Government of the People's Republic of Bangladesh
Ministry of Local Government, Rural Development and Co-Operatives

Dhaka Sanitation Improvement Project

Environmental, Resettlement and Social Management Framework

Dhaka Water Supply and Sewerage Authority

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List of Acronyms

ARP	Abbreviated Resettlement Plan
BDT	Bangladeshi Taka
BIWTA	Bangladesh Inland Water Transport Authority
BMD	Bangladesh Meteorological Department
BNBC	Bangladesh National Building Code
BOD_5	5-day Biochemical Oxygen Demand
BUET	Bangladesh University of Engineering and Technology
COD	Chemical Oxygen Demand
CPCR	Community Program and Consumer Relation
DR&CS	Construction Supervision Consultant
CUL	Compensation Under Law
DO	Dissolved Oxygen
DB	Design-Build
DBO	Design-Build-Operate
DC	Deputy Commissioner
DMCH	Dhaka Medical College Hospital
DNCC	Dhaka North City Corporation
DoE	Department of Environment
DSCC	Dhaka South City Corporation
DSIP	Dhaka Sanitation Improvement Project
DTW	Deep Tube well
DWASA	Dhaka Water Supply and Sewerage Authority
EA	Environmental Assessment
ECA	Environmentally Critical Area
ECoP	Environmental Code of Practice
ECR	Environment Conservation Rule
EGL	Existing Ground Level
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ERP	Emergency Response Plan
ESHS	Environmental, Social, Health & Safety
FGD	Focus Group Discussion
E&S	Environmental and Social
ESIA	Environmental and Social Impact Assessment
ERSMF	Environmental, Resettlement and Social Management Framework
ESMP	Environmental and Social Management Plan
GoB	Government of Bangladesh
GRC	Grievance Redress Committee
HH	Household
HTG	House Transfer Grant
IEB	Institution of Engineers, Bangladesh
IEE	Initial Environmental Examination
IFC	International Finance Corporation
IWM	Institute of Water Modelling
MLD	Million Liters per Day
MoEFCC	Ministry of Environment, Forest & Climate Change
M&E	Monitoring and Evaluation
NGO	Non-Government Organization
O&M	Operation and Maintenance
OP	Operational Policy
OHS	Occupational Health and Safety
PAP	Project Affected Person
PD	Project Director
PM	Particulate Matter
PM_{10}	Particulate Matter with aerodynamic diameter ≤ 10 micrometers
$PM_{2.5}$	Particulate Matter with aerodynamic diameter ≤ 2.5 micrometers
PMU	Project Management Unit
RAJUK	*Rajdhani Unnayan Kartipokkho*
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
SFT	Square Feet
SLS	Sewage Lifting Station
SPM	Suspended Particulate Matter
STP	Sewage Treatment Plant
TA	Technical Assistance
TDS	Total Dissolved Solids
ToR	Terms of Reference
WARPO	Water Resources Planning Organization
WB	World Bank

EXECUTIVE SUMMARY

Introduction

The Dhaka Sanitation Improvement Project is the Project by the Government of Bangladesh to improve the existing sanitation infrastructure in the Dhaka city. The components of this Project are:

- Component 1: Institutional Support for Sanitation Service Delivery, which aims to strengthen the Dhaka Water Supply and Sewerage Authority (DWASA, the executing agency) for sustainable sanitation service delivery.
- Component 2: Sewerage and Wastewater Treatment, which consists of investments for replacement, rehabilitation or reconstruction of existing sewerage and wastewater treatment facilities of Pagla Sewerage Treatment Plant (STP), and to improve its sewerage network.
- Component 3: Non-Network Sanitation[1], which consists of investments for development of non-network sanitation services in the Pagla STP network area, where sewers are not feasible.
- Component 4: Project Implementation and Management Support, which intends to support DWASA to establish a Project Management Unit to prepare and implement this Project.

Environmental and Social Impact Assessment

The key components of the Project that have potential environmental and social impacts are Components 2 and 3, which proposes the following subcomponents or subprojects for the improvement of sanitation infrastructure in the Pagla STP network area:

- Replacement of Pagla STP with the latest treatment technologies and capacity of 200 million litres of wastewater per day (Subproject 1, Subcomponent 2.1)
- Reconstruction and replacement of about 12 km of Eastern Trunk Main and the associated Sewage Lift Stations (Subproject 2 or Subcomponent 2.2)
- Reconstruction and replacement of about 7 km of Western Trunk Main and the associated Sewage Lift Stations (Subproject 3 or Subcomponent 2.3)
- Rehabilitation/Replacement and new construction of about 350 km of sewers in the Pagla catchment, including the establishment of new sewer connections (Subproject 4 or Subcomponent 2.4)
- Construction of about ten (10) numbers of 'Decentralized Wastewater Treatment' facilities in hard to reach non-sewer network areas (Subproject 5 or Subcomponent 3.1)
- Construction of a 'Septage Treatment Plant' for management of septage from the households in the non-sewer network areas (Subproject 6 or Subcomponent 3.2)
- Construction of about ten (10) numbers of 'Communal Septic Tanks in non-sewer network areas (Subproject 7 or Subcomponent 3.3)

An Environmental and Social Impact Assessment (ESIA) for the Subprojects 1, 2, and 3 (Subcomponents 2.1, 2.2, and 2.3) has been prepared and presented in a separate cover. However, for the remaining subprojects 4,5,6 and 7 (Subcomponents 2.4, 3.1, 3.2 and 3.3) the locations, alignments, designs and technologies are yet to be identified. Hence, the environmental and social assessment for these yet to be identified subprojects has been carried out in the form of an Environmental, Resettlement and Social Management Framework (ERSMF) and presented in this report.

[1] Based on detailed consideration of DSIP and DWASA's mandate, DWASA has decided to exclude this component as the responsibility for the area falls under the jurisdiction of the twin City Corporations in Dhaka (North and South), and reflecting the Institutional and Regulatory Framework for Fecal Sludge Management (FSM): Mega City Dhaka, 2015.

This ERSMF is developed to (i) ensure all relevant environmental issues are mainstreamed into the design and implementation of the proposed subcomponents or subprojects, (ii) ensure compliance of the Project with national and World Bank requirements, and (iii) screen the different sub-projects and identify the level of assessment required based on the scale and severity of the impacts generated and describe the methodologies to be followed for the preparation of the appropriate safeguards instruments required for the different sub-projects (ESIAs, ESMPs, RPs etc.). This Environmental and Social Management Framework (ERSMF) is an update of the ERSMF (December 2018), reflecting these institutional and regulatory changes as well as improvements in the risks screening and impact mitigation procedures to account for best practices.

Policy and Regulatory Framework

The Environmental Conservation Act of 1995 is the main legislative framework related to environmental protection in Bangladesh. In accordance with this Act, the development of sewerage infrastructure will need to be cleared by the Department of Environment (DoE) following the procedures given in the Environment Conservation Rules (ECR) 1997. ECR divides the projects into various categories for environmental clearances. Development or rehabilitation of sewerage facilities will generally fall into the 'Red' category.

Among the World Bank Safeguards, the policies on 'Environmental Assessment' (OP/BP 4.01), Physical Cultural Resources (OP 4.11) and Involuntary Resettlement (OP/BP 4.12) are triggered. This Project falls into Category A.

Environmental Setting of the Project Area

The Project influence area, which comprises Pagla STP catchment area, is located in the south of Dhaka city and consists of nine urban centres *(Ramna; Khilgaon; Sabujbagh; Motijheel; Lalbagh; Kotwali; Sutrapur; Demra*; and *Shyampur*) and covers a population of about 3.2 million. It is part of old Dhaka city and consists of a complex mix of commercial and residential establishments with heavily built-up and densely populated areas. Roads are narrow and congested and generally flanked by old multi-storied low to medium rise apartment buildings. The Old Dhaka city has developed freely with mixed land use showing little regard to any urban planning. Traffic congestion is a major problem in this area.

Pagla STP is the only existing wastewater treatment plant in Dhaka and is not working effectively due to inadequate maintenance, and broken sewerage network and pumping stations. Odour from these facilities is a common public nuisance and public health is a significant concern due to leaks and overflow from these facilities and lack of proper sanitation facilities in the non-sewer network areas. The surface water and groundwater resources are polluted by leachates from sewage, and the water quality of Buriganga river, in which the effluent from Pagla STP is discharged, is severely polluted and record zero dissolved oxygen levels.

Screening of Potential Impacts and Risks

The Project can be considered as an environmental improvement project since it will have an overall positive impact on the communities and the natural environment in the old city of Dhaka due to the improvement of sanitation facilities. However, the Project will have the following potential impacts and risks during construction and routine maintenance stages:

- Land acquisition and resettlement
- Generation of sludge, contaminated soils, debris, spoils and solid waste
- Severe traffic disruption and other construction-related nuisances in densely built-up areas and narrow roads
- Risks of soil and water pollution from construction and routine maintenance activities

- Workers health and safety risks mainly due to exposure to untreated sewage and its odour
- Community health safety risks mainly due to exposure to construction activities and labour influx
- Disposal of solid and liquid effluents from the treatment facilities and their impact on the receiving environment

Preparation of ESIAs and RPs/ARPs

The step-by-step procedure to be followed for carrying out ESIA studies for the proposed subcomponents in compliance with the national and World Bank requirements are described in this document. An Environmental, Resettlement and Social Management Plan (ESMP) template and Environmental Code of Practices (ECoP), and a Resettlement Policy Framework (RPF) have been prepared and presented in this ERSMF, which will guide the design and implementation of the subprojects. The RPF will provide the basis to identify the potential impacts, and prepare and implement mitigation instruments like Resettlement Action Plans (RAPs) and Abbreviated Resettlement Plans (ARPs). An entitlement matrix with details on compensation to be paid to affected households to compensate for the various types of losses associated with land acquisition and resettlement has been prepared and presented in the report. After appropriate consultation with the stakeholders, the ESIA and RP/ARP will be submitted to the World Bank and ESIA report will be sent to DoE clearance. The documents will be disclosed to the public after receipt of the required clearances. Construction works for a given subproject will start after the relevant impact mitigation instruments are fully implemented.

Institutional Arrangements

Institutional arrangements relative to safeguards in the project will be at three levels: PMU, Design, Review and Construction Supervisions (DR&CS) consultant and Contractors. DWASA has assigned two in-house officer (not below 6th Grade) on deputation/ additional charge in the PMU-DSIP as an Environmental and Social Staff who will assist PD in E&S compliance monitoring. The capacity of the staff will be enhanced for management of environmental and social risks of the Project. The PMU will be supported by a Project Management Consultant (PMC) across the various aspects of the project management including the environment and social aspects of the project. The PMU will engage the services of consultants to conduct ESIAs for subprojects. The Design, Review and Construction Supervision (DR&CS) Consultants and Contractors will have adequate Environmental and Social Specialists to supervise and implement ESMP/RAP. The cost of preparing and implementing ESMP and RPs/ARPs has been estimated at USD 1.0 million and USD 13.81 million, respectively. A Grievance Redress Mechanisms (GRM) will be established to address the grievance/ complaints of project-affected persons and other stakeholders.

Consultation and Disclosure

Public consultations were conducted during preparation of this ERSMF with all the relevant stakeholders, including the local communities, to share the Project details and this framework, and invite feedback and input from the stakeholders. This ERSMF will be disclosed on both DWASA and World Bank websites. Executive summary of the ERSMF and the Entitlement Matrix will be translated into Bangla and will be published on the DWASA website, and hard copies of these documents will be made available at local DWASA offices for public access. The ESIA and RPs/ARPs that will be prepared for the subprojects will also be consulted upon and disclosed on the DWASA and World Bank websites and will be made available to the local communities by placing them at local DWASA offices.

1 Introduction

The Dhaka Sanitation Improvement Project (DSIP) is a project of the Government of Bangladesh (GoB), aimed at improving the overall sanitation system of Dhaka city and strengthening the capacity of Dhaka Water Supply and Sewerage Authority (DWASA) to deliver its mandate. The major interventions under the project include (a) rehabilitation and reconstruction of Pagla Sewerage Treatment Plant (STP) and its associated sewerage network and (b) development of non-network sanitation services in those areas of Pagla STP catchment area where the sewer system is not available or not feasible. DWASA is the implementing agency of the Project, and the World Bank (WB), Asian Infrastructure Investment Bank (AIIB) and Government of Bangladesh (GoB) are the financing agencies of the Project. Prior to the World Bank's approval of the project, DWASA prepared this Environmental, Resettlement and Social Management Framework (ERSMF) dated December 2018. The ERSMF provided guidelines and procedures for screening for environmental and social impacts of the various interventions as well as impact mitigation planning. The implementation of the main project interventions delayed and since then there has been changes in the regulatory as well as institutional settings of the project. This Environmental and Social Management Framework (ERSMF) is an update of the ERSMF (December 2018), reflecting these institutional and regulatory changes as well as improvements in the risks screening and impact mitigation procedures to account for best practices. The ERSMF provides guidance and procedures for screening for environmental and social risks of sub-projects and subsequent risks mitigation measures.

1.1 Background

Existing Sewerage System in Dhaka City is very limited. The existing sewerage system in Dhaka city serves only about 20 percent of the city's total population. Currently, the city has only one wastewater treatment plant at Pagla. Based on city regulations, households in Dhaka are supposed to have on-site sanitation systems, but in reality, as much as about 30 percent of the city's population disposes their sewage by connecting to the drainage networks and open channels which enters the city's surface waters untreated. The city does not have a well-developed fecal sludge management system. The disposal of fecal sludge and septage from Septic tanks is sporadic. Only a negligible proportion (3-4%) of wastewater generated in the city is treated. This is due to improper and inadequate maintenance both in the sewer main, sewer collecting lines and in the lifting pump stations.

Pagla Sewerage Treatment Plant is the only existing wastewater treatment facility in Dhaka. At present, the sewerage system consists of 882 km sewer lines, 24 pumping stations and a sewerage treatment plant (STP) at Pagla. The Pagla STP is located in about 110 ha of land in the south-eastern part of the Dhaka city. It is a traditional low-cost wastewater treatment plant consisting of primary settlement followed by Facultative waste stabilization ponds and has a current capacity to treat 120 million litres of water (MLD) per day. The final effluent from the treatment plant is discharged into the adjacent Buriganga River.

Need for Improvement of Dhaka Sewerage System. The Pagla wastewater treatment plant operates at less than half its capacity due to deficiencies/ breakages in the collection network. Currently, it is treating only 40 MLD of sewage instead of its designed capacity of 120 MLD. Even in areas where sewerage exists, inadequate maintenance has hampered its effectiveness.

Dhaka Sewerage Master Plan. In 2012, DWASA prepared a Sewerage Master Plan which estimates that US$ 1.7 billion is required to upgrade the sewerage system, improve on-site sanitation systems, including improvements in the containment, collection, transport, and treatment of fecal sludge from on-site systems. Whilst the master plan indicates that the need for a city-wide sewerage services, it recognizes that this would not be a realistic strategy, based on the technical, socio-economic and financial implications of the interventions required. Accordingly, the plan identified various investments over the next 20 years - to be implemented in a phased manner. The first phase of the plan is being financed through the DSIP project.

1.2 The Proposed Project

The DSIP aims to provide improved sanitation services in the catchment area of Pagla STP. The Project has four components as follows, with Components 2 and 3 expected to extend significant environmental and social impacts:

- **Component 1. Institutional Support for Sanitation Service Delivery**: The component will provide institutional support to DWASA for sustainable sanitation service delivery. The component will include:
    - Establishment of a strengthened sanitation function in the DWASA's organizational structure;
    - Commercial strengthening of DWASA;
    - Citizens Engagement; and
    - Measures for coordination with other city stakeholders.
- **Component 2. Sewerage and Wastewater Treatment:** This component includes the following investments, which are further explained in Chapter 2:
    - Replacement of Pagla STP with the latest treatment technology (for primary and secondary treatment capacity of 200 MLD);
    - Construction and replacement of Eastern and Western Trunk Mains, and,
    - Rehabilitation/Replacement & new construction of sewers in the Pagla catchment, including the establishment of new sewer connections
- **Component 3. Non-Network Sanitation**[2]: This component will help DWASA in providing solutions for non-network sanitation services in hard-to-reach areas where sewers are not feasible, and/or where there are tenurial barriers, such as in low-income settlements. This will include conventional septic tanks, decentralized wastewater treatment facilities, and septage management including emptying services, decanting stations, and co-/treatment of fecal sludge (See Chapter 2 for more details).
- **Component 4. Project Implementation and Management Support**: This component will help DWASA establish a Project Management Unit (PMU) that will be responsible for overall project management including procurement, financial management, safeguards, public communication, and Monitoring and Evaluation (M&E) and reporting.

[2] Based on detailed consideration of DSIP and DWASA's mandate, DWASA has decided to exclude this component as the responsibility for the area falls under the jurisdiction of the twin City Corporations in Dhaka (North and South), and reflecting the Institutional and Regulatory Framework for Fecal Sludge Management (FSM): Mega City Dhaka, 2015.

1.3 Environmental and Social Assessment of the Project

The investments under Components 2 and 3 will induce significant environmental and social impacts, and hence require a detailed environmental and social assessments in compliance with the environmental regulations of the Government of Bangladesh and World Bank's operational policy requirements. However, the precise alignments and designs (treatment technologies) of some of these investments or subprojects will be known only during the Project implementation. Environmental and Social Impact Assessment (ESIA) has been carried out for the known subprojects and presented in a separate report. However, for the subprojects that are yet to be identified, this Environmental and Social Management Framework (ESMF) will guide the process to:

- integrate the environmental and social concerns into the identification, design and implementation of all the Project interventions in order to ensure that those are environmentally and socially sustainable;
- ensure all relevant environmental and social issues are mainstreamed into the design and implementation of the subprojects;
- consider in an integrated manner the potential environmental and social risks, benefits and impacts of the program and identify measures to avoid, minimize and manage risks and impacts while enhancing benefits; and
- guide the process for conducting ESIA studies for proposed subprojects in compliance with GoB's policies, acts and rules as well as with the World Bank's environmental and social safeguard policies.

This ERSMF presents detailed guidelines on preparation of ESIA, including: (i) Environment and Social Screening, (ii) Description of Surrounding Environment (establishment of "baseline environment" against which impacts of the proposed subproject would be evaluated) after identifying influence area for different subprojects; (iii) analysis of alternatives; (iv) identification of major subproject activities during both construction and operational phases; (v) assessment, prediction and evaluation of impacts of the Project activities on the baseline environment; (vi) carrying out public consultations; (vii) preparation of environmental codes of practice (ECoPs); (viii) identification of mitigation measures and preparation of impact specific Environmental, and Social Management Plans (ESMPs) including monitoring requirements, and (ix) preparation of resettlement action plans (RAP).

1.4 ERSMF Study Methodology

The methodology followed in preparing and updating the ERSMF consists of the following steps:

- Review of the Project details and meeting/discussions with various stakeholders including DWASA and World Bank
- Review of the policy and regulatory requirements
- Review and verify the policy and regulatory requirements
- Reconnaissance field visits and initial scoping and screening to determine the key environmental and social parameters and aspects that are likely to be impacted by the Project activities
- Collection and analysis of baseline environmental and social data, with the help of secondary literature review, and field data collection
- Consultations with the stakeholders including beneficiary/ affected communities and developing the consultation process.

- Reviewing the potential and likely impacts of the program activities and carrying out the screening of the sub-project in order to define the required safeguards instruments that need to be prepared.
- Compile the present ERSMF document.

1.5 Content of the Report

Chapter 2 describes the Project, its subprojects and other salient information relevant for the environmental and social impact assessment. Chapter 3 reviews the prevailing national regulatory requirements and relevant to the environmental assessment and World Bank safeguard policies applicable to this Project. Description of the baseline environmental and social conditions is presented in Chapter 4. Screening and assessment of potential environmental and social issues have been discussed in Chapter 5. Chapter 6 presents a step-by-step methodology for carrying out environmental and social assessments for the subprojects including preparation of ESIAs and ESMPs. Chapter 7 presents the procedures for preparing the RAPs. Chapter 8 presents the project's institutional structure. Finally, Chapter 9 describes the consultations that have been carried out with the stakeholders while preparing this ERSMF.

2 Project Description

2.1 Description of Existing Sewerage System

Only the southern part of the Dhaka city has sewerage coverage of conventional sewer system. Within the DWASA service area, it is estimated that approximately only 20% of the population is potentially served by the centralized separate sewerage system. Another 30% of the population is estimated to dispose of their sewage by connecting into the drainage networks and open channels (unhygienic). A small, estimated population of about 320,000 in Mirpur area was to be served by "small bore" waterborne sewerage system, which - in fact – was never utilized, and the sewage from these areas is directed to the drainage system. Improved on-site sanitation is estimated to be the sanitation system utilized by about 25% of the population within the DWASA Service Area, with the remaining 22% served by unhygienic on-site sanitation means, including pit and hanging latrines and open spaces. The population covered by various types of sanitation system are given **Table 2.1**.

Table 2.1: Sanitation System Coverage [as % of the population] in DWASA Service Area

Head	Sanitation Systems				
	Separate Sewerage	Combined Sewerage	Small Bore Systems	Improved Onsite	Unhygienic Sanitation
2010 Population	2,110,000	3,200,000	320,000	2,500,000	2,300,000
% of total population	20%	30%	3%	25%	22%

Source: Sewerage Master Plan

2.2 Description of Pagla Sewerage Infrastructure

The Pagla sewerage infrastructure consists of about 882 km sewer lines and 63,324 sewer connections, along with 24 sewage lifting stations and a sewage treatment plant at Pagla with a peak capacity of 120 MLD. Sewage collection network in Pagla Catchment is shown in **Figure 2.1**. It was constructed in 1978-1981 with subsequent upgrading in 1992 and provides treatment of the wastewater collected by the trunk sewer system. The sewer system of Dhaka was originally designed as a conventional separate sewerage system, i.e. sanitary sewer system for conveyance of wastewater from domestic premises and establishments and excludes storm/surface water which is dealt with separately by drainage channels/*khals*.

2.2.1 Pagla STP

Pagla sewage treatment plant (STP) is situated on an area of 110.5 ha. The current design capacity is 96 MLD at average flowrate and 120 MLD at the peak flowrate. The treatment process flow diagram of Pagla STP, which is based on conventional waste stabilisation ponds, is shown in **Figure 2.2**.

2.2.2 Trunk Mains

There are three main recognized trunk sewers in the city: Eastern Trunk Sewer, Western Trunk Sewer and the Southwestern Trunk Sewer.

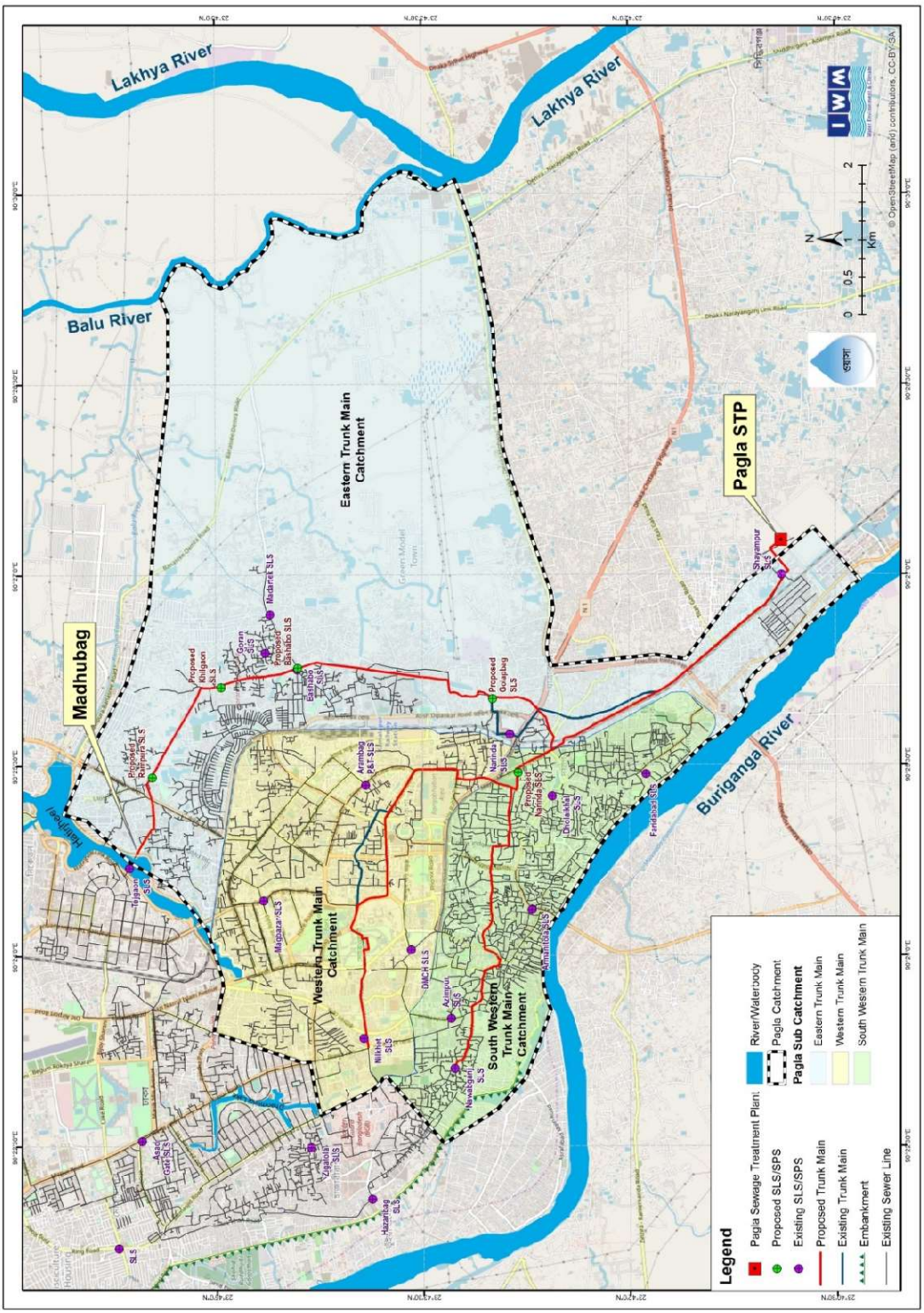

Figure 2.1: Sewage Collection Network in Pagla Catchment

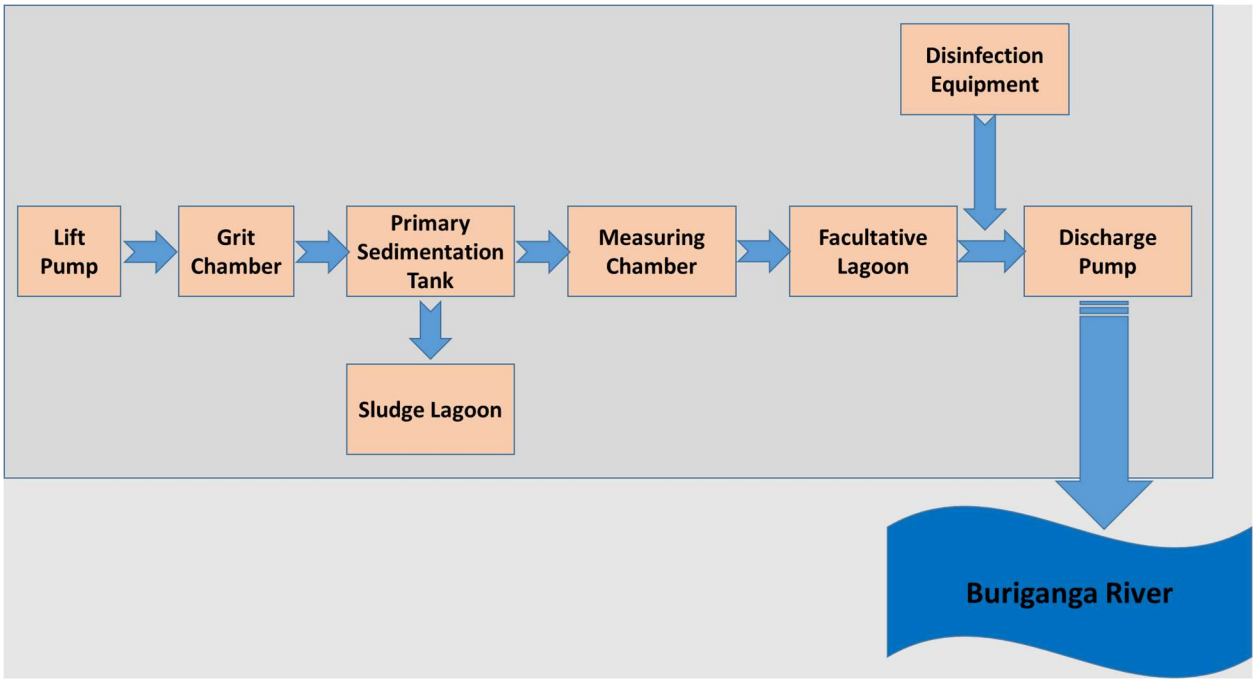

Figure 2.2: Flow Diagram of Pagla Sewage Treatment Plant

2.2.2.1 Eastern Trunk Sewer

The Eastern Trunk Sewer of 12 km in length and diameter ranging from 450 mm to 1360 mm routed from Madhubag to Pagla STP through the Sewage Lift Stations (SLS) of Basaboo and Swamibagh.

