KWSSIP
Karachi Water & Sewerage Services Improvement Project

Final Report
October 2023

Environmental & Social Management Plan

Priority Sewer Network Rehabilitation and Extension Project

MMP
MM Pakistan (Pvt) Ltd.

Karachi Water & Sewerage Services

Improvement Project [KWSSIP]

Environmental & Social Management Plan of Priority Sewer Network Rehabilitation and Extension Project

October 2023

Project Implementation Unit (PIU)
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Environmental & Social Management Plan of Priority Sewer Network Rehabilitation and Extension project

October 2023

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Disclaimer

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List of Acronyms

ADB	Asian Development Bank
AIIB	Asian Infrastructure Investment Bank
AOI	Area of Influence
BOD	Biochemical Oxygen Demand
CBOs	Community Based Organizations
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COC	Code of Conduct
COD	Chemical Oxygen Demand
CSC	Construction Supervision Consultant
dB	Decibel
DIA	Direct Impact Area
DMC	District Municipal Corporation
DPC	Dhabeji Pumping Complex
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EPRP	Emergency Preparedness and Response Plan
ESA	Environmental & Social Assessment
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESIA	Environmental & Social Impact Assessment
ESMP	Environmental & Social Management Plan
ESS	Environmental and Social Standards
FGD	Focus Group Discussion
FY	Fiscal Year
GRM	Grievance Redress Mechanism
HIV/AIDS	Human Immunodeficiency Virus / Acquired immunodeficiency syndrome
HSE	Health, Safety and Environment
IEE	Initial Environmental Examination
IFC	International Finance Corporation
IIA	Indirect Impact Area
ILO	International Labour Organization
ISO	International Standards Organization
IUCN	International Union for Conservation of Nature
JICA	Japan International Cooperation Agency
KWSC	Karachi Water & Sewerage Corporation
KWSSIP	Karachi Water & Sewerage Services Improvement Project
LMP	Labour Management Procedures
MGD	Million Gallon Per Day
MMP	MM Pakistan (Pvt.) Ltd.
MS	Mild Steel
MSDS	Material Safety Data Sheet
NCR	Non-Compliance Reports

NO2	Nitrogen dioxide
OHS	Occupational Health and Safety
PIU	Project Implementation Unit
PM_{10}	Particulate Matter 10 Micron
$PM_{2.5}$	Particulate Matter 2.5 Micron
PSN	Priority Sewer Networks
SEP	Stakeholder Engagement Plan
SEPA	Sindh Environmental Protection Agency
SEQS	Sindh Environmental Quality Standards, 2016
SMF	Social Management Framework
SO_2	Sulphur dioxide
SOPs	Series of Projects
SPs	Safeguard Policies
SSESMPs	Site Specific Environmental & Social Management Plans
SSWMB	Sindh Solid Waste Management Board
TBT	Toolbox Talks
TCU	True Colour Units
TMP	Traffic Management Plan
UC	Union Council
UNESCO	United Nations Educational, Scientific and Cultural Organization
USEPA	United State Environmental Protection Agency
VU	Vulnerable
WB	World Bank
WBG	World Bank Group
WHO	World Health Organization
WMP	Waste Management Plan

1 Introduction

The Government of Sindh (GoS) and Karachi Water and Sewerage Corporation (KWSC) plan to implement the Second Karachi Water and Sewerage Services Improvement Project (KWSSIP-2) in Karachi with financial support from the World Bank (WB) and Asian Infrastructure Investment Bank (AIIB). One planned intervention under KWSSIP-2 comprises priority sewer scheme rehabilitation and extension to enhance sewage conveyance to Lyari and Malir interceptors.

This document presents the Environmental and Social Management Plan (ESMP) of the proposed Priority Sewer Network Rehabilitation and Extension Project to comply with local regulations and WB Environmental and Social Framework (ESF) requirements and to address potential environmental and social (E&S) impacts of the project.

The proposed project will include installing and rehabilitating sewer lines with diameters ranging from 12 to 72 inches in Karachi's 14 selected priority areas.

1.1 Objective of ESMP

The ESMP has been developed in compliance with the mitigation hierarchy as per the World Bank's ESF. Impacts and risks associated with the project's pre-construction, construction, and operational phases have been assessed, and mitigation and control strategies have been devised accordingly to address the potential E&S risks associated with the project.

Other associated objectives of the ESMP are to:

- Facilitate PIU of KWSSIP in ensuring E&S sustainability of the project;
- Establish a baseline of existing E&S conditions before project initiation by collecting secondary and primary data/information on the physical, biological, and socio-economic environment of the project area;
- Identify potentially significant E&S impacts (both positive and negative) during all stages of the project;
- Avoid, minimize, and suggest mitigation and compensation measures for significant adverse impacts;
- Conduct, record, and report public consultation and participation with major stakeholders; and
- Provide an ESMP for all project stages as a tool for implementing the suggested measures and monitoring and evaluation mechanisms with adequate resources, including capacity

1.2 Document Structure

Chapter 1: Introduction – This chapter defines the ESMP's objectives and the document's structure.

Chapter 2: Brief Discussion of Legal and Institutional Requirements, Project Description, Description of the Environment, and Potential Environmental and Social (E&S) Impacts and Risks – This chapter presents the legal and institutional requirements related to the environmental protection of the proposed

project. It also provides a brief description of the project, a summary of the baseline conditions of the physical, biological, and socio-economic environment of the project area, and the potential impacts and risks of the project to the environment and society during its implementation.

Chapter 3: Environmental and Social Management Plan – The Environmental and Social Management Plan (ESMP) describes the proposed measures and actions to address the project's potential adverse impacts on the environment, workers, and communities by the WB-prescribed mitigation hierarchy.

Chapter 4: Environmental and Social Monitoring Plan – The Environmental and Social Monitoring Plan (ESMoP) provides the monitoring activities' methodology, frequency, and duration.

Chapter 5: ESMP Implementation (Institutional Arrangements, Trainings, Reporting, and Cost) – This chapter describes the institutional arrangements for the ESMP implementation during the project construction and operation, the training/capacity development programs, reporting requirements, and the indicative costs of the ESMP implementation. It also presents the Grievance Redress Mechanism (GRM) adopted for addressing grievances from the workers, communities, and stakeholders and the planned stakeholders' engagement and consultation throughout the project cycle.

Additional details on the Project Background, Legal and Institutional Requirements, Project Description, Description of the Environment, Assessment of Potential E&S Impacts and Risks, Grievance Redress Mechanism, and Information Disclosure, Consultation, and Participation prepared as part of the Environmental and Social Impact Assessment (ESIA) are provided as Annexes of this ESMP.

2 Brief Discussion of Legal and Institutional Requirements, Project Description, Description of the Environment, and Potential Environmental and Social Impacts and Risks

2.1 Legal and Institutional Requirements

2.1.1 National and Provincial Legislation

The applicable national and provincial E&S legislation and regulation to the project include the Sindh Environmental Protection Act, 2014; Sindh Environmental Quality Standards, 2016; Sindh Factories (Second Amendment) Act, 2021; Sindh Occupational Safety and Health Act, 2017; Sindh Occupational Health and Safety Rules, 2019; Sindh Minimum Wages Act, 2015; Sindh Workers Compensation Act, 2015; Sindh Prohibition of Employment of Children Act, 2017; Protection Against Harassment of Women at the Workplace Act, 2010; Sindh Local Government (Amendment) Act, 2021; Hazardous Substances Rules, 2014; and Building Code of Pakistan, 2007.

2.1.2 International Treaties and Conventions

Pakistan is a signatory to several international E&S-related treaties, conventions, declarations, and protocols.

2.1.3 World Bank Environmental, Health, and Safety (WB EHS) Guidelines

The applicable WB EHS Guidelines during the construction and operation of the project include the General EHS Guidelines (2007), the EHS Guidelines for Waste Management Facilities (2007), and the EHS Guidelines for Water and Sanitation (2007).

2.1.4 World Bank Environmental and Social Standards (WB ESS)

The applicable WB ESS to the project are ESS1 (Assessment and Management of Environmental and Social Risks and Impacts), ESS2 (Labor and Working Conditions), ESS3 (Resource Efficiency and Pollution Prevention and Management), ESS4 (Community Health and Safety), ESS5 (Land Acquisition, Restrictions on Land Use and Involuntary Resettlement), ESS6 (Biodiversity, Conservation, and Sustainable Management of Living Natural Resources), and ESS10 (Stakeholder Engagement and Information Disclosure).

2.2 Project Description

The Project will be executed through two construction packages with each package having seven schemes. **Table 2-1** summarizes the proposed 14 priority sewer schemes.

Table 2-1: Summary of Proposed 14 Priority Sewer Schemes

Scheme No.	Location	Lengths and Sizes of Sewer Pipes	
		Pipe (Inch)	Length (m)
1	Abbott Laboratories to Malir River - National Highway Quaidabad - Bin Qasim Town	24	500
		33	500
		42	867.46
2	Main Paracha Chowk to Lyari River Interceptor and Jinnah Road, Toor baba Road, Urdu Bazaar Road and Akbar Road (S.I.T.E)	12	2100
		15	2140
		18	1806
		21	675
		24	255
		27	425
3	Sector 11 via KDA Chowrangi to Lyari River Interceptor (Manghopir)	21	400
		27	400
		30	400
		36	400
		42	400
		48	1200
		54	1200
		60	560
4	Gulshan-e-Maymar to Lyari River Interceptor (Manghopir & Gulzar-e-Hijri)	18	548
		27	450
		30	500
		33	380
		42	520
		54	500
		66	500
		Conduit (2 m wide / 1.5 m deep)	2635
5	Khawaja Ghareeb Nawaz Chowk to Orangi Nala Trunk Sewer (Mominabad & Orangi)	15	630
		21	690
		24	470
		27	630
		30	400
		33	400
		36	525
		42	950
		48	655
		60	1211
		66	616
		72	418
6	Raja Tanveer Colony to Orangi Nala Trunk Sewer (Mominabad)	15	671
		18	711
		21	323
		27	294
		30	218
		33	492
		36	332
		42	945
		48	961.6
		54	594
		60	667
7		15	466

Scheme No.	Location	Lengths and Sizes of Sewer Pipes	
		Pipe (Inch)	Length (m)
	Irani Camp Road to Orangi Nala Trunk Sewer (Mominabad)	33	500
		42	500
		54	500
		66	231
		72	270
		Conduit (2 m wide/1.5 m deep)	2132
8	Masjid-e-Sattar to Scheme no. 07 of SOP-1 (UC-22, Gulshan-e-Iqbal, District East-B)	15	230
		18	385
		21	340
		24	300
		27	600
		30	160
		33	105
9	Al-Quddos Apartment Block-13C to Scheme no. 07 of SOP-1 near Masjid e Quba - (UC-22, Gulshan-e-Iqbal, District East-B)	18	100
		21	200
		24	68
10	Malir-15 to Malir River Interceptor (Shah Faisal)	18	300
		24	600
		27	600
		30	305
		36	220
		42	125
11	Dayar-e-Shereen Sweets Buffer Zone to Ziauddin Hospital to Scheme-16 of SOP-1 near Wahid Colony, North Nazimabad	24	400
		36	500
		54	400
		60	400
		66	400
		72	900
		Conduit (2 m wide/1.5 m deep)	1881
12	Atma Ram Road to 08 Chowk to Pumping Station (UC No. 01,02,03,08 & 09 Lyari Town - District South-A)	24	210
		27	160
		33	135
		36	76
		42	522
		48	317
		36	200
13	Atma Ram Road to Mirza Adam Khan Road to Pumping Station (Uc-No 01,02 & 03 Lyari Town)	15	556
		18	190
		21	829
		24	548
		27	836
		30	200
		33	330
		36	400
		42	225
14	Peoples Stadium to Pumping Station (Lyari)	18	100
		21	100
		24	303
		27	153
		30	74

2.3 Description of the Environment

2.3.1 Physical Environment

The hottest months are April to June, whereas December and January are relatively colder. July and August are the wettest months in the project area.

Karachi faces urban flooding due to inadequate drainage, waterway encroachments, urbanization, and climate change. Recent years have seen increased heatwaves in Karachi from May to September.

The laboratory analysis results of the air, noise, and water quality monitoring conducted from February to March 2022 were compared with the SEQS and WHO/WBG Standards. The PM2.5 air quality concentrations at all stations, PM10 at five locations, and NO and CO at one location exceeded the standards. The noise level at six locations exceeded the limits. All water samples showed the presence of bacterial contamination.

The land use near Scheme No. 01 is a mix of commercial, residential, and industrial zones concentrated along the National Highway N5 and Malir River. Scheme No. 02 is diverse, with commercial and residential areas along Jinnah Road and Lyari River. Scheme Nos. 03-04 are near commercial, residential, religious, and recreational spaces. Orangi Town (Schemes Nos. 05-07) is densely populated with informal settlements lacking proper planning and infrastructure. Gulshan e Iqbal (Schemes Nos. 08-09) is a well-established area with apartments, houses, and commercial spaces. Shah Faisal Colony (Scheme No. 10) is mainly residential. North Nazimabad (Scheme No. 11) features diverse housing and commercial options. District South (Schemes Nos. 12-14) includes historic and modern elements, blending colonial architecture, cultural landmarks, and commercial districts.

2.3.2 Biological Environment

Field assessments were conducted in from February to March 2022.

Per the IUCN Red List of Threatened Species, no endangered, threatened, or vulnerable plant species exist within the project sites. Approximately 1,825 trees (180 trees within the Direct Impact Area (DIA)) will have to be cut for the execution of construction activities. The typical fauna includes stray cats, stray dogs, house shrews, house rats, and common birds such as black kite, blue rock pigeon, house crow, house sparrow, and Indian myna/common myna.

2.3.3 Socio-Economic Environment

There are twenty-five settlements within the Area of Influence (AoI). The socioeconomic baseline of the project area has been established by utilizing both primary and secondary data sources.

2.4 Potential E&S Impacts and Risks

The potential environmental and social (E&S) impacts of the project on the physical, biological, and socio-economic environment with significant risk levels during the construction phase include inadequate implementation of the ESMP, Occupational Health and Safety (OHS) Plan, Community Health and Safety (CHS) Plan, and other specific plans.

OHS and Emergency Preparedness and Response impacts; solid waste management - generation of excavated material, kitchen waste, and hazardous waste; and CHS impacts. No significant impacts were identified during the pre-construction and operation phases.

3 Environmental and Social Management Plan

The Environmental and Social Management Plan (ESMP) describes the proposed measures and actions to address the project's potential adverse impacts and risks on the environment, workers, and communities during pre-construction, construction, and operation. **Table 3-1** presents the ESMP for the project with the details of the mitigation/enhancement measure(s) for every significant impact/risk identified by the WB-prescribed mitigation hierarchy and grouped according to the relevant WB ESS, the relevant guidelines/plans, and the entities responsible for implementing the measure(s).

3.1 Various Mitigation and Control Measures

The ESMP includes different types of mitigation and control measures and guidelines for managing environmental, health, safety, and social impacts and risks in the form of general and non-site-specific measures or Environmental and Social Codes of Practices (ECPs) to address general construction and operation matters; specific mitigation measures; and guidelines for making construction and operational phase site-specific plans.

3.2 Environmental and Social Code of Practices for Construction

The environmental and social codes of practice (ECPs) are generic, non-site-specific guidelines for the construction phase. The ECPs consist of environmental and social management guidelines and OHS practices to be followed by the contractors for sustainable management of all environmental, social, health, and safety issues. The ECPs are as follows: ECP 1: Waste Management; ECP 2: Fuels and Hazardous Goods Management; ECP 3: Water Management; ECP 4: Drainage Management; ECP 5: Air Quality Management; ECP 6: Noise and Vibration Management; ECP 7: Protection of Flora; ECP 8: Protection of Fauna; ECP 9: Road Transport and Road Traffic Management; ECP 10: Construction Camp Management; and ECP 11: Worker Health and Safety.

3.3 Site Specific Environmental and Social Management Plan (SSESMP)

The Contractor will prepare a Site Specific Environmental and Social Management Plan (SSESMP) demonstrating how they will comply with the requirements of the site-specific management plans, ECPs, and the mitigation measures proposed in this ESMP. The SSESMP will be submitted before any construction activities start and approved by the Engineer. The SSESMP will form part of the contract documents and be used as a monitoring tool for compliance. Violating the compliance requirements will be treated as non-compliance, leading to corrections or imposing a penalty on the Contractor.

3.4 Occupational and Community Health & Safety Plans

The Contractor will also prepare an Occupational Health and Safety (OHS) Plan for managing the identified OHS hazards and control measures. The OHS Plan will comply with WB ESS2 (Labor and Working Conditions), WB EHS Guidelines, WB Health, and Safety Framework South Asia Region (SAR), Sindh Occupational Safety and Health Act (2017), Sindh Labour Acts, International Labour Organization (ILO) Code of Practices, and Good International Industry Practices (GIIP).

A review and update of the OHS Plan will be done whenever: (i) there is a significant change in the scope of the project; (ii) there is a change in construction methodology/technique based on site conditions; and (iii) following significant OHS hazard or a major accident.

3.4.1 Job Hazard Analysis

The Contractor will conduct a Job Hazard Analysis (JHA) for each construction component, focusing on job tasks to identify hazards before they occur. It will focus on the relationship between the worker, the task, the tools, and the work environment. After identifying uncontrolled hazards, steps should be taken to utilize the hierarchy of control: elimination, substitution, engineering controls, administrative controls, and personal protective equipment, to minimize them to an acceptable risk level. Many workers are injured and killed at the worksite every day.

The JHA should be one of the major components of the larger commitment of the Contractor's health and safety management system. The JHA should be conducted on many jobs on the worksite. Priority should be given to the following types of jobs: (i) jobs with the highest injury or illness rates; (ii) jobs with the potential to cause severe or disabling injuries or illness, even if there is no history of previous accidents; (iii) jobs in which one simple human error could lead to a severe accident or injury; (iv) jobs that are new or complex to the construction or have undergone changes in construction processes and procedures; and (v) jobs complex enough to require written instructions.

3.4.2 EHS in Method Statement

The Contractor will include an EHS Chapter in each Method Statement. This EHS section will be based on the JHA and other provisions of the OHS Plan and environmental issues of the site and specific to construction methods to be followed by the Contractor. This section will be reviewed by the EHS Specialists of the Engineer/Construction Supervision Consultant (CSC) and confer approval along with other technical parameters to be reviewed by the engineering team of the CSC. The EHS Specialists will also review each revision of the method statement, and their concurrence will be required to approve the method statements.

3.5 Inclusion of ESHS Conditions in the Bidding Documents

To make Contractors fully aware and responsible for ensuring Environmental, Social, Health, and Safety (ESHS) compliance, the following conditions and all other relevant conditions in line with the "WB – Procurement of Works & User's Guide – Updated January 2017", will be made part of the bidding documents:

- The Contractor will obtain ESHS Performance Security for Compliance with the Contractor's ESHS obligations.
- The Contractor will be required to declare any civil work contracts that have been suspended or terminated and performance security called by an employer for reasons related to the non-compliance of any environmental, social, or health or safety requirements or safeguard or related to sexual exploitation and abuse and gender-based violence in the past five years.
- The Contractor will submit comprehensive and concise Environmental, Social, Health, and Safety Management Strategies and Implementation Plans (ESHS-MSIP), which include but are not limited to a mobilization strategy, strategy for obtaining consents/permits, traffic management plan, waste

management plan, workers camp management plan, etc. and a strategy for marking and respecting work site boundaries, etc.

- The Contractor will recruit qualified and experienced ESHS Staff with relevant educational backgrounds and experience for each site to manage E&S aspects of the project.
- The Contractor will be bound to disclose the "Recruitment Policy" and follow it. The Contractor will hire at least 60% of the people who live near the project area.
- The Contractor will be encouraged to contribute to the well-being of the environment and society exceptionally and find ways to take up the relevant stakeholders' suggestions as a part of their commitment and develop solutions or alternatives.
- The ESMP will be made part of the bidding documents.
- Incorporate SEA/SH/GBV provisions in the bidding document.
- The Contractor will be required to ensure compliance with the 'Code of Conduct' signed by each of its employees/workers. The issues to be addressed in the Code of Conduct will include the following:
  - Compliance with applicable laws, rules, and regulations of the jurisdiction;
  - Compliance with applicable health and safety requirements (including wearing prescribed personal protective equipment, preventing avoidable accidents, and a duty to report conditions or practices that pose a safety hazard or threaten the environment);
  - Use of illegal substances;
  - Non-discrimination (for example, based on family status, ethnicity, race, gender, religion, language, marital status, birth, age, disability, or political conviction);
  - Interactions with community members (for example, to convey an attitude of respect and non-discrimination);
  - Sexual harassment (for example, to prohibit the use of language or behavior, particularly towards women or children, that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate);
  - Violence or exploitation (for example, the prohibition of the exchange of money, employment, goods, or services for sex, including sexual favors or other forms of humiliating, degrading, or exploitative behavior);
  - Protection of children (including prohibitions against abuse, heresy, or otherwise unacceptable behavior with children, limiting interactions with children, and ensuring their safety in project areas);
  - Sanitation requirements (for example, to ensure workers use specified sanitary facilities provided by their employer and not open areas);
  - Avoidance of conflicts of interest (such that benefits, contracts, or employment, or any preferential treatment or favors, are not provided to any person with whom there is a financial, family, or personal connection);
  - Respecting reasonable work instructions (including regarding E&S norms);

- Protection and proper use of the property (for example, to prohibit theft, carelessness, or waste);
- Duty to report violations of this Code;
- Non-retaliation against workers who report violations of the Code if that report is made in good faith;

- Contract payments will be linked to environmental, health, and safety performance, measured by completing the prescribed E&S mitigation measures in the SSESMP and control measures described in the OHS Plan. In addition, for any non-compliance causing damages or material harm to the natural environment, workers, public or private property, or resources, the Contractor will be required to either remediate/rectify any such damages in a timeframe specified by and agreed with the engineer (CSC) or pay the implementing agency (IA) for the cost (as assessed by IA) of contracting a third-party to carry out the remediation work. For repeated non-compliance, the Contractor will be penalized. The penalty for non-compliance with the SSESMP and OHS Plan requirements will be 3% of the total Civil Works in the Instruction of Payment Certificate (IPC). The penalty will be imposed after all contractual instruments are applied and a Non-compliance Report (NCR) is issued by the CSC/Engineer.

3.6 Criteria for the Selection of Sub-Contractors

The Contractor will ensure that the following criteria are followed for the selection of any sub-contractor to ensure their ability to implement ESHS requirements:

- All ESF / ESS Requirements applicable to the main Contractor shall also apply to the hired Sub-contractors.
- Sub-contractor should have proven experience in providing services for at least five years with successful ESHS management.
- The sub-contractor shall provide the following:
  - Details of company information with organization structure, list of manpower with the Curriculum Vitae (CVs) of key personnel, plant, and machinery list mentioning the year of manufacturing, support agencies, other facilities, and resources.
  - Details of completion of similar types of projects within the last five years indicating their brief scope of work, the value of work, contractual duration, actual completion of the project, client's name, contact details of that client, safety appreciation or compliance certification or inspection of plant and machinery, EHS statistics, Loss Time Injuries (LTI) graph, etc.
  - Details of typical project planning and execution methodology.
  - Details of current commitments – List of all the jobs under execution with the value of the job and percentage completion with particular emphasis on projects of similar magnitude carried out.
  - Details of experience of working on similar kind of project.
  - Details of EHS policy, safety manual, safety plan, and implementation procedures in line with internationally accepted practices, along with the statistics for the last four years.

- Details of quality assurance and quality control practices currently in place for the execution of similar work.
- Details of Contractor's financial performance documents (audited balance sheets with profit and loss statements) and audit reports for the last five preceding years.
- Details of documents in support of Health, Safety, Environment, and Quality [HSEQ] performance.
- Details of insurance of employee policy, medical evaluation including drug testing policy.
- Details of managing and monitoring sub-contractor performance.
- Details of safety and security evaluation policy.
- Copies of ISO 9001, 14001, Occupational Health and Safety Assessment Series (OHSAS) 18001, or any other accreditation and certification as applicable.

Table 3-1: Environmental and Social Mitigation Plan

Impacts and Risks	Details of Mitigation / Enhancement Measures	Relevant Guidelines / Plans	Responsibility
Pre-Construction Phase			
ESS1: Assessment and Management of Environmental and Social Risks and Impacts			
Permits, NOCs, Clearances	◆ Secure all essential consents, permits, and clearances before starting civil works.	◆ Completion of ESMP Approval Process in line with Review of SEPA IEE/EIA Regulations 2021 ◆ Writing formal letters from PD-KWSSIP to the identified departments for taking necessary permits, consents and approvals.	◆ PIU
Lack of appropriate E&S personnel with CSC and Contractors	◆ Recruit qualified CSC and Contractors able to implement the Project's Environmental, Social, Health, and Safety requirements. ◆ Include personnel's education, qualification, and experience requirements in the bidding documents. ◆ Hire Contractors with good environmental, health, and safety management. ◆ Include the Contractor's qualifications as pre-qualification criteria in the short-listing process. ◆ Reflect ESMP conditions in the Contractor's bidding documents and the supervision consultant's ToR. ◆ Allocate necessary funds for ESMP implementation and monitoring.	◆ Bidding and Contract Documents ◆ ESMP, SSESMP, OHS/CHS and Other Plans	◆ CSC's Selection: PIU ◆ Contractor's Selection: PIU & CSC ◆ Contractor's EHSS Staff Recruitment: Contractor ◆ Preparation of Plans: Contractor ◆ Supervision: CSC ◆ Monitoring: PIU
Inappropriate Planning for Construction Traffic Routes	◆ Devise a Traffic Management Plan (TMP) by PIU/CSC/Contractors, in collaboration with the Sindh Traffic Police, to minimize the expected disruption at the identified access roads. ◆ Ensure PIU approves the TMP before construction activities. No work will be done without approved TMP. ◆ Ensure TMP will: ◆ Provide a safe environment for all road users;	◆ Preparation and Implementation of TMP, ECP 9	◆ Preparation of TMP: PIU/CSC/Contractor/ Sindh Traffic Police ◆ Implementation: Contractor ◆ Supervision: CSC ◆ Monitoring: PIU

Impacts and Risks	Details of Mitigation / Enhancement Measures	Relevant Guidelines / Plans	Responsibility
	◆ Protect the general public from traffic hazards that may arise as a result of the construction vehicles movement; ◆ Minimize disruption, congestion, and delays to all road users; ◆ Ensure access to adjacent private/commercial premises is maintained at all times. ◆ Ensure, whenever possible, that a sufficient number of traffic lanes to accommodate vehicle traffic volumes are provided. ◆ Ensure that delays and traffic congestion are minimal and within acceptable levels. ◆ Ensure that appropriate/sufficient warning and information signs are installed, and adequate guidance is provided to delineate the travel paths through the event site. ◆ Ensure that the roads are free of hazards and that all road users are adequately protected from the activities of road users. ◆ Implement ECP 9: Road Transport and Road Traffic Management		
ESS4: Community Health and Safety			
Improper Location of Worker Camps Leading to Environmental and Social Issues	◆ Develop worker camps at the identified campsite locations and provide ancillary facilities, such as electricity, washrooms for labor with suitable effluent and sewage disposal facilities, and water for their everyday use for drinking and bathing, etc. ◆ Ensure that camps are away from local communities with strict protocols for interaction with local	◆ Worker's CMP and Implementation of LMP	◆ Preparation and Implementation of LMP: Contractor ◆ Supervision: CSC ◆ Monitoring: PIU

Impacts and Risks	Details of Mitigation / Enhancement Measures	Relevant Guidelines / Plans	Responsibility
	communities to avoid impacts from labor influx and minimal disturbance to the nearby communities. ◆ Prepare a Worker's Camp Management Plan (CMP) and a Labor Management Plan (LMP) to ensure effective implementation. ◆ Other measures include: ◆ Develop a Code of Conduct (COC) for all site personnel. All site personnel shall sign this COC and abide by it. ◆ Ensure project staff receive training on preventing SE/SH/GBV. ◆ Provide on-site anti-harassment training to create awareness of the harmful effects of GBV, as well as consequences if GBV occurs according to the anti-harassment policies. ◆ Avoid entering settlements. ◆ Incorporate SEA/SH/GBV provision in the bidding document. ◆ Engage skilled trainers to raise awareness among project workers of the risks, expected behaviors, and consequences of violations, communicated through training and publicized codes of conduct. ◆ Raise awareness of the risks among community members and local health authorities and inform them about available grievance mechanisms. ◆ Provide extensive training for awareness-raising strategy to describe SEA/SH risks and the worker's responsibilities under the COC.		

Impacts and Risks	Details of Mitigation / Enhancement Measures	Relevant Guidelines / Plans	Responsibility
	◆ Avoid the routes/places the women use as far as possible. If unavoidable, identify alternate routes for the communities. ◆ Conduct induction training or workshops to introduce the basics of health and hygiene and the necessary preventive measures against diseases. ◆ Ensure necessary medical screening of all workers & staff and submission of proof of vaccination (COVID-19) before employment. ◆ Provide training on the worker's GRM to know their rights and responsibilities. ◆ Ensure the availability of complaint boxes at all work sites, allowing workers to report any issues and wrongdoings.		
Lack of Community Awareness	◆ Conduct FGDs and distribute pamphlets before the project implementation begins to increase local awareness. Maintain regular interaction by PIU/CSC/Contractor's Social Safeguard Team throughout construction. Share key information about the ◆ Project overview and objectives ◆ Preliminary and final design of project components ◆ Environmental and social impacts, along with mitigation measures ◆ Grievance redress mechanism and contact details	◆ Community Interactions through FGDs, Pamphlets etc.	◆ Implementation: PIU, CSC, Contractor
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement			
Land Requirements and Resettlement Issues	◆ Implement the Abbreviated Resettlement Plan (ARP) in adherence to the guidelines.	◆ Implementation of ARP	◆ Implementation of ARP: PIU ◆ Supervision: CSC ◆ Monitoring: PIU

Impacts and Risks	Details of Mitigation / Enhancement Measures	Relevant Guidelines / Plans	Responsibility
	◆ Proceed with construction activities after the Contractor confirms the full provision of compensation and assistance to the PAPs as stipulated in the ARP.		
Construction Phase			
ESS1: Assessment and Management of Environmental and Social Risks and Impacts			
Inadequate Implementation of ESMP, OHS, CHS and Other Specific Plans.	◆ Enlist Environment, Social, Health, and Safety Staff by the CSC and Contractor. ◆ Outline Environmental, Social, Occupational, and Community Health and Safety procedures within method statements. ◆ Formulate and implement a Site-Specific Environmental and Social Management Plan (SSESMP), OHS Plan, CHS Plan, and other necessary plans as per ESMP guidelines. ◆ Evaluate the Contractor's capability concerning safeguard management by the PIU - KWSSIP. ◆ Hire Contractors with good environmental, health, and safety management.	◆ ESMP, OHS, CHS and Other Specific Plans.	◆ Contractor's selection: PIU and CSC ◆ Preparation / Implementation of plans: Contractor ◆ Supervision: CSC ◆ Monitoring: PIU and TPV
ESS2: Labor and Working Conditions			
Occupational Health & Safety / Emergency Preparedness and Response	◆ Create an OHS Plan before construction, covering policies, SOPs, and training. Require approval by the consultant. ◆ Implement gas monitoring, PPE provision, and effective communication. ◆ Ensure thorough risk assessments, confined space training, and proper ventilation. ◆ Follow the WB Health & Safety Framework and integrate it into the OHS Plan. ◆ Incorporate hazard mitigation guidelines and review by CSC and PIU. ◆ Follow COVID-19 protocols. Prepare an Emergency Preparedness and Response Plan (EPRP) for emergencies ◆ Provide first aid units, equipment, and paramedical staff	◆ Implementation of OHS Plan, EPRP, ECP 11	◆ Implementation: Contractor ◆ Supervision: CSC ◆ Monitoring: PIU ◆ Coordination with National / Provincial Emergency Response Services: PIU

Impacts and Risks	Details of Mitigation / Enhancement Measures	Relevant Guidelines / Plans	Responsibility
	◆ Maintain site safety, zero-tolerance for loss of life, and health & safety training ◆ Adhere to the Sindh Workers Compensation Act, 2015 for accidents. ◆ Disposal of AC pipe disposal during excavation by SEPA-certified waste handlers ◆ Implement ECP 11: Worker Health and Safety		
Communicable Diseases - COVID- 19 and Camp Management	◆ Follow COVID-19 protocols issued by the Ministry of Health Services, GoP, April 2020. ◆ Raise worker awareness on sanitation and hygiene practices. ◆ Maintain good housekeeping at camps and sites. ◆ Provide clean water and proper personal hygiene facilities. ◆ Ensure timely treatment for affected workers to control disease spread. ◆ Implement Camp Management Plan and Labor Management Procedures. ◆ Use non-wood fuel for cooking. ◆ Appoint cleaning staff for Campsites' cleanliness. ◆ Implement ECP 10: Construction Camp Management.	◆ Implementation of COVID19 Guidelines - Health & Safety of Building and Construction Workers, Workers Code of Conduct (CoC), CMP, LMP. ECP 10	◆ Implementation: Contractor ◆ Supervision: CSC ◆ Monitoring: PIU and TPV
Working Conditions	◆ Adhere to labor standards, including Provincial Labor Laws and ILO Standards for work hours, workers' payments & compensations. Ensure their compliance with CSC/PIU. ◆ To understand their rights and responsibilities, provide workers with training on the existing Grievance Redress Mechanism (GRM). Ensure the availability of a complaint box for reporting wrongdoings. ◆ Enforce strict compliance with Labor Management Procedures (LMP)	◆ Implementation of Provincial Labor Laws and ILO Standards for work hours, workers payments & compensations	◆ Implementation: Contractor ◆ Supervision: CSC ◆ Monitoring: PIU and TPV
Employment of Child Labor	◆ Implement Sindh Prohibition of Employment of Children Act, 2017 and WB ESS 2;	◆ Implementation of Sindh Prohibition of Employment of Children Act, 2017 and WB ESS 2	◆ Implementation: Contractor ◆ Supervision: CSC ◆ Monitoring: PIU and TPV

Impacts and Risks	Details of Mitigation / Enhancement Measures	Relevant Guidelines / Plans	Responsibility
	◆ Ensure that all persons (contractors, subcontractors, and service providers) at the site are adults and have their government-issued identity cards.		
Dust Emissions	◆ Moisten surfaces regularly to suppress dust. ◆ Use barriers to contain dust at sites. ◆ Adhere to reduced speeds to control dust from vehicles. ◆ Keep sites and roads clean to prevent dust build-up. ◆ Redirect traffic away where appropriate. ◆ Cover materials to prevent wind dispersal. ◆ Plan activities to minimize dusty work during peak hours. ◆ Inform locals about construction activities and dust mitigation. ◆ Monitor dust levels around sensitive receptors. ◆ Train workers on dust control practices. ◆ Address complaints promptly through the Grievance Redress Mechanism. ◆ Implement ECP 1: Waste Management, ECP 2: Fuels and Hazardous Goods Management, ECP 5: Air Quality Management, and ECP 9: Road Transport and Road Traffic Management	◆ ESMP, ECP 1, ECP 2, ECP 5, ECP 9	◆ Implementation: Contractor ◆ Supervision: CSC ◆ Monitoring: PIU and TPV
ESS3: Resource Efficiency and Pollution Prevention and Management			
High Noise Levels from Construction Activities	◆ Install temporary noise barriers around the construction site to reduce noise transmission to nearby schools and hospitals. ◆ Plan construction activities during off-peak hours when schools and hospitals are less busy to minimize the impact of noise on their daily operations. ◆ Use modern and quieter construction equipment and machinery to reduce noise emissions during construction. ◆ Implement noise control measures on machinery and equipment using mufflers and sound-insulating materials.	◆ ESMP, Noise Management Plan, ECP 6	◆ Implementation: Contractor ◆ Supervision: CSC ◆ Monitoring: PIU and TPV

Impacts and Risks	Details of Mitigation / Enhancement Measures	Relevant Guidelines / Plans	Responsibility
	◆ Maintain construction machinery to ensure they are operating efficiently and producing less noise. ◆ Implement efficient traffic management around the construction site to reduce vehicle noise and congestion. ◆ Train construction workers to operate equipment and machinery to minimize noise and be mindful of noise levels near sensitive locations. ◆ Communicate with the local community, including schools and hospitals, about the construction schedule, potential noise impacts, and the steps taken to mitigate noise. ◆ Conduct noise monitoring around sensitive areas to ensure compliance with acceptable noise limits. ◆ Encourage construction workers to adopt quieter work practices, such as avoiding unnecessary shouting and loud conversations. ◆ Register any noise-related public complaints registered through the Project's Grievance Redress Mechanism. ◆ Implement ECP 6: Noise and Vibration Management		
Waste Management - Generation of Excavated Material, Kitchen Waste, Hazardous Waste	◆ Manage 241,800 m3 of leftover surplus material after backfilling by the Contractor. Recycle clean material and dispose of sewage-mixed material by approved handlers. ◆ Develop a Waste Management Plan (WMP) covering hazardous and non-hazardous materials, including sewage-induced material and AC pipes, with sorting, storage, and disposal procedures. ◆ Engage licensed and SEPA-approved waste contractors for proper disposal of hazardous and non-recyclable waste, including sewage material and AC pipes. ◆ Ensure secondary containment for fuel storage areas, hazardous material storage areas, and generators using concrete or brick masonry bunds (120% of fuel volume).	◆ Implementation of WMP, ECP 1, ECP 2	◆ Implementation: Contractor ◆ Supervision: CSC ◆ Monitoring: PIU and TPV

Impacts and Risks	Details of Mitigation / Enhancement Measures	Relevant Guidelines / Plans	Responsibility
	◆ Manage domestic waste from the camp by disposing it in nearby SSWMB waste disposal bins. ◆ Implement ECP 1: Waste Management and ECP 2: Fuels and Hazardous Goods Management		
Untreated Disposal of Effluent from Worker Camps	◆ Establish a closed sewage treatment system, including soak pits/septic tanks, to prevent untreated effluent release from the camp. ◆ Construct soak pits in absorbent soil, maintaining a minimum distance of 300 m from nearby water wells and bores. ◆ Ensure constant coverage of soak pits and prevent rainwater entry ◆ Use vacuum trucks to empty septic tanks if sludge reaches capacity. Seek approval from KWSC before transferring effluent to an approved municipal drain. ◆ Implement ECP 1: Waste Management, ECP 3: Water Resources Management, and ECP 10: Construction Camp Management	◆ Implementation of WMP, ECP 1, ECP 3, ECP 10	◆ Implementation: Contractor ◆ Supervision: CSC ◆ Monitoring: PIU and TPV
Soil Contamination	◆ Establish a systematic process for handling and disposing of sludge from sewer lines through SEPA-certified waste handlers, preventing spills and leakages during transit. ◆ Install arrangements to prevent spills from reaching the soil, using secondary containment for storage areas. ◆ Provide personnel with spill prevention and response training, emphasizing safe handling of sludge and hazardous materials. ◆ Use measures to prevent soil erosion and the spread of contaminants. ◆ Implement ECP 2: Fuels and Hazardous Goods Management	◆ Implementation of Spill Prevention Plan, ECP 2	◆ Implementation: Contractor ◆ Supervision: CSC ◆ Monitoring: PIU and TPV ◆
Improper Site Restoration	◆ Implement a comprehensive restoration plan for temporary sites, including Campsites. ◆ Conduct regular inspections to identify and address any damages or hazards in the restored areas.	◆ Implementation of WMP, Tree Plantation Plan, ECP 1, ECP 7	◆ Implementation: Contractor ◆ Supervision: CSC ◆ Monitoring: PIU and TPV

Impacts and Risks	Details of Mitigation / Enhancement Measures	Relevant Guidelines / Plans	Responsibility
	◆ Dispose of debris, dismantled materials, and excess construction materials following waste management regulations. ◆ Clean up and remediate any oil spills or hazardous materials promptly and appropriately. ◆ Ensure excavation trenches and similar areas are backfilled and restored to ensure safety and accessibility. ◆ Replant vegetation and landscaping the area to restore its natural appearance and functionality. ◆ Engage with the local community and stakeholders to address concerns and seek feedback on the restoration process. ◆ Monitor the restored sites over time to assess their effectiveness and make necessary adjustments if required. ◆ Establish clear guidelines and responsibilities for subcontractors regarding site restoration. ◆ Educate all project personnel about the importance of proper site restoration and their roles in achieving it. ◆ Implement ECP 1: Waste Management and ECP 7: Protection of Flora		
ESS4: Community Health and Safety			
Community Health and Safety	◆ Create a Community Health and Safety (CHS) Plan based on construction methods and hazards. ◆ Barricade construction areas like trenches, excavations, and holes and mark them with warning tapes. ◆ Minimize off-site material stacking and provide areas distant from public access with clear warning signs. ◆ Removal of excavated material from the site ◆ Reinstate excavations and trenches after completion and won't be left open for extended periods. ◆ Prevent unauthorized entry and restrict unnecessary movement across the site.	◆ Implementation of CHS Plan	◆ Implementation: Contractor ◆ Supervision: CSC ◆ Monitoring: PIU and TPV

Impacts and Risks	Details of Mitigation / Enhancement Measures	Relevant Guidelines / Plans	Responsibility
	◆ Provide safety drainage, non-slip mats, and traffic control for workers and public safety measures during wet spells. ◆ Provide signposts in the entrances and access routes ◆ Provide adequate lighting in excavated areas and trenches to ensure night safety. ◆ Vehicles and equipment are to be operated by drivers and equipment operators with valid licenses and proven competency. ◆ Minimize dust and noise nuisance through noise suppression, low-dust techniques, water sprinkling, and strategic work times. ◆ Provide safe pedestrian walkways at sensitive locations, maintained to standards suitable for all users. ◆ Barricade walkways with guardrails and clear signs ensure safe entry and exit, even for vulnerable individuals. ◆ Provide signboards at appropriate spots to warn the public about construction activities and associated risks. ◆ Inform locals about construction-related risks through community liaison and awareness efforts.		
Labor Influx / SEA – SH – GBV Incidents	◆ Prioritize hiring locals for various job categories: skilled, semi-skilled, and unskilled. ◆ Establish construction camps at designated CSC/PIU-approved locations. ◆ Include COC obligations and relevant legislation, with penalties for violations. ◆ Train project staff on preventing SEA/SH/GBV. ◆ Inform community members and health authorities about risks and grievance mechanisms. ◆ Do not allow drugs and alcohol at the construction site. ◆ Prohibit carrying weapons into the workplace. ◆ Follow Security Management Guidelines	◆ Workers COC, CHS Plan	◆ Implementation: Contractor ◆ Supervision: CSC ◆ Monitoring: PIU and TPV

Impacts and Risks	Details of Mitigation / Enhancement Measures	Relevant Guidelines / Plans	Responsibility
	◆ Secure construction sites with fencing, checkpoints, gates, and guards will secure construction sites. ◆ Maintain strong relations with local communities.		
Restricted Access	◆ Allocate space for secure pedestrian walkways at specified sensitive receptor locations for safe visitor entry and exit. ◆ Maintain walkway areas to accommodate women, children, the elderly, patients, and people with disabilities. ◆ Ensure proper barricading, potential guardrails, clear signage, and reflective tapes for visibility.	◆ Implementation of Community Health and Safety Plan	◆ Implementation: Contractor ◆ Supervision: CSC ◆ Monitoring: PIU and TPV
Construction Traffic Management and Safety	◆ Develop a Traffic Management Plan (TMP), subject to PIU/CSC approval, before initiating any construction work. ◆ Deploy barricades, signs, markings, flags, lights, and trained flagmen at crucial locations. ◆ Equip flagmen with red and green flags and lights and provide traffic management training. ◆ Provide compensation as per the Fatal Accidents Act 1855 for accidents involving the community. ◆ Implement ECP 9: Road Transport and Road Traffic Management	◆ Implementation of TMP, ECP 9	◆ Implementation: Contractor ◆ Supervision: CSC ◆ Monitoring: PIU
ESS6: Biodiversity, Conservation, and Sustainable Management of Living Natural Resources			
Vegetation Loss	◆ Formulate a site-specific Compensatory Tree Plantation Plan. ◆ Collaborate with PIU, KWSC, and relevant local bodies to designate spaces for tree planting before tree clearance. ◆ Arrange seeds, nurseries, watering, and care for the planted trees for at least five years. ◆ Adhere to Compensatory plantation (10 trees planted for each one removed). ◆ Prevent damage to trees saved from cutting during construction	◆ Implementation of TMP, ECP 7	◆ Implementation: Contractor ◆ Supervision: CSC ◆ Monitoring: PIU and TPV ◆ Identification of Compensatory Plantation Sites: PIU

Impacts and Risks	Details of Mitigation / Enhancement Measures	Relevant Guidelines / Plans	Responsibility
	◆ Compensate shrubs cut in the project's DIA by planting ornamental shrubs at locations specified by the PIU during project execution. ◆ Implement ECP 7: Protection of Flora		
ESS8: Cultural Heritage			
Cultural Heritage Sites	◆ Contractor will train workers on chance find procedures and responses. ◆ Contractor will coordinate with PIU and Directorate General of Antiquities and Archaeology for suspected chance finds.	◆ Chance Find Procedures	◆ Implementation: Contractor ◆ Supervision: CSC ◆ Monitoring: PIU
ESS10: Stakeholder Engagement and Information Disclosure			
Stakeholders Concerns and Engagement	◆ Facilitate public consultations and stakeholder participation as per KWSSIP-2 Stakeholder Engagement Plan (SEP), addressing concerns promptly. ◆ Implement comprehensive, inclusive stakeholder engagement and offer access to remedies.	◆ Implementation of KWSSIP-2 SEP	◆ Implementation: PIU, CSC and Contractor ◆ Supervision: CSC Monitoring: PIU and TPV
Operation Phase			
ESS2: Labor and Working Conditions			
OHS Risks Associated with Maintenance & Cleaning of Sewer Network	◆ Provide appropriate PPE to workers, including: ○ Goggles: to shield eyes from sewage splashes. ○ Protective face mask or splash-proof face shield: for nose and mouth protection. ○ Repellent coveralls ○ Waterproof gloves: to prevent sewage contact. ○ Rubber boots: to prevent sewage exposure. ○ Positive-pressure SCBA or air-line units for H2S exposure ◆ Provide H2S warning signs in H2S-prone areas. ◆ Remove and transport sewage waste by SEPA-certified hazardous waste handlers. Minimize road traffic by cleaning at night to minimize road traffic.	◆ OHS Procedures	◆ Preparation of OHS Procedures: PIU ◆ Implementation: KWSC Area Engineer / Supervisor

4 Monitoring Parameters and Monitoring Plan

Table 4-1 presents the project's Environmental and Social Monitoring Plan (ESMoP) for the pre-construction, construction, and operation phases. The monitoring will comprise surveillance to check whether the Contractor implements the ESMP requirements and meets the contract's provisions during the project's construction and operation phases, including the responsible agencies for implementation and supervision. Monitoring the frequency and locations of some parameters may require adjustments by the CSC and PIU during project execution.

Table 4-1: Environmental and Social Monitoring Plan

Environmental and Social Aspect	Monitoring Parameters	Monitoring Locations	Monitoring Frequency	Responsibility
Pre-Construction Phase				
ESS1: Assessment and Management of Environmental and Social Risks and Impacts				
Permits, NOCs, Clearances	◆ Ensure that all required permits, No Objection Certificates (NOCs), and clearances are up-to-date for construction activities.	-	-	PIU
Lack of Appropriate E&S Personnel with CSC and Contractors	◆ Ensure necessary Environmental and Social (E&S) personnel are appointed by the Construction Supervision Consultants (CSC) and Contractors.	-	Once	PIU
Inappropriate Planning for Traffic Management	◆ Ensure the traffic management plan aligns with the consensus of responsible authorities and will effectively manage traffic around construction sites upon implementation.	-	-	PIU, CSC, Contractor
ESS3: Resource Efficiency and Pollution Prevention and Management				
Ambient Air Quality	◆ Carbon Monoxide (CO) - 4 mg/m^3 for 8 hrs ◆ Sulphur Dioxide (SO2) - 40 µg/m^3 ◆ Nitrogen Oxide (NO) - 40 µg/m^3 ◆ Particulate Matter (PM10) - 45 µg/m^3 ◆ Particulate Matter (PM2.5) - 15 µg/m^3	Baseline Monitoring Locations	Once	Contractor, CSC
Noise Level	◆ 24hr – Noise Levels ◆ Day Time: 55 dB(A) ◆ Night Time: 45 dB(A)	Baseline Monitoring Locations	Once	Contractor, CSC
ESS4: Community Health and Safety				
Improper Location of Worker Camp Leading to Environmental and Social Issues	◆ Monitor the suitability of the worker camp's location and its impact on the environment and nearby communities.	Campsite Locations	-	PIU, CSC, Contractor
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement				
Land Requirements and Resettlement impacts	◆ Monitor land acquisition and resettlement activities to ensure	PAPs locations	-	PIU, CSC, Contractor

Environmental and Social Aspect	Monitoring Parameters	Monitoring Locations	Monitoring Frequency	Responsibility
	compliance with approved plans and minimal impact on affected communities.			
Construction Phase				
ESS2: Labor and Working Conditions				
Occupational Health and Safety	◆ Number of unsafe acts/incidents, near misses, first aid injuries, work-related illness, lost time incidents, fatalities ◆ Number of training sessions, toolbox talks, risk assessments ◆ PPE use and violations	All Project Sites	Regularly	Contractor, CSC
COVID19	◆ Number of cases in the workforce ◆ Number of COVID-19 tests ◆ Number of workers vaccinated ◆ Audit of provisions and equipment	All Project Sites	To be determined by PIU, CSC at the time of execution	Contractor, CSC
Worker Grievances	◆ Number and types of worker grievances ◆ Resolution timeframes ◆ Number and duration of worker protests	All Project Sites	Monthly	Contractor, CSC
ESS3: Resource Efficiency and Pollution Prevention and Management				
Ambient Air Quality Monitoring	◆ Carbon Monoxide (CO) - 4 mg/m^3 for 8 hrs ◆ Sulphur Dioxide (SO2) - 40 µg/m^3 ◆ Nitrogen Oxide (NO) - 40 µg/m^3 ◆ Particulate Matter (PM10) - 45 µg/m^3 ◆ Particulate Matter (PM2.5) - 15 µg/m^3	Baseline Monitoring Locations	Quarterly	Contractor, CSC
Noise Level	◆ 24hr – Noise Levels ◆ Day Time: 55 dB(A) ◆ Night Time: 45 dB(A)	Baseline Monitoring Locations	Quarterly	Contractor, CSC
Water Quality	◆ Sindh Environmental Quality Standards (SEQS) Drinking Water Quality Parameters	09 Locations: Worker Camps, Office Sites and Kitchen / Mess Areas	Monthly	Contractor, CSC
Waste Management	◆ Inspection of solid waste generation, collection, storage, recycling and disposal	All project sites, camps, focusing on areas	Fortnightly	Contractor, CSC

Environmental and Social Aspect	Monitoring Parameters	Monitoring Locations	Monitoring Frequency	Responsibility
	◆ Recording volumes of excavation and spoil generated, reused, sold, and stockpiled by location ◆ Recording waste volumes by type (kitchen and domestic, medical, batteries, electrical equipment, tires, rags, paper, scrap metal wastes, etc.) generated at various construction sites ◆ Recording the final disposal of each waste stream ◆ Calculating the rate of waste reuse/recycling ◆ Recording storage, transport, and disposal costs	where waste is stored / located		
Soil Contamination	◆ Visual Inspection ◆ Recording Incidents of oil, fuel, and chemical spills	All work areas, machinery parking areas, generator installation sites and workshops	Weekly	Contractor, CSC
Effluent Disposal	◆ Visual Inspection for checking any bypasses or leakages in effluent disposal arrangements at camp and office sites	All workers camp / office sites	Weekly	Contractor, CSC
ESS4: Community Health and Safety				
Community Health and Safety / Construction Traffic Management and Safety / Access to Receptors	◆ Status of barricading at trenches and excavations ◆ Status of provision of Pedestrian access ◆ Status of piling-up of excavated material and pipes along trenches ◆ Status of provision of access at sensitive receptor locations ◆ Status of posting safety signage ◆ Status of traffic diversions ◆ Road safety incident records ◆ Lighting arrangements	Sensitive receptor locations	Bi-weekly	Contractor, CSC

Environmental and Social Aspect	Monitoring Parameters	Monitoring Locations	Monitoring Frequency	Responsibility
	◆ Provision of safety equipment and materials at sites			
SEA/SH Incidents	◆ Status of workers' interaction with the public, nearby communities ◆ Investigation of any SEA/SH incidents reported/communicated by workers or registered by communities in GRM	All Campsites and Project Sites	Weekly	Contractor, CSC
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources				
Tree Cutting	◆ Existing vs. Planned Tree Cutting ◆ No. of Trees Planted under Compensatory Plantation Scheme ◆ Growth / Maintenance / Care of planted trees	All Project Sites and Compensatory Plantation Sites	Fortnightly	Contractor, CSC, PIU and Local Government Department, Parks and Horticulture Department - KMC and District Municipal Corporations (DMCs)
ESS10: Stakeholder Engagement and Information Disclosure				
Stakeholder Engagement	◆ Number and types of engagements ◆ Topics raised during engagement ◆ Number and types of community grievances ◆ Closure duration of grievances ◆ Claimant satisfaction of process and results grievance mechanism	Stakeholders Identified in Project's SEP	Monthly	Contractor, CSC, PIU
Public Grievances	◆ Numbers of grievances ◆ Types of grievances ◆ Number of grievances related to dust, noise, traffic, restricted access, and any abuses related to project workers. ◆ Appropriate close-out measures and actions to prevent recurrence. ◆ Grievance closed out within timeframes	Affected Communities	Monthly	Contractor, CSC, PIU
Operation Phase				
ESS2: Labor and Working Conditions				
OHS Management during Maintenance / Cleaning of Sewers	◆ Provision and Utilization of PPEs by Workers ◆ Safe disposal of removed sewage sludge	Throughout the sewer network under the project	At the time of maintenance / cleaning activities	KWSC Supervisor / In-charge

5 ESMP Implementation (Institutional Arrangements, Trainings, Reporting, and Cost), GRM and Stakeholders Engagement and Consultations

5.1 Institutional Arrangements for ESMP Implementation during Construction Phase

The key players involved in the implementation of the ESMP during the project's construction phase are the Sindh Environmental Protection Agency (SEPA), Project Implementation Unit (PIU), Third Party Validation (TPV) Consultation, Construction Supervision Consultant (CSC), and Contractor(s). **Figure 5-1** presents the organizational setup for the ESMP implementation during the project's construction phase.

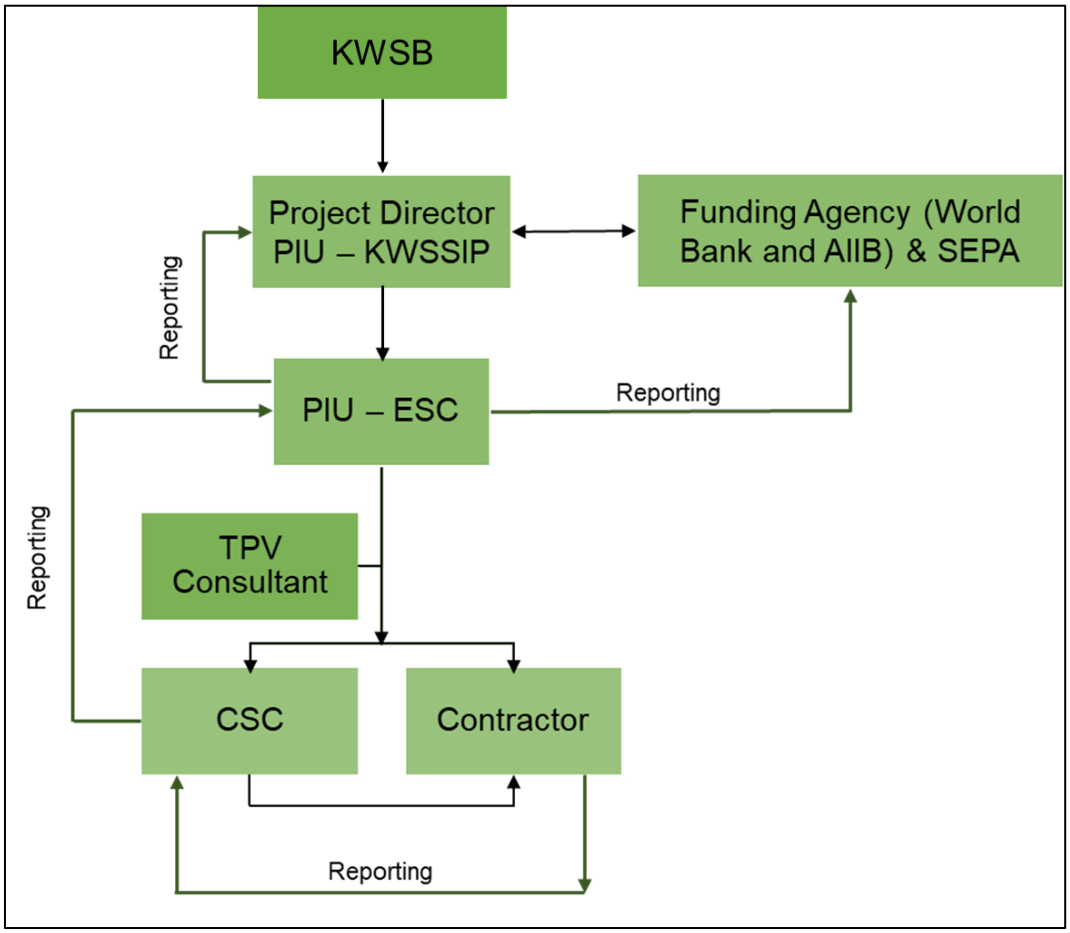


Figure 5-1: Organizational Setup for Implementation of ESMP at Construction Phase

The PIU KWSSIP-2 will bind Contractors through contract documents to implement the ESMP and other terms and conditions of the Environmental Permit of SEPA. The whole ESMP will be included in the contract documents. Construction camps will be established after necessary approvals and submission of SSESMP, Camp Management Plan, and other site-specific plans to be developed relevant to agency requirements before the commencement of new works.

5.1.1 Roles and Responsibilities

a) SEPA

As per the Sindh Environmental Protection Act, 2014, the Sindh Environmental Protection Agency (SEPA) approves the environmental and social impact assessment (ESIA) reports. SEPA will be responsible for granting a No Objection Certificate (NOC) for the ESMP before initiation of construction activities.

b) Project Implementation Unit (PIU)

The Project Implementation Unit (PIU)'s Project Director (PD) is the executive head of the entire KWSSIP-2 Project. The PD PIU is responsible for policy, administrative, and financial decisions and actions for effective and timely project implementation per the approved framework and schedule. The PD PIU will be responsible for overall project implementation, including environmental and social management and hiring contractors and consultants. PD PIU will approve the overall project and the ESMP budget and finances. The Government of Sindh will allocate these finances with assistance from the WB / AIIB.

c) Environment and Social Cell (ESC)

The Environment and Social Cell (ESC) is already established in the PIU, which currently consists of six specialists – two environment specialists, two social safeguard specialists, one gender specialist and one junior gender specialist. However, two OHS specialists and four E&S officers will be added in project implementation stage.

The ESC will be responsible for implementing the ESMP and other related tasks and ensuring that the ESMPs are included in the contract documents. The ESC under PIU will take care of the E&S aspects of the project activities. ESC will arrange environmental and social monitoring, prepare compliance reports, and submit them to PD PIU for further submission to the WB, AIIB, and SEPA to fulfill their monitoring, reporting, and compliance requirements for E&S aspects of the project. The ESC will ensure compliance with ESMP during the construction phase. Compliance will require measurements of E&S parameters and observations at the construction sites to evaluate compliance. The specific roles and responsibilities of the ESC are as follows:

- Ensure that the required E&S training is provided to the concerned staff;
- Make sure that all the contractual obligations related to E&S compliance are met;
- Carry out regular site visits to the construction sites to review the E&S performance of the Contractor(s);
- Check regularly the ESMP implementation status of the project during the construction phase is being properly carried out;
- Review monitoring reports for the progress of E&S-related activities;
- Make sure that the Contractor is implementing the additional measures suggested by the SC in environmental and social monitoring reports;

- Document and disclose monitoring results and identify necessary corrective and preventive actions in the periodic monitoring reports, and make follow-up on these actions to ensure progress toward the desired outcomes;
- Assist in the assessment of the livelihood loss and negotiation with the affected persons for fixation of compensation to be paid for temporary impacts;
- Assist the Contractor for the timely payments of negotiated prices;
- Assist the Contractor in obtaining necessary approvals from the concerned departments;
- Oversee the compliance of all the monitoring programs as given in ESMP;
- Report immediately to WB when E&S-related incidents and accidents occur;
- Maintain interface with the other lined departments/stakeholders and
- Report to the SEPA on the status of ESMP implementation.

d) Third Party Validation (TPV)

The PIU will hire the services of an independent E&S consultancy firm for the Third-Party Validation (TPV). The TPV consultants will monitor the E&S parameters and conduct field surveys at the construction sites to evaluate compliance levels. They will be engaged to conduct the external and independent monitoring of the implementation of the ESMP. This external monitoring agency is to conduct biannual, annual, and final evaluations of the ESMP implementation and recommend changes if and when necessary to the ESC. The specific roles and responsibilities of a TPV consultant will be to:

- Carry out independent monitoring at critical locations during the construction phase and monitoring the implementation of ESMP at the project area;
- Monitor GRM and resolution of complaints;
- Inform ESC, WB, and AIIB of any significant impacts arising during construction;
- Observe and amend/prepare (if required) corrective action plans; and
- Monitor plan implementation along with project Implementation Consultant.

e) Construction Supervision Consultants (CSC)

The PIU will engage Construction Supervision Consultants (CSC) for the project. The CSC will conduct day-to-day monitoring of ESMP implementation, prepare monthly monitoring reports for each site, and submit them to ESC. The ESC will review the report, discuss it with the CSC, and finalize the findings. In case of noncompliance from the contractors, the CSC will have the authority to halt the construction activities or impose penalties as per the contract conditions. The CSC will submit the final monitoring and evaluation reports to PIU as per the periodic reporting mechanism (defined later in the document). PIU will submit these reports to WB for their review and further action. Also, these reports will be submitted to SEPA per the frequency mentioned in the construction phase 'Environmental Approval' requirements. The specific roles and responsibilities of the CSC will be as follows:

- Review and approve the Contractor's management plans;

- Oversee and supervise the performance of the Contractor to make sure that the Contractor(s) is complying with ESMP;
- Ensure that the day-to-day construction activities are carried out in an environmentally and socially sound and sustainable manner;
- Maintain close coordination with the Contractor and ESC;
- Prepare training materials and implementing training programs;
- Ensure the implementation of the mitigation measures suggested in ESMP;
- Supervise and monitor E&S activities being performed at the site;
- Organize periodic E&S training programs and workshops for the consultant's and Contractor's staff;
- Periodic reporting as mentioned in ESMP; and
- Suggest any additional mitigation measures (if required).

The E&S team of CSC of the proposed project will consist of the following personnel:

- EHS Team Leader (one specialist – M.Sc. in Environmental Engineering with more than 10 - 15 years of professional experience in Environment, Health, Safety and Social Management, worked on at least two implementation projects as CSC)
- OHS Specialist (one specialist – M.Sc. in Environmental Engineering with OHS Certification, 10 years of professional experience, worked on at least one implementation project as OHS - CSC)
- Environmental Specialist / Ecologist (one specialist – M.Sc. in Ecology / Botany with courses on environment or similar with 08-10 years of professional experience related to safe tree cutting and vegetation removal, supervising compensatory plantation programs, implementing control measures to minimize disturbance to fauna, worked on at least one implementation project as CSC)
- EHS Officers (five officers – B.Sc. in Environmental Engineering with IOSH / NEBOSH and 03 years of professional experience, worked on at least one implementation project as CSC)
- Social Safeguard Specialist (one specialist – Master's degree in Sociology or related discipline with 10 years of professional experience, worked on at least one implementation project as CSC)
- Gender Specialist (one specialist – Masters in Sociology, Gender Study or equivalent with 10 years of professional experience, worked on at least one implementation project as CSC)

The same firm may qualify as CSC for other sub-projects under KWSSIP-2. In such a case, the abovementioned staffing requirements will be applicable separately for each sub-project.

f) Contractor

Contractors will be bound to appoint site-based E&S Experts with relevant educational backgrounds and experience for each site. The contractors will be responsible for implementing measures to avoid or minimize adverse E&S impacts during construction. Contractors are required to prepare Site-Specific ESMP (SSESMP) demonstrating how they will comply with the requirements of ESMP before mobilization and obtain approval from the ESC and CSC. Contractors' Environmental and Social Experts will carry out the following activities:

- Prepare SSESMP and obtain its approval from CSC;
- Implement mitigation measures as detailed in the ESMP, SSESMPs, and associated ESHS Plans at each construction site and throughout the project area;
- Take actions against all the special and general provisions of the contract document;
- Ensure compliance with ESMP recommendations and be responsible for effective liaison;
- Provide proper PPEs to the workers and train them for their proper use;
- Prepare and submit the monthly, quarterly, biannually, annual, and final progress reports to CSC;
- Report immediately to CSC and ESC when E&S incidents and accidents occur;
- Conduct the EHS training for the workers and
- Coordinate with CSC and ESC.

The Contractor will be required to have suitably qualified and experienced persons to function as environmental, social, and OHS personnel who will be working in close liaison with the ESC and CSC. Appropriate numbers of the following key personnel are required in the Contractor's team:

- Environmental Engineer (1 position) – B.Sc. in Environmental Engineering with 5 years of professional experience in project implementation.
- HSE Officer (2 positions) – B.Sc. in Environmental Engineering with OHS Certification and 5 years of professional experience in project implementation.
- Gender / GRM Officer/ Social Safeguard (2 positions) – M.Sc. in Sociology with 05 years of professional experience in project implementation.
- Flag man (6 positions) – Valid work experience at project implementation site.

5.2 Institutional Arrangement for ESMP Implementation during O&M Phase

The KWSC will administrate the proposed project during the O&M phase. In the organizational hierarchy of KWSC, the Deputy Managing Director of Technical Services (DMDTS) will be responsible for the O&M of water supply and sewerage infrastructure. Each district's Chief Engineer will be solely responsible for the utility services in his respective district. The project operation will be under the direct jurisdiction of Engineers and Supervisors, respectively. Currently, KWSC has no full-time environmental and social management staff. An E&S cell is proposed to be established at KWSC to look after the operational phases of KWSSIP sub-projects. It is proposed that at least one environmental specialist, one social specialist, and one OHS specialist be hired full-time to effectively implement operational phase ESMP requirements at KWSSIP sub-projects. The monitoring and compliance of operational phase ESMP requirements will be under the responsibilities of Engineers / Supervisors for respective towns where priority sewer schemes are situated. These personnel will report to the DMDTS to comply with and monitor operational phase ESMP requirements. The staff will be responsible for the following:

- Coordinate to monitor environmental and social compliance during operation;
- Monitor and manage compensatory tree plantations at places to be identified by the PIU at the execution stage;
- Report on the O&M progress of environmental and social compliance to the SEPA (if required);

- Assess as well as mitigate potential operational phase environmental and social impacts as identified in Section 5.4 and;
- Sustain a working partnership among the SEPA, Local Government Department, KMC, DMCs, public utilities, traffic police, NGOs, and other related public and private sector organizations.

