019

The Nakuru Countywide Inclusive Sanitation Strategy includes all aspects of sanitation (sewered and on-site sanitation, drainage and solid waste) and applies to the entire geographic area of the county from rural to urban and including peri-urban; formal and

informal areas. The concept of Countywide Inclusive Sanitation builds on the principles of Citywide Inclusive Sanitation as defined by the World Bank and partners in their Call to Action.

The strategy provides guidance on how to achieve an end and helps us deal with uncertainty and changing conditions. It provides a sound framework for the development of a sanitation strategic investment plan and future projects with the aim of achieving sustainable and inclusive sanitation services for the whole county. The strategy applies to the whole sanitation sector in Nakuru, including all relevant departments and entities of the Nakuru County government.

KISIP II project in Nakuru is directly aligned to the Nakuru Countywide Inclusive Sanitation Strategy as is seeks to improve sanitation in the selected informal settlements within Nakuru by improving sewerage connection as wells as provision of water.

5.3. Legislations to Address Social Risks on the Project

The Table below summarises the legislations that address the social risks on the project.

Table 5-3: Legislations to address social risks

Name of Act	Application	Remarks/Applicability
The Prevention, Protection and Assistance to Internally Displaced Persons and Affected Communities Act,2012	Development projects is listed as one of the causes of displacement and is dependent on the public's interest in the development project. The act provides for the full identification of PAPs and their socio-economic background.	KISIP 11 is a development project that will displace people. The act provides for their input and feedback as well as facilitating them to protect them against loss of livelihood during the time of project implementation.
he HIV and AIDS Prevention and Control Act, 2006	This is an Act of Parliament to provide measures for the prevention, management, and control of HIV and AIDS, provide for the protection and promotion	The Contractor will make provision for Voluntary Counselling and Testing (VCT) services for

Name of Act	Application	Remarks/Applicability
	of public health and the appropriate treatment, counseling, support, and care of persons infected or at risk of HIV and AIDS infection, and for connected purposes.	employees and locals, as well as conduct training on HIV/AIDS awareness. This will go a long way in ensuring the reduced risk of a new infection, and stigmatization of those already infected as well as management during the construction period.
The Sexual Offences Act,2006	The Act applies in the; • Protection of vulnerable individuals. • Confidentiality and Privacy of reported cases of Sexual Harassment (SH) and Sexual Assault (SA) in the project's duration. • Access to support services through the formation of committees that deal with issues of SH and SA. • Sensitization and training • Creation of secure reporting mechanisms for SH and SA.	Provision of substantial and extensive openings to deal with matters surrounding SH and SA or related offences, in the duration of the project and in the implementation of the Resettlement Action Plan.
Matrimonial Property Act, 2022	Applies when a couple is due for compensation that there is fair and equitable distribution of this resources with the rights and interests of parties involved.	The PAP list does include married couples and the matrimonial property act is applicable.
Children's Act No. 29, 2022.	The act focuses on the rights, welfare and protection of children in Kenya. It also applies in the	The act ensures that the rights and welfare of children are protected and taken into

Name of Act	Application	Remarks/Applicability
	safety of children as it advocates for the protection of children from exploitation and abuse.	consideration all through the implementation of the Resettlement Action Plan.

5.4. Institutional Arrangement

The proposed investments will be implemented in liaison with various government institutions mandated to provide various services to the public under various Acts of parliament. Relevant government institutions and their role is presented in table 5-3 below.

Table 5-4: Institutions Arrangement

No	Institution	Relevance
1	MLPWHUD	Ministry of Lands, Public Works, Housing and Urban Development (MLPWHUD), is the government ministry responsible for policy formations and implementation in matters related to Land, Public Works, Housing and Urban development. The ministry has established KISIP implementing unit which is responsible for planning and implementing KISIP Projects across the county. KISIP is headed by a National Coordinator who is support by various team of experts in the field of Engineering, Procurement, Sociology, Environment, Monitoring and Evaluation.
2	County Government of Nakuru	The County Government assists KISIP implementing unit to implement the Project, County Governments has also established a County Government KISIP implementation unit. The role of developing and approving of the Physical Development Plans (PDPs) is the function of the County Government through the assistance of KISIP component 2 which deals with planning and land tenure. In KISIP II, the county government is the proponent and the contractor procuring entity. The county government is also responsible Resettlement Action Plans implementation.
3	NAIVAWASCO	Naivasha Water and Sanitation Services Company (NAIVAWASCO) is a Water Service Provider (WSP) that will assist in developing water infrastructure as well as operating water and the infrastructure after Project completion. It supplies water within the project area of Karagita.

No	Institution	Relevance
4	Kenya Power	This is a government company charged with responsibility of destruction and managing electric power with the city. During implementation of the Project Kenya Power will be consulted regularly in areas where power installations require relocation.
5	WRA	Water Resources Authority (WRA) is a government parastatal under the Ministry of Water mandated to manage water resources including rivers. WRA will be consulted regularly in situations where river crossing will be required
6	KURA	KURA will be consulted regularly where KISIP II projects will require crossing, maintaining and road works within the informal settlement areas.
7	NEMA	National Environment Management Authority (NEMA) is a government parastatal under Ministry of Environment mandated to Manage Environment. NEMA will be responsible to approve and license the projects and conduct inspections during project implementation to ensure compliance to provisions of Environment license.

5.5. The World Bank Environmental and Social Safeguards

5.5.1. OP/BP 4.01 (Environmental Assessment)

The World Bank has well-established environmental assessment procedures, which apply to its lending activities and to the projects undertaken by borrowing countries, in order to ensure that development projects are sustainable and environmentally sound. Although its operational policies and requirements vary in certain respects, the World Bank follows a relatively standard procedure for the preparation and approval of an environmental assessment study, which:

i) Identifies and assesses potential risks and benefits based on proposed activities, relevant site features, consideration of natural / human environment, social and trans-boundary issues
ii) Compares environmental pros and cons of feasible alternatives
iii) Recommends measures to eliminate, offset, or reduce adverse environmental impacts to acceptable levels (sitting, design, technology offsets)
iv) Proposes monitoring indicators to implement mitigation measures
v) Describes institutional framework for environmental management and proposes relevant capacity building needs.

The environmental assessment evaluates a project's potential environmental risks and impacts in its area of influence; examines project alternatives; identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation. The assessment takes into consideration: the natural environment (air, water, and land); human health and safety) social aspects (involuntary resettlement, indigenous peoples, and physical cultural resources); and trans-boundary and global environmental aspects. Preventive measures are favoured over mitigation or compensatory measures, whenever feasible. This approach is universally applied in many institutional projects.

The World Bank considers environmental impact assessment (EIA) as one among a range of instruments for environmental assessment. Other instruments used by the World Bank include regional or sectoral environmental assessment, strategic environmental and social assessment (SESA), environmental audit, hazard or risk assessment, environmental management plan (EMP) and environmental and social management framework (ESMF). The Bank undertakes environmental screening of each proposed project to determine the appropriate extent and type of environmental assessment. Proposed projects are classified into one of three categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts:

- Category A: the proposed project is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works. For a Category A project, the Proponent is responsible for preparing an EIA report.
- Category B: the proposed project has potential adverse environmental impacts on human populations or environmentally important areas such as wetlands, forests, grasslands, and other natural habitats - but these are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases, mitigation measures can be designed more readily than for Category A projects. Like in Category The environmental assessment examines the

project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.

- Category C: the proposed project is likely to have minimal or no adverse environmental impacts. Beyond screening, no further environmental assessment action is required for a Category C project.

Environmental Assessment is used in the World Bank to identify, avoid, and mitigate the potential negative environmental associated with Bank lending operations. The purpose of Environmental Assessment is to improve decision making, to ensure that project options under consideration are sound and sustainable and that potentially affected people have been properly consulted. The magnitude of the proposed construction falls under category B and hence full ESIA and RAP is required. There has been an implementation of a RAP in three settlements (Kahawa Soweto, Embakasi Village and Kambi Moto). Under this consultancy a RAP has been prepared for Kayole Soweto and is well advanced in the preparation stage. (The RAP component was already done and compensation completed)

The relevance/applicability of this reviewed frameworks (policies, Acts and regulations).
The magnitude of the proposed construction falls under category B and hence full ESIA and RAP is Required.

Table 5-5: O.P 4.01: Environmental Assessment

Objectives	Operational Principles
To help ensure the environmental and social soundness and sustainability of investment projects. Also referred to as scoping.	Apply the screening process for each proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment (EA) so that appropriate studies are undertaken proportional to potential risks and to direct, and, as relevant, indirect, cumulative, and associated impacts. Use sectoral or regional environmental assessment when appropriate.
To support integration of environmental and social aspects of projects into the	Assess potential impacts of the proposed project on physical, biological, socio-economic and physical cultural resources, including trans-boundary and global concerns, and potential impacts on human health and safety

Objectives	Operational Principles
decision making process.	Assess the adequacy of the applicable legal and institutional framework, including applicable international environmental agreements, and confirm that they provide that the cooperating government does not finance project activities that would contravene such international obligations.
	Provide for assessment of feasible investment, technical, and siting alternatives, including the "no action" alternative, potential impacts, feasibility of mitigating these impacts, their capital and recurrent costs, their suitability under local conditions, and their institutional, training and monitoring requirements associated with them
	Where applicable to the type of project being supported, normally apply the Pollution Prevention and Abatement Handbook. Justify deviations when alternatives to measures set forth in the handbook are selected
	Prevent, minimize, or compensate for adverse project impacts and enhance positive impacts through environmental management and planning that includes the proposed mitigation measures, monitoring, institutional capacity development and training measures, an implementation schedule, and cost estimates.
	Involve stakeholders, including project-affected groups and local non-governmental organizations, as early as possible, in the preparation process and ensure that their views and concerns are made known to decision makers and taken into account. Continue consultations throughout project implementation as necessary to address EA-related issues that affect them.
	Use independent expertise in the preparation of EA where appropriate. Use independent advisory panels during preparation and implementation of projects that are highly risky

Objectives	Operational Principles
	or contentious or that involve serious and multi-dimensional environmental and / or social concerns.
	Provide measures to link the environmental assessment process and findings with studies of economic, financial, institutional, social and technical analyses of a proposed project.
	Provide for application of the principles in this Table to subprojects under investment and financial intermediary activities.
	Disclose draft EA in a timely manner, before appraisal formally begins, in an accessible place and in a form and language understandable to key stakeholders.

5.5.2. OP/BP 4.12 (Involuntary Resettlement)

The policy states that "Where large-scale of population displacement is unavoidable, a detailed resettlement plan, timetable, and budget are required. Resettlement plans should be built around a development strategy and package aimed at improving or at least restoring the economic base for those relocated. Experience indicates that cash compensation alone is normally inadequate. Voluntary settlement may form part of a resettlement plan, provided measures to address the special circumstances of involuntary resettles are included. Preference should be given to land based resettlement strategies for people dislocated from agricultural settings. If suitable land is unavailable, non-land-based strategies built around opportunities for employment or self-employment may be used". Involuntary resettlement is triggered in situations involving involuntary taking of land and involuntary restrictions of access to legally designated parks and protected areas. The objective of this policy is to avoid or minimize involuntary resettlement, though participation in resettlement planning and implementation and, where this is not feasible, to assist displaced persons in improving or at least restoring their livelihoods and standards of living in real terms relative to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher. The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Bank appraisal of proposed projects.

The relevance/applicability of this reviewed frameworks (policies, Acts and regulations).

There are potential displacements by sub-projects of roads and sewerlines in Kahawa Soweto. Also, some business people along the wayleaves might be affected that will lead to lose of income. RAP reports have been prepared for the project settlements.

5.5.3. Activities Triggering World Bank Safeguards

The assessment adopted the standard guideline of the World Bank Safeguard policies in environmental and social screening for the project. The schedule below justifies the extent to which the World Bank safeguards apply to the implementation of the proposed project implementation

Table 5-5 : Analysis of potential triggers to World Bank Safeguards Policies

World Bank Operation Policy	Applicability to the Project
Environmental Assessment OP 4.01	*Applicable*. This policy is triggered due to proposed KISIP project interaction with natural and human environment. Also KISIP Projects have been categorized as Category B which implies that the project impacts are less adverse but require Environment Assessment which defines appropriate mitigation measures.
Involuntary Resettlement OP 4.12	*Applicable.* The proposed KISIP project will result to minor impacts to people's assets and sources of livelihood due to population density in the informal settlements. RAP be prepared and implemented prior to commencement of proposed works.
World Bank World Bank Access to Information Policy 2015	*Applicable* The ESIA will be prepared with meaningful stakeholder engagement with the aim of complying with the provision of the policy which requires; Maximizing access to information, setting out a clear list of exceptions, Safeguarding the deliberative process and Providing clear procedures for making information available.
World Bank Group Environment, General Health and Safety Guidelines	*Applicable* The ESIA will be prepared within provisions of general Health and Safety Guidelines

World Bank Group Environment Health and Safety Guidelines on Water and Sanitation	*Applicable* The ESIA will be prepared within provisions of water and sanitation Health and Safety Guidelines

5.6. International Framework/Conventions/Treaties

5.6.1. The Sustainable Development Goals (SDGs)

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests. Relevant SDGs: SDG 1: No Poverty: The construction project can create job opportunities for residents, helping to alleviate poverty and improve livelihoods within the informal settlement. SDG 3: Good Health and Well-Being: Improved infrastructure, such as sanitation facilities and clean water sources, can significantly enhance the health and well-being of residents, reducing the spread of diseases. SDG 4: Quality Education: Construction projects that include the development of schools or community centers can contribute to providing better access to education for children in the informal settlement. SDG 6: Clean Water and Sanitation: The project can provide access to clean and safe water sources, as well as upgraded sanitation facilities, thereby improving hygiene and reducing waterborne diseases. SDG 8: Decent Work and Economic Growth: The project can create jobs and economic opportunities within the informal settlement, supporting sustainable economic growth and reducing unemployment. SDG 11: Sustainable Cities and Communities: By improving infrastructure and housing, the project can contribute to the development of more sustainable and resilient communities within the informal settlement. SDG 12: Responsible Consumption and Production: Implementing sustainable construction practices, such as using recycled materials and minimizing waste, can promote responsible consumption and production. SDG 13: Climate Action: The construction project can incorporate climate-resilient design elements and technologies that mitigate the impact of climate change on the informal settlement. SDG 16: Peace, Justice, and Strong Institutions: The project can contribute to the improvement of

living conditions, social cohesion, and access to justice within the informal settlement. SDG 17: Partnerships for the Goals: Collaborating with local communities, NGOs, and governmental organizations can help ensure the project's success and alignment with the broader development goals.