2.2.2.2 Western Trunk Sewer

The Western Trunk Sewer of 6 km in overall length with sewer diameter ranging from 600 mm to 900 mm, routed from Bashbari and Mohammadpur to Narinda PS through Hazaribagh, Nilkhet, Segunbaghicha, Purana Paltan and Motijheel. This trunk sewer starts in the area adjacent to the Hazaribag tannery and ends at Tipusultan road near Narinda graveyard. At this point, the main is connected to trunk sewer Hazaribagh Nawabganj-Narinda main, and after these two sewers are combined the sewage is conveyed to Narinda central pumping station. There are five sewage lift pumping stations (SLS) associated with this trunk sewer, viz. *Hazaribag, New Market, Moghbazar T&T and Zikatola*. These lift stations collect wastewater from the related catchments and deliver to this trunk sewer which forwards flows by gravity to the Narinda central pumping station. The pumping stations are used for collection and transportation of sewage towards the Pagla STP.

2.2.2.3 South-Western Trunk Sewer

Sewer of 4 km in length and diameter ranging from 400 mm to 1000 mm is located in the south-west part of the city and is routed from *Nawabgong* to *Narinda PS* via *Lalbagh, Jalkhan Gate*, *Abul Hasnat Road, Nawabpur Road and Tipu Sultan*. This trunk main was rehabilitated in the year 2003.

2.2.3 Sewage Lift Stations in the Pagla Catchment

There is a total of 24 sewage lift stations (SLS) and one main pumping station for collection and transmission of raw sewage for treatment to Pagla STP. These are detailed in **Table 2.2**.

Table 2.2: Existing Sewage Lift Stations (SLS)

S. No.	Location of Lift Station	Installed Capacity		Existing Situation	
		No. of Pumps	Capacity (m^3/hr)	No. Pump Running	Pumping (m^3/day)
1	Old DOHS Banani	3	270	1	521
2	DOHS Mohakhali	3	378	1	3,902
3	Asadgate	3	414	3	2,091
4	Maghbazar	2	552	1	3,232
5	Bashaboo	5	2,046	5	1,561
6	Nilkhet (New Market)	4	816	4	1,134
7	Arambagh (P&T)	2	816	1	1,876
8	Nawabganj	2	276	1	844
9	Azimpur	2	276	2	1,598
10	DMC	3	270	3	1,413
11	Narinda P/S new	7	7,650	7	13,573
12	Sayedabad	5	2,045	5	1,131
13	Faribadbad	2		1	1,615
14	Goran	3	276	2	893
15	Narinda (Dholaikhal)	3	270	1	336
16	Amanitola	3	270	1	1,615
17	Zigatotal	2		1	9,232
18	Bijoy Shawrani	2	165	2	275
19	Japan Garden City	2	49.84	2	33.22
20	Tejgaon	5	458.72	5	305.81
21	Modertek	3	74.75	3	49.84
22	Hazaribagh	4	285.42	3	190.28
23	Shyampur	2	344.32	2	229.55
24	Pagla Outfall	7	10110	7	120000

Source: Sewerage Master Plan

2.3 Need for Improvement of Pagla Sewerage System

Dhaka's existing sewerage system and the Pagla STP serves only about 20 percent of the city's population. Even in areas where sewerage exists, inadequate maintenance has hampered its effectiveness. The current sewage generated within the catchment served by the centralized sewerage system is approximately 250-300 MLD and is expected to exceed 500 MLD by the year 2035 according to the Sewerage Master Plan. Due to damage of the trunk mains and sewerage system, the actual flow rate entering the Pagla STP is approximately 30-40 MLD, i.e. the treatment plant is significantly under-loaded and should provide a high level of treatment.

Further, the dwellers of slum, squatter and fringe settlements in the Pagla STP catchment area are still not connected to the sewerage system and are reliant on the use of septic tanks and pit latrines.

2.4 Description of Project Components and Subprojects

Components 2 and 3 of the Project will include construction activities, and these are further detailed in this section.

2.4.1 Component 2: Sewerage and Wastewater Treatment

A summary of the works involved in Component 2 is given in **Table 2.3**. Details of Subproject 4, which is covered under this ERSMF (see Table 2.3) are further elaborated below

Table 2.3: Summary of Sewerage Infrastructure Works in Component 2

Subproject No.	Project Activities of Component 2	Existing Facility (capacity/type)	Proposed Investments/Subprojects	Subprojects for which ESIA is Prepared	Subprojects covered in this ERSMF
Sub-Component 2.1 (Subproject 1)	Pagla STP	120 MLD (Primary Treatment + Ponds)	Replacement of Pagla STP – to provide for primary and secondary treatment capacity of 200 MLD; and to meet the effluent quality of 5-day Biological Oxygen Demand (BOD5) and Suspended Solids of less than or equal to 20 mg/L, and Coliforms ≤ 1000 MPN/100 mL.	ESIA is prepared for Subprojects 1 to 3	
Sub-Component 2.2(Subproject 2)	Eastern Trunk Main (Madhubagh - Pagla STP)	12 km (diameter of 450-1360 mm)	12 km new Trunk Main (micro-tunnelling)		
Sub-Component 2.3 (Subproject 3	Western Trunk Main (Hazaribagh-Narinda)	6 km (diameter of 600-900 mm)	13 km new/rehabilitated trunk main (may be open excavation)		
Sub-Component 2.4 (Subproject 4)	Pagla Sewer Network	550 km, 24 Pumping Satiations, Population served is 5.1 million	350 km sewer lines rehabilitation / reconstruction / new construction, including house connections. install new 50,000 connections		Subproject 4 is covered under ERSMF

2.4.1.1 Subproject 4: Construction of Pagla Sewer Networks

Locations of the proposed sewer networks are yet to be identified, but the anticipated impacts from this subproject mainly will depend on the proposed construction methodology, open excavation or micro-tunneling. The technical options are yet to be decided; however, both these methods are briefly described below:

- **Open Excavation**: Open cut trench excavation is the traditional and most popular method for lateral sewer construction, repair, or replacement. Open cut trench excavation consists of excavating a trench for the manual installation of each piece of pipe. The open cut trench method involves excavating down to and exposing the existing pipeline so that it can be repaired or replaced and then backfilled. Open excavation is usually carried out when there is enough open space to carry out the construction.
- **Micro-Tunneling**: Micro-tunneling is a digging process that uses a remotely controlled micro-tunnel boring machine combined with the pipe jack-and-bore method to install pipes underground in a single pass directly. This process avoids the need to have a long stretch of an open trench for pipe-laying. Where excavated material, at the tunnel face, is mixed with bentonite and other lubrication fluids to create a slurry. The pressure at the cutting face is balanced with earth removal, groundwater head, and propulsion of the tunnel support without manned entry. Excavated material which is captured in the slurry is pumped to the surface and separated. Micro tunneling will be carried out in heavily constructed areas where there is no open space is available

2.4.2 Component 3: Non-Network Sanitation

Where sewer networks are not feasible in the Pagla catchment system due to limited road widths and lack of sanitary toilets, Component 3 will develop non-network sanitation. It is estimated that about 27,000 households that are unlikely to be connected to the proposed sewerage system for the above reasons will be provided with sanitation services under this component.

The sanitation options for the difficult to reach households include (unlikely to be connected to sewer network):

a) Shallow/small bore sewers (for households with septic tank, but, difficult to access for emptying) with decentralized wastewater treatment; or
b) Common septic tank for a row of houses (households with toilets discharging to drains), and
c) Septage management (emptying, transport and treatment) for households with septic tanks (that are emptiable and accessible). Septage treatment proposed are co-treatment at existing/proposed sewage treatment plant and in new septage treatment plants. Co-treatment will be limited to septage loads that do not overload and affect the performance of the sewage treatment plant.

While space availability would guide the above choices, it is assumed that 60% of these households can be serviced by a common septic tank and about 40% of the households will be provided with decentralized wastewater treatment. The septage from the common septic tanks, households with accessible and emptiable septic tanks and the decentralized treatment plant needs to be emptied and treated.

Locations and designs of all sub-components of the Component -3 are yet to be identified, and hence all these sub-components are included in the scope of ERSMF.

2.4.2.1 Decentralized wastewater treatment (Subproject 5)

In areas where road width restricts entry of small emptying trucks and should space be available, decentralized wastewater treatment systems will be explored. Since the solids are retained in the septic tanks, the wastewater from the septic tank will be free of solids and therefore shallow gradient and smaller diameter sewers would be possible. The wastewater collected through these sewers can be treated in decentralized wastewater treatment (DEWATS) plants.

The treatment plant typically consists of:

- Primary treatment: that includes pre-treatment and sedimentation in settlement tank;
- Secondary anaerobic treatment: in anaerobic baffled reactors and anaerobic filter; and
- Tertiary treatment in planted gravel filter

It is proposed to provide DEWATS at ten locations to serve 40% of the households (of 27,000 households or 10,800 households). Considering 5 persons per household, water supply of 120 lpcd and return wastewater flow of 80% of water supplied, the expected flow from these households would be around 5 MLD that could be serviced by 10 DEWATS units of 0.5 MLD capacity each. The land required for each DEWATS will be about 1350 m^2.

2.4.2.2 Communal septic tanks (Subproject 6)

It is proposed that pilot communal septic tank approaches are tried at ten locations where space is available to locate communal septic tanks. With 20 households connected to each communal septic tank, the volume of the tank can be suitably sized considering an emptying frequency of 3 years. While this could be a possible solution for households that are hard to access, for want of information on the availability of space, this approach will be piloted and scaled up. The land required for the communal septic tank would be 60 m^2 each.

2.4.2.3 Septage Treatment Plant (Subproject 7)

A septage treatment plant will be built under the Project. Households with no access to a sewer network and dependent on septic tanks will require septage management services. Households normally connect toilets to septic tank designed with adequate detention time to facilitate 60 – 70% of the solids. The solids accumulate at the bottom of the septic tank, and these septic tanks need to be emptied at regular intervals, else the solids will fill the tank and eventually flow out from the tank.

Regular emptying of the septic tank not only prevents the overflow of the solids but also helps in the effective functioning of the septic tank. The sludge from the septic tank is emptied with a sludge emptying truck and taken for treatment and disposal. As septage is mostly water, dewatering either through a non-mechanized system is normally practiced. The dried / dewatered sludge is co-composted before being used as a soil conditioner / fertilizer. Composting also helps to deactivate / eliminate helminths, a cause for concern. The filtrate /liquid from the dewatering unit will be treated at the proposed sewage treatment plant at Pagla.

2.4.2.4 Desludging Vehicles

Septage emptying trucks (vacuum trucks and vacutugs) will also be procured under the Project (about 12 numbers) to empty the communal septic tanks and other households requiring emptying service.

2.5 Cost and Implementation Period

The total cost of the Project is US$ 459 million (approximate), and the Project implementation period is 5 years.

3 Legal, Regulatory and Administrative Framework

3.1 Applicable Policies, Legislations and Regulations of Government of Bangladesh

The policies, legislations and regulations of Government of Bangladesh that are relevant to environmental and social aspects of the Project are noted in **Appendix 12**. These regulatory frameworks, together with the World Bank's applicable Operational Policies will provide guidance and procedures for environmental and social risks screening and mitigation planning in the project. The list of applicable National Polices, Legislation and Regulations is given below:

- Constitution of Bangladesh
- National Environmental Policy, 1992 (replaced in 2013)
- The Penal Code, 1860 [Section 277]
- Bangladesh Environment Conservation Act 1995 (amended 2010) & Rules 1997 (amended 2017)
- National Water Policy, 1999
- Bangladesh Environment Court Act, 2010
- Dhaka Mohanagar Imarat Nirman Bidhimala 2008 [Rule 59(d)]
- Local Government (Municipal) Act 2009; Schedule 2
- Bangldesh Water Act of 2013; Section 28 [Water Pollution Control]
- Water Supply and Sewerage Authority Act of 1996 [Section 17(2)(kha)]
- The Local Government (City Corporation) Act 2009
- Bangladesh National Building Code 2020
- National Environment Management Plan [NEMAP], 1995
- Seventh Five Year Plan (2016-2020)
- Eight Five Year Plan (2021-2025)
- Dhaka Sewerage Master Plan 2012
- Bangladesh Standards and Guidelines for Sludge Management, 2015
- Bangladesh Labour Act, 2006 (as amended 2018)
- Public Procurement Rule (PPR), 2008
- Right to Information Act, 2009
- Noise Pollution Control Rules, 2006
- Antiquities Act, 1968
- Bangldesh Biosafety Guideline 2007
- Bangladesh Climate Change Strategy and Action Plan (BCCSAP), 2009
- National Adaption Program of Action (NAPA), 2005
- Bangladesh Labour Rules 2015
- Bangladesh Child Labour Mitigation Policy, 2010
- High Court Directives on SEA/ SH at workplace 2009
- The Communicable Diseases (Prevention, Control and Eradication) Act,

2018

- National Land Use Policy, 2001
- National Policy for Safe Water Supply and Sanitation, 1998
- The Groundwater Management Ordinance, 1985
- Road Transport Act 2018
- National Fisheries Policy 1998
- The Protection and Conservation of Fish Act 1950
- Protection and Conservation of Fish Rules 1985

3.2 Environmental Clearance Requirements of the Proposed Investments and Subprojects

The legislations relevant for environmental assessment for proposed investments and subprojects are the Environmental Conservation Act 1995 (ECA'95) and the Environmental Conservation Rules 1997 (ECR'97). Department of Environment (DoE), under the Ministry of Environment and Forest (MoEF), is the regulatory body responsible for enforcing the ECA'95 and ECR'97.

Based on these laws and regulations, DWASA, as a proponent of this project, will conduct an EIA of the proposed works under the project for purposes of assessing and managing the safeguards impacts of the project, and to secure environmental permit to works to proceed. DoE is responsible for reviewing and issuing Environmental Clearance Certificate. Based on the current DoE's regulations, development works are classified into three categories Green, Orange A, Orange B and Red. Steps to be followed for environmental clearance for different categories of works in the project are shown in **Figure 3.1**.

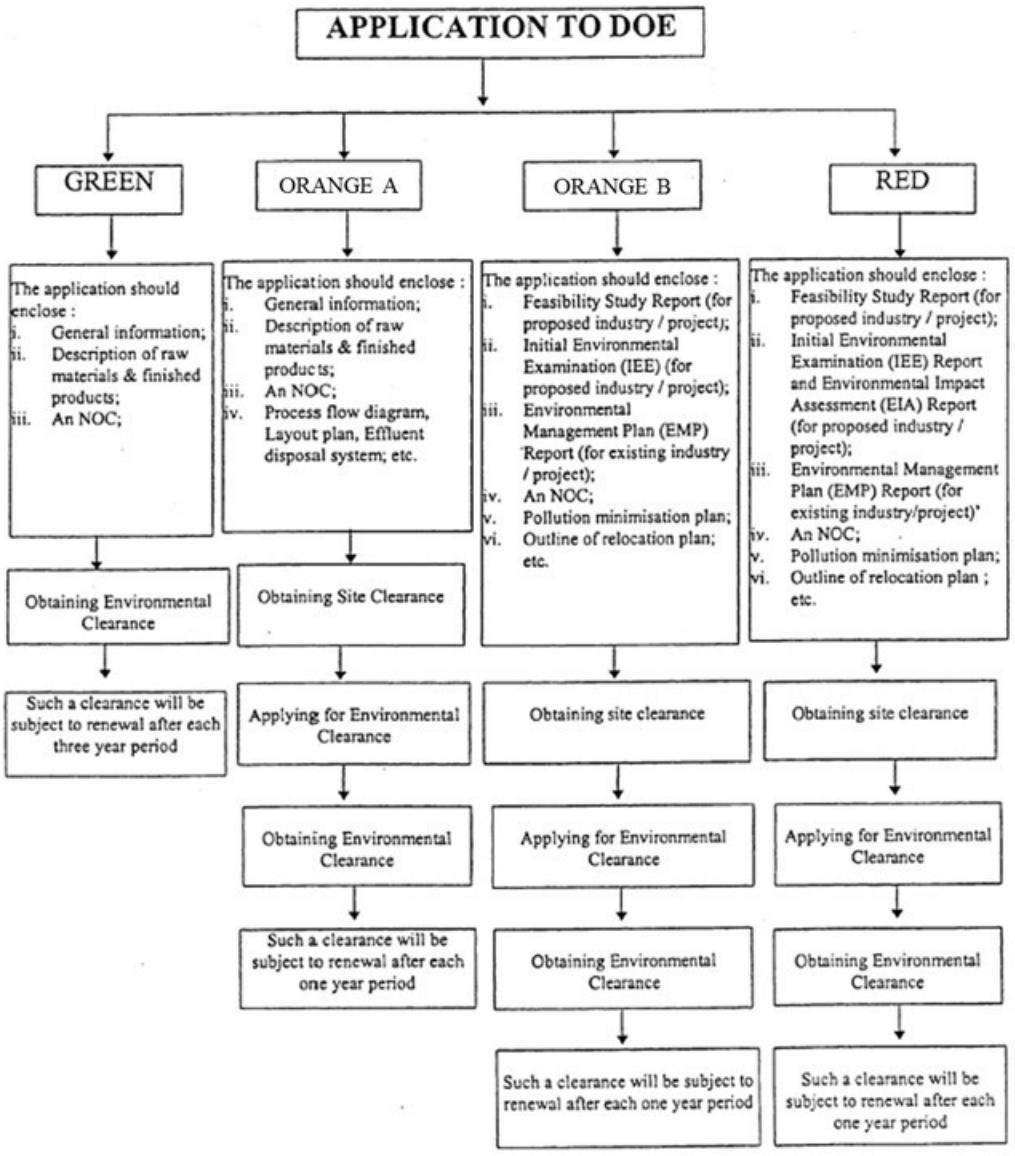

Figure 3.1: Steps to be followed to obtain environmental clearance from DoE

In this respect, DoE has approved the terms of reference/ ToC of the EIA study on 18th April, 2018. The approved ToC by DoE has been followed in preparing this EIA study (**Appendix 2**). DSIP obtained Environmental Clearance Certificate from DoE on October 23, 2019 **(Appendix 13)**. The ECC is subject to annual renewal by DWASA.

3.3 Relevant Administrative Framework

The institutional framework for the management of Dhaka city's environment control is complex and numbers of Government agencies are involved herewith. Among them the key responsible Government institutions are Department of Environment (DoE), Dhaka North City Corporation (DNCC), Dhaka South City Corporation (DSCC), Dhaka Water and Sewerage Authority (DWASA), Rajdhani Unnayan Kartipakha (RAJUK), Bangladesh Water Development Board (BWDB), Bangladesh Inland Water Transport Authority (BIWTA), and The Water Resources Planning Organization (WARPO). These multiple institutional

arrangements encourage collaboration as much as it also leads to challenges as no single institution or authority take the leading responsibility for environmental management.

Table 3.1 presents a summary of key responsibilities of major government institutions who are involved in different capacities to environmental protection and compliance.

Table 3.1: Institutional responsibilities, environmental protection and compliance

Name of the institution	**Responsibilities related to environmental protection and compliance**	**Relevance to DSIP**
Department of Environment (DoE)	Under the Ministry of Environment and Forest, DoE is responsible for • Conserving environment and improving environmental standards; • Controlling, mitigating and preventing environmental pollution; • Undertaking safety measures and determination of remedial measures to prevent environmental degradation and pollution; • Setting 'best practice based' water quality standards for inland surface water uses and discharge; • Routine monitoring of water quality to prevent pollution in water bodies; • defining environmental impact assessment (EIA) procedures • Issuing (and renewing) Environment Clearance Certificate (ECC) and controlling, preventing and regulating industrial pollution effecting environment; • Declaring Ecologically Critical Area (ECA) and protect degraded ecosystems; • Conducting inquiries on pollution of the environment and rendering direction, guidance and assistance to any other authority or organization regarding those matters; • Providing technical input to various Government committees; • Setting forth further regulations and guidelines for regulating activities affecting the environment;	*Law enforcement and monitoring agency:* DoE will issue Environment Clearance Certificate (ECC) based on EIA/EMF documents
Dhaka Water and Sewerage Authority (DWASA)	Under Ministry of Local Government, Rural Development and Cooperatives DWASA has duty to: • Regulate, construct, develop, expand and maintain sewerage line so that the human and industrial waste can be collected, pumped, processed, treated and disposed. • construct and maintain drains for storm water disposal; • collection of fees for these services;	DWASA is the executing agency of DSIP, and will ensure that all quality standard of the effluent from Pagla is maintained

Name of the institution	Responsibilities related to environmental protection and compliance	Relevance to DSIP
	• The areas, where there is no sewerage system, DWASA provides no fecal sludge/septic management service. The WASA Act 1996 does not specifically ascribe responsibility for on-site sanitation and related emptying of pits and septic tanks, collection, transportation, treatment and disposal and/ or reuse of fecal sludge from on-site facilities to the Authority. However, Sewerage master plan of DWASA (2013) recommends septic sludge management.	
Dhaka City Corporations (DSCC & DNCC)	Under Ministry of Local Government, Rural Development and Cooperatives DCCs have duty to: • Mandated to provide waste management services including sanitation and cleanliness in Dhaka City. • Collect, remove and dispose solid waste from its controlled roads, public toilet, urinal, drain and building. (including along the river banks of Dhaka) • Construct maintain and conserve surface drainage system for proper drain water disposal. • Duty to conserve, maintain and manage Government owned wetlands (including ponds, river, lake) • Duty to manage fecal sludge under City Corporation Act, 2009 (the Act referred fecal sludge as 'refuse accumulated at public toilet, urinals, drains and buildings) • Can serve notice to owners of premises if there is no sanitation facility, or inadequate sanitation facility, or sanitation facility inappropriate locations or inappropriate discharge of domestic sewage into storm drain	*Service Providing Agency* The catchment area of the Pagla STP partially falls under the jurisdictions of the DSCC and DNCC. The DCCs will oversee that solid waste generated by DSIP are properly removed and disposed; collaborate with DWASA in traffic management and providing road cutting permission; DSCC to ensure that the sanitation measures are properly installed and executed; oversee that the city drainage system are not hindered by the project; oversee that the wetlands are not affected by project activities
Bangladesh Water Development Board (BWDB)	Under Ministry of Water Resources and Flood Control BWDB has mandate to • Control, develop, maintain and conserve river, river flows and river bank. Construct dams, barrages, reservoirs, embankments, regulators or other structures for development of rivers, flood control, drainage, surface irrigation, and drought prevention. • Coordinate implementation of National Water Management Plan.	*Service Providing Agency* Oversee that the project infrastructure is not affecting the natural drainage system, particularly in eastern Dhaka.
Rajdhani Unnayan Kartipakha (RAJUK)	Under Ministry of Housing and Public Works, RAJUK has duty to: • Prepare Master Plan with defined sites of proposed roads, public and other buildings and	*Law enforcement and monitoring agency:* Oversee that DSIP is conforming to the Detailed

Name of the institution	Responsibilities related to environmental protection and compliance	Relevance to DSIP
	works, or fields, parks, pleasure-grounds and other open spaces or allocate areas of land for use for agricultural, residential, industrial or other purposes of any class specified in the Master Plan. All future developments and construction, both public and private, shall be in conformity with the Master Plan or with the amendment thereof. • Monitoring implementation of the master plan. • creation of planned townships, with related infrastructure; development control, including approval of plans for land use; • Provide building permission with the provision of sanitation system [RAJUK shall check the design of the sanitation facilities (e.g., septic tank), as well as its location/layout (to make sure that it is accessible for mechanical desludging). The provisions of Bangladesh National Building Code shall be followed for checking design of septic tank system (i.e., septic tank and soakage pit).] • RAJUK shall monitor that sanitation facilities of buildings have been sited and constructed according to the approved design during construction/reconstruction of buildings. In case of non-compliance, RAJUK shall instruct the owner to re-construct the sanitation facilities following the approved design.	Area Plan (DAP) of Dhaka city i.e. not encroaching into areas which are flood plains/flood zones, solid waste/sludge are not dumped in ecological critical areas like wet lands or on agricultural lands or water retention areas
The Water Resources Planning Organization (WARPO)	Under the Ministry of Water Resources, WARPO has mandate to: • Regulate the development and wise use of water resource • Carrying out the task of national water planning for the sustainable use and conservation of water resource. • provide administrative, technical, and legal support to the National Water Resources Council (ECNWRC) • Advise the ECNWRC on policy, planning, and regulatory matters of water resources and related land and environmental management. • Prepare and update National Water Law revising and consolidating the laws governing ownership, development, appropriation, utilization, conservation, and protection of water resources and periodically update the National Water Management Plan.	*Law enforcement and monitoring and technical agency:* WARPO will oversee that the provision of the National Water Act is not violated particularly on issues of conservation, and protection of water resources - Buriganga River being an important source of water for the region.