5.3 ESMP Trainings

Training programs will be implemented during the project life cycle to ensure all staff receive the required training in both general and job-specific issues. Training will be provided to all recruits, and continual refresher courses will be organized for the existing staff. Implementing the E&S training would ensure that the requirements of the ESMP are transparent to all project personnel and followed accordingly throughout the project lifespan. Moreover, the training programs also ensure that all site personnel are well aware of their work responsibilities, the E&S requirements of the project, and how they will be implemented and monitored on-site. They will also be introduced to the potential impacts and risks of the project, including the mitigation and control measures adopted to address those impacts and risks and where to implement the appropriate measures.

Additionally, the training would make the staff aware of the roles of PIU, the CSC, the TPV, and the Contractors regarding E&S issues. Each organization will be responsible for providing training to their staff before the start of the project and during the project execution. Training will cover all staff levels, including management, supervisory personnel, and skilled and unskilled workforces.

Training program will consist of the following:

5.3.1 ESMP Implementation Training during Pre-construction Phase

CSC will organize training for PIU, CSC, and Contractor Management & Workers, and it will provide awareness on waste management, driving safety, standard operating procedures (SOPs) for construction works; community and occupational health and safety, core labor standards, code of conduct, avoidance of interaction with communities, outcomes of GBV/SEA/SH conducts, transmissible diseases, applicable E&S laws, sensitivity of the project area and key findings of the ESMP etc.

5.3.2 ESMP Implementation Training during Construction Phase

The training during the construction phase includes the following:

- Workers will be provided with weekly ESHS awareness sessions, daily toolbox talks, and induction training during worker appointments, covering topics including OHS/CHS protocols, avoidance/protocols of community interaction, etc.
- Drivers and operators would be regularly trained before and during field operations regarding road safety, defensive driving, waste disposal, cultural values, and social sensitivity.
- All site personnel would be educated about the proper use of personal protective equipment, camp operations and management, waste disposal, resource conservation, and housekeeping through regular weekly training.
- Workers will be provided with training on ESHS management related to site restoration works at the end of the construction phase.

Construction phase trainings includes the following:

- Training of workers before hot outdoor work begins.
- Recognition of the signs and symptoms of heat-related illnesses and administra¬tion of first aid.
- Causes of heat-related illnesses and steps to reduce the risk. These include drinking enough water and monitoring the color and amount of urine output.
- Proper care and use of heat-protective clothing and equipment and the added heat load caused by exertion, clothing, and per¬sonal protective equipment.
- Effects of other factors (drugs, obesity, etc.) on tolerance to occupational heat stress.
- Importance of acclimatization.
- Importance of immediately reporting any symptoms or signs of heat-related illness in themselves or in co-workers to the supervisor.
- Procedures for responding to symptoms of possible heat-related illness and for contacting emergency medical ser¬vices.

Supervisors shall also be trained on the following:

- Implement appropriate acclimatization plan.
- Follow procedures when a worker has symptoms of heat-related illness, including emergency response procedures.
- Monitor weather reports.
- Respond to hot weather advisories.
- Monitor and encourag adequate fluid intake and rest breaks.

5.3.3 Capacity Development Trainings

In addition to regular ESMP and H&S training, the Contractor will be required to organize capacity development training once before construction and monthly throughout the construction period for the key ESHS management staff, site supervisors, and project management personnel belonging to the Contractor, PIU, and CSC for sensitizing them on effective ESHS management, relevant WB ESS and GoS requirements on ESHS management. An adequate budget for capacity development training in the ESMP cost has been maintained. A tentative training plan is presented in **Table 5-1**.

Table 5-1: Training Plan during the Construction Phase

No.	Training Activity	Participants	Trainer	Mode of Training	Content	Schedule
1.	Site Orientation and Induction	Contractor and Construction Supervision Consultant (CSC)	PIU KWSSIP-2	Presentation / Lecture	Awareness about site, working protocols	Once for everyone
2.	ESMP and Environment	Contractor	CSC and PIU KWSSIP-2	Presentation	Awareness and applicability of ESMP and ECPs	Monthly

No.	Training Activity	Participants	Trainer	Mode of Training	Content	Schedule
	Code of Practices (ECPs)					
3.	Emergency Response and Use of Fire Extinguishers	Contractor	CSC and PIU KWSSIP-2	Presentation	Potential natural and other hazard/emergencies and dealing with emergency and fire to minimize damage	Quarterly
4.	Resettlement Related Issues and Grievance Redress	Contractor	CSC and PIU KWSSIP-2	Presentation	Awareness on WB ESS5 (Involuntary Resettlement)	Quarterly
5.	Labor Management Procedures	Contractor	CSC and PIU KWSSIP-2	Presentation	Awareness on WB ESS2 (Labor and Working Conditions)	Quarterly
6.	Gender Aspects including GBV	Contractor	CSC and PIU KWSSIP-2	Presentation	Awareness on GBV, gender equality, gender related issues and their redress; awareness regarding Gender Action Plan (GAP)	Quarterly
7.	Stakeholder Engagement	Contractor	CSC and PIU KWSSIP-2	Presentation	Interaction with the Project Affected Peoples (PAPs) and Other Interested Parties, Awareness on WB ESS10 (Stakeholder Engagement)	Quarterly
8.	Awareness workshop regarding COVID-19 and other vector borne diseases	Contractor	CSC and PIU KWSSIP-2	Presentation	Risk, prevention, and available treatment	Semiannual
9.	First Aid and Cardiopulmonary resuscitation (CPR)	Contractor	CSC and PIU KWSSIP-2	Presentation	Onsite first aid procedures	Quarterly
10.	Compliance of SEPA NOC (Environmental Approval) and WB ESS	Contractor	CSC and PIU KWSSIP-2	Presentation	Awareness on SEPA NOC, rules, guidelines, regulation, and standards for satisfactory compliance	Semiannual
11.	Community Involvement for Ecological Sustainability	Community and Contractor	KMC, Park and Horticulture Department, Forest Department, Agriculture Department, CSC and PIU KWSSIP-2	Seminar and Workshop	Awareness on Plantation of beneficiary trees, protection of flora and fauna, ecological sustainability	Annual

5.4 Reporting and Documentation

The Contractor will prepare monthly reports detailing the progress on implementing the Project's Environmental, Social, Health and Safety (ESHS) Safeguards Requirements included in the ESMP. The PIU-ESC will also produce quarterly reports with CSC and Contractors' assistance.

Contractor's Monthly ESHS Reports. The monthly reports will provide the implementation status of the mitigation measures in the ESMP. It includes updates on the outcome of the field inspections carried out by the Contractor ESHS Teams and the status/results of ESHS monitoring as required under monitoring plans. The report will also provide details on all sorts of training conducted by the Contractor during the reporting month, details of complaints registered at the Project's GRM, and actions taken by the Contractor to resolve complaints.

CSC's Monthly ESHS Reports. Based on the Contractor's monthly reports, the CSC will validate the information provided in the Contractor's report, indicate the gaps in their field observations, and evaluate the Contractor's performance in implementing the project's ESHS safeguards. CSC Monthly Reports will also provide details on Corrective Action Plans (CAPs), agreed timelines for resolution of active ESHS issues, the status of penalties imposed by the CSC on Contractors for continual noncompliance, and the way forward suggested by the CSC. The report will also provide expert analysis on the adequacy of training organized by the Contractor, advice for the Contractor regarding realignment of the training program, independent analysis of GRM activities, and details/outcomes of stakeholder engagement activities carried out during the reporting month.

PIU's Quarterly Progress Reports on ESHS Management. The PIU will prepare the reports with assistance from CSC and Contractors. The report will provide a detailed account of quarterly ESHS Safeguards implementation status, mitigation measures and preventive actions undertaken, environmental and social monitoring activities conducted, details of monitoring data collected, analysis of monitoring results, particularly the noncompliance, recommended mitigation and corrective measures, GRM data, stakeholders engagement activities, ESHS training conducted, and environmental and OHS regulatory violations observed. If required, the monitoring reports will also be submitted to the SEPA under ESMP Approval Conditions.

PIU Reporting to WB. PIU will prepare and submit quarterly monitoring reports to the World Bank throughout project implementation on the ESHS performance of the project, including but not limited to the implementation of the ESCP, status of preparation and implementation of E&S instruments required under the ESCP, stakeholder engagement activities, functioning of the grievance mechanism and other aspects that the reporting would need to consider, as relevant. PIU will also submit to the World Bank the Contractor's and CSC's monthly reports on ESHS performance following the metrics specified in the respective bidding documents and contracts.

Moreover, PIU will promptly notify the Bank no later than 48 hours after learning of any incident or accident related to the project that has, or is likely to have, a significant adverse effect on the environment, the affected communities, the public or workers, including, among other things, cases of sexual exploitation and abuse (SEA), sexual harassment (SH), and accidents that result in death, serious or multiple injuries or other examples of incidents and accidents, as appropriate for the type of operation. The incident report should provide sufficient detail regarding the scope, severity, and possible

causes of the incident or accident, indicating immediate measures taken or planned to address it, and any information provided by any contractor and supervising firm, as appropriate.

Project's EHS Completion Report. At the end of construction, the PIU - ESC will submit a Project Completion Report, which will summarize the overall E&S impacts/risks that occurred during the project implementation, efforts and measures taken for mitigating or offsetting the impacts, constraints/limitations faced during execution for resolving any particular ESHS issues, overall ESHS performance of Contractor and CSC and lessons learned.

5.5 Indicative ESMP Implementation Costs

Estimated cost estimates for the Contractor's staffing, implementation of mitigation measures, preventive actions, and monitoring are presented in **Table 5-2**. The total cost of ESMP implementation is estimated at **PKR 41.941 Million**.

Table 5-2: Estimated ESMP Implementation Cost

S.NO	DESCRIPTION	QUANTITY	SAMPLE PER LOCATION	FREQUENCY/ MONTHS	RATE/UNIT	AMOUNT
A- PRE-CONSTRUCTION PHASE						
1	Air Monitoring (Ambient Air)-24 Hrs as per SEPA standards	1	3	One time	50,000	150,000
2	Vehicles, Generators and other emitting sources of fumes	1	3	One time	50,000	150,000
3	Noise Quality (24 hours specified in SEQS) – Pre-Construction Phase	1	3	One time	10,000	10,000
4	Waste Water samples collection and Laboratory analysis (SEQS parameters) - Construction Phase	1	3	One time	50,000	150,000
					TOTAL-A	**460,000**
B- CONSTRUCTION PHASE (IMPLEMENTATION PHASE)						
5	Environmental Engineer	1		18	200,000	3,600,000
6	HSE Officer	2		18	150,000	5,400,000
7	Gender/GRM Officer/Social safeguard	2		18	150,000	5,400,000
8	Flag man	6		18	50,000	5,400,000
9	Air Monitoring (Ambient Air)-24 Hrs as per SEPA standards	6	3	Quarterly	50,000	900,000
10	Vehicles, Generators and other emitting sources of fumes	6	3	Quarterly	50,000	900,000
11	Noise Quality (24 hours specified in SEQS) – Purchase of Decibel meter	1		One time	10,000	10,000

S.NO	DESCRIPTION	QUANTITY	SAMPLE PER LOCATION	FREQUENCY/ MONTHS	RATE/UNIT	AMOUNT
12	Waste Water samples collection and Laboratory analysis (SEQS parameters) - Construction Phase	6	3	Quarterly	50,000	900,000
13	Fixed cost at project sites (PPEs, In-house, Shoes, Safety helmets, Gloves, googles, Harness belts, Jackets, septic tanks, installation of safety barriers)	18		Monthly	400,000	7,200,000
14	Precautionary Boards	18		Monthly	120,000	2,160,000
15	Loader for movement of Safety Equipment with POL and driver	1		Once	1,200,000	1,200,000
16	Provision of First Aid Facility including medicine of affected person	18		Monthly	40,000	720,000
17	Capacity Development Trainings: ESHS Management, Occupational & Community Health and Safety, Disease Prevention, Maintaining Community Values – Pre - Construction Phases	18		Monthly	50,000	900,000
18	Fire Safety Equipment, Installation of Noise / Safety Barriers, Signage, Site Waste Management (Bins / Skips) etc.	1		Once	500,000	500,000
19	GRM Misc	18			40,000	720,000
20	Water Sprinklers	Lum Sum				1,800,000
					TOTAL-B	**37,710,000**
					TOTAL AMOUNT (A-B)	**38,170,000**
					ESCALATION AND CONTIGENCIES ON -B 10%	**3,771,000**
					GRAND TOTAL	**41,941,000**

5.6 Grievance Redress Mechanism

Grievance Redress Mechanism (GRM) intends to resolve a complaint as quickly and at as low a level as possible to avoid a minor issue becoming a significant grievance. Irrespective of the process stage, a complainant can pursue the grievance through the court following the law.

The Grievance Redress Committee (GRC) will work at the site, sub-project, and PIU levels. The E&S and engineering staff of PIU, in coordination with site staff, will inform the project affected and community members about the GRCs and their mechanism through consultations and by posting at prominent places. The complaints received through any media will be screened by type and category.

These complaints will be registered in the Community Complaints Register (CCR), where the name and address of the complainant, date, description of the complaint, and action taken will be recorded. The following procedure will be used to redress the grievances:

- First, complaint resolution will be attempted to be addressed at community-GRC through the involvement of the field E&S/engineering staff. The community GRC will decide within five working days of receipt of the complaint. If unsettled, a grievance can be lodged to the sub-project GRC by the complainant or by the GRC;
- Sub-project GRC will acknowledge the receipt within two working days of the complaint lodging. Initial review and consultation with the sub-project GRC will be conducted within five working days of receipt of the complaint. If required, sub-project GRC will advise the E&S/engineering specialists to conduct field visits in consultation with the aggrieved persons/parties and the local community and submit a fact-finding report. Preferably, the fact-finding will be completed within eight working days of receiving complaints. Sub-project GRC will decide within ten working days of receipt of the complaint. If unresolved, a grievance will be lodged to the (PIU-GRC) by the complainant or by the GRC, and
- The PIU-GRC will decide within 20 working days of receipt of the complaint. If the complainant is still unsatisfied, they can pursue further by submitting the case to the appropriate court of law.

All E&S issues will be dealt with according to the above GRM procedures. The GRCs will hear and clarify with the complainant (if required) about the E&S issue and will conclude and communicate their recommendations for further implementation. The complainant will be kept informed during the process, and the GRC decision will be communicated accordingly. In case of any delay, the complainant will be informed of the progress and process of their grievance. The GRC proceedings will be documented step by step, and all records will be maintained and summarized in the project progress and internal monitoring reports.

5.7 Stakeholders Engagement and Consultations Planned for the Project's Life-cycle

The project will require public consultation and disclosure activities and mechanisms to continue beyond the ESIA process throughout the project's lifecycle to comply with WB ESS 10. The planned stakeholders' engagement activities in **Table 5-3** are aligned with the SEP requirements.

Stakeholder engagement activities will be documented and reported as part of reporting requirements. The profiles of the stakeholders being consulted will be established, and disaggregated gender and other socially relevant data will be presented. Any special measures to include disadvantaged groups, for instance, physically challenged persons from affected communities, will also be documented.

Table 5-3: Planned Stakeholder Engagement Activities for the Project

Target stakeholders	Topic(s) of Engagement	Use of Method (s)	Location / Frequency	Responsibilities
Construction Phase				
Project Affected People ◆ People potentially affected by project activities ◆ People residing in project area vulnerable and disadvantaged households	◆ Grievance Mechanism/H&S Impacts, ESMP, ◆ CHS, Community Concerns, Employment Opportunities/Project Status	◆ Public meetings, open houses, trainings/workshops ◆ Separate meetings as needed for women and vulnerable/disadvantaged ◆ Individual outreach to PAPs as needed ◆ Distribution of written information: brochures, posters, flyers, website information boards in Project area ◆ Notice board(s) at construction sites ◆ Grievance mechanism ◆ KWSSIP monthly newsletter	◆ Quarterly meetings during construction/communication through mass and social media as needed ◆ Notice boards updated weekly ◆ Routine interactions ◆ Brochures in local offices	(PIU KWSSIP / CSC) Social Development and Environment Specialists
Other Interested Parties (External) ◆ Governmental committees for land use and compensation ◆ Project area residents and representatives in communities	◆ Project scope, rationale and E&S ◆ Principles/grievance mechanism ◆ Project status ◆ WB compensation requirements	◆ Face-to-face meetings ◆ Joint public/community meetings with PAPs	◆ As needed (monthly during construction phase)	(PIU KWSSIP / CSC) Social Development and Environment Specialists
Other Interested Parties (External) ◆ Press and media NGOs ◆ Businesses and business organizations ◆ Workers' organizations ◆ Academic institutions	◆ Project information – scope and rationale and E&S principles ◆ Project status H&S impacts ◆ Employment opportunities	◆ Public meetings, open houses, trainings/workshops ◆ Distribution of written information: brochures, posters, flyers, website,	Same as for PAPs	(PIU KWSSIP / CSC) Social Development and Environment Specialists

Target stakeholders	Topic(s) of Engagement	Use of Method (s)	Location / Frequency	Responsibilities
◆ General public, ◆ Jobseekers	◆ Environmental concerns ◆ Grievance mechanism process	Information boards in Project area ◆ Notice board(s) at construction sites ◆ Grievance mechanism		
Other Interested Parties (Internal) ◆ Other KWSSB staff, CSC, Contractor, sub-contractors, service providers, suppliers and their workers	◆ Project information: scope and rationale and E&S principles ◆ Training on ESMP requirements and other sub-management plans ◆ Worker grievance mechanism	◆ Face-to-face meetings ◆ Trainings/workshops ◆ Invitations to public/community meetings	Daily, as needed	(PIU KWSSIP / CSC) Social Development and Environment Specialists
Operation and Maintenance				
PAPs ◆ People residing in project area ◆ Vulnerable/disadvantaged households	◆ Satisfaction with engagement activities and GRM ◆ Grievance mechanism process ◆ Damage claim process	◆ Outreach to individual PAPs ◆ KWSSIP website ◆ Grievance mechanism ◆ KWSSIP monthly newsletter	◆ Outreach as needed meetings in affected Project area ◆ Communities (as needed/requested) monthly newsletter	KWSC Management
Other Interested Parties (External) ◆ Press and media ◆ NGOs ◆ Businesses and business organizations ◆ Workers' organizations ◆ Academic institutions ◆ Local Government ◆ Departments in Project area ◆ General public	◆ Grievance mechanism process ◆ Issues of concern ◆ Status and compliance report	◆ Grievance mechanism ◆ KWSSIP website ◆ Face-to-face meetings ◆ Submission of reports as required	As needed	KWSC Management

List of Annexures

Annexure -1: Project Background

Karachi currently has a dilapidated and under capacity collection and disposal system of sewage spanned all over the seven districts of the city. Even a short spell of rain brings great misery to residents as the rainwater mixes with sewage, overflows from the choking points and cause ponding in almost every part of the city. The proposed Priority Sewer Networks Rehabilitation and Extension project is aimed towards the introduction of an effective sewerage infrastructure that will be able to fulfill the city needs for the next many decades. The project will fulfil the existing and future sewage drainage needs of fourteen (14) selected priority areas of Karachi through the installation and rehabilitation of sewer lines with diameters ranging from 12 to 72 inches.

Karachi Water and Sewerage Services Improvement Project (KWSSIP)

In order to address the prevailing water supply and sewerage issues of Karachi, KWSSIP has been initiated as a phased program through Series of Projects (SOPs) with four overlapping phases. Following SOPs have been conceived under KWSSIP:

- SOP-1 (KWSSIP-1): Focuses on reforms, maintenance and rehabilitation
- SOP-2 (KWSSIP-2): To scale-up work done under the SOP-1
- SOP-3: Will focus on increasing water production and to ensure the additional wastewater created can be treated
- SOP-4: Will focus on improving services in informal settlements based on experience gained under the previous projects

These SOPs have been assessed to be the most suitable modality for the complex, long term challenge of addressing the serious water and sanitation service gaps in Karachi.

Second Series of Project (SOP-2) or KWSSIP-2

The SOP-2 (or KWSSIP-2) involves scaling-up infrastructure rehabilitation and expansion, complemented by capacity building to raise operational performance and improvements to the enabling environment. KWSSIP-2 has the following components:

- Component 1 is related to the capacity building and reform measures to improve the utility performance, including more reliable and energy efficient services.
- Component 2 undertakes selected infrastructure, aimed at improving the water and sewerage services in Karachi, while also increasing the city's resilience to water shortages, floods, and saltwater intrusion.
- Component 3 deals with project management and associated studies.

Selection, design, and implementation of infrastructure subprojects identified under Component-2 is based on a set of screening criteria as part of a "Project Risk Reducing Procedure" (PRRP) and ensure compliance with the WB's ESF 2018 requirements. Following are the sub-projects included under Component 2 of KWSSIP-2:

- K-IV Augmentation (Installation of water main pipes to supply the treated water from K-IV Reservoirs to the existing water supply network);
- Malir Basin Wastewater Interceptors and Treatment Plant (TP-IV)
- Improving Water Supply and Sewerage in Ten (10) Low-Income Communities (Katchi Abadis);

Project Design and Environment & Social Assessment Study

Joint Venture comprising Euro Consultants and Sunjin Engineering & Architecture Co. Limited has been engaged by the Project Implementation Unit (PIU) – KWSSIP for carrying out the feasibility study and detailed design of the project, whereas the consultancy services for carrying out its Environmental and Social Assessment (ESA) Studies have been assigned to MM Pakistan Pvt. Limited (MMP). Based on the updated detailed design information, **Table A1-1** provides an overview of the project interventions, whereas **Table A1-2** provides an overview of total length for each pipe size that will be utilized for the project:

Table A1-1: Overview of the Project Interventions

Scheme No.	Description	Location	Lengths and Sizes of Sewer Pipes	
			Pipe (Inch)	Length (m)
1	Laying of main Trunk Sewer line starting from Abbot Laboratories Factory towards Malir River	Abbott Laboratories to Malir River - National Highway Quaidabad - Bin Qasim Town	24	500
			33	500
			42	867.46
2	Laying of trunk sewer from Main Paracha Chowk to TP-III Interceptor Lyari river and at Jinnah Road, Toor baba Road, Urdu Bazaar, Muhammad Road and Akbar Road.	Main Paracha Chowk to Lyari River Interceptor and Jinnah Road, Toor baba Road, Urdu Bazaar Road and Akbar Road (S.I.T.E)	12	2100
			15	2140
			18	1806
			21	675
			24	255
			27	425
3	Laying of various diameter sewer lines in Sector 11 – North Karachi via KDA Chowrangi towards Lyari River	Sector 11 via KDA Chowrangi to Lyari River Interceptor (Manghopir)	21	400
			27	400
			30	400
			36	400
			42	400
			48	1200
			54	1200
			60	560
4	Laying of various diameter sewer lines from Gulshan-e-Maymar towards Lyari River	Gulshan-e-Maymar to Lyari River Interceptor (Manghopir & Gulzar-e-Hijri)	18	548
			27	450
			30	500
			33	380
			42	520
			54	500
			66	500
			Conduit (2 m wide / 1.5 m deep)	2635
5	Laying of various diameter sewer lines from Khawaja Ghareeb Nawaz Chowk towards Orangi Nala	Khawaja Ghareeb Nawaz Chowk to Orangi Nala Trunk Sewer (Mominabad & Orangi)	15	630
			21	690
			24	470
			27	630

Scheme No.	Description	Location	Lengths and Sizes of Sewer Pipes	
			Pipe (Inch)	Length (m)
			30	400
			33	400
			36	525
			42	950
			48	655
			60	1211
			66	616
			72	418
6	Laying of various diameter sewer lines from Raja Tanveer Colony towards Orangi Nala	Raja Tanveer Colony to Orangi Nala Trunk Sewer (Mominabad)	15	671
			18	711
			21	323
			27	294
			30	218
			33	492
			36	332
			42	945
			48	961.6
			54	594
			60	667
7	Laying of various diameter sewer lines from Irani Camp Road towards Orangi Nala	Irani Camp Road to Orangi Nala Trunk Sewer (Mominabad)	15	466
			33	500
			42	500
			54	500
			66	231
			72	270
			Conduit (2 m wide / 1.5 m deep)	2132
8	Laying of various diameter sewer lines from Cozy homes Block-13-A to Sattar Masjid Block-17 via Bait-ul-Mukarram Masjid	Masjid-e-Sattar to Scheme no. 07 of SOP-1 (UC-22, Gulshan-e-Iqbal, District East-B)	15	230
			18	385
			21	340
			24	300
			27	600
			30	160
			33	105
9	Laying of various diameter sewer lines from Masjid-e-Quba to Al-Quddos Apartment Block-13C	Al-Quddos Apartment Block-13C to Scheme no. 07 of SOP-1 near Masjid e Quba - (UC-22, Gulshan-e-Iqbal, District East-B)	18	100
			21	200
			24	68
10	Laying of various diameter sewer lines from Millat Town CNG Pump to Malir-15 Railway Phatak Jamia Millia Roads (UC-14) in Areas of Shah Faisal Town.	Malir-15 to Malir River Interceptor (Shah Faisal)	18	300
			24	600
			27	600
			30	305
			36	220
			42	125
11	Laying of various diameter sewer lines from Dayar-e-Shereen Sweets Buffer Zone to Ziauddin Hospital to Wahid Colony, North Nazimabad	Dayar-e-Shereen Sweets Buffer Zone to Ziauddin Hospital to Scheme-16 of SOP-1 near Wahid Colony, North Nazimabad	24	400
			36	500
			54	400
			60	400
			66	400
			72	900

Scheme No.	Description	Location	Lengths and Sizes of Sewer Pipes	
			Pipe (Inch)	Length (m)
			Conduit (2 m wide / 1.5 m deep)	1881
12	Laying of various diameter sewer lines at different spots from Tannery Pumping Station to Atma Ram Road Baghdadi via Mirza Adam Khan Road	Atma Ram Road to 08 Chowk to Pumping Station (UC No. 01,02,03,08 & 09 Lyari Town - District South-A)	24	210
			27	160
			33	135
			36	76
			42	522
			48	317
			36	200
13	Laying of various diameter sewer lines at different spots starting from Atma Ram Road to Zero Point Maripur Road to Peoples Play Ground Via Maripur Road Uc-No 01,02 & 03 Lyari Town	Atma Ram Road to Mirza Adam Khan Road to Pumping Station (Uc-No 01,02 & 03 Lyari Town)	15	556
			18	190
			21	829
			24	548
			27	836
			30	200
			33	330
			36	400
			42	225
14	Laying of various diameter sewer lines from Peoples Stadium to Pumping Station	Peoples Stadium to Pumping Station (Lyari)	18	100
			21	100
			24	303
			27	153
			30	74

Table A1-2: Total Length of Each Pipe Size / Conduit

No.	Pipe Size (Inch)	Total Length (m)
1.	12	2100
2.	15	4693
3.	18	4140
4.	21	3557
5.	24	3654
6.	27	4548
7.	30	2257
8.	33	2842
9.	36	2653
10.	42	5054
11.	48	3133
12.	54	3194
13.	60	2838
14.	66	1747
15.	72	1588
16.	Conduit	6648

Suitable Instruments for E&S Assessment

The proposed project is located in Sindh, therefore, the Sindh Environmental Protection Act - 2014 is the core environmental law for the proposed project. According to the SEPA's Review of IEE/EIA Regulations, 2021, the project falls under Schedule – I, hence requiring submission of an Environmental Checklist (EC) to SEPA. Based on the WB ESF, 2018, the proposed project has been classified as Environmentally and Socially 'Moderate', for which an ESMP is required.

The project may cause site specific and low intensity impacts, whereas the implementation of mitigation measures will further reduce the magnitude of these impacts. To fulfil the WB ESF, 2018, an ESMP report has been prepared. This ESMP will be followed for the preparation of an EC for submission to SEPA by PIU KWSSIP-2.

Scope of ESMP and Other Environmental & Social Studies

The ESMP identifies the potential impacts of the proposed project and suggest the applicable mitigation measures to avoid, minimize or reduce the magnitude of the impacts. It also indicates the institutional and training requirements to implement mitigation measures during the construction and operation of proposed project. The current ESMP presents a preliminary roadmap for environment and social management for construction and operation of the proposed project.

Besides this ESMP, the following documents prepared for the whole KWSSIP-2 project[1], also apply to the proposed project:

- Environmental and Social Commitment Plan (ESCP);
- Stakeholder Engagement Plan (SEP);
- Gender Action Plan (GAP); and;
- Labor Management Procedures (LMP).

Study Area - Area of Influence (AoI)

As discussed earlier, based upon the WB ESF (2018), the proposed project has been classified as 'Moderate' in view of its associated environmental and social impacts, which means that the project impacts are not envisaged to go beyond the project boundaries. The area of influence (AoI) covers the areas likely to be directly or indirectly impacted by the Project, i.e. Direct Impact Area (DIA) and Indirect Impact Area (IIA). DIA includes the core project construction sites where direct impacts of construction activities are envisaged such as cutting of trees. IIA includes areas / communities adjacent to the core project construction sites that may experience impacts (e.g. nuisance associated with traffic congestion, community safety, dust or noise etc.) during construction or operation phases of the Project.

Table A1-3 defines the Areas of Influence (AoI) covering both Direct Impact Area (DIA) and Indirect Impact Area (IIA) which have been considered for the assessment of impacts. The extent of the IIA has been determined by the reach of impacts such as noise and air pollution etc. **Figure A1-1** to **Figure A1-6** show the maps describing the AoI considered for the project schemes.

1 For other sub-projects under KWSSIP-2, a number of relevant E&S studies have been carried out including Ecological Assessment and Biodiversity Action Plan (BAP); ESIA for K-IV Augmentation Works; ESMPs and RPs for Water Supply and Sewerage in Additional Low-Income Communities (Katchi Abadis), Priority Water Network Rehabilitation and Extension, Reducing Energy Consumption, and Rehabilitation of Existing and Construction of New Filtration Plants.

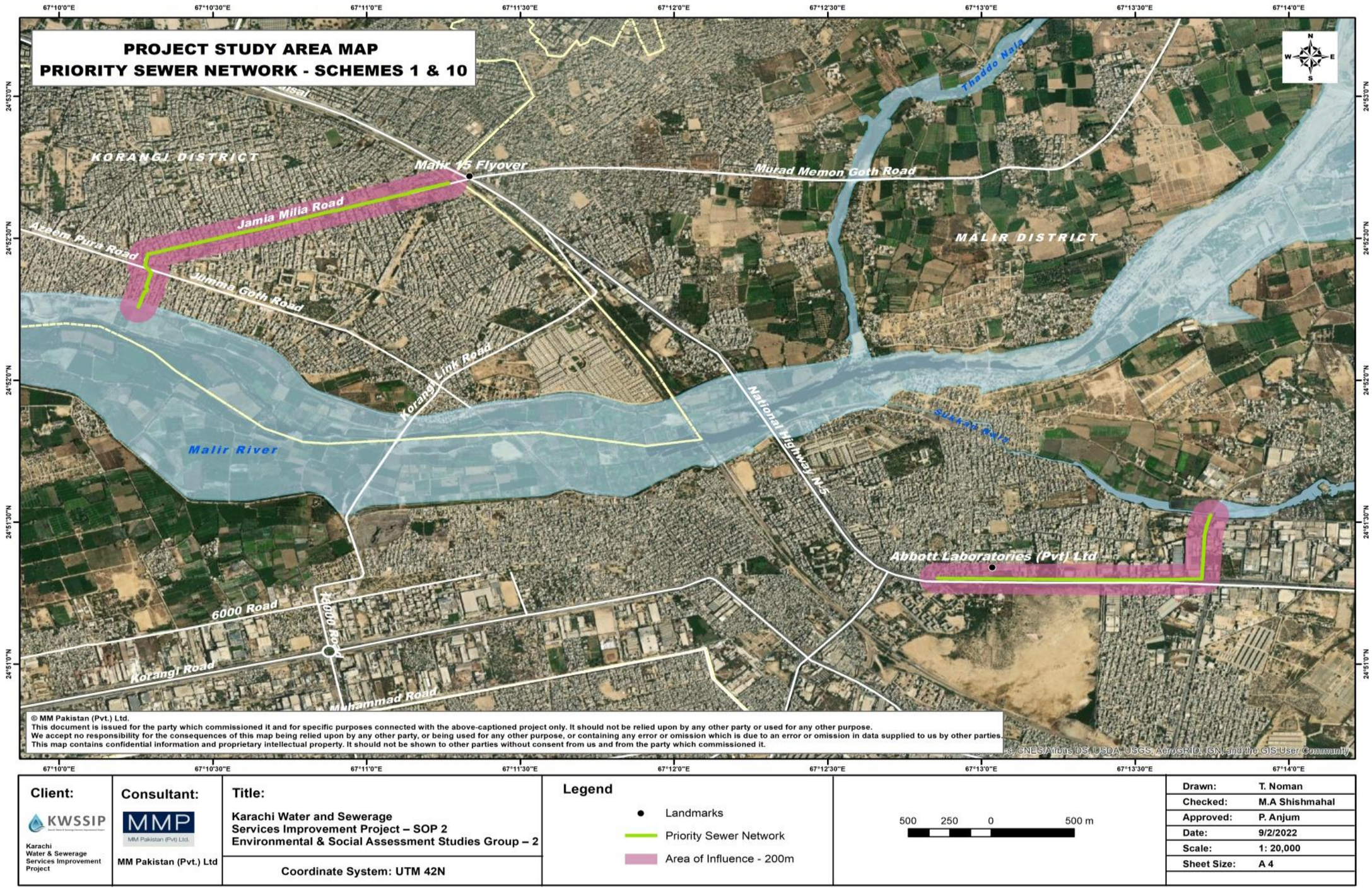


Figure A1-1: AOI map for Scheme 1 & 10

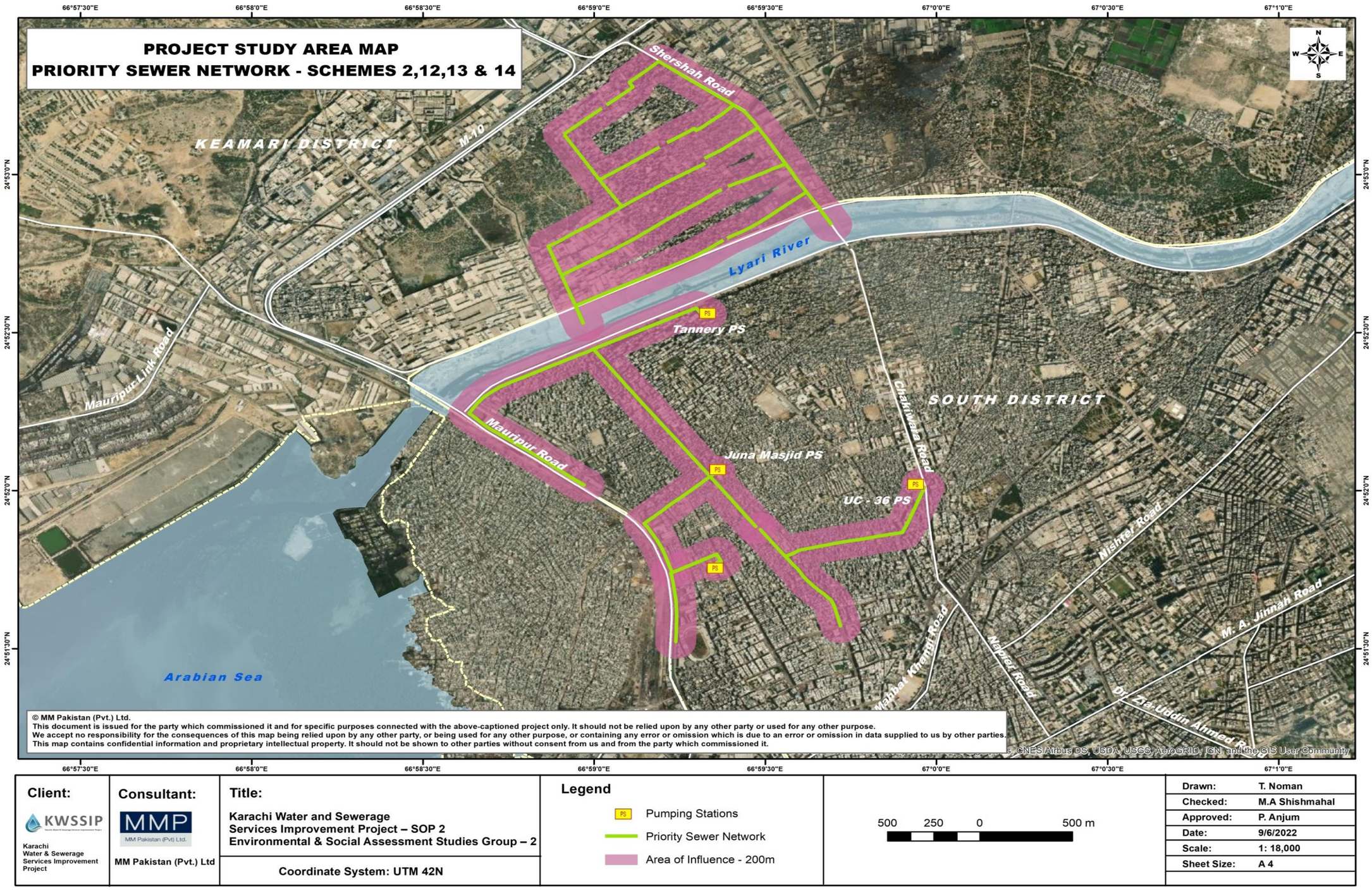


Figure A1-2: AOI maps for Scheme 02, 12, 13 & 14

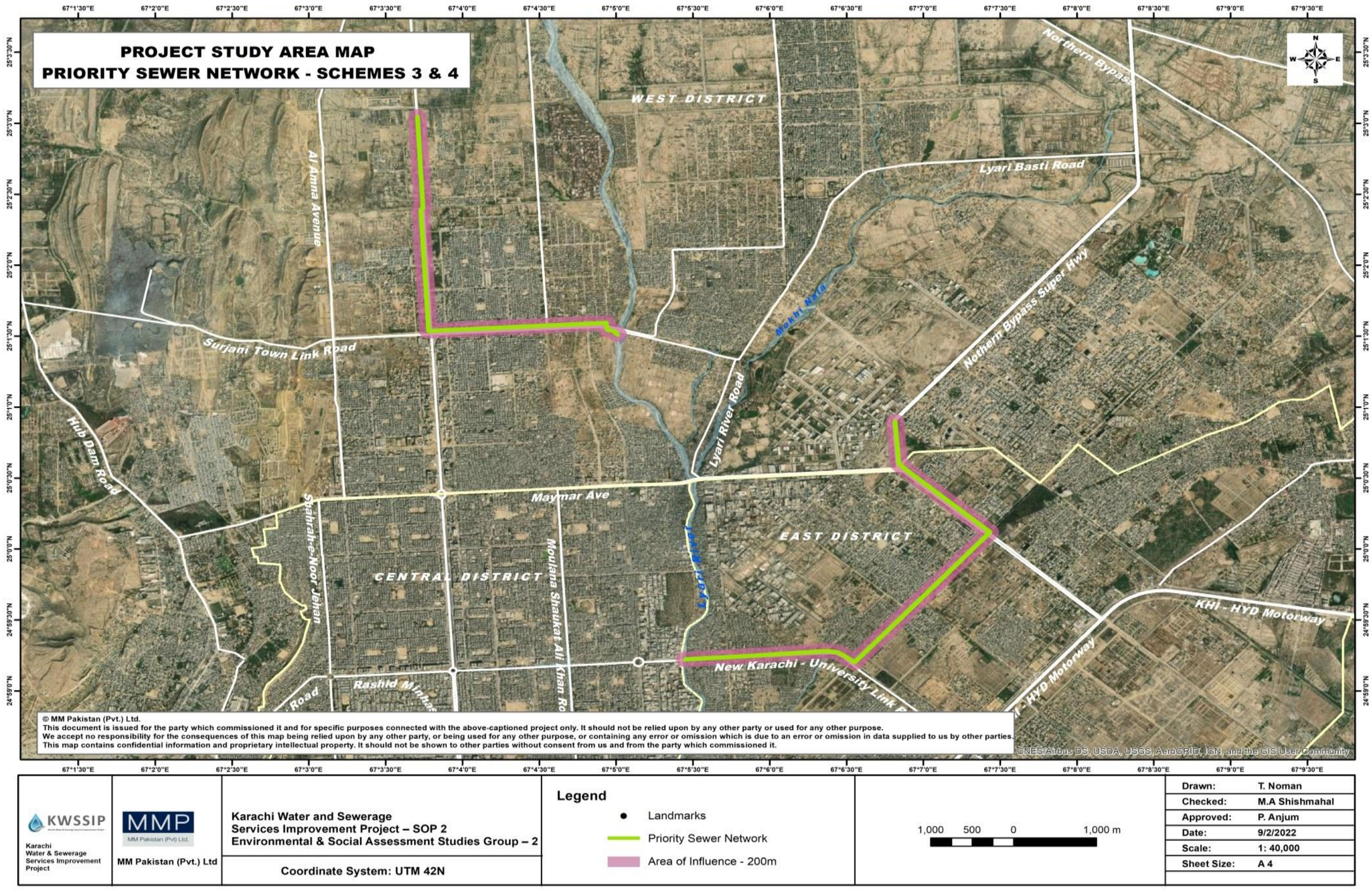


Figure A1-3: AOI map for Scheme 3 & 4

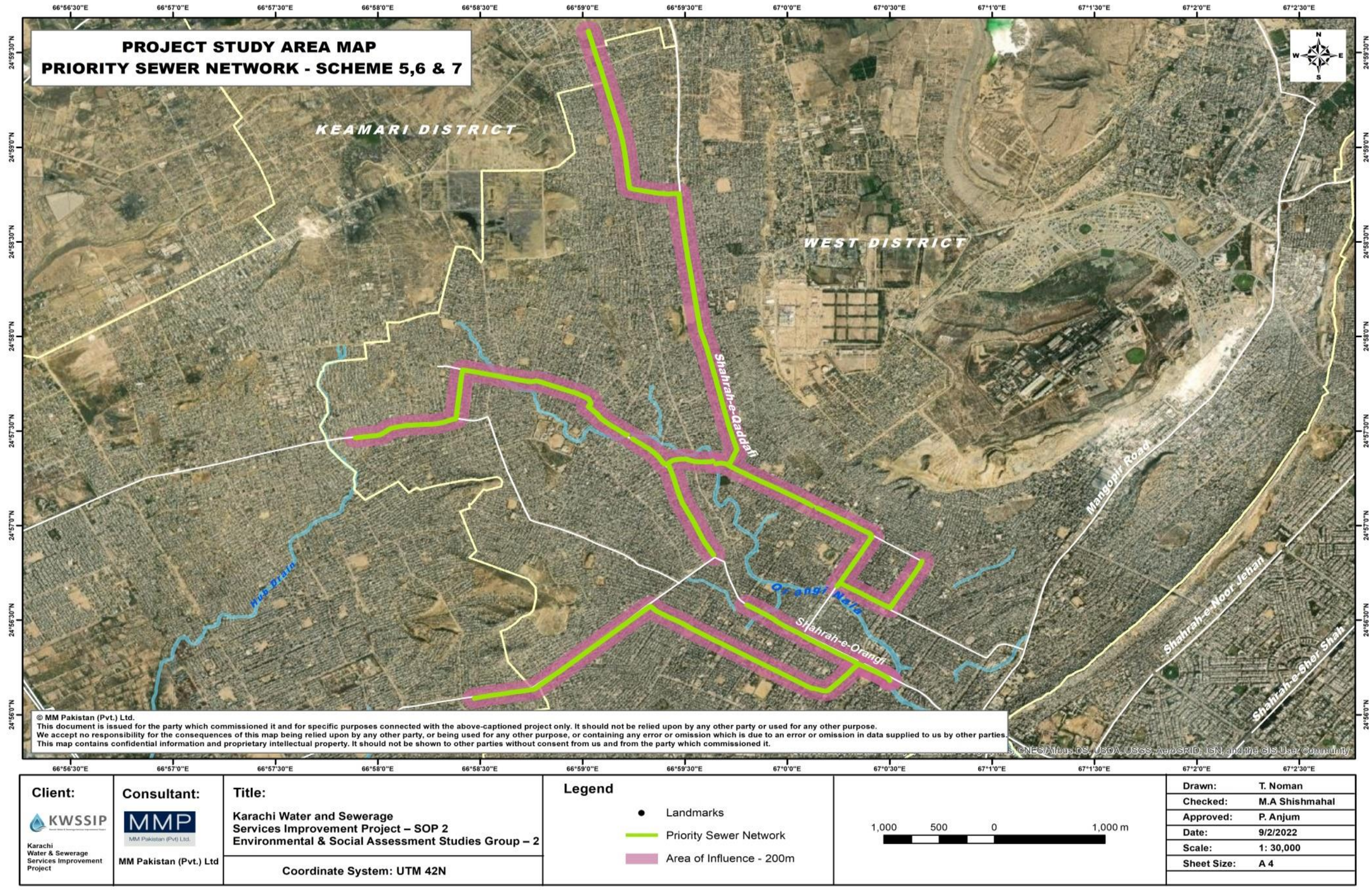


Figure A1-4: AOI map for Scheme 5,6 & 7

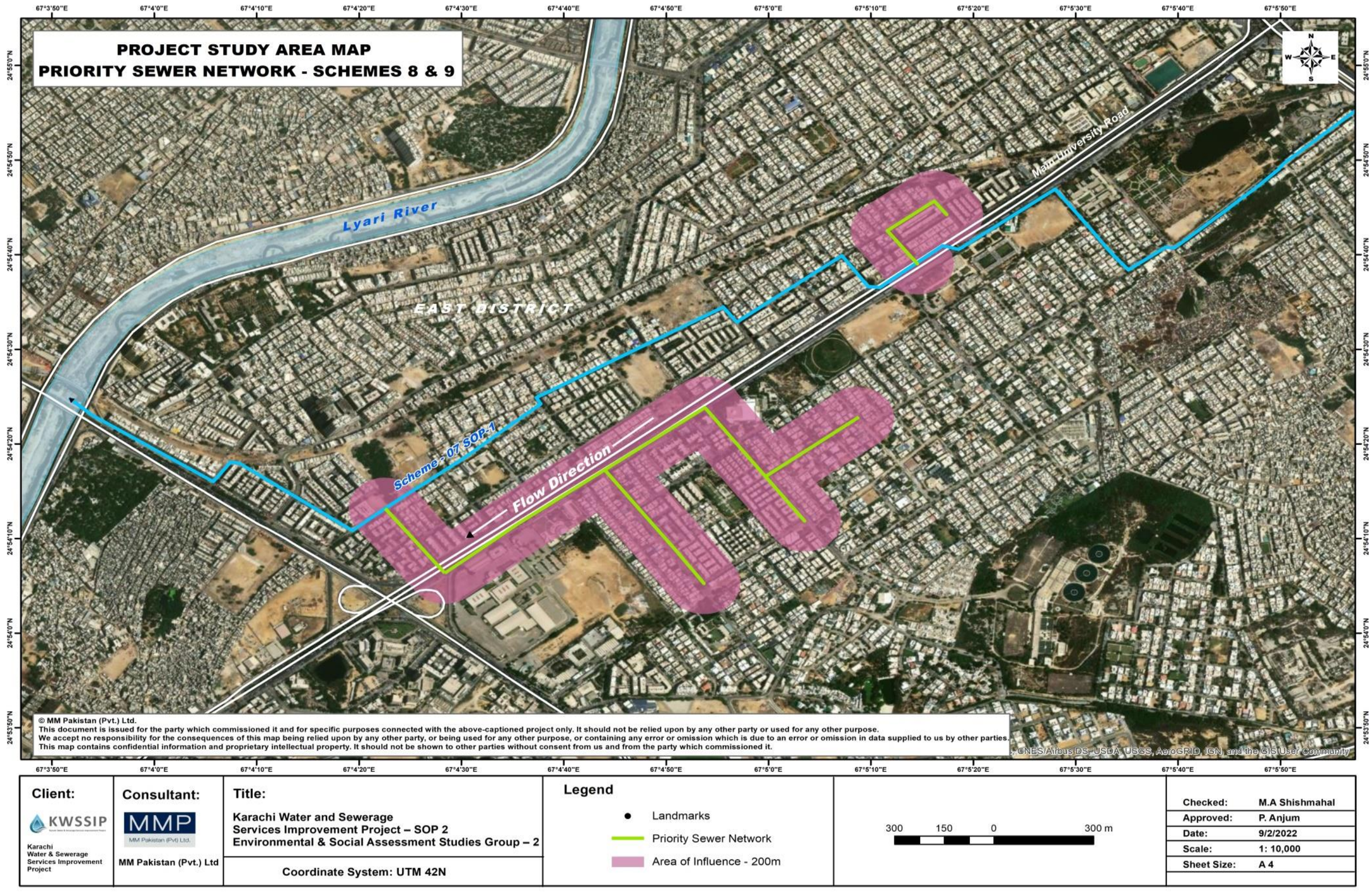


Figure A1-5: AOI map for Scheme 8 & 9

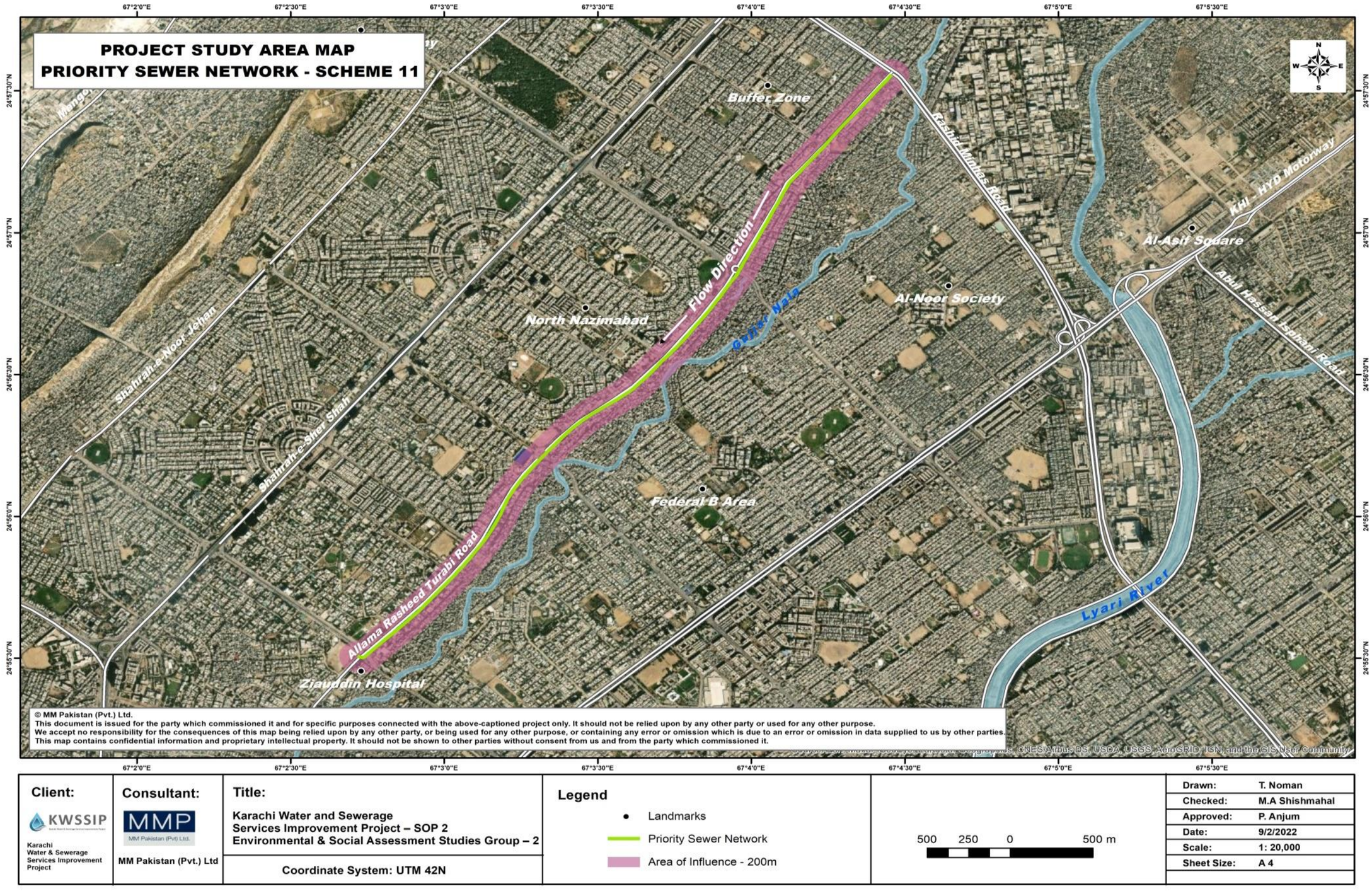


Figure A1-6: AOI map for Scheme 1

Table A1-3: Areas of Influence (AoI)

No.	Project Components / Sites	Direct Impact Area (DIA)	Indirect Impact Area (IIA)
1	Construction sites for Laying / Installation / Repair of various Sewer Lines under the project.	6 meters wide corridor for main construction / trenching area, space for the movement of machinery / dumper trucks and spaces for temporarily stocking the excavated material along excavated trenches.	200 m (100 m from the center line on both sides)
2	Campsites	Main site area	100 m radius

ESMP Study Approach and Methodology

Review of Project's Design Documents and Desk Research for Secondary Data Analysis

This involved collecting information from the PIU KWSSIP and Technical Consultants regarding the proposed project activities. The design documents and feasibility reports have been reviewed to understand the extent of construction works and their potential outcomes on the existing environment and social conditions. Moreover, literature review has been conducted on the available environmental and social baseline information of the project area. The applicable provincial policies, guidelines, legislations, and World Bank guidelines were also studied. Secondary data sources have been used to study the aspects including climate, rainfall, temperatures, geology, soils; flora and fauna profiles, critical habitats / vegetation, any sites / structures / natural features having archaeological / historical / architectural / religious or cultural significance; and Socio-economic environment including livelihood conditions in the project area.

Reconnaissance Surveys, Delineation of the Area of Influence (AoI) and Environmental & Social Screening

Reconnaissance surveys were carried out to assess the existing environmental and social conditions in the project area that may potentially be affected by the proposed project. AoI has been decided by the consultant's team based upon the assessment on possible reach of impacts and consultants past similar field experience. Screening has been performed to determine the significance of impacts, the type of assessment to be carried out and the appropriate ESA instrument required to be prepared for the project.

Review of Legislation and Guidelines

National legislation, international agreements, environmental guidelines both of SEPA and WB, and best industry practices have been reviewed to set environmental standards that PIU KWSSIP as the executing agency will adhere to during implementation of the project.

Primary Data Collection (Baseline Surveys)

Comprehensive field data gathering exercises were carried out for environmental and social baseline data collection in the AoI**.** In this regard, the consultants team performed detailed field surveys between December 2021 and April 2022.

The environment survey focused on collecting site-specific baseline information of the project area related to water quality, air quality, noise, traffic situation, land-use, sensitive receptors that could get affected by dust or noise and presence of any historical / cultural / archaeological sites etc.

The ecology survey focused on collecting baseline information on floral and faunal species. Inventory for the trees growing within the main construction areas and shall require to be cut has been prepared. Other vegetation growing in the AoI that shall not be affected by the construction activities has also been recorded. The un-identified plants were photographed and identified later using "PLANTNET" software. The data on the fauna was gathered through random sampling and observations along the alignments, visual encounters, incidental observations and indirect methods such as recording pug marks in the AoI.

Socio-economic baseline information has been obtained mainly through focus group discussions with male and female groups of the communities in the AoI. Social surveys were focused on the specific aspects of socio-economic profile of the project area related to households, education, health situation, diseases, income, gender related problems, businesses, presence of social organizations and political patterns etc.

Stakeholder Consultations

Stakeholder consultations were carried out with all key stakeholders, particularly local communities residing in the project's AoI, local businesses and government / local government bodies in line with the KWSSIP-2 SEP. Scoping sessions were undertaken with the local communities / residents, representatives from SEPA, Health / Education Departments, NGOs active in the area, Public Health Engineering Department etc. The stakeholder consultation process involved information disclosure regarding the project development with stakeholders to brief them about project and to seek their response/recommendation. A stakeholder engagement workshop has also been organized to disseminate the project information and getting feedback from the key institutional stakeholders.

Impacts Identification and Assessment

Potential impacts arising from each phase of the proposed project have been identified and assessed **based on** field data, secondary data, expert opinions and examining previous similar projects in Pakistan. These include effects on physical, **biological,** and socio-economic environment.

Recommendations for Mitigation Measures

Mitigation measures to minimize, eliminate or compensate the potential environmental and social impacts have been recommended. The mitigation measures have been recommended **based on** past experiences, best industry practices, legislative requirements and professional judgment.

Preparation of Environmental and Social Management Plan (ESMP)

An Environmental and Social Management Plan (ESMP) has been prepared for effective implementation of the recommended mitigation measures. The ESMP includes controls to minimize the identified impacts and a monitoring program to monitor effects of mitigation measures implemented and residual impacts, if any, during implementation. The ESMP has identified roles and responsibilities of all concerned parties during the implementation of the project.

Methodology for the ESMP comprises a series of integrated tasks including fieldwork (e.g., surveys, consultations etc.) and desk reviews as deemed necessary to meet the needs of the ESMP.

Annexure -2: Legal and Institutional Requirements

General

This Chapter summarizes the national, provincial, the World Bank and international environmental and social legislations, regulations, standards, and treaties relevant to this ESA Study. The footprint of the Project is located in the administrative boundaries of Sindh, therefore the rules, regulations and standards applicable in Sindh are applicable to this project. World Bank's ESS relevant to this project are duly described in this section. World Bank's EHS Guidelines (EHSGs) will also be followed to make the project implementation in compliance with these guidelines.

Applicable National and Provincial Policies

Pakistan has in place a comprehensive constitutional, policy framework for the protection of the environment and people. This section is structured around the constitutional foundation and legislative hierarchy. An overview of relevant national policies is presented here. The full list of relevant policies is provided in **Table A2-1**.

Table A2-1: Applicable National and Provincial Policies and Guidelines

National Policies (Year of implementation)	Relevance / Applicability
National Climate Change Policy, 2012	The policy commits for responding appropriately for mitigation and adaptation to climate change through tools of environmental assessment, environmental management and environmental enhancement. Hence, the development of present ESMP is consistent with this policy.
1st Sindh Labour Policy, 2018	This policy aims at decent working conditions following the international Labor standards and asks for improvement in health and safety of workers and timely payment of wages. This policy requires the stakeholders in developing strategies, plans and programs for the protection and promotion of the rights and benefits of working community without jeopardizing the genuine concerns of the employers, through any project /activity in the Sindh province and as such adherence will be required
Guidelines for Public Consultation, 1997	Public involvement can lead to a better and more acceptable decision for project implementation; hence, the project has considered these guidelines for completing this ESMP.

Relevant Applicable Sections of Provincial Environmental Law

Table A2-2 enlists the key sections of the Sindh Environment Protection Act that have a direct bearing on the project area:

Table A2-2: Key Sections of Sindh Environment Protection Act for Project

Environmental Legislation	SEPA 2014	Relevance with Project
Prohibition of Certain Discharges or Emissions:	Section 11	The project is required to comply with SEQS and demonstrate the same through regular monitoring during construction stage.
Handling of Hazardous Substances:	Section 13	The project is required to show the compliance of provincial and international standards related with Handling of Hazardous Substances during construction and operation stages.

Environmental Legislation	SEPA 2014	Relevance with Project
Regulation of motor vehicles:	Section 15	The project is required to show compliance of Sindh Environmental Quality Standards or, where applicable, the standards established under sub-clause (i) of subsection (g) of sub-section (1) of section 6.
EC, IEE and EIA:	Section 17	The project is required to obtain environmental approval before commencement of work from Sindh EPA under this section of the acts.
Environmental Monitoring:	Section 19	The project proponent (KWSSIP / KWSC) shall submit various environmental monitoring reports as per SEPA directives, including quantitative and qualitative analysis of - (a) discharge of effluents, wastes, emissions of air pollutants, noise and any other matter or action that may be found offensive under section 14 from the project; (b) ambient quality of the air, water, noise and soil before, during and after construction and during operation of the project.
Penalties:	Section 22	The project proponent (KWSSIP / KWSC) shall ensure compliance of sections 11, 17, 18 and 21 or any order issued thereunder; non-compliance shall render them liable to fines of up to PKR 5 M and an additional up to PKR 100,000/day in case of continued contravention

Review of the National and Provincial Environmental Requirements

The applicable Environmental and Social (E&S) legislations and regulations are briefly described in **Table A2-3.**

Table A2-3: Applicable National and Provincial Acts

National / Provincial Acts (Year of implementation)	Relevance / Applicability
Sindh Environmental Protection Agency (Environmental Assessment) Regulations, 2021	According to the SEPA's Review of IEE/EIA Regulations, 2021, the project falls under Schedule – I, hence requiring submission of an Environmental Checklist (EC) to SEPA.
Sindh Environmental Quality Standards 2016	Standards set out in SEQS and relevant to the Project include: ◆ Municipal and liquid industrial effluents (32 parameters) ◆ Industrial gaseous emissions (16 parameters) ◆ Motor vehicle exhaust and noise (used and new vehicles) ◆ Ambient air quality (9 parameters) ◆ Drinking water quality (32 parameters) ◆ Noise (four zones during day and night). These standards shall be applicable for the construction phase of the project.
Antiquity Act (1975) and the Sindh Cultural Heritage (Preservation) Act, 1994	Although, no heritage buildings are located in the immediate vicinity of the proposed sewer schemes, however Scheme Nos. 12, 13 and 14 are located in District South, which is home to a large number of declared heritage buildings. As for now, there are no known antiquities in the project area, however in case of chance find this act will become relevant and the Office of the Director General – Antiquities & Archaeology – GoS shall be informed in case any resource is found.

National / Provincial Acts (Year of implementation)	Relevance / Applicability
Pakistan Labor laws	Labor rights in Pakistan specified under Article 11 and 17 of the constitution of Pakistan, shall be applicable to the proposed project. More specific laws are described separately. The laws are relevant to the project.
Factories Act, 1934 and The Sindh Factories (Second Amendment) Act, 2021	This is an act related to labor rights, safety, basic welfare facilities including living, food, and occupational health including infectious diseases. It also covers work-related hazards, shelter facilities during rest time, restriction of working hours and holidays rules etc. The Sindh amended law is for the rights of labor working in the province of Sindh and applicable to the proposed works.
The Sindh Occupational Safety and Health Act, 2017	This is a consolidated law for the OHS of the persons at workplace and to protect them against risks arising out of the occupational hazards; to promote safe and healthy working environment catering to the physiological and psychological needs of the employees at workplace and is relevant to the project.
The Sindh Bonded Labor System (Abolition) Act, 2015	The Bonded Labor System (Abolition) Act defines the `Bonded Labor System' as a system of forced, or partly forced, Labor under which a debtor enters, or is presumed to have entered into an agreement with the creditor. Adherence to the act is mandatory.
Sindh Minimum Wages Act, 2015 (Sindh Act No. VIII of 2016)	The Act provides for the regulation of minimum rates of wages and various allowances for different categories of workers employed in industrial and commercial undertakings and establishments in Sindh province. Adherence to the act is mandatory.
Sindh Workers Compensation Act, 2015	This act is expedient to provide for the payment by certain classes of employers to their workers or their legal heirs of compensation for injury or death by accident. Adherence to the act is mandatory.
Fatal Accidents Act 1855	This is an Act to provide compensation to families for loss occasioned by the death of a person caused by actionable wrong. For community related accidents, this law shall be applicable.
The Sindh Prohibition of Employment of Children Act, 2017	The Act prohibit and regulate employment of children less than 14 years and is applicable to the project and the Contractors and sub-contractors will have to comply with this Act.
The Protection Against Harassment of Women at the Workplace Act, 2010	The Protection Against Harassment of Women at the Workplace Act, 2010 seeks to protect women from sexual harassment at their place of work, and equally applicable to this project.
The Sindh Local Government (Amendment) Act, 2021	Under the act, the local councils are authorized to restrict activities causing pollution. The Project will be required to follow the provisions of the LGA with regards to pollution of air, water and land during construction.

Applicability of Stringent Environmental Quality Standards

According to the WB guidelines, when host country requirements differ from the levels and measures presented in the EHSGs, the Bank will require the proponent to achieve or implement whichever is more stringent. In this regard, the comparison and applicability of relevant local and international environmental quality standards is discussed as follows:

Comparison and Applicability of SEQS vs WHO / WBG Standards on Drinking Water Quality

Comparison of local and international water quality standards is provided as **Table A2-4**. The more stringent of the two should be followed during the construction stage (drinking water quality for labor and workers). The stringent of the two are highlighted with green, while the similar values are highlighted with yellow, and these highlighted values are applicable at the project.

Table A2-4: Comparison of Local and International Drinking Water Quality Standards

Parameter	Unit	SEPA	WHO / WBG
Bacterial			
E-Coli	numbers/ml	Must not be detectable inany 100 ml sample	Must not be detectable inany 100 ml sample
Total Coliform	numbers/ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample
Physical			
Color	TCU	≤ 15 TCU	≤ 15 TCU
Taste	No objectionable / Acceptable	None	None
Odor	No objectionable / Acceptable	None	None
Turbidity	NTU	< 5 NTU	< 5 NTU
Total Hardness	mg/l	< 500 mg/l	-
TDS	mg/l	< 1000	< 1000
pH		6.5-8.5	-
Chemical			
Aluminum	mg/l	≤0.2	0.2
Antimony	mg/l	≤0.005	0.02
Arsenic	mg/l	≤0.05	0.01
Barium	mg/l	0.7	0.7
Boron	mg/l	0.3	0.3
Cadmium	mg/l	0.01	0.003
Chloride	mg/l	<250	250
Chromium	mg/l	≤0.05	0.05
Copper	mg/l	2	2
Cyanide	mg/l	≤0.05	0.07
Fluoride	mg/l	<1.5	1.5
Lead	mg/l	≤0.05	0.01
Manganese	mg/l	≤0.5	0.5
Mercury	mg/l	≤0.001	0.001
Nickel	mg/l	≤0.02	0.02
Nitrate	mg/l	≤0.50	50
Nitrite	mg/l	≤3	3
Selenium	mg/l	0.01	0.01
Residual Chlorine	mg/l	0.2-0.5 at consumer end	-
Zinc	mg/l	5.0	3

Comparison and Applicability of SEQS vs WHO / WBG Standards on Air Quality

Comparison of local and international air quality standards is provided as **Table A2-5**. The more stringent of the two shall be followed during the project construction phase. The stringent of the two are highlighted with green, which are applicable at the project.