Other several international conventions and treaties emphasize the importance of environmental and social impact assessment (ESIA) to ensure that development projects take into account their potential effects on the environment and local communities. Here are some key international agreements that address ESIA:

1. United Nations Framework Convention on Climate Change (UNFCCC): The UNFCCC promotes environmental impact assessment as a means to address climate change impacts. It emphasizes the assessment of climate-related impacts of projects, policies, and programs.
2. Convention on Biological Diversity (CBD): The CBD emphasizes the need for impact assessment to consider biodiversity conservation and sustainable use of natural resources. The Nagoya Protocol under the CBD also addresses the fair and equitable sharing of benefits arising from the utilization of genetic resources.
3. Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters: This convention provides a framework for public involvement in environmental impact assessment processes, ensuring transparency, public participation, and access to justice.
4. World Heritage Convention: The World Heritage Convention focuses on the protection of cultural and natural heritage sites. Impact assessments are required for projects that could potentially impact these designated sites.
5. International Finance Corporation (IFC) Performance Standards: While not a treaty, the IFC Performance Standards are widely recognized international standards for social and environmental risk management. They require financial institutions to conduct ESIA for projects they fund.
6. Equator Principles: Similar to the IFC Performance Standards, the Equator Principles provide a framework for assessing social and environmental risks in project financing. They apply to financial institutions and projects with significant environmental and social risks.

7. International Labour Organization (ILO) Convention No. 169: This convention focuses on the rights of indigenous and tribal peoples and requires consultation and participation in decision-making processes that may affect them.
8. Ramsar Convention on Wetlands: The Ramsar Convention emphasizes the importance of wetlands and requires impact assessments for projects that could affect these ecosystems.
9. Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention): This convention focuses on transboundary impacts of projects and requires notification and consultation between countries potentially affected by a project's impacts.
10. United Nations Guiding Principles on Business and Human Rights: Although not focused solely on impact assessment, these principles emphasize the need for businesses to respect human rights and assess potential social impacts of their operations.

These international agreements highlight the importance of considering environmental and social impacts in development projects, promoting sustainability, transparency, and community involvement. It's important to note that the specific requirements and implementation mechanisms may vary among these agreements, and countries may also have their own national regulations for ESIA processes.

CHAPTER 6. STAKEHOLDER ENGAGEMENT AND PUBLIC CONSULTATION

The assessment involved consultations with relevant stakeholders in target settlement. The aim of stakeholder consultations was to give a platform for information sharing and opinion gathering in relation to the proposed Project Consultations were done in form of public meetings and key informant interviews. The issues were than analyzed and presented to design team for finalization of Project designs and planning on how best to implement the Project. The main meetings were held within the month of February 2023.

6.1. Key stakeholder Consultations

As such a cross-section of persons were consulted in Nakuru County as indicated by the following consultation registers in the following table

Table 6-1 : Key Stakeholders met during the initial ESIA preparation

No.	Name	Office	Designation
Secondary Stakeholders			
	Arch. Kamau Kuria	Ministry of urban planning, Nakuru County Government	CO
1		Office of the chief Karagita	Chief

6.1.1. Overview from the CO, Ministry of urban planning

The CO sort clarity on the emerging priorities at the moment in all the settlements and what was the remaining scope of works under KISIP. He acknowledged the focus on the remaining priorities within the review. He however stressed on the need to fast track the projects for the sake of the people of Nakuru and emphasized the need of incorporation of the regeneration agenda in the designs where regeneration means infrastructure with NMT designs, road furniture, disabled people facilities, lighting and improvement of public spaces.

6.1.2. Overview from the chiefs

All the chiefs from the settlements had the same concern a plea, which was to fast track the projects which were already long overdue. They were all welcoming and expressed utmost appreciation for the proposed projects in the settlements. They noted that it would be also a

form of employment to the Young unemployed people from the settlements emphasizing that priority on employment opportunities should be given to the locals from the settlements.

6.2. Focused group discussions

A Focused group discussion was conducted in the premises of the Ministry of urban planning, Nakuru County Government. In attendance were the following: See attached attendance list:

The main agenda of discussion was on the emerging priorities at the moment in all the settlements and what was the remaining scope of works under KISIP. The project coordinator from the consultant enumerated to all in detail, the remaining scope of work for KISIP II and emphasized on the scope of the design review. The other major concern during the discussion was the urgency of getting the contractor on the ground for the implementation of the works. All in the meeting agreed that the project was long overdue but the project coordinator stressed that that was the reason the consultant was on site to fast track the design review, ESIA and RAP so as to facilitate procurement of the contractor. Speaking of the Contractor, the CO suggested multiple contracting to speed the work and spread the risk.

6.3. Public consultations

6.3.1. Schedule of Public Consultations

The assessment involved consultations with relevant stakeholders in target settlement. The aim of stakeholder consultations was to give a platform for information sharing and opinion gathering in relation to the proposed Project. Consultations were done in form of public meetings and key informant interviews. The issues were than analyzed and presented to design team for finalization of Project designs and planning on how best to implement the Project. The main meeting was held on 10th March 2023; attendance of the meetings was from diverse sectors of the society as summarized in table 6-1 below

Table 6-2: Schedule of Public Consultation

Date	Settlement	Stakeholder Consulted	Meeting Attendance
HELD AT NAIVAWASCO BOARDROOM			
Primary stakeholders			
10th March 2023	Karagita	✓ Community members ✓ SEC representatives ✓ Youth representatives ✓ People with Disabilities (PWD)	Total: 15 Male: 10 Female: 5
Secondary stakeholders			
10th March 2023	Karagita	✓ County officials	

Detailed Review of Issues discussed during public Participation forums is presented in table 6-2 below.

Table 6-3: Detailed Issues Discussed during Public Consultations

NO	ISSUE	RESPONSE
1	Remaining allocated Funds after completion of KISIP 2.	The team informed residents that the objective of world bank was to improve the quality of life in the settlement and if such objectives have been met then only the remaining needs can be addressed. Thus, the remaining funds, if any, would be discussed by the financier and implementing agency for KISIP for proper relocation.
2	Details of design review and incorporation of link roads.	The consultant was to focus on the scope that remained from KISIP I for the works that remained incomplete from the previous priorities and hence no new priority would be introduced in the design.
3	Clarity on remaining priorities detailed in KISIP 2.	✓ Members of Karagita were informed that one water pipeline would be done.

NO	ISSUE	RESPONSE
4	Labour and Workforce from the Settlements	EIA team informed residents that during construction the contractor will source some responsible youth from the area as casuals to supplement his permanent staff. Residents with relevant skills and training can also present their certificates through the SEC to be considered for employment opportunities if need arises
6	Clarity on remaining priorities in the settlements that aren't incorporated in the design.	The team informed residents that KISIP is continuous and the remaining needs would still be considered in subsequent KISIP phases. It was stressed that the objective at the time was to finish the remaining works from KISIP I first.
7	Possibility of a meeting with KISIP Head Office to discuss reallocation of funds.	The team informed residents that as far as public participation was concerned, the team that was on the ground from the consultant was sufficient to collect and report the views of the community regarding the project and that every concern would be raised and reported for action.

6.4. Projects prioritization during community consultation

6.4.1. Karagita Settlement:

Table 2-4 below presents a summary of Project prioritization presented by Community following Community Consultation Forums.

Table 6-4 Karagita Project Prioritization

PRIORITY 1	Roads
PRIORITY 2	Sewer system
PRIORITY 3	Flood Masts / Street lighting

Community Observations: - The community highlighted that their current pressing needs include (1) Roads, (2) Sewer system, (3) High Mast Lights, and (4) Water, ranked in that order.

They prioritized partial implementation of Musaka Road (1,941 m out of the 4,300 m), and a High Mast Light next to the adjacent railway line. The proposed road works and the light mast were however not there in the proposed SUPs set for design review.

The community were of the opinion that water supply situation in the settlement has improved considerably, and is no longer a priority. However, the Consultant established that the current water is being supplied through a temporary measure undertaken by Naivasha Water and Sanitation Company (NAIVAWASCO) from the Naivasha Industrial Park (NIP) booster station, which is anticipated to be fully directed to the NIP once it's operational.

6.5. Inclusion of Outcomes of Stakeholder Engagement in the Design of the Project

6.5.1. Employment Opportunities for the Public

The Stakeholder Engagement identified the need to provide employment opportunities to the local community members during project implementation period as the main concern from the community.

The project will provide employment opportunities for the estimated number of people in the fields of Casual Labourers, Skilled Staff, Plant Operators / Drivers, Managerial Staff, approximately 50 job opportunities will be created. The opportunities will be shared equally throughout the Project Areas and as provide by Gender Policy 2011 discussed in chapter 5.

6.6. Public Disclosure of ESIA, and Annual Monitoring Reports

This ESIA provides for the below listed provisions with regards to public disclosure

i) In accordance with EMCA 1999 Cap 387 and World Bank OP 4.01, the Project Proponent will ensure that the Results of Public Consultations including ESIA area disclosed on Judiciary website.

ii) The Reports will also be made available at Chiefs' Offices in the affected Settlements in Nakuru town for ease of access by the project interested parties at location level and Project site office,

iii) The Reports and information will also be disclosed at the ESIA Stage by NEMA and during the sector ail ESIA review by NEMA.

iv) At completion of the Project civil works EIA / EA Audit Regulations of 2003 requires the project proponent to undertake a closeout audit after completion of the project and also undertake and initial Environment Audit (EA) immediately after commissioning of the project in the 1st year, these audits are essential in determining the performance of the project in addressing issues related to environment and social safeguards, gaps identified are corrected through implementation of recommendation of the Environment and Social Audit Action Plan (ESAAP).

6.7. Construction, Operation and Decommissioning Phase Consultations

Topics / Issues for consultations during Construction, Operation and Decommissioning Phase

a) Employment opportunities
b) Training opportunities
c) Education opportunities
d) Health and safety
e) Land acquisition and resettlement / loss of livelihood
f) Local economic stimulation and business development
g) Environmental / nuisance impacts
h) Access to water / water quality
i) Biodiversity and protected areas
j) Protection of cultural heritage

Stakeholder groups that may be affected by and/or interested in the implementation of the Project, as well as proposed communication methods and media for each group, have been identified and are presented in the table below.

Table 6-5: Stakeholder Consultations during Project Construction and Operation Phase

Stakeholder/s	Type of communication	Responsibility	Timing
External Stakeholders			
Local administration representatives Chiefs and Ward Representatives	Public meetings and monthly project progress updates	Contractor / MLPWHUD	Throughout project implementation phase
Interested NGOs and other civil societies	Local media (newspapers) ESIA, published on MLPWHUD website.	Contractor / MLPWHUD	Throughout the implementation of the Project
Relevant National Government and County Government Authorities for example: KeNHA&	Official correspondence and meetings, progress reports Permitting procedures	Contractor / MLPWHUD	During project design, construction and implementation

Stakeholder/s	Type of communication	Responsibility	Timing
Kenya National Museums due to chance find clause of OP 4.11 on physical cultural resources	Official correspondence and meetings Permitting procedures	Contractor / MLPWHUD	During project Construction phase
Internal Stakeholders			
Employees (Contractor,)	Notice boards, email, Grievance Redress Mechanism, meetings	Contractor	Throughout project implementation phase
Casual workers and temporary staff	Notice boards, email, Grievance Redress Mechanism, meetings	Contractor	Throughout project implementation phase

6.8. Community Relations in Construction Phase

This section set outs the proposed objectives, mechanisms and responsibilities for liaison with Project beneficiaries during the construction phase. It identifies the approach to, and frequency of, consultation with Project beneficiaries.

The primary responsibility for liaison will be borne by the contractor who will develop own plan and more detailed proposals for community liaison. This will build on the approach outlined in this section. All potential contractors will be required to draw up this plan as part of the tender process. The objectives of the Community Relations Program will be to:

i) Provide local residents with regular information on the progress of work.
ii) Inform the project/contractor of any community related issues that may impact construction.
iii) Monitor implementation of mitigation measures and the impact of construction via direct monitoring and feedback from Project area.
iv) Identify any significant new issues that may arise during the construction period; and

v) Manage any complaints against the project/contractors and local residents (i.e., provide a grievance mechanism).

6.8.1. Construction Contractor's Role in Community Liaison

The Contractor will be required to adhere to the requirements of the Environmental and Social Management and Monitoring Plan (ESMMP) that sets out how the contractor will meet and monitor the mitigation measures recommended by the Plan. The role and responsibilities of the Contractors Community liaison include:

i) Provide primary interface between project and affected or interested persons;
ii) Coordinate and implement required pre-construction activities, namely;
iii) Produce management plans for community relations, construction camps and transport train staff with community relations responsibilities; and
iv) implement induction training workshops for all construction staff;
v) Assist in local recruitment process; and
vi) Ensure on-going communication with project and affected or interested persons

6.8.2. Community Relations in Operational Phase

The objective of the Community Relations Program in this Phase will be to:

i) maintain constructive relationships between local residents to assist in the operation of the facilities;
ii) maintain awareness of safety issues among local residents in the project areas;
iii) ensure compliance with land use constraints among land owners in the project areas;

6.8.3. Decommissioning

In the event of decommissioning of the Project, liaison will continue to take place between MLPWHUD with Project Affected or Interested Persons prior to de-commissioning. This role will complement work carried out by the proponent and social investment team to reduce the negative impact of the project decommissioning.

6.9. Grievance Redress Mechanism

The Grievance Redress Mechanism proposed herein is a Four Tier Grievance Redress Mechanism that provides for an appeal avenue in the instance the first level of grievance resolution fails to give a desirable outcome to either of the parties involved.

The four-tier grievance mechanism is - at the community, County, national and resolution through courts of law. It is desirable to resolve all the grievances at the community level to the greatest extent possible. To achieve the community or settlement level grievance mechanism must be credible and generally acceptable. The grievance redress mechanisms will aim to solve disputes at the earliest possible time in the interest of all parties concerned.

The first level in addressing grievances will be at the settlement. The settlement will form a Settlement Grievance Redress Committee comprising of two members from SEC, and three other respected community members who are not PAPs. The committee shall be elected by the community in a transparent manner and after sensitization by KISIP PCT.

The second level of grievance mechanism will involve the County Resettlement Implementation Committee (CRICs). The CRICs will consider grievance reports forwarded to it from the community grievance committee and make a determination. The CRIC will comprise of the County Coordinator, Environment Officer, Social/Community Officer, Component Heads for Infrastructure, and Land tenure, Assistant Deputy County Commissioners, and Ward Administrator.

The third level of grievance mechanism will involve the National PCT, (NRIC) which will comprise of the National Project Coordinator, Heads of Components, Environment and Social Safeguard heads, and a designated Grievance Redress Officer who will be the Secretary. It will handle grievances referred to it by the CGRCs and monitor the performance of the whole GRM for the project. The NRIC will also provide overall coordination of the implementation of this Project complain activities.

In the Fourth Level, if complainants are not satisfied by the decisions of the grievance's committees, they can seek redress from the High court.

Mode of receipt and recording of Complaints

The complaints can be made in writing, verbally, over the phone, or emails. The officer receiving the complaints should try to obtain relevant basic information regarding the grievance. It is anticipated that at this level, most complaints will be made verbally. The mediation process shall be confidential, transparent and objective, as well as accountable, easy, fast, accurate and participative.