Name of the institution	Responsibilities related to environmental protection and compliance	Relevance to DSIP
	• Setup and update the National Water Resources Database (NWRD) and Information Management System • Monitoring and evaluation of the implementation of Bangladesh Water Act.	
National River Protection Commission	The commission shall give required advice to the Government to prevent water pollution in river.	*Technical body* Need to be kept informed about any possible environmental concerns due to DSIP.

3.4 World Bank Safeguard Policies and Guidelines

Based on the anticipated environmental and social impacts of the project, the following World Bank safeguards policies were triggered and serve as guiding framework for social and environmental risks screening, environmental and social risks assessment and mitigation planning, as well as implementation and reporting on environmental and social performance of the project. **Table 3.3** provides details of how each policy applies to the proposed investments under the Project.

The Bank requires environmental and social screening and classification for all investment projects proposed for Bank financing, to help ensure that they are environmentally and socially sound and sustainable. The Screening and classification consider the natural environment (air, water, and land); human health and safety; social aspects related to involuntary resettlement and presence of Indigenous Peoples; cultural property; and trans-boundary and global environmental aspects.

The environmental and social screening and classification will help DWASA: to evaluate the environmental risks associated with a proposed operation; to determine the depth and breadth of Environmental and Social Impact Assessment (ESIA); and to recommend an appropriate choice of ESIA instrument(s) suitable for a given project.

3.4.1 Environmental Assessment (OP/BP 4.01)

EA requirement. The World Bank requires environmental assessment (EA) of projects proposed for Bank support to ensure that they are environmentally sound and sustainable. Based on the Bank Policy OP/BP 4.01, the scope and scale of the EA depends on the nature, scale, and potential environmental impact of the proposed project. EA evaluates a project's potential environmental risks and impacts in its area of influence; examines project alternatives; identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation. EA considers the natural environment (air, water and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples and physical cultural resources); and trans-boundary and global environmental aspects. The Bank Policy also envisages that the borrower Government is responsible for carrying out the EA and the Bank advises the borrower on the Bank's EA requirements. This ERSMF has been prepared in compliance with this OP/BP.

EA classification. The World Bank classifies proposed project activities into one of the four categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts. These categories are defined below.

- *Category A:* A proposed project is classified as Category A if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works.
- *Category B:* A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas--including wetlands, forests, grasslands, and other natural habitats--are less adverse than those of Category A projects.
- *Category C:* A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for a Category C project.
- *Category FI:* A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary (FI), in subprojects that may result in adverse environmental impacts. This category does not apply in this project as funding for the project does not involve FIs.

3.4.2 Natural Habitats (OP 4.04)

This Policy highlights the importance of conservation of natural habitats in project activities. The Bank supports and promotes the protection, conservation, and rehabilitation of natural habitats and their functions. Furthermore, the Bank promotes the rehabilitation of degraded natural habitats. The Bank does not support projects that involve the significant conversion or degradation of critical natural habitats. Accordingly, activities under this project will be planned and implemented with careful consideration of natural habitats.

3.4.3 Physical Cultural Resources (OP 4.11)

This policy addresses physical cultural resources, which are defined as movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings, and may be above or below ground, or under water. In line with this policy, DWASA will ensure that project impacts on physical cultural resources will be avoided or mitigated.

3.4.4 Forests (OP/BP 4.36)

This Policy recognizes the need to reduce deforestation and promote sustainable forest conservation and management in reducing poverty. The Bank believes that forests are very much essential for poverty reduction and sustainable development irrespective of their location in the world. The Bank assists borrowers with forest restoration activities that maintain or enhance biodiversity and ecosystem functionality. The Bank also assists borrowers with the establishment and sustainable management of environmentally appropriate, socially beneficial, and economically viable forest plantations to help meet growing demands for forest goods and services.

3.4.5 Projects on International Waterways (OP 7.50)

Projects on international waterways may affect the relations between the World Bank and borrowers, and between riparian states. As such the Bank attaches great importance to the riparian making

appropriate agreements or arrangements for the entire waterway, or parts thereof, and stands ready to assist in this regard. A borrower must notify other riparian of planned projects that could affect water quality or quantity, sufficiently far in advance to allow them to review the plans and raise any concerns or objections.

3.4.6 Involuntary Resettlement (OP/BP 4.12)

The WB's experience indicates that involuntary resettlement under development projects, if unmitigated, often gives rise to severe economic, social, and environmental risks: production systems are dismantled; people face impoverishment when their productive assets or income sources are lost; people are relocated to environments where their productive skills may be less applicable and the competition for resources greater; community institutions and social networks are weakened; kin groups are dispersed; and cultural identity, traditional authority, and the potential for mutual help are diminished or lost. This policy includes safeguards to address and mitigate these impoverishment risks.

The overall objectives of the Policy are:

- Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs.
- Where it is not feasible to avoid resettlement, resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in project benefits. Displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs.
- Displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

3.4.7 Projects in Disputed Areas (OP 7.60)

Projects in disputed areas may raise a number of delicate problems affecting relations not only between the Bank and its member countries, but also between the borrower and one or more neighboring countries. In order not to prejudice the position of either the Bank or the countries concerned, any dispute over an area in which a proposed project is located is dealt with at the earliest possible stage.

The Bank may proceed with a project in a disputed area if the governments concerned agree that, pending the settlement of the dispute, the project proposed for one disputing country without prejudice to the claims of the other.

3.4.8 Environment, Health and Safety Guidelines

The World Bank Group's (WBG) Environment, Health, and Safety (EHS) Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities or project by existing technology at reasonable costs. In addition, there are also industry specific EHS guidelines. The guidelines that are relevant to the Project are: General EHS Guidelines and EHS Guidelines for Water and Sanitation.[3]

[3] *https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/ehs-guidelines*

3.4.9 Public consultation and disclosure requirements by World Bank

Based on the provisions of 'OP 4.01: Environmental Assessment' of World Bank, the following conditions applies to the proposed subprojects.

Consultations. For all Category A and B projects the borrower should consult the project-affected groups and local nongovernmental organizations (NGOs) about the project's environmental and social aspects and takes their views into account. The borrower should initiate such consultations as early as possible. For Category A projects, the borrower should consult these groups at least twice: (a) shortly after environmental screening and before the terms of reference for the EA are finalized; and (b) once a draft EA report is prepared. In addition, the borrower should consult with such groups throughout project implementation as necessary to address EA-related issues that affect them.

Disclosure. For a Category A project, the borrower should provide relevant information on project interventions in a timely manner prior to consultation and in a form and language that are understandable and accessible to the groups being consulted. The borrower should provide a summary of the proposed project's objectives, description, and potential impacts for the initial consultation. For consultation after the draft EA report is prepared, the borrower should provide a summary of the EA's conclusions. In addition, for a Category A project, the borrower makes the draft EA report available at a public place accessible to project-affected groups and local NGOs. The borrower also ensures that EA reports for Category A subprojects are made available in a public place accessible to affected groups and local NGOs. The document needs to be translated into Bengali. Public availability of the EA report for Category A project in the borrowing country and official receipt by the Bank are prerequisites to Bank appraisal of these projects.

3.4.10 Applicable GoB and World Bank Policies to the Project

The legislations relevant for environmental assessment for DSIP are the Bangladesh Environmental Conservation Act 1995 (ECA'95) and the Environmental Conservation Rules 1997 (ECR'97). As per ECR'97, most subprojects and associated activities of DSIP are likely to fall under Red Category as they have significant impact on the environment

The applicable World Bank policies for the proposed investments under the Project are given in **Table 3.2**.

Table 3.2: Applicable World Bank Policies for the Project

OP/BP	Triggered	Comment
Environmental Assessment (OP4.01/BP4.01)	Yes	The proposed subprojects will have significant environmental and social impacts, which need to be thoroughly assessed and site-specific mitigation plans will need to be developed. Hence this Project can be classified as Category A.
Natural habitats (OP4.04/BP4.04)	No	The effluents from the STP and 'Decentralized Wastewater Treatment" facilities will be discharged to the Buriganga River and other natural drains. However, the aquatic and water-dependent fauna have been severely affected by habitat alteration due to river pollution over the last few decades and the river is currently unsuitable for aquatic species. Since it is currently at the most degraded condition possible (dissolved oxygen close to zero during dry season), no further departure in the downward direction is possible due to the project. OP 4.04/BP 4.04 will not be triggered.

OP/BP	Triggered	Comment
Pest Management (OP4.09)	No	As the Project will be executed under DB/DBO contract, it is yet not understood which options the contractors may propose. However, it is expected not to require major pest management measures.
Physical Cultural Resources (OP4.11)	Yes	Since the actual alignment of sewer system, sludge from treatment plant and slurry disposal sites are yet to be confirmed, there are possibilities that these may be located near physical cultural resources. Therefore, OP 4.11 may likely be triggered.
Involuntary Settlement (OP4.12)	Yes	A number of sub projects may involve displacement of people and acquisition of land. Particularly, during construction of trunk mains and collection system. This is likely to trigger OP 4.12.
Forests (OP4.36)	No	There are no forest areas within Dhaka city which may be affected by the project construction works. However, Construction of trunk mains may affect planted trees along the roads or at sites. These require special permission from the City Corporations to fell. As such the WB OP 4.36 will not be triggered.
Indigenous Peoples (OP 4.10)	No	The policy is not triggered as the geographical areas in consideration are not likely to have indigenous people as defined by the Bank policy.
Safety of Dams (OP 4.37)	No	The policy is not triggered as it will not involve the construction or maintenance of dams as defined by the Bank policy.
Consultation and Disclosure (OP17.5)	Yes	For all subprojects, the DWASA will consult with the project affected people and beneficiaries about environmental and social concerns related to the subprojects. ESIA and RAP reports of all subprojects will be disclosed on the DWASAS and World Bank websites. This ERSMF will also be disclosed in DWASA and World Bank websites.

4 Baseline Environment

An overview of the existing baseline information obtained from the secondary literature review (August 2018) is presented in this chapter. Detailed baseline environment of the Project area (covering biophysical and socioeconomic environment) will be collected and presented in the subproject ESIAs.

4.1 Project Influence Area

The Project influence area, which comprises the Pagla Sewerage Catchment, is in the south of Dhaka, and is shown in **Figure 4.1**. It covers approximately 73km^2 and includes nine urban centres, namely: Ramna; Khilgaon; Sabujbagh; Motijheel; Lalbagh; Kotwali; Sutrapur; Demra; and Shyampur. The river Buriganga borders the south-western side of the catchment and the river Balu borders along the eastern side. The areas of these urban centres are given in **Table 4.1**.

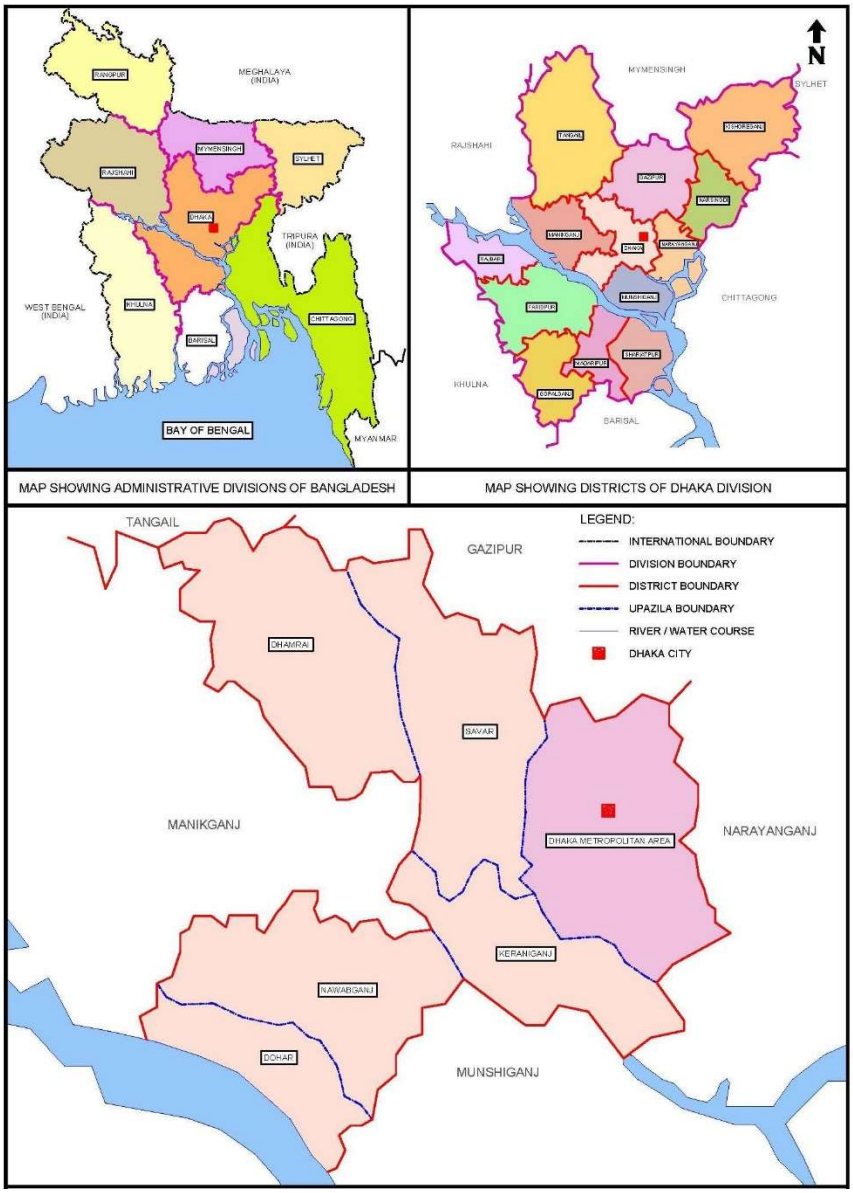

Figure 4.1: Pagla Sewerage Catchment

Table 4.1: List of Urban Centers in Pagla Catchment

Sl. No.	Urban Center	Coverage Area (km^2)
1	Lalbag	4.10
2	Kotwali	1.90
3	Sutrapur	4.0
4	Shyampur	7.60
5	Ramna	7.70
6	Motjheel	4.90
7	Sabujbag	11.70
8	Khilgaon	11.25
9	Demra	19.40

4.2 Physical Environment

4.2.1 Climate

The climate of Bangladesh is sub-tropical with three seasons; namely summer from March to May, monsoon from June to October, and winter season from November to February. The maximum temperature at Dhaka varies from 31.7°C to 41.7°C. Maximum temperature occurs in April and minimum temperature in January. Monthly minimum temperature ranges from 7.2°C to 22.8° at Dhaka. Mean monthly climate data of Dhaka city is given in **Table 4.2**.

Table 4.2: Monthly Average Climate data of Dhaka

Temperature °C												
Item	J	F	M	A	M	J	J	A	S	O	N	D
Highest	32.2	36.1	39.4	40.6	41.7	39.4	37.2	36.1	37.2	36.1	34.4	31.7
Av. Max	26.3	29.2	33.4	34.6	34.3	32.6	31.2	31.3	31.7	31.3	29.1	26.7
Av. Min	13.6	16.1	21.0	24.2	25.6	26.1	26.2	26.2	26.0	24.3	19.1	14.7
Lowest	7.2	7.2	10.0	17.8	18.3	21.7	21.7	22.2	22.8	17.8	11.7	7.2
Relative Humidity in %												
9 A.M.	73	71	73	76	78	83	86	85	83	78	62	72
6 P.M.	62	55	55	65	74	82	84	84	83	78	69	67
Average wind velocity												
Km/hr	3.0	3.9	5.8	7.8	8.9	7.4	7.8	6.9	5.6	3.9	3.2	3.0
ml/hr	1.9	2.4	3.6	4.8	5.6	4.6	4.8	4.3	3.5	2.4	2.0	1.9
Sunshine Duration												
Hours of bright sunshine.	9.1	9.5	8.7	8.9	9.7	4.8	5.1	5.7	5.9	8.2	9.3	9.4
Day (Length) (hours)	10.9	11.4	12.0	12.7	13.3	13.6	13.4	13.0	12.3	11.7	11.1	10.7
Sunshine as % of Day Length	83	83	72	70	73	35	38	44	48	70	84	88

Source: Bangladesh Meteorological Department http://www.bmd.gov.bd/bd_climate.php

The mean annual rainfall in Dhaka city area is 2148 mm, with peak rainfalls occurring in May to September (**Table 4.3**). There are two marked seasons: the rainy season from May to October, during which more than 85% of the total annual rainfall occurs and the dry season from November to April. The beginning of the rainy season varies from year to year; heavy rains commence anywhere between mid-April and early

June and ending anywhere between the end of September and mid-November. In general, mid-November to February is the coolest and driest period; March to May is the hottest period with periodic heavy thunderstorms: June to mid-September is the rainiest and humid period: and mid-September to early November is a transitional period with decreasing rainfall, often with association of thunder but with relatively high temperature and humidity.

Table 4.3: Monthly average rainfall in Dhaka city

Variable	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Normal Total rainfall (mm)	7.7	28.9	65.8	156.3	339.4	340.4	373.1	316.5	300.4	172.3	34.4	12.8
Normal no. of rainy days	2	3	5	10	15	14	17	16	13	7	2	1

Source: Bangladesh Meteorological Department http://www.bmd.gov.bd/bd_climate.php

4.2.2 Physiography

Physiography of the Project influence area (Pagla catchment area) is mainly a flat terrain with elevations ranging from 4 to 9 m above mean sea level and forms part of the Buriganga watershed. The River Buriganga flows along the southern boundary of the Project influence area.

Buriganga and other rivers surrounding Dhaka city receive water mainly from the Jamuna/Brahmaputra river including its floodplain flow during monsoon. The headwaters of the Buriganga river have been gradually reducing during the past few decades due to siltation and channel shifting. During the dry period, the off-take is fully cut-off due to huge sedimentation and the tidal water from Meghna River enters into the river systems. This river is economically significant to Dhaka. Launches and country boats provide connection to other parts of Bangladesh.

The mean monthly flows of the Buriganga during the period 1996 to 2012 is shown in **Figure 4.2**. The maximum flow is 2630 m^3/s and the minimum flow is 110 m^3/s. The average depth of the river 7.6 m and its maximum depth is 18 m.

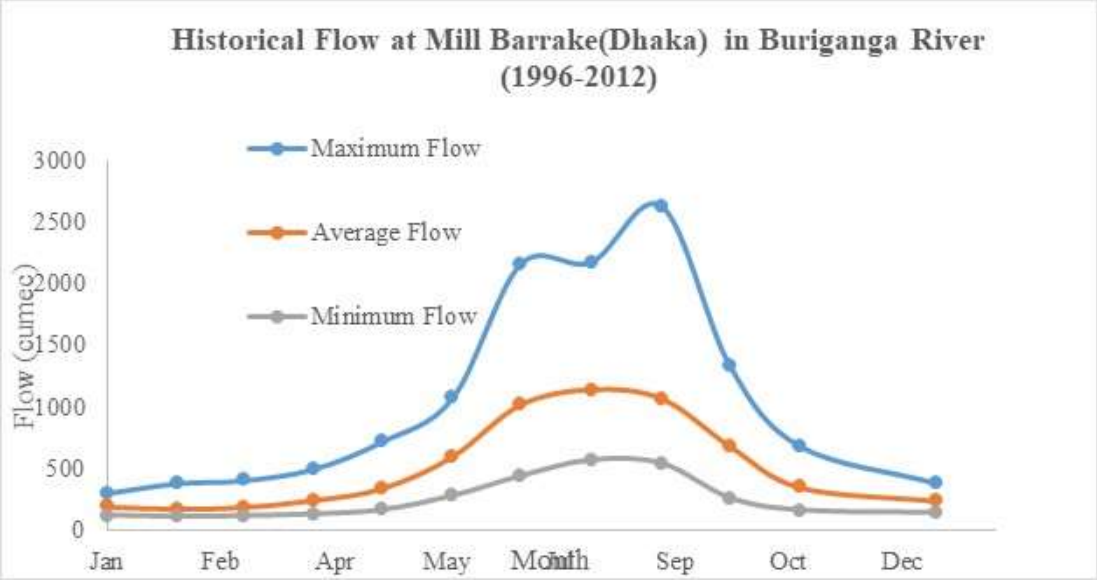

Figure 4.2 : Monthly flow hydrograph of Buriganga river at Mill Barrake

4.2.3 Air Quality

Long-term air quality measurements at Dhaka is shown in **Figure 4.3**. Concentrations of particulate matter have exceeded both the national and World Bank standards. PM_{10} concentrations have recorded more than 250 µg/m^3 during winter months (the national standard for PM_{10} is 150 µg/m^3 and WB standard is 50 µg/m^3); while $PM_{2.5}$ concentrations have exceeded 150 µg/m^3 (the national standard for $PM_{2.5}$ is 65 µg/m^3 and WB standard is 25 µg/m^3).

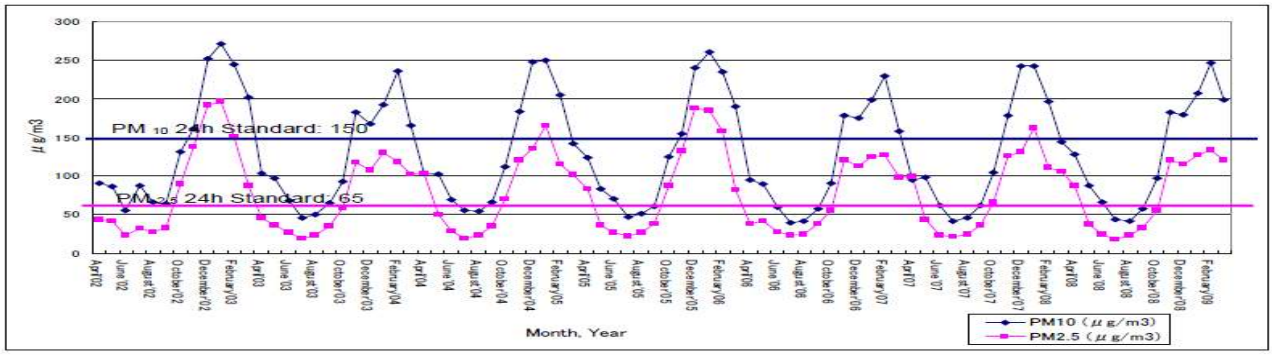

Figure 4.3: Average Monthly Level of PM10 and PM2.5 in Dhaka

4.2.4 Geology and groundwater system

According to the Report on Resource Assessment for Water Supply Sources for Dhaka City Dhaka city is situated at the southern tip of a Pleistocene terrace, the Madhapur Tract. Two characteristic geological units cover the city and surroundings, viz. Madhupur Clay of the Pleistocene age and alluvial deposits of recent age. The Madhupur Clay is the oldest sediment exposed in and around the city area having characteristic topography and drainage. The major geomorphic units of the city are the high land or the Dhaka terrace, the low lands or floodplains, depressions and abandoned channels. Low lying swamps and marshes located in and around the city are other major topographic features.

The subsurface sedimentary sequence, up to the explored depth of 300m, shows three distinct entities: one is the Madhupur Clay of the Pleistocene age, characterised by reddish plastic clay with silt and very fine sand particles. This Madhupur Clay non-conformably overlies the Dupi Tila formation of the Plio-Pleistocene age, composed of medium to coarse yellowish-brown sand and occasional gravel. The incised channels and depressions within the city are floored by recent alluvial floodplain deposits and are further subdivided into Lowland Alluvium and Highland Alluvium.

The hydro-geological setting confirms two distinguishable aquifer systems in the study area, one is Dupitila sands forming confined/semi-confined aquifer beneath the Pleistocene deposits, and the other is the recent alluvium in the floodplains containing shallow aquifers under water-table or semi-confined conditions. The Dhaka aquifer system consists of three aquifer layers at different depth location up to around 300m. Due to groundwater abstraction for water supply, the water level for the upper aquifer has dropped to more than 70m depth from the surface in some locations.

4.2.5 Surface Water Quality

The rivers, lakes and other water bodies in the Dhaka watershed experience a seasonal variation of water quality. The water quality deteriorates dramatically during the 7 months of the year from November to May. In the 5 months of monsoon, from June to October, the water quality improves due to the availability of large rainfall-runoff and flood spills from Jamuna River. The dissolved oxygen and BOD5 levels along Turag-Buriganga and Balu Sitalakhya system show major deterioration of water quality during the dry

season. In most of the river reach, the dissolved oxygen levels have been found to be near zero. Also, the BOD5 level was also higher than the allowable limit.