Table A2-5: Comparison of Local and International Air Quality Standards

Pollutants	SEPA		WHO / WBG	
	Avg. Time	Standard	Avg. Time	Standard
SO_2	24 hrs	120 ug/m^3	24 hr 10 min	40 ug/m^3 500 ug/m^3
CO	8 hrs 1 hr	5 ug/m^3 10 ug/m^3	8 hrs	4 ug/m^3
NO_2	24 hrs	80 ug/m^3	24 hr	25 ug/m^3
O_3	1 hr	130 ug/m^3	-	-

Pollutants	SEPA		WHO / WBG	
	Avg. Time	Standard	Avg. Time	Standard
SPM	24 hrs	120 ug/m^3	-	-
PM_{10}	24 hrs	150 ug/m^3	24 hr	45 ug/m^3
$PM_{2.5}$	24 hrs	75 ug/m^3	24 hr	15 ug/m^3

Comparison and Applicability of SEQS vs WHO / WBG Standards on Noise

Comparison of local and international noise standards is provided as **Table A2-6**. The more stringent of the two shall be followed during the project construction. The stringent of the two are highlighted with green, while the similar values are highlighted with yellow, and these highlighted values are applicable at the project.

Table A2-6: Comparison of Local and International Noise Standards

Category of Area/Zone	Limit in dB(A) Leq			
	SEPA		WHO/WBG	
	Day Time	Nighttime	Day Time	Nighttime
Residential area (A)	55	45	55	45
Commercial area (B)	65	55	70	70
Industrial area (C)	75	65	70	70
Silence zone (D)	50	45	55	45

International Treaties and Conventions

The relevant international treaties and conventions to the project to which Pakistan is a party are as follows:

ILO's Fundamental Conventions – Ratified by Pakistan

The following ILO's fundamental convention shall be applicable.

- Forced Labour Convention, 1930 (Convention No. 29)
- Freedom of Association and Protection of the Right to Organize Convention, 1948 (Convention No. 87)
- Right to Organize and Collective Bargaining Convention, 1949 (Convention No. 98)
- Equal Remuneration Convention, 1951 (Convention No. 100)
- Abolition of Forced Labour Convention, 1957 (Convention No. 105)
- Discrimination (Employment and Occupation) Convention, 1958 (Convention No. 111)
- Minimum Age Convention, 1973 (Convention No. 138) Minimum age specified: 14 years
- Worst Forms of Child Labour Convention, 1999 (Convention No. 182)

Applicable World Bank Guidelines

World Bank Environmental and Social Framework

The World Bank ESF sets out the World Bank's commitment to sustainable development, through a Bank Policy and a set of ESS that are designed to for environmental and social sustainability. There are ten Environmental and Social Standards and their applicability on project is given in **Table A2-7**.

Table A2-7: World Bank Environmental and Social Standards Applicable to the Project

ESS	Environmental and Social Standards	Description	Relevance with Project and Actions (to be) Taken
ESS 1	Assessment and Management of Environmental and Social Risks and Impacts	Identify, assess, evaluate, and manage environment and social risks and impacts in a manner consistent with the ESF. Adopt differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable, and they are not disadvantaged in sharing development benefits and opportunities	◆ This study has been conducted in compliance with ESS 1 and based upon the impact and risk assessment ESMP has been prepared. ◆ Project components were thoroughly screened to ensure that they are covered by and meet the requirements of ESS and Government laws and regulation ◆ E&S risks and Impacts have been identified based on surveys and consultations with primary stakeholders including communities and implementing agency ◆ The ESMP will be disclosed both at the KWSSIP and at Bank's websites. ◆ PIU - KWSSIP shall implement an Environment and Social Commitment Plan (ESCP) and comply with its conditions during the project implementation. ◆ Monitoring and reporting on E&S performance will be carried out during implementation.
ESS 2	Labour and Working Conditions	Promote safety and health at work. Promote the fair treatment, non-discrimination, and equal opportunity of project workers. Protect project workers, with particular emphasis on vulnerable workers. Prevent the use of all forms of forced labour and child labour. Support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national law. Provide project workers with accessible means to raise workplace concerns.	◆ Project will recruit the following types of workers: ◆ Direct workers will include the project managers and supervisors, who are employees of KWSSIP / KWSC; ◆ All workforces deployed by the Contractors and the Project Supervision Consultant under the KWSSIP / KWSC will be deemed to be contracted workers. The Contractor might further engage multiple subcontractors; ◆ Influx of migrant labour from other districts for construction works will be minimized by employing local workers. ◆ Labour Management Procedures (LMP) for KWSSIP-2 have been prepared to regulate working conditions and management of workers relation including worker specific Grievance Redress Mechanism (GRM), terms and conditions of employment, non-discrimination and equal opportunity, Sexual Exploitation and Abuse / Sexual Harassments (SEA/SH), protection of workforce, the

ESS	Environmental and Social Standards	Description	Relevance with Project and Actions (to be) Taken
			prohibition of child / forced labor (including in source country and supply chain) and provision of OHS management
ESS 3	Resource Efficiency and Pollution Prevention and Management	Promote the sustainable use of resources, including energy, water, and raw materials. Avoid or minimize adverse impacts on human health and the environment caused by pollution from project activities. Avoid or minimize project-related emissions of short and long-lived climate pollutants. Avoid or minimize generation of hazardous and non-hazardous waste. Minimize and manage the risks and impacts associated with pesticide use. Requires technically and financially feasible measures to improve efficient consumption of energy, water, and raw materials, and introduces specific requirements for water efficiency where a project has high water demand.	◆ The project during construction shall explore use of local materials and recycled construction materials to the maximum extent possible. ◆ With respect to Pollution Management, as part of the ESMP process, prevention and management measures have been thoroughly devised to offset risks and impacts of pollution from potential sources such as dust and emissions from operation of construction equipment, material haulage vehicles; effluents from labour / construction camp; spillage or leakage during handling of hazardous materials etc.; and disposal of wastes generated during project implementation period.
ESS 4	Community Health and Safety	Anticipate or avoid adverse impacts on the health and safety of project-affected communities during project life-cycle from routine and non-routine circumstances. Promote quality, safety, and climate change considerations in infrastructure design and construction. Avoid or minimize community exposure to project-related traffic and road safety risks, diseases and hazardous materials. Have in place effective measures to address emergency events. Ensure that safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities.	◆ The project construction phase will involve (i) excavation work, construction debris handling and disposal etc. during construction; (ii) increased dust and noise due to trenching works and (iii) restricted access etc. ◆ The impacts will be mitigated through suitable measures as incorporated in the ESMP and they will also be made an integral part of the Contractor's obligation as part of the Contractor's Site Specific Environmental and Social Management Plan (SSESMP), Occupational & Community Health & Safety Plans (OHS / CHS Plans) and other project specific plans. ◆ The Contractor during construction phase shall use security arrangements and personnel to safeguard the campsites. For this, the Contractor shall be guided by the principal of proportionality and GIIP and the relevant laws related to hiring, rules of conduct, training and equipping such security workers. ◆ The use of force in providing security shall not be permitted except when it used for defensive purposes and is in proportion to the nature of the threat.

ESS	Environmental and Social Standards	Description	Relevance with Project and Actions (to be) Taken
			◆ Security Management Guidelines for Contractors and KWSC.
ESS 5	Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	ESS 5 requires; avoidance of involuntary resettlement, in case it's unavoidable, minimization of involuntary resettlement, avoidance of forced eviction, mitigating unavoidable adverse social and economic impacts from land acquisition or restrictions on land use by: (a) providing timely compensation for loss of assets at replacement cost and (b) assisting displaced persons in improving, or at least restoring, their livelihoods and living standards, improving living conditions of poor or vulnerable persons who are likely to be physically displaced and ensuring that resettlement activities are planned and implemented with appropriate disclosure of information, meaningful consultation, and the informed participation of those affected.	◆ The project will cause disturbance to the assets of 42 Project Affected Persons (PAPs) generally in terms of removal of stalls / cabins / huts etc. coming under the trenching area. ◆ An Abbreviated Resettlement Plan (ARP) has been prepared to address these asset losses.
ESS 6	Biodiversity Conservation and Sustainable Management of Living Natural Resources	Protect and conserve biodiversity and habitats. Apply the mitigation hierarchy and the precautionary approach in the design and implementation of projects that could have an impact on biodiversity. To promote the sustainable management of living natural resources.	◆ For project's construction phase, site clearance activities will involve cutting of trees. To compensate the loss, compensatory tree plantation will be performed with the ratio of 10:1 ratio (10 trees in compensation to each affected tree).
ESS 10	Stakeholder Engagement and Information Disclosure	Establish a systematic approach to stakeholder engagement that helps proponent (KWSSIP) identify stakeholders and maintain a constructive relationship with them. Assess stakeholder interest and support for the project and enable stakeholders' views to be taken into account in project design. Promote and provide means for effective and inclusive engagement with project-affected parties throughout the project life cycle. Ensure that appropriate project information is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner.	◆ Extensive consultations with a wide range of stakeholders have been carried out while conducting this study. ◆ SEP has been prepared for the entire KWSSIP-2 (including this project) to comply with the ESS-10 requirements and it shall be followed during the implementation of the project for the effective engagement of stakeholders.

Managing the Risks of Adverse Impacts on Communities from Temporary Project Induced Labor Influx

This guidance note provides guidance on identifying, assessing and managing the risks of adverse social and environmental impacts associated with the temporary influx of labor resulting from Bank supported projects. The guidance note contains guiding principles and recommendations to be considered as part of the design and implementation of projects with civil works that require labor from outside the project's area of influence.

Environmental, Health & Safety (EHS) Guidelines

In addition to the ESS, the WBG has also established its EHS guidelines for all the interventions that are financed by the group. These EHS Guidelines are technical reference documents with general and sector-specific examples of Good International Industry Practice (GIIP). Following EHS guidelines are relevant to the proposed project during the construction and operation phase:

General EHS Guidelines*:* Issues associated with the construction and operation of maintenance facilities are addressed in the General EHS Guidelines with other key element like environment and occupational health and safety (OHS) at workplace as well as for community.

EHS Guidelines for Construction Materials Extraction: Issues associated with sourcing of construction materials are presented in the EHS Guidelines for Construction Materials Extraction.

EHS Guidelines for Water and Sanitation (2007)*:* These guidelines provide guidance on managing various EHS issues which may occur during the construction and operational phases of water and sanitation projects.

Project Categorization

The environmental impacts identified during the screening process are envisaged to be moderate, low adverse, and reversible in nature. The quantum of work and the related activities will not create significant changes. Therefore, the project is categorized as environmentally and socially 'Moderate' in light of WB ESF, and an ESMP is prepared to address environmental and social impacts.

Major E&S impacts associated with different phases of the project are as follows:

Pre-Construction Phase

i. Impacts associated with disturbance to assets
ii. Lack of appropriate E&S personnel with Construction Supervision Consultant (CSC), and Contractors
iii. Traffic related impacts due to inadequate planning

Construction Phase

i. Lacking SSESMP, OHSMP, CHSMP / Other Plans Implementation by Contractor
ii. Nuisance to public due to the generation of noise and dust

iii. Generation of excavated material
iv. Solid waste and waste water generation from campsite
v. Soil contamination due to construction activities
vi. Occupational and community health and safety risks associated with construction works
vii. Construction traffic management and safety
viii. Vegetation loss
ix. Labour influx / SEA – SH – GBV incidents

Operational Phase

i. OHS risks associated with maintenance, repair and cleaning of sewers

All the identified E&S impacts are; reversible in nature and manageable through the implementation of mitigation measures discussed in the subsequent sections of the report. With the implementation of the mitigations, the residual impacts of the project shall be short-term and site-specific without likelihood of going beyond the actual footprint of the project.

Annexure - 3: Project Description

Need and Purpose of the Project

The existing sewerage system of the city is unable to keep up with the volume of sewage generated daily. Because of this, manholes can frequently be seen overflowing in various parts of the city. The existing Roller- Compacted Concrete (RCC) sewerage pipes are either broken, deteriorated, damaged or leaked as they are more than two decades old and have outlived their potential efficacy. The roads in the city often get broken due to the regular overflow of sewage on the roads causing them to damage. Moreover, due to uncovered manholes and damaged / broken nature of sewerage pipes, people have been depositing waste material into the sewerage pipes that also cause choking in the network and resulting in massive overflows. Furthermore, the existing system is incapable to cater the rain / storm water due to being under capacity as well as having deteriorated conditions. This results into the overflow and ponding and stagnation of sewage. These dilapidated conditions of the city's existing sewerage network has resulted in considerable environmental pollution and degradation of health as the stagnant sewage water not only contaminates the ground water but also intrudes into the damaged clean water pipelines, resulting in contaminating the piped water.

Due to non-availability of adequate financial resources, KWSC has not been able to spend much on the rehabilitation of the existing sewer network. To address these issues, Priority Sewer Networks Rehabilitation and Extension Project has been included in KWSSIP 2, Component 2 with an aim to improve the performance and reliability of sewage conveyance network.

The information provided in this chapter is based upon the feasibility reports and other related information provided by the Technical Consultants.

Project Components

The proposed project will involve rehabilitation of existing and laying of new sewer lines ranging from 12 to 72 inches diameter in 14 priority sewer schemes located in various parts of the city as identified by the PIU-KWSSIP.

The scope for the enhancement and rehabilitation of proposed sewerage networks is:

- To ensure that all the sewerage effluents from the catchments reach the Sewage Treatment Plants for adequate treatment before being finally discharged.
- To design a sewerage system in a way it that it may bear the population load up to the year 2053.
- To entirely eliminate the issue of ponding of sewage in rainfall seasons.
- To redesign the undersized sewerage networks.
- To enable the system to handle at least 33% of rainfall run-off within the sewerage network.

As per the Design / Technical Consultants, the project shall be executed through two construction packages with each package having seven schemes. **Table A3-1** presents the proposed 14 priority sewer schemes.

Table A3-1: List of proposed 14 Priority Sewer Schemes in Various Districts

Scheme No.	Name	District
1	Scheme 01 - Abbott Laboratories to Malir River	District Malir
2	Scheme 02- Main Paracha Chowk to Lyari River Interceptor and Jinnah Road, Toor baba Road, Urdu Bazaar Road and Akbar Road (S.I.T.E)	District Kaemari
3	Scheme 03 - Sector 11 via KDA Chowrangi to Lyari River Interceptor (Manghopir)	District West
4	Scheme 04 - Gulshan-e-Maymar to Lyari River Interceptor (Manghopir & Gulzar-e-Hijri)	District East
5	Scheme 05 - Khwaja Ghareeb Nawaz Chowk to Orangi Nala Trunk Sewer (Mominabad & Orangi)	District West
6	Scheme 06 - Raja Tanveer Colony to Orangi Nala Trunk Sewer (Mominabad)	District West
7	Scheme 07 - Irani Camp Road to Orangi Nala Trunk Sewer (Mominabad)	District West
8	Scheme 08 - Masjid-e-Sattar to Scheme no. 07 of SOP-1 (Gulshan-e-Iqbal)	District East
9	Scheme 09 - Al-Quddos Apartment Block-13C to Scheme no. 07 of SOP-1 (Gulshan-e-Iqbal)	District East
10	Scheme 10 - Malir-15 to Malir River Interceptor (Shah Faisal)	District Korangi
11	Scheme 11 - Dayar-e-Shereen Sweets Buffer Zone to Ziauddin Hospital to Scheme-16 of SOP-1 (North Nazimabad)	District Central
12	Scheme 12 - Atma Ram Road to 8 Chowk to Pumping Station (Lyari)	District South
13	Scheme 13 - Atma Ram Road to Mirza Adam Khan Road to Pumping Station (Lyari)	District South
14	Scheme 14 - Peoples Stadium to Pumping Station (Lyari)	District South

Project location map is provided in **Figure A3-1.**

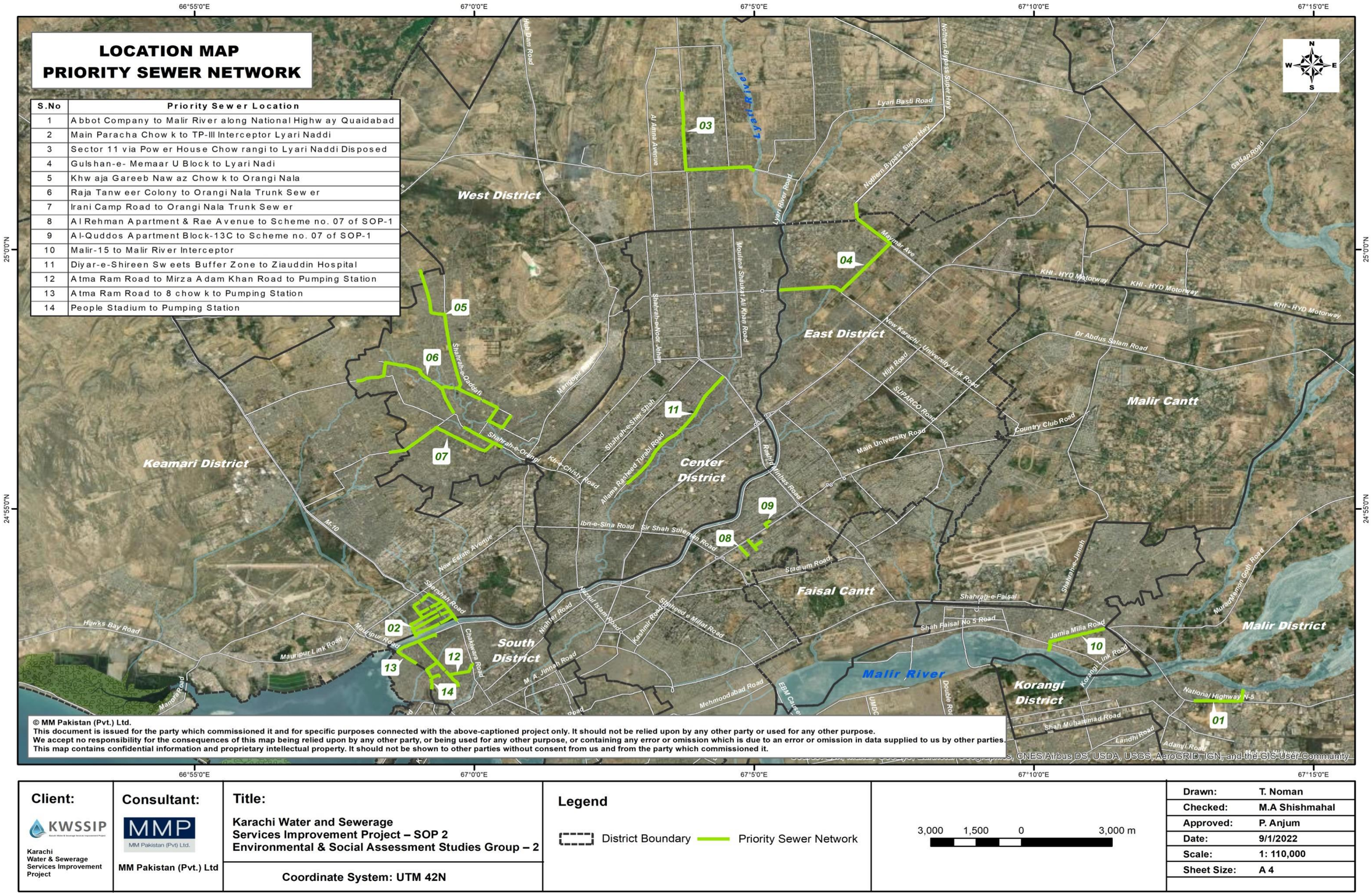


Figure A3-1: Project Location Map – 14 Priority Sewer Schemes

Scheme-wise Overview of Proposed Priority Sewer Schemes

Scheme-wise overview of proposed interventions is provided in **Table A3-2**.

Table A3-2: Scheme-wise Overview of Proposed Interventions

Scheme No.	Name	District	Catchment Area (Acres)	Projected Population to be Served by 2053	Design Sewage Flow (Cumecs)	Length of Sewer Scheme (m)
1	Scheme 01 - Abbott Laboratories to Malir River	District Malir	742.35	158,725	0.53	1867.46
2	Scheme 02- Main Paracha Chowk to Lyari River Interceptor and Jinnah Road, Toor baba Road, Urdu Bazaar Road and Akbar Road (S.I.T.E)	District Kaemari	298.11	117,809	0.40	7401
3	Scheme 03 - Sector 11 via KDA Chowrangi to Lyari River Interceptor (Manghopir)	District West	1179.93	300,837	1.01	4960
4	Scheme 04 - Gulshan-e-Maymar to Lyari River Interceptor (Manghopir & Gulzar-e-Hijri)	District East	3979.67	1,313,121	4.42	6033
5	Scheme 05 - Khwaja Ghareeb Nawaz Chowk to Orangi Nala Trunk Sewer (Mominabad & Orangi)	District West	1595.04	808,188	2.72	7662
6	Scheme 06 - Raja Tanveer Colony to Orangi Nala Trunk Sewer (Mominabad)	District West	1331.93	662,086	2.23	6210.6
7	Scheme 07 - Irani Camp Road to Orangi Nala Trunk Sewer (Mominabad)	District West	1471.13	1,072,073	3.64	4600
8	Scheme 08 - Masjid-e-Sattar to Scheme no. 07 of SOP-1 (Gulshan-e-Iqbal)	District East	360.08	99,397	0.33	2120
9	Scheme 09 - Al-Quddos Apartment Block-13C to Scheme no. 07 of SOP-1 (Gulshan-e-Iqbal)	District East	25.02	13,947	0.05	368
10	Scheme 10 - Malir-15 to Malir River Interceptor (Shah Faisal)	District Korangi	643.43	137,521	0.46	2150
11	Scheme 11 - Dayar-e-Shereen Sweets Buffer Zone to Ziauddin Hospital to Scheme-16 of SOP-1 (North Nazimabad)	District Central	1530.29	738,454	2.48	4881

Scheme No.	Name	District	Catchment Area (Acres)	Projected Population to be Served by 2053	Design Sewage Flow (Cumecs)	Length of Sewer Scheme (m)
12	Scheme 12 - Atma Ram Road to 8 Chowk to Pumping Station (Lyari)	District South	291.22	249,512	0.84	1620
13	Scheme 13 - Atma Ram Road to Mirza Adam Khan Road to Pumping Station (Lyari)	District South	333.92	288,262	0.96	4114
14	Scheme 14 - Peoples Stadium to Pumping Station (Lyari)	District South	95.29	67,166	0.23	730

Figure A3-2 to **Figure A3-7** show the alignments of the sewer schemes along with other associated details such as proposed campsites locations and AoI:

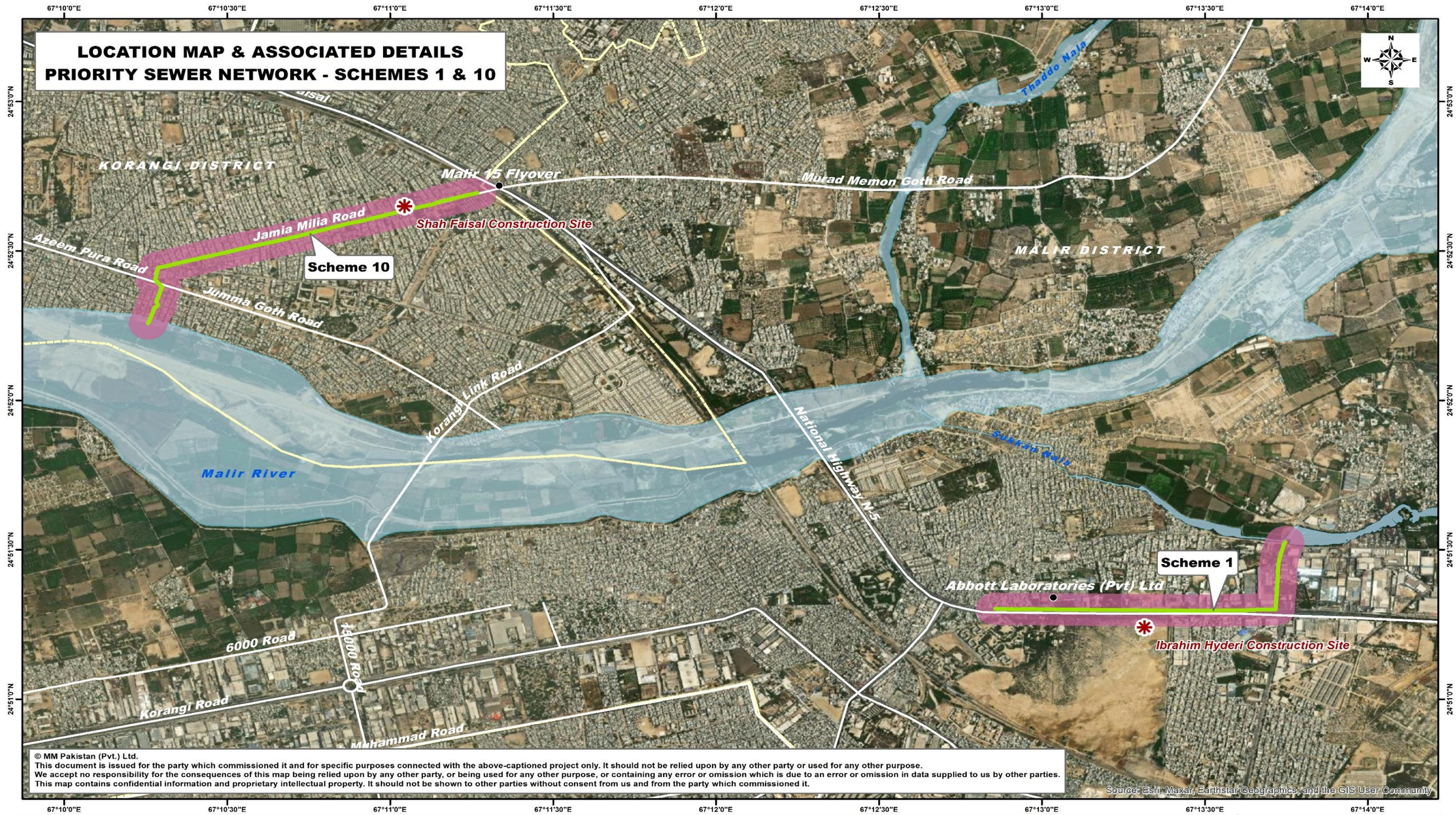


Figure A3-2: Alignments and Other Associated Detail for Priority Sewer Networks Scheme No. 1 and 10

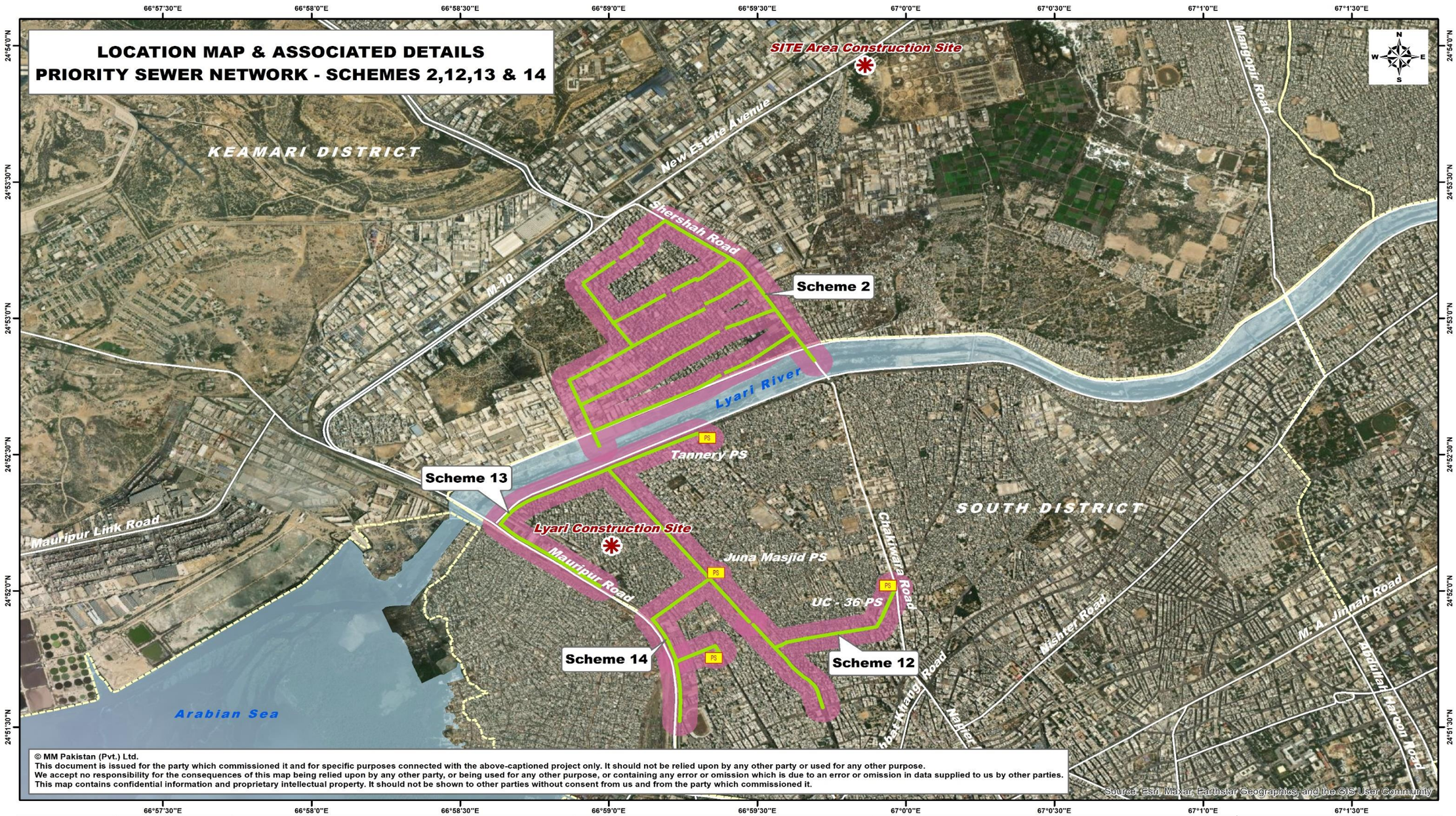
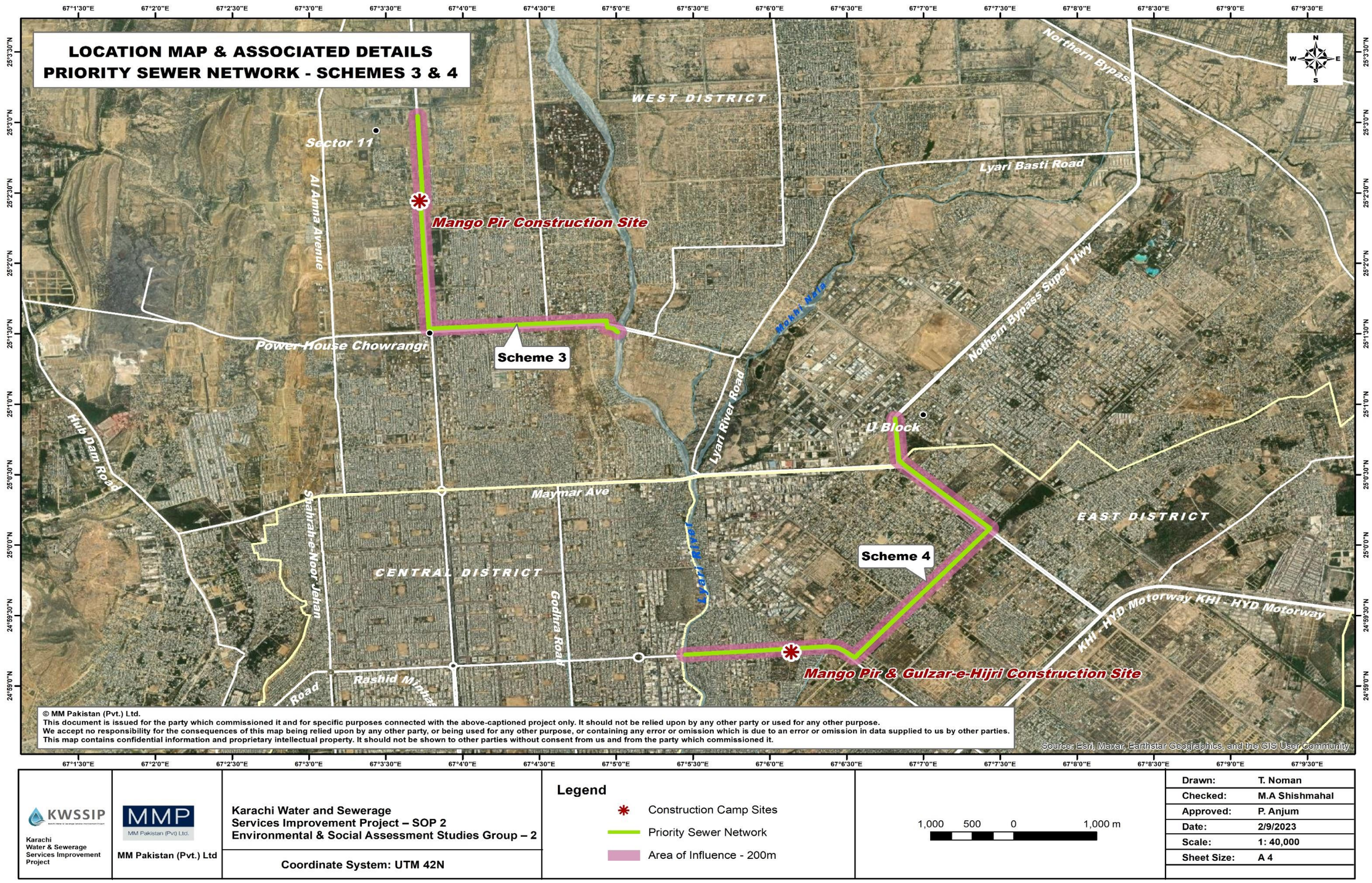


Figure A3-3: Alignments and Other Associated Detail for Priority Sewer Networks Scheme No. 2, 12, 13 and 14



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

KWSSIP Karachi Water & Sewerage Services Improvement Project	MMP MM Pakistan (Pvt.) Ltd. MM Pakistan (Pvt.) Ltd	Karachi Water and Sewerage Services Improvement Project – SOP 2 Environmental & Social Assessment Studies Group – 2 Coordinate System: UTM 42N	**Legend** Construction Camp Sites Priority Sewer Network Area of Influence - 200m	1,000 500 0 1,000 m

Drawn:	T. Noman
Checked:	M.A Shishmahal
Approved:	P. Anjum
Date:	2/9/2023
Scale:	1: 40,000
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Figure A3-4: Alignments and Other Associated Detail for Priority Sewer Networks Scheme No. 3 and 4

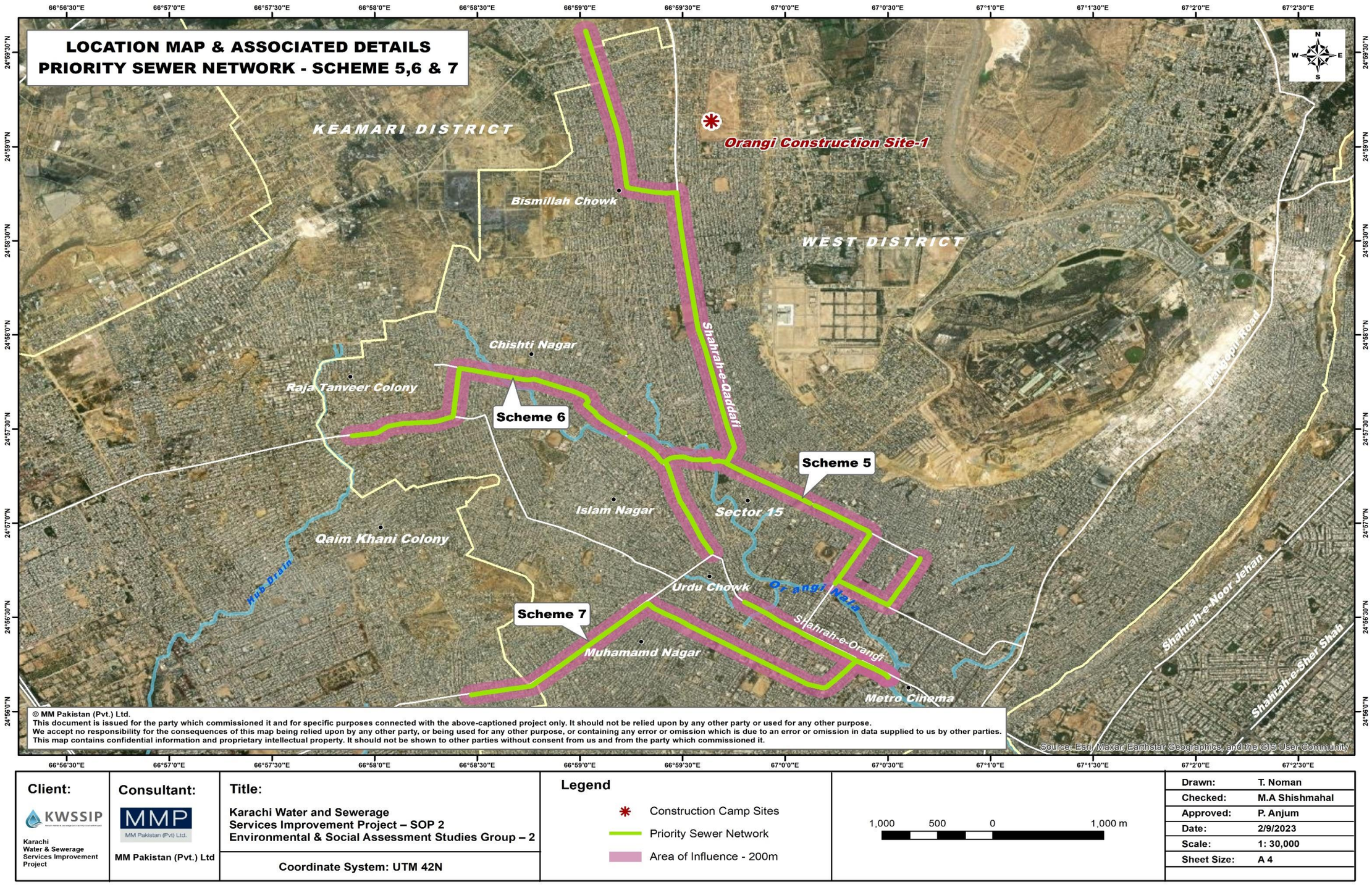
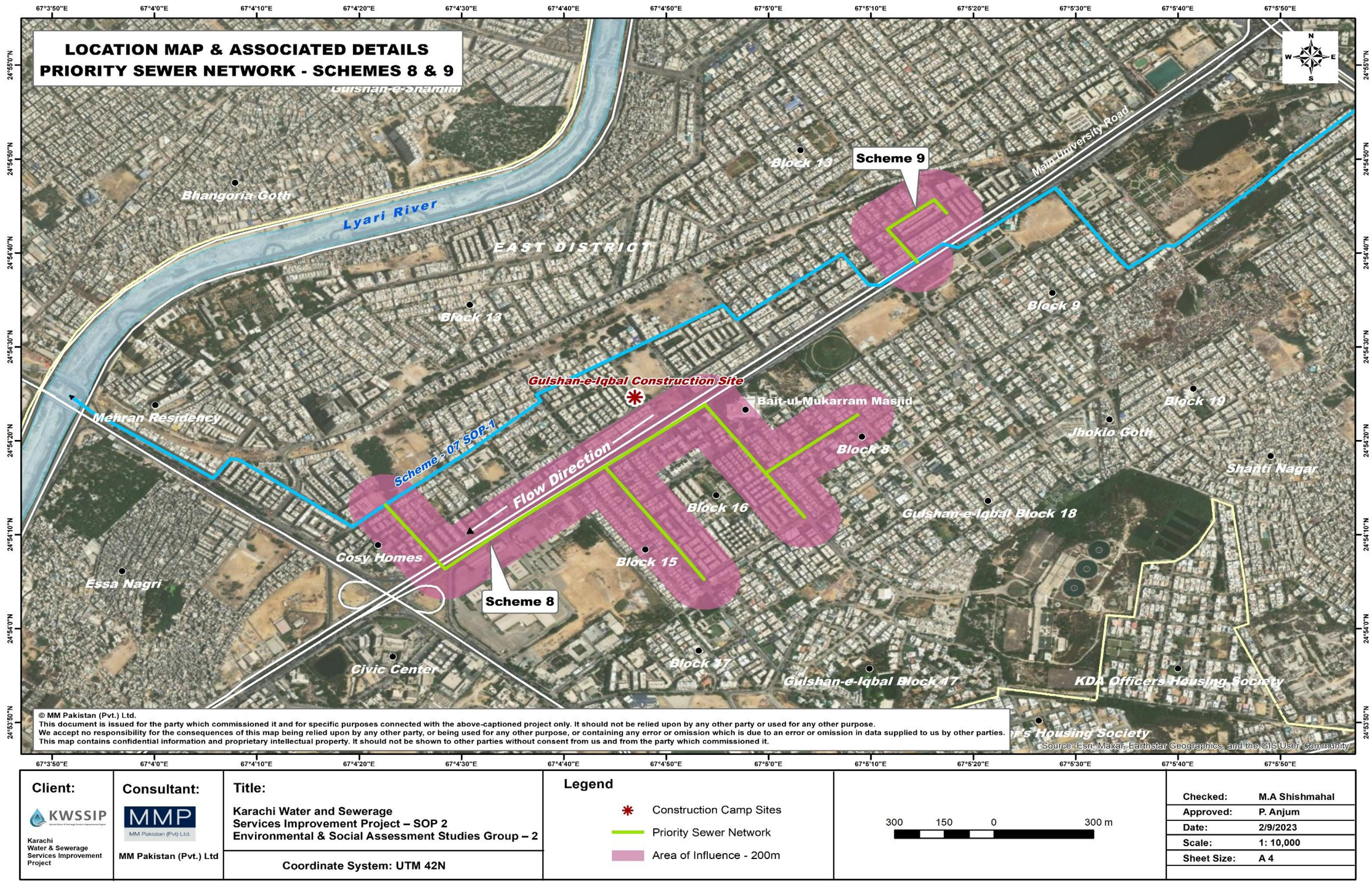


Figure A3-5: Alignments and Other Associated Detail for Priority Sewer Networks Scheme No. 5 and 6



Client: KWSSIP — Karachi Water & Sewerage Services Improvement Project	**Consultant:** MMP — MM Pakistan (Pvt.) Ltd. — MM Pakistan (Pvt) Ltd	**Title:** Karachi Water and Sewerage Services Improvement Project – SOP 2 Environmental & Social Assessment Studies Group – 2 **Coordinate System: UTM 42N**	**Legend** Construction Camp Sites Priority Sewer Network Area of Influence - 200m	300 150 0 300 m	**Checked:** M.A Shishmahal **Approved:** P. Anjum **Date:** 2/9/2023 **Scale:** 1: 10,000 **Sheet Size:** A 4

Figure A3-6: Alignments and Other Associated Detail for Priority Sewer Networks Scheme No. 8 and 9

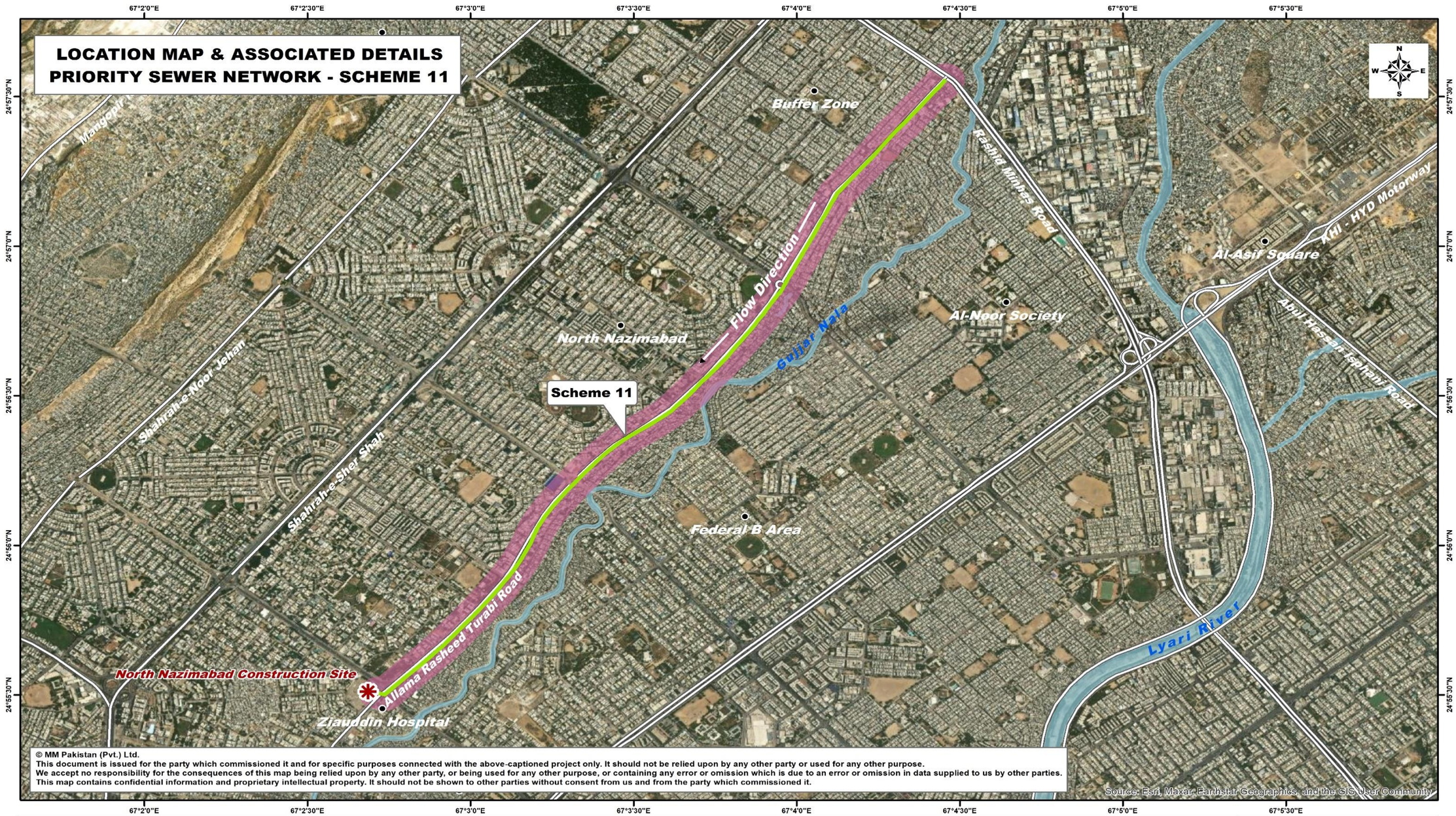


Figure A3-7: Alignments and Other Associated Detail for Priority Sewer Networks Scheme No. 11

Key Construction and O&M Activities

An overview of main activities during Construction and Operational & Maintenance phases (O&M) of the proposed project interventions are provided in **Table A3-3**.

Table A3-3: Major Construction and O&M Activities

Construction Activities	Key O&M Activities
In all schemes (1 to 14) ◆ Providing & Laying RCC ASTM C-76 BS-5911 heavy Duty ◆ Culverts, Drainage & Sewerage Pipe with spigot socket joint. ◆ Transportation, loading & unloading, stacking & excavation, disposal of surplus material and backfilling & sand cushion with appurtenances & anchor block & thrust block include, Precast RCC 1:2:4. ◆ Manhole with cover and all relevant accessories incl. Encasing of pipe for Road crossings using grade C-30 concrete with testing & commissioning complete in all respect as per drawings, specification and as directed by the Engineer / In charge. ◆ Breaking of Existing Road Pavement Structure ◆ Restoration of Roads **Additionally, in Scheme 04, 07 and 11:** ◆ Providing & Laying RCC Drainage & Sewerage drain ◆ Excavation, disposal of surplus material and backfilling complete in all respect as per drawings, specification and as directed by the Engineer / In charge.	◆ Regular cleaning of Sewer Lines

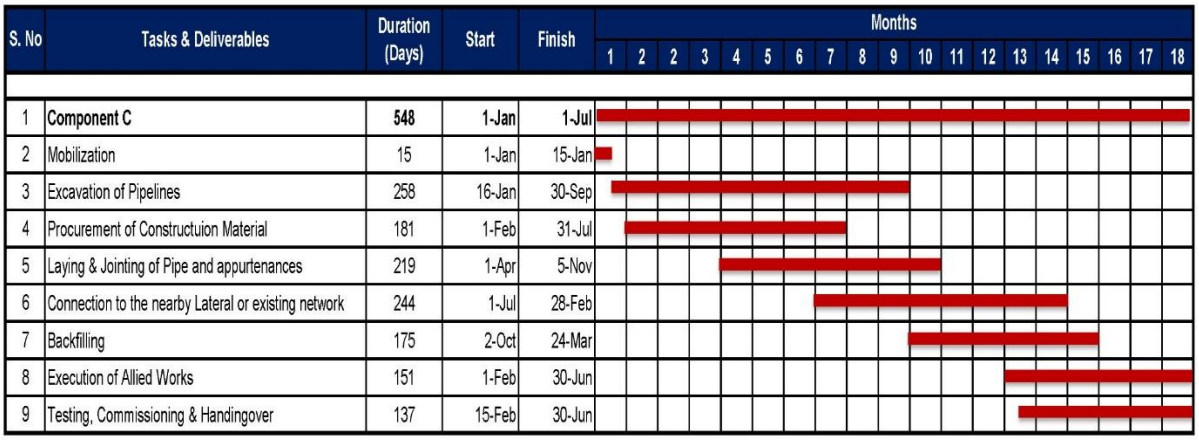
Development of Construction Camps

The Contractor will hire local workforce at the most for the project's construction works in selected priority sewer schemes. Local workforce suitably skilled with sewage pipeline trenching and laying works is readily available in all areas of Karachi and the need for their permanent stay at the campsites will be minimal. The campsites will mainly be utilized for the temporary facilities such as workers washrooms, rest areas and temporary placement of construction material and only security guards will be required to have permanent stay at the campsite. There are local grounds and open spaces available in the vicinity of the sewer schemes which could be utilized for setting up temporary material storage campsites. The final locations of proposed campsites will be selected by the Contractor with the approval of Construction Supervision Consultant (CSC) with a key consideration that they cause minimal disturbance to the nearby residential, religious and / or cultural settlements.

Construction Schedule and Manpower Requirements for Construction Phase

The project's construction timeline will be spanned over approximately 18 months. It is estimated that 50 workers will be required for each scheme, therefore total workforce consisting of both semi-skilled and skilled workers will be around 700. **Figure A3-8** shows the construction schedule for the project.

PRIORITY SEWER NETWORK REHABILITATION & EXTENSION



S. No	Tasks & Deliverables	Duration (Days)	Start	Finish
1	**Component C**	**548**	**1-Jan**	**1-Jul**
2	Mobilization	15	1-Jan	15-Jan
3	Excavation of Pipelines	258	16-Jan	30-Sep
4	Procurement of Constructuion Material	181	1-Feb	31-Jul
5	Laying & Jointing of Pipe and appurtenances	219	1-Apr	5-Nov
6	Connection to the nearby Lateral or existing network	244	1-Jul	28-Feb
7	Backfilling	175	2-Oct	24-Mar
8	Execution of Allied Works	151	1-Feb	30-Jun
9	Testing, Commissioning & Handingover	137	15-Feb	30-Jun

Figure A3-8: Construction and Implementation Schedule

Construction Material Requirement

Estimated quantities of the construction material required for the project works are provided in **Table A3-4**. All the materials are readily available in the local markets.

Table A3-4: Estimated Quantities of Construction Material

No	Construction Material	Length / Quantity
1	12” (300 mm) Pipe	2100 m
2	15” (375 mm) Pipe	4693 m
3	18” (450 mm) Pipe	4140 m
4	21” (525 mm) Pipe	3557 m
5	24” (600 mm) Pipe	3654 m
6	27” (675 mm) Pipe	4548 m
7	30” (750 mm) Pipe	2257 m
8	33” (825 mm) Pipe	2842 m
9	36” (900 mm) Pipe	2653 m
10	42” (1050 mm) Pipe	5054 m
11	48” (1050 mm) Pipe	3133 m
12	54” (1350 mm) Pipe	3194 m
13	60” (1500 mm) Pipe	2838 m
14	64” (1600 mm) Pipe	1647 m
15	66“ (1676 mm) Pipe	1747 m
16	72” (1800 mm) Pipe	1581 m
17	Granular Sub-base (NHA-201)	19373 m^3
18	Aggregate base (NHA-202ii)	19373 m^3
19	Cut-back asphalt for bituminous prime coat (NHA-302a)	129157 m^3
20	Asphalt Concrete for wearing course (class “B”) (NHA-305b	9685 m^3

Overall Resources and Waste Estimation

Water will be the key resource to be consumed during the construction works and by the workforce. Electricity shall be required mainly at campsites. The key waste streams to be generated include excavated material from construction sites, and domestic waste and wastewater from the campsites.

Water for construction and drinking purposes will be arranged by the Contractor through bowsers. For electricity, small generators will be utilized.

Table A3-5 provides an estimate of the quantities of resources which are likely to be consumed and waste which is likely to be produced.

Table A3-5: Estimate of Resources Consumption and Waste Production in Construction Phase

Resource	Unit	Per capita daily use / generation	Project daily use	Construction Period
Water (Workers Use)	liters	50	35,000	19,180,000
Water (Construction)	liters	-	-	209,471
Electricity	kWh	5	3500	1,918,000
Domestic Solid Waste	kg	1	700	383,600
Wastewater	liters	45	31,500	17,262,000
Excavated Material	m^3	N/A	N/A	17,250

The excavated material will mostly be backfilled to fill the trenches. Clean surplus excavated material will be sold to third-party vendors, whereas the excavated material mixed with sewage will be disposed through SEPA certified waste handlers with the approval of the Environmental and Social Cell (ESC) - Project Implementation Unit (PIU) and Construction Supervision Consultants (CSC).

Annexure - 4: Description of the Environment

The project sites are located in the jurisdictions of all seven districts of Karachi that include Districts East, Central, South, West, Malir, Korangi and Kaemari.

Physical and Ecological Environment

Built Environment

The built environment of Scheme No. 01 - Abbot Laboratories to Malir River is a mix of commercial, residential, and industrial areas. The commercial areas are concentrated along the National Highway N5, while the residential areas are more spread out. The industrial areas are located along the Malir River. The built environment of Scheme No. 02 - Main Paracha Chowk to Lyari River Interceptor is diverse. The area is home to a mix of commercial, residential, and industrial uses. The commercial areas are concentrated along Jinnah Road and Toor baba Road, while the residential areas are more spread out. The industrial areas are located along the Lyari River and Akbar Road. The built environment of Scheme 03 - Sector 11 North Karachi to KDA Chowrangi to Lyari River Interceptor and 04 - Gulshan-e-Maymar to Lyari River Interceptor is diverse. It is home to a number of commercial areas, residential areas, religious buildings, and parks and gardens. These areas have seen the construction of new commercial areas, residential areas, and infrastructure in recent years. These changes have made the area more liveable and have attracted new businesses and residents. Scheme Nos. 05 to 07 are located in and around the densely populated Orangi Town area of Karachi. The project area's built environment reflects its origins as an informal settlement and the organic growth this area has experienced over the years. The settlements in the Orangi localities are characterized by densely packed houses, narrow lanes, and a lack of proper planning and infrastructure. Majority of the houses in the area are primarily self-built by the residents using inexpensive materials such as bricks, mud, tin sheets, and concrete blocks. These houses are typically small and lack amenities commonly found in formal housing, such as running water and proper sanitation facilities. Schemes Nos. 08 and 09 are located in the vicinity of Gulshan e Iqbal town, which is generally a well-established residential and commercial area located in the District East of Karachi. The area consists of a mix of apartment buildings, houses, gated communities as well as commercial areas and markets. Scheme No. 10 is located in the vicinity of Shah Faisal Colony area. The built environment of the project area in Shah Faisal Colony is predominantly residential, with a mix of low-rise buildings, houses, and apartment complexes. Scheme No. 11 is located in the vicinity of North Nazimabad Town, which is generally a well-established residential area. The project area of Scheme No. 11 comprises a mix of houses, and apartments. The houses vary in size and architectural styles, ranging from modest single-story homes to larger multi-story houses. There are also several apartment complexes in proximity. The area is also home to several commercial areas, educational institutions, and healthcare facilities. Scheme Nos. 12, 13 and 14 are located in District South of Karachi, encompasses several important areas, including the historic centre of Karachi. The built environment of District South showcases a blend of colonial-era architecture, modern developments, commercial districts, and cultural landmarks. The area is rich in historical architecture, reflecting the city's colonial past and cultural heritage. No heritage buildings are however located in the immediate vicinity of the project area for the proposed sewer schemes nos. 12 to 14.

Climate

According to the Koppen Climate Classification, the project area lies in Subtropical - Arid Climate Zone, with mild winters and hot summers. Due to the proximity to the coast line, the climate of the project area is influenced by sea breezes, which results in less warm evenings throughout the year. Humidity however, generally remains high. Winds for more than half the year, including the monsoons blow from south-west to west in the project area. The hottest months are April to June whereas, December and January are relatively colder months of the year. Based on the rainfall data recorded between January 2012 to December 2021, it is evident that July and August are the wettest months in the project area. Urban flooding in Karachi is a significant issue that arises during heavy rainfall or monsoon seasons due to various factors, including inadequate drainage systems, encroachments on natural waterways, rapid urbanization, and climate change. This flooding can have detrimental effects on under-construction sewerage pipelines projects and the overall city's infrastructure. Necessary mitigation measures that are essential to address the challenges related to flooding events during the priority sewer networks construction are described in Chapter 5.

Last few years have witnessed a sharp rise in the heat waves occurrences in Karachi and its outskirts during May to September. Since heatwave may directly impact the health and performance of the site workers, making them susceptible to heat stroke, necessary mitigation measures shall be implemented during project implementation to protect the workers.

Land use

All the schemes are planned in thickly populated areas, where land is under extensive use. The predominant land use in the vicinity of the project interventions is for residential, commercial and industrial settlements.

Air, Noise, Water Quality Monitoring

Air, Noise and Water Quality monitoring was carried out in the project area at seven locations from 22 February to 15 March 2022, through SEPA certified Environmental Monitoring Laboratory. Monitoring points were selected with the objective that they are located in proximity to the project intervention areas as well as to the nearby residential settlements.

Air Quality Monitoring Zones / Coverage Area

Based upon the review of published literature[2] and experience of the monitoring laboratory, 5 km radius zone has been considered as the coverage area for each sampling point in terms of ambient air quality.

Details of monitoring locations are provided in **Table A4-1** and **Figure A4-1**.

[2] https://www.sciencedirect.com/book/9780124017337/fundamentals-of-air-pollution
http://www.igytechnicalcollege.com/Handbook%20of%20Air%20Pollution%20Prevention%20and%20Control.pdf *(Handbook of Air Pollution Control* by William A. L. Sirignano)

Table A4-1: Details of Air, Noise and Water Quality Monitoring Locations

Spot No.	Sewer Schemes Covered	Latitude	Longitude
Spot 1	Scheme 1: Near National Highway N5	24.8626° N	67.2068° E
Spot 2	Schemes 2, 12, 13, 14: Near Gulbai - Maripur	24.8711° N	66.9775° E
Spot 3	Scheme 3, 4: Near Hub Filtration Plant	25.0035 °N	67.0250° E
Spot 4	Scheme 5, 6, 7: Near Orangi Town	24.9376° N	66.9974° E
Spot 5	Scheme 8, 9: Near Gulshan e Iqbal	24.9117° N	67.0954° E
Spot 6	Scheme 10: Near Shah Faisal Colony	24.8761° N	67.1441° E
Spot 7	Scheme 11: Near Sakhi Hassan Hydrant	24.9516° N	67.0602° E

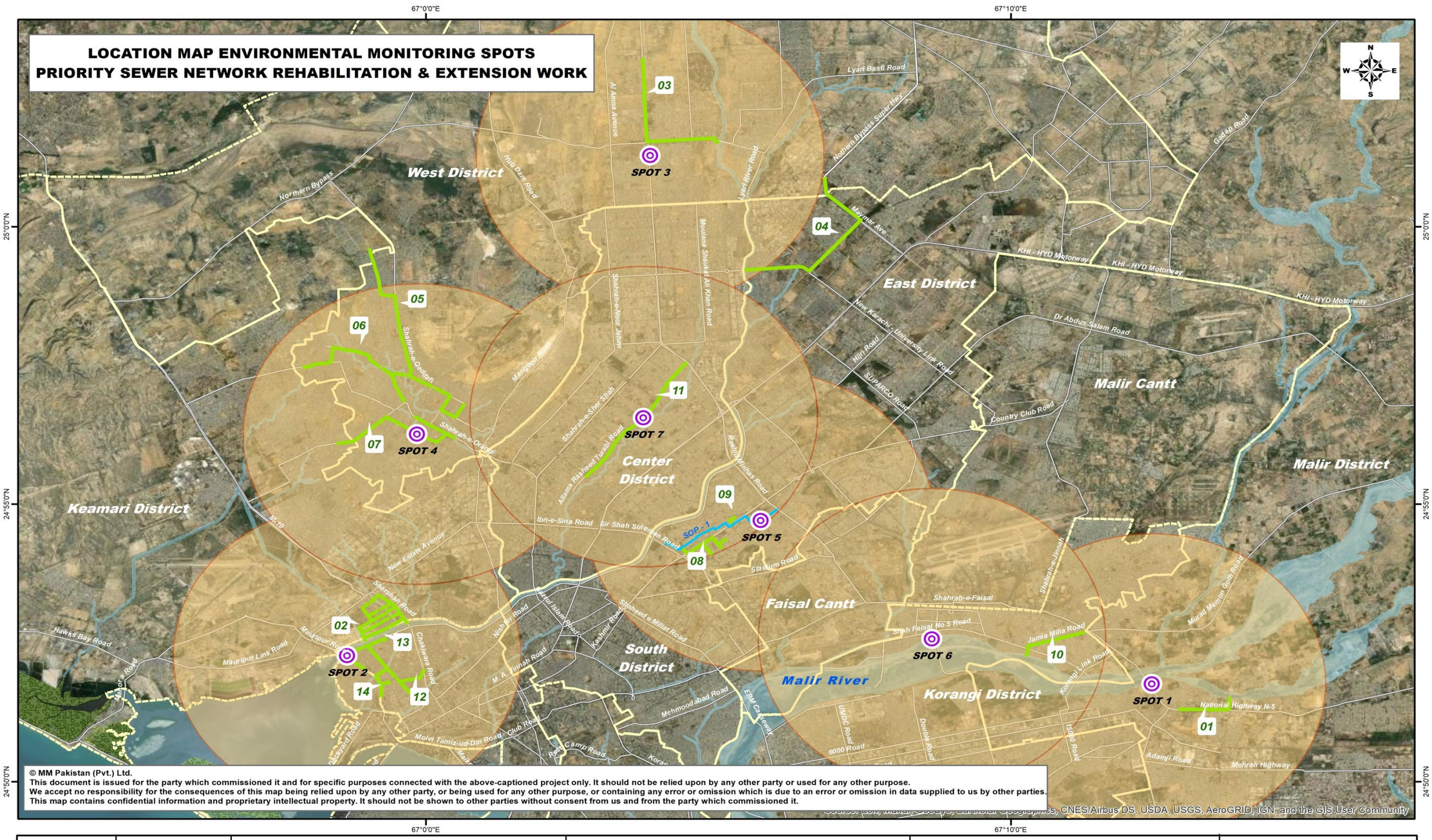


Figure A4-1: Environmental Monitoring Locations

Air Quality

Sampling was performed for a 24-hour period at each site following the SEQS for ambient air. **Table A4-2** shows the observed average concentrations for ambient air quality parameters, such as, particulate matter (PM10 and PM2.5), carbon monoxide (CO), oxides of nitrogen as NO, total suspended particles (TSP), sulphur dioxide (SO_2) and compares these with the SEQS and WHO / WB Standards. Results shows that PM2.5 values have been found exceeding the standards at all seven locations and PM10 at five out of seven locations. In addition to PM (2.5 and 10), NO and CO have also been found exceeding at Sakhi Hasan KWSC Hydrant (Scheme 11) sampling point. It is anticipated that, since the sampling locations especially Sakhi Hassan Hydrant area (Water Pump Roundabout) remains under the influence of heavy traffic movement throughout the day, the major reason for excessive air pollutant levels is the vehicular emissions. The monitoring spot was nearby the Sakhi Hassan hydrant, which remains under continuous influence of water tankers, most of which are faulty, not tuned, hence resulting in higher concentrations of PM 2.5 and NO due to incomplete combustion of the fuel. Overall, the level of vehicle fitness in Karachi is poor and incomplete combustion of fuel is a major source of PM2.5 emissions. Another factor is the poor road conditions, which also paves the way for excessive PM2.5 and PM10 emissions. As the air pollutant levels are already very high, the project will implement strict air pollution control measures to ensure that it does not aggravate the prevailing baseline conditions.

Noise

Baseline noise monitoring for the project was undertaken at seven monitoring locations for a 24 hour period at each site. Only at one out of seven locations, the observed results have been found meeting the standards for day and nighttime noise standards. At other locations, the observed values were overall found to be higher than the limits mainly due to excessive movement of private and commercial vehicles both in day and nighttime. Since most of the observed noise levels are already towards the higher side, the project will implement strict noise control measures to ensure that it does not aggravate the prevailing baseline conditions. **Table A4-3** shows the observed day and night time results.

Water Quality

Water quality sampling and analysis was performed at all the seven monitoring locations. Water samples have been collected from taps whereas the main sources of water supply were mainly the ground water bores. The testing was performed as per APHA methods. Results of the monitoring are given in **Table A4-4**. The results showed presence of bacterial contamination in all water samples, whereas all other parameters were found within the SEQS / WHO limits. Generally, the ground water quality all over Karachi is very poor due to the intrusion of sewerage into ground water aquifers as the sewerage system of the city is overall in very poor state. Overflowing of sewerage gutters are common in almost every nook and corner of the city, especially in the lower to lower-middle and middleclass settlements. Damaged sewerage and water supply system and intrusion of sewerage into water distribution lines is also a common problem. It has also been recorded that private water filtration plants are common in the sampled areas and the residents purchase filtered water from them for drinking purposes.