Table 6-6: Grievance Redress Mechanism

Step	Process	Description	Time frame	Responsibility
1	Grievance receipt and registration / logging	▪ Face to face; phone; letter, recorded during public / community meetings; WhatsApp etc. ▪ Significance assessed and grievance recorded or logged using the model complaint form and filed.	1-2 days	An aggrieved party or PAPs. GRCs
2	Development and implementation of response	• GRC meets or takes a decision on the grievance • Grievance assigned to appropriate party for resolution if necessary Response development with input from relevant stakeholders • Redress response / action approved by GRC and logged • Redress response / update of progress on resolution communicated to the complainant • Start implementing redress action	5-10 days	GRC

Step	Process	Description	Time frame	Responsibility
3	Verifying the implementation of redress action	• Redress action implemented and verified by GRC. • GRC satisfied with implementation of redress action • Complainant duly signed the grievance resolution form	10-15 Days	Environmental (Social) Officer / Safeguard Specialist at County
4	Close grievance or refer grievance to 2nd tier resolution	• Completion of redress action recorded or logged • Confirm with complainant that grievance can be closed or determine what follow up is necessary • Record final sign off of grievance • If grievance cannot be closed, return to step 2 or recommend to the next tier- County, National	15-25 Days	Environmental (Social) Officer / Safeguard Specialist at County / Grievance Office
5	Court of law	If 2nd and third level settlement does not address dispute, complainant can resort to court of law	Unknown	Safeguard Specialist at KISIP
6	Monitoring and evaluation, and reporting	Grievance Redress Mechanism Process is documented and monitored		Safeguard Specialist at KISIP

The Grievance Officers at County and National level will establish a register of resettlement / compensation related grievances and disputes. The receipt of complaints will include its logging and registration as this will help with monitoring the status of the grievances and ease reporting on them. The existence and conditions of access to this register (where, when, how) will be widely disseminated within the project community / town as part of the consultation undertaken for the project in general. The person designated to receive complaints shall receive all complaints and shall officially register these complaints using the first section of the proposed complaint registration and resolution form

CHAPTER 7. ENVIRONMENTAL AND SOCIAL IMPACTS ASSESSMENT AND MITIGATION MEASURES

7.1. Anticipated Project Positive Impacts

The Project will result in both direct and indirect benefits to the residents of the targeted informal settlement as summarized below (being impacts from construction of the pipeline for Karagita settlement);

7.1.1. Benefits of the pipeline Project

Preconstruction phase

(i) Creation of employment to people living within the informal settlements through involvement in planning and design activities such as data collection.

During project construction

(i) Creation of direct employment to people living within the informal settlements during the construction activities

During operation and decommissioning phases.

(i) Creation of employment to people living within the informal settlements through improved access.
(ii) Improved living standard of people within the settlement through improved water infrastructure
(iii) Reduced Water and Sanitation Burden to Women
(iv) The water projects will lead to Improved Accessibility to Clean and Reliable Water Supply
(v) Water will Improve Hygiene and Sanitation in the Project Areas
(vi) Reduced Cases of Water Related Diseases
(vii) Increased Land Values in the Project Area

7.2. General project Risks on Biophysical Environment during construction

The preliminary ESIA identified that the project will have less adverse risks to bio physical environment. The Projects will involve improvement of access roads, drainage, Water Supply, Sewerage and installation of security lighting system in the informal settlements.

These activities will not be out of character with the existing environment baseline situation identified in the informal settlements. Biophysical attributes discussed under this sub chapter will include;

i) Impacts on Biodiversity
ii) Impacts on Water Resources
iii) Impacts on Soil Resources

The tables below provide similar negative impacts that are applicable to all the project activities including road and drainage, Water and Sewerage and Flood lights. The assessment under section 7.9 presents specific project Impacts per each category of project activities during operation.

7.2.1. Impacts on Water Resources

The assessment identified that the main water resources within the settlements are shallow wells and boreholes. Therefore, the assessment also identified that less significance impacts are anticipated on Water resource as discussed in the table below:

Table 7-1: Impacts on Water Resources

Impact Sources	Terrestrial and aquatic Ecosystem Pollution by effluents caused by construction activities and water losses through over abstraction, infiltration and evaporation	Mitigation Efficiency	High
Nature of impact	• Reduced availability of safe domestic water, water wastage, infiltration, and evaporation • pollution of existing water resources including aquifers by construction effluents • Increase water borne related illness due to consumption of unsafe water		
Reversibility of impact	Yes		
Mitigation	As summarized in table 7-7 below		
Affected stakeholders /areas	Aquatic and terrestrial ecosystems		
Magnitude	*Extent*	Site – 2	
	Intensity	Medium-3	

Impact Sources	Terrestrial and aquatic Ecosystem Pollution by effluents caused by construction activities and water losses through over abstraction, infiltration and evaporation		Mitigation Efficiency	High
	Duration	Medium term-3		
	Probability	Likely – 3		
Significance	Weighting	(Extent+ Intensity +Duration + Probability)x WF(2+3+3+3) x1=11 (Low)		Low

7.2.2. Impacts on Soil Resources

The impacts that are likely to be triggered by the project activities in the settlements include;

i) Destruction of Soil Structure due to blasting or rock breaking
ii) Soil contamination caused by oils and fuel leaks from construction equipment
iii) Soil Erosion and mud slides due to clearing of vegetation cover and trenching activities.

The assessment also identified that less significance impacts are anticipated on Soil resource as discussed in the table below

Table 7-2: Impacts on Soil Resources

Impact Sources	Construction activities which could lead to soil compacting and interference with soil structure hence making top soils loose and susceptible to agents of erosion.	Mitigation Efficiency	High
Nature of impact	• Destruction of Soil Structure due to blasting or rock breaking leading to reduced soil aeration • Movement of plant and equipment could result to soil compacting which inhibits soil aeration leading to death of soil micro-organisms. • Soil contamination caused by oils and fuel leaks from construction equipment's leading to Oil Acidity increase • Soil Erosion due to clearing of vegetation cover and trenching activities which results to death of soil microorganism and reduced soil productivity		
Reversibility of impact	Yes		
Mitigation	As discussed in table 7-7 below		
Affected	Terrestrial ecosystems		

stakeholders / areas			
Magnitude	*Extent*	Site – 2	
	Intensity	Medium-3	
	Duration	Medium term-3	
	Probability	Likely – 3	
Significance	Weighting	(Extent+ Intensity +Duration + Probability)x WF(2+3+3+3) x1=11 (Low)	Low

7.2.3. Biophysical Environment Risk Mitigation Measures

The preliminary Environment and Social Screening report proposes the below listed mitigation measures to identified biophysical environment setting as summarized in the table below:

Table 7-3: Mitigation of Biophysical Environment Impacts

Impacts	Proposed Mitigation Measures
Destruction of Vegetation in the Project Areas	• Site Clearance and Construction activities will be limited to available reserves within the settlements, Projects will be implemented within existing reserves and wayleaves minimize destruction to vegetation cover • Reinstatement of the project sites to their original state to be carried out once construction works are completed to allow growth of vegetation. • Replant eco-friendly grass and trees along the projects after completion of the civil works.
Contamination of Surface Water Sources by Effluents from Construction Plant and Equipment	• Ensure Construction Equipment is well maintained and serviced according to manufacturers' specifications to prevent oil leaks. • Cleaning / repair of Construction Plant and Equipment to be carried out at designated yards • Contractor to have designated storage areas for oils, fuels etc. that is protected from rain water and away from nearby surface water courses
Soil Erosion resulting to loss of top soil	• The risk of Soil Erosion will be lowered through provision of soil Erosion prevention structures i.e. gabions in areas susceptible to Soil Erosion
Solid Wastes Generation from Construction Activities	• Construction wastes (residual earth, debris and scrap materials) to be collected at designated points and Contractor to dispose to designated Solid Waste Dumping Sites approved by the Nakuru County Government • Contractor's Camps and Construction Sites to have designated waste collection points,

Impacts	Proposed Mitigation Measures
	• Environmental Management, Health and Safety Training Programmes to be conducted for Contractor's Staff to create awareness on proper solid wastes management

7.3. Workers, Community Health and Safety Risks

Workers, Community Health and Safety risks are often triggered by project activities during project construction phase. These risks often affect both workers on site as well as general community in close proximity to the work site.

Management of these risks is required to be as provided for by the Occupational Health and Safety Act (OSHA 2007) and World Bank Environment Health and Safety Guidelines discussed in *chapter 3*. This assessment identified potential Environment, Health and Safety in the below listed context.

i) Excessive noise and vibrations
ii) Air Pollution and Dust Generation.
iii) Risk of Accidents at Work Sites

7.3.1. Excessive noise and vibrations

This risk often affects both workers on site and community at large, common sources noise and excessive vibrations are as a result of use of un-serviced plant and equipment as well as activities associated with blasting and rock breaking. As required by OSHA 2007 and EMC (Noise and Excessive Vibration) (Control) Regulations 2009 as well as World Bank EHS Guidelines.

Mitigating the potential seismic hazards resulting from rock blasting near a geologically unstable area requires careful planning and engineering to ensure the safety of residential structures. Here are some mitigation measures that can be considered:

1. Seismic Hazard Assessment:
    - Conduct a detailed seismic hazard assessment to understand the potential impact of rock blasting on the geologically unstable area and nearby residential structures.
    - Collaborate with geologists and seismic experts to determine the potential for ground shaking and other seismic effects.

2. Blasting Design and Timing:
    - Modify the blasting design to minimize ground vibrations and seismic effects. This might involve adjusting the blast parameters, such as timing, frequency, and charge size.
    - Schedule blasting during periods of low human activity to reduce the risk to residents.
3. Monitoring and Early Warning Systems:
    - Implement a robust monitoring system to continuously track ground vibrations and seismic activity during blasting.
    - Install early warning systems that alert workers and residents in the event of increased seismic activity.
4. Setback Distances:
    - Maintain safe setback distances between blasting areas and residential structures to reduce the potential impact of ground vibrations.
    - Determine setback distances based on the results of the seismic hazard assessment and engineering recommendations.
5. Community Awareness and Education:
    - Educate residents about the potential seismic hazards, the mitigation measures in place, and emergency response protocols.
    - Conduct drills to ensure that residents know how to respond in case of a seismic event.
6. Emergency Response Plan:
    - Develop a comprehensive emergency response plan that outlines evacuation routes, safe assembly points, and communication procedures in the event of a seismic event.
7. Public Consultation:
    - Engage with the affected community to address their concerns and gather input on the mitigation measures.
    - Incorporate community feedback into the planning and implementation of mitigation strategies.

The tables below present Environment, Health and Safety Impact Identification and Ranking assessment and a summary of mitigation of potential EHS risks.

7.3.2. Air Pollution and Dust Generation.

The risk of air pollution often affects both workers on site and community at large, common sources air pollution include use of un serviced plant and equipment which emit hydro carbons through equipment exhaust system. Poor workmanship example failure to use water sprays during dry season could also result to air pollution.

As required by OSHA 2007 and EMC (Air Quality) Regulations 2014 as well as World Bank EHS Guidelines. The tables below present Environment, Health and Safety Impact Identification and Ranking assessment and a summary of mitigation of potential EHS risks.

7.3.3. Risk of Accidents at Work Sites

The risk of accidents at worksites often affects both workers on site and community at large, these risks at times can be fatal as they could lead to death or permanent disability of victims. The risks are commonly caused by failure to observe safety requirements as provided for by as required by OSHA 2007 and the World Bank EHS Guidelines

The tables below present Environment, Health and Safety Impact Identification and Ranking assessment and a summary of mitigation of potential EHS risks.

Table 7-4: Impacts on Workers, Community Health and Safety

Impact Sources	Failure to comply to provisions of OSHA 2007 and World Bank EHS Guidelines	Mitigation Efficiency	High
Nature of impact	- noise and excessive vibrations due to un-serviced plant and equipment and Activities associated with blasting and rock breaking - Open trenches within the settlement which pose health hazards to workers and community. - Failure to use required correct signage and safety marshal on site - Un-serviced plant and equipment which emit hydro carbons through equipment exhaust system. - Poor workmanship & failure to use water sprays during dry season could also result to air pollution. - Failure to observe safe work environment requirements like use of PPEs, Warning Taps, site labelling. - Hearing impairment and respiratory related illness - Can cause death or permanent disability of victims		
Reversibility of impact	Yes		
Affected	Workers and Community		

stakeholders /areas			
Magnitude	*Extent*	Site – 2	
	Intensity	Medium-5	
	Duration	Medium term-4	
	Probability	Likely – 4	
Significance	Weighting	(Extent+ Intensity +Duration + Probability) x WF(2+5+4+4) x4=60 (Medium to High)	Medium to high

7.3.4. Environment Health and Safety Risk Mitigation Measures

The Environment and Social Screening report proposes the below listed mitigation measures to identified workers, Community Health and Safety risks as summarized in the table below.

Table 7-5: Mitigation Measure to Workers, Community Health and Safety Risks

Impact	Proposed Mitigation Measures
Noise and Excessive Vibrations.	• Contractor will comply with provisions of EMC (Noise and Excessive Vibrations) (Control) Regulations of 2009 • The Contractor will keep noise level within acceptable limits (60 Decibels during the day and 35 Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas • Hospitals and other noise sensitive areas such as schools shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity
Air Pollution and Dust Generation.	• The contractor will comply to the provisions of EMCA 2015 (Air Quality Regulations 2014) • Workers shall be trained on management of air pollution from vehicles and machinery. All construction machinery shall be maintained and serviced in accordance with the contractor's specifications • Water sprays shall be used on all earthwork areas within 200 metres of human settlement especially during the dry season.
Risk of Accidents at Work Sites	• Contractor to provide a Healthy and Safety Plan prior to the commencement of works to be approved by the Supervising Engineer.

Impact	Proposed Mitigation Measures
	• Provide Personal Protective Equipment including gloves, gum boots, overalls and helmets to workers. Use of PPE to be enforced by the Supervising Engineer. • Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles
Risk of Traffic Accidents along the Pipeline Route	• Strict use of warning signage and tapes where the trenches are open and at other active construction sites • Contractor to Employ and train Road Safety Marshalls who will be responsible for management of traffic on site • Contractor to provide a Traffic Management Plan during construction to be approved by the Supervising Engineer

7.4. Traffic Management Plan

On average, each year, about 7 workers die as a result of accidents involving vehicles or mobile plant on construction sites. A further 93 are seriously injured3. OSHA 2007 provides for site traffic organization so that vehicles and pedestrians using site routes can move around safety. The routes need to be suitable for the persons or vehicles using them, in suitable positions and sufficient in number and size.

The term 'vehicles' includes: cars, vans, lorries, low-loaders and mobile plant such as excavators, lift trucks and site dumpers etc. Construction site vehicle incidents can and should be prevented by the effective management of transport operations throughout the construction process.

This ESIA provides for the below listed key management principles that will be complied by the Contractor when dealing with traffic on Site during the construction of the identified infrastructure Project in the Informal Settlements with the understanding that the Works will be constructed within Informal Settlements which are densely populated and roads encroached.

i) Keeping Pedestrians and Vehicles Apart
ii) Minimizing vehicles movement
iii) People on Site

3http://www.hse.gov.uk/construction/safetytopics/vehiclestrafficmanagement.htm

iv) Turing of Vehicles

v) Visibility

vi) Signs and Instructions.