The water quality of Buriganga River has deteriorated tremendously over the years due to the discharge of untreated wastewater, sewage and industrial effluents from different sources. In a recent survey conducted during February-March 2017, high level of pollution became very evident. The dissolved oxygen level in Buriganga was observed to be near zero in almost the entire length of the river. This indicates that during the driest part of the year the river is absolutely unsuitable for any aquatic life. It was further noticed that the pollution level of the river is highly risky for public health in the near vicinity of the river.

4.2.6 Groundwater Quality

Since only a small part of the city is actually connected to any form of sewerage system, the majority of the population typically utilizes septic tanks and pour flush sanitation systems. Septic tank effluent disposal has generally been very sporadic and as Dhaka is surrounded by rivers and interconnected with canals, almost all domestic and industrial wastewaters enter Dhaka's surface waters untreated, with some risk of infiltration to the groundwater. As a result of this uncontrolled effluent discharge, pollutant levels in the groundwater are increasing

4.3 Biological/Ecological Environment

Terrestrial Flora: No natural terrestrial flora of significance for protection remains at the Project site(s). The composition of the plant community is low growing and herbaceous vegetation as well as other flora typical for urban sites.

Terrestrial Fauna: No wild mammal species were observed during the visit to the site and site survey.

Aquatic Flora: The open waters (rivers, khals, wetlands ponds etc.) surrounding the Project site(s) host species common to open water in and around Dhaka, including common species such as Kalmilata (Ipomoea reprans), Shapla (*Nymphaea lotus*), Helencha (*Altemathera philoxeroides*) and Kuchuripana (*Eihhcormia crassipes*).

Aquatic Fauna: Aquatic and water-dependent fauna have been severely affected by habitat alteration due to river pollution. Wetland degradation has left virtually no sheltered place for waterfowl to roost or nest.

4.4 Socio-Economic and Cultural Profile

Bangladesh has a population of 150 million (2011 Census Report by BBS). The present Population Growth Rate in Bangladesh is 1.59%. The present literacy rate is about 50% among which the male literacy is 50% and female literacy is 46%. Bangladesh is predominantly a Muslim populate (86.6%) followed by Hindus (12.1%), Buddhists (0.6%), Christians (0.4%) and Others (0.3%). The sex ratio is 99.68%. The predominant ethnic group is Bengalis (98%) followed by another indigenous minority (2%) including Chakmas, Marmas, Santals, Garos, Manipuri, Tripura, and Tanchangya.

Dhaka, the capital of Bangladesh is the largest city in Bangladesh and highest densely populated which has experienced a remarkably rapid population growth after the independence, from only 1.6 million in 1974 to about 15.4 million in 2011. Dhaka's density is estimated at 115,000 per square mile or 44,000 per square kilometer, with slum (informal dwelling) densities reported as 4,210 per acre, or 2.7 million per square mile (1 million per square kilometer). With the present rate of development, the city is poised to grow into one of the 10 megacities in the world with a projected population of 21.1 million by 2025 spreading over the entire Dhaka Metropolitan Development Plan (DMDP) area covering 1525 km2.

The Principal Industries are Garments and Textiles (2nd largest in the world), Tea, Ceramics, Cement, Leather, Jute (largest producer in the world), Chemical, Fertilizer, Shrimp Processing, Sugar, Paper, Electric and Electronics, Medicine, Fishing. The principal exports are Garments, Knitwear, Frozen Shrimps, Tea, Leather and Leather products, Jute and Jute products, Ceramics, IT Outsourcing, etc. The principal Imports: Wheat, Fertilizer, Petroleum goods, Cotton, Edible Oil etc. The principal Minerals: Natural gas, Oil, Coal, White clay, Glass sand, etc.

4.4.1 Land use

The Pagla catchment area is located in a heavily built-up urban area and densely populated area. Old Dhaka, the historic urban core of the city which runs along the eastern bank of the Buriganga River. Old Dhaka consists of a complex mixture of commercial and residential establishments. The physical infrastructure is overloaded and inadequately maintained. Roads are narrow and congested and generally flanked by old multi-storied low to medium rise apartment buildings. OId Dhaka has developed freely with mixed land use showing little regard to any urban planning.

Beyond Old Dhaka, the other urbanised areas within the Catchment area, except the Khilgaon Rehabilitation Area, have been largely developed in an unplanned manner, without sufficient regard to respecting the norms of formal planning institutions. The unplanned development of the area has resulted in congestion and dense inhabitation and settlement. Besides, insufficient development of internal road networks is rampant across the area.

4.4.2 Physical and Cultural Resources

In Pagla catchment, there are religious institutions (mosques, temples, Buddhist temples), few sites of historical importance such as public libraries and government buildings.

5 Screening of Potential Impacts and Risks

Details of construction activities to be carried out under the project and potential environmental and social impacts/risks associated with these construction activities are summarized in **Table 5.1**. DWASA will carry out screening exercise on each proposed construction activity to develop clear guidelines for the preparation of ESIAs including ESMPs and resettlement action plans (RAPs) as presented in the next two chapters. Generic mitigation measures to address these impacts are further discussed in Chapter 6 and also in **Annex 4**. An Environmental Code of Practices (ECoPs) have also been prepared to address all general construction related environmental and social risks and presented in **Annex 5**.

Table 5.1: Summary of Construction Activities and Screening of Potential Impacts

Component/investment	Activities during Pre-Construction and Construction Phase	Screening of Potential Environmental and Social Impacts and Risks
Component 2.4 and Construction, reconstruction/ replacement of catchment network (Subprojects 4 – see Table 2.4)	**Land acquisition**. Land acquisition requirement of the sewer pipeline depends on the location of the alignment and the choice of construction methodology. Further, land acquisition may also be required for construction of sewerage lift stations. **Mobilization of materials, workers and equipment**. Stack yards, site offices and labour sheds will need to be built. The land and premises required will be rented. No land acquisition will be required. **Truck routes and access roads identification/ construction**. Location and routes of the temporary access roads and truck haul routes to and from the Project site and staging areas need to be identified/constructed. Trucks using these haul routes would be carrying construction materials to the site and hauling away excavated soil. **Drainage works**. Construction of drainage infrastructure for stormwater and excess water from construction sites. **Utility relocation**. Utilities within the roadbed that could be disturbed by construction will need to be relocated. **Excavation of earth for pipe laying**. Pipe laying in trenches by cut-and-cover method may require temporary stabilization of the ground to support the excavation. When the excavation is	*Land acquisition and resettlement:* Of the three Trunk Mains, the one from Madhubagh to Pagla STP, will be built anew on DWASA lands. The other two (Western Trunk Mains) are existing -- meaning that the travel path of the pipelines will remain the same. Depending on the situation on the ground, land acquisition might be required for technical adjustments of the pipelines, and construction of the lift pump stations, and the facilities for non-network sanitation. Most of the impacts are likely to be related to temporary closure/ displacement of roadside businesses and vendors who operate trading activities in the sidewalks and road shoulders. It is also likely that construction works may displace many non-titled households which may have been squatting by the existing Trunk Mains. Traffic congestion: during the construction phase the traffic in and around the construction sites is expected to change due to re-routing of normal traffic, movement of hauling trucks and project vehicles etc. These kinds of changes in traffic pattern and concentration may give rise to traffic congestion or disturbance. For example, open excavation of roads for laying of pipes, construction of vertical shafts for micro-tunnelling etc. will restrict or halt traffic. Re-routing of traffic will then be necessary. Noise: Noise level in the area is expected to increase due to the movement of hauling trucks and the Project vehicles, pile driving,

Component/investment	Activities during Pre-Construction and Construction Phase	Screening of Potential Environmental and Social Impacts and Risks
	complete, the pipe is laid within the excavated trench, the remaining space is backfilled, and the surface is restored. Temporary supports for cut-and-cover construction typically consist of vertical support walls which include, soldier piles, sheet piles, slurry walls etc. **Ground improvement works**. Depending on the local soil condition the ground improvement works will be executed. **Placement of pipes in the trench**. Sewer pipes of diameter from 500 mm will be laid in the excavated trenches. **Civil and electro-mechanical work for SSS**: Construction/rehabilitation/repair of SLSs will require a variety of civil and electromechanical works. Apart from this all preparations for securing of land, mobilization, access road, drainage works, soil disposal, dewatering, ground improvement works will need to be carried out as discussed above.	crushing of stones, operation of electric generators etc. This will disturb the normal social and family life and can be a concern to children and elderly people. Important to notice is the impact of elevated noise on the educational and health facilities in the area. Air quality: deterioration of air quality due to the increase in dust from different project activities like crushing of stones, operation of diesel engines may pose a health concern to residents in and around the construction sites. The Influx of labour due to the increase in employment opportunities in the Project, workers from outside the Project areas are likely to gather at the Project site. This is expected to change the local social texture and interaction. Groundwater contamination: leachate from the waste dumping ground, wastewater infiltration etc. may contaminate the groundwater. Surface water contamination: discharge of wastewater from construction sites may contaminate water bodies, lakes, rivers etc. Drainage congestion: the existing drainage system may get blocked by excavated soil, solid waste from labour sheds and construction sites Slurry, spoil earth and solid waste management: slurry from deep micro-tunnelling, solid waste generated from other construction activities may alter the existing environment, block drainage route etc. Occupational health and safety risks generally associated with the construction works. Community health and safety risks due to exposure to construction activities, especially to the construction trenches and vehicular/equipment movement. Chance finds: If sensitive archaeological sites are located along the pipeline routes, treatment plants site then there could be potential risks of damage to the artefacts,

Component/investment	Activities during Pre-Construction and Construction Phase	Screening of Potential Environmental and Social Impacts and Risks
		drainage congestion into archaeological sites, contamination from wastewater and air, dewatering can damage the foundation, sediment deformation due to pile driving can damage old archaeological structures etc.
Component 3: Non-network sanitation services: Subproject 5: Decentralized Wastewater Treatment Plant	**Land Acquisition:** construction of a wastewater treatment plant will require sites. Stack yards, site offices and labour sheds will need to be built. **Earthworks for construction of primary treatment facility**. These activities will include excavations for connecting the trunk mains to primary treatment facilities, and installation of mechanical screens to remove gross, suspended and floating solids from the raw storage. Construction of grit chamber, where sand and small stones settle to the bottom. Construction of settling tanks. **Excavated material disposal**. The excavated spoils will need to be removed from the site and disposed of. Protocols developed during final design would be followed to identify spoils that may contain contaminated materials so that they can be handled appropriately and disposed of at a suitable location. Most of the excavated material would be clean, which can be reused beneficially at other locations. **Dewatering**. Dewatering, if necessary, to remove water from a construction site. **Construction of secondary treatment facilities**. The technology for secondary treatment facility will be decided by the DBO contractor. It includes facilities for biological processes to remove the dissolved organic matter that escapes primary treatment. **Sludge treatment facilities**. The technology for sludge treatment	Land acquisition and resettlement may be required for the proposed developments Earthworks will involve the generation of excess spoils and debris. Generation of solid waste from construction activities. Local traffic around the construction sites can be affected by the construction-related traffic. Traffic congestion is expected to be the most significant impact since the construction areas are surrounded by narrow roads and heavily built-up areas. Risk of soil and water pollution from the construction activities. Dust and emissions from the construction activities and equipment. Noise and vibration from the construction activities. Occupational health and safety risks generally associated with the construction works. The influx of labour due to the increase in employment opportunities in the Project, workers from outside the Project areas are likely to gather at the Project site. This is expected to change the local social texture and interaction. Risks associated with labour influx and workers accommodation, including gender-based violence. Community health and safety risks due to exposure to construction activities, especially to the construction trenches and vehicular/equipment movement.

Component/investment	Activities during Pre-Construction and Construction Phase	Screening of Potential Environmental and Social Impacts and Risks
	facilities will be decided by the DBO contractor.	
Component 3: Non-network sanitation; Subproject 6: Communal Septic Tanks	Land Acquisition: Land for the community septic tanks will be identified in consultations with the local communities and preferably in the government owned lands or facilities. Site Development: Site development activities include excavations, civil works for construction of chambers and laying of pipeline from the households to the septic tanks.	Land acquisition and resettlement may be required for the subproject. Impacts and risks associated with construction activities are similar to the above construction works and laying of pipeline described for Subproject 4.
Component 3: Non-network sanitation services Subproject 7: Septage Treatment Plant	The septic tank sludge will be can collected and discharged in sludge tanks at the sewage treatment plants for further treatment. The proposed site development activities will be similar to the works defined in Subproject 5.	Land acquisition may be required for all these facilities. Other potential impacts and risks associated with these activities are similar to impacts of Subproject 5.

Details of operation and maintenance (O&M) activities involved during the routine maintenance of proposed facilities and potential environmental and social impacts/risks associated with these construction activities are summarized in **Table 5.2**.

Table 5.2: Summary of Operation and Maintenance Activities and Screening of Potential Impacts

Component/investment	Activities during Pre-Construction and Construction Phase	Screening of Potential Environmental and Social Impacts and Risks
Component 2.4 and Construction, reconstruction/ replacement of catchment network (Subprojects 4 – see Table 2.4)	The man-holes need to be regularly checked and protected from solid waste dumping. Jetting-cum-suction machine, submersible dredger pump and sewer cleaning machine of power bucket type will be needed to proper maintenance of the trunk sewers. The collected sludge will be disposed on identified waste disposal sites regularly by packed tractor trolley, mounted tanker and other environmentally friendly collection and disposal sources. Maintaining the reliability of the equipment and facilities	Noise level, odor and air pollution from construction works. Possibility of groundwater and surface water contamination from leachate and effluent discharge, Sludge from the treatment plants The overflows from soak pits at households, community toilets Disruption of local traffic during regular maintenance Health and safety can be an issue around the dumping ground of treated sludge, increase of traffic can become risks to pedestrians, infiltration of wastewater or

Component/investment	Activities during Pre-Construction and Construction Phase	Screening of Potential Environmental and Social Impacts and Risks
		leachate to surface water and groundwater sources can be major health concerns. Employment and business opportunities: it is expected that new employment opportunities will be created due to various facilities to be implemented. For example, FSM sites and new SLS sites will generate new employment opportunities. This is regarded as a positive impact of an investment but also may cause new social interaction with the local community with the external workforce.
Component 3: Non-network sanitation services: Subproject 5: Decentralized Wastewater Treatment	Routine operation of the primary and secondary treatment facilities, and sludge treatment facilities. Regular cleaning of grit chamber lines to remove grease, grit and other debris, Collection and disposal of trash obtained at the primary treatment facility. Collection and disposal of sludge from the treatment facilities.	Leaks and overflows from the sewerage system can cause contamination of soil, groundwater and surface water. The overflow of the sewage water particularly during monsoon is an existing problem which causes water-borne diseases such as diarrhoea, cholera, typhoid, dysentery, skin infection, etc. in the project area. The project will have a positive impact on the people since the improved sanitation system will be established and therefore overflow of the sewage water will be stopped and waterborne diseases will be reduced. Liquid effluents from the WWTP if not properly treated may contaminate the receiving water bodies. Generation of solid waste from the wastewater collection and treatment system. Odor and emissions from wastewater treatment operations may include hydrogen sulfide, methane and ozone. Workers exposure to occupational related hazards such as open water bodies, trenches, working at heights, slippery walkways etc. Workers exposure to pathogens and vectors contained in the sewerage Disposal of sludge and its impact on the ecosystem of the disposal sites.

Component/investment	Activities during Pre-Construction and Construction Phase	Screening of Potential Environmental and Social Impacts and Risks
Component 3: Non-network sanitation; Subproject 6: Communal Septic Tanks	Desludging from the community septic tanks and transport them to the STPs for further treatment.	Workers exposure to faecal matter and odours from the septic tanks. Workers exposure to pathogens and vector contained in the sludge, Leakage of the material from the pumping from the septic tanks to the vehicles and the transport to the STPs.
Component 3: Non-network sanitation services: Subproject 7: Septage Treatment Plant	The generated sludge will be disposed on identified waste disposal sites regularly by packed tractor trolley, mounted tanker and other environmentally friendly collection and disposal sources. Maintaining the reliability of the equipment and facilities	Positive health benefits to the local community and the natural environment. Workers exposure to occupational related hazards such as open water bodies, trenches, working at heights, slippery walkways etc. Workers exposure to pathogens and vector contained in the sewerage Disposal of sludge and its impact on the ecosystem of the disposal sites

6 Environmental and Social Assessment Framework

This chapter describes the step-by-step procedures to be followed for carrying out the ESIA studies for proposed subprojects and preparation of ESIA and ESMP reports.

6.1 Screening of Subprojects

As a first step, environmental screening of each subproject will be carried using a screening checklist in **Annex 1** to get an idea about the nature and magnitude of environmental impacts of a particular subproject. This preliminary identification of possible impacts will guide to identify further detail environmental assessment. This environmental screening will be carried out through:

- Reconnaissance of the subproject area and identification of presence of environmental and social sensitive receptors
- Identification of major subproject activities;
- Preliminary assessment of the probable environmental impacts of different activities during construction and operational stages.

One of the outcomes of the screening exercise will be the classification of the subprojects into various environmental categories defined by World Bank OP 4.01 (categories A, B and C) and ECR 1997 (Red, Orange A and B, Green). Classification of the subprojects following OP 4.01 and ECR 1997 is given in **Table 6.1.** All subprojects, except subproject 7, can be classified into Category A or Red. ESIA reports will be submitted for all these subprojects. For the subproject 7, a limited ESIA or IEE will be prepared.

Terms of references (ToR) for the proposed ESIA studies have already been cleared by DOE and are presented in **Annex 2**. An outline (table of contents) of the ESIA reports are given in **Annex 3**. ESIAs of the proposed subprojects will be prepared following the Annexes 2 and 3.

Table 6.1: Environmental Categorisation of Subprojects

Sub-project	Component	Proposed Investment or Subproject	Category of the subproject according to ECR 1997	Category of the Project according to OP 4.01	Instruments to be prepared
4	Component 2	Pagla Sewer Network Reconstruction	RED	A	ESIA, RAP
5	Component 3	Decentralized Waster water treatment Plants Construction	RED	B	ESIA, RAP
6	Component 3	Septage Treatment Plant Construction	RED	A	ESIA, RAP
7	Component 3	Communal Septic Tanks Construction	Orange A	B	ESMP/IEE, RAP

6.2 Baseline Data Collection

Project influence area for each subproject will be identified covering areas like to be directly or indirectly affected by the subproject construction and operation; areas that will be subjected to impacts from

unplanned but predictable developments caused by the subproject, and areas that will be subjected to cumulative impacts that result from the subproject in conjunction with the other activities in its area of influence.

Baseline environmental data of the project influence area (covering physical, chemical, biological and socioeconomic environment) will be collected through a review of secondary literature and primary surveys. Primary surveys will be carried out for assessment of traffic levels, ambient air and noise quality, surface water and groundwater quality, and ecological conditions in the project influence area. Primary surveys will also be carried out to establish the baseline socioeconomic conditions of the communities in the Project area.

6.3 Analysis of Alternatives

Environmental and social issues will be mainstreamed into the Project design through a detailed analysis of alternatives of the subproject location, alignment, design, technology, and construction approach. The primary objective of the "analysis of alternatives" is to identify the location/design/technology for a particular subproject that would generate the least adverse impact and maximize the positive impacts.

The criteria to be considered in evaluating various alternatives will be based on the following sub-criteria:

- Technical Aspects: Robustness, constructability, geology, maintenance requirements, history of performance, etc.
- Financial Aspects: Construction cost and maintenance cost
- Environmental Aspects: project footprints, material requirements, and
- Social Aspects: Land acquisition, Resettlement, nuisance, Impacts on char people, socioeconomic impacts, etc.

The following technologies will be analysed thoroughly in the respective subproject specific ESIA using criteria described above:

- Technology for Non-network sewerage treatment: The non-network sewage treatment/disposal may have several options from the viewpoints of low-cost sanitation and technical alternatives corresponding to different sizes and localities of beneficiaries, such as a cluster of individual households, apartment type housing and an independent household. Some adaptable technologies which are also applicable in non-network areas under Pagla catchment could be as follows: Septic tank with infiltration as a typical method; Compact aerobic domestic sewage treatment module; and Biological sewage treatment
- Technology for Septage Treatment Plant: Potential options of STP technologies are: (i) Modern Trickling Filter (TF) technology; (ii) Conventional Activated Sludge (CAS) technology; (iii) Combinations of (i) and (ii); and (iv) Extended Aeration.
- Technology for Sludge Management: Options to ensure proper systematic control of the septic sludge management may include: i) DWASA takes the lead role in septic tank sludge management (either via own sludge collection vehicles or enter into service agreements with service providers), or ii) facilitate that private sector service providers deal directly with households, and DWASA takes a monitoring function.
- Sanitation options for difficult to reach households: Potential options are: shallow/small bore sewers with decentralized wastewater treatment; or common septic tank for a row of houses; and septage management (emptying, transport and treatment) for households with septic tanks.
- Open excavation versus micro-tunneling: Potential options for laying of sewage pipeline is through open excavation and micro-tunneling.

6.4 Impact Assessment

Based on the initial assessment, potential impacts and risks of the proposed subprojects have been identified and presented in previous Chapter 5. These impacts are broadly summarized below:

- Disposal of sludge, contaminated soils, debris, spoils and solid waste
- Traffic disruption and other construction-related nuisances in heavily built-up areas and narrow roads
- Workers health and safety risks mainly due to exposure to untreated sewage and its odour
- Risk of pollution on soil and water resources from construction and routine maintenance activities
- Community health safety risks mainly due to exposure to construction trenches, equipment and labour influx
- Disposal of effluents and their impact on the receiving environment (e.g. Buriganga river)

Detailed assessment of these impacts will be carried out in the respective subproject specific ESIA. In addition, the impacts of the proposed subprojects on the environmental and social components will be identified through consultation with experts and local community. The impacts will be analyzed and graded qualitatively (e.g., high, medium, low) in order to identify the major impacts. Potential impacts will be predicted using the professional judgment of the multi-disciplinary team members based on baseline information collected and any modeling studies if required. The impact assessment will consider both cumulative and induced impacts of the subproject.

6.5 Environmental and Social Management Plan

ESMPs will be prepared to address all the identified potential environmental and social impacts following the principles of mitigation hierarchy. To the extent feasible, all potential impacts will be avoided through design changes, and if avoidance is not possible – measures will be taken to minimise the magnitude of the impact. Mitigation measures will be proposed for all the significant impacts. If the residual impacts are still significant even after applying the mitigation measures, compensation measures will be proposed. Further, enhancement measures will be proposed for increasing the benefits of positive impacts. A sample ESMP is prepared and presented in **Annex 4** to address the impacts during construction and operation stages.

Environmental Code of Practices (ECoPs) have been prepared under this ERSMF to provide guidance to be followed to address general environmental risks due to various activities during planning, design, construction, operation and maintenance phases associated with each subproject. The ECoPs will also include mitigation measures to address general environmental and social risks associated with the general construction activities. These ECoPs have been prepared in conformity with the World Bank Group General EHS Guidelines and Good International Industry Practice. The ECoPs are presented in **Annex 5**.

An environmental monitoring plan will also be prepared in the ESMP to monitor the effectiveness of the mitigation measures and compliance with the environmental standards. An environmental monitoring plan template is provided in **Annex 6**.

A chance find procedures to be implemented in case any chance finds are made during earthworks, have been prepared and are presented in **Annex 7**.

6.6 Stakeholder Consultations and Disclosure

Stakeholder consultation will be used to help identify opportunities and risks, improve subproject design and implementation, and increase subproject ownership and sustainability. Stakeholder consultations will be carried during all phases of the project.

The stakeholders of the Project have been classified into the following two categories.:

- Primary Stakeholders: include individuals, groups, institutions that either have a direct influence on the project or are directly impacted (positively or adversely) by the project and its activities. These stakeholders include households, business operators, formal/informal local entities like DSCC ward commissioners, Upazila Parishads (UZPs, if applicable), civil society organizations, private landowners, and users of public lands like encroachers, poor non-titled persons/households, business owners and others who are likely to be displaced temporarily or permanently during project implementation.
- Secondary stakeholders: are interested parties in the project other than those directly affected. They include: government officials (including elected and non-elected) , regulatory institutions such as DOE; City Corporations, Dhaka Metropolitan police, Local Government, RAJUK, BWDB and WAPRO, Civil society Organizations (CSOs), Non-government organisations, and the Media.

Stakeholder consultations will be carried out during the preparation of the safeguards instruments to obtain their feedback and address their concerns.

The ESIA, ESMP and RAP of each subproject will be disclosed on the DWASA website and on the World Bank website.[4] Executive summary of the ESIAs and RAPs will be translated into Bangla and will be disclosed on the DWASA website. Hardcopies of the Executive Summary reports of Bangla will also be made available in all DWASA offices and Union Councillors Offices in the Pagla catchment area.

6.7 Submission of ESIA for DOE and World Bank Clearance

ESIA (or ESMPs) and RAP for each subproject will be submitted to World Bank and DOE clearance and approval before initiating any construction works.

6.8 Implementation of ESMPs of Subprojects

The steps to be followed during the construction stage of subprojects for effective implementation of ESMP are described in this section.

6.8.1 Environmental and Social Requirements in Bidding Documents

The ESMPs of the subprojects will be included in the respective bidding documents. Based on the outcome of the ESIA and ESMP, the environmental and social requirements of the Contractor will be clearly spelled out in the bidding documents. The Environmental Specialist of the PMU will work with the Procurement Specialists of the Project on ensuring the following guidance is incorporated accordingly.

- All sections of bidding documents are to be reviewed in detailed and cross reference will need to be made to the safeguards policies and instruments relevant to the specific subprojects which have been prepared as per the requirements of this ERSMF.
- Inclusion of Environmental, Social, Health and Safety (ESHS) Requirements as technical specifications, including the need for the Contractors ESHS staff and code of conduct

[4] The ERSMF and EIA were previously disclosed on DWASA's website prior to the World Bank's Approval; and will be re-disclosed following this update.