Table A4-2: Ambient Air Quality Level

No.	Measuring Parameter	Unit	SEQs / WBG Limit 2	Spot 1	Spot 2	Spot 3	Spot 4	Spot 5	Spot 6	Spot 7
1	Oxides of Nitrogen as NO	(µg/ m^3)	40	20.8	21	25	12.5	24.15	37.5	187.5
2	Sulfur Dioxide (SO2)	(µg/ m^3)	40	4.2	33	Nil	Nil	NIL	8.3	0
3	Carbon Monoxide (CO)	(mg/m^3)	4 (for 8 hrs)	2	ND	Nil	4	1.8	0.75	10.41
4	Total Suspended Particulate (TSP)	(µg/m^3)	500 µg/m^3	270	134	135.00	134.83	235	264	343.70
5	Particulate Matter (PM2.5)	(µg/m^3)	15	40.42	53.58	39.95	53.54	54.29	25.50	155.16
6	Particulate Matter (PM10)	(µg/m^3)	45	54.79	46.62	35.40	46.58	46.60	29.38	137.58
7	Ozone (O3)	(µg/m^3)	130	17	14	16	14	11	20.75	21
8	Lead (Pb)	(µg/m^3)	1.5	0.8	0.01	ND	ND	ND	0.29	ND

Table A4-3: Noise Monitoring

No	Monitoring Location	Time	Category	Measured Values	SEQS	WHO / WBG
1	Spot 1	Day	Residential	62.17	55	55
		Night		56.21	45	45
2	Spot 2	Day	Commercial	68.3	65	70
		Night		59.39	55	70
3	Spot 3	Day	Commercial	59.57	65	70
		Night		47.43	55	70
4	Spot 4	Day	Residential	58.76	55	55
		Night		53.15	45	45
5	Spot 5	Day	Commercial	62.24	65	70
		Night		59.83	55	70
6	Spot 6	Day	Residential	51.95	55	55
		Night		48.72	45	45
7	Spot 7	Day	Residential	71.2	55	55
		Night		60.27	45	45

Table A4-4: Water Quality Results

No	Measuring Parameters	Unit	Testing Method	SEQs Limits	WHO / WBG	Spot 1	Spot 2	Spot 3	Spot 4	Spot 5	Spot 6	Spot 7
1	Color	TCU	Pt-Co	< 15 TCU	< 15 TCU	<1	2	2	2	1	2	1
2	Taste	Taste	Sensory Evolution	Objection / Non-Objection	Objection / Non-Objection	Non-Objection	Non-Objection	Non-Objection	Non-Objection	Non-Objection	Non-Objection	Non-Objection

No	Measuring Parameters	Unit	Testing Method	SEQs Limits	WHO / WBG	Spot 1	Spot 2	Spot 3	Spot 4	Spot 5	Spot 6	Spot 7
3	Odor	Odor	Sensory Evolution	Objection / Non-Objection	Objection / Non-Objection	Non-Objection	Non-Objection	Non-Objection	Non-Objection	Non-Objection	Non-Objection	Non-Objection
3	Turbidity	NTU	APHA-2130	< 5 NTU	< 5 NTU	<1	1.1	1.15	1.15	1	ND	1
5	Total Hardness as CaCO3	mg/l	APHA-2340	< 500	-	150	11	115	105	135	165	180
6	Total Dissolved Solids (TDS)	mg/l	APHA-2450C	< 1000	< 1000	351	32	326	320	321	226	518
7	pH @ 25^{o}C	pH	ASTM-1293	6.5 - 8.5	-	7.53	7	7.02	7.02	7.78	7.17	7.35
8	Aluminum (AL)	mg/l	ASTM D-857	<0.2	0.2	0.04	0.164	0.163	0.163	0.1	0.085	0.03
9	Antimony (Sb)	mg/l	APHA 3111 Sb	<0.005	0.02	ND	ND	ND	ND	ND	Nil	ND
10	Arsenic (Ar)	mg/l	Merck Kit Method	< 0.05	0.01	0.022	ND	ND	ND	ND	Nil	0.02
11	Barium (Ba)	mg/l	APHA-D3651	0.7	0.7	0.019	ND	ND	ND	ND	Nil	0.024
12	Boron (B)	mg/l	APHA 4500-B	0.3	0.3	0.09	ND	ND	ND	ND	Nil	0.15
13	Cadmium (Cd)	mg/l	ASTM D-3557	0.01	0.003	0.01	ND	ND	ND	ND	Nil	0.01
14	Chloride (Cl^-)	mg/l	APHA 4500-Cl^-	< 250	250	69.4	62.36	62.35	62.3	76.43	175.6	108
15	Chromium (Cr)	mg/l	APHA 3500-CrB	< 0.05	0.05	0.021	ND	ND	ND	ND	Nil	0.032
16	Copper (Cu)	mg/l	Test Kit Method	2	2	0.61	0.11	0.11	0.1	ND	Nil	0.74
17	Cyanide (Cn)	mg/l	APHA 4500 CN	<0.05	0.07	0.013	ND	ND	ND	ND	Nil	ND
18	Fluoride (F)	mg/l	APHA 4500 F^-	< 1.5	1.5	0.61	0.178	0.178	0.178	0.951	0.951	0.8
19	Lead (Pb)	mg/l	APHA 3500 Pb B	< 0.05	0.01	ND	ND	ND	ND	ND	Nil	0.01
20	Manganese (Mn)	mg/l	APHA 3500 MnB	< 0.5	0.5	0.29	ND	ND	ND	ND	Nil	0.34
21	Mercury (Hg)	mg/l	Test Kit Method	< 0.001	0.001	ND	ND	ND	ND	ND	Nil	ND
22	Nickel (Ni)	mg/l	APHA 3500 Ni	< 0.02	0.02	0.009	ND	ND	ND	ND	Nil	0.01
23	Nitrate (NO3)	mg/l	Test Kit Method	< 0.50	50	ND	ND	ND	0.2	ND	Nil	ND
24	Nitrite (NO2)	mg/l	Test Kit Method	< 3	3	ND	ND	ND	ND	ND	Nil	ND
25	Selenium (Se)	mg/l	APHA 3500 Se	0.01	0.01	ND	ND	ND	ND	ND	Nil	ND
26	Residual Chlorine	mg/l	Test Kit Method	0.2 - 1.5	-	0.29	0.26	0.26	0.26	0.32	0.32	0.25
27	Zinc (ZN)	mg/l	APHA 3500 Zn	5	3	2	1.068	1.068	1.068	1	1	2
28	Faecal Coliforms	Count / ml	APHA 922 B	0 Per 100 ml	0 Per 100 ml	2	28	28	13	36	Nil	2
29	E Coli	Count / ml	Total Viable Count	0 Per 100 ml	0 Per 100 ml	1	15	15	5	16	18	2
30	Total Bacterial Count	Count / ml	APHA 922 B	0 Per 100 ml	0 Per 100 ml	3	43	43	24	52	Nil	4
31	Pesticides	mg / l	Kit Method	0.001	-	Nil	Nil	Nil	Nil	Nil	Nil	Nil

Ecological Environment

The status of the flora and fauna of the study area was determined through detailed field assessments carried out between 15 February 2022 to 15 March 2022.

Flora

The natural vegetation existing within the AoI of priority sewer schemes was studied through direct observations of floral species. The following plant species were recorded:

Trees: *Acacia nilotica* (Babur), *Azadarichta indica (*Neem), *Conocarpus lencifolius* (Cono), *Dalbergia sisso* (Sheesham), *Delonix regia* (Gul e mohar), *Eucalyptus citriodora* (Safeda), *Ficus benghalensis* (Bargad), *Ficus elastic* (Rubber tree), *Ficus microcarpa* (Ficus), *Ficus palmate* (Phagwara, Anjir, Patguleri), *Ficus religiosa* (Peeple), *Ficus virens* (Jangli Pipit, Man, Palakh), *Guaiaum offic inale* (Lignum), *Leucaena leucocephala* (White lead tree), *Mangifera indica* (Mango/ Aam), *Moringa oleifera* (Moringa/ sowanjhna), *Parkinsonia aculeate (*Mexican Palo-Verde), *Phoenix dactylifera* (Date palm), *Pithecellobium dulce* (Jungle jalebi/ Madras Thorn), *Polyathia longifolia* (False Ashoka), *Ricinus communis* (Arand, Castor-Oil Plant), *Roystonea regia (*Royal palm), *Syzygium cumini*(Jamun/ Java plum), *Thespesia populnea, Terminalia catappa* (Badam), *Ziziphus jujube* (Bair).

Shrubs: *Abutilon indicum* (India Abutilon), *Achyranthes aspera* (Ubat kandi), *Aerva javanica var javanica* (Booh), *Calotropis Procera (*Aak), *Cordia myxa* (*Lasura), Heliotropium rariflorum*, *Ipomoea cornea* (Bush Morning Glory), *Nerium oleander* (Oleander/ Ganira, Kunair), *Prosopis juliflora* (Vilayati keekar), *Salsola imbricate (*Lana, Gora Lana, Hashok).

Herbs: *Amaranthus virdis* (Chull), *Datura alba (*Tooh), *Solanum nigrum (Mako, Kach-Mach).*

The list of natural vegetation flourishing within the AoI is provided in **Table A4-5**.

Table A4-5: Tree Inventory

Plant species growing in the AoI with Conservation Status:

No.	NAME OF SPECIES	COMMON NAMES	IUCN STATUS	SCH #1	SCH #2	SCH #3	SCH #4	SCH #5	SCH #6	SCH #7	SCH #8	SCH #9	SCH #10	SCH #11	SCH #12	SCH #13	SCH #14
1.	*Acacia nilotica*	Babur	LC	-	-	-	1	-	-	-	1	-	-	-	-	-	-
2.	*Azadarichta indica*	Neem	LC	1	1	10	9	59	100	18	13	42	8	-	2	49	6
3.	*Conocarpus lencifolius*	Cono	NT	1	3	234	132	166	200	92	18	50	60	-	1	49	26
4.	*Dalbergia sissu*	Sheesham	LC	1	-	-	-	-	-	-	-	-	-	-	-	-	-
5.	*Delonix regia*	Gul e mohar tree	LC	1	-	-	-	2	-	-	4	3	-	-	-	4	1
6.	*Eucalyptus citriodora*	Safeda	LC	-	-	-	1	-	-	15	-	3	-	-	-	141	-
7.	*Ficus elastica*	Rubber tree	NE	-	-	-	3	6	-	5	-	-	-	-	-	2	1
8.	*Ficus Benghalenses*	Bargad	NE	-	-	-	1	-	-	-	-	3	-	-	-	4	-
9.	*Ficus microcarpa*	Ficus	LC	-	-	-	-	-	-	-	1	-	-	-	-	-	-
10.	*Ficus palmata*	Phagwara, Anjir, Patguleri	NE	-	-	-	-	-	-	12	-	2	-	-	2	-	-
11.	*Ficus religiosa*	peeple	NE	-	-	-	-	5	-	-	-	2	-	-	-	4	-
12.	*Ficus virens*	Jangli Pipit, Man, Palakh	LC	1	-	-	5	-	-	-	-	-	1	-	-	3	-
13.	*Guaiaum officinale*	Lignum	EN	-	-	-	-	-	8	3	29	53	12	-	-	3	-
14.	*Leucaena leucocephala*	White lead tree	NE	-	-	-	4	-	-	5	8	-	-	-	-	12	-
15.	*Mangifera indica*	Mango/ Aam	DD	-	-	-	1	-	-	-	-	-	-	-	-	-	-
16.	*Moringa oleifera*	Moringa/sowanjhna	LC	-	-	-	-	3	-	-	-	-	-	-	-	1	-
17.	*Parkinsonia aculeata*	Mexican Palo-Verde	LC	1	-	1	-	-	-	4	-	1	-	-	-	-	-
18.	*Phoenix dactylifera*	Date palm	NE	1	-	8	1	-	-	-	6	4	-	-	-	-	12
19.	*Pithecellobium dulce*	Jungle jalebi/ Madras Thorn	LC	-	1	-	-	-	-	-	-	-	-	-	-	-	-
20.	*Polyathia longifolia*	False Ashoka	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.	*Ricinus communis*	Arand, Castor-Oil Plant.	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	1
22.	*Roystonea regia*	Royal palm		-	-	7	-	-	-	-	-	-	-	-	-	-	-
23.	*Syzygium cumini*	Jamun/ Java plum,	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.	*Thespesia populnea*	---	LC	-	-	-	-	3	-	2	7	2	-	-	-	5	1
25.	*Terminalia catappa*	Badam	LC	-	-	-	-	-	-	-	-	1	-	-	-	3	1
26.	*Ziziphus jujuba*	Sufi beer	LC	1	3	-	4	1	-	1	1	2	-	-	1	4	1

No.	NAME OF SPECIES	COMMON NAMES	IUCN STATUS	SCH #1	SCH #2	SCH #3	SCH #4	SCH #5	SCH #6	SCH #7	SCH #8	SCH #9	SCH #10	SCH #11	SCH #12	SCH #13	SCH #14
Total (1825)				**8**	**8**	**260**	**162**	**245**		**308**	**157**	**88**	**168**	**81 0**	**6**	**284**	**50**
27.	*Amaranthus virdis*	Chull	NE	x	-	-	x	-	-	-	x	-	-	x	-	-	-
28.	*Datura alba*	Tooh	NE	-	-	-	x	-	-	-	x	-	-	-	-	-	-
29.	*Solanum nigrum*	Mako, Kach-Mach	NE	-	-	-	x	-	-	-	-	-	-	-	-	-	-
30.	*Abutilon indicum*	India Abutilon	NE	-	-	-	x	x	-	-	x	-	-	-	-	x	-
31.	*Achyranthes aspera*	Ubat kandi	NE	-	-	-	x	-	-	-	-	-	-	-	-	-	-
32.	*Aerva javanica var javanica*	Booh	NE	-	-	-	x	-	-	-	x	-	-	-	-	-	-
33.	*Calotropis Procera*	Aak	NE	-	-	x	x	x	x	-	x	-	-	x	-	-	-
34.	*Cordia myxa*	Lasura	LC	-	-	x	-	-	-	-	-	-	-	-	-	-	-
35.	*Heliotropium rariflorum*	----	NE	-	-	x	-	-	-	-	-	-	-	-	-	-	-
36.	*Ipomoea cornea*	Bush Morning Glory	NE	-	-	-	x	-	-	-	-	-	-	-	-	-	-
37.	*Nerium oleander*	Oleander/ Ganira, Kunair	LC	-	-	-	-	-	x	-	x	-	-	-	-	-	-
38.	*Prosopis juliflora*	Vilayati keekar	NE	x	x	x	x	x	x	x	x	x	x	-	x	x	x
39.	*Salsola imbricata*	Lana, Gora Lana, Hashok	NE	-	-	x	-	-	-	-	x	-	-	-	-	-	-
40.	*Ziziphus nummularia*	Jungle berr/ berri	NE	x	-	-	x	-	-	-	-	-	-	-	-	-	-
41.	*Chloris barbata*	Ganni, Jargi.	NE	x	-	-	x	-	-	-	x	-	-	-	-	-	-
42.	*Desmostachya bipinnata*	Drabh	LC	-	-	-	x	-	-	-	-	-	-	-	-	-	-
43.	*Dactyloctenium aegyptium*	Egyptian crowfoot grass	NE	x	-	-	-	-	-	-	x	-	-	-	-	-	-
44.	*Dactyloctenium scindicum*	Sind Crowfoot Grass	NE	x	-	-	-	-	-	-	x	-	-	-	-	-	-
45.	*Phragmites australis*	Kaano	LC	-	-	-	x	-	-	-	x	-	-	-	x	-	-
46.	*Typha sp,*	*Booh/ bulrush*	*LC*	-	-	-	x	-	-	-	-	-	-	-	-	-	-

Trees to be Cut

Out of the total 1825 trees growing in the AoI, 180 trees coming under the Direct Impact Area (DIA) will have to be cut for the execution of construction activities. All these tree species are common and none of them are of critical nature. As environmental compensation, the contractor shall be required to plant 10 trees for every cut / uprooted tree. Details of the trees that will require to be cut are provided under **Table A4-6**. Suitable spaces for compensatory tree plantation will be identified by the PIU KWSSIP before execution of construction activities in consultation with Local Government Department, Parks and Horticulture Department - KMC and District Municipal Corporations (DMCs) before execution of construction activities. A Compensatory Tree Plantation Plan provides details on different aspects of compensatory plantation and to be followed by the contractor. The plan also includes an indicative cost calsulated for compensatory tree plantation plan for the project which has also been included in the Project's ESMP implementation Cost.

Table A4-6: Trees in DIA to be Cut for Construction Activities

No.	Name Of Species	Common Names	IUCN Status	No. of Trees
1	*Acacia nilotica*	Babur	LC	1
2	*Azadarichta indica*	Neem	LC	27
3	*Conocarpus lencifolius*	Cono	NT	55
4	*Ficus palmata*	Phagwara, Anjir, Patguleri	NE	3
5	*Ficus religiosa*	Peeple	NE	13
6	*Eucalyptus citriodora*	Safeda	NE	65
7	*Guaiaum officinale*	Lignum	LC	7
8	*Phoenix dactylifera*	Date palm	NE	4
9	*Ziziphus jujube*	Bair	LC	5
Total				**180**

Among the listed species, some species carries both ecological and religious significance. These include the following:

- *Ficus religiosa* (Peepal): *Ficus religiosa*, commonly known as the Peepal tree, holds religious significance in Buddhism and many Buddhists consider it a symbol of wisdom and enlightenment.
- *Azadarichta indica* (Neem): *Azadarichta indica*, commonly known as Neem, has significant ecological and medicinal importance. It is a valuable tree with various uses in traditional medicine and organic farming practices. Neem has insecticidal and pesticidal properties, making it an essential component in natural pest control methods.
- *Phoenix dactylifera* (Date palm): *Phoenix dactylifera*, also known as the Date palm, has both ecological and cultural significance. Ecologically, Date palms provide habitat and sustenance for various animal species. Culturally, Date palms have been historically important in many societies, providing a valuable source of food, shelter, and materials for various purposes.
- *Acacia nilotica* (Babur): *Acacia nilotica*, also known as the Babur or Indian Gum Arabic tree, is ecologically important as it provides habitat and food for various wildlife species. In some cultures, Acacia species, including Acacia nilotica, have symbolic significance and have been used in traditional medicine.

It is pertinent to mention that no buddhist communities are residing in the project area, therefore cutting of peepal trees will only temporarily affect the ecological baseline. None of the species are ecologically sensitive or endangered, therefore their cutting will have temporary negative impact on the ecological environment. Cutting of all above trees in the DIA will be compensated through compensatory tree plantation in line with the Tree Plantation Plan.

Tree Plantation Plan

As detailed below, the Tree Plantation Plan has been prepared for the restoration vegetation being affected by the project construction activities.

As estimated during ESMP study of the proposed project, **180** trees would be cut/uprooted during project execution. These trees will be cut with the condition that the Contractor will plant 10 trees for each cut tree i.e. total **1800** trees will be planted. An indicative replenishment cost of **Rs. 981,392** will be required for raising one avenue mile (500 plants) of tree and their maintenance for 5 years, keeping the rate of daily wages as Rs. 700 per man per day (MD) as detailed in Table 1.1 to 1.4. The total replenishment cost of **Rs. 981,392** (**3.6** avenue miles x **Rs. 272,609**) should be reflected in the bidding as well as contract documents related to the project execution. During project implementation, it should be ensured that the tree plantation has been carried out and appropriate arrangements have been made for its nourishment at least for five years after execution of the project as per recommendations of Forest / Wildlife Departments and under KWSC's supervision.

Suitable spaces for compensatory tree plantation will be identified by the PIU - KWSSIP before execution of construction activities in consultation with Local Government Department, Parks and Horticulture Department - KMC and District Municipal Corporations (DMCs).. Efforts will be made to plant compensatory trees as close to the site of original cut tree as possible. Seed supply, nursery, watering and any other necessary maintenance arrangements will be managed by the Contractor for the trees planted under compensatory plantation during the Contract Period and Defect Liability Period. At the end of Defect Liability Period, the trees will be handed over to the Parks and Horticulture Department - KMC and District Municipal Corporations (DMCs) which will have the ownership of the land for compensatory plantation sites.The following or other suitable indigenous trees species are suggested to be planted as compensatory plantations at the identified sites however necessary alterations in the selection of species may be made by the Contractor in the light of Parks and Horticulture Department - KMC guidelines:

*Melia azadarach L (Neem), Moringa oleifera (Sohanjana), Albizia lebbek (Srikh), Cassia fistula (amaltas), Cordia myxa (Lasura), Phoenix dactylifera, (Date Palm), Terminalia arjuna (Arjan), Ficus bengalensis (Bur), Ficus religiosa (*Peepal*).* In addition, orchids may also be developed where feasible using drip irrigation techniques.

The total replenishment costs are provided from **Table A4-7** to **Table A4-11**.

Table A4-7: Estimated Cost of Plantation of One Avenue Mile (500 Plants) for First Year.

No.	Description	Quantity	Rate (Rs.)	Man Days	Amount (Rs.)
1	Clearance of site	One Avenue Mile (500 plants)	700/MD	10	7,000

No.	Description	Quantity	Rate (Rs.)	Man Days	Amount (Rs.)
2	Layout	One Avenue Mile	700/MD	4	2,800
3	Digging of pits @ 3cft each	500 pits	700/MD	20 @ 25 pits per person	14,000
4	Average cost plants	500 plants	Rs.50/-	-	25,000
5	Carrying of plants from nursery to site including loading/unloading	500 plants	Rs. 10/- per plant	-	5,000
6	Planting of plants (including 25%) restocking with ball of earth	500+125 =625 plants	Rs. 5 per plant	-	3,125
7	Replacement of earth with silt 1 cft. (0.0283 m^3) per pit 500 cft. (14.15m^3)	500 pits	700/MD	20 @ 25 pits per person	14,000
8	Hand watering 30 times during dry months	500x30=15,000 plants	700/MD	50	35,000
9	Reopening of pits 2 times@1Cft	500x2=1000 pits	700/MD	10 @ 100 pits per person	7,000
10	Weeding 4 times	500x4=2000 plants	700/MD	5	3,500
11	Miscellaneous/ Unforeseen	Lump Sum			4,000
Total (1st year)					**Rs. 120,425**

Table A4-8: Estimated Cost of Maintaining Plantation of One Avenue Mile (500 Plants) for Second Year

No.	Description	Quantity	Rate (Rs.)	Man Days	Amount (Rs.)
1	Restocking of 25% plants per Avenue Mile	125 plants	Rs.30/- Each	-	3,750
2	Carrying of plants from Nursery to site including loading/ unloading	125 plants	Rs.10/- Each	-	1,250
3	Re-digging of pits 25% @ 3cft each	125 pits	700/MD	5 @ 25 pits/person	3,500
4	Planting of plants with ball of earth	125 plants	Rs. 5 per plant	-	625
5	Hand watering 30 times During dry months	500x30=15,000 plants	700/MD	50 @ 300 plants per person	35,000
6	Re-opening of Pits 2 times @ 1 Cft.	500x2=1,000 pits	700/MD	10 @ 100 pits/person.	7,000
7	Weeding 2 times	500x2=1,000	700/MD	10 @ 100 pits/person.	7,000
8	Miscellaneous/ Unforeseen	Lump Sum			3,000
Sub-Total					**61,125**
Escalation @ 10 %					**6,112**
Total (2nd year)					**Rs. 67,237**

Table A4-9: Estimated Cost of Maintaining Plantation of One Avenue Mile (500 Plants) for Third Year.

No.	Description	Quantity	Rate (Rs.)	Man Days	Amount (Rs.)
1	Restocking of 20% plants per Avenue Mile	100 plants	Rs.30/- Each	-	3,000
2	Carrying of plants from Nursery to site including loading/ unloading	100 plants	Rs.10/- Each	-	1,000
3	Re-Digging of Pits @ 3cft.	100 pits	700/MD	4 @ 25 pits/person	2,800
4	Planting of plants with ball of earth	100 plants	Rs. 5 per plant	-	500
5	Hand watering 20 times During dry months	500x20=10,000 plants	700/MD	33 @303 plants/person	32,100
6	Re-opening of Pits 2 times @ 1cft.	500x2=1000 pits	700/MD	10 @100 plants/person	7,000
7	Weeding	500 plants	700/MD	5 @100 plants/person	3,500
8	Miscellaneous/ Unforeseen	Lump Sum			3,000
Sub-Total					**50,200**
Escalation @ 10%					**5,020**
Sub-total for 3rd year					**Rs. 55,220**

Table A4-10: Estimated Cost of Maintaining Plantation of One Avenue Mile (500 Plants) for Fourth Year.

No.	Description	Quantity	Rate (Rs.)	Man Days	Amount (Rs.)
1	Restocking of 10% plants per Avenue Mile	50 plants	Rs.30/- Each	-	1,500
2	Carrying of plants from Nursery to site including loading/ unloading	50 plants	Rs.10/- Each	-	500
3	Re-Digging of Pits @ 3cft each	50	700/MD	2 @ 25 pits per person	1,400
4	Planting of plants with ball of earth	50 plants	Rs.5 per plant	-	250
5	Hand watering 10 times During dry months	500x10 =5000 plants	700/MD	17 @ 300 plants per person	11,900
6	Weeding	150 plants	700/MD	1	700
7	Miscellaneous/Unforeseen	Lump Sum			2,000
Sub-Total					**18,250**
Escalation @ 10%					**1,825**
Total for 4th year					**Rs. 20,075**

Table A4-11: Estimated Cost of Maintaining Plantation of One Avenue Mile (500 Plants) for Fifth Year.

No.	Description	Quantity	Rate (Rs.)	Man Days	Amount (Rs.)
1	Restocking of 5% plants per Avenue Mile	25 plants	Rs.30/- Each	-	750
2	Carrying of plants from Nursery to site including loading/ unloading	25 plants	Rs.10/- Each	-	250
3	Re-Digging of Pits 5% @ 3 cft each	25 pits	700/MD	0.5	350
4	Planting of plants with ball of earth	25 plants	Rs.5 per plant	-	125
5	Hand watering 5 times During dry months	500x5 =2,500 plants	700/MD	8	5,600
6	Weeding	150+25= 175 plants	700/MD	1	700
7	Miscellaneous/Unforeseen	Lump Sum			1,000
Sub-Total					**8,775**
Escalation @10%					**877**
Total for 5th year					**Rs. 9,652**

Total cost of 1 avenue mile (500 trees) for 5 years (120,425+67,237+55,220+20,075+9,652) = **Rs. 272,609.**

Replenishment Cost of Tress

- Total trees to be uprooted=180
- Planting of trees for each uprooted tree =10
- Avenue miles = 180x10/500= 3.6

Cost for 3.6 avenue miles= Rs. 272,609x3.6= 981,392 **(Rs. 0.98 Million).**

Fauna

The project area is totally urban and thickly populated, hence the common fauna found includes stray cats (*Felis catus*), stray dogs, House Shrew (*Suncus murinus*), House Rat (*Rattus rattus*) and common birds such as Black Kite (*Milvus migrans*), Blue Rock Pigeon (*Columba livia*), House Crow (*Corvus splendens*), House Sparrow (*Passer domesticus*) and Indian Myna/Common Myna (*Acridotheres tristis*).

Sensitive Receptors

A survey of all fourteen schemes was conducted to identify sensitive receptors such as Educational Institutes, Religious sites, Health facilities and Recreational facilities during the study. During survey 52 health facilities including hospitals, clinic, labs and medical centers were found situated within the Indirect Impact Area (IIA) of the AoI. Similarly, 79 educational institutes, 54 Religious sites including one graveyard and recreational places such as one Park were also identified, that too in the IIA. The

complete list is attached in **Table A4-12**. These sensitive receptor's locations have also been marked on the maps, which are provided as **Figure A4-2** to **Figure A4-8**.

Table A4-12: Sensitive Receptors

Latitude	Longitude	Sensitive Receptors	Name
Health Facilities			
24.9041	67.0833	Clinic	Najla's Beauty Clinic
24.9047	67.0831	Clinic	Naz Homeo Clinic
24°57'01	67°41'78	Clinic	physiotherapy rehabilitation centre
24.905	67.0829	Clinic	Tajwer Eye
24.9047	67.0831	Clinic	The Dental Kingdom
24.9051	67.0828	Clinic	The Specialist Clinic
24.9533	66.9992	Health	Agha Khan Laboratory
24.9434	67.0068	Health	Al Kausar Medical Centre
24.9536	66.9987	Health	Dr Ayesha Nadeem Clinic
24.9416	66.9990	health	Eye Hospital
24.9558	66.9896	health	Good One Ultra Sound
24.9437	67.0091	Health	International Lab
24.9441	67.0093	Health	Jinnah Sindh Medical University Lab
24.9400	67.0020	health	Maternity Hospital
24.9575	66.9874	health	Noor Medical Centre
24.9625	66.9734	health	Noor Medical Centre
24.9554	66.9899	health	North Mehran diagnostic Centre
24.9514	66.9918	health	Rehman Physiotherapy Centre
24.9446	67.0096	Health	Shamim Lab
24.9545	66.9905	health	Taha Eye Clinic
24.8858	66.9885	Health Centre	Al Shifa Health Centre
24.8865	66.9850	Health Centre	Al Shifa Medical Centre
24.8865	66.9850	Health Centre	Asif Laboratory
24.8861	66.9905	Health Centre	Back Side of Govt. Hospital
24.8676	66.9817	Health Centre	Benazir Bhutto Shaheed Hospital
24.8861	66.9904	Health Centre	Govt. Hospital
24.8644	66.9981	Health Centre	Memon Medical Centre and maternity home
24.8620	66.9937	Health Centre	Mehran ultra Sound Centre
24.8630	66.9896	Health Centre	Mianwali Medical Centre
24.8832	66.9873	Health Centre	Shahzad Laboratory
24.8674	66.9889	Health Centre	Women and Child Care dispensary
24°56'24	67°33'38	Hospital	Al Huda Hajama Homeo Hospital
24.9388	67.0036	Hospital	Al- Khidmat Hospital
24°56'23	66°59'38	Hospital	APWA clinic
24°56'13	66°58'51	Hospital	Baber Hospital
24.8747	67.1742	Hospital	Darul Birr welfare Hospital
24.8774	67.1845	Hospital	Dr Rhuksana Row & Maternity Centre
24°55'30	67°24'38	Hospital	Dr Zia Uddin Hospital
24°56'39	67°34'82	Hospital	Hi Life Hospital
24°56'60	66°58'32	Hospital	Iqbal general hospital maternity Home
24°56'96	66°04'18	Hospital	Javed Clinic
24°56'71	66°58'38	Hospital	Kamran Clinic
24°56'66	66°58'35	Hospital	Madina general hospital maternity Home
24.9580	66.9658	Hospital	Perveen health care
24°56'14	66°59'56	Hospital	safir welfare hospital
24°56'19	67°32'57	Hospital	Sana Clinic & Maternity Centre
24.9868	67.0933	Health	Umar Farooq Medical Center
24°56'34	67°34'42	NGO	Anmol Zindage Old Age Home
24.8698	66.9785	NGO	Edhi Welfare Centre
24.9515	67.0025	NGO	Edhi Welfare Trust

Latitude	Longitude	Sensitive Receptors	Name
24.8741	66.9831	NGO	Human Welfare house
24.8667	66.9896	NGO	Young Somro Anjuman
Educational institutions			
24°55'57	67°39'38	College	Bahria Foundation College
24.8595	66.9954	College	Govt. Girls College
24°56'80	67°31'51	College	Humdard Intermediate College
24°56'33	67°34'25	College	Karachi medical and dental college
24.8629	66.9896	College	Nusrat Bhutto Graduate College
24°55'58	67°39'56	College	Proper College
24°56'20	67°32'74	College	Saallits College
24.8747	66.9843	College	Teacher Training M.C Elementary College
24°55'55	67°38'07	College	The Academy
24°56'45	67°35'17	College	The Smart College
24°56'33	67°31'20	College	Zia Uddin Intermediate College
24°56'94	66°04'67	Madarsa	iqra madinat ul Quran academy
24.9532	66.9993	Madarsa	Iqra Qanzul Emman
24.9422	66.9983	Madarsa	Madrassa Darul Quran
24.8705	66.9795	School	Abbas school for boys
24.8832	66.9871	School	Al Haram Iqra Secondary School
24.9612	66.9838	school	Al Hira Secondary School
24°56'36	66°59'14	school	Al Maqsood education System
24.9615	66.9834	school	Al Qalam School
24°56'23	66°59'38	School	all Pakistan women's association - Apwa rana secondary school
24.9034	67.0842	School	Beacon house School System
24°55'52	67°35'91	School	Beacon house School System
24.9546	66.9904	school	Best way Grammar School
24°55'54	67°37'20	School	Blossom International School
24.9036	67.0729	School	Bright Beacon Academy
24.9630	66.9775	school	Calimex English Language
24°55'35	67°25'03	School	Children’s Educational Centre Government School
24.9467	67.0109	School	City District Government primary school
24.9539	66.9977	School	Darakshan Grammar School
24.9611	66.9731	school	Elite Heaven School
24°57'12	67°48'99	School	Froebel Grammar Academy
24°56'20	67°32'65	School	Ghazi Foundation School
24.8713	66.9853	School	Ghazi Muhammad Bin Qasim Secondary School
24.9477	67.0060	School	Government High School
24.8659	66.9990	School	Govt. Boys Secondary Campus School
24.8641	66.9919	School	Govt. Boys Secondary School Layri
24.8635	66.9924	School	Govt. Girls Pri Sec School Wali.M Haji Yaqoob Lyari
24.8857	66.9883	School	Innovative Beacon School
24.9529	67.0000	School	International World School
24°56'25	67°33'40	School	Iqra Garden School
24.8757	66.9868	School	Iqra Hidiaqtul Itfaal Secondary school
24.9109	67.0849	School	Iqra Islamia School
24°56'36	67°34'57	School	Iqra Islamic Education Academy
24°56'57	67°33'75	School	iqra rozatul Itfaal school
24°56'17	66°59'48	School	K K ABDAL School
24.9537	66.9982	School	K.I.M.S
24.8839	66.9885	School	Karachi Children Academy
24°56'22	67°32'90	School	Knowledge Valley School
24°55'40	67°25'53	School	Little Folks School
24.8687	66.9802	School	Madrassa Kalsoom Ali
24.8709	66.9860	School	Master Academy of Education
24°56'69	67°31'43	School	Niams Schooling System

Latitude	Longitude	Sensitive Receptors	Name
24.9627	66.9799	school	P.S.G School
24.9508	67.0039	School	Pacific coaching centre
24°56'36	67°34'53	School	Pak Children Paradise School
24.8830	66.9867	School	PGSS Coaching Centre
24.8829	66.9867	School	Private School
24°56'21	67°32'78	School	Progressive public School
24°56'34	67°34'39	School	Sesame Academy
24°56'23	67°33'17	School	Shining Star Secondary School
24.9860	66.9861	School	Sindh Foundation School
24°56'15	66°59'53	School	Smart School
24.8818	66.9847	school	Superstar Secondary School
24.8623	66.9870	School	TC F School
24.9523	67.0012	School	TCF School
24°55'40	67°25'48	School	The City School
24.8753	66.9857	School	The Educators
24.8601	66.9953	School	The Educators International College
24°56'56	67°40'03	School	The Innovator Academy
24.8724	66.9848	School	The Junagardh Academy Centre
24.9623	66.9811	School	The Merit Inn
24.9495	67.0062	School	The Merit School
24.8651	66.9887	School	The Rose Academy
24°56'10	67°31'78	School	Windsor Public High School
24.8846	66.9893	School	Young Scholar Grammar School
24°56'94	66°58'47	School	Ameen Public School
24°56'74	66°58'40	School	Falcon English High School
24.9034	67.0842	School	Seeding
24°57'21	67°41'69	Shrine	Dargha Sharif Hazrat Azeem Shah
Religious sites			
24.8551	67.2147	Mosque	Jamia Masjid
24.8640	66.9955	Mosque	Imam Bargha
24.8865	66.9902	Mosque	Imam Bargha Hussainyat
24.8865	66.9850	Mosque	Jami Masjid Abbas
24.8742	66.9833	Mosque	Jamia Ghazi Masjid
24.8613	66.9872	Mosque	Jamia Kanzul Uloom Rizvia
24°56'44	67°35'25	Mosque	Jamia Masijd Abu Baqar Siddique
24°57'14	67°41'06	Mosque	Jamia Masijd Darul Islam
24.9034	67.0842	Mosque	Jamia Masjid
24.8732	66.9841	Mosque	Jamia Masjid
25.0506	67.0620	Mosque	Jamia Masjid Abdul Aziz
24.9431	67.0074	Mosque	Jamia Masjid Abu Baqar
24.8633	66.9866	Mosque	Jamia Masjid AH
24.8856	66.9880	Mosque	Jamia Masjid Ahlahaddis
24.8549	67.2158	Mosque	Jamia Masjid Al Furqan
25.0294	67.0626	Mosque	Jamia Masjid Ali ul Murtaza
24°56'34	66°59'19	Mosque	Jamia Masjid Bab e rehmat
24.9065	67.0816	Mosque	Jamia Masjid Bait ul Mukarram
24.9428	67.0079	Mosque	Jamia Masjid Banaras
24.9010	67.0868	Mosque	Jamia Masjid COD Hils Star
25.0294	67.0626	Mosque	Jamia Masjid Faizan e Ali
24.9550	66.9903	Mosque	Jamia Masjid Farooq Azam
24.8663	66.9992	Mosque	Jamia Masjid Furqania
24.8651	66.9910	Mosque	Jamia Masjid Humza
24.8856	66.9909	Mosque	Jamia Masjid Hanifia
24.8603	66.9951	Mosque	Jamia Masjid Irfania
24.8632	66.9927	Mosque	Jamia masjid Khulfay Rashideen
24.8769	67.1833	Mosque	Jamia Masjid Madrasa Abu Baqar Siddique

Latitude	Longitude	Sensitive Receptors	Name
24.8775	67.1850	Mosque	Jamia Masjid Madrasa Madinat ul Uloom
24°56'19	67°32'54	Mosque	Jamia Masjid Madrasa Rahimat
24.8643	66.9918	Mosque	Jamia Masjid Mehmoodia
24.8642	66.9970	Mosque	Jamia Masjid Noumania
24.8633	66.9894	Mosque	Jamia Masjid Nourani
24.9112	67.0854	Mosque	Jamia Masjid Quba
24.8820	66.9852	Mosque	Jamia Masjid sabir
24.8882	66.9884	Mosque	Jamia Masjid Sabira
24.8854	66.9818	Mosque	Jamia Masjid Sher shah
24.9591	66.9718	Mosque	Jamia Masjid Siddiqia
24.8738	66.9823	Mosque	Jamia Masjid Subhani
24°56'33	67°34'25	Mosque	Jamia Masjid Taif
24.9457	66.9951	Mosque	Jamia Masjid Umer Farooq
24°56'84	67°31'54	Mosque	Jamia Masjid Usmania
24.8674	66.9890	Mosque	Juna Jamia Masjid
24.8722	67.1712	Mosque	Madarssat ul Madina
24.8639	66.9848	Mosque	Madrassa Muhammad Nabvi
24.8701	66.9868	Mosque	Madrissat ul Madina
24.9872	67.0915	Mosque	Masjid Khadija tul Kubra
24.8692	66.9874	Mosque	Minhaj Model School and Quran Institute
24°56'21	67°32'81	Mosque	Muslim Masjid
24.8720	66.9784	Mosque	Taj Agra Jamia Masjid
24.8743	66.9835	Shrine	Hazrat Khuwaja Ghazi Ghulam Haider Qadri
24.8646	66.9983	Shrine	Baba Ujalay Shah
24.8846	66.9820	Graveyard	Grave Yard
24.5116	66.1331	Graveyard	Graveyard
Parks			
24.9369	67.0074	Park	Park sector 5

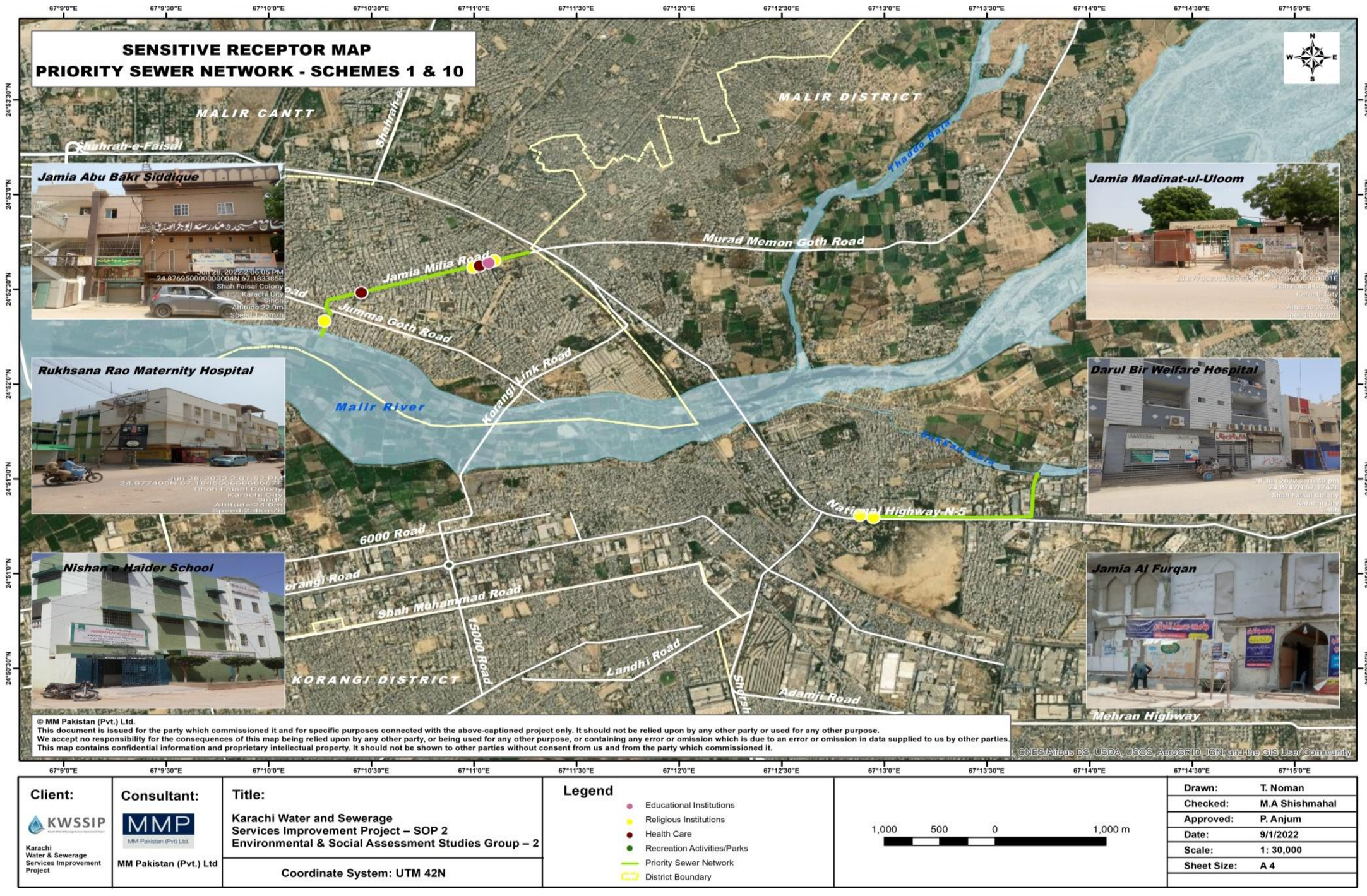


Figure A4-2: Identified sensitive receptors in Scheme 1 & 10

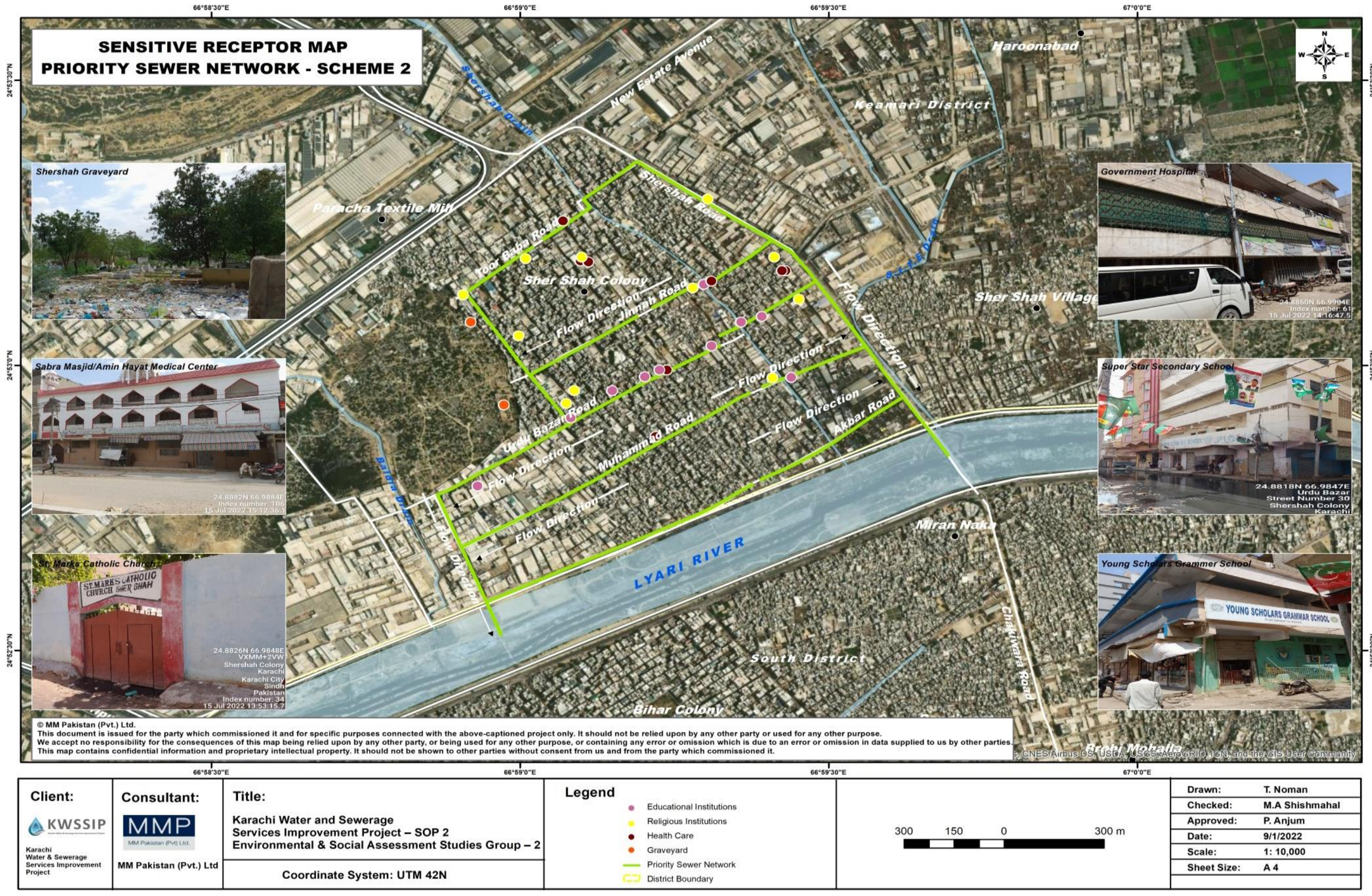


Figure A4-3: Identified sensitive receptors in Scheme 2

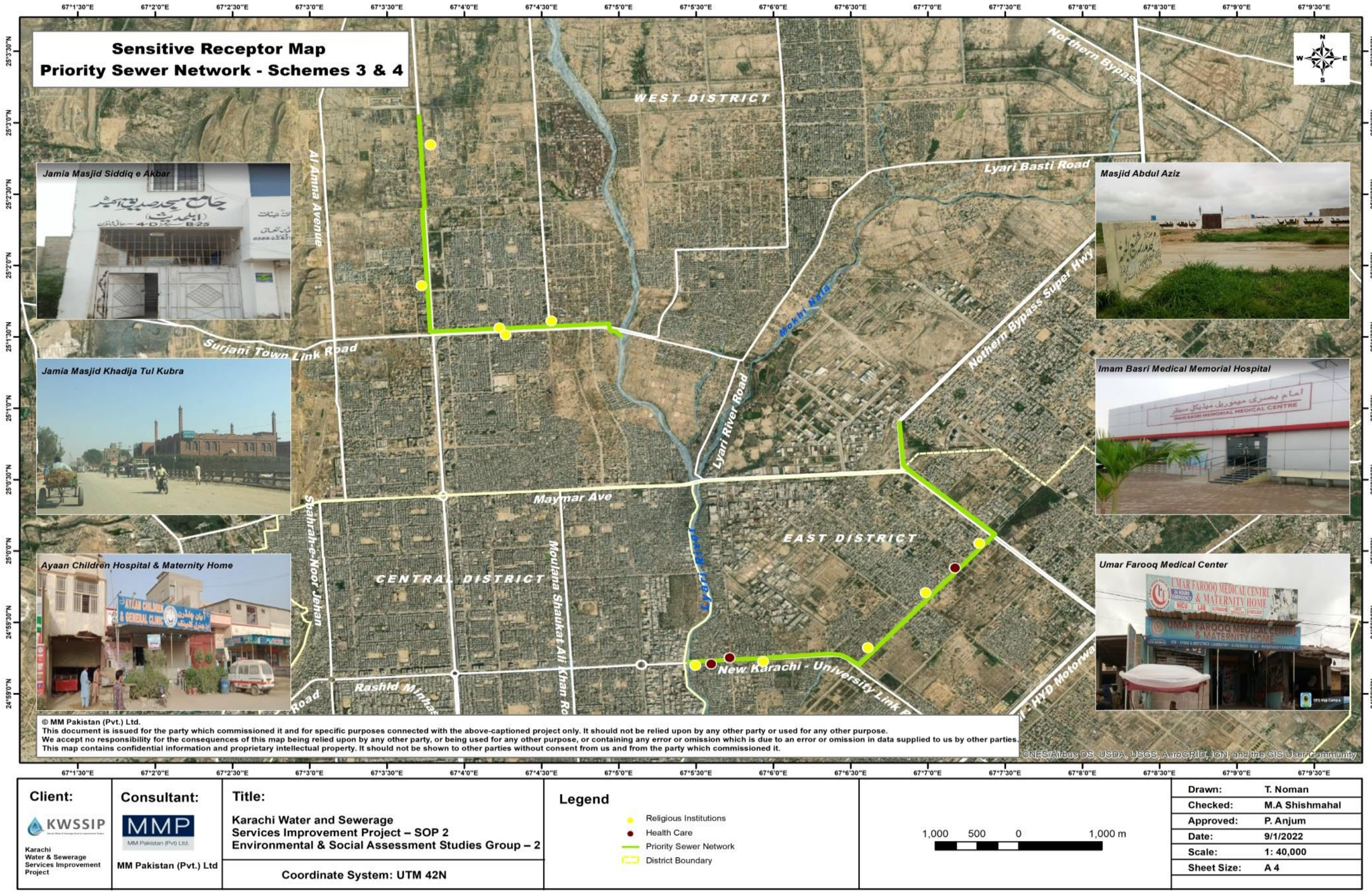


Figure A4-4: Identified sensitive receptors in Scheme 3 & 4

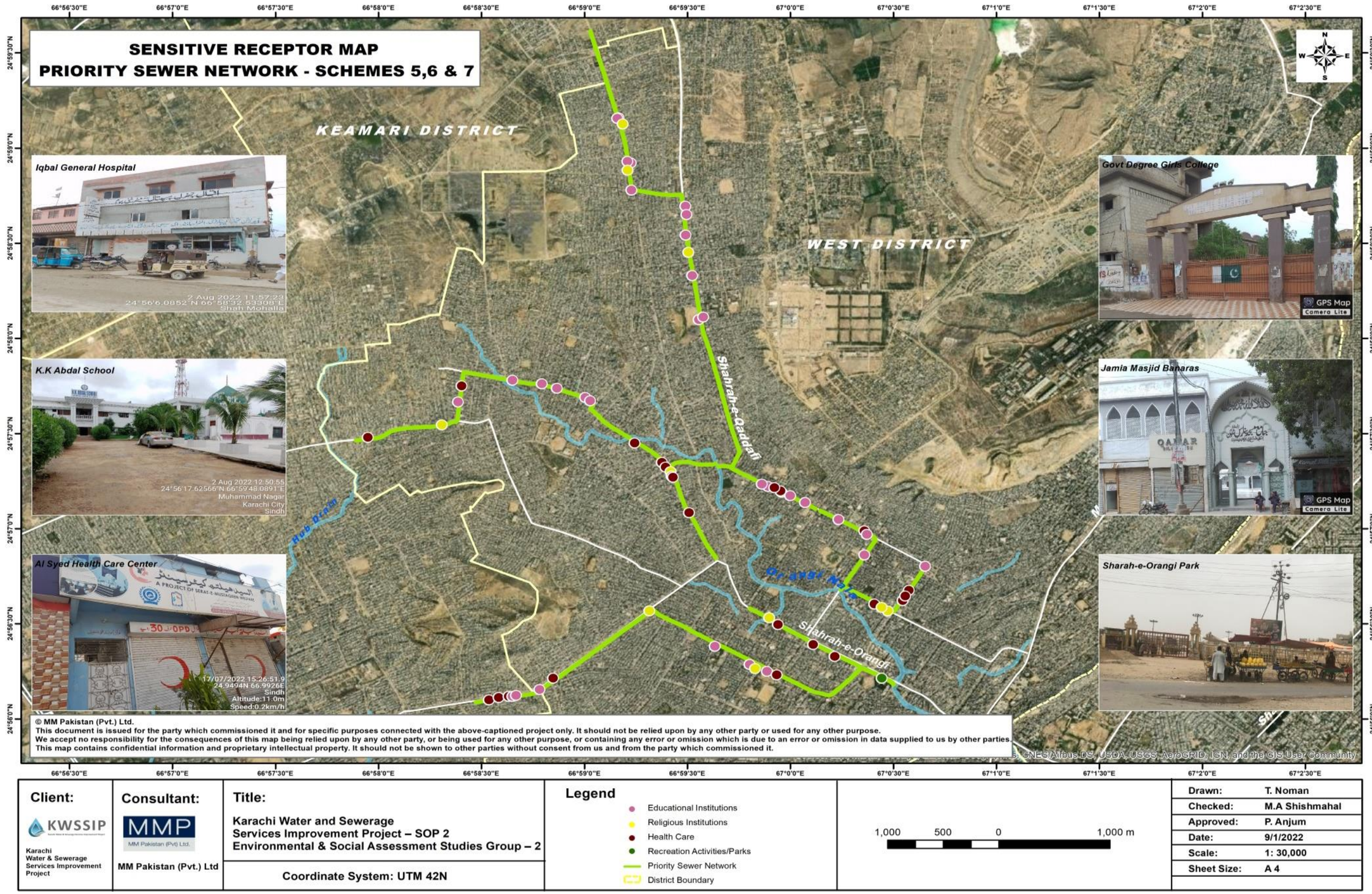


Figure A4-5: Identified sensitive receptors in Scheme 5,6 & 7

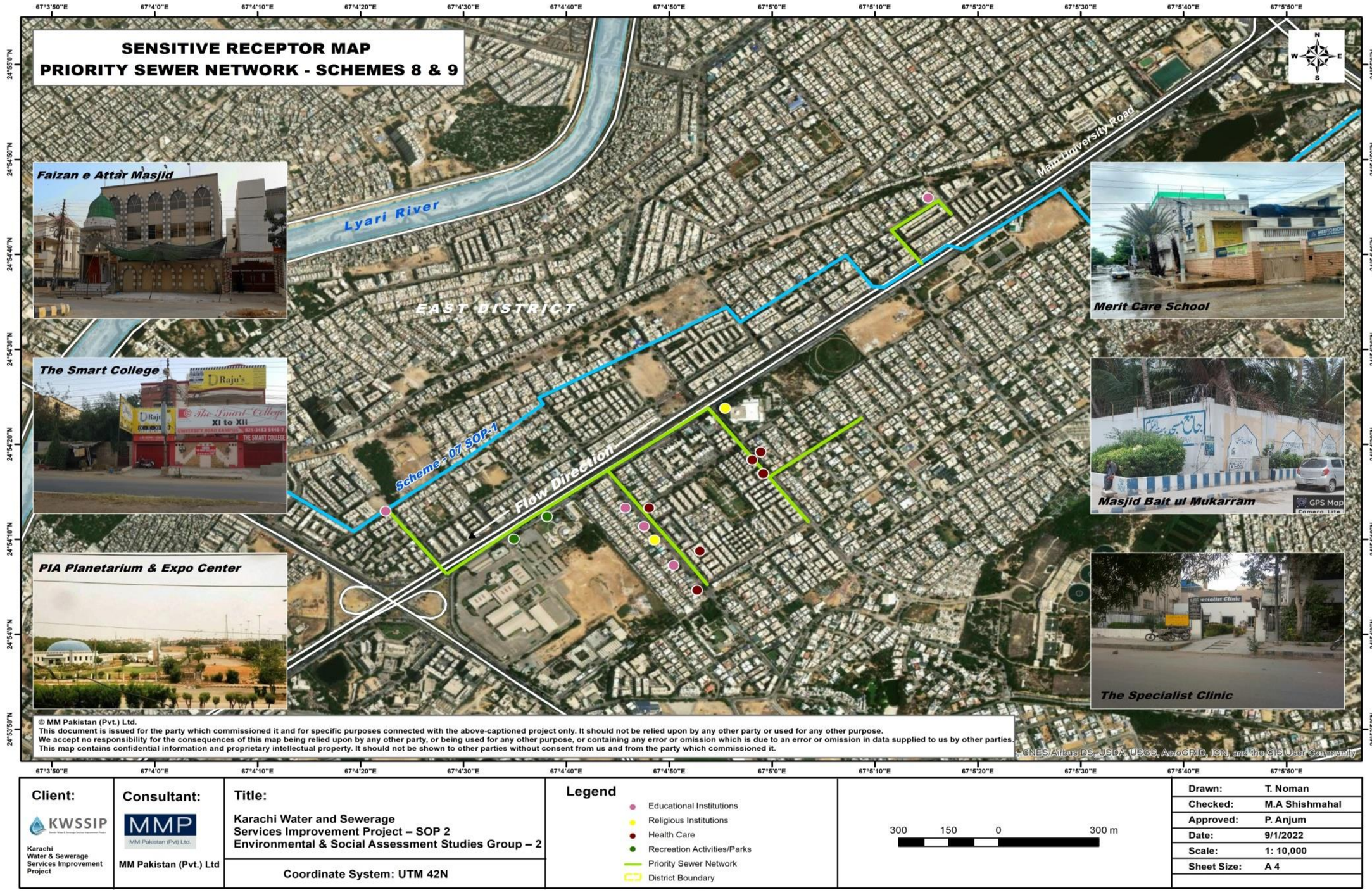


Figure A4-6: Identified sensitive receptors in Schemes 8 & 9

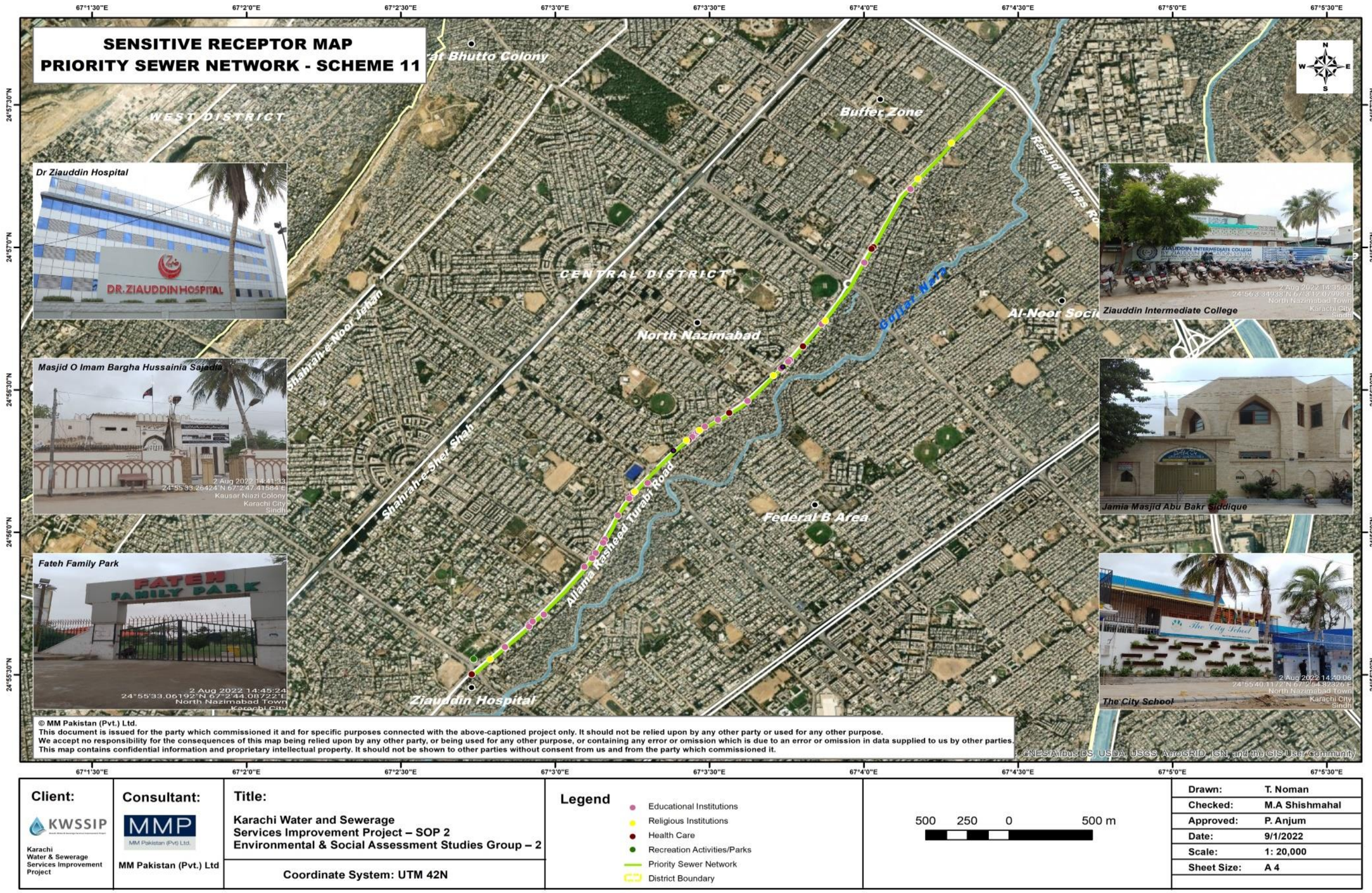


Figure A4-7: Identified sensitive receptor in Scheme 11

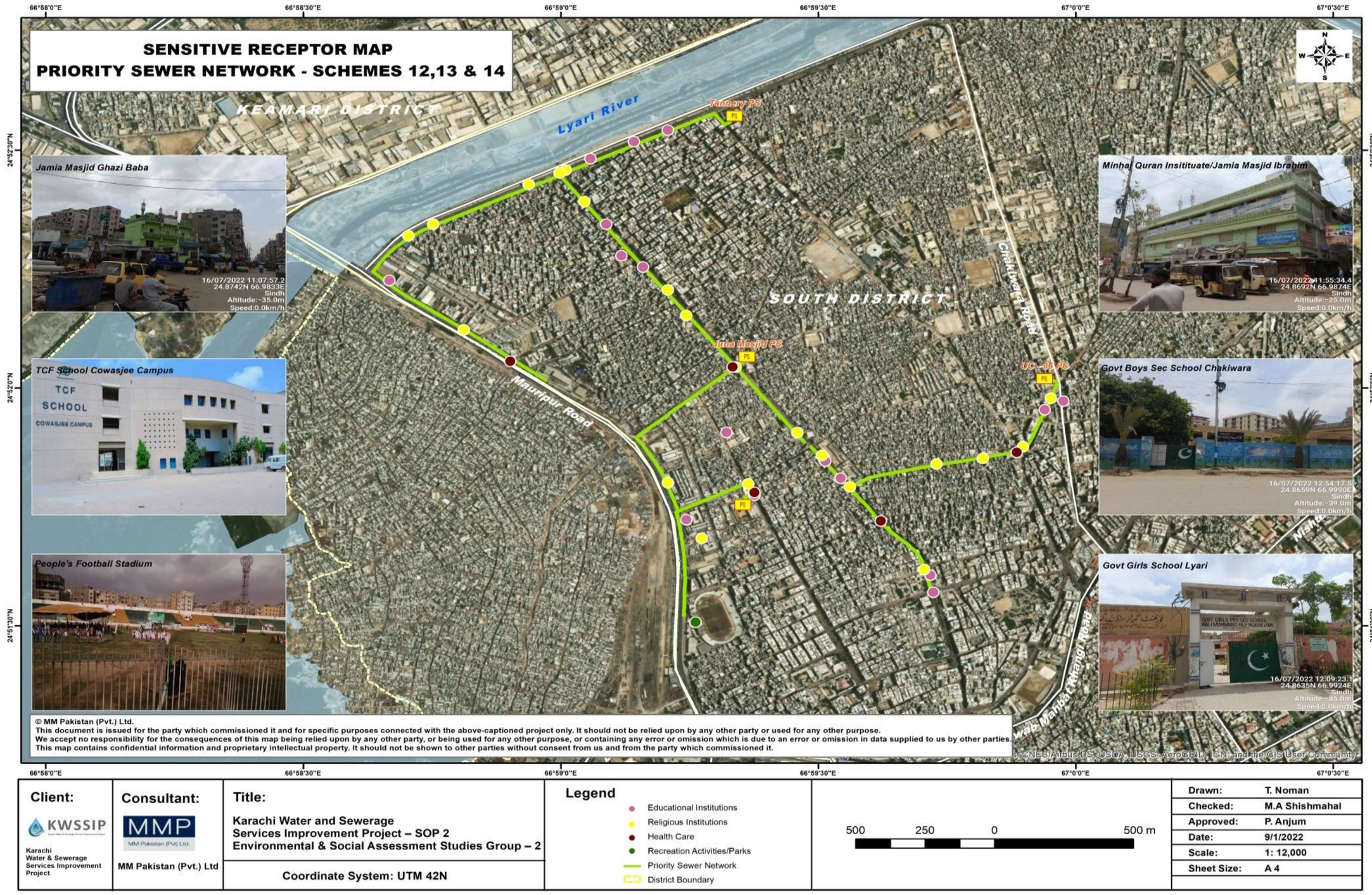


Figure A4-8: Identified sensitive receptors in Scheme 12,13 & 14

Socio-economic Baseline

This section presents the socioeconomic baseline based on data collected through rounds of public consultation and a household socioeconomic survey conducted for the ESMP. There are around 25 small and large communities that are located in the AoI of the project. Socio–economic baseline of the project area has been established by utilizing both primary and secondary data sources. Baseline was strengthened by sample socio-economic survey conducted within the AoI of the Priority Sewer Network with the sample size of 315 male and female respondents as detailed in **Table A4-13**. Sample size has been calculated based upon the population size and no. of households situated in each locality. **Figure A4-9** shows the consultation locations marked on a map.