The table below provides details on how traffic will be managed on site under the above discussed principles

Table 7-6: Traffic Management Plan

TRAFFIC MANAGEMENT PLAN
Keeping Pedestrians and Vehicles Apart on Site
- Entrances and exits- provide separate entry and exit gateways for pedestrians and vehicles; - Walkways- provide firm, level, well-drained pedestrian walkways that take a direct route where possible; - Crossings- where walkways cross roadways, provide a clearly signed and lit crossing point where drivers and pedestrians can see each other clearly; - Visibility- make sure drivers driving out onto public roads can see both ways along the footway before they move on to it; - Obstructions– do not block walkways so that pedestrians have to step onto the vehicle route; and - Barriers- think about installing a barrier between the roadway and walkway
Minimizing vehicles movement
- Limit the number of vehicles on site - Provide car and van parking for the workforce and visitors away from the work area; - Control entry to the work area; and - Plan storage areas so that delivery vehicles do not have to cross the site.
People on Site

- Contractor will take steps to make sure that all workers are fit and competent to operate the vehicles, machines and attachments they use on site by, for example:
  - checks when recruiting drivers / operators or hiring contractors;
  - training drivers and operators;
  - managing the activities of visiting drivers
- Accidents can also occur when untrained or inexperienced workers drive construction vehicles without authority.
- Access to vehicles will be managed and people alerted to the risk

Turning of Vehicles

The need for vehicles to reverse will be avoided where possible as reversing is a major cause of fatal accidents.
  - One-way systems will be adopted by the contractor as this can reduce the risk, especially in storage areas.
  - A turning circle could be installed so that vehicles can turn without reversing

Visibility

TRAFFIC MANAGEMENT PLAN
If vehicles reverse in areas where pedestrians cannot be excluded the risk is elevated and visibility becomes a vital consideration. This ESIA provides for: - Aids for drivers- mirrors, CCTV cameras or reversing alarms that can help drivers can see movement all-round the vehicle; - Signallers- who can be appointed to control manoeuvres and who are trained in the task; - Lighting- so that drivers and pedestrians on shared routes can see each other easily. Lighting may be needed after sunset or in bad weather; - Clothing- pedestrians on site should wear high-visibility clothing.
Signs and Instructions
- Make sure that all drivers and pedestrians know and understand the routes and traffic rules on site. Use standard road signs where appropriate including the Heavy Vehicles turning sign - Provide induction training for drivers, workers and visitors and send instructions out to visitors before their visit

7.5. Social Risks

The Project activities as described in the report have the potential of triggering various social risks both at both Project construction phase and operation phase.

This assessment has identified potential social risks associated with the Project as listed below

i) Loss of Temporal Assets and disruption of sources of Livelihood
ii) Disruption of Public Utilities like cables, access culverts,
iii) Labour Influx and sexual offences including minor abuse
iv) Human Rights and gender inclusivity
v) Increased Transmission of communicable diseases including HIV / AIDS
vi) Increased Crime and Insecurity

7.5.1. Loss of Temporal Assets and Disruption of Sources of Livelihood

This impact is likely to be triggered during Project construction phase, this assessment identified that proposed road reserves, water and sewerage wayleaves in the informal settlement are encroached by either extension of residential and or business structures.

These structures will be demolished to provide required space for implementation of the Project as illustrated in sample photos below. This implies that OP 4.12 will be triggered by the Project and therefore a detailed RAP will be prepared. However, the Project will impact

on people's assets and sources of livelihoods which encroach into the road reserves as summarized below from the Abbreviated Resettlement Action Plan (ARAP) prepared for the Project;

Table 7-7: RAP Breakdown

No	PAP Category	Settlements
		Karagita
1	Structure owners	18
2	Tenants	2
3	Number of female PAPs	10
4	Number of male PAPs	10
5	Vulnerable persons	0
	Total	20
Settlement	PAPs	Implementation Budget (Kshs)
Karagita	20	566,600.00
Structures affected are timber / wood vendor kiosks		

7.5.2. Disruption of Public Utilities

This impact is likely to be triggered during Project construction phase whereby contractors often damage infrastructure installations such as access culverts to homes, drainage channels, communication cables and power lines power lines. Disruptions of public utility infrastructure often trigger grievances from the users if not promptly mitigated.

The tables below provide Social Impact Identification and ranking while and possible mitigation measures of the identified social risks

7.5.3. Labour Influx Effects

This impact is triggered during Project construction phase due to the Project attracting various categories of workers from local, national and international markets. This therefore leads to concentration of people in one area drawn from diverse social and cultural background often results to a number of issues as listed below;

i) Strain on various resources (example water, sewerage and accommodation services)
ii) Grievances from local community members over job opportunities.
iii) Sexual Offences
iv) Teenage Pregnancies

7.5.4. Human Right and Gender Inclusivity

This impact is triggered during Project construction phase due to the potential of the contractor failure to comply with the following provisions;

i) Gender Inclusivity requirements in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 gender rule.
ii) failure to protect Human Risk Areas Associated with, Disadvantaged Groups, interfering with Participation Rights, and interfering with Labour Rights

7.5.5. Increase in prevalence of communicable diseases

This impact is triggered during Project construction phase due to the Project attracting various categories of workers from local, national and international markets. This therefore leads to concentration of people in one area drawn from diverse social and cultural background often results to people engaging in risky sexual activities.

Table 7-8: Impacts on Social Setting

Impact Sources	Project Impacts to peoples' assets and sources of livelihood and concentration of people with diverse cultural and social background in one location	Mitigation Efficiency	High
Nature of impact	(i) Loss land Assets and Sources of Livelihood including trees and crops (ii) Disruption of Public Utilities like cables, access culverts, (iii) Labour Influx and sexual offences including minor abuse (iv) Human Rights and gender inclusivity (v) Increased Transmission of communicable diseases including HIV/AIDS and other communicable diseases		
Reversibility of impact	Yes		
Mitigation Measures	As detailed in table 7-11 below		
Affected stakeholders	Workers and Community		
	Extent	Site – 2	

Impact Sources	Project Impacts to peoples' assets and sources of livelihood and concentration of people with diverse cultural and social background in one location		Mitigation Efficiency	High
Magnitude	*Intensity*	Medium-5		
	Duration	Medium term-4		
	Probability	Likely – 4		
Significance	Weighting	(Extent+ Intensity +Duration + Probability)x WF(2+3+3+3) x1=11 (Low)		Low

7.5.6. Social Risks Mitigation Measures

The Environment and Social Screening report proposes the below listed mitigation measures to identified Social risks as summarized in the table below.

Table 7-9: Mitigation of Social Impacts

Impacts	Proposed Mitigation Measures
Loss of Temporal Assets and Sources of Livelihood	• Prepare a detailed Resettlement Action Plan (RAP) report which documents the nature and magnitude of project impact to people's assets and sources of livelihood, the report should also propose adequate compensation and livelihood restoration measures to affected Project Persons.
Disruption of Public Utilities	• Contractor to carry out piloting to locate services such as pipes and cables along the Pipeline Route before commencing excavation works. • The relevant Services Providers and Agencies to be notified prior to commencement of Works so that any relocation works can be carried out before the Pipeline Construction Works begin. • Length of excavation to be restricted to sections that can be reinstated within the shortest period possible to minimize time of disruption of services
Increased Transmission of HIV/AIDS	• HIV/AIDS Awareness Program to be instituted and implemented as part of the Contractor's Health and Safety Management Plan to be enforced by the Supervising. This will involve periodic HIV/AIDS Awareness Workshops for Contractor's Staff • Access to Contractor's Workforce Camps by outsiders to be controlled • Contractor to provide standard quality condoms to personnel on site
Labour Influx and sexual offences	• Effective community engagement and strong grievance mechanisms on matters related to labour. • Effective contractual obligations for the contractor to adhere to the mitigation of risks against labour influx • Proper records of labour force on site while avoiding child and forced labour • Fair treatment, non-discrimination, and equal opportunity of workers. • Comply to provisions of WIBA 2007 and IFC PS 2 on labour and Working Conditions, and ILO Conventions 87, 98, 29,105,138,182,100,111

Impacts	Proposed Mitigation Measures
	• Develop and implement a children Protection Strategy
Human Rights and gender inclusivity	• Mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 gender rule. • Protecting Human Risk Areas Associated with, Disadvantaged Groups, Interfering with Participation Rights, and interfering with Labour Rights
Increased Crime and Insecurity	• Contractor and Supervision Team to liaise regularly with the Local Administration and Police Service to address any security and crime arising during project implementation. • Contractor to provide 24 hours security to Workforce Camps, Yards, Stores and to the Supervising Team's Offices

7.6. Specific Project Risks during Operation

This sub chapter discusses specific Project risks associated with the Projects during operation phase as summarized below.

Table 7-10 Operation Impacts and Mitigation for Water Projects

Issue	Summary of Mitigation
Risk of water pipeline bursts leading to water wastages (Non-Revenue Water percentages increase)	• Regular check, repair and maintenance of the water pipeline • Activate a community watch group for information sharing on the status of the water line • Implement a leak detection and repair program (including records of past leaks and unaccounted- for water to identify potential problem areas)
Risk of illegal connection to the water	• This is common in the low-income areas where residents illegally tap the water pipeline • This will require constant inspection by Nairobi Water Company officials and installation of leak and burst detectors at designated areas along the pipeline. • Conduct public sensitization programs on importance not interfere with the water pipeline and the need to seek official water connection from NAIVAWASCO.

Table 7-11 Operation Impacts and Mitigation for Sewer Projects

Issue	Summary of Mitigation
Pollution of Water Resources (drainage channels within the settlement) by raw sewage from blocked Sewer pipes and Manholes.	• Activate a community watch group for information sharing on the status of the sewer line • Awareness rising among community members not to dump solids in manholes. • Regular cleaning of grit chambers and sewer lines to remove grease, grit, and other debris that may lead to sewer backups • Regular inspection of the system to ensure performance is

Issue	Summary of Mitigation
	maintained at high levels; • Communities living within the river basins where the trunk sewers will be constructed should be enlightened on dangers of using raw sewerage to irrigate farmlands.
Odour Menace from Manholes and leaking raw sewerage into drainage channels within the settlement	• NAIVAWASCO to ensure appropriate covering of all manholes within the settlement • Regular cleaning of grit chambers and sewer lines to remove grease, grit, and other debris that may lead to sewer backups

Table 7-12 Operation Impacts and Mitigation for Roads and Drainage Projects

Impact	Proposed mitigation measure
Increased Accidents associated with motor cycles over speeding within the settlement due to good roads	• Appropriate signage should be put up on the roads to warn drivers especially in areas where there are children or people crossing the road to reduce accidents • The County Government to enlighten motorist and cyclist on importance of obeying traffic rules especially in residential areas. • The County Government to enlighten residents and school children on the importance of adhering to provisions of road safety rules • Regular inspection and maintenances of the road by County Government of Nakuru to ensure the speed control parameters and signage are in good condition. • Regular crackdown, arrest and prosecution of motorists and cyclist who disobey road safety directions.

Pollution from fossil fuels from vehicles with increasing GHG emissions.	• Encourage locals to use fuel efficient vehicles and other types such as those that run on electricity
	• Encourage people do drive less and learn to use public means of transport and bicycles
	  • Increase tree cover and vegetation along the newly improved roads and open spaces.
	  • Implement urban greening projects, including street tree planting, parks, and green buffers.
	  • Trees absorb carbon dioxide (CO2) and provide shade, reducing the urban heat island effect and promoting air quality.

Flooding due to poor drainage channels	• Maintenance of the drainage channels to ensure that there is no blockage of the channels
Loss of business associated with poor road condition during operation phase	• Regular maintenance and repair of the road by County Government, this should be through regular road marking, sealing of pot holes, ensure road signage is in place among other operations

Table 7-13 Operation Impacts and Mitigation for Floodlights Projects

impact	Mitigation measure
Risk of electrocution	• Ensuring that all the wires are appropriately insulated and are safe from causing harm to humans. • Creation of awareness to the locals to avoid getting into contact with dangerous electrical current
May cause eye problem when there is bad lighting	• Ensure that the lighting system is proper to avoid flipping that can result to eye problems for people

7.7. Impacts as a result of decommissioning phase

The decommissioning phase of the infrastructure will involve the process of bringing these systems into operation after their construction is completed. This phase involves testing, verification, and ensuring that the infrastructure is fully functional and ready for use. The decommissioning phase has several impacts on various aspects of the environment, economy, and society. Here are some potential impacts associated with the decommissioning phase of the infrastructure:

1. Operational Benefits:
    - Improved Transportation: Commissioned roads enhance connectivity, reduce travel times, and promote the movement of goods and people, contributing to economic growth and improved quality of life.
    - Effective Drainage: Commissioned drainage systems help prevent flooding, erosion, and waterlogging, reducing property damage and health risks to residents.
2. Enhanced Safety and Security:
    - Floodlights: Commissioned floodlights improve visibility during nighttime, enhancing safety for pedestrians and drivers and reducing the risk of accidents and crime.
3. Environmental Impacts:
    - Sustainable Drainage: Properly commissioned drainage systems can reduce the impact of storm water runoff on natural water bodies and ecosystems, helping to mitigate water pollution and habitat disruption.
    - Energy Efficiency: decommissioning energy-efficient floodlights can help reduce energy consumption and minimize light pollution, benefiting both the environment and surrounding communities.

4. Economic Impacts:
    - Job Creation: The decommissioning phase requires various skilled workers for testing, fine-tuning, and maintenance activities, providing employment opportunities in the local community.
    - Property Value: Improved infrastructure often leads to increased property values in the surrounding area, benefiting property owners and local governments.
5. Social Impacts:
    - Access to Services: Commissioned infrastructure improves access to essential services such as sanitation and transportation, particularly benefiting marginalized communities in need.
    - Community Well-being: Functional infrastructure contributes to better quality of life, reducing health risks associated with poor drainage and enhancing safety through proper lighting.
6. Public Services:
    - Sanitation and Sewer Systems: Commissioned sewer systems ensure proper waste disposal, reducing the risk of waterborne diseases and environmental contamination.
7. Quality of Life:
    - Recreation and Public Spaces: Commissioned infrastructure like roads and drainage systems can lead to the creation or improvement of public spaces, enhancing residents' opportunities for recreation and community interaction.
8. Urban Planning and Development:
    - Facilitated Development: Properly commissioned infrastructure can unlock development potential in previously underdeveloped areas, attracting businesses, residences, and investments.
    - Urban Growth: Commissioned infrastructure can encourage urban expansion and planned development, contributing to well-organized and sustainable urbanization.
9. Community Engagement:
    - Stakeholder Satisfaction: A successful decommissioning phase leads to positive feedback from local residents, fostering community trust and satisfaction in the construction project and the governing authorities.

10. Long-Term Sustainability:
    - Maintenance Planning: decommissioning often involves establishing maintenance protocols, ensuring the longevity and continued functionality of the infrastructure over time.