- Where required the PMU Environmental specialist may be required to update recommendations in the respective ESMP to match the language in the Bid Document where major discrepancies have been noted to facilitate consistency in all documents.
- The inclusion of Environmental, Social, Health and Safety Performance in the contract documents.

6.8.2 Contractor's Construction Environmental Action Plan

As a requirement under the bidding documents, the Contractors will be required to submit a *Construction Environmental Action Plan* prior to their mobilisation for PMU approval. This plan will consist of the following site-specific management plans that will be prepared in compliance with the requirements of the bidding documents, ESMP and World Bank EHS guidelines:

- Traffic management plan
- Pollution prevention plan
- Waste management plan
- Labour influx and construction camp management plan
- Code of conduct for the workers
- Occupational health and safety
- Fuels and hazardous substances management plan
- Emergency preparedness plan

In addition, the Contractor will need to submit a Job Safety/Hazard Analysis at the beginning of construction works at each new site addressing the measures associated with various hazards the work sites. These reports will be reviewed and approved by the PMU after ensuring the mitigation measures proposed in the analysis are in place at the work sites.

6.8.3 Compliance Monitoring and Reporting

Environmental and Social staff of the Contractor are responsible to implement the ESMP, while the environmental and social specialists of the Construction Supervision Consultant and PMU will be responsible for overall monitoring of the EMSPs throughout the Project implementation.

Compliance monitoring comprises of on-site inspection of the construction activities to verify that measures identified in the ESMP and that are included in the clauses for contractors are being implemented. This type of monitoring is similar to the normal technical supervision tasks ensuring that the Contractor is achieving the required standards and quality of work.

The following reports will be prepared on the implementation of ESMP:

- Monthly environmental monitoring reports by the Contractor on the status of implementation of environmental, social, health and safety aspects, and
- Quarterly environmental monitoring reports by the PMU on the status of implementation of environmental, social, health and safety aspects

The topics to be covered in these reports are summarized below:

- Environmental incidents or non-compliance with contract requirements
- Health and safety incidents, accidents, injuries and all fealties that require treatments
- Inspection of Workers accommodation; Workers and community grievances
- Trainings conducted and their content;
- Environmental issues encountered and how they were mitigated and
- Compliance status on ESMP requirements

7 Resettlement Framework

7.1 Needs for Private and Public Lands

Although DWASA does not anticipate land acquisition, some patches of private land may be acquired to accommodate pipeline alignments beyond the route of the existing lines. Dhaka is densely populated and parts of the roads (travel path of the sewer lines) have been encroached into by adjacent private buildings. There are also small-scale businesses that are operated on sidewalks and road shoulders. Pending finalization of the pipeline layout plans and Social Screening, DWASA may (i) acquire patches of private lands at some points; (ii) reclaim public lands that have been encroached into – which will mean partial/full dismantling of an unknown number of buildings, and temporary displacement / closure of various small businesses housed in permanent structures, and those that are operated on sidewalks and road shoulders. Considering the potential impacts, DWASA has proposed this RPF to deal with the adverse impacts that might be caused by the project.

7.2 The RF Objectives

The RF is proposed to identify the potential adverse impacts related to land acquisition and involuntary resettlement and to prepare and implement Resettlement Action Plans / Abbreviated Resettlement Action Plans (RAPs/ARPs) as and where necessary. Within the framework of this RPF, DWASA intends to,

- Enhances the social development outcomes of the proposed activities;
- Identify and mitigates adverse impacts that the projects might cause on people (separately for men and women), including protection against loss of livelihood activities;
- Develop necessary safeguard mitigation measures, in consultation with the project-affected peoples, that would commensurate with the nature and magnitude of the potential impacts; and
- Ensure that the project is prepared and implemented in full compliance with the relevant GOB policies and the World Bank's OP 4.12 on Involuntary Resettlement and any other applicable operational policies.

7.3 Planning Principles & Impact Minimization

Considering the potential adverse impacts associated with the use of private lands and displacement of private activities from public lands, including its own, DWASA will adhere to the following guidelines:

- Prior to finalizing the sewer line layouts and details of the civil works for lifting pump stations, DWASA will undertake community and stakeholder consultations – separately with men and women – on the project's objectives, scopes and social safeguard and non-safeguard implications. As noted above, safeguard impacts may also consist of displacement / closure of business activities that may have encroached into the public lands along the Trunk Mains. While consultations will remain open to all, DWASA will ensure participation of the following entities and peoples.
    - All formal/informal local entities and persons with interests and concerns about sanitation and water supply, as well as others with stakes in the project and are deemed key actors to influence design and implementation of the project activities.
    - The persons, such as public land users, private landowners, business owners and others, who would be affected by the project activities.

- Project design will most certainly consider avoiding/minimizing land acquisition from private ownerships. In cases of absolute necessity, DWASA will use private lands and lay the pipelines, to the extent feasible, in ways so that temporary displacement / closure of commercial and other activities from public and private lands remain at a minimum.
- Installation of pipelines of Trunk Main will be completed in a timeframe that would be shortest required by construction works (e.g, curing time required for RRC works), to minimize disruptions to commercial activities and, pedestrian and vehicular movements.
- DWASA will prepare and implement the mitigation plans in consultation with the communities, including those who would be affected, living along the travel path of the pipelines.
- As required for safeguard compliance, DWASA will prepare and fully implement the mitigation plans like RAP / ARP, before commencement of the civil works under a given Contract package/subproject.
- DWASA will undertake social screening of all construction activities to identify potential social safeguard issues and adopt and implement impact mitigation measures consistent with the Bank's OP 4.12 and any other applicable operational policies. *(A Social Screening Form is suggested in Annex 8).*

7.4 Use of Private and Public Lands

Considering the reality and potential impacts, DWASA proposes to obtain private and public lands, which may have been authorized and unauthorized private uses, by using the following means:

Private Lands. Wherever found absolutely necessary, DWASA will use the present *Acquisition and Requisition of Immovable Properties Act, 2017,* and mitigate the associated adverse impacts in compliance with the Bank's OP 4.12 on Involuntary Resettlement.

Public Lands *(Including DWASA's Own Lands)*

- Under Authorized Use: If the required lands are presently under lease from DWASA or any other GOB agencies, DWASA may seek to use them by fulfilling the lease conditions. DWASA would obtain the lands owned by other agencies through inter-governmental transfer that will also involve a cost. For example, land required for the construction of SLS in Golapbagh belongs to DNCC. Accordingly, DWASA has started the process to seek transfer of the land for the project.
- Under Unauthorized Use: Such lands may belong to DWASA itself or other GOB agencies. Subject to inter-governmental transfer, DWASA will use the lands by mitigating the associated adverse impacts consistent with the Bank's OP 4.12 on Involuntary Resettlement.

7.5 Impact Mitigation Objectives

The principles and guidelines proposed in this Resettlement Policy Framework (RPF) are to avoid or minimize adverse impacts on private landowners and public land users; mitigate the adverse impacts that are unavoidable; and assist the project affected persons (PAPs) to improve, or at least to restore, their living standards and income earning and production capacity to the pre-project levels. To achieve these objectives, DWASA will consistently adhere to the following guidelines:

- Avoid or minimize private land acquisition;
- Avoid or minimize displacement of persons and households who may have been using public lands for residential, commercial and other purposes; and

- Identify and mitigate the adverse impacts associated with private land acquisition; displacement from public lands; use of common property resources; and temporary displacement / closure of businesses and livelihood activities during implementation of civil works.

7.6 Applicability and Impact Mitigation Plan

The principles and guidelines as proposed in this RPF will apply to all land-based activities undertaken under all Contract Packages that will involve land acquisition from private ownerships and/or displace people from DWASA's own and other public lands, which they may have been using for residential, commercial or other purposes with or without formal authorization.

To mitigate the adverse impacts, DWASA will prepare and implement one of the following instruments:

- Resettlement Action Plan (RAP). Where land acquisition and resumption of public lands, including DWASA's own, for civil works activities included under a Contract Package, or the entire project, affect 200 or more persons; or
- Abbreviated Resettlement Plan (ARP). *Under above conditions,* where the number of project-affected persons are *fewer* than 200, documenting the affected persons and valuation of affected assets, impact mitigation measures and budget, and an ARP implementation schedule.

The number of project-affected persons (PAPs) consists of all affected persons and their household members, irrespective of their tenure status to the lands they use for any purposes.

7.7 Land Acquisition/Use Principles and Guidelines

In the absence of a resettlement policy, safeguard issues associated with land acquisition and displacement had been addressed until very recently by using the Bangladesh *Acquisition and Requisition of Immovable Property Ordinance, 1982* and the Bank's OP 4.12 together. Recently, GOB has passed a new legislation titled *Acquisition and Requisition of Immovable Property Act, 2017.* But the Act still does not address the issues that are critical to complying with the Bank's social safeguard requirements[5]. Therefore, the 2017 Act will be used to legalize the acquisitions in the country's land administration system, and the OP 4.12 will provide the basis to define resettlement policy objectives and adopt and implement impact mitigation measures. In keeping with the OP 4.12, DWASA will use the following principles and guidelines to acquire private lands and resume public lands from private uses, and to adopt and implement the required impact mitigation measures.

While preparing the pipeline layout plans and other civil works, DWASA will consider, to the extent feasible, alternatives with an emphasis on avoiding and / or minimizing adverse impacts on private

[5] Provisions of the Acquisition Ordinance of 1982 and the Act introduced in 2017 do not fully satisfy the requirements of the OP 4.12. Most important of the inadequacies are: the compensation determined in accord with the Ordinance almost always fell much short of the replacement value of the affected lands; no provisions are there to ensure payment and receipt of compensation before the lands are used for works; complete indifference to the post-acquisition short- and long-term socioeconomic changes that the affected households may face; and no provisions for compensation and assistance for PAPs who do not have legal titles to the acquired lands. These inadequacies remain in the 2017 Act; the only difference is that now the affected landowners will be paid three times more of the 'compensation-under-law' determined by using the same methods used under the 1982 Ordinance. But there is no certainty that this will match the replacement value of the affected lands and other replaceable properties.

landowners and those who have been using public lands with and without authorization. To minimize adverse impacts, DWASA will use the following principles:

- Where lands are required, DWASA will consider,
  - Use as much of public lands as possible;
- Avoid or minimize the following:
  - Displacement from homesteads,
  - Loss of lands valued high in terms of productivity and uses,
  - Loss of buildings / structures that are used for permanent business / commercial activities, and
  - Dislocation of encroachers and non-titled (squatters) persons and households.
- Impacts on community facilities, such as educational institutions, places of worship, cemeteries, etc., and buildings / structures that are socially and historically important.
- If technically feasible, DWASA will consider re-aligning / adjusting parts of the pipeline alignment to avoid affecting concentrations of commercial activities.

Option to offer residual lands to acquisition: Where portion of the lands remaining after acquisition becomes economically and residentially unviable, the landowner will have the option to offer the entire parcel to acquisition.

7.8 Impact Mitigation Principles

Where adverse impacts are found unavoidable, DWASA will plan to mitigate them in accordance with the following principles:

- Resettlement of the project affected persons will be planned and developed as an integral part of the project design.
- Absence of legal titles in cases of public land users will not be considered a bar to assistance, especially for the socioeconomically vulnerable groups.
- Vulnerability, in terms of socioeconomic characteristics and ethnicities of the affected persons / households will be identified and mitigated according to the provisions adopted in this SMRPF.
- Homestead-losers, including the poor and vulnerable households squatting on public lands, will be assisted with physical relocation and provision of basic facilities like water supply, sanitation, etc.
- DWASA will negotiate with people, who are economically well-off and use public lands / properties for free, to relinquish occupation of the lands without or with a minimum of financial or any other form of assistance[6].
- Assets like equipment, machineries or parts / components thereof that can be dismantled and moved away intact will not be eligible for compensation, but the owners will be paid the actual costs to dismantle and move them.

[6]It was found under all previous projects that well-off influential people built expensive and durable structures on public lands for their own use or to rent them out to others. They ranged from local politicians, musclemen and other influential persons.

- No compensation will be paid for facing temporary inconveniences by business operators and traders, unless they are required to completely stop their operations during the construction period.
- To ensure sustenance of their income streams, DWASA will undertake measures to find spaces in the vicinities, for the sidewalk vendors to temporarily relocate until the civil works are completed. Or, they will be allowed to move on their own to any vacant spaces they may find suitable.
- Where the project activities cause community-wide impacts, affecting community facilities like educational institutions, places of worship and the like, DWASA will rebuild them with its own resources and / or provide alternatives in consultation with the user communities.

7.9 Eligibility for Compensation/Assistance and Entitlements Matrix

The following categories of PAPs will be eligible for compensation and/or assistance as per the standards adopted in this SMRPF (see the Entitlement Matrix below):

- *Private Landowners*. Persons who have legal rights to the affected lands and other assets, such as houses / structures, trees, etc., built and grown on them.
- *Non-Titled Persons*. Socio-economically vulnerable persons / households who do not have legal rights to the affected lands, but use them for residential, commercial and livelihood purposes.
- *Owners of Displaced Businesses*. Compensation for income loss from businesses that are (i) displaced from private lands and those belonging to DWASA and other public agencies; and (ii) required to temporarily close down during implementation of the civil works. In both cases, compensation / assistance will apply to the actual owners of the affected businesses.
- *Employees of Affected Businesses* -who are employed in the above two types of affected businesses.
- *Rental Income Earners*, from built premises situated on private lands. DWASA will urge those, who earn rental income by erecting buildings on public lands, to relinquish occupation of the lands *without or with a minimum* of financial or any other form of assistance.
- *Leaseholders*. Owners of affected business and other economic activities on formally leased-in public lands, where leases stipulate compensatory conditions in cases when lands are taken back or acquired before lease expiration.
- *Vulnerable Households,* such as those headed by poor women, those with disabled members, and the like.
- *Community and Groups*. Where local communities and groups are likely to lose income earning opportunities or access to crucial common property resources used for livelihood purposes.

7.10 Compensation Principles & Standards

The following principles and standards will be used to determine compensation and assistance for persons / households in the different impact categories:

Acquired Lands and Other Assets

- Replacement costs for an equal amount of land of same use and quality, including the registration costs and stamp duties.
- Replacement costs of houses / structures and other immovable built items (e.g. water supply, sanitation, drainage, etc.) at current market prices of the same building materials, plus the current costs of labour to build them.

- Current market prices of trees and other assets which are irreplaceable.
- Current market prices of crops in the field or on trees, if the lands are used before harvests.
- If the acquired land is agricultural and amounts to 20 percent or more of the total productive lands owned by the affected household, a transition allowance at three times the value of the crops produced a year in the acquired land.

Displacement from Homesteads

- *Displaced from private lands*: Relocation assistance in lands the affected households can personally arrange to buy, or in public lands arranged by DWASA.
- *Displaced from public lands*: Relocation assistance for socioeconomically vulnerable households in public lands arranged by DWASA.
- Provision of pre-acquisition level basic utilities, such as water supply, sanitation, electricity, etc.

Loss of Business, Employment and Rental Income

Temporarily Closed Businesses:

Where business activities come to a complete closure during construction, the owners will be paid for income loss at rates based on average daily net income for smaller of the number of days needed to reopen the individual businesses or complete the civil works.

Partially Affected Businesses:

Where business premises are partially dismantled and the remainders are structurally safe and useable, compensation, calculated as above, for smaller of the number of days needed to repair and reopen the individual businesses, or complete the civil works.

Businesses Completely Displaced from Present Premises:

- Relocation site in public lands, *plus* compensation for 45 days based on average daily net income, OR
- Compensation, calculated as above, for the number of days the business owners need to find alternative locations themselves, which will be paid for a maximum of 90 days.

Loss of Employment Income from Displaced & Temporarily Closed Businesses:

Persons who have been continuously employed by the displaced and temporarily closed businesses for at least six months up to the day of PAP census (cut-off date), will be compensated for the period until their employers restart their operations, or for a maximum of 30 days. The daily rates will be based on their monthly salary or daily wages paid by the employers.

Loss of Income from Rented-out Premises:

Three months' rent at the current rates for loss of rental income from premises affected on private lands.

Leasehold Lands

- *Formally Leased-in from DWASA or Other Public Agencies*: Compensation as stipulated in the lease agreement.
- *Formally Leased-in Khas*: Compensation, if any, stipulated in the lease agreement.

Vulnerable Households

In addition to mitigating the impacts, DWASA will pay transition allowance for a time-period to complete the civil works, or as could be determined from the census data.

Unforeseen Impacts*:* DWASA will adopt and implement policies, in consultation with the affected persons / stakeholders and the Bank, to mitigate any adverse impacts that may have so far remained unknown and not covered in this SMRPF.

Cut-Off Dates. Will be established to identify the nonland assets that will qualify for compensation and discourage abuse of the mitigation policies by defrauding the project. These are the dates on which census of the affected persons and assets are taken. No person or his / her assets will qualify for compensation unless they are recorded in the census taken on the cut-off dates.

7.11 Compensation Payment

In cases of acquisitions, a part of the compensation for lands and other affected assets built or grown thereon will be assessed and paid to the title holding PAPs by the Deputy Commissioner (DC), the heads of the Acquiring Body. If this payment, 'compensation-under-law' (CUL), is found lower than their replacement costs and / or market prices, DWASA will directly pay the difference or 'top-up' to make up for the shortfall.

With and without acquisition, compensations / assistance due to all other PAPs, such as encroachers and non-titled PAPs, business owners and employees and those, who are not covered by the 2017 Acquisition Act, but qualify according to this RPF, will also be directly paid by DWASA.

Top-up Determination and Payment: Where an owner loses lands and other assets in more than one *mouza* or land administration unit, the person will be counted once, and his/her top-up will be paid together. The amount of top-up due to the affected person will be determined by comparing the *total amount of CUL* paid by the DC for lands and other assets acquired at all locations with the *total replacement costs and/or market prices thereof.*

Compensations / entitlements due to the PAPs, including those who are not covered by the acquisition act, but eligible according to this RPF, will be paid in full before commencement of civil works by the contractors.

Based on the principles proposed for impact mitigation, the following matrix defines the specific entitlements for different types of losses, entitled persons, and the institutional responsibility to implement them.

ENTITLEMENT MATRIX

1. Loss of Commercial & Other Lands

Ownership Type	Entitled Person	Entitlement	Responsibility
Private Lands	*Legal Owners,* as determined by DC, or by courts in cases of legal disputes	Compensation-under-law (CUL) or replacement costs, whichever is greater. ***If applicable*** • Top-up equal to the difference between CUL and replacement costs. • Transition allowance (TA) for income loss (see Loss Category 5 below).	• CUL paid by DC • Top-up & TA paid by DWASA
Public Lands (including DWASA's) Under Lease	*Leaseholders*	• Contractual obligations with the public agencies, as determined by DC, and / or • Contractual obligations with DWASA	Paid by DC and/or DWASA

2. Loss of Homestead Lands

Location	Entitled Person	Entitlement	Responsibility
Homesteads on Private Lands	*Legal Owners,* as determined by DC, or by courts in cases of legal disputes	***In addition to CUL & applicable top-up (as for Commercial & Other Lands):*** • Relocation assistance, including land development, where households choose to relocate on their own, or developed plots if they decide to relocate in public lands arranged by DWASA. • Restoration of pre-acquisition level basic utilities (water supply, sanitation, electricity, etc.).	By DWASA
Homesteads on Public Lands	*Vulnerable Non-Titled Persons*	• Relocation assistance, including developed plots in public lands to be arranged by DWASA. • Provision of water supply & sanitation facilities.	By DWASA

3. Loss of Houses/Structures Used for Living, Business & Other Activities

Type & Location	Entitled Person	Entitlement	Responsibility
All Houses / Structures on Acquired Private Lands	*Legal owners,* as determined by DC, or by courts in cases of legal disputes.	• Compensation-under-law (CUL) or replacement cost, whichever is greater. • Transfer Grant (TG) to cover the carrying costs of household goods, at one-eighth of the replacement costs of the affected structures.	CUL paid by DC. TG paid by DWASA

Type & Location	Entitled Person	Entitlement	Responsibility
		• Allowed to keep the salvageable materials.	
Shiftable & Non-shiftable Structures on Acquired Public Lands	*Vulnerable Non-Titled Persons*	• *Shiftable structures*: House Transfer Grant (HTG) and House Construction Grant (HCG), @ BDT 50 per sft of floor area with a minimum of BDT 5,000 and maximum of BDT 8,000. • *Non-shiftable structures*: HCG @ BDT 70 per sft of floor area with minimum of BDT 8,000 and maximum of BDT 10,000. • Allowed to keep the salvageable materials.	HTG and HCG paid by DWASA

4. Loss of Trees on Acquired Private & Public Lands

Location	Entitled Person	Entitlement	Responsibility
On Private Lands	*Legal owners* as determined by DCs, or by courts in cases of legal disputes	• Current market value of trees, based on species, size and maturity. • Current market prices of fruits on trees, if they are felled before harvest. • Owners are allowed to cut the trees and keep them.	By DCs (included in the CUL) and/or By DWASA (included in the top-up)
On Public Lands	*Non-titled Persons*	As those stipulated above for trees and fruits.	By DWASA

5. Loss of Business, Employment & Rental Income

Impact Type	Entitled Person	Entitlement	Responsibility
Business: • *Temporary closure of businesses in existing premises*	*Business Owners* (premise/land owners & tenants)	Compensation, based on daily net income, for the actual number of days the businesses remain closed or needed to complete the civil works, whichever is smaller.	By DWASA
• *Partially affected businesses*	*Business Owners* (premise/land owners & tenants)	Compensation, calculated as above, for the number of days needed to repair and reopen the individual businesses, or complete the civil works, whichever is smaller.	By DWASA
• *Businesses requiring removal from the existing premises and spots*	*Business Owners* (premise/land owners & tenants)	• Relocation site in public lands, *plus* compensation, calculated as above, for the number of days needed to reopen the individual businesses, for a maximum of 45 days, or	By DWASA

Impact Type	Entitled Person	Entitlement	Responsibility
		• Compensation, calculated as above, for the number of days the business owners need to find alternative locations themselves, which will be paid for a maximum of 90 days.	
Loss of employment income	*Business Employees*	Compensation at current daily wage rate for the period needed to reopen the businesses, which will be for a maximum of 30 days.	By DWASA
Loss of income from rented-out premises	*Legal Owners*	Three months' rent at the current rates to the owners of the premises.	By DWASA

6. Unforeseen Losses

Impact Type	Entitled Person	Entitlement	Responsibility
As may be identified during subproject preparation & implementation	*As identified*	As determined in consultation with the Bank and stakeholders.	By DWASA

7.12 Preparation of Impact Mitigation Plan

Once the layout plans for pipelines and other civil works are finalized and land acquisition needs determined, the major preparation tasks will consist of:

- *Land Acquisition Proposals (LAPs).* Where lands from private and public ownerships, excepting those owned by DWASA itself, are to be acquired, LAPs will be prepared as per the standard requirements of the Acquiring Body.
- *PAP Census and Fixing the Cut-off Dates*. To prepare RAPs and ARPs, assess details of the impacts and impacted persons / households with respect, but not limited, to the impact categories and compensation / assistance eligibility criteria proposed in this SMRPF. The dates on which censuses are taken will constitute the cut-off dates for non-titled persons / households, and those on which the legal notice under Section 4 of the acquisition act is served will be the cut-off dates for private landowners. (Private landowners are not allowed to alter appearance of the lands by erecting new structures or otherwise, after the Notice 4 is served.)
- *Market Surveys for Valuation of Affected Assets*. To determine the replacement costs / market prices of lands, houses / structures and other replaceable, and market prices of irreplaceable, affected assets.

7.13 Contents of RAP and ARP

The RPs or ARPs will be prepared in view of the number of persons affected by the civil works under the contracts that will simultaneously go into implementation. *With the principles and guidelines proposed in the RPF, the action plans will include the following*.

Resettlement Action Plan (RAP)

- Description of the civil works to be carried out under the different contracts with location of major impacts, such as land acquisition, displacement / dismantling of buildings, displacement of commercial activities, etc.;
- Results of census survey and summary of impact details (Project Affected Person / household level raw data will be computerized to prepare the entitlement files);
- A brief account of the socioeconomic condition of the persons/households who will be adversely affected;
- An account of the alternatives considered to avoid and / or minimize the adverse impacts;
- An account of the consultations with the affected persons / households about the mitigation measures and implementation procedure;
- Entitlements and entitled persons / households for different types of losses as per the principles and guidelines adopted in this ESMPF;
- An account of households which would be made vulnerable by the project activities that would be carried out under different contracts and the special assistance that are to be provided;
- An account of the vulnerable persons/households who would be more vulnerable by the project activities. These households are likely to be headed by poor women, households with disabled persons, and the like.
- Resettlement budget with breakdowns by loss categories and the number of persons entitled to compensation / assistance, and a RAP implementation schedule.

Abbreviated Resettlement Plan (ARP)

- Documentation of the private and public lands, including DWASA's own, required for the civil works under each contract, affected persons, and valuation of the affected assets;
- Description of compensation and other resettlement assistance that will be provided according to the principles and guidelines adopted in this SMRPF;
- An account of the consultations with the displaced persons/households about acceptable alternatives; and
- A resettlement budget with breakdowns by loss categories and the number of persons entitled to compensation/assistance, and an ARP implementation schedule.

7.14 Community/Stakeholder Consultations

In addition to the community / stakeholder consultations already undertaken, DWASA will again consult the stakeholders, especially the would-be affected persons / households, roadside businesses and others about the adverse impacts that could not have been avoided. DWASA will,

- Consult and provide information to the PAPs on specifics of the mitigation measures and the processes that will be followed to implement them;
- Inform the affected landowners of the legal documents required to claim compensation from DC, and explain the procedure where the landowners may need to have them processed anew (DWASA will actively assist the landowners procure any documents required for CUL payment); and

- Explain the functions and limitations of the Grievance Redress Committees, and how the aggrieved PAPs could lodge their complaints and grievances.

Stakeholder consultation will be carried out throughout the project preparation and implementation period and DWASA will consider stakeholder inputs and feedback to minimize the project's adverse impacts at any stage of the project cycle.