Table A4-13 Sample Distribution

No	Community	District	No. of Respondents	
			Male	Female
1	Rabbani Masjid Bin Qasim Town	Malir	9	0
2	Akbar Road (Gali-16, Block B (Scheme-II)	Keamari	8	0
3	Sher Shah Mohallah	Keamari	0	9
4	Shershah colony C block (Scheme-II)	Keamari	14	8
5	Shershah colony A Block (Scheme-II)	Keamari	12	8
6	Shershah Colony Street 11 (Scheme-II)	Keamari	10	8
7	Surjani Town FL-3, FL-6 (Scheme -3)	West	10	7
8	Sukhia Goth Ward-3 (Scheme-4)	West	12	8
9	Sector-5 E (Scheme 5,6,7)	West	9	8
10	Ghosia Colony Orangi (Scheme -5,6,7)	West	12	0
11	Khalilabad (Scheme -5,6,7)	West	9	0
12	Sector 5E 385 (Scheme -5,6,7)	West	0	8
13	Faridabad Colony (Scheme -5,6,7)	West	8	0
14	Khalilabad (Scheme -5,6,7)	West	0	10
15	Sachal Goth A Block (Scheme 8)	East	11	7
16	Tayyab Jokhyo Goth (Scheme -9,10,11)	East	10	0
17	Gulshan e Iqbal Block 16 (scheme 9,10,11)	East	8	0
18	Sodagram Society (Scheme -12)	East	8	9
19	Baghe Malir (Scheme -12)	East	10	0
20	New Madina Market (Scheme -12)	Korangi	8	0
21	M Rafique	Central	10	0
22	Saima Tower Buffer Zone (Scheme-13)	Central	10	0
23	Shah Baig Lain	South	11	0
24	R-Chowk	South	9	8
25	New Kalari Agra Taj	South	9	0
Total Respondents			**217**	**98**

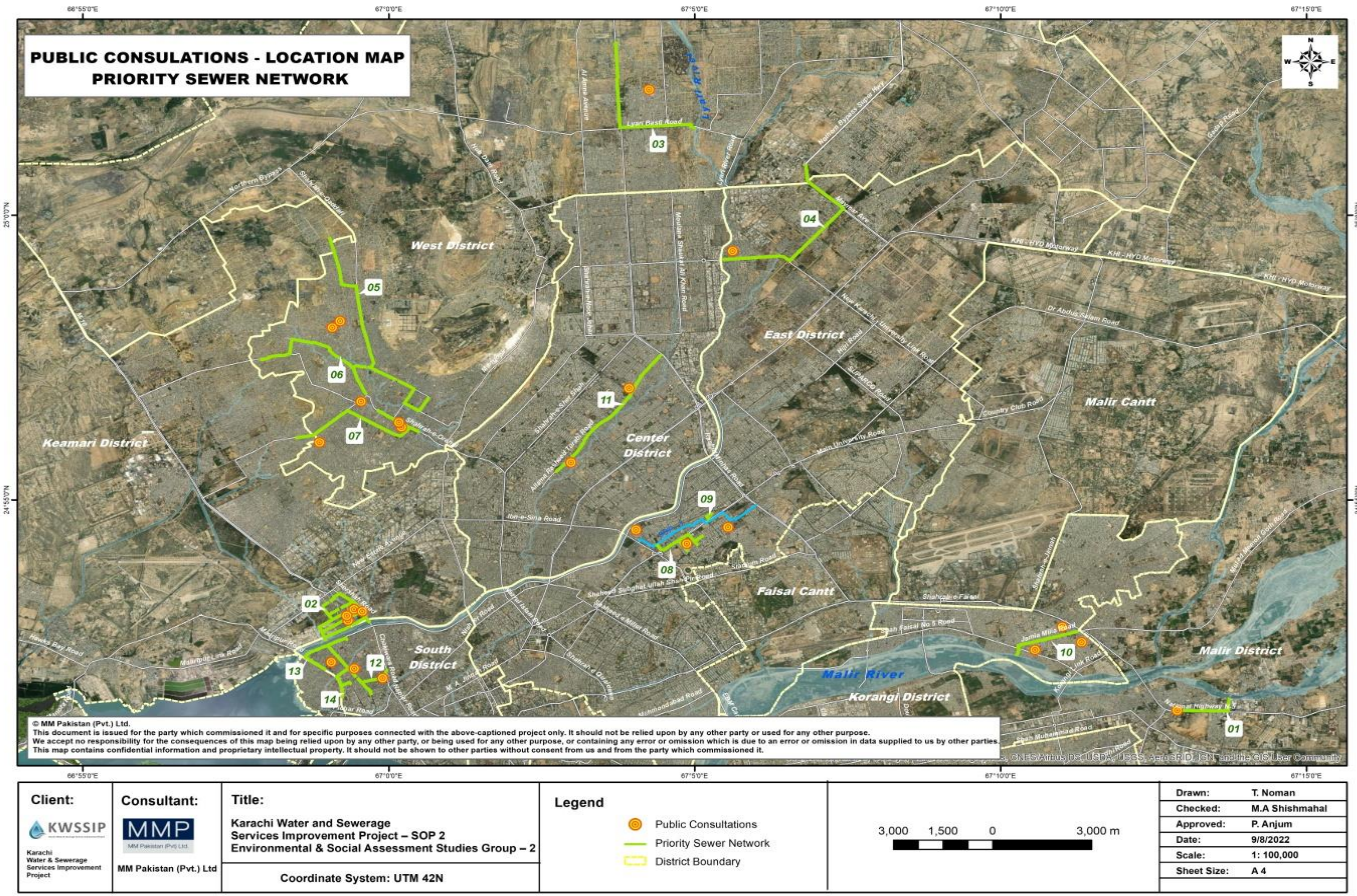


Figure A4-9: Public Consultation Map

Socioeconomic data was collected through questionnaire in **Figure A4-10**.

Figure A4-10: Questionnaire

KWSSIP
Karachi Water & Sewerage Services Improvement Project

MMP
MM Pakistan (Pvt) Ltd.

Questionnaire for Institutional Consultation

Name of department _____ **District** _____

Name of consulted representative _____**Designation** _____

Health

Health facilities	Total Numbers in district
District Hospitals	
BHU	
RHC	
MCH	

What major water brown disease are observed in the district?

_____
_____
_____
_____

What measures are taken by the health department/Ministry to overcome these diseases?

_____
_____
_____
_____

What would be the social or environment impacts on peoples by the implementation of this project?

1. _____
2. _____
3. _____

How your institution can help to this project for increasing its efficacy for the public interest

1. _____
2. _____
3. _____

Name of interviewer _____ **Date** _____ **Designation** _____

Name of interviewer _____ **Date** _____ **Designation** _____

Questionnaire for Institutional Consultation

Name of department _____ **District** _____

Name of consulted representative _____**Designation** _____

Education

Total no of primary schools in district	Girls	Boys
Estimated enrollment		
School having washroom facilities		
Schools having drinking water facilities		

What kind of problems you are facing with current sewerage system /how it is effecting to the enrollment in schools

_____
_____
_____
_____

Through this project implementation, how it would benefit you/education department

_____
_____
_____
_____

Any campaigns are runned by education department or any other institution on health and hygiene if yes what was the campaigns?

_____
_____
_____
_____

Any suggestions

_____
_____
_____
_____

Name of interviewer _____ **Date** _____ **Designation** _____

Name of interviewer _____ **Date** _____ **Designation** _____

Questionnaire for Institutional Consultation

Name of department _____ **District** _____

Name of consulted representative _____**Designation** _____

Fisheries

What are the effects/problems facing the fisherman's due to untreated sewer water wasted in marine

_____
_____
_____
_____

What kind of water born disease are they facing?

_____
_____
_____
_____

What kind of skin disease they are facing due to direct exposure to marine water?

_____
_____
_____
_____

How this project will impact on fisherman's community?

_____
_____
_____
_____

What are your suggestions?

_____
_____
_____
_____

Name of interviewer _____ **Date** _____ **Designation** _____

Name of interviewer _____ **Date** _____ **Designation** _____

Questionnaire for Institutional Consultation

Name of department _____ **District** _____

Name of consulted representative _____**Designation** _____

Agriculture

The vegetables cultivated on waste water are good enough for health ❑ Yes ❑ No

If yes then how

_____
_____
_____
_____

If no then wat are the adverse effects of these on health

_____
_____
_____
_____

How departmentally these are these are prohibited

_____
_____
_____
_____

How this project will effect on improving the public health?

_____
_____
_____
_____

Any suggestion or recommendation

_____
_____
_____
_____

Name of interviewer _____ **Date** _____ **Designation** _____

Name of interviewer _____ **Date** _____ **Designation** _____

Socio-Economic Survey (Key Informant) Questionnaire

Questionnaire No. | | | | |

1. Geographic location

Settlement / Kachi Abadi _____Tehsil/town_____ District _____

North _____ South _____

Respondent Name_____ Fathers Name _____ Age _____

Education (❑ Yes / ❑ No) if yes then what is qualification _____

Family size

Male	Female	System of family		Children
		Joint	Single	

2. Estimated population of area

Total no of HH	No. Mohalla / Streets	Type of Housing Units

3. Source of Drinking water

Water Supply	Groundwater / Hand-Pump	Water Filter Plant	Masjid	Bottle Water

a) Condition of available water sources

Easy Access	Partially Easy Access	Un Fit

b) availability of water supply water for houses

No of hours per day_____ no# houses for available #_____

c) ground water condition for use

Sweet water	Water table

d) Usages of ground water

Cleaning	Bathing	Cooking	Drinking	Other

e) do you use of treatment technique at house

❑ Yes ❑ No if yes what_____

f) how would you rate the quality of drinking water

❑ Good ❑ Acceptable ❑ Poor ❑ don't know

g) is there any water treatment facility available in village

❑ Yes ❑ No nearby is _____ it functional ❑ Yes ❑ No

h) in which months availability of water is most vulnerable _____

i) major water born disease _____

4. Sanitation

Do you have toilet within house premises ❑ Yes ❑ No how many_____

a) Types of toilet available in house

Flush to piped sewer system	Flush to septic tank	Flush to pit	Flush to open sewerage	Compositing toilet	PIT latrine	Bucket	Hanging toilet	Open defecation	others

How your HH disposes off waste water _____

How dispose of the solid waste collection _____

Any treatment measures are taken _____

5. General

Is there any NGO working on water or on sanitation? ❑ Yes ❑ No

If yes specify how / what type of /project doing ? _____

Your suggestions on to improved and effective water and sanitation system

_____

_____

Socio-Economic profile

(Focus Group Discussion)

1. Geographical information

Locality_____ Tehsil/Town_____ District _____

2. Population

Estimated population_____ No. HH_____

Family system

❑ Joint (in percentage) ❑ single_____

Structure of Housing

❑ Kachaa ❑ Pacca ❑ Kacha and Pacca

3. Ethnicity

S. No	Communities	No./Percentage (approx.)
Total		

4. Languages

❑ Sindhi ❑ Urdu ❑ Pashto ❑ Srieky ❑ Others _____

5. Major occupations

S. No	Occupation	Percentage

6. Educational facilities

Description	No. of institution				In case of no. nearest to the locality
	Girls	Boys	Girls	Boys	
Primary school					
Middle school					
High school					
Colledge					
Madersa					
Other (specify)					

7. Health facility

❑ Facility within village _____
❑ Government hospital _____
❑ BHU _____
❑ Mother and child care Health unit _____
❑ Dispensary _____
❑ Hakeem / Practitioners _____

8. Common Diseases in Village

❑ Malaria ❑ Typhoid ❑ Polio ❑ TB ❑ Diarrhea ❑ Haptitas
❑ Skin diseases ❑ Eye Diseases ❑ Any other) _____

9. Civic infrastructure

Type of Amenity	Available in the village	Available in nearby village/locality	Distance from the village
Electricity			
Water supply/Tap water			
Sui-Gas			
Fuel cylinder			
Filling station (patrol/Gas)			
Fuel Agency			
Cable Television			
Access to internet			
Telephone (land line)			
Post office			
Bank			
Mosque			
Graveyard			
Other			

10. Source of drinking water

Tap water/ water supply	Hand-pump	Bottled water	Public Filtration plant	Stream /canal	Others

Water table (ft) _____

Quality of table water for drinking

Excellent	Good	Unfit

11. Sewerage system availability in in locality ❑ Yes ❑ No

If not then where do you disposes your sewerage

Open pit	Septic tank	Open drain	Pipe	Socking pit	Other

Do you have any system for collection of solid waste ❑ Yes ❑ No

a) If yes give details _____

b) If No, then where do you dump your waste _____

Leadership Patterns

12. Who is the most influential person in the village

Designation	Name
MNA/MPA	
UC Member	
Village elder	
Teacher	
Cast/family elder	
Religious leader	
Other	

13. Conflict resolving patterns

How conflicts are resolved

Jirga	Tribal/cast/head	Family head	Court	Any other

14. Women participation

S. No	Activities	Participation Tick (yes/No)	Hours per day	% of Contribution
1.	House Hold			
2.	Child caring			
3.	Farming/crop activities			
4.	Livestock raring			
5.	Sale and purchase of goods			
6.	Produce products			
7.	Do formal jobs			
8.	Others			

a) Women contribute in HH income ❑ Yes ❑ No

If yes, how

_____

_____

b) Are women consulted in decision making matters ❑ Yes ❑ No

If yes, in what matters?

c) Is there any industry in your village or in the vicinity? ❑ Yes ❑ No

If yes which industry?

15. Does any NGO or CBO exist in the area? ❑ Yes ❑ No

If yes: explain their names and activities?

Do there exist any vulnerable households in the area ❑ Yes ❑ No

Widows	Handicapped	Homeless	Others

16. Specify the nearest facility or amenity? (KM)

❑ Police station ❑ Grain Market ❑ Cattel Market ❑ Other

State the pressings needs of the area

Any development in progress at your village regarding community benefit

Community perception about the project

Any specific observations

a) _____

b) _____

Facilitator: _____ **Date:** _____

Facilitator: _____ **Date:** _____

Administrative Setup

The project area falls in almost all districts of Karachi. The UCs that fall under the catchment area (based on Design Consultant Feasibility Report) of project schemes is presented in **Table A4-14**.

Table A4-14: List of Union Council Under Project Catchment Area

Schemes	Districts	Union Councils
Scheme - 1	District Malir	Quaidabad, Rehri
Scheme - 2	District Kaemari	Sher Shah Colony
Scheme - 3	District West	Maymarabad, Manghopir
Scheme - 4	District East	Gujjro
Scheme - 5	District West	Ghaziabad, Bilal Colony, Gobal Colony, Dad Nagar, Islam Chowk
Scheme - 6	District West	Chishti Nagar, Islam Chowk, Madina Colony, Muhammad Nagar, Gobal Colony, Frontier Colony
Scheme - 7	District West	Azad Nagar, Gulshan-e-Ghazi, Hanifabad, Haryana Colony, Muhammad Nagar, Frontier Colony
Scheme - 8	District East	Gillani Railway Station
Scheme - 9	District East	Gillani Railway Station
Scheme - 10	District Korangi	Al Falah Society, Rafah e Aam
Scheme - 11	District Central	Buffer Zone 1, Buffer Zone 2, Sakhi Hassan, Hyderi
Scheme - 12	District South	Bhagdadi, Newabad, Khada Memon, Daryabad, Shahbaig Lane, Behar Colony, Chakiwara, Rangiwara
Scheme - 13	District South	Agrataj Colony, Daryabad, Shahbaig Lane, Behar Colony
Scheme - 14	District South	Daryabad, Newabad

Ethnic Structure

The most common ethnic groups found in Project Area are presented in **Table A4-15**.

Table A4-15: Ethnic Structure in AoI

No	Ethnic Group	%
1	Muhajir	37.3
2	Pathan	21.2
3	Khaskheli	9.7
4	Sindhi	14.7
5	Seraiki	4.2
6	Syed	1.4
7	Other	11.5
Total		**100**

Language

In the Project's AoI, Urdu, Sindhi and Pushto were found to be the dominant languages. Some respondents speak other languages as well. Statistics are shown in **Table A4-16**.

Table A4-16: Languages Spoken in the AoI

No	Ethnic Group	%
1	Urdu	42.4

No	Ethnic Group	%
2	Sindhi	13.8
3	Pashto	20.7
4	Seraiki	5.5
5	Punjabi	12.9
6	Other	4.6
Total		**100**

Religion

The population is predominantly Muslim with small religious minorities, which include Hindu and Christians.

Employment Types

Overall, the project area is highly dense and easily accessible both for local residents as well as visitors. The areas are well connected with the surrounding areas and other areas of the city through roads and via modes of transport including public buses, taxis, rickshaws, and motorcycle rickshaws. The majority of the consulted male community members were found to be employed with mostly private jobs and few with lower scale government jobs. Both male and female members of the communities residing nearby the industrial areas were found to be mostly employed at industrial units. Many consulted community members were also found to be associated with small businesses. The detailed statistics regarding occupational status of the respondents is presented in **Table A4-17**.

Table A4-17: Occupational Status in the AoI

No	Occupational Status	%
1	Business/ Shopkeeper	37.8
2	Labour	30.9
3	Driver	3.7
4	Private Job	18.9
5	Govt. Job	6.5
6	Any other	2.3
Total		**100**

Monthly Income of the Respondents

Most of the families are comprised of larger family sizes with males mostly associated with the different professions as mentioned above to earn their livelihood. The results shown that majority of the respondents belong to ‘lower to lower middle income class’ with monthly earnings up to PKR 30,000. Income distribution details are given in **Table A4-18**.

Table A4-18: Monthly Income of the Respondents

No	Average Monthly Income (Rs.)	%
1	Up to 17,500	28.1
2	17,501 - 30,000	43.8
3	30,001 – 50,000	15.2
4	50,001 – 75,000	9.7
5	75,000 – 100,000	2.3
6	Above 100,000	0.9
Total		**100**

Access to Social Amenities in the Project Area

The results of the survey revealed that majority of the respondent households relate to electricity, water supply and all other necessities. Details are provided in **Table A4-19**.

Table A4-19: Social Infrastructure in the AoI

No	Facility	%
1	Electricity	100
2	Water Supply	96.7
3	Sewerage	89.4
4	Dispensary/ hospital	100
5	School	100
6	Metaled Roads	96.7
7	Graveyard	100

Quality of Health Facilities

Government as well as Private Hospitals / Clinics health facilities are available in all the towns under which the priority sewer schemes are located. The quality of services was found to be variable from area to area as reported by the respondents. Overall, the private medical facilities were reported to be better however expensive, while the facilities at Government owned hospitals / clinics were generally reported to be reasonable.

Quality of Educational Facilities

The quality of educational facilities at private institutions was reported to be better as compared to government owned facilities. Majority of the respondents were however found satisfied with the quality of education at government schools as well.

Sanitation Profile

The hygienic and sanitation conditions prevalent in the most parts of the project area were not found satisfactory. Overflowing and stagnant sewage could be seen in almost every low to lower middle-class settlements under the AoI due to blockages in the sewerage networks. Majority of the respondents reported that during the rains, the sanitation profile further degrades and ponding of rainwater becomes common at most of the streets.

Social Organizations

Edhi Foundation, Chippa, Al-Khidmat Foundation and Sailani Trust etc. were found to be active in almost all areas under the AoI. Similarly, many health and education related foundations and trusts are also running various facilities in the project area.

Women Participation and Issues Faced by Women

The information on gender aspects was also collected through individual interviews and group discussions with female respondents by the gender enumerators. **Table A4-20** indicates the women participation in various activities.

Table A4-20: Women Participation in the Various Activities

Activity	Percentage (%)
Household	81.9
Child caring	45.8
Livestock	2.7
Farming	1.4
Employment	6.9

It has been reported by the consulted women members of the community that they routinely face restrictions and limitations regarding autonomy. Most of the women were of the string opinion that attainment of higher levels of education especially not only for women but also for men could become an agent towards change. Furthermore, mass media was perceived as having a positive role to play in supporting women's empowerment.

Level of Education

Table A4-21 illustrates the level of formal education of respondents. It has been recorded that the consulted female respondents were only educated with basic education and the level of being reasonably educated was found to be minimal.

Table A4-21: Level of Formal Education of Respondents

Education Level	Percentage (%)
Primary	26.4
Middle	9.7
Matric	2.7
Higher secondary school certificate	2.7
Bachelor of Arts (BA)	2.7
Master of Arts (MA)	0
Un-educated	55.5
Total	**100.0**

Participation in Decision Making Process

Most of the women respondents informed that although it's a patriarchal society, however the elder women of the families are usually asked by the men during decision making process regarding important issues such as marriages of their children etc. However, final decision power lies with the male head of the family.

Sexual Exploitation / Abuse / Sexual Harassment (SEA/SH) and Gender Based Violence (GBV)

The World Bank has been taking concerted measures to strengthen its approach to the prevention and mitigation of SEA/SH risks in Bank-financed projects. In this scenario, the female respondents identified some facts in relation to the questions regarding GBV, SEA/SH Prevention and Response:

- The female members of the communities following traditional Pashtun or Baloch traditions are usually protected from SEA and SH incidents as these traditions limits the unnecessary freedom.
- The girls are usually not allowed to go alone to public places or using public transport, especially after the painful incidents occurred in Karachi and other parts of the country during the recent past in relation to child abuse.

- The females often practice veil/purdah with their will and are not comfortable to even go to hospital alone.
- All the consulted working women were of the view that the society offers no protection to women. They avoid using rickshaws late at night due to a majority of male passengers. Women prefer buses and minibuses because they have reserved seats for women, however, opined that it is the government's job to introduce a better public transport system keeping women's needs in mind.

Women Requests

Collectively, major requests from the consulted female members of the communities are as follows;

- Improvement in available government owned health and educational facilities.
- Provision of clean drinking water.
- Introduction of women-only transport schemes
- Setting up of the skill development centres in the project area.

Annexure - 5: Assessment of Potential Environmental and Social Impacts and Risks

Potential impacts arising from design, construction and operation phase of Priority Sewer Networks Rehabilitation and Extension Project have been identified and assessed on the basis of field data, secondary data, experts' opinion and examining similar projects. These impacts include effects on physical, biological and socio-economic environments. Impacts associated with design, construction, operational phases are detailed in this Chapter.

Methodology for Screening of Impacts

The methodology for assessing the risk level associated with each potential impact is presented below. Risk is assessed as the likelihood that the activity will have an effect on the environment as well as the consequence of the effect occurring. It is often described like this:

Risk = Likelihood × Consequence

Likelihood Scale

Likelihood	Definition	Scale
Certain	Will certainly occur during the activity at a frequency greater than every week if preventative measures are not applied	5
Likely	Will occur more than once or twice during the activity but less than weekly if preventive measures are not applied	3
Unlikely	May occur once or twice during the activity if preventive measures are not applied	2
Rare	Unlikely to occur during the project	1
Adapted from: EPA Victoria, 2004. Site EMP Kit- Guidance Notes		

Consequence Scale

Consequence	Definition	Score
Catastrophic	The action will cause unprecedented damage or impacts on the environment or surrounding communities. Occurrence will almost certainly result in the work being halted and a significant fine.	5
Major	The action will cause major adverse damage on the environment or surrounding communities. Occurrence may result in work being halted and a fine.	3
Moderate	The action will cause limited adverse impacts on the environment or surrounding communities, work is unlikely to be halted, fines unlikely.	2
Minor	No or minimal adverse environmental or social impacts no likelihood of being fined.	1
Adapted from: Environmental Management for Construction Handbook-Safeguards Unit Central & West Asia Department- Asian Development Bank - ADB		

Risk Score Table

		Consequence			
		Catastrophic	**Major**	**Moderate**	**Minor**
Likelihood	Certain	**25**	**15**	**10**	5
	Likely	**15**	**9**	6	3
	Unlikely	**10**	**6**	4	2
	Rare	5	3	2	1

Risk	**Significant**	**15-25**
	Medium	**6-10**
	Low	**1-5**

Pre-Construction Phase

Screening of potential impacts during the pre-construction phase is provided in **Table A5-1**.

Table A5-1: Screening of Possible Impacts during Pre- Construction Phase

No.	Potential Issue	Likelihood(Certain, Likely, Unlikely, Rare)	Consequence (Catastrophic,Major, Moderate, Minor)	Risk Level (Significant,Medium, Low)	Residual Impact (Short term, Long term)
1	Permits, NOCs, Clearances	Likely	Moderate	Medium	Short Term
2	Lack of Appropriate E&S Personnel with CSC and Contractors	Likely	Moderate	Medium	Short Term
3	Inappropriate Planning for Traffic Management	Likely	Major	Medium	Short Term
4	Improper Location of Worker Camp Leading to Environmental and Social Issues	Likely	Major	Medium	Short Term
5	Land Requirements and Resettlement impacts	Likely	Major	Medium	Short Term

Critical Risk Level

Significant Risk Level

Medium Risk Level

Low Risk Level

Permits, NOCs, Clearances Impacts

a) Impacts

Without necessary permissions from relevant Government Agencies, the project cannot be implemented. Failure to obtain necessary consents, permits, and other appropriate regulatory clearances may result work stoppage. Permissions and clearances are required mainly from the government agencies including Sindh Environmental Protection Agency (SEPA) and District Administrations.

a) Mitigation Measures

Necessary consents, permits and clearances shall be obtained before the start of civil works.

Lack of Appropriate Environment and Social Personnel with PIU, CSC and Contractors

a) Impacts

Lack of E&S personnel's environmental safeguard capacity or selection of environment non-responsive contractors may result in failure of ESMP implementation and may be a source of non-compliances. Inadequate resources will lead to major impacts and risk in the physical, biological, and social environment and eventual harms to environment and non-compliances with ESMP requirements.

b) Mitigation Measures

Mitigation measures include:

- PIU shall recruit qualified CSC and Contractors who are able to implement the Project's Environmental, Social, Health and Safety requirements as per the desired standards.
- Education, qualification and experience requirements of personnel shall be included in the bidding documents.
- Contractors with poor environmental, health, and safety management shall not be hired.
- Contractor's qualifications as stated in this ESMP to be included as the pre-qualification criteria in the short-listing process.
- the conditions of the ESMP will be correctly reflected in the contractor's bidding documents and the supervision consultant's ToR.
- Necessary funds to be allocated in the Contract documents for ESMP implementation and monitoring.

Inappropriate Planning for Traffic Management

a) Impacts

The construction traffic will need to utilize the roads approaching to priority sewer schemes. This may cause nuisance to the general traffic and could result in traffic congestions.

b) Mitigation Measures

- PIU / CSC / Contractors in collaboration with Sindh Traffic Police (relevant sections) will devise a Traffic Management Plan (TMP) to minimize the expected disruption.
- PIU shall accord approval of TMP before initiation of construction activities and no temporary or permanent works shall be initiated before the plan is approved by the PIU.
- Scheme-wise overview of alternate routes options during the construction period is provided in **Table A5-2**.

Table A5-2: Overview of Alternate Route Options During Construction Period

Scheme No.	Description	Location	Alternate Routes during Construction
1	Laying of main Trunk Sewer line starting from Abbot Laboratories Factory towards Malir River	Abbott Laboratories to Malir River - National Highway Quaidabad - Bin Qasim Town	No alternate route needed as the construction activities will be performed at the east bound section of N5 and adequate space is available outside the construction area for the movement of east bound traffic.
2	Laying of trunk sewer from Main Paracha Chowk to TP-III Interceptor Lyari river and at Jinnah Road, Toor baba Road, Urdu Bazaar, Muhammad Road, and Akbar Road.	Main Paracha Chowk to Lyari River Interceptor and Jinnah Road, Toor baba Road, Urdu Bazaar Road and Akbar Road (S.I.T.E)	For the traffic moving from Main Paracha Chowk towards Liyari Interceptor, the other track of Mirza Adam Khan Road (Dual Carriageway) will be utilized as the alternate route.
			For the other relatively smaller roads of the scheme such as Jinnah Road, Toor baba Road, Urdu Bazaar Road and Akbar Road, various connecting streets exist in the surroundings of these roads and could effectively be utilized as alternate routes.
3	Laying of various diameter sewer lines in Sector 11 – North Karachi via KDA Chowrangi towards Lyari River.	Sector 11 via Power House Chowrangi to Lyari River Interceptor (Manghopir)	No alternate routes needed as the pipelines will be laid in the median of the dual carriage way. No disturbance to traffic is expected as adequate space is available in the median for construction activities.
4	Laying of various diameter sewer lines from Gulshan-e-Maymar towards Lyari River.	Gulshan-e-Maymar to Lyari River Interceptor (Manghopir & Gulzar-e-Hijri)	No alternate routes needed as the pipelines will be laid in the median of the dual carriage way. No disturbance to traffic is expected as adequate space is available in the median for construction activities.
5	Laying of various diameter sewer lines from Khawaja Ghareeb Nawaz Chowk towards Orangi Nala.	Khawaja Ghareeb Nawaz Chowk to Orangi Nala Trunk Sewer (Mominabad & Orangi)	Majority of the works in Scheme No. 05 will be performed at Shahrah e Qazzafi and Northern Bypass – Orangi Link roads, both of which are dual carriageways having plenty of space available for the laying of sewer lines without causing any significant hindrance in the traffic movement.
7	Laying of various diameter sewer lines from Raja Tanveer Colony towards Orangi Nala.	Raja Tanveer Colony to Orangi Nala Trunk Sewer (Mominabad)	Scheme No. 06 works will be mainly performed at the Orangi Road which is a dual carriageway. Laying of sewer lines will be done in the median of the road and adequate space is available

Scheme No.	Description	Location	Alternate Routes during Construction
			for construction works without disturbing the traffic. Some disturbance to traffic may occur at roads emerging out from small neighbouring localities where the local sewer lines will be connected to the main line such as Sector 11 – Ittefaq Colony Road, Islam Chowk Road – Baloch Para and Chishti Nagar Road. However, a number of adjacent roads are available in proximity to these roads to serve as an alternate path for the traffic to move.
8	Laying of various diameter sewer lines from Irani Camp Area towards Orangi Nala	Irani Camp to Orangi Nala Trunk Sewer (Mominabad)	Scheme No. 07 works will be performed at KK Abdal (also known as Street No. 04) Road and Fareed Colony – Gulshan e Ghazi Road both of which are dual carriageways. Works will be performed at the median, where adequate spaces is available and no significant disturbance to traffic movement is expected.
9	Laying of various diameter sewer lines from Cozy homes Block-13-A to Sattar Masjid Block-17 via Bait-ul-Mukarram Masjid	Masjid-e-Sattar to Scheme no. 07 of SOP-1 (UC-22, Gulshan-e-Iqbal, District East-B)	The section of scheme no. 08 that runs in parallel to the Main University Road will be laid at the service road, therefore no significant disturbance to traffic movement is expected. Also, the road from Baitul Mukarram Masjid to Sattar Masjid also have adequate space available in the median, where the works will be performed, and the works will not cause disturbance to traffic flow. Alternate road for the other narrower road where the works will be performed include Jamia Masjid Al Gilani Road, alternate for Azam Khan Road.
10	Laying of various diameter sewer lines from Masjid-e-Quba to Al-Quddos Apartment Block-13C	Al-Quddos Apartment Block-13C to Scheme no. 07 of SOP-1 near Masjid e Quba - (UC-22, Gulshan-e-Iqbal, District East-B)	Works have to be performed mainly at Umrao Tariq Road and Nasir / Amir Shehenshahi Roads are available as alternate roads for smooth traffic movement.
11	Laying of various diameter sewer lines from Millat Town CNG Pump to Malir-15 Railway Phatak Jamia Millia Roads (UC-14) in Areas of Shah Faisal Town.	Malir-15 to Malir River Interceptor (Shah Faisal)	Shahfaisal Town / Azeempura Road where major section of the sewer scheme will be laid is a dual carriageway with wide corridor and laying of pipelines in the median and service road areas will not cause significant disturbance to the traffic movement. Remaining section of the scheme will be laid at the westbound section of Jamia Milia Road and eastbound section will be available for the flow of traffic in both directions during construction period.
12	Laying of various diameter sewer lines from Dayar-e-Shereen Sweets	Dayar-e-Shereen Sweets Buffer Zone to Ziauddin Hospital	Pipeline under this scheme will be laid at the service road of the south-bound section of Syed Raees Ahmad Jafri

Scheme No.	Description	Location	Alternate Routes during Construction
	Buffer Zone to Ziauddin Hospital to Wahid Colony, North Nazimabad	to Scheme-16 of SOP-1 near Wahid Colony, North Nazimabad	Road and Allama Rasheed Turabi Road. As an alternate, the north bound track could be utilized for traffic movement in both directions during construction phase.
13	Laying of various diameter sewer lines at different spots from Tannery Pumping Station to Atma Ram Road Baghdadi via Mirza Adam Khan Road	Atma Ram Road to 08 Chowk to Pumping Station (UC No. 01,02,03,08 & 09 Lyari Town - District South-A)	Laying of pipeline at narrow Denso Road and Haji Pir Mohammad Road connecting Chakiwara Pumping Station to Atma Road will result in road closures. Therefore, Slaughter Yard Road alternate to Haji Pir Mohammad Road and Gali No. 21 (Chakiwara) alternate to Denso Road could be utilized for the movement of traffic. Atmaram Pritamdas Road is wider, and one track of the road could be utilized for the movement of bi-directional traffic during construction stage.
14	Laying of various diameter sewer lines at different spots starting from Atma Ram Road to Zero Point Maripur Road to Peoples Play Ground Via Maripur Road Uc-No 01,02 & 03 Lyari Town	Atma Ram Road to Mirza Adam Khan Road to Pumping Station (Uc-No 01,02 & 03 Lyari Town)	All the major roads where the pipeline will be laid under this scheme include Mirza Adam Khan Road, Atmaram Pritamdas Road, Maripur Road and Ahmad Shah Bukhari Road. Mirza Adam Khan Road and Maripur Road are dual carriageways and works will be performed at the service road areas of these roads, therefore no significant disruption to traffic is expected. Atmaram Pritamdas and Ahmad Shah Bukhari Roads are wider, and one track of these roads could be utilized for the movement of bi-directional traffic during construction stage.
15	Laying of various diameter sewer lines from Peoples Stadium to Pumping Station	Peoples Stadium to Pumping Station (Lyari)	Pipeline under this scheme will be laid at Maripur Road and Skaikh Abdul Rasheed Road. Adequate space is available at both the roads for the uninterrupted traffic flow during construction stage. Many small streets are also available in the vicinity of Skaikh Abdul Rasheed Road, which could be utilized in case of traffic jams.

Improper Location of Worker Camps Leading to Environmental & Social Issues

c) Impacts

The duration of the construction activity for the project is expected to be 18 months and approximately 700 skilled / unskilled workers will be engaged. Influx of these workers could affect project areas negatively in terms of:

- Disturbance to privacy of nearby communities.
- Community exposure to Labour Influx; Gender Based Violence, Sexual Exploitation and Abuse (SEA) / Sexual Harassment (SH)

- Improper Sewage and Waste Disposal
- The influx of workers may bring communicable diseases to the project area.

d) Mitigation Measures

- The Contractor will hire local workforce at the most for the project's construction works at priority sewer schemes. Local workforce, suitably skilled with sewage pipeline trenching and laying works is readily available in all areas of Karachi and the need for their permanent stay at the campsites will be minimal.
- The campsites will mainly be utilized for the temporary facilities such as workers washrooms, rest areas and temporary placement of construction material and only security guards will be required to have permanent stay at the campsite.
- Campsite locations are proposed after consulting with the Technical Consultants and keeping in view the suitable distance from the nearby settlements. However, final locations will be selected by the Contractor with the approval of Supervision Consultant with a key consideration that the selected locations are appropriately distant from settlements and religious and / or cultural facilities.
- The Contractor in collaboration with the PIU / CSC will ensure that camps are suitably separated from local communities with strict protocols for interaction with local communities in order to avoid impacts from labor influx and having minimal disturbance to the nearby communities.
- Contractors will follow whereas PIU shall ensure the adherence to the labor standards including Provincial Labor Laws and ILO Standards for work hours, worker's payments & compensations.
- The Contractor in collaboration with the PIU / CSC will establish strict protocols for interaction with local communities.
- Contractors must follow whereas PIU shall ensure the adherence to the labor standards including Provincial Labor Laws and ILO Standards for work hours, worker's payments & compensations.
- Contractor shall prepare a Workers Camp Management Plan (CMP) and ensure its effective implementation.

Other necessary measures shall include:

- Contractor shall develop a Code of Conduct (COC) for all site personnel. All site personnel shall sign this COC and abide by it.
- Contractor shall ensure that project staff will receive training on the prevention of Sexual Exploitation, GBV / SH.
- Provision related to SEA/SH/GBV will be incorporated in the bidding document,
- The Contractor shall raise awareness of the risks among community members and local health authorities and inform them about available grievance mechanisms.
- Contractor shall conduct induction training or workshops to introduce the basics of health and hygiene and the necessary preventive measures against diseases.
- Necessary medical screening of all workers & staff and submission of proof of vaccination (COVID-19) prior to any employment shall be ensured.

- Workers shall be provided with trainings on the Worker's GRM so that they know their rights and responsibilities.
- Availability of complaint box shall be ensured at all work sites.

Land Requirements and Resettlement Issues

a) Impacts

The project will cause disturbance to the assets of 42 Project Affected Persons (PAPs) in terms of removal of stalls, cabins, huts, washrooms etc. coming under the trenching area.

b) Mitigation Measures

- As described earlier, an Abbreviated Resettlement Plan (ARP) has been prepared for the proposed project in compliance with the WB ESS5. The effective implementation of the ARP will ensure that the resettlement impacts of the project described above are adequately addressed. Compensation and assistance will be paid to the PAPs in accordance with the ARP.
- Construction activities will not commence until all the compensation and assistance have been provided to the PAPs.

Impacts Associated with Anti Encroachment Drive

Informal settlements and squatters are widespread in Karachi, including residential and commercial encroachers on vacant lands, sidewalks, public spaces etc. A major Anti-Encroachment Drive (AED) was initiated in Karachi in October 2018 on the order of the Supreme Court of Pakistan. The Court ordered to vacate public spaces (such as parks, footpaths, amenity plots) across the city from unauthorized uses and occupations. The order is currently under implementation by various civic and local agencies, including KMC, who are required to report periodically to the Court regarding progress. The focus of the AED is on commercial activities encroaching on public spaces. Thousands of businesses, street vendors, and hawkers have been affected, primarily in most commercial districts. Acknowledging the adverse impacts of AED on the poor and vulnerable groups, the GoS and local agencies like KMC are making efforts to relocate some affected businesses.

a) Zone of impact

In general, for the proposed Priority Sewer Networks Rehabilitation and Extension Project, the zone of impact for the project alignment could be defined as the space required for the laying of sewerage infrastructure and any additional area required for construction-related activities (stocking of materials, backfill, the area used by construction labor, or any other temporary use etc.).

b) Methodology Adopted for AED-Related Screening

The AED-related screening was assessed through the following means:

- Information from a focal person of the concerned district;
- Visual observations of focal persons, consultants, and PIU-KWSSIP specialists at the time of screening survey; and

- Public consultations.

c) Screening of AED Affected Areas and Project

- The Commissioner's office was approached to collect previous data available with the department with reference to AED. Unfortunately, no past data is available in this regard, therefore, AED-related screening of proposed project sites was carried out in different districts of Karachi with the help of focal persons of District Municipal Corporations (DMCs), Municipal Corporations (MCs), and District Councils nominated by concerned Deputy Commissioners' offices.
- Joint visits of focal persons from civic agencies, Environmental and Social Experts of KWSSIP and the E&S Consultant was conducted to screen out the proposed project affected by AED during July 2022.
- Based on the information provided by the focal person, visual observations, and public consultations, it is concluded that no AED has been carried out in the zone of impact of the proposed project since October 2018. No AED is expected to be carried out in the project's zone of impact as this zone is clear of any encroachments.

Construction Phase

Screening of potential impacts during the construction phase of the project are provided in **Table A5-3**.

Table A5-3: Screening of Possible Impacts during Construction Phase

No.	Potential Issue	Likelihood(Certain, Likely, Unlikely, Rare)	Consequence (Catastrophic,Major, Moderate, Minor)	Risk Level (Significant, Medium, Low)	Residual Impact (Short term, Long term)
1	Inadequate Implementation of ESMP, OHS, CHS and Other Specific Plans.	Likely	Major	Significant	Short Term
2	Occupational Health & Safety and Emergency Preparedness & Response	Likely	Major	Significant	Long term
3	Communicable Diseases - COVID- 19 and Camp Management	Likely	Major	Medium	Short term
4	Employment of Child Labor	Unlikely	Major	Moderate	Long Term
5	Employment Generation	Overall Positive			
6	Dust Emissions	Likely	Moderate	Medium	Short term
7	High Noise Levels from Construction Activities	Likely	Moderate	Medium	Short term
8	Waste Management - Generation of Excavated Material, Kitchen Waste, Old Asbestos Pipes	Likely	Major	Significant	Short term
9	Untreated Disposal of Effluent from Worker Camp	Likely	Moderate	Medium	Short term
10	Soil Contamination	Likely	Moderate	Medium	Short term
11	Improper Site Restoration	Likely	Major	Medium	Short term
12	Community Health & Safety	Likely	Major	Significant	Short term
13	Labor Influx / SEA – SH – GBV Incidents	Likely	Moderate	Medium	Short term
14	Construction Traffic Management and Safety	Likely	Moderate	Medium	Short term
15	Vegetation Loss	Likely	Moderate	Medium	Short term
16	Restricted Access	Likely	Moderate	Medium	Low
17	Stakeholders Concerns and Engagement	Unlikely	Moderate	Low	No residual Impact

Critical Risk Level

Significant Risk Level

Medium Risk Level

Low Risk Level

Inadequate implementation of ESMP, OHSMP, CHSMP and Other Plans

a) Impacts

Inadequate implementation of ESMP and associated plans will result in major concerns in the form of community grievances, environmental / social impacts and risking the health and safety of the workforce.

b) Mitigation Measures

- The CSC and Contractor will recruit qualified and experienced Environment, Health, Safety and Social Staff in line with the requirements mentioned in Section 6.8.2.
- Contractor to define Environmental, Social, Occupational & Community Health and Safety procedures for all works in method statements and shall prepare and implement Site Specific Environmental Social Management Plan (SSESMP), OHS Plan, CHS Plan and other required plans based on the ESMP guideline. These procedures and plans shall be approved by the PIU and CSC before the Contractor commences any physical works on ground.
- PIU - KWSSIP shall review the Contractor's capacity with respect to safeguard management . Contractors not possessing the required capacity for E&S safeguards management will not be pre-qualified.

Occupational Health & Safety and Emergency Preparedness & Response

a) Impacts

- Occupational Health and Safety risks related to the project shall mainly be associated with the project's construction phase as the workers will be exposed to a number of physical hazards such as accidents related to the use of heavy equipment and cranes, falling of objects, trip and fall accidents near deep excavations, heat stress / heat stroke occurrences during extreme hot weather, fires at construction sites, increased levels of dust and noise at sites etc.
- During excavation activities, old asbestos cement (AC) pipes either in abandoned state or in use by the current sewerage network in priority sewer schemes could be found.
- Toxic gases (e.g., hydrogen sulfide) can accumulate in sewerage lines, leading to asphyxiation or poisoning. Confined spaces lack proper ventilation, exacerbating the risk.
- Limited space may lead to physical hazards, such as getting trapped or crushed.
- Inadequate air circulation can cause heat stress and discomfort.
- Working near or on old pipelines may weaken the structures, risking collapse or injury to workers and nearby residents.

b) Mitigation Measures

- Before commencing construction activities, Contractors will develop an Occupational Health and Safety (OHS) Management Plan in compliance with national/local regulations. The OHS plan should include an OHS Policy Statement, OHS Organization, SOPs for all tasks, Hazard Identification and Risk Management, Job Hazard Analysis, Method Statements with OHS considerations, OHS

training requirements, incident recording and reporting protocols. The OHS plan must be approved by the supervision consultant before construction begins.

- Contractor will implement gas monitoring systems and provide personal protective equipment (PPE) like gas masks and respirators.
- Contractor will establish effective communication procedures to alert workers in case of emergencies.
- Contractor will conduct thorough risk assessments and provide confined space entry training to workers.
- Contractor will ensure proper ventilation with fans or blowers to maintain airflow.
- Contractor will obtain accurate maps and blueprints to avoid accidental damage.
- Contractor will use non-destructive digging techniques and erect barricades and warning signs.
- The PIU-KWSSIP and Contractors will follow the Health & Safety Framework by the World Bank and incorporate it into the OHS plan.
- Specific mitigation guidelines for construction hazards and all contractor level plans will be reviewed and approved by the CSC and PIU.
- The established occupational health and safety protocols on COVID-19, issued by the Ministry of National Health Services, Regulations and Coordination, GoP - April 2020, will be adhered to.
- Contractors must prepare an Emergency Preparedness and Response Plan (EPRP) as part of the OHS Plan to handle larger emergencies.
- The PIU will collaborate with national/provincial emergency response services to ensure external emergency response arrangements (e.g., Fire, Ambulance, Epidemic Control) if Contractor resources are insufficient.
- At every workplace, a readily available first aid unit with sterilized dressing material and appliances will be provided, along with suitable transport for transferring injured or ill persons to the nearest hospital.
- Proper equipment and paramedical staff will be available at every workplace and construction camp.
- The Contractor will maintain site safety and install hard barricading, flexible green netting, signboards, temporary safety and traffic diversions throughout the construction period, providing PPE to all workers.
- A zero-tolerance policy for loss of life will be developed and implemented by the Contractor.
- Contractors will ensure organization of Health and Safety trainings for all site personnel throughout the construction period.
- In case of accidents resulting in injuries or fatalities to workers, compensation will be provided following the Sindh Workers Compensation Act, 2015.
- If any AC pipes are found during excavation activities, they will be disposed of through SEPA certified waste handlers.

Communicable Diseases - COVID- 19 and Camp Management

a) Impacts

Inappropriate camp management may lead to spread of communicable diseases t among workers.

b) Mitigation Measures

The Contractor shall ensure the following measures:

- Implementation of health and safety protocols on COVID19 i.e. Health & Safety of Building and Construction Workers - Issued by Ministry of National Health Services, Regulations and Coordination, GoP - April, 2020.
- Awareness among workers will be created on proper sanitation and hygiene practices;
- Good housekeeping practices will be maintained at camp and project sites;
- Adequate personal hygiene facilities will be provided in good condition with adequate supply of clean water;
- Arrangements will be made to treat the affected workers on time to control the movement of vectors diseases;
- Implementation of Camp Management Plan and Labor Management Procedures (LMP).
- Use of non-wood fuel for cooking;
- Contractor shall implement ECP 9: Construction Camp Management.
- Cleaning staff shall be appointed for maintaining cleanliness at Campsites.

Employment of Child Labor

a) Impacts

Major impacts of child labor include psychological, physical damage to the child being employed, deprivation of educations and chances of sexual exploitation.

b) Mitigation Measures

- The Contractor shall have its employment policy in accordance with relevant acts, guidelines and labor policies i.e. The Sindh Prohibition of Employment of Children Act, 2017 ;
- No child having age below 18 shall be allowed to be employed in any construction work by the – construction contractors, sub-contractors and any service providers.
- Contractor will ensure that all persons at site are adults and have their government issued identity card with them.

Employment Generation

Primarily a positive impact, the project will create significant temporary employment for construction workers, maintenance, support, administrative, security and project management staff. Majority of

project staff are expected to be recruited locally from within the native / local workforce. It is expected that around 700 employment opportunities shall be created during the construction period.

Dust Emissions

a) Impacts

- Local air quality shall be affected by dust and vehicular emissions due to the movement of construction vehicles.
- The impacts of dust emissions shall mostly be limited to the work areas.

b) Mitigation Measures

The Contractor will implement the following measures to protect the identified sensitive receptors from dust nuisance:

- **Water Spraying:** Regular sprinkling of water on construction sites and exposed surfaces to suppress dust emissions and keep dust particles from becoming airborne.
- **Enclosures and Barriers:** Setting up temporary barriers or windbreaks using mesh screens or fences around construction sites to contain the dust and prevent it from spreading to nearby sensitive areas where necessary.
- **Speed Limits and Traffic Control:** Adherence to reduced speed limits around construction sites to minimize the dispersion of dust from vehicle movements and control dust generation.
- **Regular Cleaning:** Regularly sweeping and cleaning the construction areas and access roads to prevent dust buildup and keep the surroundings clean.
- **Traffic Diversion:** Whenever possible, diverting heavy traffic away from schools and hospitals during construction to minimize dust exposure in those areas.
- **Cover Material Piles:** Covering construction materials, such as sand, gravel, and soil piles, to prevent wind from dispersing dust particles and affecting nearby facilities.
- **Work Scheduling:** Planning construction activities in a way that minimizes dusty operations during peak hours when schools and hospitals are most active.
- **Community Engagement:** Engaging with the local community, including schools and hospitals, to inform them about construction activities, potential dust impacts, and the mitigation measures being implemented.
- **Regular Monitoring:** Conducting regular monitoring of dust levels around sensitive areas to ensure compliance with acceptable limits and take corrective actions if needed.
- **Worker Training:** Training construction workers on dust control measures and best practices to minimize dust generation during construction and maintain a clean and safe work environment.
- Earliest resolution of any dust related public complaints registered through Project's Grievance Redress Mechanism.

High Noise Levels from Construction Activities

a) Impacts

Construction activities will involve use of construction equipment and machinery i.e. excavators, cranes, power generators, loaders and dumper trucks etc. which may generate high noise levels at the project sites and can have effects on the people nearby the project sites. However, these increased noise levels will prevail only for a short duration during the construction phase.

b) Mitigation Measures

The Contractor will implement the following measures to protect the identified sensitive receptors from noise nuisance.

- **Noise Barriers:** Where necessary, installing temporary noise barriers around the construction site to reduce the transmission of noise to nearby schools and hospitals.
- **Work Scheduling:** Planning construction activities during off-peak hours when schools and hospitals are less busy to minimize the impact of noise on their daily operations.
- **Equipment Selection:** Using modern and quieter construction equipment and machinery to reduce noise emissions during construction.
- **Noise Control on Machinery:** Implementing noise control measures on machinery and equipment by using mufflers and sound-insulating materials.
- **Maintain Equipment:** Regularly maintaining construction machinery to ensure they are operating efficiently and producing less noise.
- **Traffic Management:** Implementing efficient traffic management around the construction site to reduce vehicle noise and congestion.
- **Worker Training:** Training construction workers to operate equipment and machinery in a way that minimizes noise and to be mindful of noise levels near sensitive locations.
- **Community Engagement:** Communicating with the local community, including schools and hospitals, about the construction schedule, potential noise impacts, and the steps being taken to mitigate noise.
- **Noise Monitoring:** Conducting regular noise monitoring around sensitive areas to ensure compliance with acceptable noise limits.
- **Encourage Quiet Work Practices:** Encouraging construction workers to adopt quieter work practices, such as avoiding unnecessary shouting and loud conversations.
- Earliest resolution of any noise related public complaints registered through Project's Grievance Redress Mechanism.

Waste Management - Generation of Excavated Material, , Old Asbestos Pipes

a) Impacts

- During construction phase the major waste streams will include Excavated Material from trenching / excavation and Domestic Waste from construction camps. Wet excavated material mixed with

sewage could be generated from those sections of the priority sewer networks where existing sewers are nearby. The works may require removing the sewage sludge at choking points along these networks and at locations where new network will be connected with the old network. Other Hazardous Waste streams include used oil filters, used oils from machinery and small quantities of Medical Waste resulting from first aid treatments.

- During excavation activities, asbestos cement (AC) pipes may be recovered that could either be abandoned or in use by the current sewerage network in priority schemes.
- Estimated quantities of major waste stream to be generated during the construction phase includes the following;
  - 806,000 cubic meter of Excavated Material
  - 383,600 kg of Domestic Waste from Construction Camp
- Quantification of other waste streams will only be possible after the design and the method statements are finalized.

b) Mitigation Measures

- After backfilling and other related works, 241,800 m^3 of surplus material shall be the leftover. Clean surplus excavated material will be sold to third-party vendors, whereas the excavated material mixed with sewage will be disposed through SEPA certified waste handlers with the approval of the Environmental and Social Cell (ESC) - Project Implementation Unit (PIU) and Construction Supervision Consultants (CSC).
- A waste management plan will be developed by the Contractor prior to the start of construction. The plan will cater sorting and storage of hazardous and non-hazardous materials prior to disposal, placing of waste bins at the project sites for waste disposal and an onsite hazardous waste storage facility i.e. designated area with secondary containment. The plan will also include specific measures to handle and manage sewage induced excavated material and AC pipes generated due to sewer pipelines laying works.
- Licensed and SEPA approved waste contractors will be engaged to dispose-off all hazardous and non-hazardous waste materials that cannot be recycled or reused including, wet sewage induced excavated material and AC pipes etc. (if found during excavation).
- Fuel storage areas, hazardous material storage areas, and generators will have secondary containment in the form of concrete or brick masonry bunds. The volume of the containment area shall be equal to 120% of the total volume of fuel stored.
- Domestic waste from the camp will be disposed to the nearest SSWMB waste disposal bins.

Untreated Disposal of Effluent from Worker Camp

a) Impacts

The project's construction camp will be a source for the generation of domestic effluent from the toilets, washrooms, and the kitchen area.

b) Mitigation Measures

- The Contractor will ensure that no untreated effluent is released. A closed sewage treatment scheme including soak pits / septic tanks will be constructed to treat the effluent from the construction/labor camp.
- Soak pits will be built in absorbent soil and shall be located 300 m away from any nearby water wells, bores etc.
- It will be ensured that the soak pits remain covered all the time and measures are taken to prevent entry of rainwater into them.
- In case the septic tank gets filled with sludge, it shall be emptied through vacuum truck and after getting approval from KWSC, the removed effluent shall be transferred to the approved municipal drain.

Soil Contamination

a) Impacts

During construction, spills of fuel, lubricants, chemicals, and equipment leaks pose soil contamination risks. Sludge from sewer lines is another significant source of contamination. To mitigate these risks, the Contractor will implement the following measures.

b) Mitigation Measures

- Establishing a systematic process for handling and disposing of sludge from sewer lines through SEPA certified waste handlers, preventing spills and leakages during transit.
- Installing arrangements to prevent spills from reaching the soil, using secondary containment for storage areas.
- Providing personnel with spill prevention and response training, emphasizing safe handling of sludge and hazardous materials.
- Using measures to prevent soil erosion and the spread of contaminants.

Improper Site Restoration

a) Impacts

Failure to restore temporary sites, such as Campsites, appropriately can result in the area losing its value and functionality. These sites may become a nuisance to the public and users due to damaged conditions, debris, dismantled materials, excess construction materials, oil spills, and other issues. Of particular concern are excavation trenches and similar areas, which can create accessibility and safety challenges to public. Mitigation Measures.

Following measures will be adopted by the Contractor for site restoration works:

- Implementing a comprehensive restoration plan for temporary sites, including Campsites, before project completion.

- Conducting regular inspections to identify and addressing any damages or hazards in the restored areas.
- Properly disposing of debris, dismantled materials, and excess construction materials in accordance with waste management regulations.
- Cleaning up and remediating any oil spills or hazardous materials promptly and appropriately.
- Ensuring excavation trenches and similar areas are backfilled and restored to ensure safety and accessibility.
- Replanting vegetation and landscaping the area to restore its natural appearance and functionality.
- Engaging with the local community and stakeholders to address any concerns and seeking feedback on the restoration process.
- Monitoring the restored sites over time to assess their effectiveness and making necessary adjustments if required.
- Establishing clear guidelines and responsibilities for subcontractors regarding site restoration.
- Educating all project personnel about the importance of proper site restoration and their roles in achieving it.

Community Health & Safety

a) Impacts

Communities could face the following health and safety risks of construction activities:

- Nuisance due to dust and noise.
- Nuisance due to rains.
- Restricted access to sensitive receptor locations as identified under Section 4.3.
- Chances of fall into unprotected excavations, or other similar accidents.
- Poor storage of materials, equipment and other obstructions in public areas, including inadequate control of waste materials, are also common causes for slips, trips and falls.

b) Mitigation Measures

- Contractor shall prepare Community Health and Safety Plan based on construction methods, site specific hazards and framework
- Construction areas including trenches, excavations, holes and obstructions shall be properly barricaded and marked with warning tapes.
- Off-site stacking of material shall be avoided to the maximum possible extent. In case it is unavoidable, stacking areas shall be positioned away from public access with adequate posting of warning signs.
- Excavated material shall not be piled next to the trenches and excavations for long periods shall be removed from site on a frequent basis.

- Excavations and trenches shall not be left open for long and be reinstated as soon as the works in that particular section is completed.
- Site supervisors shall be trained to keep a watch on people especially kids trying to enter the construction area and restrict them crossing the site unnecessarily.
- Safety measures during wet spells include; stabilizing work areas with drainage, providing non-slip mats and implementing traffic control. Prompt clean-up, proper storage, and regular inspections ensure safety for workers and the public during wet spells.
- The entrance, access routes to the construction areas and any obstructions shall be clearly signposted.
- Adequate lighting shall be installed at excavated areas and trenches to keep them well-lit and prominent during night for the sake of workers as well as public safety.
- Contractor shall ensure that all the vehicle drivers and equipment operators have valid licenses and proven competency to safely operate vehicles and equipment in populated areas.
- Following measures shall be adopted for minimizing the nuisance caused by dust and noise to the public:
  - Use of noise suppression on equipment;
  - Use of low-dust producing construction techniques;
  - Use of water sprinkling for dust suppression;
  - Work at times when the public are less likely to be in the area;
  - Provision of solid barriers adjacent to public areas and sensitive receptors where possible.
- Contractor shall provide safe pedestrian walkways at the identified sensitive receptor locations where required to allow safe entry and exit to the visitors.
- The walkways provided shall be maintained to a standard suitable for use by women, children, elderly, patients and disables.
- The walkways shall be properly barricaded, where necessary provided with guardrails and made prominent by installing signs and reflective tapes.
- Sign boards will be placed at appropriate locations to warn the public about construction activities and the associated risks
- Community liaison will be maintained. Community awareness will be raised about the construction related risks.

Labor Influx / SEA – SH – GBV Incidents

a) Impacts

- Influx of workers at project sites may pose a threat of communicable diseases, most common are HIV/AIDs (Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (AIDS), COVID- 19, tuberculosis, pulmonary infections, typhoid, cholera and dysentery, malaria, rabies and other skin disease, hepatitis A, B and C, in case of not complying with adequate control measures.

- The influx of labor, seeking construction jobs can be associated with a series of social challenges such as crime, illegal drug abuse etc.
- Many of the skilled labor employed from outside the project area may cause some antipathy among the local people and outsiders.

b) Mitigation Measures

- The contractor shall employ more locals in skilled, semi-skilled, and unskilled work. ;
- The contractor will proactively manage the potential impacts from labor influx and potential cultural conflicts between local communities and workers, which include following:
  - Construction camp will be built at the designated areas;
  - Inclusion of COC obligations and the applicable legislation in the contracts of all employees and workers with the provision of sanctions and penalties in case of violations;
- Contractor shall ensure that project staff will receive training on the prevention of Sexual Exploitation, Gender Based Violence and Abuse (SEA) / Sexual Harassment (SH).
- Construction crew will avoid entering settlements.
- The Contractor shall raise awareness of the risks among community members and local health authorities and inform them about available grievance mechanisms.
- The routes/places used by the women will be avoided as far as possible. If unavoidable, alternate routes will be identified for the communities.
- Any violation of the COC will lead to strict punishment including termination of employment;
- The use of drugs and alcohol will not be allowed at the work/construction site;
- Carrying weapons into the workplace premises will be prohibited;
- Site security arrangements will be ensured in line with Security Management Guidelines for Contractors
- Appropriate fencing, security check points, gates and security guards will be provided at the construction sites to record entry and exit of workers, staff and visitors;
- The Contractor will ensure that good relations are maintained with local communities.

Construction Traffic Management and Safety

a) Impacts

Movement of construction traffic could cause temporary nuisance to public in the vicinity of priority sewer schemes trenching areas.

b) Mitigation Measures

The Contractor shall implement the following measures for effectively managing the construction traffic and public safety:

- Traffic Management Plan shall be prepared before taking up any construction work and shall be implemented after getting approved from the PIU / CSC.

- Barricades, signs, markings, flags, lights and flagmen shall be deployed at key spots.
- The flagmen shall be trained for traffic management and equipped with red and green flags and lights.
- In case of community related accident, compensation shall be paid in accordance with Fatal Accidents Act 1855.

Vegetation Loss

a) Impacts

180 trees growing in the Direct Impact Area (DIA) under the AoI, will require to be cut for the execution of construction activities. Details of the trees to be cut are provided in **Table A5-4**.

Table A5-4: Trees in DIA to be Cut for Construction Activities

No.	Name Of Species	Common Names	IUCN Status	No. of Trees
1	*Acacia nilotica*	Babur	LC	1
2	*Azadarichta indica*	Neem	LC	27
3	*Conocarpus lencifolius*	Cono	NT	55
4	*Ficus palmata*	Phagwara, Anjir, Patguleri	NE	3
5	*Ficus religiosa*	Peeple	NE	13
6	*Eucalyptus citriodora*	Safeda	NE	65
7	*Guaiaum officinale*	Lignum	LC	7
8	*Phoenix dactylifera*	Date palm	NE	4
9	*Ziziphus jujube*	Bair	LC	5
Total				**180**

b) Mitigation Measures

Specific scheme-wise Compensatory Tree Plantation Plans shall be prepared by the Contractor based upon the Tree Plantation Plan. According to the Tree Plantation Plan;

- The Contractor shall make inventory of the trees that shall require to be cut before initiation of construction activities based on finalized work plan and requirements.
- Suitable space for tree plantation shall be identified by the PIU and KWSC in consultation with Local Government Department, Parks and Horticulture Department - KMC and District Municipal Corporations (DMCs) before clearance of trees.
- Efforts will be made to plant compensatory trees as close to the site of original cut tree as possible.
- Seed supply, nursery, watering and any other necessary maintenance arrangements will be managed by the Contractor for the trees planted under compensatory plantation, during the Contract Period and Defect Liability Period.
- At the end of Defect Liability Period, the trees will be handed over to the Parks and Horticulture Department - KMC and District Municipal Corporations (DMCs), which will have the ownership of the land for compensatory plantation sites.
- Compensatory plantation of the trees shall be undertaken by the Contractor at the replacement ratio of ten trees for every tree that is cut (i.e. 10:1 ratio);

- For trees that could be saved from cutting, all precautions shall be taken to protect them from any damage from construction activities.
- The Contractor will also be required to compensate the cutting of shrubs in the project's DIA through plantation of ornamental shrubs at the areas to be specified by the PIU at the time of project execution.

Restricted Access

a) Impacts

The construction activities may block access to the sensitive receptors**.**

b) Mitigation Measures

- Contractor shall leave space for safe pedestrian walkways at the listed sensitive receptor locations to allow safe entry and exit to the visitors.
- The walkways spaces shall be maintained to a standard suitable for use by women, children, elderly, patients and disabled.
- The walkways shall be suitably barricaded, where necessary provided with guardrails and made prominent by installing signs and reflective tapes etc.

Stakeholders Concerns and Engagement

a) Impacts

The identified stakeholders may have different types of stakes associated with various aspects of the project depending on their professions, affiliations, and involvements.

b) Mitigation Measures

- Stakeholder Engagement Plan for the KWSSIP-2 shall be followed throughout project implementation. Chapter 8 provides detailed account of Stakeholders Engagement and Information Disclosure.
- PIU, CSC, and Contractor to ensure public consultations and participation of stakeholders throughout the project lifecycle in line with the KWSSIP-2 Stakeholders Engagement Plan (SEP). This would ensure that concerns about the impacts of the project are addressed at the right time.
- Stakeholder engagement to be carried out in a meaningful and inclusive way, providing access to remedy.

Operational Phase

OHS Risks Associated with Maintenance & Cleaning of Sewer Network

a) Impacts

- Deterioration and wear & tear could occur with the passage of time and will require regular maintenance. Sanitation workers involved in the cleaning and maintenance of the proposed priority sewer networks could be exposed to Hydrogen Sulphide (H_2S) when cleaning or maintaining the

sewer lines. Sanitation workers dealing with sewage may be at increased risk of becoming ill from waterborne diseases.

- Public could face nuisance in terms of odour and pathogens exposure if the waste removed from the sewer lines during maintenance / cleaning shall not be removed from the site and disposed timely. Transportation of removed waste could also cause become a source of nuisance to general traffic.

b) Mitigation Measures

Sanitation workers involved in the cleaning and maintenance shall be provided with proper PPEs. The following PPE is recommended for workers involved in cleaning / maintenance of sewer lines:

- Goggles: to protect eyes from splashes of sewage.
- Protective face mask or splash-proof face shield: to protect nose and mouth from splashes of sewage.
- Repellent coveralls
- Waterproof gloves: to prevent exposure to sewage.
- Rubber boots: to prevent exposure to sewage.
- For protecting sanitary workers from Hydrogen Sulphide (H2S) exposure, it is advised that only positive-pressure self-contained breathing apparatus (SCBA) or positive-pressure air-line units with an emergency egress bottle shall be used in any known or suspected H_2S environment.
- Appropriate H_2S warning signs shall be posted in immediate areas prone to potential H_2S exposure.

SEPA certified hazardous waste handlers will be contracted for the safe and timely removal and transportation of removed sewage waste for its appropriate disposal. Cleaning and maintenance operations will be performed at night when the roads are quieter with less vehicular traffic.

WB Health & Safety Framework – South Asia Region (SAR)

HEALTH AND SAFETY FRAMEWORK

South Asia Region (SAR)

Table of Contents

1 Overview

Health and Safety is defined as the process of anticipation, recognition, evaluation and control of hazards arising in or from the workplace and the community that could impair the health, safety and well-being of workers, considering the possible impact on the surrounding communities and the general environment. The Health and Safety Framework outlines the management of workplace and community hazards and take appropriate preventive measures to make workplace and community safer and healthier.