CHAPTER 8. ENVIRONMENT AND SOCIAL MANAGEMENT AND MONITORING PLAN

8.1. Management Plan Principles

This Project is geared towards enhancing social and economic benefits to the people living in the Project area who will directly improving infrastructure in the settlements. However; the project should also observe environmental protection requirements in accordance to the established laws and regulations to ensure sustainability. To realize this goal, acceptability by a majority of the beneficiaries and minimal effects to the physical environment will require to be integrated in the Project through constant consultations, evaluations and review of the design aspects throughout the Project coverage. Among the factors that need to be considered in this particular project implementation will include:

i) The contractor will hire qualified community liaison officers who will be act as an inter-phase between the contractor and community. The community liaison person will be responsible for implementing components of the Stakeholder engagement requirements which require continuous engagement of the community.
ii) Enhance integration of environmental, social and economic functions in the project implementation.
iii) Consider preventive measures towards possible social and economic disruptions that may arise from the project implementation in accordance with the laid down guidelines.
iv) The contractors and other players in the project activities be prevailed upon to implement the Environmental Management Plan (EMP) through a sustained supervision and continuous consultations.

8.2. Specific Management Issues

8.2.1. Management Responsibilities

In order to implement the management plan, it is recommended that a supervisor is identified to oversee environment and management aspects during construction of the project. The supervisor would also be expected to co-ordinate and monitor environmental management during construction and provide monitoring schedules during operations. The contractor will be required to submit, under due consideration of the ESMMP as part of the ESIA the below listed management plans.

Project Specific Sub Plans to be developed by the Contractor

- Occupational health and safety plan
- Traffic management plan
- Public health and safety management plan
- The provisions for the worker's grievance mechanism
- Environmental and social monitoring plan (with further detail to the outline of monitoring indicators as presented in the ESMMP) below.

8.2.2. Environmental Management Guidelines

Upon completion and commissioning the Project, it will be necessary to establish appropriate operational guidelines on environmental conservation and social linkages to enable the operations' management identify critical environmental and social issues and institute appropriate actions towards minimizing associated conflicts.

Basically, the guidelines should cover among other areas

- Environmental management programs
- Standard Operation Procedures (SOP) Environment, Health and Safety
- Compliance monitoring schedule provided in the ESMMP
- Initial and Self Environmental audit schedules as required by EIA/EA Regulation of 2003
- Continued stakeholder engagement as discussed in chapter 6 of this assessment.

8.2.3. Environmental Education and Awareness Rising

The Nakuru Government field staff and the other beneficiaries will understand the basic environmental principles associated with the projects. In this regard, therefore, the following steps will to be considered:

Environmental Education and Awareness Rising

- Creation of liaisons on all matters related to environment management of the facilities once commissioned
- Encourage contribution of improvement ideas from the beneficiaries on specific issues related to the management of the facilities
- Establish initiatives that would instil a sense of ownership of the facilities and related components to all beneficiaries,

8.2.4. Decommissioning Process

Due to the long-term life of the intervention facilities and related components, a decommissioning audit will be undertaken at least 1 year before the process for any of the components commences, following a notice to decommission. The decommissioning process will be guided by a comprehensive decommissioning plan developed through the decommissioning audit process. However, the following features will be decommissioned upon completion of the works:

- Contractor's camp and installations that will be removed without compromising on the safety and general welfare of the immediate residents. Special care to be given to associated wastes and dust emitted in the process,
- Materials stores that will comprise fresh materials and used items. Each category will be moved safely out of site ensuring minimal or no impacts to the related environment and social setting,
- Wastes and debris holding sites will be cleared with maximum re-use of the debris either on surfacing the passageways or other grounds such as schools and church compounds.

Table 8-1: General ESMP for Construction Phase: Environmental and Social Management and Monitoring Plan

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
Seeking approvals from NEMA for ESIA, approval of campsite by Directorate of Occupational Health and Safety (DOSH)	Delay in implementation of the Project due to objections and stop orders	Low	▪ The Contractor shall ensure that all pertinent permits, certificates and licences have been obtained prior to any activities commencing on site and are strictly enforced / adhered to; ▪ The Contractor shall maintain a database of all pertinent permits and licences required for the contract as a whole and for pertinent activities for the duration of the contract	All the Project components Responsibility MoTIH & UD & Contractor	• Number of approvals / permits issued	~KShs.50,000	Contractor
construction campsites	Environmental degradation risks	Medium	▪ Isolate through fencing the camp sites from access by the public for their safety. ▪ Preferably to be located on land	Campsites Responsibility Contractor(s)	• Number of public outcry due to accidents	~KShs.50,000	Contractor

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			already cleared land wherever possible ▪ The Contractor's Camp layout shall take into account availability of access for deliveries and services and any future works				
Access to campsites and construction sites	Environmental degradation risks	Medium	▪ Utilize to the extent possible the existing public roads to avoid social and economic disruption ▪ Ensure road safety measures for the construction vehicles to the extent possible by observing all traffic regulations	Access Roads Responsibility Contractor(s)	• Cases of private land required • Accidents occurrence incidences	No direct cost associated	Contractor
Environmental and Social Training and Awareness	Risks of Environmental and Social degradation risks and occupational health and safety related accidents	Medium	▪ The Contractor and sub-contractors shall be aware of the environmental requirements and constraints on construction	All Workers Responsibility Contractor(s)	• Number of Trainings Held • Availability of Training reports • Attendance list	~KShs.50,000	Contractor's environmental and social safeguards expert

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			activities contained in the provisions of the ESMMP ▪ The Contractor will be required to provide for the appropriate Environmental Training and awareness as described in this ESMMP in his costs and programming ▪ An initial environmental awareness training session shall be held prior to any work commencing on site, with the target audience being all project.		of participants during the training's sessions		
HIV/AIDS awareness and prevention campaign	Risks of Increased HIV and Aids transmission in the area	Medium	▪ The Contractor shall institute HIV/AIDS awareness and prevention campaign amongst his workers for the duration of the	All Workers <u>Responsibility</u> Contractor(s)	• Number of Trainings Held • Availability of Training reports	KShs. 25,000	Contractor's occupational health and safety officer

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			contract, contracting and implementing organisation, with preference for an organisation already working on this issue in the Project area; ▪ The campaign shall include the training of facilitators within the workers, information posters in more frequented areas in the campsite and public areas, availability of promotional material (T-shirts and caps), availability of condoms (free), and theatre groups		• Attendance list of participants during the training sessions		
Local Labour / Employment	Delay in Project implementation due to opposition from aggrieved community members	Medium	▪ Wherever possible, the Contractor shall use local labour, and women must be encouraged to be involved in construction work	All the Project Lots <u>Responsibility</u> Contractor	• Number of workforces employed from the local community • Number of	No direct costs associated	Contractor

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			▪ The contractor shall ensure compliance to the gender balance as required by the 2/3 gender rule		females employed		
Setting out and clearance of project routes and site	Delay in project implementation due to opposition from PAPs	High	▪ Implementation of Resettlement Action Plan (RAP) recommendations before commencement of civil works ▪ In the event that the contractor requires additional land, the contractor will apply the provisions of the RAP. ▪ if the respective land setting is not reflected in the RAP, to comply with WB OP 4.12; prior to the acquisition of any additional land, the contractor shall submit the respective plan for	All the settlements <u>Responsibility</u> MLPWHUD– Implement RAP Contractor – extra compensation on site	• Numbers of satisfied PAPS • Extend of route opened to the contractor	Kshs. 566,600.00as provided for in the RAP report	County Government of Nakuru

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			compensation and this plan has to be approved by the relevant authorities as well as by the PEA.				
Earth moving, excavations (Vegetation clearance, channeling and site preparations)	Vegetation Cover destruction	Low to medium	▪ Construction activities will be limited to Project sites / routes which already exist therefore limited destruction to vegetation cover, ▪ Compensatory planting of trees i.e., plant at least twice the number of trees	All work areas Responsibility Contractor(s)	• Soil erosion extend and intensity on site	No direct cost	Contractor
	Impacts on Water Resources - water pollution	Low to medium	• No grey water runoff or uncontrolled discharges from the site / working areas (including wash down areas) to adjacent storm water shall be permitted;	All work areas Responsibility Contractor(s)	• Water quality flowing through storm	No direct cost	Contractor

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			• Water containing such pollutants as cements, concrete, lime, chemicals and fuels shall be discharged into a conservancy tank for removal from site where applicable • The Contractor shall also prevent runoff loaded with sediment and other suspended materials from the site / working areas from discharging to storm water channels				
	Siltation and Sedimentation Control	low	• Any work along storm water channels will be isolated to prevent silt propagating downstream; • Debris and other	civil works areas <u>Responsibility</u> Contractor(s)	• Silt load in storm water channels	No direct cost	Contractor

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			material will be prevented from entering Storm water channels; contamination by other pollutants); • Sand / silt traps should be used so as to prevent silt and any other sediments from getting into storm water channels • Site compounds and stockpiles will be located away from shallow wells and storm water channels				
	Soil Erosion Impacts	low	• Earthworks should be controlled so that land that is not required for the Project works is not disturbed; • Wherever possible, earthworks should	civil works areas <u>Responsibility</u> Contractor(s)	• Extend of soil erosion on site	No direct cost	Contractor

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			be carried out during the dry season to prevent soil from being washed away by the rain. • Excavated materials and excess earth should be kept at appropriate sites approved by the Supervising Engineer. • The contractor should adhere to specified cut and fill gradients and planting embankments with shrubs and grass to reduce erosion				
Site Safety, Management of Liquid / Solid Wastes and general management of	8.2.4.1. Risk of Accidents at Work Sites	High	▪ Contractor to provide a Healthy and Safety Plan (HSP) prior to the commencement of works to be	civil works areas Responsibility Contractor(s) Supervision	• Number of fatalities and accidents recorded in the incidence book	KShs.125,000	Contractor's occupational health and safety office

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
sanitation and Hygiene			approved by the Supervising Engineer. ▪ Provide Personal Protective Equipment (PPE) including gloves, gum boots, overalls and helmets to workers. Use of PPE to be enforced by the Supervising Engineer. ▪ Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles ▪ Strict use of warning signage and tapes where the trenches are open and at other active construction sites ▪ Contractor to Employ and train Road Safety Marshalls who will				

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			be responsible for management of traffic on site				
	Solid Wastes impacts	High	▪ The contractor shall develop a comprehensive Waste Management Plan (WMP) prior to commencement of works ▪ Properly labelled and strategically placed waste disposal containers shall be provided at all places of work ▪ Litter bins should have secured lids to prevent animals and birds from scavenging ▪ All personnel shall be instructed to dispose of all waste in a proper manner ▪ Recycling of construction material shall be practiced	civil works areas Responsibility Contractor(s) Supervision	• Quantity of solid Wastes Generated and appropriately disposed	~KShs.25,000	Contractor's occupational health and safety office

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			where feasible e.g., containers and cartons ▪ Earth spoils shall be disposed of in pre identified sites				
	Liquid Wastes Impacts	High	▪ Water containing pollutants such as concrete or chemicals should be directed to a conservancy tank for removal from the site where applicable ▪ Potential pollutants of any kind and form shall be kept, stored and used in such a manner that any escape can be contained ▪ In case of any form of pollution the contractor should notify the Resident Engineer (RE) ▪ Wash areas shall be placed and constructed in such a	civil works areas <u>Responsibility</u> Contractor(s) Supervision	• Quantity of liquid Wastes Generated and appropriately disposed	KShs.25,000	Contractor's occupational health and safety office

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			manner so as to ensure that the surrounding areas including groundwater are not polluted ▪ No grey water runoff or uncontrolled discharges from the site or working areas to any adjacent Storm water channels.				
	Sanitation issues resulting from both solid and liquid wastes on site Risks associated with water borne diseases exposed to community and workforce	High	▪ The Contractor shall - laws relating to public health and sanitation ▪ All temporary/ portable toilets or pit latrines shall be secured to the ground to the satisfaction of the RE to prevent them from toppling over ▪ A wash basin with adequate clean water and soap shall be provided alongside	All work areas <u>Responsibility</u> Contractor(s) Supervision	Incidence of reported cases of water related diseases among the workforce and neighbor community	No direct cost associated	Contractor's occupational health and safety office

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			each toilet. Staff shall be encouraged to wash their hands after use of the toilet, in order to minimise the spread of possible disease				
Storage of fuels / noise and excessive vibration management	Fuels, Oils and other hydro-carbons	High	▪ The contractor shall ensure that the machines and equipment are in good condition when on site. ▪ Ensure proper handling of lubricants, fuels and solvents while maintaining the plant and equipment. ▪ Any chemical or fuel spills shall be cleaned up immediately. The spilt liquid and clean-up material shall be removed, treated and transported to an appropriate site licensed for its	civil works areas <u>Responsibility</u> Contractor(s) Supervision	• Quantity of waste fuels and oils appropriately disposed	KShs.150,000	Contractor's occupational health and safety office

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			disposal.				
	Storage of fuel oils, lubricants, chemicals and flammable materials Hazards of fire outbreak, oil and chemical spills.	High	▪ Follow specifications of the Occupational Health and Safety Act 2007, EMCA 2015 and others in the development and operation of stores.	All work areas Responsibility Contractor(s) Supervision	Incidence of reported cases of fuel leaks and fire incidences	No direct cost associated	Contractor's occupational health and safety office
	Noise and Vibration control from plant and equipment Risk to health and safety of community and workers	High	▪ The Contractor shall keep noise level within acceptable limits and construction activities shall, where possible, be confined to normal working hours in the residential areas ▪ hospitals and other noise sensitive areas shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity ▪ Any complaints received by the	civil works areas and access roads Responsibility Contractor(s) Supervision engineer	Reported complaints from neighbor community and institutions	No direct cost associated	Contractor's occupational health and safety office

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			Contractor regarding noise will be recorded and communicated to the RE ▪ The Contractor must adhere to Noise Prevention and Control Rules of April 2005				
Air pollution control	Air Quality Control Air pollution causing respiratory disorders to human	High	▪ Workers shall be trained on management of air pollution from vehicles and machinery. All construction machinery shall be maintained and serviced in accordance with the contractor's specifications ▪ The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be re-	All work areas <u>Responsibility</u> Contractor(s) Supervision	Cases of respiratory complication at nearby health centre	No direct costs (Integrated in the works costs)	Contractor's occupational health and safety office

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			vegetated or stabilised as soon as practically possible ▪ The contractor shall not carry out dust generating activities (excavation, handling and transport of soils) during times of strong winds ▪ Vehicles delivering soil materials shall be covered to reduce spills and windblown dust ▪ Water sprays shall be used on all earthwork areas within 200metres of human settlement.				
Traffic management on site	Risks of Accidents, Injuries or death of workers or community member	high	▪ Strict use of warning signage and tapes where the trenches are open and active sites ▪ Employ and train road safety Marshalls who will be	Civil work areas and access roads <u>Responsibility</u> Contractor(s) Supervision engineer	Accidents occurrence incidences	No direct cost	Contractor's occupational health and safety office and Community Liaison officer