7.15 Documentation

While RAPs / ARPs will include summary of the impacts and impacted persons/households, DWASA, assisted by Design Review and Construction Supervision Consultant (DR&CS) consultant will ensure availability of the following and any other documentations as and when requested by the Bank:

- Minutes of stakeholder consultations undertaken during social screening (and Census of PAPs and affected assets) on the potential adverse impacts that would be caused by land acquisition and displacement from public lands, the mitigation measures adopted in the SMRPF, as well as the implementation procedures, etc.
- Inventory of different categories of PAPs based on social screening and the census of affected persons / households and assets.
- Replacement costs / current market prices of different types of assets, as determined through market price surveys.
- Entitlement files of individual PAPs, with the accounts of losses, CUL payment by DCs, and top-up and any other entitlements payment by DWASA.
- Records of complaints and grievances and the decisions given by Grievance Redress Committees, DWASA, or by LGD under the Ministry of LGRD&C.

7.16 Monitoring and Reporting

Monitoring will consist of an array of steps related to land acquisition, and preparation and implementation of impact mitigation plans. DR&CS consultant will assist DWASA to set up and operate a computerized system to monitor and report progress and performance in land acquisition and resettlement activities. DWASA will provide the Bank with the following information for its review of performance and compliance with the OP 4.12:

- Contract-wise bimonthly updates indicating progress in land acquisition and CUL payment by DC, and any issues that are to be addressed to facilitate the acquisitions;
- Contract-wise bimonthly updates on DWASA's part of the payment: (i) top-up and other applicable entitlements to the CUL recipients; (ii) compensation / entitlements to the affected non-titled persons; and (iii) compensation / entitlements to any other persons / groups not covered in this RPF but found later to be affected by the project.
- Detailed report for Bank's Implementation Support Missions covering the entire resettlement program, which will include, among other information, the latest status of land acquisition and compensation payment by DC and DWASA; implementation of any other stipulations adopted in the RAP; detailed accounts of the GRC activities, including those that are dealing with labour issues; and any issues that are to be addressed to improve performance of the resettlement program.

DWASA will conduct independent Mid-term and End-term reviews to assess (i) how effectively and efficiently impact mitigation plan like RAPs or ARPs have been prepared and implemented; (ii) adequacy of the mitigation policies and measures; and (iii) the extent to which the intended social development objectives have been achieved. For review and concurrence, DWASA will share the consultants' TORs with the Bank.

7.17 Implementation Arrangement & Capacity Building

DWASA will implement the project in its entirety, with all stipulations adopted in this RPF. It will establish a Project Management Unit (PMU) headed by a Project Director (PD) and will staff it, among others, with its own officials who are supposed to have gained valuable experience in the previous Bank-supported project. DWASA has deputized one Social Officer to exercise oversight on the social impacts of the project, and to work directly with staff and management of Project Management Consultant (PMC) and DR&CS to address and comply with the requirements of GoB and World Bank relative to social impacts of the project. The specialist will assist the PD to oversee implementation of this RPF, which includes, among other tasks, (i) Social screening of all project sites; (ii) Census of the project affected persons / households and assets; (iii) Preparation and implementation of the impact mitigation plans like RAP / ARP; (iv) Preparation of land acquisition proposals and track progress in the acquisition process; and (v) Preparation of the bi-monthly updates and those required by the Bank's Implementation Support Missions.

The DSM consultant will have a Social Development Specialist who will perform, jointly with PMU specialist, the tasks described above. In addition, the DSM specialist will be responsible for preparing and implementing the impact mitigation plans like RAP / ARP as required in terms of number of project-affected persons (PAPs), Contract package, or the project as a whole. The DSM consultant may engage an organization to carry out the process tasks, such as social screening; census of PAPs, and affected assets and valuation thereof; preparatory tasks for compensation delivery; and all other tasks that are required in preparation and implementation of RAP/ARP. *The DSM consultant will directly appoint the organization and the lead firm will administer the contract.*

As noted above, DWASA has recently implemented a project with quite complex resettlement issues. Most of its officials who staffed its PMU of the previous project are still there and are most likely to be working in this project. Nevertheless, the project will support training of the DWASA officials who would join the PMU and would variously contribute to the management of social issues, including safeguards.

7.18 Land Acquisition & Resettlement Budget

The borrower will finance the entire resettlement program that will include land acquisition and compensation for various types of losses that would be caused on titled and non-titled persons / households described as "persons eligible for compensation/assistance". The needs for private land acquisition and that of displacement from public lands, as well as the associated impacts thereof will be known after the layout plans and design of the sewer lines are finalized. Choice of technology – micro-tunnel / open cut -- may also have significant cost implications for the project itself, as well as the impacts associated with land acquisition and temporary displacement from public and private lands. Considering the situation DWASA has decided that it would propose a lump sum of BDT 1,160.0 million (USD 13.81 million) in the DPP to carry out the resettlement program. This could be revised as and when required during implementation of the civil works. DWASA will include itemized budgets for land acquisition and resettlement in the RAPs / ARPs which will be subjected to Bank review and clearance.

7.19 Public Disclosure of RPF

As required, the RPF and all impact mitigation plans will be subjected to review and clearance by the Bank. After receipt of the Bank clearance, DWASA will post the RPF and its Bangla translation in its website *before* project appraisal and authorize the Bank to disclose it at its Country Office Information Centre and in its external website. DWASA will also ensure that copies of the document, including the translation, are made available at its headquarters, its site offices, Dhaka South City Corporation (DSCC) and Dhaka North City Corporation (DNCC) and their wards, public libraries and other places accessible to the public. As to disclosure, DWASA will inform the public by notification in two national newspapers (Bangla and English) about this RPF and where it could be accessed for review and comments.

8. World Bank Corporate Commitments

Gender and Citizen Engagement are two overarching corporate commitments of the World Bank. Bank-funded projects like DSIP are required to design the projects in manners that ensure participation of women in decision-making and, more importantly, share in the socioeconomic benefits they bring about. The other concern is Citizen Engagement that requires much wider participation of project beneficiaries, including women, civil society organizations and similar entities, and the public. DWASA will address both Gender and Citizen Engagement issues under the proposed project.

8.1 Addressing Gender Issues

By visiting various project sites, it is estimated that currently a very small proportion of women work at construction sites, providing ancillary services (cooking and cleaning) and as unskilled laborers. It is widely known that safety in the workplace is one of the most important barriers for more employment opportunities in construction. As a result, they are deprived of the income they could have earned by working on jobs that don't need that much of skills. Women in general stay away, or not allowed by their families, from works where incidence of gender-based violence (GBV) and sexual exploitation and abuse (SEA) is likely to be higher. In the proposed project, DWASA will address this by gender sensitization and awareness raising campaign to the contractors, sub-contractors, labor suppliers and other project related agencies on (i) Gender-Based Violence/Sexual Exploitation and Abuse (GBV/SEA), including safety of women in the work place and how the female workers should be treated in the construction sites to ensure their safety and dignity; and (ii) increasing the proportion of the female workers and promoting "equal pay for equal work". *The proposed project is gender-tagged*. While ensuring safety, this will require DWASA to address two gender-related issues as confirmed by the gender analysis: (i) gap in access to safe and reliable sanitation facilities and time spent in addressing the health burden of poor sanitation; and (ii) gender gap in employment in the sector.

Gender Gap in Sanitation*:* Evidence shows there are gender differences in sanitation decision making, facility use, construction and maintenance. Yet there is little evidence on gender equity in participation and leadership. Women's participation in sanitation policy- and decision-makings remarkably limited. This eventually leads to gender-related gaps across the value chain (Gates Foundation, 2017). Measurement and evaluation in the sector is most often limited to access and use, with very limited attention to gender-disaggregated data and much less consideration for participation and empowerment. To overcome these gaps, the project will employ a two-fold strategy: (i) DWASA will be encouraged to engage with women as a part of their communication campaign to ensure that their specific service needs are responded to and (ii) the project will develop specific indicators to record gender-disaggregated data on access and participation.

Gender Gap in Employment: DWASA is meant to provide water supply and sanitation services to some 15 million people in the city. It is however recognized that various constraints -- financial and others -- have long prevented the agency to operate at a level that could be considered satisfactory. Yet, regardless of the persistent operational difficulties it faces, there is one inequity that clearly stands out: DWASA employs far fewer women at any level of operation. Being the largest and Capital of the country, the city has plenty of women with variety of technical and other expertise, as well as those who are at the lowest socioeconomic strata -- always in search livelihood. In this regard, the project will encourage DWASA to employ as many women as possible in the sector as a whole, and especially in the new jobs that the project would create. DWASA will set a target in consultation with Bank's task team.

8.2 Citizen Engagement Strategy

DWASA's citizen engagement strategies will include (i) Community / Stakeholder Consultations as the primary tool to promote stakeholder participation in the project design and implementation process; (ii) A Grievance Redress Mechanisms (GRM) to respond to the needs of beneficiaries and to address and resolve grievances and complaints regarding implementation of the stipulations adopted in this RPF, as well as other issues that are of significance, but may have been overlooked by the decision-makers. The second GRM will deal *exclusively* with issues that involve workers employed by the Contractors for site development, construction and other activities. (iii) Citizen Report Cards that will assess community / stakeholder satisfaction and generate beneficiary feedback on social outcomes of the project.

The project will support DWASA to ensure citizen engagement throughout its implementation period and monitor their involvement in decision-making. Building community awareness and gathering beneficiary feedbacks will be carried out through open community meetings, workshops, etc., by widely publicizing these events using leaflets/brochures and other communication means. The project will track progress in ensuring citizens engagement by measuring proportion of the beneficiaries are aware of what were supposed to be done and are satisfied with DWASA's actual performance on the ground. Below are elaborations of citizen engagement strategies that would be used by the project.

Community/ Stakeholder Consultation*: C*onsultations[7]were undertaken with local people during Social Impact Assessment. Participants included various stakeholder groups, such as business owners and others in permanent buildings, titled and non-titled households living by the Trunk Main alignment; roadside vendors selling vegetables, fruits and various other perishables sitting in groups and alone in the open; and pedestrians. The main topics of consultations were project objectives, its scope of work and, most importantly of its socioeconomic implications consisting of adverse impacts that would be caused during implementation of civil works, as well as the possible mitigation measures that DWASA would implement. The participants were also informed of the grievance redress mechanism (GRM) and grievance redress committees (GRC) and, if needed, how they could lodge grievances and complaints to the GRCs.

Stakeholder consultations will continue throughout the project preparation and implementation period. A Social Screening instrument has been designed to have participation of local residents, including those who are among the would-be affected persons. Census of affected persons and properties will also provide opportunities to have face-to-face discussions with the affected persons/households. Consultations will continue during implementation of RPs / ARPs and will focus more and more on those who have been affected.

8.3 Grievance Redress Mechanism

DWASA will establish a Grievance Redress Mechanisms (GRMs) for the project to receive, investigate and address concerns and complaints from PAPs and others who will be affected due to land acquisition and displacement from private and public land and any related project activities DWASA will constitute

[7] Consultation is defined as a continuous two-way communication process consisting of: "feed-forward" the information on the project's goals, objectives, scope and social impact implications to the project beneficiaries, and their "feed-back" on these issues (and more) to the policymakers and project designers. In addition to seeking feedback on project-specific issues, participatory planning approach also serve the following objectives in all development programs: public relations, information dissemination and conflict resolution.

Grievance Redress Committees (GRCs) at locations that would be easily accessible to the people who are likely to be affected by the project, as well as the workers who would be engaged by the Contractors. The GRM that has been in use will deal with the complaints and grievances about any irregularities in applying the provisions adopted in this RPF, as well as other issues transpiring from the project activities. The complaints may range from land- and displacement-related issues, compensation payment to various inconveniences created by pipeline installation works (e.g., open cut canals) for pedestrian and vehicular movements. Based on consensus, the GRCs will basically try to resolve grievances / complaints amicably and quickly to facilitate implementation of the civil works.

Where decisions made at the field/subproject levels are found unacceptable by the aggrieved persons and complainants, GRCs will refer such unresolved cases to the PMU with details of the complaints and hearings, for a decision by the Project Director. If a decision made at PMU level still remains unacceptable, the case will be referred to the Local Government Division (LGD) of the line ministry for review and final decision. *A decision accepted by an aggrieved person at any level of hearing will be binding on DWASA. It is also important to note that the GRM does not pre-empt an aggrieved person's right to seek redress in the courts of law.*

GRC memberships, as suggested below, will be gender-representative. Female members will account for at least a third of the total number of GRC members. The GRCs at the field/subproject levels will have the following memberships.

GRC Membership at Project / Subproject Level

a) Executive Engineer in charge of the Work/Contract Package (Convener – non-voter)
b) Elected Member of DSCC/DNCC (or Union Parishad/Upazila Parishad) -- Voting Member
c) Elected Female Member of DSCC/DNCC (or Union Parishad/Upazila Parishad) -- Voting Member
d) Female teacher of local High School/College -- Voting Member
e) Representative of the affected persons -- Voting Member
f) Representative of any CSO working in the area -- Voting Member
g) Social/Environmental Specialist of DR&SC Consultant (Member Secretary – non-voter)

GRC Membership at PMU Level

a) Project Director
b) Executive Engineer in charge of Work/Contract Package (Member Secretary)
c) Social/Environmental Specialist of DR&CS Consultant
d) Social Officer at the PMU

One of the DWASA officials overseeing RPF implementation under a Contract Package will be given the responsibility to receive, review and sort the cases in terms of nature of grievances/complainants and urgency of resolution, and schedule hearings in consultation with the GRC convener. All cases at the GRC level will be heard within three weeks of their receipt; but those related to financial matters for poor and vulnerable will be heard in two weeks or earlier. For the cases reviewed at PMU, decisions will be communicated to the field/subproject level GRCs in one week. Decisions, if any, on unresolved cases at the LGD level will be made in no more than four weeks.

To ensure that grievance redress decisions are made in formal hearings and in a transparent manner, DWASA will adhere to the following guidelines:

- The person designated by DWASA/Convener will receive all grievance redress applications without making a judgment about merits of the complaints. DWASA / Convener will maintain a *Grievance Register* containing all complaints regardless of their merits.
- The designated person will give the complainants signed receipts with their names, addresses, dates, and brief descriptions of the complaints, and will officially inform the complainants about the hearing dates and venues.
- Reject a grievance redress application with any recommendations written on it by a GRC member or others, such as politicians and other influential persons;
- Remove a recommendation by any person that may have been written separately and submitted with the grievance redress application;
- Disqualify a GRC member who has made a recommendation on the application or separately before the formal hearing;
- Where a GRC member is removed, appoint another person in consultation with the Project Director, and keep the World Bank informed about the change and the reason to do so; and
- The convener will also ensure strict adherence to the impact mitigation policies and guidelines adopted in this RPF and the mitigation standards, such as compensation rates, established through market price surveys.

To ensure impartiality and transparency, hearings on complaints will remain open to the public. The GRCs will record the details of the complaints, the reasons that led to acceptance or rejection of the individual cases, and the decisions agreed with the complainants. DWASA will keep the records of all resolved and unresolved complaints and grievances and make them available for review as and when asked for by the World Bank and other interested entities / persons.

8.4 Labour Issues: Employment, Living Accommodation and Treatment

Living accommodation for low-skilled workers, who are often large in numbers, is always left to labour suppliers or *sardars* who are extremely reluctant to provide the basic amenities required to live in a reasonably safe and hygienic environment. Labour requirements for individual Contract packages will remain unknown until the scope and designs of the civil works are finalized. But to ensure safe and hygienic conditions in the "labour camps/sheds", DWASA and the Contractors will address the following issues -- *as separately applicable for male and female workers:*

- Identifying alternative locations where labour camps could be set up during implementation of the civil works under each Contract / Work package. Wherever possible, labor camps should be away from residential neighbourhoods, to avoid potential discord and confrontations with the local residents;
- Ensuring hygienic living conditions with clean drinking water, sanitation and washing and other facilities. Drinking waters from shallow tube-wells must be tested for contamination (presence of arsenic, e.g.) and the test results must be preserved for inspection;

  The contractor / labor sardars will ensure cleanliness of the sanitation and washing facilities through appropriate arrangement with the users.

- Ensuring measures required for safety and dignity of female workers in terms of living accommodation, sanitation and washing facilities, etc.;
- Ensuring that the contractors / labor sardars do not employ child labourers who are under 14 years of age;
- Preventing confrontation of workers with the local communities who might adversely react to the presence of nonlocal laborers (It is to be noted that contractors do not like to hire local laborers who might protest working extra hours without pay and other forms of exploitation); and
- Preventing exposure to health risks linked to Sexually Transmitted Diseases (STDs).

9 Project Institutional Framework

DWASA will be responsible for the overall management, supervision, and execution of the Project through a Project Management Unit (PMU). PMU will be established, and a full-time Project Director (PD) in the rank of the additional chief engineer will be appointed.

9.1 Institutional Arrangements for ESIA Preparation and Implementation

The overall responsibility of environmental and social performance including ESMP and RAP implementation of the Project will rest with the PMU. Institutional arrangements for safeguard implementation of the Project are given in **Figure 9.1**. DWASA has an existing 'Social, Environmental and Communication Division', which needs to be strengthened for the management of environmental and social impacts of the Project. PMU will hire or deputize environmental and social staff and engage consultants for preparation of safeguard instruments for the proposed subprojects and ensure their effective implementation.

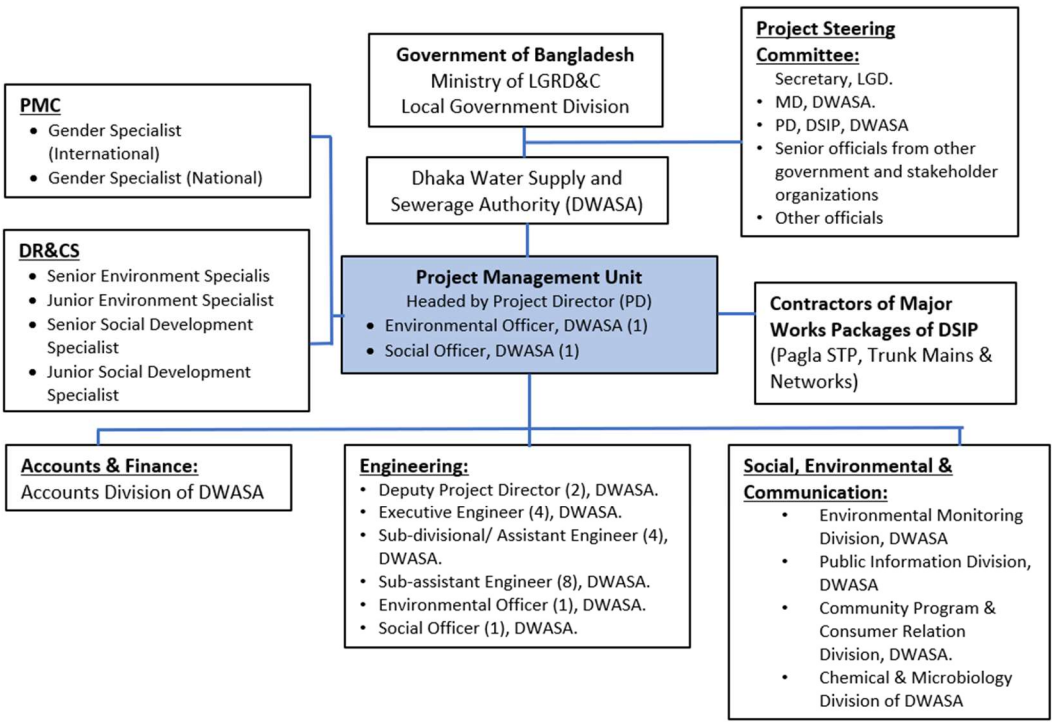

Figure 9.1: Organogram for Environmental and Social Management of the Project

Details of environmental and social staff associated with various consultants and contractors to be engaged under the Project are summarized below:

- **Designated Environmental and Social Staff in the PMU.** DWASA will designate Environmental and Social Officers. The officers, working at the PMU, will over the implementation of the environmental and social management commitments of the project and work closely with the DR&CS and contractors to implement ESMPs. They will compile quarterly monitoring reports on

ESMP and RAP/ARP compliance, to be sent to the Project Director and also share with the World Bank, throughout the construction period. Terms of references for the environmental and social staff of PMU is given in **Annex 10**.

- **ESIA Consultants.** PMU has already procured services of a consulting firm for preparation of ESIA in the preparatory stage of DSIP.
- **Project Management Consultant (PMC**): The PMC team will consist of an environmental specialist and a social specialist. They will support the PMU staff in carrying out their responsibilities.
- **Feasibility Study Consultant**: The Feasibility Study Consultant was responsible for preparation of bidding documents for (i) Design-Build-Operate (DBO) bidding documents for procurement of contractors for construction of STP and (ii) Design-Build (DB) bidding documents for procurement of contractors for construction of sewerage network.
- **Design, Review and Construction Supervision (DR&CS) Consultant:** The DR&CS will ensure adherence to the design parameters including quality requirements, as well as all ESMP and RP/ARP measures related to construction. DR&CS will consist of four environmental and social specialists: 2 senior specialists supported by two junior specialists
- **Contractors:** DBO/DO Contractors for Component 2 and the other Contractors for Component 3 will also have adequate environmental, health and safety specialists to implement the Environmental, Resettlement and Social Management Plans of the ESMP and RP/ARP.

Roles and responsibilities of PMU's environmental and social staff and consultants for environmental and social management of the Project are given in **Table 9.1**.

Table 9.1: Roles and Responsibilities in Environmental and Social Management of the Project

Organizations	Responsibilities
PMU	• Ensure that all project activities are well-managed and coordinated. • Recruitment of consultants for ESIA studies; and approval of ESIA by the DOE and WB • Procurement of works and goods. • Payment of compensation to the project affected households • Recruitment and supervision of Consultants
E&S Staff within PMU	• Screening and determining the scope of ESIA work required for subprojects, reviewing consultant deliverables related to environmental assessment, reviewing bid documents for inclusion of ESMP and any applicable RP/ARP measures, supervising construction activities, producing periodic monitoring reports, • Supervising DR&CS for the implementation of ESMP and RP/ARP • Closely coordinate with other concerned agencies, local governments and communities to support the implementation of ESMP and RP/ARP
Project Management Consultant	• Support the E&S staff of PMU in carrying out their responsibilities • Review of ESIA reports prepared by ESIA Consultants • Ensuring inclusion of ESMP in bidding documents • Providing training on ESMP principles and requirements to DR&CS, contractors, DWASA field staff, and others as needed to ensure effective implementation of ESMP and RP/ARP
ESIA Consultants	• Carrying out ESIA studies in compliance with the GoB and World Bank guidelines following the EMF • Preparing ESMP for inclusion in the bid documents
DR&CS	• Supervise civil works, ensuring compliance with all design parameters including quality requirements and ESMP implementation • Prepare monthly reports and submit to PMU

Organizations	Responsibilities
	• DR&CS will have dedicated environmental and social staff
DBO/DB Contractor	• Mainstreaming environmental and social issues in the subproject designs • Prepare construction environmental action plans with site-specific mitigation measures. • implementation of mitigation and monitoring measures proposed in the ESMP and RP/ARP • Each contractor will recruit an Environmental, Health, and Safety Manager, who will be responsible for implementing the contractors' environmental, health and safety responsibilities, and liaising with government agencies. S/he will have an adequate environmental, social, health and safety staff.

9.2 Capacity Building and Training

Capacity building programs will be conducted to all the Project staff including engineers and relevant stakeholders during initial stages of the Project to sensitize them on the management of environmental and social issues, and to build the requisite capacities.

The proposed training plan is given in **Table 8.2** DWASA will engage a training consultant to deliver the training programs. At the construction site, DR&CS will take the lead in implementing the capacity building plan, though the contractors will also be responsible for conducting training for their own staff and workers. The various aspects that are covered under the capacity building will include general environmental and social awareness, key environmental and social sensitivities of the area, key environmental and social impacts of the project, ESMP requirements, OHS aspects, and waste disposal. Table 9.2 provides a summary of various aspects of environmental and social trainings to be conducted at the construction site. PMU may revise the plan during the project implementation as required.

Table 9.2: Environmental and Social Training Programs

Contents	Participants	Trainer	Schedule
General environmental and socioeconomic awareness; Environmental and social sensitivity of the project influence area; Key findings of the ESIA; Mitigation measures; EMP; RPF and RP/ARP Social and cultural values of the area.	The selected staff of PMU, DWASA (Assistant Engineer, Sub-Divisional Engineer, Executive Engineer and Project Director) including personnel from the Environment Monitoring Division, Public Information Division and Community & Consumer Relationship Division.	DWASA Training Institute will hire appropriate local expert	Before the start of the project activities. (To be repeated as needed.)
General environmental and socioeconomic awareness; Environmental and social sensitivity of the project influence area; Social safeguard mitigation measures, as adopted in the RPF; Community issues;	DWASA personnel including Sub-Assistant Engineers & Assistant Engineers who will in charge of Operation & Maintenance and local associate consultants and the Engineers from the local contractor	DR&CS E&S Staff	During project implementation (To be repeated as needed.)

Contents	Participants	Trainer	Schedule
E&S issues associated with the construction works ESMP, RP/ARP and Corporate Concerns as described in the ERSMF – GBV and SEA on the part of all who will deal the male and female workers (Contractors, labor sarders, and the like) Workers health and safety	Construction crew	Contractors EHS Staff	Prior to the start of the construction activities and during the construction activities (To be repeated as needed.)
Workshop/seminar to disseminate basics of ESMP, RPF and RP/ARP, Corporate Concerns about gender issues and citizen engagement, etc.	City Corporations (DNCC & DSCC), RAJUK, Dhaka Metropolitan Police (for traffic management), BPDB, local councilors, elites of the localities, social women organizations, etc.	DR&CS and Contractor	During initial stages of construction (to be repeated as needed)

9.3 Budget for Preparation and Implementation of ESIA and RAP

Tentative cost estimates for preparation and implementation of ESIA are given in **Table 9.3**. However, the budget for land acquisition and resettlement will be known only when the subproject locations and construction methodologies are finalized. Considering the situation DWASA has decided that it would propose a lump sum of BTD 1160.3 million (USD 11.72 million) in the project cost estimates. This could be revised as and when required during the implementation of the civil works. Detailed cost estimates will be provided in the RAPs of respective subprojects.