2 Purpose

This document is a framework for the Borrower to implement a practical approach to manage Occupational Health and Safety (OHS) and Community Health and Safety (CHS) impacts and risks in accordance with national/local regulatory framework, the World Bank Environmental and Social Standards and Environmental Health and Safety (EHS) Guidelines, ISO Standards, Good International Industry Practices (GIIP), etc. This framework document will be in accordance with the following:

- National laws including Acts, Regulations, Codes of Practice, Guidelines, etc. where the project is located.
- ESS2 – Labor and Working Conditions
    - The Borrower will develop and implement written labor management procedures applicable to the Project.
    - Measures relating to occupational health and safety will be applied to the project. The OHS measures will include the requirements of ESS2 and consider the General Environmental Health and Safety Guidelines (EHSGs) and, as appropriate, the industry-specific EHSGs and other GIIP.
    - The OHS measures will be designed and implemented to address, (a) identification of hazards, (b) provision of preventive and protective measures including method statements, safe work procedures, etc., (c) training of project workers, (d) documentation, reporting, and remedies of occupational incidents, (e) emergency prevention and preparedness and response arrangements to emergency situations, and (f) remedies for adverse impacts such as occupational injuries, deaths, disability and disease.
    - All parties who employ or engage project workers will develop and implement procedures to establish and maintain a safe working environment, including that workplaces, machinery, equipment and processes under their control are safe and without risk to health, including by use of appropriate measures relating to chemical, physical and biological substances and agents. Such parties will actively collaborate and consult with project workers in promoting understanding, and methods for, implementation of OHS requirements, as well as in providing information to project workers, training on occupational safety and health, and provision of personal protective equipment without expense to the workers.
    - Workplace processes will be put in place for project workers to report work situations that they believe are not safe or healthy, and to remove themselves from a work environment which they have reasonable justification to believe presents an imminent

and danger to their life or health. Project workers will not be retaliated against or otherwise subject to reprisal or negative action for such reporting or removal.

- Project workers will be provided with facilities appropriate to the circumstances of their work, including access to canteens, hygiene facilities, and appropriate areas for rest.
- A system for regular review of occupational safety and health performance and the working environment will be put in place and include identification of safety and health hazards and risks, implementation of effective methods for responding to identified hazards and risks, setting priorities for mitigation actions, and evaluation of results.
- Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) reporting, prevention and management in the workplace must be addressed in the project health and safety management plan and in the labor management procedures.

- ESS4 – Community Health and Safety (CHS)
  - The Borrower will develop, implement and review/update (as required) a CHS Management Plan or CHS Management measures which will be included in the Environmental and Social Management Plan (ESMP) applicable to the Project.
  - Conduct risk assessment to identify and assess the risks and prevent their adverse impacts on the health and safety of project-affected communities during the project life cycle from both routine and nonroutine circumstances.
  - Implement appropriate control measures to avoid or minimize community exposure to project-related traffic and road safety risks, diseases, and hazardous materials.
  - Ensure the safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities.
  - Ensure appropriate community emergency preparedness and response plan is available and communicate to all stakeholders to address emergency events.
  - Community engagement, communication and reporting processes shall be developed and implemented for community members to report health and safety incidents, incidents (including complaints) must be investigated appropriately, and action plans implemented and communicated to the community.
  - The Borrower will promote quality and safety, and considerations relating to climate change and natural disasters, in the design and construction of infrastructure projects, including dams.
  - SEA/SH reporting, prevention and management for local communities must be addressed in the project health and safety management plan.

- World Bank Group Environmental Health and Safety Guidelines (EHSGs), 2007.
- International Labour Organization (ILO) Code of Practice: Safety and Health in Construction Industry, 1992.
- ILO Codes of Practice: Safety and Health in Building and Civil Engineering Work, 1972.
- International Organization of Standardization (ISO) Standards. Examples include 45001 - Occupational Health and Safety Management Systems, ISO 4007 – Eye and Face Protection, ISO

20345 – Safety Footwear, ISO 3873 – Industrial Safety Helmets, ISO 20345 & ISO 16024 – Fall Protection.

- Good International Industry Practices (e.g., UK HSE Executive, Safe Work Australia, US OSHA, Global Reporting Initiative (GRI)).

3 Scope

The Health and Safety Framework is applicable on all World Bank-financed projects in the South Asia Region (SAR).

4 Implementation of the Health and Safety Framework

The implementation of this framework should adopt a risk-based approach when applying to the World Bank-financed projects. It is critically important that the project conducts impact/risk assessments (environmental, social and health & safety) to identify and assess impacts and risks both in the workplace and in the community.

For OHS impacts and risks, the Borrower shall develop and implement a Health and Safety Management Plan (HSMP) to manage OHS impacts/risks. The detail and comprehensiveness of the Project HSMP should be based on the risk and not on the size of the project or types of contracts (ICB, NCB, etc.). All projects are required to have a HSMP that includes all elements of this framework (e.g. policy, organization, emergency management, etc.). In large (mega) projects where the risk assessment identified multiple significant risks (substantia/high), it is advisable that the Contractor (or Subcontractor) prepare and implement H&S sub plans to manage these risks and will be included in the annex of the Project HSMP. A Project HSMP Plan template is provided in Annex 1.

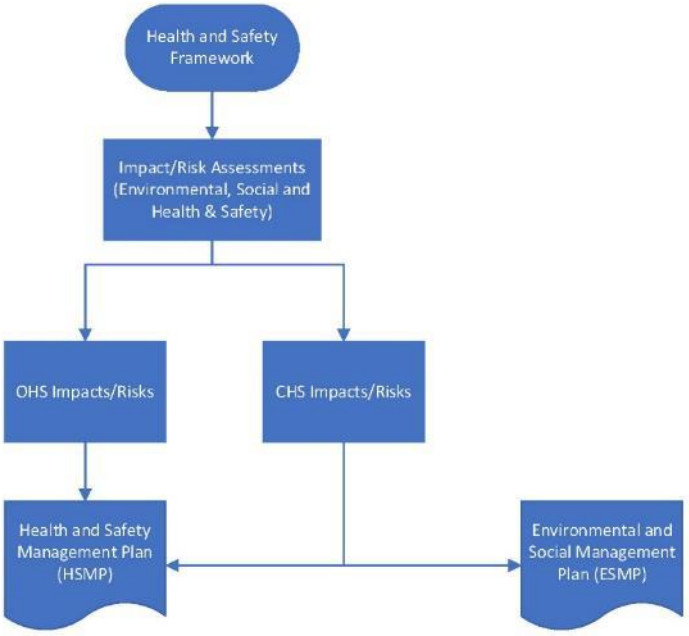
The Borrower is responsible for the project and shall ensure that this Health and Safety Framework is applied. The Borrower can delegate/assign the PIU or Contractor to develop and implement a HSMP to address the Health and Safety Framework requirements and to manage health and safety impacts and risks at the project operational level.

For CHS impacts and risks, the Borrower shall address and manage CHS impacts/risks under the Environmental and Social Management Plan (ESMP) and to some extent in the Health and Safety Management Plan (HSMP).

In some situations, there may be overlapping of the management plans due to project activities impacting both the workers and local communities. For example, road construction projects have significant impacts to workers and local communities and will require robust plans to manage OHS and CHS risks.

The Health and Safety Framework implementation flowchart is provided below (Figure 1).

Figure 1. Health and Safety Framework Implementation Flowchart



Note: CHS impacts and risks may overlap both management plans (HSMP and ESMP) in some projects, e.g. road construction (traffic management plan) will impact both workers and the community.

The Health and Safety Management Plan (HSMP) is the key tool to manage health and safety risks and impacts associated with the Project. Its core purpose is to ensure that all activities are planned, carried out, controlled and directed with consistent, approved, health and safety management practices, procedures or standards.

The HSMP should be applied as a living document and undergo routine review and updates when any of the following happens:

- There is a change in the scope of the project, or
- There is a change in construction methodology/technique based on site condition, or
- Following a major incident/near miss, or
- New or emerging health and safety risks (e.g. disease pandemic), or
- Change in local legal/regulatory requirements, or
- At the end of the Project (to allow for improvements in subsequent projects).

The PIU/Contractor is responsible for the review and update of the HSMP and communicate with relevant stakeholders (e.g. workers, subcontractors, suppliers, local communities, etc.).

In addition, the Contractor/Sub-Contractor can also prepare, submit and implement H&S sub-plans, procedures or SOPs to address specific work activity hazards either as a separate document or as part of the HSMP.

There should be one overall project HSMP that outlines the management of health and safety risks. Do not duplicate efforts by having multiple Health and Safety Plans for contractors, subcontractors, suppliers, etc.

5 Health and Safety Management Strategy - Working Together for Success

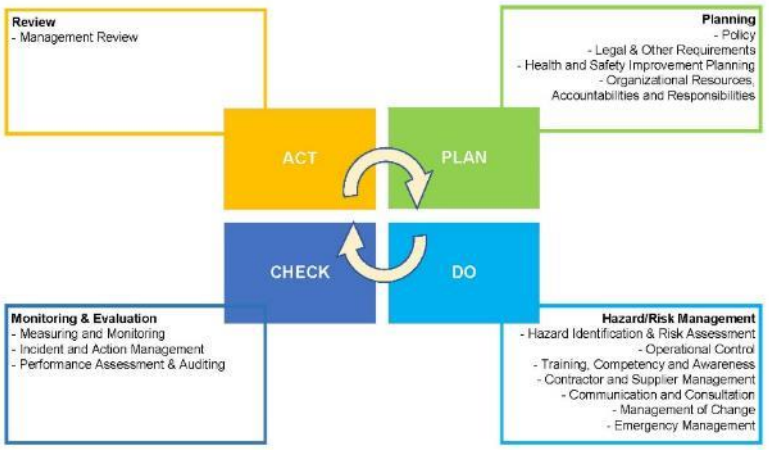
The responsibility for safety cannot be "delegated" to the "OHS Officer or Manager". The OHS staff of the PIU and/or Contractor support line management by assisting in jobsite training, serving as trained and knowledgeable observers, providing administrative assistance, monitoring and evaluating the success of the safety program and acting to continuously improve this plan. While this role is important, commitment and active participation by everyone, every day, on every task, is necessary if the PIU and Contractor are to achieve the level of health and safety excellence, both in the workplace and in the community, that the Borrower expects.

6 Health and Safety Management System

The PIU/Contractor management goal is to aspire Zero Harm to all workers and the community members while carrying operational activities. To achieve this goal, the PIU/Contractor shall prepare a HSMP in accordance with the minimum expectations in line with the policies, standards and best practices noted in this framework (e.g. ESS2 & ESS4, ISO, GIIP, etc.). The HSMP is an overarching health and safety management system for the project. All 15 elements of this framework must be included in the HSMP. In addition, safe work processes and procedures (e.g. Work Statements, SOPs, Work Instructions, etc.) must be developed and implemented for complex and high-risk activities. For example, Operational Control is one of the key elements, and it is expected that in high-risk work activities (e.g. crane lifting, tunnelling, etc.) the Contractor must develop and apply SOPs/Safe Work Procedures to operate safely.

The Health and Safety Management System is designed on the principles of continual improvement and adopts the methodology of Plan, Do, Check and Act (PDCA) (Figure 2). The structure of the management system generally follows the layout of common international standards such as the ISO 45001 and OHSAS 18001 where key elements of the system are aligned to PDCA.

Figure 2. PDCA – Health and Safety Management System



Given all the resources of standards, procedures and guidelines that have been described, the PIU/Contractor shall comply with the following principles:

- Wherever there is a conflict in guidance of the above, the more stringent safety requirement shall be applied. The PIU/Contractor must make sure that all applicable national laws and regulations are always complied.
- In this document 'Shall' and 'Must' signifies a mandatory requirement whereas 'Should' will be used to mention a recommended practice that the PIU/Contractor management will strive to accomplish.

7 Health and Safety Framework Elements

7.1 Element 1 - Health and Safety Policy

The PIU/Contractor must develop a Health and Safety Policy that establishes a clear set of objectives and targets for the effective management of Occupational Health and Safety (OHS) and Community Health and Safety (CHS) performances for the project. It should be consistent with the World Bank's codes of business practice (e.g. Environmental and Social Framework and Standards) and aligned to the local legal framework and requirement.

The Health and Safety Policy must commit to:

a) The prevention of incidents that may lead to injuries, illnesses, pollution, property and environmental damage, security, process losses and product quality impacts.
b) Compliance with legal and other requirements, including international accords and external requirements to which the Borrower is committed.
c) The effective management of OHS and CHS risks and impacts.

d) Establishing measurable objectives and targets for improving OHS CHS performance.
e) Providing the resources needed to meet OHS/CHS performance objectives.
f) Encouraging worker participation and promoting awareness of OHS/CHS risks and opportunities.

The PIU/Contractor shall establish project specific measurable targets to achieve above mentioned objectives. The determination of these targets is based upon the drive for continuous improvement, external peer group benchmarking and stakeholders' input.

7.2 Element 1 - Human Rights Policy

The Borrower's human rights policy should have focus on the responsibility to respect human rights and play a positive role in the communities where they operate. To this end, the Borrower (PIU/Contractor) should commit to respecting human rights as set out in the United Nations Universal Declaration of Human Rights and the International Labour Organization (ILO) Declaration on Fundamental Principles and Rights at Work, as well as adhere to the United Nations Guiding Principles on Business and Human Rights, the Voluntary Principles on Security and Human Rights and the World Bank Environmental and Social Standards (ESS) 2: Labor and Working Conditions.

The Borrower (PIU/Contractor) must continually assess the human rights context of their activities, including impacts that they may cause and those to which they may contribute or be directly linked. This determines the prevention, mitigation and control measures required, including using leverage from their business relationships.

The Borrower (PIU/Contractor) should recognize, respect and abide by all project workers, community worker, and employment laws and expect their subcontractors and other third-party companies to meet the same standards. No child or forced labor and discriminatory behavior is allowed under the project/program – by the contractors or sub-contractors or primary suppliers.

The Borrower (PIU/Contractor) should value and respect the traditions, diversity and the culture of different communities in the project area where they do business.

The Borrower (PIU/Contractor) should recognize the effect that their activities may have on local communities, and they should strive to engage in a meaningful way with the communities where they do business to help ensure that they positively contribute to the welfare of the local communities.

The Borrower (PIU/Contractor) preferably should endeavor to conduct business with communities who share their values and business principles.

7.3 Element 2 - Legal and Other Requirements

All applicable OHS/CHS legal requirements such as national laws and regulations, World Bank ESS2 & ESS4, etc. must be identified, evaluated for compliance and documented in a project legal register.

The project legal register must:

a) Define accountability for maintaining compliance or conformance to each requirement.
b) Be reviewed regularly for currency, and expiry/renewal dates.
c) Include or provide reference to records that show periodic evaluation of compliance.
d) Include relevant legislative obligations (international, federal, state/provincial, regional or local).

e) Include relevant Borrower policies and standards and external voluntary commitments.
f) Include any other requirements, such as license, codes of practice and product quality obligations.
g) Be accessible to the relevant personnel and stakeholders.

Any new/periodic changes or updates must be communicated to relevant stakeholders.

7.4 Element 3 - Risk Assessment

Risk assessment involves hazard identification and risk management, which are core activities to manage OHS/CHS risks and performance. The objective is to ensure OHS/CHS hazards are timely identified, and their resulting risks to people, property, assets and the environment are evaluated and managed.

A risk assessment is a critical examination of health and safety hazards at a project worksite and to ensure the PIU/Contractor to implement corrective measures to protect workers from health and safety hazards in the workplace.

A community health and safety risk assessment is required to identify, assess and manage for all World Bank financed projects. It is critically important that community health and safety impacts resulted from the project be identified and managed to ensure that the project social license to operate will not be impacted.

The process for analyzing and managing OHS/CHS risk includes:

a) Establishing the context, including acceptability criteria for the risk analysis.
b) Hazards identification to determine risk scenarios and select a suitable level of risk evaluation.
c) Risk estimation outcome and assigning risk ownership.
d) Recording the risk analysis in a risk register.
e) Managing risks according to their classification of either High, Substantial, Moderate, and Low to achieve levels that are deemed to be As Low As Reasonably Practicable (ALARP).
f) Utilizing the hierarchy of control:
    - Elimination of the hazard;
    - Substitution with less hazardous materials, processes, equipment, etc.;
    - Use engineering and process controls;
    - Apply administrative controls or management strategies; and
    - Use of personal protective equipment (PPE).
g) Developing and agreeing on further actions or monitoring of the risks, considering the hierarchy of controls.
h) Verifying the completion of actions.
i) Re-evaluating the risk and classification as appropriate.
j) Reviewing and updating the risk register over time.
k) Documenting, reporting and communicating the risk information.

As noted in the framework implementation section, CHS impacts/risks will be addressed and managed under the ESMP and HSMP.

7.5 Element 4 – Health and Safety Improvement Planning

Establish processes and plans to manage performance and to provide for continual improvement. Objectives and targets must be established for the management of OHS/CHS performance. They must be measurable and contribute to the prevention of incidents or reduce their impact(s).

To enable objectives and targets to be met, improvement plans must be developed, documented and integrated into the overall project planning process.

OHS/CHS improvement plans must:

a) Specify the required resources (both human and financial/budget) needed to meet the objectives.
b) Specify role responsibilities for implementing the improvement plans and their actions.
c) Establish the timeframes for completion of the improvement plans and achieving the objectives.

Project Director, Project Manager, Construction Manager and/or Resident Engineer are fully committed to achieve the above-mentioned targets. Leading and lagging indicators should be established to drive performance to meet these targets.

7.6 Element 5 - Organizational Resources, Accountabilities and Responsibilities

Resources, responsibility and accountability is appropriately allocated for the implementation, maintenance and continual improvement of the Health and Safety Management Plan.

The PIU/Contractor shall establish committees with representatives of workers and management or make other suitable arrangement consistent with national laws and regulations (if available) for the participation of workers in ensuring safe working conditions. A Community Health and Safety Committee comprising of community members may be required under the ESMP/HSMP to address for CHS risks.

All roles with health and safety accountability and responsibilities (including regulatory requirements) must:

- Be documented in role descriptions; and
- Be included in the organization chart specific to the managed site. The organizational charts must be available to all workers and local communities.

Where subcontractors and suppliers are involved, these areas of accountability and responsibility must be clarified with respect to those contractors.

7.7 Element 6 - Training, Competency and Awareness

Processes are established to provide the requisite training, competency and awareness to effectively manage OHS/CHS impacts and risks. There must be a process for the delivery and maintenance of awareness and/or competence based training. Every worker shall receive instruction and training regarding the general safety and health measures common to the project site(s).

All new workers, contractors and/or visitors must undertake relevant safety training. At a minimum, safety induction/orientation training must include reference to the significant OHS/CHS risks identified at the managed site. No person shall be employed in any worksite unless that person has received the necessary

information, instruction, and training to be able to do the work competently and safely. All training must be recorded and documented.

All roles requiring technical certification, registration or licensing are verified and documented. The requisite qualifications/competencies must be maintained for all personnel performing such roles and their associated work activities.

There must be a process to communicate and engage with local community members on CHS impacts and risks. Awareness communications, training and outreach should be conducted throughout the life of the project.

7.8 Element 7 - Contractor and Supplier Management

OHS/CHS risks associated with procured materials, equipment, services and labor are effectively managed.

There must be a process to identify and evaluate risks associated with the planned procurement of materials, equipment, services and labor. This must include an analysis of any downstream implications which may be impacted by the selection. This process must be supported by a written procedure that specifies the criteria for contractor/supplier selection, evaluation and re-evaluation and the rejection of product(s) or material(s).

Individuals engaged on a temporary or casual basis to work within existing managed sites are to be inducted and managed in the same way as permanent staff. There must be a process to ensure all contractor tools and equipment are inspected and evaluated to be in a safe condition and conform to the site's standards and procedures.

7.9 Element 8 - Communication and Consultation

There must be a process to encourage the participation of workers, contractors and community members in activities which promote improvements in health and safety performance. In particular, this must include their appropriate involvement in:

- Hazard identification, risk analysis and determination of controls.
- Incident investigation.
- The development and review of the health and safety policy and objectives.

Workers must be informed about their participation arrangements, including:

- Who is their representative(s) on health and safety matters?
- Time and resources necessary to participate in health and safety activities.
- Access to information that is relevant to current or planned health and safety improvement activities.
- The mechanisms to identify and remove obstacles or barriers to participation.
- Disciplinary actions for safety violations and non-compliances.

There must be a process for communicating about the management of OHS/CHS risks at the various levels of the managed site. This includes, but is not limited to:

- Internal communications to raise awareness about OHS/CHS risks, performance measures and changes or improvements.
- Pre-start meetings or briefings (e.g. toolbox talks) for sharing safety observations/ experiences, lessons learned or raising awareness about OHS/CHS risks.
- Sharing knowledge and lessons learned from around the Project (external to the site, business or site); such as relevant incidents, hazardous conditions or suggested practices.

There must be a grievance process to receive feedback, suggestions and complaints on OHS and CHS matters. This process must include a procedure for documenting, evaluating, implementing (as appropriate) and archiving the improvements.

There must be a process to ensure that, when appropriate, relevant external stakeholders are consulted about pertinent OHS/CHS matters (including statutory and regulatory requirements) as needed.

Communications, engagement and consultation with local communities on CHS matters shall be addressed in the ESMP.

7.10 Element 9 - Operational Control

The Contractor is responsible to manage risks associated with the site's work activities. This shall be achieved by implementing operational controls, as well as other mandated or necessary risk treatment processes to control the risk to As Low As Reasonably Practicable (ALARP).

There must be a process for the development of procedures or work instructions that detail the controls required to treat risks associated with the work activities. These procedures must reference applicable operating criteria, be communicated, available to the appropriate users, and followed.

Plant and equipment must be maintained, inspected and tested to ensure they meet the design descriptions and specifications. All equipment or services provided by third parties, must be inspected, and have the controls verified to ensure the safe operation, and adherence to the health and safety performance objectives.

Where new or non-routine tasks and activities are conducted, the controls identified during the pre-task hazard assessment must be implemented.

Operational controls are health and safety controls designed to eliminate, mitigate or manage the risks/impacts. The Contractor shall develop and implement health and safety controls for risks identified by the project risk register. For example, if a project identified working at height, crane lifting and scaffolding as high-risk activities then the Contractor must develop and implement Working at Height, Lifting, Hoisting & Rigging and Scaffolding procedures incorporating the hierarchy on control concepts (i.e. elimination, engineering, safe work procedures and PPE) to manage these risks. By applying a risk based approach, the Contractor will need to develop and implement operational controls/procedures based only on the risk identified.

Table 1 below summarizes the types of health and safety controls/procedures generally found in civil construction projects. This list is not intended to be all-inclusive as there may be other high-risk activities in projects not listed here.

Table 1 – Health and Safety Controls/Procedures

OHS / Safety Rules (e.g., Golden Rules)	Permit to Work Systems
Excavations and Trenching	Fire Safety
Heavy / Mobile Equipment	Electrical Work / Safety
Barricading and Signs	Hazardous Material Management
Cell/Mobile Phone Use	Equipment Inspection & Maintenance
Safe Driving (Light Vehicles)	Dredging
Material Handling (Loading and Unloading)	Demolition
Traffic Interface Planning / Management	Confined Space
Severe Weather Management	Hot Work (Welding, Grinding, Cutting)
Lifting, Hoisting and Rigging	Hand and Power Tools
Scaffolding	Housekeeping
Work at Height	Lockout/Tagout (Isolation)
Working Near or Over Water	Ladder Safety
Illumination	Hazardous Waste
Ground Support	Fitness for Work (Health/Medical Surveillance)
Water Management	Personal Protective Equipment (PPE)
Tunnelling	Noise Hazard & Protection
Bulk Earthworks and Civil Works	Respiratory Protection
Steel Erection	Working in Heat / Cold
Pressurized Equipment	Manual Handling (Ergonomics) / Vibration
Clearing and Land Disturbance	Fatigue Management
First Aid	Travel and Remote Site Health
Project Worker Welfare Facilities	Animal Bites & Stings
Camp Management	Working Alone
Site Security Management	Radiation (Ionizing and Non-Ionizing)
Blasting and Explosives	Infectious / Communicable Disease (e.g. COVID-19)
Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) Reporting and Management	Other hazards/risks on project site identified through risk assessment

The Contractor shall ensure workers are trained, supervised and applied the required health and safety procedures on managed site.

7.11 Element 10 - Management of Change

There must be a procedure to identify and manage changes to the operational processes and controls that may impact on OHS performance. Changes may be planned or unplanned, sudden or gradual, and temporary or permanent. The procedure must include an analysis of the risks associated with a change and include a contingency to cover emergency situations where the full management of change procedure cannot practically be applied. These situations require the Resident Engineer / Project Manager (or his/her designated deputy) who is accountable for the managed activity to approve the change.

Workers and contractors must be trained to identify what constitutes a change and how to initiate the management of change process.

After completing the change, a formal review must be carried out to evaluate the actual impact against the intended impacts, and to identify the reasons for any deviation.

7.12 Element 11 - Emergency Management

To ensure that the appropriate resources and emergency response plans are prepared, practiced and available. The PIU/Contractor is responsible to develop and implement an Emergency Response Preparedness (ERP) Plan that will provide an effective response for the mitigation, control and recovery from incidents/ accidents including natural disasters which can impact or disrupt the project and/or its managed site(s) and activities.

The PIU/Contractor must clearly define accountability for the ERP and ensure it is adequately resourced. PIU/Contractor must also ensure that individual team members are provided with the relevant training for their required roles. The ERP exercise (drill) must be tested and validated annually. The ERP must be updated to reflect the lessons learned from the exercises and actual incidents.

The process for managing incident communications, notification and reporting must be integrated into the ERP and clearly:

- Identify who is responsible for incident communication, notification and reporting.
- Define how communication protocols are to be conducted with internal and external stakeholders.

The ERP must include local communities during emergencies including natural disasters when the risk and impact assessments identified potential aspects/impacts caused by the project.

7.13 Element 12 - Measuring and Monitoring

The objective is to monitor risks and impacts of the work activities and evaluate the effectiveness of the operational controls. There must be a process for measuring and monitoring the key characteristics of the managed site and its work activities that may have significant OHS/CHS risks. Measuring and/or monitoring can be either qualitative or quantitative but must follow a standardized methodology.

Procedures for measuring and monitoring occupational health exposure and environmental impact must conform to national laws and other international standards that are stated in the contract. Exceedances from specified requirements or limits must be recorded, investigated and reported back to the worker, work area or the community involved. The appropriate actions in response to the exceedance must be recorded, assigned accountability and tracked to completion.

Medical/Health Surveillance

Any medical/health surveillance program must:

- Include project personnel and contractors.
- Be consistent with local regulatory requirements.
- Be designed based on the identification and evaluation of operational health risks.
- Support the project and site's objectives and targets.

7.14 Element 13 - Incident and Action Management

All incidents including near misses must be reported, investigated and corrective actions identified, implemented and communicated. There must be a written procedure for incident management including investigation, reporting and corrective action(s) to prevent recurrence. It must include reference to the appropriate methodologies for:

a) Reporting.
b) Investigating.
c) Analysis of the impact(s) and the potential risk of future incident.
d) Communicating to relevant people/stakeholders.
e) Managing corrective actions to prevent reoccurrence.

The Resident Engineer/Project Director is responsible for all incidents that occurred in the project, and the Site Manager/Supervisor of the involved person(s) must ensure that incident is reported and investigated.

Incident investigations must be completed by competent investigators who have been trained in the appropriate investigation methodology.

All significant incidents must be summarized for lessons learned after the investigation and communicated to all workers and relevant stakeholders.

Community health and safety incidents caused or impacted by the project must be reported, investigated and corrective actions identified, implemented and communicated to the community.

7.15 Element 14 - Performance Assessment and Auditing

A process must be developed for measuring OHS/CHS performance. Metrics must include leading and lagging indicators and be based on qualitative and quantitative data.

Performance must be measured on a regular basis and include an evaluation of:

- the extent to which objectives are being met;
- progress against targets;
- the effectiveness of controls;
- proactive conformance measures; and
- reactive or historical performance measures.

The Contractor should provide a monthly report summarizing the OHS/CHS performance and contain details or summaries of all incidents and progress against corrective actions. The report must be sent to the Project Management Team, the Borrower and other relevant stakeholders.

Audits and Inspections

There must be a process for conducting audits and regular inspections of all work areas including those areas/sensitive areas where there is a potential concern for local communities. The process must include a written procedure, where relevant, to define the scope and depth of audit/inspection and consider:

a) The level of evaluated risk associated with specific activities that the project or site undertakes.

b) The identification of non-conformances with health and safety procedures and the HSMP requirements.
c) The identification of hazards and impacts in the project risk register.
d) Compliance to legal and other requirements as identified and recorded in the legal register.
e) The results of previous audits and inspections.

At the completion of the audit and inspection, a report must be provided to the Resident Engineer/ Project Director, Site Manager and the Supervisor responsible for the work area.

The Project and/or managed site must define an annual schedule of planned audits. The schedule must be developed, based on an evaluation of significant OHS/CHS risks associated with the project or site and the results of previous audits. The audit should be conducted by external third party. Corrective actions to address non-conformance must be assigned and tracked until completion.

7.16 Element 15 - Management Review

The HSMP must be reviewed bi-annually at a minimum. The review must evaluate any need for change and establish actions to improve the HSMP, its processes and resource needs.

Records of completed management review(s) must be retained and include:

a) Decisions and actions relating to possible changes to policy, objectives and targets.
b) Information relating to revised risks and any proposed treatment and controls.
c) Improvement suggestions (including the community) for inclusion into future management plans.
d) Any other alternation, modification and improvement to the HSMP that demonstrates a commitment to continual improvement.

Relevant outputs from the management review(s) must be made available for communication and consultation throughout the project/managed site, the Borrower and relevant stakeholders.

Annex 1 - Health and Safety Management Plan (HSMP) Template

Project title

Effective Date	xxxxxx	**Status**	DRAFT
Version Number	xxx	**Document Number**	xxxxxx

Health and Safety Management Plan

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Health and Safety Management Plan

About the Project Health and Safety Management Plan template

The Project Health and Safety Management Plan (HSMP) is a key document to address the Health and Safety Framework requirements of how OHS and CHS risks will be managed in a project. The HSMP incorporates the 15 elements of the framework to which the Borrower (PIU/Contractor) must address for the project.

Under the Health and Safety Framework, it is mandatory that each project to develop and implement a Project HSMP that identifies the hazard, assess the risk and implement control measures to eliminate or reduce the risk.

The purpose of the Health and Safety Management Plan is to:

- Clearly and succinctly communicate how significant risks in the project will be managed;
- Ensure key requirements including legal / regulatory obligations are considered and met;
- Provide requirements on health and safety standards, procedures and guidelines; and
- Outline how the implementation of the HSMP will be evaluated.

Project personnel and contractors must have access to the HSMP. They should understand it (as it relates to their role) and implement it in their work area, relevant to the hazards encountered by each role.

If a project is subjected to local government regulators management plan template(s), then those templates must be used. Do not duplicate effort.

The Project HSMP should be considered live and dynamic during each stage of the project life cycle. It is recognised that project risks and how they will be managed can change during the life of a project. If the HSMP changes, it must comply with Health and Safety Framework's management of change requirements (Element 10).

This template should be suitable for any project (type and size) with some modifications as required. Additional sub sections may be added as required depending on the size, complexity and risk of the project.

Finally, the Resident Engineer and/or Project Director must determine and justify how this template is to be applied to each project (e.g. a single Plan covering the entire project, or individual Plans or Sub-plans for each work package area, or sub-contractor).

Note: As stated in the Health and Safety Framework, CHS impacts, and risks are addressed in the ESMP. There may be overlapping of CHS and OHS in both the HSMP and ESMP such as road construction where significant risks are found both in the workplace and in the community. In such instances, the Contractor must ensure the HSMP and ESMP requirements are implemented and enforced.

Health and Safety Management Plan

Project title

1 Introduction

1.1 Overview

Describe the purpose of the Project HSMP (e.g. Health and Safety Framework and/or local legal requirements), intended audience (stakeholders), issuance, etc.

1.2 Change Authority

Describe the management of change for any future changes to this HSMP and who can authorize it.

2 Project Description

Provide the project background and scope including the project stage and the activities to be undertaken. Provide brief description of people involved in project (employees, contractors, sub-contractors, suppliers, etc).

3 Objectives

Set out the health and safety objectives and should include Key Performance Indicators (KPIs) to achieve these objectives.

Include any assumptions/ constraints made in the objectives or project scope.

4 Health and Safety Values

4.1 Health and Safety Policy Statement

Insert the Project Health and Safety Policy and/or Contractor Policy (if available) statement.

4.2 Message from Project Leader

Provide an overall vision, values and conduct and behavior expectations from the Resident Engineer or Project Director.

If this template is used by contractors, then the Contractor Director/Manager will address in this space.

5 Health and Safety Organization

Having the appropriate organizational structure and people are essential for the success of a project. Clearly identify and describe the organization structure and people who will be responsible for the management of the project's OHS/CHS risks and compliance to this Plan and other legal requirements. Health and Safety accountability and responsibility must be documented in the role descriptions.

5.1 Team Structure

Short description/ chart of personnel responsible for health and safety management and supervision.

5.2 Roles and Responsibilities

Short description of health and safety roles and responsibilities include the project management team.

Health and Safety Management Plan

6 Legal and Other Requirements

Provide a summary of all the legal obligations with a short description of the main requirement(s) under each obligation (e.g. *Labour Act, Work Bank ESS2 & ESS4, etc.)*.

A Project legal register form is provided in Annex 1.

7 Hazard Identification and Risk Management

7.1 Project OHS / CHS Significant Risk Summary

Describe the process of how the Project Risk Register was achieved including the name of the facilitator and participants (e.g. project team members, health and safety staff and contractor representatives) and when it was undertaken.

Insert a brief bullet point summary to outline the key significant **inherent** risks (i.e. substantial and high). Follow a format like this: *the impact arising from a defined hazard due to a specific activity* e.g. "respiratory disease due to the inhalation of respirable crystalline silica during underground drilling".

Provide details of all significant inherent risks for the project showing current controls in Appendix 1. The significant inherent risk register is a subset of the comprehensive risk register for the project.

Community health and safety (CHS) risks must be identified, assessed and documented in the Project Risk Register. The management of CHS risks will be addressed in the ESMP but can may overlap with the HSMP For example, road construction projects will impact both workers and local communities. In this situation, a traffic management plan may be included in the both the HSMP and ESMP as operational control.

7.2 Health and Safety Operational Control

This section outlines how the key significant risks for the project (as defined in Section 7.1) will be managed. At a minimum, the project current controls must comply with the Health and Safety Framework and other legal requirements.

This is the most important section of the HSMP. It needs to be kept specific to the project and written in a clear and concise manner that enables the information to be used during project familiarisation and induction. As in Section 7.1, there is flexibility to communicate this information in a way that best suits for the project. You may use paragraphs, dot points, tables, etc. You may combine this information with the summary presented in Section 7.2.1.

Provide sufficient information to ensure that current and planned controls are understood by the reader.

7.2.1 Impact / Hazard / Activity 1

Describe how the risk will be managed during the project.

8 Communications

8.1 Onsite Communication and Consultation

8.1.1 Health and Safety Training including Induction

Describe the Health and Safety training process and requirements.

8.1.2 Health and Safety Activities, Meetings and Committees

List all activities, briefings and committee meetings such as toolbox talks, daily pre-start meeting, pre-job briefing, safety committee meeting, safety inspections/ audits, etc.

There is flexibility to communicate this information in a way that best suits your project. You may use

paragraphs, dot points, tables, etc.

8.1.3 Health and Safety Message Board

List strategic locations of Health and Safety message boards so that project workforce will be able to receive relevant information.

8.2 Communication with Contractors and Suppliers

8.2.1 Contractors and Sub-Contractors

List processes and types of information to ensure contractors and subcontractors can safety manage the activities and people in their work areas.

8.2.2 Suppliers

List processes and types of information to ensure the supplier can safely manage the activities and people within their responsibility.

8.3 Community / External Communication

8.3.1 Community Liaison

Describe accountability and process to report any OHS/CHS information to the communities as part of the community engagement requirements.

8.3.2 Regulatory/ Local Government

Describe accountability and process to report any OHS/CHS information to local government agencies/ department as part of the legal reporting requirements.

8.4 Consultation and Complaints

Describe the process to promote the active participation of project workforce in health and safety decisions. Employees and contractors are consulted and given opportunity, encouragement, and training to be proactively involved in health and safety matters affecting the project and their work activities. All workplace consultation should be recorded.

Describe the process to ensure health and safety complaints are received, reviewed and managed in accordance with the health and safety framework requirement.

A similar process shall be developed and implemented for CHS consultation and complaints from community members.

8.5 Non-Compliance/ Conformance and Disciplinary Process

Describe the disciplinary process for non-compliance or non-conformance to health and safety policies and procedures including the requirements of this document.

9 Training and Competency

Describe the project specific health and safety training required by workers and contractors including inductions (where relevant). For project personnel refer to the training needs analysis. For contractors, refer to the contractor prequalification to identify and specific training and induction needs on what the contractor approval is conditional. It is not sufficient to just list the types of training. The HSMP should document which role types should receive each type of training.

Role Type	Project Training
All workers and contractors	Safety Induction

9.1 Awareness and Competency

Describe the health and safety training induction, awareness, and competency on the project. Awareness and competency considerations should include:

- Safety induction and training provided by the project to raise awareness levels;
- Task specific competency assessments conducted by the Contractor;
- Training and induction for the Owner's team specific to the area in which the work is conducted; and
- Competency assessment and required training to render workers/contractors competent to carry out the work activity.

10 Emergency Management

10.1 Emergency Response

Provide a brief summary of site's emergency response preparedness (ERP) plan including reporting procedures, emergency contacts, emergency response team (ERT), evacuation plan/ assembly points and emergency test/ evacuation drills. The intent of this section is to ensure that the site manager/supervisor/worker at the operational level will know what to do in an emergency situation. It is not the intention that the complete site's ERP procedure be included in this section. In large, complex projects the ERP should be a standalone document that is managed by the PIU/Contractor.

There is flexibility to communicate this information in a way that best suits your project. You may use paragraphs, dot points, tables, etc.

Fire, spill response and first aid training and competency can be addressed in the sections below.

The ERP must include local communities during emergencies including natural disasters when the risk and impact assessments identified potential aspects/impacts caused by the project.

10.2 Fire Protection and Prevention

Provide a brief summary of the site's fire protection and prevention procedures including fire response (internal/ external), fire notification and alarms, use and management of firefighting equipment (e.g. fire extinguishers), high risk fire activities such as welding, smoking policy, fuel storage and fire inspections.

10.3 Hazardous Substance Spill Response and Prevention

This Section is not mandatory but if the project or site use or store large quantity of hazardous substances you may include a brief summary of the hazardous substance spill response and prevention management procedures.

10.4 First Aid and Medical Facilities

Provide information on the first aid kits, first aiders, eye wash stations and emergency showers including their locations within the project site.

Described the first aid and/or medical facilities available onsite including the location, medical supplies and equipment and personnel (e.g. first responder, paramedic, nurse) manning the facilities. Also provide information in regard to medical evacuation (i.e. ambulance, medivac, etc), hospitals or health clinics.

Health and Safety Management Plan

11 Site Security Plan

Describe the site's security plan addressing building and infrastructure security, exterior boundaries, access/ egress of project personnel and visitors, movement of equipment and materials, site traffic and vehicle parking, patrol and security inspections, responsibility during emergency situations, etc.

12 Incident Reporting and Investigation

Describe the project incident reporting and investigation process which must be aligned to local legal requirements (if available), SAR OHS Incident Reporting and Investigation Guidelines and any other requirements specified in the contract.

There is flexibility to communicate this information in a way that best suits your project. The sub sections below are outlines to assist – add or delete as required. Use paragraphs, bullet points, flow chart, etc.

Community health and safety incidents caused or impacted by the project must be reported, investigated and corrective actions identified, implemented and communicated to the community.

12.1 Roles and Responsibilities

Provide a short description of the investigation team roles including competency. Also include the roles and responsibilities of the corrective action owners.

12.2 Management of Incidents

Refer to SAR OHS Incident Reporting and Investigation Guidelines and/or Contractor's Incident Management Procedure (if available).

12.2.1 Investigation of Incident and Near Miss

12.2.2 Corrective and Preventive Actions

12.2.3 Reporting and Recording

12.3 Injury Management

Describe the project injury management process to ensure that any workplace injury is treated, managed and complied with the project's fitness for work criteria before the individual can return to normal work duties (i.e. return-to-work program).

13 Project Health and Safety Performance

Develop objectives, targets and key performance indicators (KPIs) such as the number of risk assessment, training and inspection/audit conducted that are proactive and where the outcomes can be directly controlled by the project/ owner's team by implementing OHS and CHS operational controls based on the project risk assessment. Do not develop targets that may inadvertently discourage incident reporting or create a blame culture (e.g. zero incident reports raised, zero audit findings etc).

13.1 Measuring and Monitoring

Describe the health and safety monitoring process where the project impacts the workplace, the environment and the community. Environmental and occupational health monitoring will be conducted to verify the efficacy of operational controls identified in the management of 'High' risks.

13.2 Key Performance Indicators

Develop and describe the key performance indicators (KPIs) for project health and safety objectives and targets. This section can be combined with Section 3 Objectives.

Health and Safety Management Plan

13.3 Audits and Inspections

The HSMP shall be audited internally by the PIU and externally by relevant stakeholders (e.g. Bank). During these audits, the auditor(s) must determine if the risks are being mitigated as described and whether the measures of success (e.g. KPIs) are being achieved.

The following table outlines when the plan will be audited and by whom.

Audit / Inspection	Who will audit the plan?	When is it scheduled for?

The table above contains examples only. Delete examples and adjust as required for each project.

The Contractor shall implement a routine inspection program for specific work area and activity. Where the work activity/ process has been identified as 'Substantial or High' risk, daily or pre-start inspection should be applied.

14 Management of Change (MOC)

Describe the MOC process and requirements for changes to the operational processes and controls that may impact on OHS / CHS performance. Changes may be planned or unplanned, sudden or gradual, and temporary or permanent. MOC must be approved by area or process owner(s) and communicated to area workers, community members (if impact the community) and other relevant stakeholders.

14.1 New Significant Risk/ Hazard Identified

Describe the process when a new or unforeseen risk/ hazard has been identified (e.g. through a near miss, incident, new process or non-routine activity that was not planned) and how the risk will be managed.

15 Management Review

Describe the management review of the HSMP process including participants and how often it is done. The review must evaluate any need for change and establish actions to improve the Plan, its processes and resource needs. The review must be documented and communicated to workers, contractors and relevant stakeholders.

Annex 1

Project Legal Register

Health and Safety Management Plan

PROJECT LEGAL REGISTER

Using the Health, Safety, Environment, Community (HSEC) legal obligations identified for the project, list the obligations relevant to the project and describe how they will be met. You may choose to delete rows containing legislation that does not apply to your project. If so, include the statement below. If not, delete the statement below.

Version xxxx of the Legal Obligations Register was reviewed by (names) and legislation deemed to be not applicable to the project was omitted.

Legislation	How does the legislation apply to Project?	H	S	E	C	Last Amendment	How will these obligations be met in this project?

Annex 2

Project Significant Risk Register

You may present your Significant Risk Register in the table below, or as a separate Excel or Word document (provide a link to the document or a specific reference including document name and location).

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SIGNIFICANT RISK REGISTER

						Inherent Risk				Current Risk			
Project Activity	OHS / CHS Issue or Hazard	Hazard	Risk Scenario	Risk Scenario Impact Description	Cause(s)	Risk Scenario Consequence	Risk Scenario Likelihood	Risk Scenario Classification	Controls	Risk Scenario Consequence	Risk Scenario Likelihood	Risk Scenario Classification	Comments and Action Items

Revision History

First Issue	Effective date	Prepared by	Approved by	
1.0				
Revision Number	**Revision date**	**Revised by**	**Approved by**	**Reason for change**

Health and Safety Management Plan

Security Management Guidelines for Contractors

The Contractor during construction phase shall use security arrangements and personnel to safeguard the installations, sites and personnel.

To accomplish project security objectives, the security should be provided for the following:

- Construction camp
- Project offices and work sites;
- Visitors and foreign consultants
- Critical assets and infrastructure related to the project; and
- Local labors' residential accommodation and other facilities.

Security Guidelines for the Project

- Adoption/compliance with the World Bank Group's Good Practice Notes on Assessing and Managing the Risks and Impacts of the Use of Security Personnel and a project/contract specific Code of Conduct for the security personnel.
- Security will be provided in a manner that does not jeopardize the community's safety and security, or the KWSC's relationship with the community.
- Security arrangements will follow the principle of proportionality, respect for human rights, and good international practice.
- Community engagement will be maintained about the project's impacts on community safety and security, create awareness concerning the Code of Conduct commitment and project grievance mechanism, as outlined in the Stakeholder Engagement Plan (SEP) and SEA/SH mitigation measures given in the ESMP.
- Contractor's Social Specialist will share information with nearby communities if required, about security arrangements, the Contractor's security policies, and the expected conduct of security personnel.
- Arrange dialogue with communities about security issues to identify potential risks and local concerns, and can serve as an early warning system.
- Maintain coordination with the contractors regarding the security issues.

Security Guidelines for Contractors

- Contractors will maintain liaison and coordination with any government's security agencies deployed in the area;
- The Contractor will carry out a continuous risk assessment of the security arrangements in place, monitor its security personnel, and identify any necessary corrective or preventive actions for continuing security operations.
- The contractor will prepare and implement clear standard operating procedures (SoP) for the security personnel;

- Security personnel will not use force or extract work from workers;
- The Contractor will ensure that those providing security are not implicated in past abuses;
- The Contractor will provide adequate training in the use of force and appropriate conduct toward workers and communities;
- The Contractor will ensure that security personnel act within the applicable legislation of the province / country;
- The Contractor will not sanction any use of force except when used for preventive and defensive purposes in proportion to the nature and extent of the threat;
- The Contractor will provide a grievance mechanism to express concerns about the security arrangements and acts of security personnel;
- If security personnel are permitted to use force, instructions must be clear on when and how force may be used, specifying that security personnel are permitted to use force only as a matter of last resort and only for preventive and defensive purposes in proportion to the nature and extent of the threat, and in a manner that respects human rights;
- Security personnel will be instructed to exercise restraint and caution, clearly prioritizing prevention of injuries or fatalities and peaceful resolution of disputes. The use of physical force will be reported to and investigated by the Contractor;
- Any persons injured as a result of the action of security personnel will be transported to medical facilities;
- The instructions for security personnel will make clear that arbitrary or abusive use of force is prohibited;
- Unlawful acts of any security personnel will be reported to the appropriate authorities.
- The Contractor may seek support from government authorities or other providers of the security services to aid preventative planning, evaluation, monitoring and follow-up to ensure security services providers meet Project expectations. Support may include strategies to identify and manage presence of ex-combatants and ex-military personnel within the community and within the Project security services.
- The Contractor's security services' responsibilities will include preventing hazardous materials or waste from leaving the Project site or the hazardous waste disposal site for the Project.

The Contractor will need to establish mitigation measures in relations to engaging and partnering with local stakeholders, such as supporting the extension of policing services to prevent the intensification of violent conflicts.

Environmental Code of Practice

The ECPs are listed below and details are presented subsequently:

- ECP 1: Waste Management
- ECP 2: Fuels and Hazardous Goods Management
- ECP 3: Water Resources Management
- ECP 4: Drainage Management
- ECP 5: Air Quality Management
- ECP 6: Noise and Vibration Management
- ECP 7: Protection of Flora
- ECP 8: Protection of Fauna
- ECP 9: Road Transport and Road Traffic Management
- ECP 10: Construction Camp Management
- ECP 11: Worker Health and Safety

ECP 1: Waste Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
General Waste	Soil and water pollution from the improper management of wastes and excess materials from the construction sites.	• The Contractor shall • Develop site specific waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food waste etc.) prior to commencing of construction and submit to supervision consultant for approval. • Organize disposal of all wastes generated during construction in the designated disposal sites approved by the Project. • Minimize the production of waste materials by 3R (Reduce, Recycle and Reuse) approach. • Segregate and reuse or recycle all the wastes, wherever practical. • Vehicles transporting solid waste shall be covered with tarps or nets to prevent spilling waste along the route. • Train and instruct all personnel in waste management practices and procedures as a component of the environmental induction process. • Provide refuse containers at each worksite. • Request suppliers to minimize packaging where practicable. • Place a high emphasis on good housekeeping practices. • Maintain all construction sites in a cleaner, tidy and safe condition and provide and maintain

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		appropriate facilities as temporary storage of all wastes before transportation and final disposal. • Potable water should be supplied in bulk containers to reduce the quantity of plastic waste (plastic bottles). Plastic bag use should be avoided.
Hazardous Waste	Health hazards and environmental impacts due to improper waste management practices	The Contractor shall • Collect chemical wastes in 200 liter drums (or similar sealed container), appropriately labelled for safe transport to an approved chemical waste depot. • Store, transport and handle all chemicals avoiding potential environmental pollution. • Store all hazardous wastes appropriately in bunded areas away from water courses. • Make available Material Safety Data Sheets (MSDSs) for hazardous materials on-site during construction. • Collect hydrocarbon wastes, including lube oils, for safe transport off-site for reuse, recycling, treatment or disposal at approved locations. • Construct concrete or other impermeable flooring to prevent seepage in case of spills.

ECP 2: Fuels and Hazardous Goods Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Fuels and hazardous goods.	Materials used in construction have a potential to be a source of contamination. Improper storage and handling of fuels, lubricants, chemicals and hazardous goods/materials on-site, and potential spills from these goods may harm the environment or health of construction workers.	The Contractor shall • Prepare spill control procedures and submit them for supervision consultant approval. • Train the relevant construction personnel in handling of fuels and spill control procedures. • Store dangerous goods in bunded areas on top of a sealed plastic sheet away from watercourses. • Refueling shall occur only within bunded areas. • Store and use fuels in accordance with MSDSs. Make available MSDS for chemicals and dangerous goods on-site. • Transport waste of dangerous goods, which cannot be recycled, to a designated disposal site. • Provide absorbent and containment material (e.g., absorbent matting) where hazardous material are used and stored; and ensure personnel trained in the correct use. • Provide protective clothing, safety boots, helmets, masks, gloves, goggles, to the

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		construction personnel, appropriate to materials in use. • Make sure all containers, drums, and tanks that are used for storage are in good condition and are labelled with expiry date. Any container, drum, or tank that is dented, cracked, or rusted might eventually leak. Check for leakage regularly to identify potential problems before they occur. • Store and use fuels in accordance with MSDSs. • Store all liquid fuels in fully bunded storage containers, with appropriate volumes, a roof, a collection point and appropriate filling/decanting point. • Store hazardous materials above flood level considered for construction purposes • Put containers and drums in temporary storages in clearly marked areas, where they will not be run over by vehicles or heavy machinery. The area shall preferably slope or drain to a safe collection area in the event of a spill. • Take all precautionary measures when handling and storing fuels and lubricants, avoiding environmental pollution. • Avoid the use of material with greater potential for contamination by substituting them with more environmentally friendly materials.

ECP3: Water Resources Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Hazardous material and Waste	Water pollution from the storage, handling and disposal of hazardous materials and general construction waste, and accidental spillage	The Contractor shall • Follow the management guidelines proposed in ECPs 1 and 2. • Minimize the generation of sediment, oil and grease, excess nutrients, organic matter, litter, debris and any form of waste (particularly petroleum and chemical wastes). These substances must not enter waterways or storm water systems.
Discharge from construction sites	Construction activities, sewage from construction sites and work camp may affect the surface water quality. The construction works will modify groundcover and topography changing the surface water drainage patterns of the	The Contractor shall • Install temporary drainage works (channels and bunds) in areas required for sediment and erosion control and around storage areas for construction materials.

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
	area. These changes in hydrological regime lead to increased rate of runoff, increase in sediment and contaminant loading, increased flooding, and effect habitat of fish and other aquatic biology.	• Install temporary sediment basins, where appropriate, to capture sediment-laden run-off from site. • Divert runoff from undisturbed areas around the construction site. • Stockpile materials away from drainage lines • Prevent all solid and liquid wastes entering waterways by collecting solid waste, oils, chemicals, bitumen spray waste and wastewaters from brick, concrete and asphalt cutting where possible and transport to an approved waste disposal site or recycling depot. • Wash out ready-mix concrete agitators and concrete handling equipment at washing facilities off site or into approved bunded areas on site. Ensure that tires of construction vehicles are cleaned in the washing bay (constructed at the entrance of the construction site) to remove the mud from the wheels. This should be done in every exit of each construction vehicle to ensure the local roads are kept clean.
Soil erosion and siltation	Soil erosion and dust from the material stockpiles will increase the sediment and contaminant loading of surface water bodies.	The Contractor shall • Stabilize the cleared areas not used for construction activities with vegetation or appropriate surface water treatments as soon as practicable following earthwork to minimize erosion. • Ensure that roads used by construction vehicles are swept regularly to remove dust and sediment. • Water the loose material stockpiles, access roads and bare soils on an as required basis to minimize dust. Increase the watering frequency during periods of high risk (e.g., high winds).
Drinking water	Untreated surface water is not suitable for drinking purposes due to presence of suspended solids and Ecoli.	The Contractor Shall • Provide the drinking water that meets SEQS standards. Drinking water to be chlorinated at source and ensure presence of residual chlorine 0.1 ~ 0.25 ppm as minimum after 30 minutes of chlorine contact time.

ECP 4: Drainage Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Excavation and earth work, and construction yards	Lack of proper drainage for rainwater/liquid waste or wastewater owing to the construction activities harms environment in terms of water and soil contamination, and mosquito growth.	The Contractor shall • Prepare drainage management procedures and submit them for supervision consultant approval. • Prepare a program to prevent/avoid standing waters, which supervision consultant will verify in advance and confirm during implementation. • Provide alternative drainage for rainwater if the construction works/earth-fillings cut the established drainage line. Establish local drainage line with appropriate silt collector and silt screen for rainwater or wastewater connecting to the existing established drainage lines already there. • Rehabilitate road drainage structures immediately if damaged by contractors' road transports. • Build new drainage lines as appropriate and required for wastewater from construction yards connecting to the available nearby recipient water bodies. Ensure wastewater quality conforms to SEQS, before it is being discharged into the recipient water bodies. • Ensure that there will be no water stagnation at the construction sites and camp. • Provide appropriate silt collector and silt screen at the inlet and manholes and periodically clean the drainage system to avoid drainage congestion. • Protect natural slopes of drainage channels to ensure adequate storm water drains. • Regularly inspect and maintain all drainage channels to assess and alleviate any drainage congestion problem.
Ponding of water	Health hazards due to mosquito breeding	• Do not allow ponding of water especially near the waste storage areas and construction camp. • Discard all the storage containers that are capable of storing of water, after use or store them in inverted position.

ECP 5: Air Quality Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Air quality can be adversely affected by vehicle exhaust emissions and combustion of fuels.	The Contractor shall • Prepare air quality management plan (under the Pollution Prevention Plan) and submit the plan for supervision consultant approval. • Fit vehicles with appropriate exhaust systems and emission control devices. Maintain these devices in good working condition. • Operate the vehicles in a fuel efficient manner. • Cover hauls vehicles carrying dusty materials moving outside the construction site. • Impose speed limits on all vehicle movement at the worksite to reduce dust emissions. • Control the movement of construction traffic. • Water construction materials prior to loading and transport. • Service all vehicles regularly to minimize emissions. • Limit the idling time of vehicles not more than 2 minutes.
Construction machinery	Air quality can be adversely affected by emissions from machinery and combustion of fuels.	The Contractor shall • Fit machinery with appropriate exhaust systems and emission control devices. Maintain these devices in good working condition in accordance with the specifications defined by their manufacturers to maximize combustion efficiency and minimize the contaminant emissions. Proof or maintenance register shall be required by the equipment suppliers and contractors/subcontractors. • Focus special attention on containing the emissions from generators. • Machinery causing excess pollution (e.g. visible smoke) will be banned from construction sites. • Service all equipment regularly to minimize emissions. • Provide filtering systems, duct collectors or humidification or other techniques (as applicable) to the concrete batching and mixing plant to control the particle emissions in all its stages, including unloading, collection, aggregate handling, cement dumping, circulation of trucks and machinery inside the installations.
Construction activities	Dust generation from construction sites, material stockpiles and access roads is a nuisance in the environment and can be a health hazard, and also can affect the local crops;	The Contractor shall • Water the material stockpiles, access roads and bare soils on an as required basis to minimize the potential for environmental nuisance due to dust. Increase the watering frequency during periods of high risk (e.g. high winds). Stored materials such as gravel and sand shall be covered and confined to avoid their being wind-drifted. • Minimize the extent and period of exposure of the bare surfaces. • Restore disturbed areas as soon as practicable by vegetation/grass-turfing.

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• Store the cement in silos and minimize the emissions from silos by equipping them with filters. • Establish adequate locations for storage, mixing and loading of construction materials, in a way that dust dispersion is prevented because of such operations. • Not water as dust suppression on potentially contaminated areas so that a liquid waste stream will be generated. • Crushing of rocky and aggregate materials shall be wet-crushed, or performed with particle emission control systems. • Not permit the burning of solid waste.

ECP 6: Noise & Vibration Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Noise quality will be deteriorated due to vehicular traffic	The Contractor shall • Prepare a noise and vibration management plan (under the Pollution Prevention Plan) and submit the plan for supervision consultant approval. • Maintain all vehicles in order to keep it in good working order in accordance with manufactures maintenance procedures. • Make sure all drivers and operators will comply with the traffic codes concerning maximum speed limit, driving hours, etc. • Organize the loading and unloading of trucks, and handling operations for the purpose of minimizing construction noise on the work site.
Construction machinery	Noise and vibration may have an impact on people, property, fauna, livestock and the natural environment.	The Contractor shall • Appropriately site all noise generating activities to avoid noise pollution to local residents. • Use the quietest available plant and equipment. • Maintain all equipment in order to keep it in good working order in accordance with manufactures maintenance procedures. Equipment suppliers and contractors shall present proof of maintenance register of their equipment. • Install acoustic enclosures around generators to reduce noise levels. • Fit high efficiency mufflers to appropriate construction equipment. • Avoid the unnecessary use of alarms, horns and sirens.
Construction activity	Noise and vibration may have an impact on people, property, fauna, livestock and the natural environment.	The Contractor shall • Notify adjacent landholders prior any typical noise events outside of daylight hours. • Educate the operators of construction equipment on potential noise problems and the techniques to minimize noise emissions.

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• Employ best available work practices on-site to minimize occupational noise levels. • Install temporary noise control barriers where appropriate. • Notify affected people if major noisy activities will be undertaken, e.g. blasting. • Plan activities on site and deliveries to and from site to minimize impact. • Monitor and analyze noise and vibration results and adjust construction practices as required. • Avoid undertaking the noisiest activities, where possible, when working at night near the residential areas.

ECP 7: Protection of Flora

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Vegetation clearance	Local flora are important to provide shelters for the birds, offer fruits and/or timber/fire wood, protect soil erosion and overall keep the environment very friendly to human-living. As such damage to flora has wide range of adverse environmental impacts.	The Contractor shall • Prepare a plan for protection of flora and submit the plan for supervision consultant approval. • Minimize disturbance to surrounding vegetation. • Use appropriate type and minimum size of machine to avoid disturbance to adjacent vegetation. • Get approval from supervision consultant for clearance of vegetation. • Make selective and careful pruning of trees where possible to reduce need of tree removal. • Control noxious weeds by disposing of at designated dump site or burn on site. • Clear only the vegetation that needs to be cleared in accordance with the engineering plans and designs. These measures are applicable to both the construction areas as well as to any associated activities such as sites for stockpiles, disposal of fill a, etc. • Not burn off cleared vegetation – where feasible, chip or mulch and reuse it for the rehabilitation of affected areas, temporary access tracks or landscaping. Mulch provides a seed source, can limit embankment erosion, retains soil moisture and nutrients, and encourages re-growth and protection from weeds. • Return topsoil and mulched vegetation (in areas of native vegetation) to approximately the same area of the roadside it came from.

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• Avoid work within the drip-line of trees to prevent damage to the tree roots and compacting the soil. • Minimize the length of time the ground is exposed or excavation left open by clearing and re-vegetate the area at the earliest practically possible. • Ensure excavation works occur progressively and re-vegetation done at the earliest • Provide adequate knowledge to the workers regarding nature protection and the need of avoid felling trees during construction • Supply appropriate fuel in the work camp to prevent fuel wood collection.

ECP 8: Protection of Fauna

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction activities	The location of construction activities can result in the loss of wild life habitat and habitat quality	The Contractor shall • Prepare a plan for protection of fauna and submit the plan for supervision consultant approval. • Limit the construction works within the designated sites allocated to the contractors. • check the site for animals trapped in, or in danger from site works and use a qualified person to relocate the animal.
Vegetation clearance	Impact on migratory birds, its habitat and its active nests	The Contractor shall • Not be permitted to destruct active nests or eggs of migratory birds. • Minimize the tree removal during the bird breeding season. If works must be continued during the bird breeding season, a nest survey will be conducted by a qualified biologist prior to commence of works to identify and locate active nests. • If bird nests are located/ detected within the ledges and roadside embankments then those areas should be avoided. • Petroleum products should not come in contact with the natural and sensitive ecosystems. Contractor must minimize the release of oil, oil wastes or any other substances harmful to migratory birds' habitats, to any waters, wetlands or any areas frequented by migratory birds.
	Clearance of vegetation may impact shelter, feeding and/or breeding and/or physical destruction and severing of habitat areas	The Contractor shall • Restrict the tree removal to the minimum numbers required. • Relocate hollows, where appropriate.

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• Fell the hollow bearing trees in a manner which reduces the potential for fauna mortality. Felled trees will be inspected after felling for fauna and if identified and readily accessible will be removed and relocated or rendered assistance if injured. After felling, hollow bearing trees will remain unmoved overnight to allow animals to move of their own volition.
Night time lighting	Lighting from construction sites and construction camps may affect the visibility of night time migratory birds that use the moon and stars for navigation during their migrations.	The Contractor shall • Use lower wattage flat lens fixtures that direct light down and reduce glare, thus reducing light pollution, • Avoid flood lights unless they are absolutely required. • Use motion sensitive lighting to minimize unneeded lighting. • Use, if possible, green lights that are considered as bird's friendly lighting instead of white or red colour lights. • Install light shades or plan the direction of lights to reduce light spilling outside the construction area.
Construction camps	Illegal poaching	The Contractor shall • Provide adequate knowledge to the workers regarding protection of flora and fauna, and relevant government regulations and punishments for illegal poaching. • Ensure that staff and Subcontractors are trained and empowered to identify, address and report potential environmental problems.

ECP 9: Road Transport and Road Traffic Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Increased traffic use of road by construction vehicles will affect the movement of normal road traffics and the safety of the road-users.	The Contractor shall • Prepare a traffic management plan and submit the plan for supervision consultant approval. • Strictly follow the Project's 'Traffic Management Plan' and work with close coordination with the Traffic Management Unit. • Prepare and submit additional traffic plan, if any of his traffic routes are not covered in the Project's Traffic Management Plan, and requires traffic diversion and management. • Include in the traffic plan to ensure uninterrupted traffic movement during construction: detailed drawings of traffic arrangements showing all detours, temporary road, temporary bridges temporary diversions, necessary barricades, warning signs / lights, road signs etc.

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• Provide signs at strategic locations of the roads complying with the schedules of signs contained in the Pakistan Traffic Regulations.
	Accidents and spillage of fuels and chemicals	The Contractor shall • Restrict truck deliveries, where practicable, to day time working hours. • Restrict the transport of oversize loads. • Operate vehicles, if possible, to non-peak periods to minimize traffic disruptions. • Enforce on-site speed limit.

ECP 10: Construction Camp Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Siting and Location of construction camp	Campsites for construction workers are the important locations that have significant impacts such as health and safety hazards on local resources and infrastructure of nearby communities.	The Contractor shall • Prepare a construction camp management plan and submit the plan for supervision consultant's approval. • Locate the construction camp within the designed sites or at areas which are acceptable from environmental, cultural or social point of view; and approved by the supervision consultant. • Consider the location of construction camp away from communities in order to avoid social conflict in using the natural resources such as water or to avoid the possible adverse impacts of the construction camp on the surrounding communities. • Submit to the supervision consultant for approval a detailed layout plan for the development of the construction camp showing the relative locations of all temporary buildings and facilities that are to be constructed together with the location of site roads, fuel storage areas (for use in power supply generators), solid waste management and dumping locations, and drainage facilities, prior to the development of the construction camp. • Local authorities responsible for health, religious and security shall be duly informed on the set up of camp facilities so as to maintain effective surveillance over public health, social and security matters.
Construction Camp Facilities	Lack of proper infrastructure facilities, such as housing, water supply and sanitation facilities will increase pressure on the local services and	Contractor shall provide the following facilities in the Campsites • Adequate housing for all workers.

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
	generate substandard living standards and health hazards.	• Safe and reliable water supply, which should meet SEQS. Drinking water to be chlorinated at source, and ensure presence of residual chlorine 0.1 ~ 0.25 ppm as minimum after 30 minutes of chlorine contact time (World Health Organization -WHO guideline). • Hygienic sanitary facilities and sewerage system. The toilets and domestic waste water will be collected through a common sewerage. Provide separate latrines and bathing places for males and females with total isolation by location. The minimum number of toilet facilities required is one toilet for every ten persons. • Treatment facilities for sewerage of toilet and domestic wastes. • Storm water drainage facilities. • Paved internal roads. • Provide child crèches for women working construction site. The crèche should have facilities for dormitory, kitchen, indoor and outdoor play area. Schools should be attached to these crèches so that children are not deprived of education whose mothers are construction workers. • Provide in-house community/common entertainment facilities. Dependence of local entertainment outlets by the construction camp to be discouraged/prohibited to the extent possible.
Disposal of waste	Management of wastes is crucial to minimize impacts on the environment	The Contractor shall • Ensure proper collection and disposal of solid wastes within the construction camp. • Insist waste separation by source; organic wastes in one container and inorganic wastes in another container at household level. • Store inorganic wastes in a safe place within the household and clear organic wastes on daily basis to waste collector. Establish waste collection, transportation and disposal systems with the manpower and equipment/vehicles needed. • Do not establish site specific landfill sites. All solid waste will be collected and removed from the work camp and disposed in approval waste disposal sites.
Fuel supplies for cooking purposes	Illegal sourcing of fuel wood by construction workers will impact the natural flora and fauna	The Contractor shall • Provide fuel to the construction camp for their domestic purpose, in order to discourage them to use fuel wood or other biomass.