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			responsible for management of traffic on site ▪ Contractor to provide a traffic management plan during construction to be approved by the resident engineer				
Materials sourcing, from burrow pits and quarries delivery and storage	Environmental and Safety risks associated with burrowing and opening up of new quarry sites	Medium to High	• Ensure that appropriate authorization to use the proposed borrows pits and quarries has been obtained before commencing, • This should be achieved through preparation of specific Environment and Social Impact Assessment for identified quarries and burrow pits to inspected and	Burrow Pits and Quarry Site <u>Responsibility</u> Contractor(s) Supervision	• Environmental Status of reinstated burrow pits • Complains from the community on burrow pits and material transportation	Cost to be identified once the burrow areas are determined	Contractor's occupational health and safety office and Community Liaison officer

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			approved by NEMA. • Carry out inspection of each of the site's soil stability before excavation; • Borrow pits and quarries shall be located more than 20 meters from watercourses in a position that will facilitate the prevention of storm water runoff from the site from entering the watercourse; • The Contractor shall give a 14-day notice to nearby communities of his intention to begin excavation in the borrow pits or quarries;				
Management	Labour Influx	Medium	• The contractor	Project Corridor	• Number of	No direct	Contractor's

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
of Social Issues on site	to Project settlements	to High	awarded the Project will develop a labour Management Plan (LMP) in consultation with local leaders. • The contractor will ensure effective community engagement and strong grievance mechanisms on matters related to labour • Effective contractual obligations for the contractor to adhere to the mitigation of risks against labour influx, the contractor should engage a local community liaison person. • The contractor will ensure proper records of labour	Responsibility Contractor(s) Supervision	grievances recorded by disgruntled works force and community	cost	social safeguards expert

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			force on site while avoiding child and forced labour • The contractor will ensure comply to provisions of Work Place Injuries and Benefits Act (WIBA) 2007				
	Gender Inclusivity in Project activities	Low	• The contractor will mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 Gender Rule. • The existing community structures headed by location chiefs should be involved in local labour hire, emphasize the requirement of hiring women,	Project Corridor <u>Responsibility</u> Contractor(s) Supervision	• women and Men employed by the Project	No direct cost	Contractor's social safeguards expert

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			youth and people with disability and VMGs • Protecting Human Risk areas Associated with, Disadvantaged Groups, Interfering with Participation Rights and interfering with Labour Rights				
	Children abuse impacts	High	• The contractor will develop and implement a Children Protection Strategy that will ensures minors are protected against negative impacts associated by the Project. • All staff of the contractor must sign, committing themselves towards protecting children,	Project Corridor <u>Responsibility</u> Contractor(s) Supervision	Number of cases reported involving abuse of children	No direct cost	Contractor's social safeguards expert

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			which clearly defines what is and is not acceptable behaviour • Children under the age of 18years should be hired on site as provided by Child Rights Act (Amendment Bill) 2014				
	Increase of communicable diseases including HIV and Aids	High	• HIV/AIDS Awareness Program and other communicable diseases to be instituted and implemented as part of the Contractor's Health and Safety Management Plan to be enforced by the Supervising Engineer. • This will involve periodic HIV/AIDS and other	All Workers <u>Responsibility</u> Contractor(s)	• Number of Trainings Held • Availability of Training reports • Attendance list of participants during the training sessions	Budgeted above in row (5) on page 8.5	Contractor's social safeguards expert

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			communicable diseases Awareness Workshops for Contractor's Staff • Access to Contractor's Workforce Camps by outsiders to be controlled • Contractor to provide standard quality condoms to personnel on site				
Contractor de-mobilization and site reinstatement	Associated risks of environmental degradation	Medium	▪ The site is to be cleared of all construction materials, including litter prior to hand over ▪ Fences, barriers and demarcations associated with the construction phase must be removed from the site ▪ Fences, barriers and demarcations	All work areas <u>Responsibility</u> Contractor(s) Supervision	Closeout audit report findings	No direct anticipated	Contractor

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget	Proposed Personnel/Entity in charge of Activity
			associated with the construction phase must be removed from the site ▪ Rehabilitation Activities of Environmental Cases identified must continue throughout the defect liability period				
Total Estimated Cost for ESMMP					EMP	Khs 500,000.00	
RAP Cost					RAP	Kshs 566,600.00	
Total ESMP Implementation						1,066,600.00	

8.2.5. Summary of proposed contractor's personnel implementing the ESMMP

1. Environmental safeguards expert
2. Social safeguards expert
3. Community liaison officer

Table 8-2: Operational Phase: Environmental and Social Management and Monitoring Plan

Roads and Drainage

No.	Issue	Action required	Responsibility	Provisional Budget
1	Loss of business associated with poor road condition during operation phase	• Develop a capacity building plan or program for road maintenance team who are mandated to operate and maintain the road • Regular maintenance and repair of the road by County Government, this should be through regular road marking, sealing of pot holes, ensure road signage is in place among other operations	Nakuru County Government	To be established at operation phase and included in the operation of the Projects
2	Loss of business associated with breakdown of flood lights	• Develop a capacity building plan or program for flood lights maintenance team who are mandated to operate and maintain the flood lights • Regular maintenance of the flood lights by County Government, this should be through regular replacement of bulbs	Nakuru County Government	To be established at operation phase and included in the operation of the Projects

No.	Issue	Action required	Responsibility	Provisional Budget
2	Increased Accidents associated with motor cycles over speeding within the settlement due to good roads	• Develop a capacity building plan or program on road safety campaign that targets road users. • The County Government to enlighten motorist and cyclist on importance of obeying traffic rules especially in residential areas. • The County Government to enlighten residents and school children on the importance of adhering to provisions of road safety rules • Regular inspection and maintenances of the road by County Government of Nakuru to ensure the speed control parameters and signage are in good condition. • Regular crackdown, arrest and prosecution of motorists and cyclist who disobey road safety directions.	Nakuru County Government	To be established at operation phase and included in the operation of the Projects

Sewer lines

No.	Issue	Action required	Responsibility	Monitoring Indicator	Provisional Budget
1	Risk of encroachment and construction of structures water sewer lines	• Mapping and installation of beacons to which illustrate the width of the water and sewerage pipeline reserve • Regular inspection of the pipeline corridor for encroachment. • Prosecution of encroachers as required by Nakuru City County by laws on way leaves and road reserves maintenance. • Conduct public sensitization programs on importance not interfering with way leaves and public reserve land	NAIVAWASCO	Number of encroachment cases reported	To be established at operation phase and included in the operation of the projects
2	Risk of water pipeline bursts leading water wastages (Non-Revenue Water percentages increase)	• Regular check, repair and maintenance of the pipeline • Activate a community watch group for information sharing on the status of the pipeline	NAIVAWASCO	Number of reported cases water bursts	To be established at operation phase and included in the operation of the projects
3	Risk of illegal connection to the water and sewer line pipeline	• This is common in the informal settlements where residents illegally tap water pipelines in order to get free services. • This will require constant inspection by NAIVAWASCO officials and installation of leak and burst detectors at designated areas along the pipeline. • Conduct public sensitization programs on importance not interfering with the water and	NAWA NAIVAWASCO SSCO	Number of illegal connection cases reported	To be established at operation phase and included in the operation of the projects

No.	Issue	Action required	Responsibility	Monitoring Indicator	Provisional Budget
		sewer pipeline and the need to seek official water connection from NAIVAWASCO			
4	Health Risks from Burst / Blocked Sewers	• Regular inspections, repair and maintenance of the sewer lines to be carried out by NAIVAWASCO • Residents to be encouraged by NAIVAWASCO & to form Community Watch Groups for information sharing and reporting on the status of the sewer lines • NAIVAWASCO & to undertake awareness campaigns to educate community members not to dump solids in manholes. • NAIVAWASCO to develop an inventory of system components, with information including age, construction materials, and drainage areas served for ease of identification and maintenance of the sewers.	NAIVAWASCO	Number of sewer blockages and overflows reported	To be established at operation phase and included in the operation of the projects
5	Land and Soil Contamination by Raw Sewage	• The NAIVAWASCO to carry out regular patrols and attend to burst pipes promptly • NAIVAWASCO to encourage land owners along sewer lines to maintain vegetated belts along the pipeline to control any overflows flows and trap soil. They will also be encouraged to take responsibilities at the lowest levels in regard to protecting the sewer line e.g., by promptly reporting to NAIVAWASCO in case of bursts / blockages;	NAIVAWASCO	Cases of land and soil contamination reported	To be established at operation phase and included in the operation of the projects

8.3. Decommissioning Flow Chart

The project has been designed to operate effectively for over 20 years. In the event that the infrastructure will be required to be overhauled, then the following steps should be considered in order to undertake the procedure in a structured manner with minimum impact to both human and natural environment.

Table 8-3: Decommissioning Flow Chart

	Action	Actor
Step 1	Initiation Development of an Objective Worksheet and checklist incorporating references, legal, stakeholder engagement and policies Undertake decommissioning audit	Proponent
Step 2	Prepare Road Map for Decommissioning Design Conduct design review to validate elements of the design and ensure design features are incorporated in the decommissioning design. Public consultations	Proponent
Step 3	Prepare and Award Contract Prepare a contract that incorporates validated project information and award to a contractor as per the Procurement rules.	Proponent
Step 4	Execute Decommission Works Implement design elements and criteria on the Project in accordance with specifications and drawings. Inspect during decommissioning and at Project completion to ensure that all design elements are implemented according to design specifications.	Contractor
Step 5	Non-Conformance, Corrective/Preventive Action Determine root cause Propose corrective measures Propose future preventive measures	Proponent

CHAPTER 9. CONCLUSION AND RECOMMENDATIONS

9.1. Recommendations

As has been alluded to in this report, the following can be said in summary.

The implementation of the design of the Project as an immediate and long-term measure to cater especially for the needs of the community will be a major step in improving the infrastructure in the settlement.

The negative impacts identified in this ESIA during all the phases of the project including waste generation, air pollution, noise pollution, occupational health and safety impacts, community health and safety impacts, traffic, labour influx and gender impacts will be limited to the specific project location and can be mitigated through the measures proposed in the ESMP as well as the preparation and implementation of safeguard policies including but not limited to:

- Waste Management Plan
- Labour influx strategy
- Gender-based violence plan
- Child protection strategy
- Employment plans
- Occupational Health and Safety Plan
- Decommissioning Plan
- Hazard Material Management Plan

Other plans to aid the implementation of the safe project implementation can be included as the project continues. In addition, the recommendations of the public consultation and participation were incorporated into the findings of this report.

The ESIA recognizes that the short-term benefits of the project will be realized once the project is fully implemented according to plan. The adverse impacts on the physical and natural environment will be “in sum total,” not significant, and can be handled through the recommended mitigation measures. There are incremental costs required to achieve these. Compensation for demolition of structures and livelihoods will be done through a Resettlement Action Plan which is provided under a separate report.

Future recommendations for design

Designing infrastructure for informal settlements requires a thoughtful and context-specific approach to address the unique challenges and needs of these communities. Here are some future recommendations for the design of water pipelines in informal settlements:

1. Community Engagement: Involve residents in the design process to understand their needs and preferences. Engage in participatory planning to ensure that the infrastructure meets the actual requirements of the community.
2. Adaptability and Flexibility: Design infrastructure that can adapt to the changing needs and growth of the settlement. Flexibility in design allows for expansion, upgrades, and modifications over time.
3. Sustainable Materials and Techniques: Use locally sourced and sustainable materials that are affordable and environmentally friendly. Incorporate green infrastructure elements for drainage, such as rain gardens and permeable surfaces.
4. Inclusive Design: Ensure that infrastructure is accessible to all, including people with disabilities and vulnerable groups. Design roads and walkways with ramps and proper lighting for safety.
5. Multi-Functionality: Integrate infrastructure elements to serve multiple purposes. For example, green spaces can serve as recreational areas, drainage solutions, and community gathering spaces.
6. Smart Technologies: Incorporate technology for efficient management and monitoring of infrastructure. Smart meters for water and energy can help manage resources effectively.
7. Decentralized Systems: Consider decentralized systems for sewage treatment and water supply, reducing the strain on centralized infrastructure. This can include small-scale wastewater treatment and rainwater harvesting systems.
8. Resilience to Climate Change: Design infrastructure to withstand the impacts of climate change, such as increased rainfall and flooding. Implement flood-resistant design and consider elevating infrastructure where necessary.
9. Safety and Security: Provide proper lighting through solar-powered floodlights and ensure that roads and public spaces are well-lit for safety and security, particularly at night.

10. Local Workforce and Skills Development: Use the construction of infrastructure as an opportunity for skill development and employment for local residents. This can also enhance community ownership and pride.
11. Regular Maintenance Plans: Develop plans for ongoing maintenance and repair of infrastructure. Engage the community in the maintenance process to ensure the longevity of the infrastructure.
12. Legal Recognition and Tenure Security: Advocate for legal recognition of informal settlements to provide residents with tenure security, enabling them to invest in and maintain their living spaces.
13. Partnerships and Collaboration: Collaborate with NGOs, community-based organizations, government agencies, and private sector entities to pool resources, expertise, and support for holistic development.

Each informal settlement is unique, so solutions should be tailored to the specific context and needs of the community. It's crucial to involve local stakeholders, experts, and the community itself throughout the design and implementation process.

9.2. Conclusion

Key findings of the Environment and Social Impact assessment of the proposed KISIP investments Nakuru County Informal Settlements of *Karagita* are as follows:

ix) The Project has an overall positive impact on the informal settlements as it will improve the living conditions of people living and working in the informal settlements, through improving accessibility, drainage, waste, and security.

x) The Project does not have significant and potentially irreversible negative impacts on the environment and people. The few identified negative impacts associated with construction Projects can easily be mitigated, and an Environmental and Social Impact Management Plan has been prepared as part of this report, whose implementation will be monitored to ensure compliance and protection of the environment. A monitoring plan to ensure this happens has also been developed.

xi) The Project will not lead to displacement of people as the roads are designed to follow the designated road reserves on the physical development plans (PDPs). However, there are encroachments on the road reserves mostly of temporal structures for

informal traders. A RAP has been prepared to mitigate against this to ensure that their livelihoods are not negatively impacted upon.

However, the Project will impact on people's assets and sources of livelihoods which encroach into the road reserves as summarized below from the Abbreviated Resettlement Action Plan (ARAP) prepared for the Project.

Table 9- 1: RAP Breakdown

No	PAP Category	Settlements
		Karagita
1	Structure owners	18
2	Tenants	2
3	Number of female PAPs	10
4	Number of male PAPs	10
5	Vulnerable persons	0
	Total	20
Settlement	PAPs	Implementation Budget (Kshs)
Karagita	20	566,600.00
Structures affected are timber / wood vendor kiosks		

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

xiii) The RAP will be fully implemented before the commencement of the Project civil works

xiv) Construction activities should commence only when NEMA issues an approval / license.

xv) Adhere to all the recommendations in the EIA license and Environmental Management and Monitoring Plan during all the project phases.

xvi) Obtain all necessary trade permits from the Nairobi County Government during construction.