Table 9.3: Proposed Budget for Preparation and Implementation of ESIA and RAP/ARP

Item	Quantity	Unit Rate, USD	Total, USD
Consultants for preparation of ESIA and RAP/ARP for 4 sub-projects	4	100,000	400,000
Environmental and Social Monitoring and Reporting during the implementation of 4 sub-projects	4	100,000	400,000
Consultations, capacity building and training programs for 4 sub-projects	4	25,000	100,000
Third-party Auditing	4	25,000	100,000
Total			1,000,000

10 Stakeholder Consultations and Disclosure

10.1 Consultation Meetings

Public consultations were carried out during the preparation of this ERSMF. Eleven consultation meetings were conducted from May 23, 2018 to June 02, 2018 in the Pagla STP catchment area. A total of 414 people (385 male and 29 female) participated in these consultation meetings. Details of the consultation meetings are given in **Table 10.1** and photographs of these meetings are given in **Annex 11**.

All of the meetings were held at easy accessible public places including Union Parishads, Ward Councillors' office, School, Community Centre, etc. where all categories of people were present. The participants in these meetings were public representatives (Ward Councillors, Union Parishad Chairman, Member, Secretary), Businessmen, and Local Communities including women.

The purpose of the consultation meetings was to present the overall project interventions to the stakeholders and know their concern and expectations regarding the project. During consultations, a Bangla Leaflet was disbursed among the participants to disseminate the message of the project and make aware of the project as well. A presentation was made on the current scenario of the sanitation system, proposed Project interventions, potential environmental impacts and risks, and the planned mitigation measures.

Table 10.1: Details of Public Consultation Meetings

Sl. No.	Location	Date
1	Matuail UP	23/05/2018
2	Sonir Akhra/ Dania	23/05/2018
3	Armanitola	24/05/2018
4	Narinda	24/05/2018
5	Meradia	26/05/2018
6	Manda UP	27/05/2018
7	Shahjahanpur	27/05/2018
8	Mugda	29/05/2018
9	Shyampur	30/05/2018
10	Mugda 2nd	02/06/2018
11	Lalbagh	02/06/2018

10.2 Feedback from the Stakeholder

All the participants of the meetings have largely welcomed the Project interventions. However, they have raised some concerns which are summarized in **Table 10.2**.

Table 10.2: Feedback on Consultation Meetings

Feedback from Stakeholders	Actions by DWASA
Existing sewerage system of DWASA is not functional, which is a potential source of contamination of drinking water as well as existing drainage system /canal particularly in the Matuail area;	Existing sewerage system will be rehabilitated under the Present Project which will minimize the contamination of water resources

Feedback from Stakeholders	Actions by DWASA
There is serious lack of awareness by the residents, who are responsible for indiscriminate dumping of solid wastes in the drainage khal of Maradia area;	Dhaka North City Corporation and Dhaka South City Corporations are working on raising awareness about solid waste management.
Construction of the Project will be quite challenging due to massive traffic congestion. The Project needs to adopt an appropriate measure to reduce nuisance during construction; Works should be done in such a manner that public nuisance and risks of the accident are minimized.	Nuisance from construction activities, particularly traffic management, noise and vibration will be addressed the subproject ESIAs and mitigation measures will be implemented during construction. Measures for protection of community safety (e.g., installation of barricades around the excavated areas) will be considered during construction. DWASA is also considering the micro-tunneling option for laying of pipelines to minimize public nuisance.
Participants raised concern on how every household, particularly in the narrow lane area, will be connected to the main sewer system. Almost all households want to connect to the sewer network.	Sewerage network will be extended to all feasible areas. If not, no-network sanitation facilities will be provided. As per the sewerage master plan, around 65% of Pagla STP catchment area can be connected by sewer lines. Rests of the areas will be brought under non-network sanitation coverage.
After completion of the pipeline works, roads should be restored to the original condition.	The roads disturbed by the construction activities will be restored by DWASA
Contractors generally do work as per specification and have little regards to environment	ESMP will be included in the contract documents, and DWASA will ensure its implementation
Issue prior notice/announcement regarding the development intervention	Public will be informed in advance about the construction activities.
If there are any land acquisition and resettlement, affected people should be paid proper compensation. Local communities should be given preference for employment opportunities.	A compensation plan is developed and presented in this ERSMF.

10.3 Access to Information

This ERSMF will be disclosed on both DWASA and World Bank websites. Executive summary of the ERSMF and the Entitlement Matrix (given in Section 7.4.3) will be translated into Bangla and will be published on the DWASA website, and hard copies of these documents will be made available at local DWASA offices for public access. The ESIA and RAP documents to be prepared for proposed subprojects will also be disclosed on the DWASA and World Bank websites and also will be made available to the local communities by placing them at the local DWASA offices.

Annex 1: Environmental Screening Checklist

Environmental Screening Form 1: Trunk Main by Open Excavation

Sub-project Work Package Name and Location			
Layout of Trunk Main		Attachment A: layout map	
a)	Does the alignment crosses water bodies If yes locate on layout map	□ Yes	□ No
b)	Does the alignment crosses rail crossing If yes locate on layout map	□ Yes	□ No
c)	Does the alignment crosses road crossing If yes locate on layout map	□ Yes	□ No
d)	Does the alignment crosses bridge crossing If yes locate on layout map	□ Yes	□ No
e)	Does the alignment crosses storm water drainage channels If yes locate on layout map	□ Yes	□ No
f)	Does the alignment crosses drainage box culverts If yes locate on layout map	□ Yes	□ No

Environmental Screening Checklist

Screening Questions	Yes	No	Scale of Impact			Remarks/Possible Negative Impact and Assessment (S/M/I/N)*
			High	Medium	Low	
Potential Environmental Impact during planning and design phase/subproject siting (Adjacent/within/closed)						
Protected area (Forest)						
Wetland						
National park						
Wildlife sanctuary						
Buffer zone of the protected area						
Special area for protecting biodiversity						
Environmental Conditions						
Will be subproject activities cause negative effects on rare (vulnerable), threatened or endangered species of flora or fauna or their habitats?						
Is the construction being carried out in an ecologically sensitive area?						
Is there a possibility of loss of natural floral or faunal habitats?						
Will the project be carried out in a groundwater depleted zone?						
Will there be negative effects on designated wetlands?						
Is there water logging in the subproject area?						
Will the construction activities cause water logging in the subproject area?						
Is there possibility of GW water contamination by subproject activities?						

Screening Questions	Yes	No	Scale of Impact			Remarks/Possible Negative Impact and Assessment (S/M/I/N)*
Negative effects on locally important or valued ecosystems or vegetation?						
Destruction/felling of tress and cutting of vegetation?						
Negative effect on surface water quality/surface water pollution?						
Demolish of existing building or loss of property, economic livelihood?						
Negative impact on soil stability and compactness in the subproject area?						
Potential Environmental impacts during construction						
Will dust and vibration-generating equipment be used?						
Will the excavation/trenching works and movement of vehicles generate air pollution?						
Will there be noise pollution during the construction?						
Will fuel and/or hazardous goods be used in construction activities?						
Will fuel and/or hazardous substances be stored at the construction site?						
Is there a possibility of discharging liquid effluent/slurry from the construction site?						
Will construction materials be stockpiled near surface waters, and natural water courses?						
Will construction activities affect the natural drainage pattern of the site (e.g. filling up low-lying area/land)?						
Will earthwork (earth excavation, backfilling, stockpiling of excavated soil) involved in construction activities?						
Is there a possibility of water stagnation at the construction site?						
Will there be traffic congestion due to construction materials transport and wastes generated?						
Will the construction involve blocking of roads (e.g. sewer laying)?						
Will any archaeological and historical structures be affected?						
Will any structure(s)/ entity(s) (e.g., shops) be temporarily affected during subproject activity?						
Environmental and Social Risks						
Is significant movement of vehicles involved during construction activities?						
Increased wind-blown dust from material storage areas?						

Screening Questions	Yes	No	Scale of Impact			Remarks/Possible Negative Impact and Assessment (S/M/I/N)*
Is there a safe source of drinking water and adequate sanitation facilities available for the workers at or near the construction site?						
Is there health risks to labors involved in construction activities?						
Is there health risks to the neighboring people of the subprojects area?						
Potential Operational Risks						
Is there enough capacity to monitor the working condition of the sewerage facility or infrastructure?						
Is there any risk of surface and groundwater pollution from the subproject?						
Is there a risk to safety and human health to neighborhood community other than workers?						
Will the subproject affect the way of life adversely and restrict access to common property resources of any indigenous people?						
Negative effects on local business, institutes or public facilities?						

*S = Significant; M = Moderate; I = Insignificant; and N = None.

Comments:

Prepared by: (Name, designation, mobile number, signature, date)

Reviewed by: (Name, designation, mobile number, signature, date)

Environmental Screening Form 2: Trunk Main by Micro-tunneling

Sub-project Work Package Name and Location			
Layout of Trunk Main		Attachment A: layout map	
a)	Does the alignment crosses water bodies If yes locate on layout map	□ Yes	□ No
b)	Does the alignment crosses rail crossing If yes locate on layout map	□ Yes	□ No
c)	Does the alignment crosses road crossing If yes locate on layout map	□ Yes	□ No
d)	Does the alignment crosses bridge crossing If yes locate on layout map	□ Yes	□ No
e)	Does the alignment crosses storm water drainage channels If yes locate on layout map	□ Yes	□ No
f)	Does the alignment crosses drainage box culverts If yes locate on layout map	□ Yes	□ No

Environmental Screening Checklist

Screening Questions	Yes	No	Scale of Impact			Remarks/Possible Negative Impact and Assessment (S/M/I/N)*
			High	Medium	Low	
Potential Environmental Impact during planning and design phase/subproject siting (Adjacent/within/closed)						
Protected area (Forest)						
Wetland						
National park						
Wildlife sanctuary						
Buffer zone of the protected area						
Special area for protecting biodiversity						
Environmental Conditions						
Will be subproject activities cause negative effects on rare (vulnerable), threatened or endangered species of flora or fauna or their habitats?						
Is the construction being carried out in an ecologically sensitive area?						
Is there a possibility of loss of natural floral or faunal habitats?						
Will the project be carried out in a groundwater depleted zone?						
Will there be negative effects on designated wetlands?						
Is there water logging in the subproject area?						
Will the construction activities cause water logging in the subproject area?						
Is there possibility of GW water contamination by subproject activities?						
Negative effects on locally important or valued ecosystems or vegetation?						

Screening Questions	Yes	No	Scale of Impact			Remarks/Possible Negative Impact and Assessment (S/M/I/N)*
Destruction/felling of tress and cutting of vegetation?						
Negative effect on surface water quality/surface water pollution?						
Demolish of existing building or loss of property, economic livelihood?						
Negative impact on soil stability and compactness in the subproject area?						
Potential Environmental impacts during construction						
Will dust and vibration-generating equipment be used?						
Will the excavation/trenching works and movement of vehicles generate air pollution?						
Will there be noise pollution during the construction?						
Will fuel and/or hazardous goods be used in construction activities?						
Will fuel and/or hazardous substances be stored at the construction site?						
Is there a possibility of discharging liquid effluent/slurry from the construction site?						
Will construction materials be stockpiled near surface waters, and natural water courses?						
Will construction activities affect the natural drainage pattern of the site (e.g. filling up low-lying area/land)?						
Will earthwork (earth excavation, backfilling, stockpiling of excavated soil) involved in construction activities?						
Is there a possibility of water stagnation at the construction site?						
Will there be traffic congestion due to construction materials transport and wastes generated?						
Will the construction involve blocking of roads (e.g. sewer laying)?						
Will any archaeological and historical structures be affected?						
Will any structure(s)/ entity(s) (e.g., shops) be temporarily affected during subproject activity?						
Environmental and Social Risks						
Is significant movement of vehicles involved during construction activities?						
Increased wind-blown dust from material storage areas?						

Screening Questions	Yes	No	Scale of Impact			Remarks/Possible Negative Impact and Assessment (S/M/I/N)*
Is there a safe source of drinking water and adequate sanitation facilities available for the workers at or near the construction site?						
Is there health risks to labors involved in construction activities?						
Is there health risks to the neighboring people of the subprojects area?						
Potential Operational Risks						
Is there enough capacity to monitor the working condition of the sewerage facility or infrastructure?						
Is there any risk of surface and groundwater pollution from the subproject?						
Is there a risk to safety and human health to neighborhood community other than workers?						
Will the subproject affect the way of life adversely and restrict access to common property resources of any indigenous people?						
Negative effects on local business, institutes or public facilities?						

*S = Significant; M = Moderate; I = Insignificant; and N = None.

Comments:

Prepared by: (Name, designation, mobile number, signature, date)

Reviewed by: (Name, designation, mobile number, signature, date)

Annex 2: Terms of Reference for the ESIA (Approved from DOE)

Government of the People's Republic of Bangladesh
Department of Environment
Head Office, Paribesh Bhaban
E-16 Agargaon, Dhaka-1207
www.doe.gov.bd

Memo No: 22.02.0000.18.72.44.18 . 214 Date: 18 /04/ 2018

Subject: Approval of Terms of Reference (TOR) for Environmental Impact Assessment (EIA) in favour of Preparatory Activities of Dhaka Sanitation Improvement Project (PADSIP), Dhaka WASA.

Ref: Your application on 27/03/2018.

With reference to your letter dated 27.03.2018 for the subject mentioned above, the Department of Environment hereby gives approval of TOR for Environmental Impact Assessment (EIA) in favour of Preparatory Activities of Dhaka Sanitation Improvement Project (PADSIP), Dhaka WASA subject to fulfilling the following terms and conditions.

1. Dhaka WASA shall conduct a comprehensive Environmental Impact Assessment (EIA) study considering the overall activity of the said Project in accordance with the TOR submitted to the DOE and additional suggestions provided herein.
2. The EIA report should be prepared in accordance with following indicative outlines:

1. Executive summary
2. Environmental Baseline Data

2.1. Project Data Sheet

a. **Project location and area**
The location of the project and area involved

b **Project Concept**
An outline of description of the concept and objectives of the project, the types of activities expected, and the development plans for achieving the objectives.

c **Project Components**
Components of the project concerning the types of activities proposed to be located in the area, the number and distribution of underground and overhead tanks, other infrastructure, utilities and service requirements.

d **Project Activities**
A list of the main project activities to be undertaken during: site clearing and construction, operation of activities and associated developments.

e **Project schedule**
The phase and timing for development of the surface water treatment plant, transmission line, underground and overhead tanks in Khulna, infrastructure and other facilities required.

f **Resources and utilities demand**
Resources required to develop the project, such as soil and construction material and demand for utilities (water, electricity, sewerage, waste disposal and others), as well as infrastructure (road, drains and others) to support the project.

Mr. Salim, EE. 06/05/18

2.2. Physical and chemical components

a **Map and survey information**
Location map
Cadastral map showing land plots (project and adjacent area)
Topographic map for identifying catchment boundaries, general land use and terrain survey map showing contour information
Aerial photograph

b **Geology and soil**
Geological map showing geological units, fault zone, and other natural features
Soil map and soil profile analysis. This may only be established from soil survey and geotechnical investigation (important for analysis for soil stability, cut and fill)
Soil properties and composition

c **Hydrology and drainage**
Catchment boundaries of rivers/lakes/canals which drain the project
Hydrological characteristics of rivers in and around the project area, including flow, salinity and sediment load for varies return period
Flood characteristics and historical records of flood events covering areas affected, height of flood and frequency
Ground water potential and aspects of aquifer, such as recharge zones, ground water abstraction etc.
Drainage system and drainage characteristics in the project area
Coastal zone characteristics

d **Water quality and use**
Water quality of the receiving water bodies likely to be affected by the project
Beneficial uses of the water need to be established for rivers or any other water bodies likely to be impacted by the development. The locations of these water utilization should be identified in the map
Sources of pollutants from existing and known future activities within the catchment of the rivers

e **Air quality and noise**
Baseline data of the project site with respect to air quality and noise level
Air pollutant and noise sources from existing and known sources

2.3. Ecological components

a **Habitats**
Aquatic habitat likely to be impacted by the project
Terrestrial habitat likely to be impacted by the project

b **Species and Population**
Identification of population of flora and fauna to assess their conservation status of being rare, endemic and endangered
Identification of population of flora and fauna to assess their conservation status of being rare, endemic and endangered
Biodiversity of the project site

2.4. Social and Economic Factors

a **Population**

Population within and around the project area
Organizational structure of communities and the degree of public awareness and response to the proposed project

b **Human settlement**
Size and distribution of human settlement
Community infrastructure, utilities and services available
Housing and future requirements within the impacted area
Historical/archaeological features of significance

c **Economic activities**
Economic activities of population in and around the project area. Activities should include those that are dependent on resources which may be impacted by the project
Income dependence on economic activities impacted directly or indirectly by the project
Employment and economic returns to the population by the project

2.5. Infrastructure and utilities

a Availability of infrastructure to support the proposed project. Attention should focus on different transportation requirements due to project increase in traffic to and from the project area

b Availability of utilities and services, especially water, gas and electricity supply, sewerage and waste disposal facilities to cater to the projected demand for such utilities and services

3. Identification and Prediction of Potential Impacts (identification, prediction and assessment of positive and negative impacts likely to result from the proposed project).

In identification and analysis of potential impacts'-the 'Analysis' part shall include the analysis of relevant spatial and non-spatial data. The outcome of the analysis shall be presented with the scenarios, maps, graphics etc. for the cases of anticipated impacts on baseline. Description of the impacts of the project on air, water, land, hydrology, vegetation-man maid or natural, wildlife, socio-economic aspect shall be incorporated in detail.

4. EVALUATION OF IMPACTS

The judgment of significance of impacts can be based on one or more of the following, depending on the environmental factor being evaluated. These are :

i. comparison with laws, regulation or accepted national or international standards
ii. reference to pre-set criteria such as conservation or protected status of a site, feature or species
iii. consistency with pre-set policy objectives
iv. consultation and acceptability with the relevant decision makers, local community or the general public.

5. MITIGATION OF IMPACTS

Mitigation measures which may be considered including:

i. changing project layout, transport routes, disposal routes or locations, timing or engineering design

ii. introducing pollution controls, waste treatment, phased implementation and construction, engineering measures, monitoring, landscaping, social services or public education;
iii. compensation to restore, relocate or provision of concession for damage

6. Environmental Management Plan

The responsibilities and actions required of the project initiator or implementing body should be identified in the EMP. Some of those responsibilities and actions include: allocation of institutional responsibilities for planning and management of environmental requirements, allocate responsibility to execute mitigation action, implement a programme of monitoring to check the effectiveness of mitigation measures, and if necessary, taking additional measures to correct or overcome the impact in question, in-house monitoring capacity building and allocation of budget.

The EMP should recognize and include the following:

i) Management of soil erosion, land slides and siltation during site clearance and earth work
ii) Management of runoff
iii) Regulation of the types of activities allowed in the project area
iv) Management of liquid, solid and gaseous wastes generated from the project area
v) Environmental monitoring requirements
vi) Responsibilities and role of the project proponent for protection of environment

The program for monitoring should generally identify:

i. the type of monitoring required
ii. the location of monitoring
iii. the types of measures to be undertaken (e.g. dissolve oxygen, if fisheries is important in a river)

7. Management Plan/Procedures:
For each significant major impact, proposed mitigation measures will be set out for incorporation into project design or procedures, impacts, which are not capable of mitigation, will be identified as residual impacts Both technical and financial plans shall be incorporated for proposed mitigation measures..
An outline of the Environmental Management Plan shall be developed for the project.
In Environmental Monitoring Plan, a detail technical and financial proposal shall be included for developing an in-house environmental monitoring system to be operated by the proponent's own resources (equipments and expertise).

8. Consultation with Stakeholders/Public Consultation
ensures that consultation with interested parties and the general public will take place and their views taken into account in the planning and execution of the project Beneficial Impacts (summarize the benefits of the project to the Bangladesh nation, people and local community and the enhancement potentials)

9. Emergency Response Plan & Disaster Impact Assessment

10. Conclusion and Recommendations

3. Without approval of EIA report by the Department of Environment, Dhaka WASA shall not be able to open L/C in favor of importable machineries.
4. Without obtaining Environmental Clearance, Dhaka WASA shall not start operation of the projects.

5. Dhaka WASA shall submit the EIA along with a filled-in application for Environmental Clearance in prescribed form, the applicable fee in a treasury chalan, the applicable VAT on clearance fee in a separate treasury Chalan, the no objection certificates (NOCs) from the local authority, NOC from forest department (if it is required in case of cutting any forested plant/trees-private or public) and NOC from other relevant agencies for operational activity etc. for each project to the Dhaka Metropolitan of DOE in Dhaka with a copy to the Head office of DOE in Dhaka.

18.04.2018

(Syed Nazmul Ahsan)
Director (Environmental Clearance)
Phone # 8181673

Project Co-Ordinator
Preparatory Activities of Dhaka Sanitation Improvement Project (PADSIP)
Dhaka WASA
WASA Bhaban (12th Floor)
Kawran Bazar, Dhaka.

Copy Forwarded to :

1) The Secretary, Ministry of Environment and Forests, Bangladesh Secretariat, Dhaka.
2) Director, Department of Environment, Dhaka Metropolitan Office, Dhaka.
3) Staff Officer to the Director General, Department of Environment, Head Office, Dhaka.

Annex 3: Table of Contents of ESIA

The suggested and indicative contents of the EIA report is given below

Executive Summary

Concisely discusses significant findings and recommended actions.

1. Introduction

    1.1 Overview

    1.2 Background of the project

    1.3 Objective of EIA

    1.4 Approach to work

    1.5 Area/Corridor of Impact

    1.6 Composition study team

2. Legal and administrative framework

    2.1 GoB requirements (legislation; guidelines and rules; policies; international treaties signed by Bangladesh; national and provincial authorities; environmental procedures), their applicability, and compliance status for the Project.

    2.2 World Bank requirements (operational Policies and safeguard requirements; and WBG Environmental Health guidelines) and their triggering and compliance status for the Project.

3. Project description

    3.1 Need and purpose of project

    3.2 Project location

    3.3 Salient features

    3.4 Description of project components

    3.5 Construction activities

    3.6 Construction machinery, materials and other supplies (including estimated numbers/quantities)

    3.7 Waste generation and disposal (including estimated quantities)

    3.8 Manpower requirements

    3.8 Operation and maintenance (supplies; waste generation and management; manpower requirements; others).

4. Baseline description/analysis

    4.1 Study area

    4.2 Physical environment

    4.3 Biological environment

    4.4 Social and economic environment

4.5 Cultural aspects (cultural heritage; archaeology; and other objects of special interest, e.g. graveyards, monuments).