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• Made available alternative fuels like natural gas or kerosene on ration to the workforce to prevent them using biomass for cooking. • Conduct awareness campaigns to educate workers on preserving the protecting the biodiversity and wildlife of the Project area, and relevant government regulations and punishments on wildlife protection.
Health and Hygiene	There will be a potential for diseases to be transmitted including malaria, exacerbated by inadequate health and safety practices. There will be an increased risk of work crews spreading Sexually Transmitted Infections (STIs) and Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS). In adequate safety facilities to the construction camp may create security problems and fire hazards	• The Contractor shall • Provide adequate health care facilities within construction sites. • Provide first aid facility round the clock. Maintain stock of medicines in the facility and appoint fulltime designated first aider or nurse. • Provide ambulance facility for the labourers during emergency to be transported to nearest hospitals. • Initial health screening of the labourers coming from outside areas. • Train all construction workers in basic sanitation and health care issues and safety matters, and on the specific hazards of their work. • Provide HIV awareness programming, including STIs and HIV information, education and communication for all workers on regular basis. • Provide adequate drainage facilities throughout the camp to ensure that disease vectors such as stagnant water bodies and puddles do not form. Regular mosquito repellent sprays during rainy season in offices and construction camp and yards. • Not dispose food waste openly as that will attract rats and stray dogs. • Carryout short training sessions on best hygiene practices to be mandatorily participated by all workers. Place display boards at strategic locations within the camp containing messages on best hygienic practices. The Contractor shall • Provide appropriate security personnel (police or private security guards) and enclosures to prevent unauthorized entry in to the camp area. • Maintain register to keep a track on a head count of persons present in the camp at any given time. • Encourage use of flameproof material for the construction of labour housing / site

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		office. Also, ensure that these houses/rooms are of sound construction and capable of withstanding wind storms/cyclones. • Provide appropriate type of firefighting equipment suitable for the construction camp • Display emergency contact numbers clearly and prominently at strategic places in camp. • Communicate the roles and responsibilities of labourers in case of emergency in the monthly meetings with contractors.
Site Restoration	Restoration of the construction camp to original condition requires demolition of construction camp	The Contractor shall • Dismantle and remove from the site all facilities established within the construction camp including the perimeter fence and lockable gates at the completion of the construction work. • Dismantle camp in phases and as the work gets decreased and not wait for the entire work to be completed. • Give prior notice to the labourers before demolishing their camp/units. • Maintain the noise levels within the national standards during demolition activities. • Different contractors should be hired to demolish different structures to promote recycling or reuse of demolished material. • Reuse the demolition debris to a maximum extent. Dispose remaining debris at the designated waste disposal site. • Handover the construction camp with all built facilities as it is if agreement between both parties (contactor and land-owner) has been made so. • Restore the site to its condition prior to commencement of the works or to an agreed condition with the landowner.

ECP 11: Worker Health and Safety

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Best practices	Construction works may pose health and safety risks to the construction workers and site visitors leading to severe injuries and deaths. The population in the proximity of the construction site and the construction workers will be exposed to a number of (i) biophysical health risk factors, (e.g. noise, dust, chemicals, construction material, solid waste, waste water, vector transmitted diseases etc.), (ii) risk factors resulting from human behavior (e.g. STD, HIV etc.) and (iii) road accidents from construction traffic.	The Contractor shall • Prepare an OHS plan and submit the plan for supervision consultant's approval. • Implement suitable safety standards for all workers and site visitors which should not be less than those laid down on the international standards (e.g. International Labour Office guideline on 'Safety and Health in Construction; WBG's 'Environmental Health and Safety Guidelines') and contractor's own national standards or statutory regulations, in addition to complying with Pakistan standards. • Provide the workers with a safe and healthy work environment, taking into account inherent risks in its particular construction activity and specific classes of hazards in the work areas. • Provide personal protection equipment (PPE) for workers, such as safety boots, helmets, masks, gloves, protective clothing, goggles, full-face eye shields, and ear protection. Maintain the PPE properly by cleaning dirty ones and replacing them with the damaged ones. • Safety procedures include provision of information, training and protective clothing to workers involved in hazardous operations and proper performance of their job. • Appoint an EHS manager to look after the health and safety of the workers. • Inform the local authorities responsible for health, religious and security duly informed before commencement of civil works and establishment of construction camp so as to maintain effective surveillance over public health, social and security matters.
Child and pregnant labour accident	Lack of first aid facilities and health care facilities in the immediate vicinity will aggravate the health conditions of the victims	The Contractor shall • Ensure health care facilities and first aid facilities are readily available. Appropriately equipped first-aid stations should be easily accessible throughout the place of work. • Document and report occupational accidents, diseases, and incidents. • Prevent accidents, injury, and disease arising from, associated with, or occurring in the course of work by minimizing, so far as reasonably

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		practicable, the causes of hazards, in a manner consistent with good international industry practice. • Identify potential hazards to workers, particularly those that may be life-threatening and provide necessary preventive and protective measures. • Provide awareness to the construction drivers and operators to strictly follow the driving rules. • Provide adequate lighting in the construction area, inside the tunnels, inside the powerhouse cavern and along the roads.
Construction Camp	Lack of proper infrastructure facilities, such as housing, water supply and sanitation facilities will increase pressure on the local services and generate substandard living standards and health hazards	The Contractor shall provide the following facilities in the Campsites to improve health and hygienic conditions as mentioned in ECP 9 Construction Camp Management • Adequate ventilation facilities • Safe and reliable water supply. • Hygienic sanitary facilities and sewerage system. • Treatment facilities for sewerage of toilet and domestic wastes • Storm water drainage facilities. • Recreational and social facilities • Safe storage facilities for petroleum and other chemicals in accordance with ECP 2 • Solid waste collection and disposal system in accordance with ECP1. • Arrangement for trainings • Paved internal roads. • Security fence at least 2 m height. • Sick bay and first aid facilities
Other ECPs	Potential risks on health and hygiene of construction workers and general public	The Contractor shall follow the following ECPs to reduce health risks to the construction workers and nearby community • ECP 2: Fuels and Hazardous Goods Management • ECP 4: Drainage Management • ECP 5: Air Quality Management • ECP 6: Noise and Vibration Management • ECP 8: Road Transport and Road Traffic Management .
Training	Lack of awareness and basic knowledge in health care among the construction workforce, make them susceptible to potential diseases.	The Contractor shall • Train all construction workers in basic sanitation and health care issues (e.g., how to avoid malaria and transmission of STIs HIV/AIDS).

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• Train all construction workers in general health and safety matters, and on the specific hazards of their work. Training should consist of basic hazard awareness, site specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate. • Implement malaria, HIV/AIDS and STI education campaign targeting all workers hired, international and national, female and male, skilled, semi- and unskilled occupations, at the time of recruitment and thereafter pursued throughout the construction phase on on-going and regular basis. This should be complemented by easy access to condoms at the workplace as well as to voluntary counselling and testing.

Guidelines for the Preparation of Site-specific Plans and Procedures during Construction phase

Specific plans relevant to the ESMP are as follows:

Site Specific Environmental and Social Management Plan (SSESMP)

Project- specific Stakeholder Engagement Plan / Communication Plan

1. Occupational health and safety plan
2. Community health and safety plan
3. Emergency preparedness and response plan
4. Workers camp management plan
5. Site-specific compensatory tree plantation plan
6. Waste management plan
7. Traffic management plan
8. Spill prevention and response plan
9. Pollution prevention plan
10. Material Transportation Plan

1. Contractor's Site Specific Environmental and Social Management Plan (SSESMP)

The Contractor will develop a construction phase SSESMP in line with the ESMP. The Contractor will also be expected to have its own Environmental and Social Management System aligned to the principles of ISO 14001:2015 and OHSAS 45001 or equivalent. These plans will be formally approved by PIU-KWSSIP and CSC before any work occurs on site. The SSESMP will consist of the following as a minimum and be structured as follows:

a. Section 1: Master SSESMP Document

The master SSESMP document will clearly define the Contractor's ESHS commitments and requirements, including:

- Place a high emphasis on good housekeeping practices.
- ESHS policy, committing to compliance with the ESMP.
- Identification of all regulations, standards, and regulatory limits, and specify the means for maintaining compliance.
- Training plan outlining training and capacity building (covering both introductory sessions and technical training).
- Contractor's ESMS and H&S management system
- Organizational capacity and structure, roles and responsibilities, key resources
- Procedures, logistics and communication channels

- Monitoring, inspections, audits and evaluations
- Reporting
- Management of nonconformity procedures (including management and tracking)
- A permit register, with all permits required by the national requirements relating to the project, including timeframes and renewal dates and procedure
- An environmental, social, health and safety (ESHS) risk assessment register, to be maintained and updated monthly and discussed with PIU KWSSIP.
- Description of project areas, including the number, a map, key activities, opening and closing schedule, and access plans.
- A pre-construction plan, which outlines the pre-construction surveys planned to be carried out to record the existing baseline of each site, any changes to the baseline, and any additional measures (following the mitigation hierarchy) to avoid, minimize and mitigate. This will include detailed photographic and video footage for each specific work area

b. Section 2: SSESMP Sub-plans and Procedures

Development and implementation of specific sub-plans, which are detailed as follows shall be referenced under the SSESMP. All plans need to be developed in line with the applicable standards and GIIP. In addition to GIIP measures, the sub-plans will include the specific mitigation measures identified within the ESMP. The key mitigation measures identified in the ESMP shall require to be included in the relevant sub-plans. The plans will typically include a similar structure, such as:

- A standard introduction referencing the project, summarizing the project description, linkage of the plan to the SSESMP and other plans, the purpose and scope of the plan
- Requirements and standards
- Roles and responsibilities
- Impact and risk assessment
- Control measures
- Training requirements
- Monitoring and reporting procedures
- Other relevant details
- Document/record control

It is important to note that many plans have overlapping or cross-cutting measures that may need to be considered and included in multiple plans. All plans, when developed, will be reviewed and considered together by the Contractor as part of its overall system, to ensure that key environmental, social, health, safety and security measures are appropriately included, and there are no contradictions between plans. **Table A5-5** presents the sub-plans to be prepared by the Contractor.

Table A5-5: Sub-plans to be prepared by the Contractor and Summary of the Aspects to be Covered

Plan	Objectives and Contents
Social and community	
Project- specific Stakeholder Engagement Plan / Communication Plan	◆ Ensuring that the mechanism for information disclosure on purpose and nature of the construction activities, early notification of construction start date, scheduling and duration and potential impacts and health and safety measures/ mechanisms is in place ◆ Mechanism for issuance of notification to communities and sensitive receptors for any transport disruptions, construction activities, pedestrian accessibility, etc. is intact ◆ Feedback and grievance redress mechanism is followed ◆ Recruitment and Procurement, Employment of Local Workers details are clear to communities
Health and safety	
Occupational health and safety plan	To implement a safe working environment, procedures and culture during the construction phase. Further policies / procedures to be developed if need identified through site audits.
Community health and safety plan	To avoid, minimize and manage community health and safety risks.
Emergency preparedness and response plan	To cover potential emergencies during construction
Workers camp management plan	To ensure that all Project accommodation areas are designed, constructed and maintained as healthy, clean and pleasant locations for workers to live in.
Biodiversity	
Site-specific compensatory tree plantation plan	The plan will provide details on the contractor's role and step by step approach for managing and monitoring compensatory tree plantation.
Environmental	
Waste management plan	To identify predicted waste streams, appropriate handling, reuse and recycle opportunities and, as a last resort, disposal methods
Traffic management plan	To plan, coordinate and management all traffic and access risks in relation to the construction phase of the project.
Spill prevention and response plan	To prevent spills and plan for appropriate responses
Pollution prevention plan	To effectively control air, noise, water and wastewater pollution
Material Transportation Plan	Construction material logistics planning entails managing materials and equipment both to and from construction sites. These two vital processes are inbound logistics and outbound logistics. Both of these equipment and material management activities require a detailed and thorough plan.

1. Project- Specific Stakeholder Engagement Plan / Communication Plan

What is a Project- Specific stakeholder engagement / communication plan?

A project-specific stakeholder engagement plan—also known as a stakeholder management plan—is a subsidiary document that is often created alongside the main project plan for a given body of work. It is a written document that is formulated before a project begins, and which is kept on file and updated over the course of the project as necessary. Its purpose is to identify a project's key stakeholders, and to outline a methodology and approach for how the project team will interact and communicate with those stakeholders.

What goes into a stakeholder engagement plan?

Stakeholder Identification

This section is used to identify all of the project's stakeholders by name. At a minimum, the section also defines their roles and responsibilities as they relate to the project. In some cases, it can be much more extensive.

Planning to Interact with the Stakeholders

The next section is dedicated to actually determining how the project team will interact and engage with the stakeholders identified in the first portion of the plan. This will often involve a deeper assessment of each stakeholder, which will be used to inform the rest of the plan.

Stakeholder Engagement Activities

The final portion of the plan is essentially an outline of the various activities the project team will undertake to communicate with stakeholders, manage their expectations, and keep them engaged with the project. This includes activities such as pre-planned meetings with stakeholders or key reports. This section of the document will also typically outline the types of communications that will be used throughout the project—FGDs, pamphlets, media, periodic meetings etc.—and which each form of communication is best suited for.

Contractor shall follow the KWSSIP-2 Stakeholder Engagement Plan in principal for preparing the Project-specific SEP / Communication Plan. Indicative overview of contents to be covered is as follows:

- **INTRODUCTION**

✓ Background to Stakeholder Engagement
✓ Objectives of the Stakeholder Engagement Plan
✓ Structure of the Document

- **PROJECT DESCRIPTION**

✓ Project Overview
✓ Key Project Aspects
✓ Social Area of Influence

- **LEGAL FRAMEWORK**

✓ Local and WB Requirements for Stakeholder Engagement and Public Consultation

- **KEY PROJECT PRINCIPLES OF STAKEHOLDER ENGAGEMENT AND APPROACH**

✓ Stakeholder Identification and Analysis
✓ Methodology and Approach for Engaging Stakeholders
✓ Vulnerable Groups

- **STAKEHOLDER ENGAGEMENT**

✓ Stakeholder Engagement Activities according to National and International Requirements

- ✓ Stakeholder Engagement Activities within the Scope of ESMP Studies and KWSSIP-1 Stakeholders Requirements
- ✓ Summary of the Social Field Studies for the ESMP
- ✓ Tools for Communication Routine (E.g. Internet/Website, Public Media, FGDs etc.)
- ✓ Community Relations
- ✓ Notice Boards

- ◆ **STAKEHOLDER ENGAGEGEMENT PROGRAM**

- ✓ Pre-Construction Phase
- ✓ Construction Phase

- ◆ **GRIEVANCE MECHANISM**

- ✓ Public Grievance Mechanism
- ✓ Receipt of Grievances
- ✓ Acknowledgement and Record Keeping
- ✓ Investigation
- ✓ Response to Complainant
- ✓ Discussion of Resolution
- ✓ Worker Grievance Mechanism

- ◆ **EXTERNAL COMMUNICATIONS**

- ✓ Institutional Arrangements, Roles and Responsibilities

2. Occupational and Community Health & Safety Plan

Occupational and Community Health and Safety Plans (OHS / CHS Plans) are key document to address how OHS and CHS risks will be managed in a project. A Health & Safety Framework has been prepared by the World Bank E&S Safeguards Unit which is applicable on all World Bank-financed projects in the South Asia Region (SAR). The framework provides guidelines not only to the proponent but also to the project Contractors to implement a practical approach to manage Occupational Health and Safety (OHS) and Community Health and Safety (CHS) impacts and risks in accordance with national/local regulatory framework, the World Bank Environmental and Social Standards and Environmental Health and Safety (EHS) Guidelines, ISO Standards, Good International Industry Practices (GIIP), etc. The framework also includes a template for OHS / CHS Plans which should be followed by the Contractor for making these plans.

Some key guidelines to be covered under the plan are presented in **Table A5-6**.

Table A5-6: Specific Mitigation Guidelines for Dealing with OHS Hazards

No.	Work Activities and Associated Hazards	Mitigation Guidelines
1.	**Trench Excavation** Collapse of Excavation and falling of materials while working in excavations could result in workers injuries or fatalities. Workers could be at risk from: ◆ Excavations collapsing and burying or injuring people working in them; ◆ Material falling from the sides into excavation;	**Collapse of excavations:** a- **Temporary support** - Before digging any trench pit, or other excavations, Contractor shall decide what temporary support will be required and

No.	Work Activities and Associated Hazards	Mitigation Guidelines
	◆ People or plant falling into excavations. ◆ Serious accidents could occur if buried services are damaged during excavation work. ◆ Excavation inside water stream or at dry areas during wet weather can cause many safety hazards including intrusion of water into excavation, slippery conditions for the drivers of equipment, causing the ground to be slippery and muddy thereby creating the possibility of slips and falls, and making the site work less stable. **(*Ref:https://www.hse.gov.uk/construction/safetytopics/excavations.htm)***	accordingly plan the precautions to be taken. b- Contractor shall make sure the equipment and precautions needed (trench sheets, props, baulks etc.) are available on site before work starts. c- **Battering the excavation sides** - Battering the excavation sides to a safe angle of repose may also make the excavation safer. d- In granular soils that may come across during trenching, the angle of slope should be less than the natural angle of repose of the material being excavated. In wet ground a considerably flatter slope will be required. **Falling or dislodging material:** a- **Loose materials** - may fall from spoil heaps into the excavation. Edge protection should include toe boards or other means, such as projecting trench sheets or box sides to protect against falling materials. Head protection should be worn. b- Effect of plant and vehicles - Do not park plant and vehicles close to the sides of excavations. The extra loadings can make the sides of excavations more likely to collapse. **Falling into excavations** a- **Prevent people from falling** – Contractor shall protect edges of excavations with substantial barriers where people are susceptible to fall into them. b- To achieve this, use of following options shall be made: ◆ Guard rails and toe boards inserted into the ground immediately next to the supported excavation side; or fabricated guard rail assemblies that connect to the sides of the trench box ◆ The support system itself, e.g. using trench box extensions or trench sheets longer than the trench depth.

No.	Work Activities and Associated Hazards	Mitigation Guidelines
		Inflow of surface or ground water a- Depending on the permeability of the ground, water may flow into any excavation below the natural groundwater level. b- The supports to the side of the excavation should be designed to control the entry of groundwater and the design should take any additional water loading into account. c- Particular attention should be given to areas close to lakes, rivers and the sea. d- Water entering the excavation needs to be channeled to sumps from where it can be pumped out; however, the effect of pumping from sumps on the stability of the excavation should be considered. **Safety Measures for Excavation in Wet Weather** a- Weather conditions needs to be checked before daily work to be aware of rain and storm possibilities. b- Inspection of trenches to be done every day before construction begins. c- Workers shall not be allowed to go near unprotected trenches. d- Heavy equipment shall be kept away from trench edges. e- Workers shall be trained to have the skills needed to identify wet weather hazards and how to minimize risks. f- Protective equipment shall always be worn and in a correct manner. g- All power tools shall be correctly maintained and used properly. h- Protective systems including benching, sloping, shoring, and shielding shall be utilized. i- Planning and implementation of safety systems and inspections shall be used regularly on the construction sites. **Other aspects of excavation safety** a- Safe means of getting into and out of an excavation shall be provided. If a risk assessment identifies that ladders are a

No.	Work Activities and Associated Hazards	Mitigation Guidelines
		reasonable means of access and egress from an excavation, ladders with suitable length and of sufficient strength shall be provided for the purpose. b- Use of petrol or diesel engines in excavations shall be avoided without arranging for the fumes to be ducted safely away or through forced ventilation. **Inspection** a- A competent person who fully understands the dangers and necessary precautions shall inspect the excavation at the start of each shift. b- Excavations shall also be inspected after any event that may have affected their strength or stability, or after a fall of rock or earth. c- A record of the inspections shall be maintained and any faults that are found should be corrected immediately. d- A written report shall be made containing the following information: ◆ Location and description of the place of work or work equipment inspected; ◆ Date and time of the inspection; ◆ details of: ◆ Any matter identified that could give rise to a risk to the health or safety of any person; ◆ Any action taken as a result of any matter identified; ◆ Any further action considered necessary; and ◆ Name and position of the person making the report.
2.	**Excavators** Most fatal and serious injuries involving excavators occur when the excavator is: ◆ **Moving** – and strikes a worker / pedestrian, particularly while reversing; ◆ **Slewing** – trapping a person between the excavator and a fixed structure or vehicle; or ◆ **Working** – when the moving bucket or other attachment strikes a worker or when the bucket inadvertently falls from the excavator. ◆ Most excavator related deaths involve a person working in the vicinity of the excavator rather than the driver.	**Controlling the risk** It is important to select the right excavator for the job. There are five main precautions needed to control excavator hazards. These are: a- **Exclusion:** People should be kept away from areas of excavator operation by the provision of suitable barriers. Bunting or fencing can be used to create and maintain a pedestrian exclusion area.

No.	Work Activities and Associated Hazards	Mitigation Guidelines
	(Ref:https://www.hse.gov.uk/construction/safetytopics/excavators.htm)	b- **Clearance:** When slewing in a confined area the selection of plant with minimal tail swing is preferred. Clearance of over 0.5m needs to be maintained between any part of the machine, particularly the ballast weight, and the nearest obstruction. c- **Visibility:** Excavators with the best view around them directly from the driver position should be selected. Excavators should be equipped with adequate visibility aids to ensure drivers can see areas where people may be at risk from the operation of the machine. d- **Plant and vehicle marshal/banksmen:** A Plant and vehicle marshal/banksmen should be provided in a safe position to direct excavator operation and any pedestrian movements. e- **Bucket attachment:** Quick hitches can be used to secure buckets to the excavator arm. **Training and competence** There are three categories of people who must be trained and made competent regarding the excavator hazards and precautions: a- **Drivers:** should be trained, competent and authorized to operate the specific excavator. Training certificates from recognized schemes help demonstrate competence and certificates should be checked for validity; b- **Plant and vehicle marshal:** should be trained, competent and authorized to direct excavator movements and, where possible, provided with a protected position from which they can work in safety; and c- **Pedestrians:** should be instructed in safe pedestrian routes on site and the procedure for making drivers aware of their presence through sign boards and on-site instructions. **Inspection and maintenance**

No.	Work Activities and Associated Hazards	Mitigation Guidelines
		a- A program of daily visual checks, regular inspections and servicing schedules shall be established in accordance with the manufacturer's instructions and the risks associated with each vehicle. b- Drivers shall be advised to report defects or problems. Reported problems shall be put right quickly and the excavator taken out of service if the item is safety critical.
3.	**Lifting Operations (Cranes)** ◆ **Collapse of the Crane** – such incidents present significant potential for multiple fatal injuries, both on and off-site; ◆ **Falling of the Load** – these events also present a significant potential for death and major injury. ***(Ref:https://www.hse.gov.uk/construction/safetytopics/lifting-operations.htm)***	**Pre-requisite:** a- Cranes and lifting accessories such as slings shall be of adequate strength, tested and subject to the required examinations and inspections. b- All crane operators, and people involved in slinging loads and directing lifting operations, shall be trained and competent. **Planning lifting operations** a- All lifting operations shall be planned so they are carried out safely with foreseeable risks taken into account. b- The person appointed to plan the lifting operation shall have adequate practical and theoretical knowledge and experience of the lifts being undertaken. c- The plan will need to address the risks identified by a risk assessment, the resources required, procedures and the responsibilities so that any lifting operation is carried out safely. d- The plan shall ensure that the lifting equipment remains safe for the range of lifting operations for which the equipment might be used. **Supervision of lifting** a- The right level of supervision shall be in place for lifting operations, reflecting the degree of risk and personnel involved in the particular lifting operation. b- The crane supervisor shall direct and supervise the lifting operation to make sure it is carried out in accordance with the method statement.

No.	Work Activities and Associated Hazards	Mitigation Guidelines
		c- The crane supervisor shall be competent and suitably trained and should have sufficient experience to carry out all relevant duties and authority to stop the lifting operation if it is judged dangerous to proceed. **Thorough examination** a- Lifting equipment shall be thoroughly examined at the prescribed intervals. This shall be a detailed and specialized examination by a competent person. b- Records of thorough examinations and tests shall be: made readily available to the relevant authorities; secured; and capable of being reproduced in written form.
4.	**Heat Stress / Heat Stroke** ◆ Workers who are exposed to extreme heat may be at risk of heat stress. ◆ Exposure to extreme heat can result in occupational illnesses and injuries. ◆ Heat stress can result in heat stroke, heat exhaustion, heat cramps, or heat rashes. ◆ Burns may also occur as a result of accidental contact with hot surfaces. ***(Ref:https://www.cdc.gov/niosh/topics/heatstress/recommendations.html)***	**Control of Heat Stress** Work practice recommendations include the following: a- Limit time in the heat and/or increase recovery time spent in a cool area. b- Use tools intended to minimize manual strain. c- Increase the number of workers per task. d- Train supervisors and workers about heat stress. e- Use a buddy system where workers observe each other for signs of heat-related illnesses. f- Require workers to conduct self-monitoring and create a work group (i.e., workers, a paramedic, and a safety manager) to make decisions on self-monitoring options and standard operating procedures. g- Provide adequate amounts of cool, potable water near the work area and encourage workers to drink often. h- Use a heat alert program whenever the weather service forecasts a heat wave. i- Institute a heat acclimatization plan and encourage increased physical fitness. **Training** Contractor shall implement a heat stress training program for all workers and supervisors which will cover the following: a- Training of workers before hot outdoor work begins.

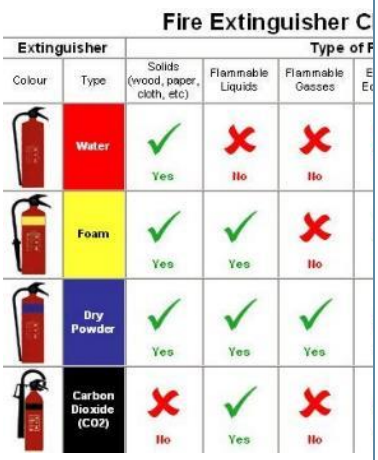
No.	Work Activities and Associated Hazards	Mitigation Guidelines
		b- Recognition of the signs and symptoms of heat-related illnesses and administration of first aid. c- Causes of heat-related illnesses and steps to reduce the risk. These include drinking enough water and monitoring the color and amount of urine output. d- Proper care and use of heat-protective clothing and equipment and the added heat load caused by exertion, clothing, and personal protective equipment. e- Effects of other factors (drugs, obesity, etc.) on tolerance to occupational heat stress. f- The importance of acclimatization. g- The importance of immediately reporting any symptoms or signs of heat-related illness in themselves or in co-workers to the supervisor. h- Procedures for responding to symptoms of possible heat-related illness and for contacting emergency medical services. Supervisors shall also be trained on the following: a- Implementing appropriate acclimatization plan. b- Procedures to follow when a worker has symptoms of heat-related illness, including emergency response procedures. c- Monitoring weather reports. d- Responding to hot weather advisories. e- Monitoring and encouraging adequate fluid intake and rest breaks. **Hydration** The Contractor shall provide the means for appropriate hydration of workers and ensure that: a- Water should be potable, <15°C (59°F), and made accessible near the work area. b- Estimate how much water will be needed and decide who will get and check on water supplies. c- Provide individual drinking cups for each worker.

No.	Work Activities and Associated Hazards	Mitigation Guidelines
		d- Encourage workers to hydrate themselves. e- Workers should drink an appropriate amount to stay hydrated. f- For moderate activities in the heat that last less than 2 hours, drink 1 cup (8 oz.) of water every 15–20 minutes. g- If sweating lasts for several hours, drink sports drinks containing balanced electrolytes. h- Avoid alcohol and drinks with high caffeine or sugar. i- Generally, fluid intake should not exceed 6 cups per hour.
5.	**Confined Space Working** The most likely hazards related to confined spaces include: ◆ A risk of fire or explosion can arise flammable substances and oxygen enrichment. ◆ Hot conditions can lead to a dangerous rise in core body temperature and this can be made worse by wearing PPE, highly physical or strenuous work. ◆ The presence of toxic gas, fume or vapour can lead to asphyxia or unconsciousness ◆ A lack of oxygen in the atmosphere may also lead to asphyxia or unconsciousness. ***(Ref:https://www.hse.gov.uk/pubns/priced/l101.pdf)***	**Work in confined spaces** a- No person at work shall enter a confined space to carry out work for any purpose unless it is not reasonably practicable to achieve that purpose without such entry. b- A site specific method statement shall be produced by the Contractor and all workers shall adhere to the method statement instructions before the work is carried out. c- It shall be ensured that there is suitable ventilation within the workplace. d- Damaging any underground utilities shall be avoided. e- It shall be ensured that workers are provided with the following: ◆ Head, hand and foot protection ◆ Eye and hearing protection ◆ Waterproof and thermal clothing ◆ Respirators and breathing apparatus ◆ Appropriate safety harnesses. f- It shall be ensured that Emergency arrangements such as First aid procedures, arrangements for the safety of rescuers and mechanism of liaison with emergency services are in place before any work starts to make sure that the workers can be rescued safely if required. g- Those who are identified as rescuers need to be:

No.	Work Activities and Associated Hazards	Mitigation Guidelines
		◆ Ready at hand ◆ Properly trained ◆ Fit to carry out their task ◆ Protected against the cause of the emergency ◆ Capable of using any equipment provided for rescue, for example breathing apparatus, lifelines and fire-fighting equipment. h- Training is critical in all work with confined spaces. The Contractor shall ensure that all workers are given suitable and appropriate training to carry out the workplace task. This will include trainings on; emergency procedures and use of breathing apparatus.
6.	**Welding Safety** There are a variety of welding methods available, all of which have inherent safety and health hazards associated with them, such as: a- Metal fumes are formed when a metal is heated above its boiling point and its vapors condense into very fine particles. Health effects can range from short-term illnesses such as metal fume fever with flu-like symptoms to longer-term issues such as lung damage or neurological disorders. b- Burns may be caused by contact with hot surfaces or hot flying particles. c- Eye injuries can result from exposure to ultraviolet and infrared radiation created from the arc or from particulates or spattering. d- Electric shock may occur due to improper grounding and/or contact with current through damp clothing, wet floors and other humid conditions. Even if the shock itself is not fatal, the jolt may still cause welders to fall from their work positions. In addition, stray welding current may cause extensive damage to equipment, buildings and electrical circuits. e- Fire caused by heat, sparks, slag or flames contacting combustible or flammable materials in the welding area. f- Improper use and storage of oxygen and acetylene may result in fire or explosion g- Strains, neck and lower back injuries resulting from repetitive motions and work orientation. h- Lacerations resulting from accidental contact with sharp edges and burrs. *(Ref:https://www.hse.gov.uk/welding/index.htm)*	**Safety Measures** The Contractor shall ensure the following: a- Welders, bystanders and work space are properly protected. b- Use of local exhaust ventilation, such as an exhaust trunk, while performing welding activities whenever possible to minimize exposures to welding fume. c- Use of respiratory protection below the recommended air quality levels. d- Protecting worker's exposures to UV and infrared radiation by providing a properly fitted welding helmet, with proper grade of filter plate while ensuring that it must be worn. An auto-darkening welding helmet is highly recommended as these helmets do not need to be raised to check welds and can be kept in the lowered position all the time, reducing fume exposure. These helmets also reduce the urge to use the neck muscle to flip the helmet to the "up" position, which can cause significant neck discomfort and possible injury. e- Safety glasses should also be worn under the welding helmet to provide impact protection and to protect eyes from particulates when hoods are lifted.

No.	Work Activities and Associated Hazards	Mitigation Guidelines
		f- Pant cuffs and rolled up sleeves should be avoided. g- Workers shall be trained to protect their body from spatter and arc flash with flame-resistant gloves and apron or jacket, flame-resistant natural fiber clothing (such as wool or cotton) and leather boots etc. h- Any combustible or flammable materials shall be put away from the welding area to prevent fires. i- A clear egress path shall be maintained out of the welding area as well as to the nearest emergency equipment such as fire extinguisher, emergency eyewash and emergency shower. j- Check welding equipment and personal protective equipment (PPE) for defects and damage before beginning work. Ensure PPE is properly stored and maintained when not in use. k- Position welding curtains as needed to protect others in the area from splatter, flash and glare. l- Setting up any signs or safety cones as needed. m- Prevent lacerations by identifying sharp edges and burrs, wearing appropriate gloves, deburring, and proper storage methods. n- Ensure good insulation from work surfaces, the electrode, the electrode holder and grounding surfaces is obtained and maintained. o- Practice good lifting techniques by workers and considering ergonomics when setting up the work and minimizing awkward postures. p- Workers shall be trained on the safe use, transportation and storage of compressed gases prior to use.
7.	**Construction Dust** a- Drilling, cutting, sanding and driving over dusty areas can pose risks for the workers involved. b- Dust that can enter the nose and mouth during breathing is referred to as 'total inhalable dust'. Some dust may consist of larger or heavier particles that tend to get trapped in the nose, mouth, throat or	**Control Measures** a- Contractor shall ensure that workers are protected from excessive exposure to dust. b- Keep construction areas shall be kept as clean as possible.

No.	Work Activities and Associated Hazards	Mitigation Guidelines
	upper respiratory tract where they can cause damage. c- Chronic effects of dust in the lungs are usually permanent and may be disabling, so prevention of the onset of disease should be given the highest priority. *(Ref:https://www.hse.gov.uk/construction/healthrisks/hazardous-substances/construction-dust.htm)*	c- Workers shall be provided with clothing that resists dust and essential PPEs. d- Working shifts shall be rotated to limit inhalation of polluted air by workers specially the potentially dusty work sites. e- Dust shall be suppressed and dampen at project sites by sprinkling water. f- Construction vehicles shall be driven at slow speeds to keep dust emissions limited. g- Contractor shall provide construction workers with information / training about potential dust hazards and instructions on how to avoid them. h- Workers shall be trained to wet the tools before cutting into any materials as it can reduce dust accumulation.
8.	**Construction Noise** a- Exposure to high levels of noise can cause permanent hearing loss. b- Loud noise can create physical and psychological stress, reduce productivity, interfere with communication and concentration, and contribute to workplace accidents and injuries by making it difficult to hear warning signals. *(Ref:https://www.hse.gov.uk/noise/hearingprotection.htm)*	**Control Measures** a- As a first step, the Contractor shall choose quieter equipment and machinery to save the cost of introducing noise-reduction measures and providing hearing protection, health surveillance and associated trainings etc. b- Hearing protection shall be issued to employees: ◆ where extra protection is needed above what has been achieved using noise control ◆ as a short-term measure while other methods of controlling noise are being developed. c- Contractor shall make sure that the protectors give enough protection - at least to get below 85 dB at the ear. d- Use of protectors to the noisy tasks and jobs in a working day shall be made mandatory. e- No employee should be exposed to a noise level greater than 85 dB (A) for a duration of more than 8 hours per day without hearing protection. f- Periodic medical hearing checks shall be performed on workers exposed to high noise levels.

No.	Work Activities and Associated Hazards	Mitigation Guidelines
9.	**Fire Safety** a- Fire at a construction site can endanger the lives of workers and others who happen to be on the site. b- A fire during the course of construction also can result in severe structural damage; destruction of machinery, equipment or materials; and untimely delay in project completion.	**Control Measures** a- The Contractor shall develop an effective fire prevention and extinguishing plan before the onset of construction. The plan shall be put into practice as soon as construction operations begin and shall be closely followed throughout the course of construction. b- Contractor shall ensure that fire safety and firefighting trainings are provided to selected workers from each worker groups so that they can handle the localized fires. c- Contractor shall ensure the availability of right fire extinguishers at project construction and Campsites to deal with different types of fires in accordance with the following chart:  Fire Extinguisher C Extinguisher / Type of F Colour / Type / Solids (wood, paper, cloth, etc) / Flammable Liquids / Flammable Gasses / E Ec Water — Yes / No / No Foam — Yes / Yes / No Dry Powder — Yes / Yes / Yes Carbon Dioxide (CO2) — No / Yes / No d- The local fire department shall be made aware of construction plans and kept up to date during the course of construction regarding items such as access to the sites during both working and non-working hours; and the location of fuel storage, power and fuel shutoffs, power generators, and fixed-fire extinguishing systems. e- The project requires considerable works related to welding. Cutting and welding sparks cause more construction fires than any other ignition source. The personnel responsible for fire

No.	Work Activities and Associated Hazards	Mitigation Guidelines
		safety shall ensure that adequate precautions are taken during welding works and adequate numbers of fire extinguishers are present in proximity to the work areas. f- Suitable fire extinguishers are Carbon Dioxide or Dry Powder because of the risk of electrical fires in the welding area, whereas use of water based extinguisher shall be avoided. g- Fuel gas and oxygen cylinders shall be placed upright and secured at safe locations, protected from high temperatures and adequately separated from each other. h- Typical Fire Safety Checklist is attached at the end of this annexure, which shall be followed by the Contractor during construction phase.

3. Emergency Preparedness and Response Plan (EPRP)

The Contractor will be responsible for ensuring adequate emergency preparedness and response planning for the construction phase of the project. **Table A5-7** presents the contents to be covered under EPRP.

Table A5-7: Emergency Response Plan

Impact to be addressed	Management/Mitigation/ Enhancement to be included in plan	KPI
Construction phase emergency preparedness and response plan, including flooding, medical emergencies etc.	◆ Develop and implement a regularly updated EPRP so that project staff, relevant local authorities and emergency services are prepared to respond to accidental and emergency situations in a manner that prevents and mitigates harm to people and the environment. The EPRP will include: ◆ Identification of accidents and emergency situations and the communities and individuals that may potentially be impacted. ◆ Identification of response procedures, provision of equipment and resources, designation of responsibilities, communication systems and channels and periodic response training ◆ Routine inspection of work sites ◆ Maintenance of plant, equipment, supplies and materials required for preventative measures and emergency responses ◆ Clearly defined evacuation procedures	◆ Records of training drills ◆ Disclosure of EPRP to affected communities, emergency services and operations workers ◆ Type, duration and adequacy of emergency response in specific situations

Impact to be addressed	Management/Mitigation/ Enhancement to be included in plan	KPI
	◆ Training requirements for staff and managers, including details on who provides training ◆ Identification of relationship to and integration with other plans ◆ Identification of revision timeframe and process ◆ Template for incident reporting forms ◆ Identify a set of procedures to assist in rapid and early identification and responses to potential and occurring emergencies relevant to the construction phase. These are likely to include categories such as: ◆ Flooding ◆ Equipment failure or malfunctioning ◆ Seismic activity ◆ Terrorism ◆ Address specific situations such as emergencies occurring: ◆ In the dark: with extra attention on emergency power sources, backup lighting systems, mobile lighting for response teams ◆ In adverse weather: with extra attention placed on emergency shelter and clothing for responders, and shelter for evacuees ◆ Produce detailed information on internal and external equipment, personnel, facilities, funding, expert knowledge and material that will facilitate appropriate responses to specific types of emergencies ◆ Identify procedures for using, inspecting, testing and maintaining emergency response equipment, which may include equipment under the control of third parties (such as local fire brigades or emergency medical teams) ◆ Produce inundation maps that will be provided to aid evacuation plans and be distributed to local authorities ◆ Develop a rescue and relief plan to cover actions required in the event of a flood. This will include details on: ◆ Support for evacuees to provide food, fuel and shelter ◆ Securing potable water supplies to affected areas ◆ Identification of buildings for use as relief camp ◆ Identification of health facilities and contact details of key personnel	

4. Workers Camp Management Plan

Contents to be covered in the plan by the Contractor are presented in **Table A5-8**.:

Table A5-8: Workers Camp Management Plan

Impact to be addressed	Management/Mitigation/ Enhancement to be included in plan	KPI
Construction worker well-being in accommodation facilities Community, health, safety and security and relations/conflict between workers and host communities	◆ Describe the minimum national legislative requirements plus the applicable international requirements relevant to the facility standards and management of labour accommodation – these are aligned with the WBG guidance note on workers accommodation. ◆ Describe standards to be met that will avoid safety hazards and protect workers from disease, illness, exposure to natural hazards, including but not limited to ◆ Types and materials of living facilities ◆ Provision of minimum amounts of space for each worker ◆ Adequate drainage, dormitories, bed and storage ◆ Provision of sanitary, laundry, cooking and medical facilities and potable water ◆ Location of accommodation in relation to the workplace ◆ Any health, fire, safety or other hazards or disturbances and local facilities ◆ Provision of first aid and medical facilities ◆ Heating and ventilation ◆ Workers freedom of movement to and from the employer-provided accommodation will not be unduly restricted ◆ Include an accommodation code of conduct with rights, rules and regulations for workers' accommodation ◆ Identify a grievance and maintenance response mechanism for the accommodation facilities and services	◆ Worker accommodation plan compliant with the WBG guidance note on workers' accommodation ◆ Types of accommodation (on site, offsite) ◆ Number of accommodated employees and rooms ◆ Ratio of facilities to workers ◆ Accommodation inspections ◆ Worker and community grievances ◆ Disease type / incidence, and lost time impacts ◆ Water / food quality inspections test results ◆ Waste segregation and appropriate disposal monitoring results ◆ Hygiene inspection results

5. Site-specific Compensatory Tree Plantation Plan

A Compensatory Tree Plantation Plan has been prepared for the project. This will be followed by the Contractor for the development of Site-specific Compensatory Tree Plantation Plan. The Contractor will develop this plan in consultation with the PIU, Local Government Department, Parks, and Horticulture Department - KMC and District Municipal Corporations (DMCs) which will provide land for compensatory plantation.

Compensatory planting shall involve replacement, planting or making available of a number of trees as a replacement for a damaged or uprooted tree. The aim of this plan shall be to address the conditions that shall be observed when carrying out compensatory planting with respect to uprooted or damaged trees in accordance with the PIU and Parks and Horticulture Department - KMC Guidelines.

General Principles to be Followed for Compensatory Plantation

a- Wherever removal of existing trees is justified and permitted, the Contractor shall be required to carry out compensatory planting in accordance with the PIU and Parks and Horticulture Department - KMC Guidelines.

b- Whilst compensatory planting is a compulsory requirement for all trees, the Contractor shall also compensate uprooting / clearance of shrubs, through planting ornamental shrubs at locations to be identified by the PIU.

c- Compensatory planting may also apply in cases in which severe pruning is carried out and severely mutilates or damages the tree. The criteria for compensatory planting are to be approved by the PIU and Parks and Horticulture Department - KMC prior to authorizing interventions on trees.

d- The quality of trees and site targeted for replacement should meet certain specifications to ensure as much as possible equivalence to offset the adverse impact on the environment, landscape, general amenity and ensure conditions for the survival of newly planted species.

e- Ratio of compensatory plantations shall be 10 trees in place of every affected tree.

f- In order to prevent monocultures, where compensation would involve the planting of a considerable number of trees, species composition should not be limited to the species for which compensation is being carried out. A diversity of species shall require to be planted to compensate for the tree, such as reflecting the natural diversity at the site earmarked for planting.

g- Non-indigenous species are to be replaced by indigenous species.

h- Indigenous trees for planting purposes shall be insofar as reasonably possible from local stock.

i- Unless prevented by the conditions on the site chosen for compensatory planting, replacement trees shall be at least of medium-standard trees, that is, the overall height exceeding 1 m and stem diameter exceeding 5 cm, with a well-balanced branching head.

j- Replacement trees shall be planted in accordance with good practices, ensuring distance between individual trees and built structures are appropriate for growth of mature trees specimens. In certain contexts, this requirement may need to be reconciled with other specifications (e.g. denser planting, clustering) that may need to be pursued for the purpose of improved blending into surrounding landscape, improved screening of structures or for mimicking the natural distribution of trees within a particular natural habitat.

Contents of the plan includes the following:

- **Tree Inventory**

To develop a realistic and useful compensatory plantation plan, it is necessary to complete an inventory and analysis of the trees found growing in the DIA. Typical inventory data sheet that could be adopted for the purpose is as follows:

Date:_____ Map#:_____

Tree Inventory Data Sheet

Tree Information			Tree Condition					Planting Location				Conditions				If Pruning Needed What Type?			Comments
Tree #	Code	DBH	G	F	P	D	H	Swlk	<4'	>4'	Lwn	Weak Fork	Over. Wires	Dead Wood	Cav	Clean	Raise	Reduct.	

Legend:
(Tree Condition) G = Good F = Fair D = Dead H = Hazard
(Planting Location) Swlk = Sidewalk <4' = less than 4' >4' = more than 4' Lwn = Lawn
(Conditions) Weak Fork = Weak Branch Fork Connection Over Wires = Overhead Utility Wires Dead Wood = Dead Wood in Crown Cav = Cavity in Trunk
(If Pruning Needed What Type?) Clean = Crown Cleaning Raise = Crown Raising Reduct. = Crown Reduction

- **Selection of Tree Species**

This section will include details on species to be planted. Selection should be made while ensuring possibilities of monocultures and a diverse species should be planted.

- **Details of Compensatory Plantation Sites**

A key section in the plan shall be regarding the details on identification of compensatory planting locations. Planting locations should be identified before tree cutting by the Contractor in consultation with the PIU and Parks and Horticulture Department - KMC. This section should include geographic and ownership details of compensatory plantation sites.

- **Maintenance Needs**

The plan should provide clear-cut guidelines on maintenance needs of the trees, a strategy for the removal of hazard conditions, and the development of an operational maintenance program. This should contain details on maintenance responsibilities, watering frequencies, fertilization and pruning etc. Disposal of the tree debris, including recycling operations etc. should also be covered.

6. Waste Management Plan

The waste management plan will identify predicted waste streams, appropriate handling, reuse and recycle opportunities and, as a last resort, disposal methods. Contents to be covered in waste management plan by the Contractor are presented in **Table A5-9**.:

Table A5-9: Waste Management Plan

Topic to be addressed	Management / mitigation/ enhancement to be included in plan	KPI
General waste management plan requirements	◆ Identify predicted waste streams, appropriate handling, reuse and recycle opportunities and, as a last resort, disposal methods. ◆ Prepare in accordance local waste regulations and the WBG EHS Guidelines for Construction Materials Extraction (2007), the WBG General EHS guidelines ◆ Cover all waste streams from the project (solid, liquid, hazardous, non-hazardous), for all activities, including construction works and worker facilities and accommodation. ◆ Develop a waste management system reflected in the plan that addresses issues linked to waste minimisation, generation, transport, disposal, and monitoring including: ◆ Contractor training requirements with respect to waste handling procedures ◆ Waste generation data collection for each waste stream by volume. This will include the proportion of each waste stream going for reuse, recycling or disposal. Any unusual waste volumes will be investigated ◆ An audit schedule which details the frequency of waste management audits and those responsible for undertaking them ◆ Procedure for reporting any environmental incidents related to waste ◆ The specific regulatory licensing and reporting requirements as they relate to waste. ◆ A map showing each temporary waste storage location for the Project ◆ Strict conditions on handling and storage of fuel, explosives, and chemicals will be imposed on the Contractor and suppliers to prevent accidental pollution and injury. ◆ Procedures for, and identification of, licensed contractors to collect, transport and dispose of waste ◆ If any waste facilities are developed detailed management plans would be required following national and international standards.	Waste record completion Recycling rates Amount of waste generated by stream
Waste segregation	◆ Segregate wastes in designated storage areas, such that hazardous and non-hazardous wastes are not mixed and to allow for recycling and reuse where appropriate ◆ Segregate hazardous waste (such as oils, lubricants, batteries, chemicals and medical waste) from other waste types to avoid cross contamination ◆ Label waste streams for identification and warning purposes	No non- compliances of waste being mixed identified in inspections
Storage requirements	◆ Correctly identify wastes and stored pending collection/transfer for reuse, recovery,	◆ No non- compliances with management measures identified

Topic to be addressed	Management / mitigation/ enhancement to be included in plan	KPI
	recycling or disposal in an environmentally sound manner ◆ Locate waste storage areas on areas of impermeable hard standing to prevent leaching of any contaminants should spillage or leakage occur ◆ Identify a suitable method to cover all skips ◆ Store liquid wastes/oil/chemicals in tanks or drums located in bunded areas which can hold 110% of the capacity of the largest tank or drum or, for multiple drum storage, 25% of the total volume of material stored ◆ Install temporary sediment basins, where appropriate, to capture sediment-laden run-off from site ◆ Store hazardous waste in closed containers away from direct sunlight, wind and rain in designated storage areas. Limit access to hazardous waste to those who have received training. ◆ Provide adequate ventilation where volatile wastes are stored, safety datasheets. ◆ Have spill management equipment (spill kits, eyewash stations, PPE) and readily available information on chemical compatibility for workers including labelling each container, demarcation of the area (e.g. on a facility map/site plan) ◆ Include visual and emissions management measures implemented as appropriate (e.g. screening)	◆ No spillages resulting from chemical storage in bunded areas.
Handling and transportation	◆ Train staff to carry out handling and storage ◆ Make available and maintain spill response equipment in areas where hazardous wastes may be spilt ◆ Train an appropriate number of site personnel in spill response techniques ◆ Prepare and implement spill prevention and response plan and emergency preparedness and response plan to address any accidental release and leakage ◆ Assign each waste shipment a unique waste consignment number. The Contractor is responsible for ensuring that a register is kept at site recording all waste shipments leaving the site and their disposal destination ◆ Ensure a waste transfer note accompanies all waste consignments from the construction site to the disposal destination ◆ Confirm that contractors handling, treating, and disposing of hazardous waste are reputable and legitimate enterprises, licensed by the relevant regulatory agencies and following good international industry practice for the waste being handled ◆ Design transportation of waste to minimise and prevent spills releases or exposures to workers, the public or the environment.	◆ All staff involved with waste management trained on waste management and materials handling ◆ No spills

Topic to be addressed	Management / mitigation/ enhancement to be included in plan	KPI
	◆ Secure and label waste containers designated for off-site shipment with the contents and associated hazards ◆ Confirm that the waste containers are correctly loaded on the transport vehicles before leaving the site, and that they are accompanied by relevant documentation that describes the load and its associated hazards, consistent with the reference framework.	
Recycling and reuse	◆ Evaluate waste production processes and identify potentially recyclable materials ◆ Investigate external markets for recycling ◆ Establish recycling objectives and formal tracking of waste generation and recycling rates ◆ Provide training and incentives to employees	Recycling targets included in plan and audited against.
Disposal	◆ Use offsite waste treatment or disposal facilities appropriately permitted, or if not available based on the most suitable site in consultation with authorities ◆ Do not release the waste if there is concern about the standard of transport or destination of the waste ◆ Dispose of any medical waste at licensed facilities ◆ Do not permit burning of waste	◆ Permits held for waste treatment and disposal sites ◆ Medical waste licensed facilities records kept
Wastewater management	◆ Establish wastewater management system for worker and facilities wastewater. Treated water discharged in line with WBG and national limits, or tankered off site to appropriate licensed treatment facility or Include appropriate capacity of septic tank ◆ Include the importance of using project toilets and related procedures in site induction procedures.	◆ Wastewater treated in line with relevant standards ◆ No effluent not meeting standards discharged.
Contaminated materials or areas	◆ Develop procedure to identify, manage and remove any identified contaminated land as part of construction areas	◆ Any contaminated soils or ground managed in line with national and international requirements. ◆ Minimisation of pollution to ground and surface water resources

7. Traffic Management Plan

The TMP shall ensure the following:

- Providing a safe environment for all road users;
- Providing protection to the general public from traffic hazards that may arise as a result of the construction vehicles movement;
- Minimizing disruption, congestion and delays to all road users;

- Ensuring access to adjacent private/commercial premises maintained at all times.
- Ensure whenever possible, that a sufficient number of traffic lanes to accommodate vehicle traffic volumes are provided.
- Ensure that delays and traffic congestion are kept to a minimum and within acceptable levels.
- Ensure that appropriate/sufficient warning and information signs are installed and that adequate guidance is provided to delineate the travel paths through the event site.
- Ensure that the roads are free of hazards

Contents to be covered in traffic management plan by the Contractor are presented in **Table A5-10**.:

Table A5-10: Traffic Management Plan

Impact to be addressed	Management / mitigation/ enhancement to be included in plan	KPI
Reduced road safety and impacts upon communities	◆ Undertake a road safety awareness programme along the main site access routes in coordination with PIU ◆ Provide information regarding construction activities and activities to stakeholders ◆ Plan and coordinate transport timings to minimise bottlenecks and avoid peak high-risk periods (e.g. school runs).	◆ Implementation of road safety awareness program along main site routes ◆ Provision of construction information to communities / stakeholders regarding construction activities. ◆ Quarterly stakeholder consultation meetings
Reduced road safety	◆ Train drivers fully in road safety and appropriately licensed certified and medically fit to operate the class of vehicle and for the vehicle's operation on and off site. ◆ Implement a no tolerance policy to alcohol and drugs including testing of drivers. ◆ Prohibit hand-held cell phones and radios while driving	◆ Inspect contractor's licences ◆ Inspect transportation contractors for knowledge and compliance with the traffic management plan
	◆ Ensure all vehicles are road worthy, drivers made aware of the potential risks as part of training. ◆ Include fatigue management as part of training ◆ Review likelihood of local workers using motorcycles as means of transportation to and from work or during off hours and decide whether such use is permitted and conditions for doing so, in particular use of helmets and possibly other protective gear.	◆ Vehicle inspections undertaken monthly
	◆ Undertake routine vehicle inspections and monitoring on an on-going basis ◆ Use hazard identification and risk assessment for vehicles on a regular basis ◆ Prohibit vehicles will be prohibited from being overloaded	

Impact to be addressed	Management / mitigation/ enhancement to be included in plan	KPI
	◆ Utilize low emissions vehicles for the transportation of materials (wherever practicable) ◆ Install seat belts and require they are worn by all occupants	
	◆ Use licensed contractors for waste and fuel transportation ◆ Undertake due diligence of subcontractors (e.g. those bringing equipment to site), and adequately brief them on the traffic management plan. ◆ Include clauses related to traffic management plan implementation and use of qualified drivers in contracts.	◆ Inspect contractor's licences ◆ Inspect transportation contractors for knowledge and compliance with the traffic management plan
	◆ Require adherence to all national and specific area speed limits ◆ Impose and monitor speed restrictions for project traffic ◆ Organize delivery schedules are reasonable and achievable to prevent speeding by drivers	◆ Monitor vehicle speeding and driver's schedules
	◆ Designate crossing points along the access roads based on consultation with local communities	Designated crossing points implemented.
	◆ Erect road signs to i. clearly indicate the route of construction traffic and speed limits, ii. identify where the road is single carriageway about the dangers of overtaking and iii. be in accordance with local laws and rules ◆ Appoint and locate flag staff at intersections in the case of intensive traffic ◆ Where the access roads join the main road, erect illuminated and flashing signs to warn road users of the crossing points ◆ Restrict night-time use of road for large vehicles	◆ Erect traffic and road safety signs along project routes in-line with local laws ◆ Flag staff at intersections. ◆ Illuminated / flashing signs at crossing points
	◆ Put in place an action plan in case of an accident ◆ Communicate the action plan to all drivers ◆ Report and investigate all accidents and incidents/	◆ Action plan in place and training provided. ◆ Any incidents/accidents responded to rapidly and in line with GIIP including investigations undertaken and measures to prevent reoccurrence identified and implemented within short timeframes
	◆ Implement no-driving policy at night except for exceptional circumstances ◆ Prohibit traffic movements during extreme weather conditions such as heavy rainfall, to avoid potential road accidents associated with driver's visibility and road hazards ◆ Require all loads to be secured	◆ No road traffic incidents at night ◆ No road traffic incidents in extreme weather ◆ No complaints about vehicle emissions

Impact to be addressed	Management / mitigation/ enhancement to be included in plan	KPI
	◆ If road crossing is required, schedule movements to ensure that vehicles arrive and leave at the same time (two-way movement) ◆ Fit vehicles with warning alarms for reversing ◆ Maintain site vehicles in accordance with the manufacturer's instruction, with catalytic convertors installed and maintained. Older construction vehicles to be replaced with more fuel-efficient ones. ◆ Enforce a 'no-idling' policy ◆ Do not allow parking outside of site areas (e.g. along local roads)	

8. Spill Prevention and Response Plan

Contents to be covered in Spill Prevention and Response Plan by the Contractor are presented in **Table A5-11**.

Table A5-11: Spill Prevention and Response Plan

Topic to be addressed	Management / mitigation/ enhancement to be included in plan	KPI
Spill prevention and response plan	◆ Develop a spill prevention and response plan to follow GIIP and include: ◆ Procedures for immediate spill response actions specified for all relevant scenarios relating to hazardous materials used in the construction processes. ◆ Complete list of equipment available for use in emergency situations. ◆ Procedures for immediate information to authorities in case of discharges and standards for reporting irregular events. ◆ Programme for training of key staff in emergency responses. The training is to be based on various emergency scenarios.	No pollution events

9. Pollution Prevention Plan

Contents to be covered in Pollution Prevention Plan by the Contractor are presented in **Table A5-12**.:

Table A5-12: Pollution Prevention Plan

Impact to be addressed	Management / mitigation/ enhancement to be included in plan	KPI
Dust	Use covers and/or control equipment such as water suppressors	No excessive dust levels reported in visual inspections No dust related grievances
Dust resuspension on unpaved roads	Implement dust suppression techniques on unpaved roads, such as applying water or non-toxic chemicals to minimise dust from vehicle movements Compact and periodically grade and maintain all construction roads	No excessive dust levels reported in visual inspections. No dust related grievances No reports of speeding

Impact to be addressed	Management / mitigation/ enhancement to be included in plan	KPI
	Enforce a speed limit for heavy goods vehicles (HGVs) on-site at 20km per hour	
Dust from open area sources, including storage piles	Use control measures such as installing enclosures and covers, and increasing moisture content Use vegetation on exposed surfaces of stockpiled materials	All stockpiles are enclosed or covered. No non-compliance recorded in visual inspections
Emissions from burning materials	Prohibit bonfires and burning of waste materials	No burning of waste materials
Emissions from generators	Consider the location and height of exhaust pipes to ensure proper dispersion of pollutants Use generators of a modern design and keep them well maintained	Generators of modern design and in good working order
Dust emissions from cement batching plant	Contain and arrest the dusty processes Suppress dust using water or proprietary suppressants that are fitted with a low-level water supply alarm. Protect external sources, such as stockpiles and external conveyors, from wind whipping by dampening or covering during the delivery, storage, and handling of crushed rock/sand/coarse aggregate	All stockpiles are enclosed or covered. No dust related grievances.
Emissions from construction vehicles	Implement the manufacturer recommended engine maintenance programs regardless of the size or type of vehicle Instruct drivers on the benefits of driving practices that reduce both the risk of accidents and fuel consumption, including measured acceleration and driving within safe speed limits Enforce a ‘no-idling’ policy Replace old construction vehicles with newer more fuel-efficient alternatives where possible Convert high use vehicles to cleaner fuels where possible Install and maintain emission control devices such as catalytic converters	Maintain records of the engine maintenance programmes for all vehicles Records of driver training maintained No idling vehicles noted during site inspections Newer more fuel-efficient vehicles recommended onsite
Noise and vibration due to construction traffic on existing roads	Manage project vehicles to not wait or queue up with engines running at the entrance to the site access or on the public roads Maintain vehicles Restrict deliveries to be within working hours of the site minimising significant movements during sensitive times Use adjustable or directional audible vehicle-reversing alarms or use alternative warning systems, e.g. white noise alarms (including arrangements to minimise the need to perform reversing manoeuvres) Avoid unnecessary revving of engines, reducing speed of vehicle movement and maintaining the condition of the road surface to avoid body slap from empty lorries, designing and maintaining access routes to minimise vehicle noise. Explain and train drivers to minimise vehicular noise impacts	Construction traffic use identified routes No community grievances raised with respect to construction traffic-related noise
Noise complaints	Investigate noise and vibration complaints raised using the project grievance mechanism	Complaints are satisfactorily resolved in

Impact to be addressed	Management / mitigation/ enhancement to be included in plan	KPI
		line with timeframes given in the grievance mechanism No further complaints regarding previous resolved issues are received
Noise from construction activities	Restrict access of the general public to the site access road and transmission line construction zone	No incidents of members of the public accessing the restricted zone
Noise from construction works	Use site terrain, material stockpiles and suitable work locations to screen work locations and maximise the distance between work activities and nearest noise sensitive receptors.	Noise levels to not exceed threshold values
Noise from construction activities	Where feasible, prioritise noisy activities to be undertaken in the daytime (i.e. avoid night working)	Night-time noise levels do not exceed threshold values

10. Material Transportation Plan

Aspects to be covered under this plan includes the following:

Inbound transportation logistics: Inbound transportation is highly sensitive to a reciprocal relationship between cost and time. Products and machinery have to be available exactly when needed. Delayed deliveries can stop production while early arrivals can make material and equipment management stressful.

Outbound transportation logistics: No matter how detailed the logistics plan is, there will always be some excess material that needs returning. Rented construction equipment also has to go back to the dealer promptly to avoid unnecessary costs. Part of outbound transportation logistics also includes waste disposal.

Construction material logistics: Different construction materials arrive at different milestones throughout the project, requiring skilled coordination to ensure a smooth workflow. Good material logistics also account for the true costs involved in transporting materials, such as truck rental fees, operating costs and fuel expenses. Included in material logistics is also the cost associated with loading and offloading.

Construction equipment logistics: Having a construction material logistics plan starts with knowing what machinery and attachments are required for specific tasks. Equipment logistic plans also identify timeframes when vital tools have to be sourced, transported, used and returned.

Site management logistics: Construction manager has to prepare sites to accept deliveries as they arrive and have the resources present to efficiently deal with removing items from trucks, securely storing them and having them available precisely when needed. Any break in logistical chain links could result in lost time. Good site management plans account for every logistical step required for smooth trucking to and from construction sites.

Communication logistics: Clear and concise communications are the key to successfully executing construction material and equipment logistic plans. Everyone involved in the supply chain needs to know what their role is and when they're required to fulfill it.

Regulation logistics: Good logistic plans account for regulatory compliance both on and off the road. Safety should be the number one concern for all construction managers who develop logistic plans. Failing to safely transport construction materials can have devastating consequences. However, tragic accidents can be prevented by knowing all transportation regulations and building strict compliance into a logistics plan.

Typical Fire Safety Checklist

TYPICAL FIRE SAFETY CHECKLIST
(SELF-INSPECTION FORM FOR CONSTRUCTION WORK)

Adequate protective equipment and planning for fire emergencies helps keep small fires small, limits losses.

Yes	No	CONDITION
		Housekeeping
☐	☐	Are construction materials stored in an orderly manner?
☐	☐	Is combustible scrap and trash removed from the site regularly?
☐	☐	Are metal containers with covers provided for disposal of oily or paint-soaked rags?
		Smoking
☐	☐	Are NO SMOKING signs posted in hazardous areas?
☐	☐	Are NO SMOKING regulations enforced?
		Electrical
☐	☐	Is temporary wiring installed according to the provisions of the *National Electrical Code*?
☐	☐	Is wiring, including connections to junction boxes, panels, equipment, and the like in good condition?
☐	☐	Are overcurrent protective devices (fuses, circuit breakers) in good operating condition?
☐	☐	Are ground fault circuit interrupters (GFCI) provided where required?
		Welding and Cutting
☐	☐	Are any welding, cutting, or brazing operations in progress?
☐	☐	Are any combustible materials exposed by these operations?
☐	☐	Is a fire watch provided during, and for at least 30 minutes after, these operations?
☐	☐	Is portable fire extinguisher or small hose protection available where these operations are carried on?
		Temporary Heaters
☐	☐	Are temporary heaters in use of "approved" type?
☐	☐	Is sufficient clearance maintained between heaters and combustible materials?
☐	☐	Is a competent (licensed, where required) person responsible for temporary heating operations?
☐	☐	Are fuel storage and refueling arrangements satisfactory?
		Flammable-Combustible Liquids
☐	☐	Are flammable-combustible liquids stored and dispensed in a satisfactory manner?
☐	☐	Is adequate ventilation provided where flammable adhesives, paints, solvents, and other chemicals are in use?
☐	☐	Are roofing operations involving tar kettles supervised by a competent person?
☐	☐	Are tar kettles in use equipped with metal covers?
☐	☐	Are asphalt-saturated roofing mops removed from the building and safely discarded after use?
		Exits
☐	☐	Are fire exits unobstructed, including access ways and discharge areas?
☐	☐	Are all exits clearly marked?
☐	☐	Are exits adequately lighted?
☐	☐	Are stair exit fire doors in good operating condition?
☐	☐	Is adequate egress provided from uppermost work areas?

Yes	No	CONDITION
		Extinguishers and Small Hose
☐	☐	Are sufficient portable extinguishers of the proper type provided throughout?
☐	☐	Are extinguishers and small hoses kept in good operating condition?
☐	☐	Is equipment unobstructed and its location highlighted?
☐	☐	Is equipment protected against freezing?
☐	☐	Are selected personnel trained to operate extinguishers and small hose?
		Sprinkler Systems
☐	☐	Is sprinkler installation progressing with construction?
☐	☐	Are sprinkler controlled valves accessible, labeled and open where necessary?
☐	☐	Are systems adequately protected against freezing?
☐	☐	Are sprinkler alarms in service?
☐	☐	Are sprinkler system pumper connections clearly marked and accessible to the public fire department?
☐	☐	Is the public fire department familiar with the sprinkler installation?
		Hydrants
☐	☐	Are hydrants unobstructed and accessible to the public fire department?
☐	☐	Are hydrants in good operating condition?
		Standpipes
☐	☐	Are standpipe systems installed and in service up to the highest level of construction operations?
☐	☐	Are standpipe system hose connections unobstructed and accessible to the public fire department?
☐	☐	Are standpipe systems adequately protected against freezing?
☐	☐	Are standpipe system pumper connections clearly marked and accessible to the public fire department?
		Fire Alarms
☐	☐	Is a standard procedure established for reporting a fire to the fire department?
☐	☐	Are all workers instructed in this procedure?
☐	☐	Is an audible alarm in operation to alert workers of a fire on the site?
☐	☐	Is there a public fire alarm pull box located nearby?
☐	☐	Has the public fire department visited the site during the past month?
		Watchmen-Guards
☐	☐	Is watch service provided during all nonoperating hours?
☐	☐	Does service cover the entire project site?
☐	☐	Are watchmen-guards instructed in the fire reporting procedure?
		Construction Offices, Trailers, Sheds
☐	☐	Are combustible offices, trailers and sheds located at least 30ft (10m) away from major buildings and materials storage?
☐	☐	Are heating devices in offices, trailers and sheds of an "approved" type?
☐	☐	Are heating devices properly installed and vented?
☐	☐	Are fuel cylinders and fuel lines for heating devices protected against vehicular damage?
		Tarpaulins
☐	☐	Are tarpaulins used for temporary enclosure of building construction?
☐	☐	Are tarpaulins in use of the flame-resistant type?
☐	☐	Are tarpaulins in use tightly secured to prevent contact with ignition sources such as temporary heaters?

Environmental & Social Field Monitoring Report Template

Environmental & Social Field Monitoring Report

Note: This template will be updated by the contractor as per site specific mitigation measures/impacts that will have to be monitored. The checklist will be reviewed and approved by the ESC.

Project Name

Reporting Period: Week / Month

Prepared by: Contractor Name

Table of Content

A. INTRODUCTION

To be filled.

B. OVERALL CONSTRUCTION AND ESMP IMPLEMENTATION STATUS

To be filled.

Table 1: Progress Status

S.N.	Project Site Name / Section	Construction Progress Status	Environmental and Social Safeguard Status
1.			
2.			
3.			
4.			

C. IMPLEMENTATION STATUS OF ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES

1. Has ESMP been incorporated into the bidding and contract documents? Provide details here.

2. Have E&S Monitoring Checklists been filled during this reporting period? Provide details here. Sample E&S monitoring checklist is attached in **Annexure I** (Contractor will have to extend / revise the checklist keeping in view the project/site requirements and attach the filled checklists as Annexure I). Attach Construction Progress Photographs as **Annexure II** and E&S Non-Compliance and Compliance Photographs as **Annexure III**.

1. Summary of the environmental compliances are presented below.

I. Air, Noise and Water pollution

3. Have mitigation measures for air, noise and water pollution been adopted according to ESMP? Provide details here.

II. Stockpiling of Construction Materials

4. Have the materials such as aggregates, sand, cement, steel etc. stockpiled near to the work sites and kept safely at designated places with proper coverage to avoid surface runoffs? Provide details here.

lll. Excavated Material Management

5. Excavation of the ground will be required for trenching / laying of pipes and related civil works which will result in generation of excavated material. Have mitigation measures for excavated material management been adopted according to ESMP? Provide details here.