CHAPTER 10. REFERENCES

1) County Government Act No. 17 of 2012
2) Environment and Social Management Framework (ESMF), 2019 for KISIP II, by MLPWHUD, State Department for Housing and Urban Development, Kenya.
3) Gender Policy, 2011 by Ministry of Gender, Children and Social Development Gender Policy
4) https://climateknowledgeportal.worldbank.org/
5) Kenya gazette supplement Environmental Management and Coordination (Waste Management) Regulations, 2006.
6) Kenyan New constitution, 2010
7) Kenya National Bureau of Statistics (KNBS) (2019): The 2019 Kenya Population and Housing Census. Counting our people for the implementation of vision 2030.
8) Kenya Roads Board Act No. 7 of 1999.
9) Kenya National Youth Policy, 2006 Ministry of Youth Affairs
10) Kenya Vision 2030
11) KISIP I RAP Report prepared by Ga Consultants Limited in joint venture with IPE Global Limited, 2015 for, MoTIHUD Kenya.
12) KISIP II Design report for Construction of Roads, Footpaths, NMT Facilities, Drainage, High Mast Floodlights & Sewer Works in Karagita, Lakeview, London/Hilton, and Kwa Murogi Settlements in Nakuru County, March 2023 by Tertiary Consulting Engineers in joint venture with GA Consultants Limited for MLPWHUD, State Department for Housing and Urban Development, Kenya.
13) KISIP II Project Inception Report prepared by Tertiary Consulting Engineers in joint venture with GA CONSULTANTS LIMITED, 2022 for MLPWHUD State Department for Housing and Urban Development, Kenya.
14) Legal Notice No. 160: Kenya Gazette Supplement No. 84-Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006
15) MoALF. 2017. Climate Risk Profile for Nakuru. Kenya County Climate Risk Profile Series. The Kenya Ministry of Agriculture, Livestock and Fisheries (MoALF), Nairobi, Kenya.
16) National Environment Policy (NEP), 2013 by Ministry of Environment, Water and Natural Resources
17) National Policy on Water Resources Management and Development
18) Nakuru County Integrated Development Plan 2018-2022 by County Government of Nakuru,2018.
19) Noise and Excessive Vibration Pollution (Control) Regulations, 2009

20) Occupational Health and Safety Act (OSHA 2007)
21) Operational Manual - OP 4.01: Environmental Assessment, Revised 2013 by World Bank
22) Operational Manual - OP 4.11: Physical Cultural Resources, Revised 2006 by World Bank
23) Operational Manual - OP 4.10: Indigenous Peoples, Revised 2006 by World Bank
24) Operational Manual - OP 4.12: Involuntary Resettlement, Revised 2016 by World Bank
25) Operational Manual World Bank Access to Information Policy, 2015
26) Physical and Land Use Planning Act, 2019
27) Project Appraisal Document (PAD) for KISIP, 2019 by MLPWHUD State Department for Housing and Urban Development, Kenya
28) Republic of Kenya, Environmental Management and Coordination Act (EMCA 1999) amended 2015
29) Republic of Kenya, Environmental Management and Coordination (Water Quality) Regulations, 2006
30) Republic of Kenya Land Act, 2012
31) Republic of Kenya Urban Areas and Cities Act 2011 by the National Council for Law Reporting
32) Republic of Kenya Public Health Act (Cap.242) by the National Council for Law Reporting
33) Resettlement Policy Framework (RPF) 2019 for KISIP II by MLPWHUD State Department for Housing and Urban Development, Kenya
34) Sessional Paper No. 3 of 2009 on National Land Policy, Ministry of Lands Kenya
35) Republic of Kenya Sessional Paper No. 3 of 2016 on National Housing Policy
36) Republic of Kenya Sessional Paper No. 6 of 1999 on Environment and Development
37) Special issue, Kenya gazette supplement No. 62, Legislative supplement No. 16, Legal notice No 31, The Environmental Management Coordination Act (EMCA), no 8 of 1999
38) Stakeholder Engagement Framework (SEF), 2019 for KISIP II by MLPWHUD State Department for Housing and Urban Development, Kenya
39) The Environmental (Impact Assessment and Audit) Regulations, 2003
40) The Environmental Management and Coordination (Air Quality Regulations 2014)
41) The Sustainable Development Goals (SDGs)
42) Vulnerable and Marginalized Groups Framework (VMGF), for KISIP II, 2019 for MLPWHUD, State Department for Housing and Urban Development, Kenya
43) Water Act, 2016 Republic of Kenya
44) World Bank Group Environment, General Health and Safety Guidelines
45) World Bank Group Environment Health and Safety Guidelines on Water and Sanitation

ANNEXES

ANNEX 1 ENVIRONMENT AND SOCIAL SCREENING MATRIX

Annex 1: Environment and Social Screening Matrix

Criteria	Yes/No	Comments	Other GoK/ WB Policies applicable	Recommended scale of Environmental Assessment
Part A: Triggers to EMCA				
Applicability of Second Schedule of EMCA	Yes	Project activities fall within provisions of EMCA schedule 2	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4, 7.5 and 7.6)
Part B: Details of Site location	Yes/No	Description	GoK/ WB Policies applicable	Proposed Mitigations or Enhancements
Site of ecological importance as described in environment screening checklist	No	Sites located within human urban settlements	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4)
Are there vulnerable or endangered species (terrestrial or aquatic) in the area?	No	Sites located within human urban settlements	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4)
Are there natural habitats in the site? Or in its proximity	No	Sites located within human urban settlements	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4)
If there are natural habitats, are they fragile, unique, limited in size? Are these world heritage / Ramsar sites	No	Sites located within human urban settlements	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4)
Are there wetlands, areas of saturated soils (permanent or temporary), or evidence of ponding (cracks, high clay content in soils, dead vegetation, water marks)?	No	Sites located within human urban settlements	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4, 7.5 and 7.6
Is the site already degraded (low groundwater, poor soil quality)?	No	Sites located within human urban settlements	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4)

Criteria	Yes/No	Comments	Other GoK/ WB Policies applicable	Recommended scale of Environmental Assessment
Are there steep slopes in the proximity of the investment site?	No	Sites located within human urban settlements	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4)
Do people live on the proposed site?	Yes	Sites located within human urban settlements	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4)
List existing land uses (ranching, farming)?	Yes	Human Urban Settlement	N / A	N / A
Is there existing site access (roads)?	Yes	Human Urban Settlement	N / A	N / A
Is the site vulnerable to natural hazards (in floodplain, near volcano, on seismic fault, near coastline in hurricane zone)?	No	Sites located within human urban settlements	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4)
Are there land title conflicts?	No	No conflict - KISIP 2 has addressed land tenure issues	N / A	N / A
Are there known archaeological, historical or other cultural property? Are any of these world heritage / UNESCO designated etc.	No	Sites located within human urban settlements no archeological site identified	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4)
Do indigenous peoples live on or near the site?	No	No indigenous people identified on site	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4)
Part C: Analysis of likely physical Impacts				
(i) Scope of proposed activities				
Will the investment generate an increase in solid wastes or machine wastes (oil, etc.)?	Yes	Wastes from construction activities including plant and	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4 and 7.5

Criteria	Yes/No	Comments	Other GoK/ WB Policies applicable	Recommended scale of Environmental Assessment
		equipment and materials on site		
(ii) Water Resource Impacts				
Could the investment result in a modification of groundwater levels by altering flows, paving surfaces or increasing water extraction?	No	Nature of anticipated project activities are small and less adverse to ground water resources	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4 and 7.5
Could it affect groundwater quality?	No	Nature of anticipated project activities small and less adverse to ground water resources	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4 and 7.5)
Could it affect quality (through sediment, wastewater, storm discharge or solid waste) of nearby surface waters (lake, rivers, streams)?	No	There are no notable nearby surface waters.	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4 and 7.5
Will it affect water quantity in nearby water bodies (lake, river, stream)?	No	There are no notable nearby water bodies	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4 and 7.5
Are there nearby potable water sources that need to be protected?	No	Settlements located in humans' settlements with no natural habitat	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4 and 7.5
(iii) Ecosystem Impacts				
Could the investment affect natural habitats or areas of high ecological value?	No	Settlements located in humans' settlements with no natural habitat.	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4 and 7.5)
Could it affect natural characteristics of adjacent or nearby sites?	No	Settlements located in humans' settlements with no natural habitat,	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4 and 7.5)

Criteria	Yes/No	Comments	Other GoK/ WB Policies applicable	Recommended scale of Environmental Assessment
Could it affect wildlife or natural vegetation?	No	No game parks and reserves in the settlements	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4 and 7.5)
(iv) Drainage Impacts				
Will the investment in storm water drainage affect existing drainage patterns?	Yes	The settlements have challenges in storm water as discussed in chapter 2, investing in storm water drainage will resolve the problem. However, during construction minor impacts on existing storm water drainage will be experienced	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4 and 7.5)
Will it cause standing water, which could cause public health risks?	Yes	Storm water drainage will help drain stagnant water existing in the settlements However, during construction minor impacts on existing storm water drainage will be experienced	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4 and 7.5)
Will erosion result in sediment discharge to nearby water bodies?	No	No nearby water bodies present	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4 and 7.5)

Criteria	Yes/No	Comments	Other GoK/ WB Policies applicable	Recommended scale of Environmental Assessment
Will surface drainage patterns be affected in borrow pits and quarries?	Yes	Project activities will not directly lead to burrow pits and quarries within the settlement, however on the areas where burrow pits will be opened, drainage patterns of likely to be impacted.	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4 and 7.5)
Will infiltration patterns be affected?	No	The settlement pattern is dense, less impact is anticipated on infiltration patterns	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4 and 7.5)
Socio-economic impacts				
Will the project entail resettlement of population?	No	No persons will be physical resettled; however, the project will trigger partial impacts to structures encroaching into road reserves, business and other sources of livelihood encroaching on the reserve will be affected	Applicable as discussed in chapter (4))	As discussed in sub chapter (7.4 and 7.5)
Will the project affect indigenous peoples?	No	No indigenous people identified on site	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4)

Criteria	Yes/No	Comments	Other GoK/ WB Policies applicable	Recommended scale of Environmental Assessment
Will it limit access to natural resources to local populations?	No	No natural resources were identified with the target settlements	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.4)
Will it have an impact on land use?	Yes)	Once upgrading of infrastructure in the settlements is completed, the land use in the settlements will improve with better housing, attraction of other social amenities such as schools, hospitals, shops.	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.6)
Will it induce further encroachment of nearby areas?	No	The projects will in fact help to clear road reserves and water / sewerage wayleaves in the settlement which are encroached	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.6)
Will it cause any health impacts?	No	Minor construction activities related impacts will be mitigated as discussed in sub chapter 4.5	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.5)
Will it disturb nearby communities during construction?	Yes	Minor disturbance during construction which can be mitigated	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.5)

Criteria	Yes/No	Comments	Other GoK/ WB Policies applicable	Recommended scale of Environmental Assessment
Could cultural resources be affected?	No	No cultural resources were identified	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.5)
Could it affect nearby properties?	Yes	Less significant impacts to people's assets and sources of livelihood as discussed above which will be appropriately compensated as presented in the RAP assessments for the Project	Applicable as discussed in chapter (4)	As discussed in sub chapter (7.5)

ANNEX 2 PUBLIC PARTICIPATION MINUTES AND LIST OF PARTICIPANTS

KENYA INFORMAL SETTLEMENT IMPROVEMENT PROJECT II (KISIP II) | 4 NO. SETTLEMENTS THE COUNTIES OF
NAIROBI AND NAKURU [CONTRACT. NO.: KE-MOTI-214833-CS-QCBS]

MINUTES OF THE PUBLIC PARTICIPATION MEETING FOR KARAGITA SETTLEMENT
VENUE: NAIVAWASCO BOARDROOM
TIME: TIME: 10.00 AM -12.00 PM

IN ATTENDANCE

CONSULTANT – GA

	NAME	DESIGNATION
1	Dr. Eng. Elisha Akech	Project Team leader
2	Eng. Patrick Wambulwa	Project Environmentalist

COUNTY, KISIP AND SETTLEMENT OFFICIALS AND SETTLEMENT RESIDENTS

	NAME	DESIGNATION
9.	See Attendance List	

Time: 10:0am – 12:05pm

Attendance

The consultant, representation of the local leadership attended the meeting. A full list of attendance is attached herewith.

Agenda:

1. Introduction
2. Overview of the proposed project
3. Prediction of Positive and Negative Impacts of the Proposed Works.
4. Community's Response and Discussions
5. Recommendations and way forward
6. Adjournment

Agenda 001: Introduction

The meeting was called to order at 10:0am by Sec chair, James Mburu. This was followed by a word of prayer from Alex Mwerema the Managing Director for NAIVAWASCO and thereafter a self-introduction session.

The consultant started with welcoming the attendees. This was followed by a brief of the purpose of the meeting. In his opening remarks, the environmentalist thanked the members for availing themselves for the meeting.

Agenda 002: Overview of the Proposed Project

The Environmentalist informed the members that the meeting was in line with the Kenya Informal Settlement Improvement Project. The project aims at improving the settlement through laying of pipeline from Police line to Karagita tanks and building of two de-fluoridation units to reduce high levels of fluorine in water within Naivasha water sources.

In his presentation the environmentalist explained the role of the consultant in the proposed project was to undertake an Environmental and Social Impact Assessment Study that not only guides the design of the options but also incorporates the opinions and views of the beneficiary community in the proposed interventions.

In his assertion, the ESIA study aimed at;

- Informing the community on the proposed interventions;
- Engaging the community on the environmental issues in regards to sanitation status in their area
- Impacts prediction during the implementation of the project
- Involving the general community in decision making as far as the proposed project is concerned.
- Some of the anticipated benefits of the proposed project may include;
    - ❖ Improved water supply to the areas of Karagita and its surrounding

Agenda 003: Prediction of Positive and Negative Impacts of the Proposed Works.

The environmentalist went ahead to further provide positive and negative impacts of the project during and after the implementation of the project. Some of the positive impacts anticipated from the project, the impacts discussed are as follows;

1. Improve the general water availability of water within Karagita settlement by providing a new direct line which will not be affected by the increasing Industrial Parks water demand
2. Improve the water quality of supplied water through the de-fluoridation treatment to reduce the impacts of high fluorine in water to the people of Karagita. The impact being the browning of teeth which is a social concern in the area.

As the consultant gave the negative impacts he also mentioned some of the mitigation measures that can be applied to curb its effects; The negative effects and mitigation measures are as follows;

S/N	Negative Impacts	Mitigation Measures
1	Destruction of trees and Vegetation. However, it was noted that within the project areas	A proposition of the planting of trees after the project completion to replace the trees that will be damaged during implementation.

S/N	Negative Impacts	Mitigation Measures
	there are no trees or visible vegetation.	
2	Contamination of Surface water	Directing waste water through the right drainage channels
3	Soil Erosion from the constant movement and digging of soil within the area.	The use of Rip-Rap to mitigate the measures of soil erosion to avoid serious damages from soil erosion.
4	Callous solid and soil waste disposal	The contractor should include screens for the culvert entry and exit points to manage soil and solid wastes.
5	Noise Pollution and Vibration	• Insistence that the contractor works within the designated working hours that are 8:00am-5:00pm. To allow for the residents to rest during the night. • Ensure the trucks are well maintained to avoid unnecessary noise from the trucks being used. • Insistence on having the truck running only when they are in use • Manual labour to be utilised in the excavations.
6	Air Pollution and Dust Emission	• To mitigate this the contractor will be urged to organize for the watering of the sites at least two times a day to control the emission of dust.
7	Accidents happening on site	• Highlighting and marking areas that are dangerous using safety tape to fully secure the area to avoid accidents on site. • For those that will be working on site, the basic requirement of wearing Protective gear and gear that makes them visible to avoid accidents and injuries amongst the workers.
8	Traffic and road safety	The contractor will be required to have trained traffic marshals on site to help with traffic flow.
9.	Disruption of public utilities such as water, sewerage, electricity and data or internet cables.	The site will have personnel from the different utilities to provide services in relation to the service.

AGENDA 004: Community Deliberations on Issues Discussed.

Member of County Assembly

The member appreciated the consultancy team for giving full details on the project and gave a suggestion on the use of local labour when the footpaths are done to ensure the community youth benefit from employment opportunities.

The consultant assured the members that it is a mandate that the contractor should source local labour for such activities.

Community Member
It was noted that some of the activities that are being carried out will disrupt/destroy some of the community efforts that have been implemented by the community. The member wanted to understand what would happen to such efforts.
The consultant informed the members that the contractor is required to ensure that they repair and restore the project sites to as they were before or even better.
Community Member
The member needed clarification on when the project will be implemented, as it is noted that government projects take time before implementation.
The consultant retaliated by providing that it will depend on the studies of the project but once they are approved, the contractor will be selected by following due government procedure and upon the selection of a contractor the project will be likely to begin.

Community Member
The member wanted to find out if there will be provision for water connection for the households in Karagita?
The consultant informed the members that the project will cover the pipeline, de-fluoridation tank and renovation of Karagita tank only. The available system will be used to get the available water. It will be the work of NAIVAWASCO to ensure that anybody who wants to connect to the system is connected in accordance to his or her laid down procedures of water connection.

Community Member
What will happen to services that will be affected along the wayleave like water lines, power, electricity or any other facility?
The consultant informed the members that the project will work closely with the service providers so that minimal disruption will occur. The services shall need restoration immediately after being affected to minimize damage.

Agenda 005 Recommendations and Way forward.

- It was recommended that in preparation for the implementation the Settlement Executive Committee and the Grievance Redress Committee should work on clearing wayleaves so that the project cannot be delayed.
- It was agreed that that the contractor must use local community members to implement the project.
- It was agreed that the contractor to reinstate any facility destroyed by the project on time.

Agenda 006Adjournment

There being no other business, the MCA gave closing remark by appreciating the consultancy team for coming and urged that they were eagerly awaiting a quick implementation of the project. Meeting ended with a word of prayer from a member at 12Noon.

Attendance List

Photo Plate

Consultation meeting for Karagita water pipeline project

ANNEX 3 CHANCE FIND PROCEDURES

CHANCE FIND PROCEDURES

KENYA INFORMAL SETTLEMENTS IMPROVEMENT PROJECT

ENVIRONMENT AND SOCIAL IMPACT ASSESSMENT (ESIA) REPORT

Policy and Legal Provision

World Bank OP 4.11 on Physical Cultural Resource and National Museums and Heritage Act 2006 laws of Kenya provides for; *'if you believe that you may have encountered any archaeological materials or any material national importance stop work in the area and follow the procedure box below'*

Chance Find Procedures

(i) All construction activity in the vicinity of the remains is to cease immediately.
(ii) The Supervising engineer or Environment Officer shall contact Kenya National Museums Immediately

Public relations:

E-mail: publicrelations@museums.or.ke

Director General: -

Email: dg@museums.or.ke

Fax: +254 -20-3741424

Tel: +254-20-8164134/35/36

(iii) The find location will be recorded and all remains will be left in place.
(iv) Potential significance of the remains will be assessed and mitigated options will be identified.
(v) If the significance of the remains is judged to be sufficient to warrant further action and they cannot be avoided, then the Director of Kenya National Museums will determine the appropriate course of action
(vi) In the case of human remains, if the remains are assessed to be archaeological, then Director of Kenya National Museums will determine how to handle them.
(vii) Options could include avoidance or respectful removal and reburial.
(viii) If human remains are encountered and they are not archaeological, then Nakuru County Government will be contacted immediately for appropriate reburial.

ANNEX 4: COMPANY & LEAD EXPERT 2023 LICENSE

FORM 7 (r.15(2))

nema
mazingira yetu | uhai wetu | wajibu wetu

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/18790
Application Reference No: NEMA/EIA/EL/24750

M/S **TERTIARY CONSULTING ENGINEERS LTD**
(individual or firm) of address
P.O. Box 46439 - 00100 NAIROBI

is licensed to practice in the capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Firm of Experts** registration number **3049**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **2/2/2023** Expiry Date: **12/31/2023**

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001:2015 Certified

nema
mazingira yetu | uhai wetu | wajibu wetu

Payment Receipt

Invoice Number:EPL_25702
Invoice Status:PAID
Payment Date:04/04/2023

Applicant Details:
PIN:A000093769U
Name:Eng. Dr. Zablon Isaboke Oonge
Phone:
Email:oongezi@gmail.com

Service	Description	Amount (KES)
Expert License	Payment for Expert License	5,000
Convenience Fee	Ecitizen Convenience Fee	50.00
	Total Amount Paid	5,050
	Balance	0

Payment Mode eCitizen

Note :This document is computer generated and therefore not signed. Present it during licence or permit collection

ANNEX 5: WATER QUALITY RESULTS.

Kihoto Borehole Water Chemical Analysis.

FORM F/9/1/3

WATER RESOURCES AUTHORITY

NHIF building, 9th floor, Wing B
P.O. Box 45250-00100, Ngong Road, Nairobi
Tel: +254-020-2732291/2729048/9
Email: wra@wra.go.ke,
Website: www.wra.go.ke

Central Water Testing Laboratories
P.O. Box 45250, 00100, Off Dunga Road, Nairobi
Tel: +254 773903729
Email: cwtl@wra.go.ke; centralwatertestinglabs@gmail.com

Physical-Chemical Laboratory Results Certificate

Report Issue Date:	17/11/2021	**Sample No:**	WRA/HQ/CWTL-13071 **Year:** 2021
Name of Customer:	Athi Water Works Development Agency	**Date Received:**	02/11/2021
Email Address:	kjshah3008@gail.com	**Type of Sample:**	Borehole water
Telephone Number:	-	**Date of Sampling:**	31/10/2021
Sample submitted by:	John	**Source of sample:**	Kihoto, Naivasha
Purpose of Sampling:	domestic	**Received by:**	Nicky Sitati
County:	NAKURU		

PARAMETERS	UNIT	ANALYTICAL METHOD	RESULTS	KS EAS 12:2018 STANDARDS (MAX.)
pH	pH Scale	APHA 4500-H+ B	7.5	5.5-9.5 (6.5-8.5)*
Colour	mgPt/l	APHA 2120 B	2.5	50(15)*
Turbidity	N.T.U	APHA 2130 B	ND	25 (5)*
Conductivity (25°C)	µS/cm	APHA 2510B	1631	2500 (1500)*
Iron	mg/l	APHA 3500-Fe B	ND	0.3
Manganese	mg/l	APHA 3500-Mn B	<0.01	0.1
Calcium	mg/l	APHA 3500-Ca B	8.8	150
Magnesium	mg/l	APHA 3500-Mg B	9.2	100
Sodium	mg/l	APHA 3500-Na B	334	200
Potassium	mg/l	APHA 3500-K B	22	50
Total Hardness	mg $CaCO_3$/L	APHA 2340 C	60	600 (300)*
Total Alkalinity	mg $CaCO_3$/L	APHA 2320 B	580	500**
Chloride	mg/l	APHA 4500-Cl- B	105	250
Fluoride	mg/l	APHA 4500-F- C	6.4	1.5
Nitrate	mg/l	APHA 4500-NO3-D	5.0	45
Nitrite	mg/l	APHA 4500-NO2- B	<0.01	0.9
Sulphate	mg/l	APHA 4500-SO42- E	45	400
Free Carbon Dioxide	mg/l	APHA 4500-CO2 C	10	Not Applicable
Total Dissolved Solids	mg/l	APHA 2510 A	1011	1500 (1000)*

**Maximum limits for treated potable water; **WHO maximum guideline value; APHA: American Public Health Association (2005) - Standard methods for the examination of water & wastewater; "<": value below method detection limit; ND: Not detectable*

Comments:

Soft, clear water but with high Fluoride content. For drinking purposes, defluoridation/treatment is recommended such that te eventual Fluoride concentration does not exceed 1.5mg/l. The other chemical characteristics are satisfactory.

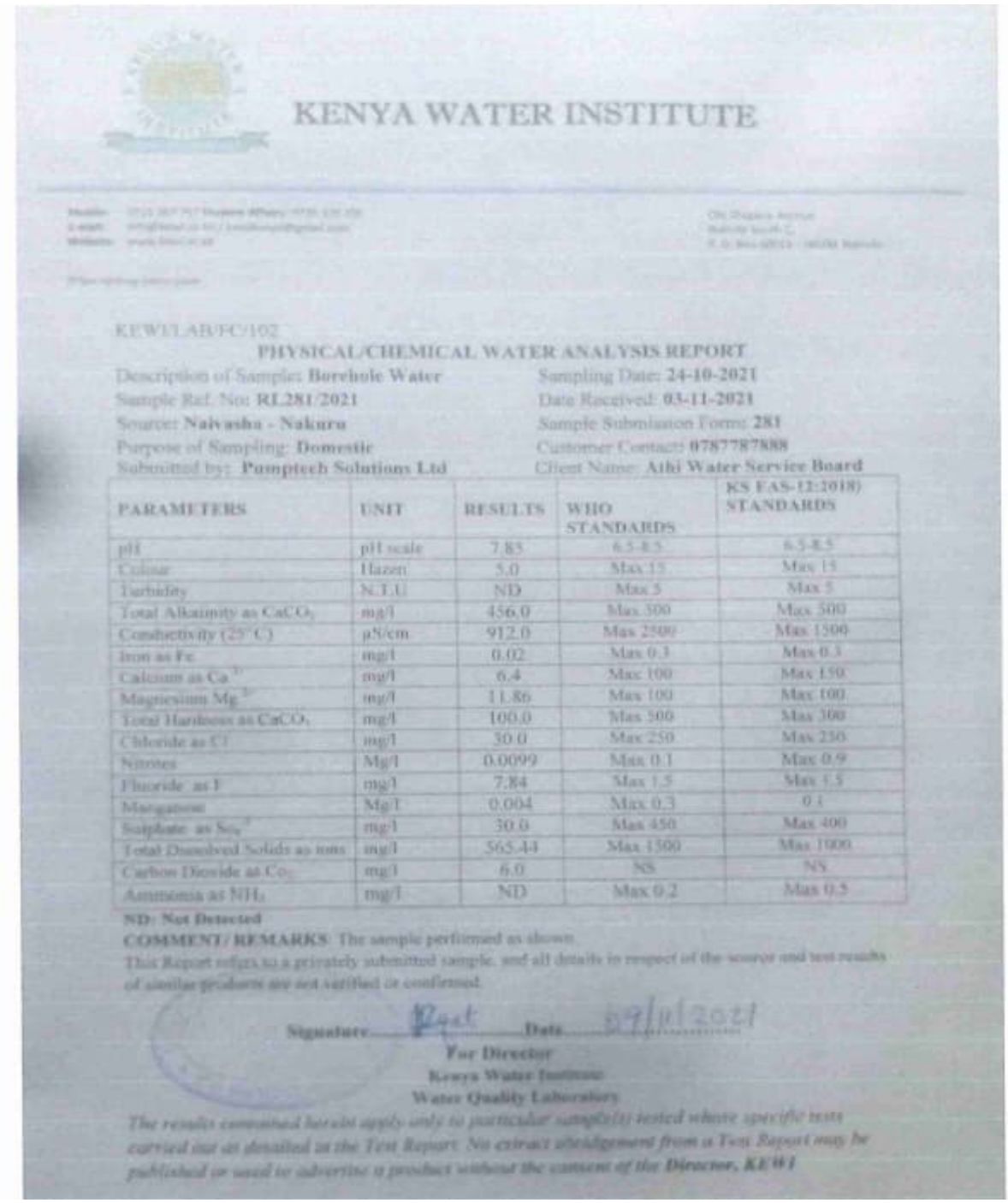
WATER RESOURCES AUTHORITY
CENTRAL WATER TESTING LABORATORY
Tel: 0773 903 729
P. O. Box 45250 - 00100, NAIROBI
centralwatertestinglabs@gmail.com
cwtl@wra.or.ke

Julia Prisila
Laboratory Analyst

John Muasya
Assistant Technical Coordination Manager

The results contained herein apply to the particular sample(s) tested ...

Police Line Borehole water chemical Analysis



KENYA WATER INSTITUTE

KEWI/LAB/FC/102

PHYSICAL/CHEMICAL WATER ANALYSIS REPORT

Description of Sample: **Borehole Water** Sampling Date: **24-10-2021**
Sample Ref. No: **RL281/2021** Date Received: **03-11-2021**
Source: **Naivasha - Nakuru** Sample Submission Form: **281**
Purpose of Sampling: **Domestic** Customer Contact: **0787787888**
Submitted by: **Pumptech Solutions Ltd** Client Name: **Athi Water Service Board**

PARAMETERS	UNIT	RESULTS	WHO STANDARDS	KS EAS-12:2018) STANDARDS
pH	pH scale	7.85	6.5-8.5	6.5-8.5
Colour	Hazen	5.0	Max 15	Max 15
Turbidity	N.T.U	ND	Max 5	Max 5
Total Alkalinity as $CaCO_3$	mg/l	456.0	Max 500	Max 500
Conductivity (25° C)	µS/cm	912.0	Max 2500	Max 1500
Iron as Fe	mg/l	0.02	Max 0.3	Max 0.3
Calcium as Ca^{2+}	mg/l	6.4	Max 100	Max 150
Magnesium Mg^{2+}	mg/l	11.86	Max 100	Max 100
Total Hardness as $CaCO_3$	mg/l	100.0	Max 500	Max 300
Chloride as Cl	mg/l	30.0	Max 250	Max 250
Nitrites	Mg/l	0.0099	Max 0.1	Max 0.9
Fluoride as F	mg/l	7.84	Max 1.5	Max 1.5
Manganese	Mg/l	0.004	Max 0.3	0.1
Sulphate as SO_4^{2-}	mg/l	30.0	Max 450	Max 400
Total Dissolved Solids as ions	mg/l	565.44	Max 1500	Max 1000
Carbon Dioxide as Co_2	mg/l	6.0	NS	NS
Ammonia as NH_3	mg/l	ND	Max 0.2	Max 0.5

ND: Not Detected

COMMENT/ REMARKS: The sample performed as shown.

This Report refers to a privately submitted sample, and all details in respect of the source and test results of similar products are not verified or confirmed.

Signature ..... **Date** 27/10/2021

For Director
Kenya Water Institute
Water Quality Laboratory

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