IV. Occupational / Community Health and Safety

6. Provide details on the implementation of occupational & community health and safety measures which have been followed on the construction sites.

7. Have the workers been adequately provided with safety gears like jackets, helmet, goggle, facemasks, boots, ear plugs etc.?

8. Are workers utilizing those PPEs?

9. Have the excavated areas been barricaded to ensure public safety?

10. Status of construction traffic speed?

11. Are work hours being regulated?

V. Employment Opportunity

12. Have the local communities been employed at construction sites for working as unskilled / skilled labor in line with ESMP requirements? Provide details here.

VI. Camp Site Management

13. Status of Camp Management Plan and ESMP Camp / Labor Management Measures implementation.

VII. Training and Awareness Program

14. Include here the project specific training plan and provide status on implementation of ESMP trainings requirements.

VIII. Public Consultation

15. Provide status of Stakeholders Engagement Status against the ESMP Stakeholders Engagement requirements.

D. IMPLEMENTATION OF E&S MONITORING PLAN

16. Provide here the status of implementation for ESMP's E&S Monitoring Plan and attach the Monitoring Results / Reports / Actions Taken or Planned for controlling any parameters not meeting the WBG / SEPA standards.

E. IMPLEMENTATION OF GRIEVANCE REDRESS MECHANISM

17. Grievance Redress Mechanism (GRM) has been established to receive and facilitate the resolution of affected people's concerns, complaints, and grievances on various environmental / social management and other construction related issues. The GRM is willing to be proactive and accessible to all donors to address their concerns grievances and issues effectively and swiftly, in accordance with WB Guidelines. Provide here the status on receipt and resolution of complaints under GRM. Also attach as **Annexure – II,** the GRM Meeting Attendance Sheets / Minutes / List of Register Complaints / Details of Decided Actions for their Resolution.

F. CORRECTIVE ACTION PLAN

18. Provide here a detailed corrective action plan (CAP) finalized in consultation and agreement to the PIU / CSC with details of Active E&S Issues, Corrective Actions for the resolution of these issues, Responsible entity for the resolution of the issues and Deadlines for resolution.

G. CONCLUSION

19. Provide here a brief conclusion and way forwards for the next reporting period.

Annex I: Environmental & Social Monitoring Checklist Format

Project Name:

Environmental & Social Monitoring Checklist

Date: ……..

SN	Activity	Details	Remarks
1.	**Employment generation**		
a.	Number of local labour employed during construction		
b.	Number of construction workers hired from outside		
c.	Number of child workers involved (if any)		
d.	Number of women employed during construction phase		
2.	**Training and awareness program**		
a.	Participants on awareness program on electrocution, health and safety		
b.	Participants on awareness program on environment management		
c.	Participants on income generating training (if any)		

SN	Activity	Details	Remarks
3.	**Occupational health and safety measures**		
a.	First aid facility and emergency services provided at work sites		
b.	Protective gears provided to workers and using helmet, facemasks, gloves, muffle, boots, jacket, goggles etc.		
c.	Sexual Exploitation, GBV / SH / HIV/AIDS awareness provided to workers		
d.	Number and types of accident occurred		
e.	Accidental insurance for worker		
f.	Information, sign, signboard used at construction sites		
4.	**Camp site management**		
a.	Clean drinking water supply at camp site		
b.	Temporary pit latrine at campsite		
c.	Kitchen waste management at camp site		
d.	First aid facilities available at camp sites		
e.	Types of fuel used for cooking (kerosene/LPG gas/firewood)		
5.	**Vegetation Removal and Compensatory Plantation**		

SN	Activity	Details	Remarks
a.	Number of trees cut		
b.	Compensatory plantation land allocation status		
c.	Compensatory plantation status		
6.	**Spoil management**		
a.	Quantities of excavated materials generated		
b.	Reuse status of excavated materials		
7.	**Air, water and noise quality**		
a.	Dust generation from construction sites		
b.	Noise generation from construction sites		
c.	Drinking water quality at campsite		
8.	**Safe disposal of construction waste**		
9.	**Grievance received in last month**		
10.	**Establishment of safeguard unit**		

Annexure II: Construction Progress Photographs

Annexure III: E&S Non-Compliance and Compliance Photographs

Annexure IV: GRM Status and Details

Annexure - 6: Grievance Redress Mechanism

This Section outlines the policy and procedure for documenting, addressing, responding and employing methods to resolve project grievances and complaints that may be raised by the project affectees or community members arising from environmental and social performance, the engagement process, resettlement and/or unanticipated environmental or social impacts resulting from project activities that are performed and/or undertaken by PIU. The Section describes the scope and procedural steps and specifies roles and responsibilities of the parties involved in addressing the grievances.

Principles

A GRM is established to address any complaints or grievances arising during the implementation period of the projects. People of the project area may perceive risks to themselves or their property or their legal rights or have concerns about the possible adverse environmental and social impact that a project may have. Any concerns or grievances will be addressed quickly and transparently, and without retribution to the project affected or community members or complainant.

The primary principle of GRM is that all complaints or grievances are resolved as quickly as possible in a fair and transparent manner.

Objectives

The objectives of the GRM are to:

- develop an organizational framework to address and resolve the grievances of individual(s) or community(s), fairly and equitably;
- provide enhanced level of satisfaction to the aggrieved;
- provide easy accessibility to the aggrieved/affected individual or community for immediate grievance redress;
- ensure that the targeted communities and individuals are treated fairly at all times;
- identify systemic flaws in the operational functions of the project and suggest corrective measures; and
- ensure sustainability of the project.

Type of Complaints

The major complaints that may arise during the execution of the proposed project at site include but not limited to:

- E&S issues (dust, noise, air pollution, social and cultural issues);
- Damage and blockage of public utilities;
- Traffic inconvenience;
- Gender based violence (GBV) and harassment;
- Resettlement issues including loss of livelihood; and

- Issues related to compensation of resettlement impacts.

Disclosure of GRM

The GRM shall be disclosed at PIU-KWSSIP, KWSC head office, and concerned project engineers, KWSSIP website as well as at sub-project sites.

Structure of Grievance Redress Mechanism

The project will establish a three-tier GRM comprising Community GRC, sub-project GRC; and PIU-GRC.

Community GRC (Tier-1)

The community-GRC will provide a platform for project affected or community members to raise and discuss their concerns, resolve the E&S including resettlement issues at the community level and coordinate with project management to communicate these issues and concerns. Community-GRC will be established to maintain a close rapport and coordination with affected persons and community members throughout the project implementation. The social development specialist (SDS) of PIU with the assistance of SC will facilitate the establishment of community-GRC that is representative of the ethno-cultural and gender diversity within the community. The community-GRC will comprise the following six members with one as the committee convener:

- Three female members (from the project **affected** or community members); and
- Three male members (from project **affected** or community members).

The project E&S and engineering staff will coordinate with community-GRC to review and resolve the issue or concern related to resettlement planning or implementation as well as environmental and social concerns preferably within five (05) working days from receipt of the grievance. Any complaints that cannot be resolved at community-GRC will be forwarded to the next tier.

Sub-Project GRC (Tier-2)

KWSSIP will constitute a GRC headed by concerned Project Manager (PM) at each project site to resolve all grievances and complaints of the project affectees or community members received either directly or through the Tier-1. Sub-project GRC will comprise of the following members:

- Project Manager (PM), as head/convener of sub-project GRC;
- Environment, SDS and Gender specialists of PIU;
- E&S specialists of Supervision Consultant (SC)
- Resident Engineer of supervision consultant;
- A representative (E&S specialist) of contractor (if required); and
- A representative of local community.

Note: Representative from any other district government department may be called as and when required by the sub-project GRC. Environmental Specialists of PIU and SC will join sub-project GRC meeting related to environmental issues only.

Sub-project GRC will meet once a month and when the need arises. The sub-project GRC will review grievances involving all E&S issues including resettlement issues that may arise due to project implementation. Sub-project GRC will perform the following functions:

- Record, categorize and prioritize the grievances that need to be resolved by the committee and resolve them within ten (10) working days;
- Invite and hear aggrieved persons/parties to produce evidence of their claims and record their view point;
- Communicate its decisions and recommendations on all resolved issues to PIU and the aggrieved persons for smooth implementation;
- Forward the unresolved cases/ complaints to PIU-GRC within an appropriate time frame with reasons recorded and its recommendations;
- Develop an information dissemination system and acknowledge the aggrieved persons/parties about the development regarding their grievance;
- Maintain a complaint register accessible to the project affectees or community members with brief information about complaints and sub-project GRC decision with status report; and,
- Maintain complete record of all complaints received by the sub-project GRC with actions taken.

Any complaint that cannot be resolved by the sub-project GRC, will be forwarded to the next tier – the PIU-GRC.

PIU-GRC (Tier-3)

At the third tier, the PIU has already constituted a GRC (PIU-GRC). The PIU GRC will receive complaints either directly or through the Tier-2 GRC. The committee has the following composition:

- Project Director KWSSIP, (Chairman of PIU-GRC);
- SDS, Member
- Gender Specialist, Member;
- Concerned Project Manager – PIU, Member;
- SDS of SC, Member; and
- Representative of Civil Society.

Note: Representative from any other district government department may be called as and when required by the PIU-GRC. Environmental Specialists of PIU and SC will join PIU-GRC meeting related to environmental issues only.

The PIU-GRC through authorized representative, will acknowledge the complainant about his/her complaint, scrutinize the record, investigate the remedies available and request the complainant to

produce any record in favor of his/her claim. After thorough review and scrutiny of the available record on the complaint, field visit will be conducted to collect additional information, if required. Once the investigations are completed, the PIU-GRC will give decision within twenty (20) working days of receipt of the complaint. If the complainant is still dissatisfied with the decision, he/she can go to the court of law, if he/she wishes so.

Organization of the GRC is shown in **Figure A7-1**.

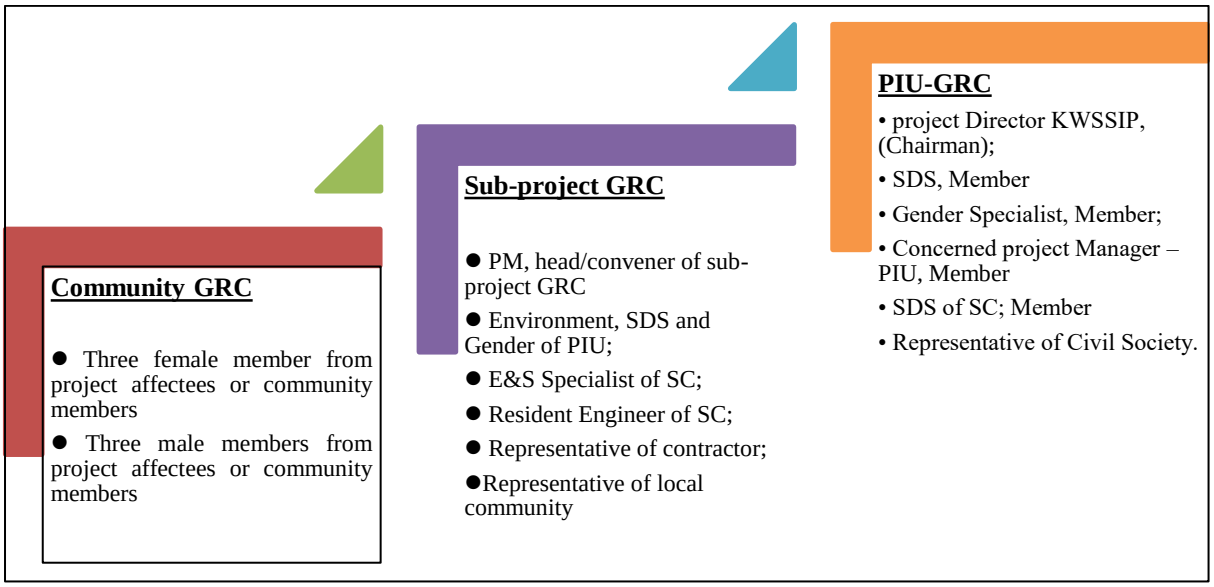


Figure A7-1: Organogram of GRC

Gender representation will be ensured by inducting a female member in all GRCs. The mechanism will ensure the access of project affectees or community members to a GRM that openly and transparently deals with the grievances and makes decision in consultation with all concerned that are consistent with the WB ESF requirements.

Gender Based Violence (GBV) Committee

Besides PIU-GRC, a GBV committee has also been established and notified within PIU consisting of the following members:

- Concerned Project Manager, Head/ Convener of GBV Committee;
- Gender Expert, KWSSIP, Secretary; and
- SDS KWSSIP, Member.

GBV Committee will address the gender related issues caused by the project activities during RP and project implementation.

Grievance Redress Procedure/ Mechanism

The intention of GRM is to resolve a complaint as quickly and at as low a level as possible to avoid a minor issue becoming a significant grievance. Irrespective of the stage of the process, a complainant has the option to pursue the grievance through the court as is his/her legal right in accordance with law.

The GRCs will work at site, sub-project and PIU levels. The E&S and engineering staff of PIU, in coordination with site staff will inform the project affectees and community members about the GRCs and its mechanism through consultations and by posting at prominent places. The complaints received through any media will be screened by type and category. These complaints will be registered in Community Complaints Register (CCR), where the name and address of complainant, date, description of complaint and action taken will be recorded. The following procedure will be used to redress the grievances:

- First, complaint resolution will be attempted to be addressed at community-GRC through the involvement of the field E&S/engineering staff. The community-GRC shall give decision within five working days of receipt of the complaint. If unsettled, grievance can be lodged to the sub-project GRC by the complainant or by the GRC;
- Sub-project GRC will acknowledge the receipt within two working days of lodging of complaint. Initial review and consultation with the sub-project GRC will be conducted within five working days of receipt of complaint. If required, sub-project GRC will advise the E&S/engineering specialists to conduct field visits in consultation with the aggrieved persons/parties and local community and submit a fact-finding report. Preferably, the fact finding will be completed within eight working days from receipt of complaints. sub-project GRC shall give decision within 10 working days of receipt of the complaint. If unresolved, a grievance will be lodged to the (PIU-GRC) by the complainant or by the GRC; and
- The PIU-GRC shall give decision within 20 working days of receipt of the complaint. If the complainant is still not satisfied, he/she can pursue further by submitting the case to the appropriate court of law.

All E&S issues will be dealt according to the above GRM procedures. The GRCs will hear and clarify with the complainant (if required so) about the E&S issue and shall conclude and communicate their recommendations for further implementation in due course of time. Complainant will be kept informed during the process and the GRC decision will be communicated to him/her accordingly. In case of any delay, the complainant will be informed on the progress and process about his/her grievance. The GRC proceedings will be documented step by step and all records will be maintained and summarized in the project progress and internal monitoring reports.

Lodging of Complaint

The complainant(s) can lodge their grievances through a number of ways/channels including online, mail, phone, WhatsApp, e-mail and complaint box. Moreover, PIU has established an e-Portal for filing and tracking progress of the application online; the details are provided below.

- It is an electronic complaint lodging system (application) that will be accessible through a link on the PIU KWSSIP website;
- The focus of the e-portal is the quick complaint lodging for all types of primary stakeholders;
- Any project affectee or community member with internet access can lodge a complaint with option for anonymous complaints. Uploading of photos for better understanding of the problem will also be an option;
- Each complainant will get a unique Grievance Number to track their complaints through the e-portal;

- Each complaint will go through a quick resolution mechanism being managed by a dedicated team at the PIU. Each complainant will be contacted to ensure that his/her issue is resolved;
- The portal will differentiate between types of complaints for targeted decision-making and action on behalf of PIU; and
- The portal will allow a quick and easy method for monitoring of the entire complaint lodging and resolution mechanism.

Annexure - 7: Information Disclosure and Stakeholders Consultations

Overview

Public consultation and information disclosure is an essential component of the Environmental and Social Assessment (ESA) process, recognized by development agencies and national governments alike. It is an inclusive process conducted throughout the project life cycle and most effective when initiated at an early stage of the project development process. For effective stakeholders' engagement at KWSSIP-2, Stakeholder Engagement Plan (SEP) has been prepared in line with the ESS-10: Stakeholder Engagement and Information Disclosure. This SEP has been followed at the project for the identification of relevant stakeholders, public consultation, and information disclosure.

Stakeholders Identification and Analysis

In line with the SEP, the three categories of stakeholders for the project are outlined below:

- Primary Stakeholders - Affected Parties – persons, groups and other entities within the project area of Influence (AoI)[3] that are directly influenced (actually or potentially) by the project and/or have been identified as most susceptible to change associated with the project, and who need to be closely engaged in identifying impacts and their significance, as well as in decision-making on mitigation and management measures;
- Primary Stakeholders - Vulnerable Groups – persons who may be disproportionately impacted or further disadvantaged by the project(s) as compared with any other groups due to their vulnerable status[4], and that may require special engagement efforts to ensure their equal representation in the consultation and decision-making process associated with the project; and,
- Other Interested Parties – individuals/groups/entities that may not experience direct impacts from the project but who consider or perceive their interests as being affected by the project and/or who could affect the project and the process of its implementation in some way;

Stakeholder identification and consultation were done as per the SEP of KWSSIP-2.

Primary Stakeholders – Project Affected Parties and Vulnerable Groups

Project Affected Parties include the project owner (KWSC, PIU of KWSSIP), 42 PAPs and communities in the AoI that will be the direct beneficiaries of the project as well as those that could be affected by environmental and social impacts such as social and cultural issues, noise, dust and increased vehicular traffic etc.

The vulnerable or disadvantaged groups relevant to the project include; women, elderly citizens; , disabled citizens; minorities (ethnic, religious, women); low-income households; women/child headed households; and transgender persons.

3 This refers to the overall project area which may have direct or indirect impacts due to project activities in these locations.
4 Vulnerable status may stem from an individual's or group's race, national, ethnic or social origin, color, gender, language, religion, political or other opinion, property, age, culture, literacy, sickness, physical or mental disability, poverty or economic disadvantage, and dependence on unique natural resources.

Secondary Stakeholders - Other Interested Parties

Interested parties under this category includes the following:

- SEPA;
- SSWMB;
- Revenue Department;
- KMC and DMCs;
- Local Councils;
- Civil Society Organizations (CSO) and Community Based Organizations (CBO);
- Academia and Subject Specialists;
- Labor and Human Resource;
- Social Welfare Department;
- Women Development Department;
- Donor Agencies; and
- Press and Media.

Details regarding roles and responsibilities of the concerned secondary stakeholders are given in **Table A7-1**.

Table A7-1: Role and Responsibilities of Project's Secondary Stakeholders

Project Stakeholders	Roles and Responsibilities
Sindh Solid Waste Management Board (SSWMB)	◆ The Board shall regulate control or inspect the source points of generation, accumulation, transfer, recycling, trading of the solid waste. ◆ The Board shall have the right over the solid waste related issues, assets, funds and liabilities of the Councils and shall possess sole rights on all kinds of solid waste within the limits of all Councils. ◆ The Board may support, promote, administer, execute and implement schemes for undertaking any commercial or business enterprise which may benefit the management of waste.
Sindh Environmental Protection Agency	◆ SEPA is the regulatory authorities and mainly responsible for the development and implementation of the environmental policies and strategies in order to integrate the environmental issues and sustainable development approaches into the legal and regulatory frameworks as per Sindh Environmental Protection Act, 2014. ◆ EPAs are responsible for the issuance of NOC of the Proposed project. ◆ EPA Sindh is responsible for the compliance of ESMP and NOC provision during the construction and operation stages of the project.
Revenue Department	◆ Provide and verify land ownership data which include but not limited to the ownership record, land categorization and price details.
KMC and DMCs	◆ Planning development and maintenance of Karachi roads, bridges, streetlights, storm water drains, land control/ removal of encroachment, solid waste management, municipal watch and ward, firefighting, traffic engineering, charged parking, etc.
Political Parties	◆ The political parties working to resolve the problems faced by Karachi take up the issues of water and sanitation at different forums.

Project Stakeholders	Roles and Responsibilities
	◆ The city mayor, to be elected by the citizenry through the local bodies elections, will likely be from a political party. The working of KWSC and KWSSIP falls under the mandate of the mayor.
Local Councillors	◆ Elected and represent union committee constituents. Key link between constituents and city legislature and executive.
Civil Society Groups (CSG) and (CBOs)	◆ Largely policy and advocacy with limited interaction with government except in areas where strong CBO culture exists. ◆ CSOs in Karachi involved in development activism and service delivery. ◆ Identification of project-related environmental and social issues ◆ Identification of mitigation measures and solutions to ensure community issues, including those of vulnerable / disadvantaged groups are adequately addressed ◆ Identification of positive win-win solutions for environmental and social sustainability of the project
Cantonment Boards	◆ Six cantonment boards in Karachi with Clifton being the largest and Karachi Cantonment Board the smallest. Manage public services, environmental development and land use in their jurisdictions. Self-sufficient and managed directly by Core Commander and Ministry of Defence.
Academia and Subject Specialists	◆ Identification of project-related environmental and social issues and concerns ◆ Identification of positive solutions for environmental and social sustainability of the project that are technically sound and cost-effective
Labor and Human Resource	◆ Enforcement of labor laws ◆ Promotion of healthy labor management and conditions ◆ Monitoring of labor working conditions ◆ Implementation of labor standards ◆ Address grievances of labor force ◆ Maintain the minimum wages rates and impose restriction of child labor
Social Welfare Department	◆ Social protection including institutional care, skill development and rehabilitation ◆ Provide welfare services
Women Development Department	◆ Cover all the needful grounds regarding women without the discrimination of class, creed, religion, economic position. ◆ Address concerns of women related to the project ◆ Create employment opportunities ◆ Training and capacity building of women
Communities and project Affected Persons	◆ Participation in social impact assessment surveys, Consultation, and Focus Group Discussions ◆ Identification of project impacts, specific community concerns/suggestions from community leaders, male and female community members ◆ Identification of mitigation measures and solutions for enabling win-win solutions ◆ Supervision and disbursement of resettlement cost to APs.
Vulnerable / Disadvantaged Groups	◆ Identification of project impacts on vulnerable / disadvantaged groups ◆ Identification of mitigation measures and solutions to ensure vulnerable / disadvantaged groups are not adversely affected
Beneficiaries of the project	◆ Identification of issues. suggestion and coordination for improvement of the project design ◆ Support for implementation and aftercare of the project ◆ Identification of project-related environmental and social issues and concerns ◆ Identification of positive solutions for environmental and social sustainability of the project that are technically sound and cost-effective. ◆ Aftercare of the project
Donor Agencies	◆ Compliance with Environmental and Social Safeguards of Unilateral and Multi-Lateral Development Agencies

Project Stakeholders	Roles and Responsibilities
	◆ Lessons from previous/on-going development projects in the project-affected districts

Disadvantaged / Vulnerable Individuals or Groups

It is particularly important to understand whether project impacts may disproportionately fall on disadvantaged or vulnerable individuals or groups, who often do not have a voice to express their concerns or understand the impact of a project. It would also be critical to ensure that awareness raising and stakeholder engagement with disadvantaged or vulnerable individuals or groups be adapted to take into account particular sensitivities, concerns and cultural sensitivities of such individuals or groups and to ensure a full understanding of project activities and benefits. The vulnerability may stem from person's origin, gender, age, health condition, literacy levels, economic deficiency and financial insecurity, disadvantaged status in the community (e.g. religious and ethnic minorities or fringe groups), dependence on other individuals or natural resources, especially those living in remote, and insecure or inaccessible areas. Engagement with the vulnerable groups and individuals often requires the application of specific measures and assistance aimed at the facilitation of their participation in the project-related decision making so that their awareness of and input to the overall process are commensurate to those of the other stakeholders. In this project, the vulnerable or disadvantaged groups include:

- Women working in the water and sanitation sector in the city;
- Elderly employees and citizens;
- Disabled employees and citizens;
- Minorities (ethnic, religious, women);
- Low-income households;
- Women/child headed households; and
- Transgender persons.

Vulnerable groups within the communities affected by the project will be further confirmed and consulted through dedicated means, throughout the stakeholder's engagement process as appropriate.

Consultation Participation Process

The project intends to utilize various methods of engagement that was used as part of its continuous interaction with project stakeholders. For the engagement process to be effective and meaningful, a range of various techniques applied that were specifically tailored to the identified stakeholder groups in line with the SEP. For ascertaining the perceptions of different stakeholders about the project consultations/ meetings were carried out at following two levels:

- Consultations with Secondary Stakeholders - Other Interested Parties
- Consultations with Primary Stakeholders – PAPs and Vulnerable / Disadvantage Group

The stakeholder's engagement has been carried out in line with the requirements mentioned under Annexure – II of SEP (Planned Stakeholders Engagement Activities - Stage 1 - Project Design).

Consultations with Secondary Stakeholders - Other Interested Parties

Other Interested Parties - Secondary stakeholders identified, in the form of departmental stakeholders such as non-governmental organizations, government departments, and utility departments, were not only approached separately for the project's consultations, but also invited for a stakeholder consultation session, arranged to allow for all these departments to gather, and facilitate a meaningful dialogue on the project, and obtain their feedback on the project.

All relevant Government Departments/Organizations were invited in the consultation session where they were informed of the project in detail and requested to share their concerns and suggestions. Local representatives of all other stakeholder groups were also invited to the consultation session to encourage a collaborative and inclusive approach which include the stakeholders from the civil society sector, academia and media representatives.

Consultations with Primary Stakeholders - Project Affected Parties

Affected Parties include local communities, community members and other parties that were subject to direct impacts from the project. The public consultations have been arranged through Participatory Appraisal (PA) method. Participation mechanism and consultative process included: Information sharing, dissemination of information regarding impacts of the projects on social life and people in the project AoI, benefits of the project and participation of stakeholders in the project related activities, where their feedback were ultimately being incorporated back into the project design to the extent deemed possible.

For the public consultations, following steps were adopted**.**

a) Consultations with Beneficiaries

Consultations were conducted with beneficiaries of the project and will continue during the ongoing project stages and the project implementation to achieve the desired objectives. Public consultations organized at different locations in the project area along the alignments.

b) Consultations with Project Affected Parties

In order to align with international standards and good practice, local level engagement was provided to all PAPs likely to be affected during the ESA process. Apart from those potentially affected communities and their representatives, the vulnerable and disadvantaged people within these communities (people who would not normally be involved in decision-making) were also engaged.

The main purpose of the consultation exercise was to disseminate project information to relevant stakeholders and solicit their feedback received at an early stage regarding potential issues and concerns based on the current project concept and design features. Identification of stakeholders is one of the major steps for designing an effective consultation process. For this purpose, several site visits were carried out by E&S team to identify the relevant stakeholders for consultation.

Consultation meetings were conducted with the identified stakeholders. The stakeholders were briefed about background and scope of the project at the beginning of the meeting sessions. Concerns and suggestions of the respondents were noted down by the team and pictures of the session were taken with the consent of the stakeholders. If the interviewees had any queries regarding the project, the team responded to their queries during the session**.**

c) Methods of Public Consultation

The following methods were used for public consultation with project stakeholders in order to ascertain their stakes regarding project implementation. The views of the beneficiaries were formally recorded. The locations selected randomly situated near the proposed route of the road.

- Formal Group Meetings
- Informal Group Meetings
- Individual meetings
- Focused Group Discussions (FGDs)
- Gender Consultations

d) Categories of Stakeholders Contacted

Different categories of stakeholders which include but not limited to the residents, farmers, business/ shop owners, government and private servants, drivers, labor and women were contacted during consultations.

Community Consultation

Consultations mainly in form of “Focus Group Discussions” (FGD) with Primary Stakeholders in priority sewer schemes were carried out, majorly at public places. It was important to provide meaningful input for the public into the decision-making process through consultation. It was helpful to create a strong foundation for long-lasting and trustful relationships between the project and the stakeholders. It was helpful for the organizations enhance risk management and have better project outcomes. Local and traditional leaders, representatives of the communities, potential vulnerable groups such as women and youth has been consulted to understand their specific issues and concerns. This will enable meaningful participation. The findings and recommendations has been discussed and disclosed in an open and transparent manner with the communities in order to solicit their comments and suggestions in the studies.

On the whole 315 participants have been consulted including 217 males and 98 females. **Table A7-2** provides an overview of consulted communities. The complete settlement wise list of participants is provided in **Table A7-3** and social baseline photographs in **Figure A7-1**.

Table A7-2: Overview of Consulted Communities

No	Community	District	No. of Respondents	
			Male	Female
1.	Rabbani Masjid Bin Qasim Town	Malir	9	0
2.	Akbar Road (Gali-16, Block B (Scheme-II)	Keamari	8	0
3.	Sher Shah Mohallah	Keamari	0	9

No	Community	District	No. of Respondents	
			Male	Female
4.	Shershah colony C block (Scheme-II)	Keamari	14	8
5.	Shershah colony A Block (Scheme-II)	Keamari	12	8
6.	Shershah Colony Street 11 (Scheme-II)	Keamari	10	8
7.	Surjani Town FL-3, FL-6 (Scheme -3)	West	10	7
8.	Sukhia Goth Ward-3 (Scheme-4)	West	12	8
9.	Sector-5 E (Scheme 5,6,7)	West	9	8
10.	Ghosia Colony Orangi (Scheme -5,6,7)	West	12	0
11.	Khalilabad (Scheme -5,6,7)	West	9	0
12.	Sector 5E 385 (Scheme -5,6,7)	West	0	8
13.	Faridabad Colony (Scheme -5,6,7)	West	8	0
14.	Khalilabad (Scheme -5,6,7)	West	0	10
15.	Sachal Goth A Block (Scheme 8)	East	11	7
16.	Tayyab Jokhyo Goth (Scheme -9,10,11)	East	10	0
17.	Gulshan e Iqbal Block 16 (scheme 9,10,11)	East	8	0
18.	Sodagram Society (Scheme -12)	East	8	9
19.	Baghe Malir (Scheme -12)	East	10	0
20.	New Madina Market (Scheme -12)	Korangi	8	0
21.	M Rafique	Central	10	0
22.	Saima Tower Buffer Zone (Scheme-13)	Central	10	0
23.	Shah Baig Lain	South	11	0
24.	R-Chowk	South	9	8
25.	New Kalari Agra Taj	South	9	0
Total Respondents			**217**	**98**

Table A7-3: Attendance Sheets of Socio-Economic Baseline / Consultations Participants

Female Participants

Participants List of FL 3,FL6 Sec 6		
No.	**Name**	**Settlement**
1.	Farhana	FL 3,FL6 Sec 6
2.	Shahnoor	
3.	Amna	
4.	Amber Azeem	
5.	Farhan Kashif	
6.	Ainy	
7.	Rimsha	

Participants List of Kasar Niazi Colony		
No.	**Name**	**Settlement**
1.	Madam Erum	Kausar Niazi Colony

Participants List of Khalilabad		
No.	**Name**	**Settlement**
1.	Sajida	Khalidabad
2.	Zarrm	
3.	Naghma	
4.	Shahina	
5.	Afsari	
6.	Mehnaz	
7.	Shama	
8.	Kaneez	
9.	Fatima	
10.	Afiya	

Participants List of R-Chowk		
No.	Name	Settlement
1.	Sadaf	R-Chowk
2.	Nasreen	
3.	Khadija	
4.	Zubaida	
5.	Noor Jan	
6.	Taj Bibi	
7.	Mumtaz	
8.	Asia	

Participants List of Sachal Goth		
No.	Name	Settlement
1.	Yameena	Sachal Goth
2.	Qamaronisa	
3.	Noor Bibi	
4.	Lata	
5.	Habiba	
6.	Benazir	
7.	Shagufta	

Participants List of Scheme 33 Sukhia Goth		
No.	Name	Settlement
1.	Amna	Scheme 33 Sukhia Goth
2.	Nazeera	
3.	Rasheeda	
4.	Hameeda	
5.	Kainat	
6.	Shahida	
7.	Shameen	
8.	Naheed	

Participants List of Sector 5E		
No.	Name	Settlement
1.	Hina Ali	Sector 5E
2.	Humaira	
3.	Faryal	
4.	Sania	
5.	Farah	
6.	Saira	
7.	Shaheen	
8.	Nighat Faheem	

Participants List of Shahbaig Laru		
No.	Name	Settlement
1	Shoukat Hussain	Shah Baig Lane
2	Abdul Latif	
3	G.Rasool	
4	Fida Hussain	
5	Akram Ali	
6	Gul Ameen	
7	Niaz Mohd.	
8	Maroof	
9	Naik Bakht	
10	Mohammad Ali	

Participants List of Shahbaig Laru		
No.	Name	Settlement
11	Shahbaz Baloch	

Participants List of Shersha colony		
No.	Name	Settlement
1.	Habeeb Akhter	Shershah colony
2.	Tahira Nadeem	
3.	Samia	
4.	Sidra	
5.	Humaira	
6.	Samina	
7.	Iqra	
8.	Zubaida	
9.	Aqeela	

Participants List of Shersha colony Block B		
No.	Name	Settlement
1	Sajida	SherShah Colony Block B
2	Rehana	
3	Ruqaiya	
4	Shagufta	
5	Amna	
6.	Kanwal	
7	Kishwar	
8	Naheed	

Participants List of Shershah		
No.	Name	Settlement
1.	Nosheen	Shershah
2.	Aqeela Anwar	
3.	Zubaida	
4.	Asma	
5.	Uzma	
6.	Saira	
7.	Shazia Imdad	
8.	Naila	

Participants List of Sodagram Society		
No.	Name	Settlement
1.	Shameen	Sodagram Society
2.	Rubina	
3.	Shumaila	
4.	Naheed	
5.	Sumaira	
6.	Dr.Samreen	
7.	Miss ishrat	
8.	Shareefa bibi	

Male Participants

Participants List of Akbar Road		
No.	Name	Settlement
1.	Hassan khan	Akbar Road
2.	Ab.Hafiz	
3.	Naseeb ali	

4.	Nadeem	
5.	Ghulam.Hussain	
6.	Farad Ali	
7.	Amir Husain	
8.	Akhter Ahmed	

Participants List of AL Noor Academy School		
No.	**Name**	**Settlement**
1.	Abdul Saleem	AL Noor Academy School
2.	M.Ibrahim	
3.	Amir Khan	
4.	Zahid Ahmed	
5.	Hammad	
6.	Mazian Ali	
7.	Azhar Ali	
8.	Azhar Hussain	
9.	Kahish Zaman	

Participants List of Bagh-e-Rizwan		
No.	**Name**	**Settlement**
1.	Sajjad Hussain	Bagh-e-Rizwan
2.	Asif	
3.	Haris	
4.	Shamim Shazad	
5.	Raheel	
6.	Umar	
7.	Mubashir	
8.	Syed Asim	

Participants List of Bin Qasim Town		
No.	**Name**	**Settlement**
1.	Asgher Khan	Bin Qasim Town
2.	sher Ali	
3.	Naseer udin khan	
4.	M. Somar	
5.	Aslam	
6.	Akhlaq	
7.	Nasrullah	
8.	Imran	
9.	Marzada	

Participants List of D-13 Block 3		
No.	**Name**	**Settlement**
1.	Imran	D-13 Block 3
2.	Nafise	
3.	Hamza	
4.	Faisal Mohed	
5.	M. Amir	
6.	Sultan	
7.	M. Ramazan	
8.	M.Aqeel	
9.	M.Suleman	

Participants List of FL 3,FL6 Sec 6		
No.	Name	Settlement
1.	Shaheed Burni	FL 3,FL6 Sec 6
2.	M. Tahir Khan	
3.	M.Waseem	
4.	Hammad Raza Khan	
5.	M.Tasleen	
6.	Kanal	
7.	Aftab	
8.	M.Tasbeen	
9.	M.Shafique	
10.	M.Shafqeen	

Participants List of Kasar Niazi Colony		
No.	Name	Settlement
1.	M.Rafique	Kasar Niazi Colony
2.	Hussain Gul	
3.	Sher ali	
4.	Amjad Farooque	
5.	M.Kashif	
6.	M.Farooq	
7.	M.Shazad	
8.	Imran	
9.	Tariq Zaman	

Participants List of Ghazi-Abad		
No.	Name	Settlement
1.	Syed faraz Ali Shah	Ghaziabad
2.	Syed Naseem ud Din	
3.	Syed ayaz Askari	
4.	Irfan Siddiqui	
5.	Subhan	
6.	M.Ghulam Mustafa	
7.	Raees Ahmed	
8.	Mashidin	
9.	Farooz Alam	

Participants List of New Kalari Agrah Taj		
No.	Name	Settlement
1.	Aness Sangar	New Kalari Agrah Taj
2.	Anwar Chaki Somaro	
3.	Syed Mukiaemd Shah	
4.	Umar Farooq	
5.	M.Bataqiu	
6.	Abdul Sattar	
7.	Ismail	
8.	M. Ayub	
9.	Bilawal Bahat	

Participants List of Attath Chowk		
No.	Name	Settlement
1.	M Khatri	Attath -Chowk
2.	Asif	
3.	Danish	
4.	Mahir Muhammad	
5.	Anwar Ahmed	
6.	M.Pervez	

Participants List of Attath Chowk		
No.	Name	Settlement
7.	Hasnain	
8.	Gul Mohd.	
9.	M.Ibrahim	

Participants List of Sachal Goth		
No.	Name	Settlement
1.	M.Ramzan	Sachal Goth
2.	Shafi Mughal	
3.	Rashid Ali	
4.	Fazal Dard Somaro	
5.	Mrs.Faheem	
6.	Shakeel Ahmed	
7.	Allah badharo	
8.	Ghulam Mustifa	
9.	Sahib Arbab	
10.	Ali Akber	
11	Allah Dad Gopang	

Participants List of Scheme 33 Sukhia Goth		
S. No.	Name	Settlement
1.	Abdul Razzaq	Scheme 33 Sukhia Goth
2.	M.yousuf	
3.	Sohaib	
4.	Farooq	
5.	Dadalo	
6.	Sahar	
7.	Qayoom	
8.	Faheem	
9.	Mutilab	
10.	Abdullah	
11.	Khair mohammad	
12.	Waheed Baksh	

Participants List of Sector 15 A-5 Bufferzone		
No.	Name	Settlement
1.	M.Hanif	Sector 15 A-5 Bufferzone
2.	Taha Jamal	
3.	Nouman Zaman	
4.	Abdullah	
5.	Farooque	
6.	Anees Rehan	
7.	Amjad Farooque	
8.	Sharfee Ahmed	
9.	M Zeeshan Ali	

Participants List of Sector 5E		
No.	Name	Settlement
1.	M.Saheed	Sector 5E
2.	Fahad	
3.	Shazeeb	
4.	Moheez	
5.	M.Hamza	
6.	Faiz Ahmed	
7.	Rehan	
8.	M.Sajad	

Participants List of Sector 5E		
No.	Name	Settlement
9.	Ayoob	

Participants List of Baghe Malir		
No.	Name	Settlement
1.	Saifullah	Baghe Malir
2.	M.Anwar	
3.	Naiz Ahmed	
4.	M.ubaid	
5.	Waqar Ahmed	
6.	Adil	
7.	Samiullah	
8.	M.Waqas	
9.	Ahmed Raza	
10.	Amir Farooq	

Participants List of Madina Market		
No.	Name	Settlement
1.	Syed Mohib Ali Shah	Madina Market
2.	M. Nadeem	
3.	Asid Shah	
4.	Fakhurul Islam	
5.	Syed Moledullah	
6.	Syed Atullah	
7.	Syed Farahanullah	
8.	Syed Farmn	

Participants List of Shahbaig Lane		
No.	Name	Settlement
1.	Shoukat Hussain	Shahbaig Lane
2.	Abdul Latif	
3.	G.Rasool	
4.	Akram Ali	
5.	Gul Ameen	
6.	Niaz Mohd.	
7.	Maroof	
8.	Naik Bakht	
9.	Shahbaz Baloch	

Participants List of Shershah colony		
No.	Name	Settlement
1.	Akhter Ali Gul	Shershah colony
2.	Imran Tarique	
3.	Akhter Abbasi	
4.	Fareed Khan	
5.	Ali raza	
6.	Sajjad Ahmed	
7.	Ajaz Ahmed	
8.	Ab. Qadir	
9.	Hassan	
10.	M.Amir Koraski	
11.	Baloch Ahmed	
12.	Faisal	
13.	Shazid Bhatti	
14.	Dawood shah	

Participants List of Shershah Colony Block A		
No.	Name	Settlement
1.	M. Tahir	Shershah Colony Block A
2.	Haji Ghulam Hussain	
3.	Hafiz	
4.	M. Sajjad	
5.	Shaheed	
6.	Arshad	
7.	M. Farhan	
8.	M. Zahid	
9.	M. Tariq	
10.	Noman	
11.	Ibrahim	
12.	M. Afzal	

Participants List of Shershah		
No.	Name	Settlement
1.	Khursheed	Shershah
2.	Arshad Ali	
3.	Sher Ahmed	
4.	Zahid Ali	
5.	Shah Meer	
6.	M.Ismail	
7.	Abdul Ghaffar	
8.	Qadir Baksh	
9.	Zafir Ali	
10.	Sajjad Rahman	

Participants List of Sodagram Society		
No.	Name	Settlement
1.	Zamir	Sodagram Society
2.	Zahid	
3.	Younis	
4.	Rizwan Khan	
5.	Ilyas	
6.	Manhal	
7.	Kashif	
8.	Ab.Ghani	

Participants List of Tayab Jhokio Goth		
No.	Name	Settlement
1.	Nadeem Jokhio	Tayab Jhokio Goth
2.	M.Ali	
3.	M.Alayas	
4.	M.Shazad	
5.	Haji Abbas Jhokio	
6.	M.Umar Jhokio	
7.	Al.Ramazan Jhokio	
8.	Bilawal Jhokio	
9.	Shahbaz	
10.	Adam jhokio	

Figure A7-1: Social Baseline Photographs

Public Consultation (Female)

Layari near suleman road

Layari

Orangi Town

Scheme 2 Shershah

Scheme 8 Sachal Goth

Shah Faisal

Surjani Town

Public Consultation (Male)

Bufferzone Saima Towers

Gulshan

Gulshane Iqbal Tayeb Goth

Keamari

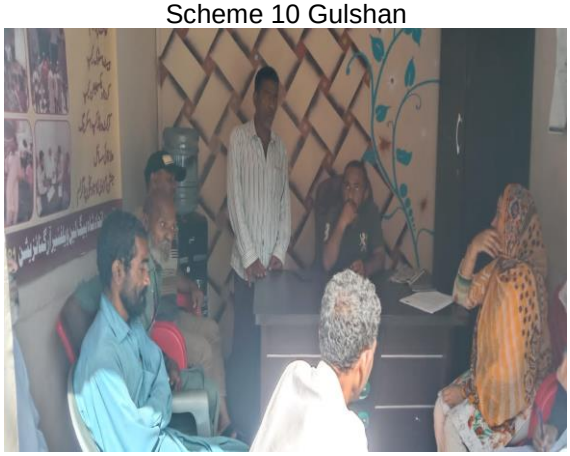
Kausar Niazi Colony

Lyari

Orangi Town

Scheme 10 Gulshan

Scheme 12 shah Faisal 1



Shah Beg Line

Shershah

Sukhia Goth

Surjani Town

Institutional Consultations

Assistant Deputy Commissioner (ADC)

Competitive and Liveable City of Karachi (CLICK)

District Health Officer South

Rural Support Programmes Network (RSPN)

Sindh Solid Waste Management Board (SSWMB)

Town Education Officer Bin Qasim

Feedback and Concerns from the Communities

Participants were first briefed about the project objectives and major interventions associated with the project implementation. Afterward, people were asked to express their views regarding various activities of the proposed project. In general participants appreciated the project and offered comments & suggestions to enhance the expected environmental and social benefits and to mitigate the adverse impacts. The community perception about the project was found reasonably good. Majority of respondents favoured the proposed project based on the expectations that the project will provide work opportunities for the local communities. The digest of major issues discussed during the meetings are given in **Table A7-4**. Feedback of women consultations is provided in the subsequent section.

Table A7-4: Summary of Consultation Meetings

Stakeholder	Summary of Key Issues Raised	Responses
Rabbani Masjid Bin Qasim Town	Local people should be preferred when hiring	Agreed. The contractor will be contractually bound to disclose the "Recruitment Policy" and follow it. They will be required to hire at least 60 percent people who live within proximity to the Project Area.
Akbar Road (Gali-16, Block B (Scheme-II)	This is the best project which may bring incomparable development in the city.	Agreed. Overall, the project will considerably improve the sanitation profile of the city.
	Is there a grievance redress mechanism system in place and will it be effective?	There is a grievance redress mechanism in place managed by the PIU-KWSSIP. Communities are encouraged to register any complaints in the GRM so that they can be resolved amicably and fairly.
Sher Shah Mohallah	Local people should be preferred when hiring	Agreed. The contractor will be contractually bound to disclose the "Recruitment Policy" and follow it. They will be required to hire at least 60 percent people who live within proximity to the Project Area.
	Worker's camp and their possible conflicts with local communities	Worker's camp site location has been selected far away from the communities. As per the ESMP directives, the Contractor shall be bound to develop campsite at the identified location only and equip it with proper facilities to restrict access of workers to the outside shops etc. so that their interaction with nearby communities shall be avoided.
Sher Shah colony C block (Scheme-II)	Hiring process shall be open and transparent and hiring committee should include participants from nearby communities.	Agreed. The contractor will be contractually bound to disclose the "Recruitment Policy" and follow it. They will be required to hire at least 60 percent people who live within proximity to the Project Area.
Sher Shah colony A Block (Scheme-II)	Male family members should be employed in the project related jobs so that they could get the jobs in their hometown. Hiring process should be transparent and hiring of local workers should be ensured.	As per the ESMP directives, the Contractor will be bound to hire local unskilled and semi-skilled workers at the most.
Sher Shah Colony Street 11 (Scheme-II)	It was also mentioned that the relevant Government personnel must ensure the Contractor staff is cooperative with the public and maintain the right attitude and try to facilitate them instead of being confrontational.	During the project implementation stage, measures will be prepared that will include GRM and institutional arrangements.
Surjani Town FL-3, FL-6 (Scheme -3)	Nuisance related to construction traffic, dust and noise.	Suitable mitigation measures have been made part of the ESMP that shall be followed by the Contractor to protect communities from the impacts of construction traffic, dust, and noise. These include, preparation and implementation of Traffic Management Plan, water sprinkling, avoidance of noisy work at night, ensuring low speed driving, immediate collection of excavated material, installation of safety barriers etc.
	What are the main Project activities?	Under the proposed Priority Sewer Networks Rehabilitation and Extension project, the introduction of a sustainable sewerage

Stakeholder	Summary of Key Issues Raised	Responses
		infrastructure will be made that will be able to fulfil the sewerage drainage needs of the selected priority areas for the next many decades. The project will result in the drastic improvement of sewage collection and conveyance system to cater the existing and future drainage needs through laying / rehabilitation of sewer lines
Sukhia Goth Ward-3 (Scheme-4)	Worker's camp and their possible conflicts with local communities	Worker's camp site location has been selected far away from the communities. As per the ESMP directives, the Contractor shall be bound to develop campsite at the identified location only and equip it with proper facilities in order to restrict access of workers to the outside shops etc. so that their interaction with nearby communities shall be avoided.
Sector-5 E (Scheme 5,6,7)	Who will develop organizational structure to handle the environmental and social issues during the project implementation?	Project Implementation Unit (PIU) of KWSSIP would be responsible for all aspects of project implementation including technical, operational, and financial management, and overseeing the implementation of ESMP. It is the responsibility of PIU as the Project Proponent to ensure implementation of the ESMP through consultants and contractor(s).
Ghosia Colony Orangi (Scheme - 5,6,7)	Hire those contractors, who will be familiar and respect with community's views and concerns.	Contractor will be contractually bound to implement code of conduct as detailed in ESMP's Chapter 5 of the report to ensure protection of community values.
	The community members requested that concerned authorities should enhance the quality of health and education facilities in the project area.	The Contractor may consider taking this up for the social wellbeing.
Khalidabad (Scheme - 5,6,7)	Safety while crossing the road	To avoid any safety related incidences and ensuring well-being of the residents, the construction areas will be barricaded in line with the ESMP guidelines to restrict any pedestrian entrance. Implementation of other CHS measures incorporated in the ESMP shall also ensure community safety.
Sector 5E 385 (Scheme - 5,6,7)	Local people should be preferred when hiring	The contractor will be contractually bound to disclose the "Recruitment Policy" and follow it. They will be asked to hire at least 60% people who live within close proximity to the Project Area
	Impacts of Excavation associated with project works	Construction activity will be conducted along the already defined corridor and may result in temporary soil dumps and congestion in the AoI. Adequate measures have been included in this ESMP that will be implemented by the Contractor for protecting public from nuisance.
Faridabad Colony (Scheme - 5,6,7)	Chances of dust emissions due to construction activities.	Construction activity will be conducted along the already defined corridor however it may result in generation of dust in the AoI. Adequate measures have been included in the ESMP that will be implemented by the Contractor for protecting public from dust nuisance.

Stakeholder	Summary of Key Issues Raised	Responses
Khalidabad (Scheme - 5,6,7)	Is there a grievance redress mechanism system in place and will it be effective?	There is a grievance redress mechanism in place which with cooperation from the KWSSIP is expected to handle any issues fairly.
Sachal Goth A Block (Scheme 8)	Many respondents explained that Karachi is experiencing a sanitation crisis that stems largely from poor governance.	The project will amicably resolve the sanitation related issues faced by the city.
Tayyab Jokhyo Goth (Scheme -9,10,11)	What is the procedure to address grievances?	Most of the concerns raised by stakeholders have been incorporated into the project's environmental and social assessment and ESMP. In addition, a Grievance Redress Mechanism / Complaint Handling Mechanism will be developed at the implementation level by forming Grievance Redress Committee which will receive and resolve complaints of the project affected persons and other stakeholders of the project area.
Gulshne Iqbal Block 16 (scheme 9,10,11)	Safety while crossing the road especially students/pupils, old and women.	The traffic management and CHS plans will be prepared and implemented in line with the ESMP guidelines for ensuring public safety.
Sodagran Society (Scheme -12)	The stakeholders requested the concerned authorities to ensure the project was completed on a fast-track basis and hoped it would not suffer any delays.	A fully capable Project Implementation Unit (PIU) has been setup within KWSC consisting primarily of existing KWSC staff; to mitigate weaknesses in certain specialized areas, as well as selected individual consultants to further strengthen the PIU in project preparation and implementation. The PIU is headed by the Project Director supported by a team of technical directors/ managers and further supported by individual technical and safeguards consultants.
Bagh e Malir (Scheme -12)	This project will hopefully resolve issues related to ponding of rain and sewage water.	This project will considerably improve the sanitation profile and the design includes the provision of handling the storm water as well.
New Madina Market (Scheme -12)	The area is facing too many difficulties due to damaged sewerage network and many streets have become a sewage pool	The project will amicably resolve the sanitation related issues faced by the area as well as the city overall.
M Rafique colony	Safety while crossing the road especially students/pupils, old and women.	traffic management and CHS plans will be prepared and implemented in line with the ESMP guidelines for ensuring public safety.
Saima Tower Buffer Zone (Scheme-13)	Since pipeline laying will require considerable excavation, it is a usual practice all over the city that trenches are left uneven and excavated material is left alongside which cause severe nuisance to public.	Adequate measures have been included in this ESMP that will be strictly implemented by the Contractor for protecting public from nuisance related to excavated material and no excavated material will be left unattended. Roads that will be damaged due to construction works will be properly reconstructed as a part of the project.
Shah Baig Lain	The community perception for the project was overall found to be highly positive and it has been demanded that such initiatives must be taken immediately.	The execution of the proposed project will be initiated at the earliest by the GoS.

Stakeholder	Summary of Key Issues Raised	Responses
	Hire those contractors, who will be familiar and respect with community's views and concerns.	Contractor will be contractually bound to implement code of conduct as detailed in ESMP's Chapter 5 of the report to ensure protection of community values.
R-Chowk	Safety while crossing the road	To avoid any safety related incidences and ensuring well-being of the residents, the construction areas will be barricaded in line with the ESMP guidelines to restrict any pedestrian entrance. Implementation of other CHS measures incorporated in the ESMP shall also ensure community safety.
New Kalari Agrah Taj	The proposed sewer network should be maintained, cleaned and not left choked; the issue consistent with the existing sewerage network.	KWSC will ensure efficient and smooth operations of the project. The proposed sewer network will be regularly maintained for smooth flow of sewage.

Outcomes of Women Consultations

Consulted women pointed out towards the issues they face and provided some recommendations which as follows:

- Most of the women respondents informed that although it's a patriarchal society, however the elder women of the families are usually asked by the men during decision making process regarding important issues such as marriages of their children etc. However, final decision power lies with the male head of the family.
- The female members of the communities following traditional Pashtun or Baloch traditions are usually protected from SEA and SH incidents as these traditions limits the unnecessary freedom.
- The girls are usually not allowed to go alone to public places or using public transport, especially after the painful incidents occurred in Karachi and other parts of the country during the recent past in relation to child abuse.
- The females often practice veil/purdah with their will and are not comfortable to even go to hospital alone.
- All the consulted working women were of the view that the society offers no protection to women. They avoid using rickshaws late at night due to a majority of male passengers. Women prefer buses and minibuses because they have reserved seats for women, however, opined that it is the government's job to introduce a better public transport system keeping women's needs in mind.

Collectively, major requests from the consulted female members of the communities are as follows;

- Improvement in available government owned health and educational facilities.
- Provision of clean drinking water.
- Introduction of women-only transport schemes.
- Setting up of the skill development centres in the project area.

Consultation with Secondary Stakeholders

Various departments, organizations and offices related to the proposed project have been consulted. They were briefed on the ESMP process, the proposed project, proposed interventions and the potential negative and positive impacts of the project. The contacted representatives expressed their interest in the project as it will contribute in solving the acute sewerage and sanitation problems of Karachi and offered their complete support in all respects.

List of offices visited, and officials consulted is provided in **Table A7-5**, whereas the digest of discussions held with these departments / officials are given in **Table A7-6**.

Table A7-5: Consultation with Institutional Stakeholders

No	Department / Organization	Designation
1	Sindh Environmental Protection Agency (SEPA)	Deputy Director
2	District Municipal Corporation (DMC) South	Administrator
3	Sindh Solid Waste Management Board (SSWMB) Sindh	Assistant Director Compliance
4	District Health Department South	District Health Officer
5	District Government South	Additional District Commissioner-1 South
6	Health Department South	Health Officer
7	DMC, East	Assistant District Commissioner
		Administrator
8	Health Department East	D.H.O
		A.D.H.O
9	CLICK Local Government Department Government Of Sindh	Senior Environmental Specialist
		Senior Social Safeguard Specialist
10	Public Health Engineering Department	Research Officer
11	Urban Resource Centre (NGO)	Director
12	Rural Support Network (NGO)	Provincial Monitoring Coordinator
		WASH Engineer
		Monitoring Officer

Table A7-6 Feedback and Concerns

Stakeholder	Summary of Key Issues Raised / Comments	Responses
SEPA	The ESA study should thoroughly cover all the environmental and social aspects and the report should provide clear-cut guidelines on the mitigation of identified impacts associated with the project. Keeping in view the nature of the project and scope of the construction activities, submission of an Environmental Checklist will suffice the SEPA requirements.	The Environmental Checklist will thoroughly cover all the environmental and social aspects and the report will be finalized / submitted to SEPA after careful review of the E&S experts associated with the project from PIU and the ESA Consultants.
District Municipal Corporations (South and East)	Keeping in view the proposed interventions, it is anticipated that the project will bring drastic improvement in the city's sewerage network.	The project will improve the sanitation profile of the city.
	The proposed project is the great initiative by the GoS and it is needed that further sanitation sector	The proposed Priority Sewer Networks Rehabilitation and Extension project is aimed towards the introduction of a

Stakeholder	Summary of Key Issues Raised / Comments	Responses
	improvement projects may also be initiated.	sustainable sewerage infrastructure that will be able to fulfil the city needs for the next many decades. The project will result in the drastic improvement of sewage collection and conveyance to cater the existing and future drainage needs.
Sindh Solid Waste Management Board (SSWMB) Sindh	Though sewage management does not directly come under the SSWMB's domain however sewage conveyance has a direct relationship with solid waste. The deteriorated sewerage network often results in choking of the system as dumping of domestic waste in open spots of the sewerage system is a common practice among the cities. It is anticipated that the project will result in enclosed sewerage network which will discourage unauthorized dumping of domestic waste and will hence reduce pressure on SSWMB as well.	The project will not only improve the sanitation profile of the city, it will also reduce the ratio of unauthorized dumping of solid waste in open drains as the proposed network will be enclosed.
Health Department (South and East)	It is a known fact that stagnant sewage is a root cause for several waterborne diseases in Karachi. The proposed project is very nice initiative which will result in reducing the spread of water borne diseases.	The project has a great potential to improve the health profile of the city.
District Government Department Offices and Public Health Engineering Department	The project will overall have far reached positive impacts however, a common practice observed all over the city is; since pipeline laying requires considerable excavation, most of the times these trenches are left uneven and excavated material is left alongside which cause severe nuisance to public. This issue must be dealt with concerted efforts and vigilance.	Strict measures have been included in this ESMP that will be sternly implemented by the Contractor for protecting public from nuisance related to excavated material and no excavated material will be left unattended. Roads that will be damaged due to construction works will be properly reconstructed as a part of the project.
CLICK - Local Government Department	It is a positive project, and such initiatives are awaited since long. Environmentally and socially, the project will bring a big relief.	The project will undoubtedly improve the sanitation profile of the city.
	The sewer lines are being chocked because the solid waste is not properly managed, and people dump domestic wastes in open drains. The proposed sewer network should be maintained, cleaned and not left choked; the issue consistent with the existing sewerage network.	KWSC will ensure efficient and smooth operations of the project. The proposed sewer network will be regularly maintained for smooth flow of sewage. Majority of the proposed works will be enclosed which will discourage dumping of domestic waste in sewer lines.
Urban Resource Centre (NGO)	The project will improve overall quality of life as the chances of ponding of sewage will be reduced.	The project has a great potential to improve the sanitation profile of the city. Provision in the design has already

Stakeholder	Summary of Key Issues Raised / Comments	Responses
		been kept for the handling of storm water.
Rural Support Network (NGO)	Overall, the project is a much needed initiative. Since unemployment is a common problem especially in the poor localities of the city, local people should be preferred for hiring.	Agreed. The contractor will be contractually bound to disclose the "Recruitment Policy" and follow it. They will be required to hire at least 60 percent people who live within close proximity to the Project Area.

Addressing Stakeholder Concerns

Most of the concerns raised by stakeholders have already been incorporated into the ESMP. In addition, a Grievances Redressal Mechanism will be developed at the implementation level, which will receive and resolve complaints of the communities and other stakeholders of the project area.

Stakeholder Consultation Workshop

PIU - KWSSIP organized a Stakeholder Consultation Workshop on 28th July 2022 at Regent Plaza in relation to information disclosure and stakeholders engagement on SOP-2 Projects. The main objective of the workshop was to get their feedback at broader level. The stakeholders being invited include relevant Government Departments, NGOs, Academia, World Bank, Sindh Environmental Protection Agency (SEPA), Pakistan Air Force (PAF), K-Electric, Transport and Mass Transit Department, World Wildlife Fund (WWF), Pakistan Telecommunication Company Limited (PTCL), National Refinery Limited (NRL), Karachi Development Authority (KDA), Planning & Development Board (P&DB) and Local Community representatives. The stakeholders actively participated and provided precious comments, suggestions and shared their views based on their practical experience at different projects. The proceeding of the workshop started with recitation of Holy Quran, followed by welcome address by the Project Director KWSSIP and Project Presentations by the ESA Consultants about the project interventions. The stakeholder consultation list of the participants is given as **Figure A7-2**. The participants unanimously supported the project. Following are the summarized comments / suggestions by the stakeholders regarding the project:

- PD – PIU KWSSIP informed the participants that the effects of the project will be remarkably progressive as it will enable KWSC to serve the residents of the city with a sanitation network that will ensure smooth flow of sewage, restrict the long-lasting issue of sewage ponding and allow storm water to flow through the network.
- In addition to lowering water system contamination, a well-functioning sewer system will also lessen the likelihood of local communities, infrastructure, and water sources being swamped by sewage floods.
- Since laying pipelines demands extensive excavation; it is typical practise to see these trenches left uneven and excavated material left beside, which is quite inconvenient for the general people. Sincere efforts and attentiveness will be required to address this issue.
- The city's deteriorating sewerage network frequently causes the system to choke as domestic waste is frequently being dumped in the damaged openings of the sewerage system. It should be ensured that no points be left open which could become a point of unauthorized domestic waste disposal.

Frequent cleaning of sewers should also be ensured so that sewage could flow without any blockages.

Photographs of Stakeholder Consultation Workshop are shown in **Figure A7-3**.

Figure A7-2: Attendance Sheets of Stakeholder Consultation Workshop

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Stakeholder Consultation Workshop – Environmental & Social Assessment Studies

SOP 02 Projects for Karachi Water & Sewerage Services Improvement Project (KWSSIP)

28th July 2022

S. No.	Name	Designation / Department	Signature
1.	Muhammad Tariq	ASE	
2.	Bilal Zafar	KWSSIP	
3.	Sibtain Mughal	Joint Director Comm	
4.	Dr. Abdul Ghaffar	Env. Engg. Deptt. NED University	
5.	Mr. Shoaib Qureshi	Addl Director SEPA	
6.	Ali Larosh	Sr. Project officer WWF-Pakistan	Alilarosh
7.	Farooq Bhutto	K Electric	
8.	Yar Muhammad	Transport Deptt-	
9.	Huma Haleposto	Safeguard Specialist	
10.	Zahid Farooq	Joint Director LRC KHI	

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S. No.	Name	Designation / Department	Signature
11.	UZAIR HAMEED KHAN	MANAGER ROW OPS PTCL	
12.	Mushtaque Ahmed Soomro	Coordinator Protocol NRL.	
13.	CDR Rehan Sadiq	Sr. Mgr Administration	
14.	KHALID M. SIDDIQUI	Member (Service) PED Board GOS	
15.	SYED ALI NAUMAN	CHIEF ENGINEER, K.D.A.	Nauman 28/07/2022
16.	Kamran Akbar	Sr. Social Div SP	
17.	SARFARAZ	KWSIP	
18.	Mazhar Ali Shaikh	Director Katchi Abadi KWSSIP	
19.	Abdul Rehman	WB	
20.	Engr: M. Usman Memon	S.E I/C (BWSD). PSIC: Steel.	

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S. No.	Name	Designation / Department	Signature
21.	KAMRAN UMAR	EE / KDA	
22.	Khurram Shah	SDS / KWSSIP	
23.	Syed Waqar Hussain	ES / KWSSIP	
24.	ARSLAN ASGHAR	PRINCIPAL ENVIRONMENTALIST - PK	
25.	Aqeel Ahmed Maggi	SA. Asstt. Engineer M.Co	
26.	Muhammad Saqib Siddiq	Sr. Social & Resettlement Spec.	
27.	Muhammad Norman	Junior Engineer WAPDA K-4	
28.	Muhammad Yousaf	Manager (LAND) PSM	
29.	Mazhar Abbas	Assistant Manager (PSM)	
30.	Intelehab A Rajput	Chief Engineer (ESM) KWSSIP	

1071PO1 I 01 (Stakeholder Consultation Workshop – Attendance List)

MMP NESPAK EMC

KWSSIP Karachi Water & Sewerage Services Improvement Project

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S. No.	Name	Designation / Department	Signature
31.	Tuba Noman	GIS Specialist	[signature]
32.	Muhammad Sajjad	Resettlement Expert NESPAK	[signature]
33.	M. A. Shishandi	MMP	[signature]
34.	M. Shariq Ahmed	Nespak Lhr. (PM-CA)	[signature]
35.	Fahad Saleem	Nespak (Env. spec.)	[signature]
36.	OMAR ARIF	EMC Pakistan	[signature]
37.	Talal Ahmed	MMP	[signature]
38.	Rameez ul Islam	MMP	[signature]
39.	GUL MIR KHAN	Chief Engr (T&C) KIV ...	[signature]
40.	Hajeeb-ur-Rehman	Manager PTCL N/WBD	[signature]

1071PO1 I 01 (Stakeholder Consultation Workshop – Attendance List)

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SOP 02 Projects for Karachi Water & Sewerage Services Improvement Project (KWSSIP)

28th July 2022

S. No.	Name	Designation / Department	Signature
41.	Dr. Aamir Alamgir	Assistant Professor / Institute of Environmental Studies Uni	
42.	Ghulam Kibria	Energy update	
43.	Wg Cdr DARYA KHAN	OC Admin / PAF SWEED. Korangi	D. Coor
44.	Muhammad Nawaz	Social safeguard, Specialists	
45.	Zulfiqar Laghari	Sr. Social Development Specialists	
46.	Muhammad Zafar Iqbal	Resettlement MMP Specialists	Muhammad 28/7/22
47.	Mehmood Rahim Junejo	M.M.P.	M. Rahim
48.	A. Rehman	Lewis.	
49.	Nasreen Baloch	Assistant Director Social welfare.	
50.	Jawed Shami	Team leader Deputies	

MMP NESPAK EMC

KWSSIP

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S. No.	Name	Designation / Department	Signature
51.	Masood ur Rehman	Sr. Environmentalist-I	
52.	Nadeem Akhtar	Pakistan Refinery Sr Manager construct	
53.	Khurram Shehzad.	CE-Civil PIU	
54.	Aamir Waqar	SE (Civil) PIU.	
55.	Syed Babar Ali	Social specialist Click consultant	
56.	Rehan Zahir	Survey Officer	
57.	Syed Waqas	Sub Engg.	
58.	Hareeda Kaleem	Gender Specialist	
59.	Ismail Zaidi	CMES	
60.	Mussawir Qureshi	PIU SWEEP	

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S. No.	Name	Designation / Department	Signature
61.	Hania Handani	Design Engineer	
62.	Imad Mohsin	Civil Engineer	
63.	Sonia	SCDA	
64.	Farah Yamin Khan	Consultant WBG	
65.	Muhammad Ijaz	Consultant	
66.	Azizullah Channa	Assistant Professor Env. Eng Mehran Uet, J	
67.	Salman Manj	consultant	
68.	Syed Hasan Ali.	Addl Manager	
69.	Ziad Chandio	Sr. Engr (G-03)	
70.	Jawad Ahmed	C.R.O	

1071PO1 I 01 (Stakeholder Consultation Workshop – Attendance List)

Figure A7-3: Pictorial views of Stakeholder Consultation Workshop

The Welcome address given by Syed Salahuddin (Project Director)

Khurram Shams Khan and Syed Waqar Hussain Shah present the objectives of the workshop to the audience

Participants in Stakeholder Consultation meeting

Question from the stakeholder

Group photo after the successful completion of stakeholder meeting