5. Project alternatives

5.1 Without project alternative

5.2 Site Options

5.3 Design Options

5.6 Other temporary and permanent facilities

6. Climate Change

6.1 Climate Change

6.2 Risk of flooding

7. Public Consultation and Information Disclosure

7.1 Scoping sessions

7.2 Focused group discussions

7.3 Public consultations

7.4 Information disclosure

8. Potential environmental impacts and their mitigations

8.1 Impact assessment, prediction, and characterization method.

8.2 Impacts during construction phase

8.3 Impacts during operational phase

8.4 Impacts during decommissioning phase.

9. Potential social impacts and their mitigations

9.1 Resettlement and compensation

9.2 Impacts and their mitigations during construction phase

9.3 Impacts and their mitigations during operational phase.

10. Cumulative and Induced Impacts

10.1 Cumulative impacts of on-going and planned projects in the area and on Buriganga River

10.2 Induced impacts of the Project.

11. Environmental management plan (EMP)

11.1 Types of impacts and their mitigations

11.2 Mitigation measures

11.3 Environmental Code of Practices

11.4 Monitoring Plan

11.6 Communication and documentation

Annex 4: Sample Environmental Management Plan

Typical impacts, mitigation measures and institutional responsibilities during construction phase

Activity / Issues	Potential Impacts	Proposed Mitigation and Enhancement Measures	Ref. to ECoP	Responsible Parties
Construction and use of labour shed - generation of wastewater, sewage, solid waste	Pollution of water and soil	Construction of temporary septic tank/sewage treatment plant to serve the temporary work site facilities, or temporary sewer connection to existing sewer/drainage system	ECoP 2, ECop 3, ECoP 4, ECoP 15 ECoP 17	Contractor
	Health of labour	Conduct health screening and management		Contractor
	Conflict with locals - Due to increase in opportunities for job in the construction activities, labourers from outside the locality will migrate to the area. This might create conflict with the locals	Ensure equitable opportunity for employment for the locals and continue consultation with local representatives and community regarding social issues.		Contractor/PMU
Additional traffic Rerouting of Traffic	For the laying of sewer works, there will be temporary disruption to the local community in terms of access to roads, (especially in dense areas and narrow roads), shops and residences.	Open trench segments would be temporarily covered to allow residents and service vehicles to access driveways and loading areas. Trench segments would be excavated and closed promptly, minimizing the time that trenches are open in front of residence driveways and businesses. Alternate access should be assessed and ensured with proper maintenance work for smooth traffic mobility around the construction area. Also arrange adequate cordon and traffic cone with traffic man for safe movement of traffic. Repair the road as soon as work will be completed.	ECoP 13 ECoP 17	Contractor
Felling of trees	Felling of trees and clearing of vegetation may cause local	Notify Department of Forest, Department of Environment and the City Corporations regarding felling of trees along	ECoP 17	Contractor

Clearing vegetation	ecological degeneration which might be irreversible	the pipeline routes or other construction sites; follow national guidelines.		
Wastewater from construction site	The potential impacts on groundwater quality are associated with potential spills/leaks to groundwater and surface water from fuel storage, waste handling, etc.	Minimize the generation oil and grease, organic matter, litter, debris and any form of waste (particularly petroleum and chemical wastes). The contractor should 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.	ECoP 2 ECop 3 ECoP 4 ECoP 6 ECoP 15	Contractor
Operation of project equipment, drilling, piling, welding and cutting, demolition, crushing of stones and bricks, traffic movement, generators, labour concentration	Higher noise level – noise pollution	Where sheet piles are needed and soil conditions allow, vibratory pile drivers would be used instead of impact pile drivers. Construction specifications would provide that noise levels for scrapers, pavers, graders, and trucks should not exceed 90 dBA, and pile drivers should not exceed 95 dBA. For all other equipment, specifications would provide that noise levels should not exceed 85 dBA. Substituting hydraulic or electric models for impact tools such as jack hammers and pavement breakers would further reduce construction noise Maintain all vehicles in good operating condition Use temporary noise control barriers as practicable Monitor noise level and manage site activities accordingly	ECoP 12 ECoP 17	Contractor
Operation of project equipment, demolition, crushing of stones and bricks, traffic movement, generators, burning of asphalt, off-road truck movement,	High dust and other particle concentration in air – air pollution. The impact will depend on meteorological and ground conditions. Dust can affect the ability of nearby vegetation to survive	Water unpaved surfaces Limit on-site vehicle speed to 15 mph Prohibit activities during high winds Sweep streets Remove deposits on road ASAP	ECoP 11 ECoP 17	Contractor

excavation in dry condition	and maintain effective evapotranspiration Potential nuisance impacts on residential areas in close vicinity of the construction activities. It may also pose health in certain cases. Volatile organic compounds (VOCs) may be carcinogenic	Cover construction materials Restore disturbed areas as soon as practicable		
Emissions of CO2, CO, SO2, NOx and PM10 will result from the operation of the proposed project and road vehicles during construction of the pipeline and associated facilities.	CO2 emission is a greenhouse gas that contribute to climate change CO and NO2 is highly toxic to human health at elevated concentration SO2 is a toxic gas, may impact both freshwater and terrestrial ecosystems by contributing acid deposition. Potentially cause respiratory illness.	Adopt engineering design approach which shall avoid or minimize emissions to the atmosphere. Apply good engineering practice in the choice of methods and equipment specification to minimize fugitive emissions. Fit vehicles with appropriate exhaust system and emission control devices	ECoP 11	Contractor
Vibration from boring, soil compaction, piling, heavy truck movement, delivery of materials	Construction activities would result in varying degrees of ground-borne vibration, depending on the stage of construction, the equipment and construction methods employed, the distance from the construction locations to vibration-sensitive receptors and soil conditions. Such vibration would be annoying to the residents and is a potential risk to	Activities which may generate significant vibration should be limited during day-time. Identification of Vulnerable structure and proper engineering practices should be adopted to avoid any damage to the structure. In such cases, in addition to the construction specifications, the guidelines in Annex V: PCR and Annex VI: Chance Find should be followed.	ECoP 12	Contractor

	old/vulnerable structures. Particularly, old structures which has significant cultural value.			
Excavation of earth and backfilling (specifically, for open excavation)	Change in soil structure, degradation of soil quality. Suffering to local community Traffic disruption Along the alignment of the trunk mains properties of significant cultural value could be located. Excavation activities may result in damage to these vulnerable structures.	Proper engineering practices adopted during backfilling and reinstatement. The stripped top soil will be backfilled carefully in position after the completion of the pipe laying. Excess excavated material to be removed and disposed of in line with regulations. The impacts are of temporary nature. The worked should be planned and managed in the following way so that the inconvenience period is minimized: • Construction activity would be phased, and traffic would be rerouted during construction. Traffic plans would describe traffic operations in detail during the construction period. Construction would be scheduled to minimize disruption of existing traffic patterns to area residents and businesses. Affected neighbourhoods would be provided with appropriate information. • Materials delivery or removal during peak traffic hours along major arterials would be avoided when possible. Flaggers would be present to direct traffic around the construction site. • In the event of finding of properties of cultural value during construction, in addition to the construction specifications, the guidelines in Annex V: PCR and Annex VI: Chance Find should be followed.	ECoP 11 ECoP 12 ECoP 13 ECoP 14 ECoP 15 ECoP 16 ECoP 17	Contractor
Dewatering and trenching (specifically, for open excavation)	The dewatering and trenching activities may generate water, having high suspended solids concentration due to turbidity.	Surface runoff from construction sites should be discharged into storm water drain via suitable sediment removal facilities	ECoP 7	Contractor

Relocation of utilities (specifically, for open excavation)	Disruption of utility services in the locality	Qualified Persons/Contractors working in the vicinity of the sewerage system shall carry out thorough site investigation to ascertain the exact locations of the existing utility system within and around their project site and mark their locations and plot the information in the proposal drawings. Submit plan and drawings for relocation of the utilities and obtain permission from the agency concerned, employ suitable equipment and qualified personnel for utility relocation, make provision of water, electricity, gas or other utilities as necessary for the affected people.	ECoP 11 ECoP 12 ECoP 13 ECoP 14 ECoP 15 ECoP 16 ECoP 17	Contractor/ PMU/ Supervision consultants
Civil and electro-mechanical works for construction and/or rehabilitation of Sewage Lift Stations (SLS)	During construction and/or rehabilitation of Sewage Lift Stations (SLS) in urbanized areas existing social life will be impacted additional traffic of trucks and other project vehicles, concentration of labours, generation of solid waste and wastewater from construction works, elevated noise and dust levels etc.	The construction site shall be cleaned of all debris, scrap materials and machinery on completion of construction for the safety of public and users. Solid waste to be removed and disposed of in line with regulations. The impacts are of temporary nature. The worked should be planned and managed in the following way so that the inconvenience period is minimized: • Construction activity would be phased, and traffic would be rerouted during construction, if necessary. • Materials delivery or removal during peak traffic hours along major arterials would be avoided when possible. • Adopt precautionary measures to arrest dust pollution in the air during construction (covering loose construction materials, watering construction areas to minimize dust resuspension, covering construction etc) • Abide by the construction specifications which would provide limit to noise levels due to different activities.	ECoP 12 ECoP 16 ECoP 17	Contractor
Construction of portals and drop shafts	Construction of portals and drop shafts would likely be located in fully developed, urbanized locations on existing roads. As a result,	The impacts are of temporary nature. Proper engineering planning and design standards should be followed to complete the work within minimum duration. Efficient management practices need to be followed.	ECoP 11 ECoP 12 ECoP 13	Contractor

(specifically, for micro-tunnelling)	there would be major disturbance of social life during the micro-tunnelling activities, particularly, existing traffic flow will be disrupted requiring re-routing, pedestrian movement will be restricted, and business and commerce may be affected.	Construction activity would be phased, and traffic would be rerouted during construction. Traffic plans would describe traffic operations in detail during the construction period. Construction would be scheduled to minimize disruption of existing traffic patterns to area residents and businesses. Affected neighbourhoods would be provided with appropriate information.	ECoP 14 ECoP 15 ECoP 16 ECoP 17	
Tunnelling (specifically, for micro-tunnelling)	Compared to open excavation, micro-tunnelling will reduce the volume of soil to be removed for lying of pipes in the tunnel. However, if the soil/slurry are dumped over ground and not removed timely it may cause major impact on the drainage system, traffic movement and hardship of to the people of the locality. Along the alignment of the trunk mains properties of significant cultural value could be located. Excavation activities may result in damage to these vulnerable structures.	The removed soil in the form of slurry should be proper extracted and transported to some land fill site as permitted by the DoE and the City Corporations. In the event of finding of properties of cultural value during construction, in addition to the construction specifications, the guidelines in Annex V: PCR and Annex VI: Chance Find should be followed.	ECoP 11 ECoP 12 ECoP 13 ECoP 14 ECoP 15 ECoP 16 ECoP 17	Contractor
Construction of WWTP and STP	Inefficient treatment of fecal sludge. Treated percolate/effluents not meeting DOE standards for sludge and effluents.	Select appropriate technology/process of fecal sludge treatment. Treated sludge and effluent must meet criteria.	ECoP 11 ECoP 12 ECoP 13 ECoP 14	Contractor/DWASA

			ECoP 15 ECoP 16 ECoP 17	
Reuse or disposal of treated fecal sludge and percolate/effluent (specifically, for FSM treatment facilities)	Inappropriate disposal of treated sludge poses health risks to workers and other individuals as well as the community. Reuse will positively affect the environment.	During design phase, select appropriate technology for reuse of treated sludge and effluent. In case reuse is not possible, then appropriate disposal means should be identified and selected as per DOE's sludge management guidelines.	ECoP 6 ECoP 4	Contractor/DWASA
Health and safety (H&S) risk of all workers at WWTP and STP	Health risk for workers working in the WWTP and STP. Workers may suffer infectious diseases due to exposure to fecal matters during operation and maintenance.	Provide all the personal protective equipment for the safety of the workers. Develop O&M and H&S manual for the WWTP and STP. Organize training regarding H&S for all workers.	ECoP 15 ECoP 17	FSTP Operator/DWASA
Efficient Performance of WWTP and STP	Inefficient working of WWTP and STP can cause lower quality treatment and result in under treatment of wastewater and sludge. This may cause health and safety risks for the workers and the environment.	Develop O&M manual for the STP. Follow O&M manual and ensure all the components of the FSTP are maintained as per the specifications. Organize training regarding O&M for the plant operator.	ECoP 16	FSTP Operator/DWASA
Inefficient emptying of pit latrines and septic tanks (specifically, for septic sludge collection from households)	Nuisance and disease spreading risk	Pit latrines and septic tanks must be emptied frequently. Solids that accumulate in septic systems (septage) must also be removed periodically, usually every 1 to 3 years, depending on design and usage. The objective of this is to maintain proper functioning and prevent clogging and overflows. In order to clean the pit latrines, vacuum tankers must be used as mentioned in the Institutional and Regulatory Framework for FSM - Megacity Dhaka. Manual emptying of pits must not be practiced.	ECoP 16	DSCC, DNCC, DWASA and private operator

Collection and conveyance of faecal sludge (specifically for septic sludge collection from households)	Nuisance and disease spreading risk	Vacuum trucks for faecal sludge removal are complex mechanical systems that must be operated correctly, both to accomplish sludge removal and protect the health and equipment of the service providers. Type of vacuum trucks should be selected based on the width and type of access roads. The following steps are recommended for the operation of vacuum trucks: a) Park the truck as close to the system as possible. The maximum distance is determined by the length of hose and elevation rise from the bottom of the pit or septic tank to the vacuum truck tank inlet. This should typically be no more than 25 metres in linear distance and 4 metres in elevation gain. b) Further distances or elevation differences may require intermediate pumps. c) Inform the occupant of the pending service and note any concerns or issues. d) Clearing the area of people and inspect the site for possible hazards, such a high groundwater table that can cause a tank to 'float' if emptied. e) Secure the truck using wheel chocks. f) Lay out and connect the hoses from the truck to the tank or pit to be emptied. g) Open the tank or pit by removing the access ports or covers over the storage system. h) Engage the vacuum equipment by using a power take-off from the truck's transmission. i) Increase the vacuum to the proper level with the valve closed by watching the vacuum gauge, then lowering the end of the hose into the storage system, and opening the valve sufficiently such that the sludge is drawn out of the	ECoP 16 ECoP 17	Private operator and DWASA

		tank or pit. Closing the valve periodically re-builds the vacuum to enable the removal of further sludge. j) Continue this process until the job is complete. k) Break up sludge that has agglomerated into a solid mass, either by making use of a long handle shovel and adding water when necessary to reduce the viscosity of the sludge, or by reversing the direction of the flow and forcing the contents of the vacuum truck tank back through the hose and into the sanitation system in order to use the high-pressure stream to break up the sludge. l) Observe good housekeeping practices during facility loading and unloading. Clean trucks and equipment regularly to prevent sludge build-up that may give rise to odours. If sludge spills occur, prompt and efficient clean-up should be undertaken.		
Management of collected faecal sludge (specifically, for septic sludge collection from households)	Soil and water pollution	Secondary treatment for collected faecal sludge from pits and septic tanks is required as mentioned in the Institutional and Regulatory Framework for FSM - Megacity Dhaka and Bangladesh Standards and Guidelines for Sludge Management.	ECoP 4 ECoP 6 ECoP 7 ECoP 16 ECoP 17	FSTP Operator/DWASA
Solid waste generation during construction work (specifically, for generated solid waste from micro-tunnelling activities)	Nuisance as well as air, soil and water pollution	Solid wastes generated from construction activities are excess excavated earth (spoils) and discarded construction materials. The latter include bricks, concrete pipes, cement bags, wood, steel, oils, fuels, and other similar items. Domestic solid wastes may also be generated from the workers' camp. Improper waste management could cause odour, vermin problems, pollution, and flow obstruction of nearby watercourses. These factors could negatively impact the landscape. Earthwork from excavation of tunnels which cannot be reused needs to be disposed safely.	ECoP 4 ECoP 6 ECoP 7 ECoP 16 ECoP 17	Contractor/DWASA

		The following mitigation measures to minimize impacts from waste generation shall be implemented by the contractor during the construction work: Prepare and implement a Construction Waste Management Plan, refer to ECoP 4 (Annex IV); As far as possible utilize the debris and excess soil in construction purpose, for example, for raising the ground level or construction of access roads etc.; Avoid stockpiling any excess spoils at the site for a long period of time. Excess excavated soils should be immediately disposed to approved designated areas; If disposal is required, the site shall be selected preferably from barren, infertile lands. Sites should be located away from residential areas, forests, water bodies, and any other sensitive land uses; Domestic solid wastes should be properly segregated in biodegradable and non-biodegradable category for collection and disposal to designated solid waste disposal site. Create a compost pit (with impermeable bottom and sides) at workers' camp sites for disposal of biodegradable waste. Non-biodegradable/recyclable material shall be collected separately and sold in the local recycling material market; Residual and hazardous wastes such as oils, fuels, and lubricants shall be disposed off using DOE guidelines; Prohibit burning of construction and/or domestic wastes; Ensure that wastes are not haphazardly thrown in and around the project site. Provide proper collection bins and create awareness to utilize the dust bins. Recycle waste material where possible; Conduct site clearance and restoration to original condition after the completion of construction work.		

		DWASA to ensure that site is properly restored prior to issuance of construction completion certificate.		
Workers health and safety (specifically for septic sludge collection from households)	Workers need to be mindful of the occupational hazards. Potential impacts are negative and long-term but reversible by mitigation measures.	Comply with requirements of the Government of Bangladesh's Labour Law of 2006 and all applicable laws and standards on workers' H&S. - Ensure that all site personnel have a basic level of H&S training. - Mark and provide sign boards. Signage shall be in accordance with international standards and be easily understood by workers, visitors, and the general public as appropriate. - Always wash hands after contact with faecal sludge - Avoid touching face, mouth, eyes, nose, before washing hands. - Eat in designated areas away from faecal sludge handling activities. - Do not smoke or chew tobacco or gum while working in direct contact with faecal sludge. - Use gloves when applicable. - Keep wounds covered with clean, dry bandages. - Change into clean work clothing on a daily basis.	ECoP 15 ECoP 17	FSTP Operator
Labour Camps	Influx of migrant laborer's Additional pressure on the local resources and social infrastructures Risk of social conflict	The contractor will preferably engage local labour force except for the laborer's requiring special skills and non-availability of such skilled labourers from local area. Project to assess and manage labor influx risk based on risks identified in the ESIA. Depending on the risk factors and their level, appropriate site-specific Labor Influx Management Plan and/or a Workers' Camp Management Plan. Project will incorporate social and environmental mitigation measures into the civil works contract. The	ECoP 15 and ECoP 16	Contractor

		responsibilities for managing these adverse impacts will be clearly reflected as a contractual obligation, with a mechanism for addressing non-compliance. **Worker's Accommodation** • For migrant labourers the contractor will provide labour camps with all basic facilities sufficiently away from local habitation • • Provisioning adequate arrangements of drinking water, lighting, ventilation, bedding, bathing and other basic facilities in the labour camps; • Ensuring proper health-check-ups of all laborer's employed at the project site; • Providing separate toilet facilities for men and women at the accommodation as well as site; and • Facilitating healthcare services and medical care in case of sickness. • Locate handling sites away from populated areas • Follow proper operation and handling measures to minimize exposure • Provide prior warning /signals for blasting • Provide sirens in vehicles to avoid any collision with human/animals • Organise awareness programs on environmental resource management • Organise Health camps • Use of child labour will be strictly prohibited. Contractor will maintain a labour register with name, age and sex with supporting document. • Provide signages near construction sites and approach roads		

		Avoiding Gender Based Violence • Contractor will prepare and implement robust measures to address the risk of gender-based violence that include (i) mandatory and repeated training and awareness raising for the workforce about refraining from unacceptable conduct toward local community members, specifically women; (ii) informing workers about national laws that make sexual harassment and gender-based violence a punishable offence which is prosecuted; (iii) introducing a Worker Code of Conduct as part of the employment contract, and including sanctions for non-compliance (e.g., termination), and (iv) contractors adopting a policy to cooperate with law enforcement agencies in investigating complaints about gender-based violence. • Additional measures can aim to reduce incentives to engage with the local community by providing workers with the opportunity to spend their time off away from the host community, where feasible with a small transport allowance, ideally allowing workers to regularly return for brief visits to their families, spouses and friends, or to visit nearby urban centers that provide a variety of legal social opportunities. For workers who need to travel further it may be attractive to forego weekends off in exchange for longer breaks that would allow for such home leave travel.		
	Impact on Human health, especially workers working at construction sites (Labour Camps)	• Routine medical checkup of Field staff and labourers • Provision of potable drinking water at site • Provision of proper sewage and waste disposal system. Sanitation facilities have to be provided at the camp sites. • Awareness program on HIV aids and other communicable disease may be provided to the work force.	ECoP 15 and ECoP 16	Contractor

		• First aid facilities to be provided at the construction camps. Any case of disease outbreak may be immediately subjected to medical treatment. Mosquito repellant to be provided to the labors such as coil and sprays. The camps may maintain cleanliness and hygienic condition. • Proper ventilation may be provided in labour camps		
	Impact of labour influx/ migrant workforce	• Provisioning adequate arrangements of drinking water, lighting, ventilation, bedding, bathing and other basic facilities in the labour camps; • Ensuring proper health-check-ups of all labourers employed at the project site; • Providing separate toilet facilities for men and women at the accommodation as well as site; • Contractor and labourers will sign code of conduct to maintain good manners with the community and avoid GBV • Project will undertake awareness raising program for the workers and community on the risk of labor influx; and • To the extent possible, local workforce will be engaged to minimize the influx of workers	ECoP 15 and ECoP 16	Contractor

Typical impacts, mitigation measures and institutional responsibilities during O&M phase

Activity / Issues	Potential Impacts	Proposed Mitigation and Enhancement Measures	Ref. to ECoP	Responsible Parties
Leaks and overflows from the sewerage system	Leaks and overflows from the sewerage system can cause contamination of soil, groundwater, and surface water. Depending on the elevation of	Recommended measures to prevent, minimize, and control leaks and overflows include: Establish routine maintenance program, including: o Development of an inventory of system components, with information including age, construction materials,		DWASA

	groundwater, leaks in gravity mains may also allow groundwater into the sewer system, increasing the volume of wastewater requiring treatment and potentially causing flooding and treatment bypass. Overflows occur when the collection system can not manage the volume of wastewater, for example due to high flows during rain events or as the result of power loss, equipment malfunctions, or blockages. The excess flows may contain raw sewage, industrial wastewater, and polluted runoff	drainage areas served, elevations, etc o Regular cleaning of grit chambers and sewer lines to remove grease, grit, and other debris that may lead to sewer backups. Cleaning should be conducted more frequently for problem areas. Cleaning activities may require removal of tree roots and other identified obstructions o Inspection of the condition of sanitary sewer structures and identifying areas that need repair or maintenance. Items to note may include cracked/deteriorating pipes; leaking joints or seals at manhole; frequent line blockages; lines that generally flow at or near capacity; and suspected infiltration or exfiltration o Monitoring of sewer flow to identify potential inflows and outflows • Conduct repairs prioritized based on the nature and severity of the problem. Immediate clearing of blockage or repair is warranted where an overflow is currently occurring or for urgent problems that may cause an imminent overflow (e.g. pump station failures, sewer line ruptures, or sewer line blockages); • Review previous sewer maintenance records to help identify “hot spots” or areas with frequent maintenance problems and locations of potential system failure, and conduct preventative maintenance, rehabilitation, or replacement of lines as needed; • When a spill, leak, and/or overflow occurs, keep sewage from entering the storm drain system by covering or blocking storm drain inlets or by containing and diverting the sewage away from open channels and other storm drain facilities (using sandbags, inflatable dams, etc.). Remove the sewage using vacuum equipment or use other measures to divert it back to the sanitary sewer system.		
Wastewater and sludge treatment, discharge, and use	Liquid effluents	Based on an assessment of risks to human health and the environment , consider re-use of treated effluent, especially in areas with limited raw water supplies. Treated wastewater quality for land application or other uses should be consistent with the relevant public health-based		DWASA

		guidance from the World Health Organization (WHO) and applicable national requirements.		
	Solids removed from wastewater collection and treatment systems may include sludge and solids from cleaning of drainage and sewer collection systems (including seepage systems), screening solids, and sludge from various unit operations used for wastewater treatment.	Select appropriate sludge treatment technologies, considering, for example, the quantity and sources of sludge; available resources for capital expenditures, training, operations and maintenance; availability of skilled operators, maintenance personnel, etc.; and the desired disposal methods or end uses of the treated solids.		DWASA
	Air emissions from wastewater treatment operations may include hydrogen sulfide, methane, ozone (in the case of ozone disinfection), volatile organic compounds (such as from industrial discharges), gaseous or volatile chemicals used for disinfection processes	Cover emission points (e.g., aeration basins, clarifiers, sludge thickeners, tanks, and channels), and vent emissions to control systems (e.g., compost beds, biofilters, chemical scrubbers, etc.) as needed to reduce odors and otherwise meet applicable national requirements and internationally accepted guidelines; • Where necessary, consider alternate aeration technologies or process configurations to reduce volatilization		
	Occupational health and safety aspects associated with accidents, chemical exposure and noise	• Install railing around all process tanks and pits. Require use of a life line and personal flotation device (PFD) when workers are inside the railing, and ensure rescue buoys and throw bags are readily available; • Use PFDs when working near waterways;	ECoP 15 and ECoP 16	DWASA
	Community health and safety aspects	Regular operation of the system will minimize • Preventing sewerage system overflows;	ECoP 16	

		• Preventing buildup of potentially toxic and explosive gasses in the sewer.		
For the collecting sewer lines constructed by open excavation solid waste or debris may fall into the man-holes	Clogging of the sewer lines and trunk mains	The man-holes need to be regularly checked and protected from solid waste dumping. Jetting-cum-suction machine, submersible dredger pump and sewer cleaning machine of power bucket type will be needed to proper maintenance of the trunk sewers. The collected sludge will be disposed on identified waste disposal sites regularly by packed tractor trolley, mounted tanker and other environmentally friendly collection and disposal sources. Maintaining the reliability of the equipment and facilities	ECoP 4 ECoP 6 ECoP 7 ECoP 16	DWASA
For sewer lines constructed by micro-tunnelling method – deposition of sludge, solid waste	Clogging of sewer lines	Preventive maintenance programmes should be undertaken as follows: Regular checking of protection of the drop shafts against any dumping of solid waste or debris or entry of overland flow Annual monitoring of deposition of sludge in the trunk mains by remotely controlled devices Cleaning of sludge in sewer lines Based on a number of performance indicators e.g. volume of sewage flow, predictive maintenance works to be undertaken Maintaining the reliability of the equipment and facilities	ECoP 4 ECoP 6 ECoP 7 ECoP 16	DWASA
Collection and disposal of septic sludge and treated sludge	Adverse impact on the ecosystem of the disposal sites, odour from collecting vehicles	Collection and disposal of sludge regularly by packed tractor trolley, mounted tanker and other environmentally friendly collection and disposal sources. Maintaining the reliability of the equipment and facilities	ECoP 4 ECoP 6 ECoP 7 ECoP 16	DWASA

Annex 5: Environmental Code of Practices

This Environmental Code of Practice (ECoP) is a guideline to reduce or eliminate environment risks due to various activities during planning, design, construction, operation and maintenance phases associated with each subproject to be implemented under DSIP.

ECoP 1.0: Planning and Design Phases of a subproject

These guidelines discuss the issues to be considered during project preparation to avoid/address environmental concerns through modifications in project design and incorporation of mitigation measures.

Finalization of Alignment/Project Location

- Adequate consultations with the communities to identify the concerns and preferences need to be taken up during selection of the alignment of new sewer lines.
- Alignment shall conform to the natural topography as far as possible to avoid excessive cut and fill.
- Consultations with the local communities are to be conducted to obtain their suggestions and incorporate their concerns to address the potential environmental impacts.
- In case of flood prone or water logging areas, hydrological surveys have to be conducted before alignment finalization.

Compliance to Legal Requirements

The bid document shall include the various applicable clearances pertaining to environmental management and shall contain the necessary procedures for compliance of the same.

Cost Estimation

Some activities included in ECoP 1.0 have certain monetary involvement. These activities are outlined below:

- There will be one Focus Group Discussion (FGD), with at least 15 participants from different communities of the society, for adequate consultations to identify the concerns and preferences related to a particular infrastructure development project.
- Two surveyors will carry out a Key Informant Information (KII) of at least 50 participants from different communities of the society affected by the infrastructure development project.
- Two surveyors will carry out a hydrological survey before finalizing alignments and/or reduced levels for infrastructure development projects in a flood prone or water logging area with very flat slopes.

ECoP 2.0: Site Preparation

The preparation of site for construction involves:

- Marking and clearance of the required project area of all encroachments by the PMU of DWASA prior to mobilization of Contractor;
- Informing the local community about construction schedule; and
- Site preparation by the contractor prior to commencement of construction. Scope of this ECoP includes only the measures to address environmental concerns expected during the site preparation.

Site Preparation Activities

- Informing the local community and local ward councils about the likely schedule of construction

After obtaining the consent of the community, the PMU of DWASA shall be responsible to stake out the subproject locations.

Site Preparation Activities by the Contractor

- The contractor shall submit the schedules and methods of operations for various items during the construction operations to the PMU for approval.
- The clearance of site shall involve the removal of all materials such as trees, bushes, shrubs, stumps, roots, grass, weeds, part of topsoil and rubbish. Towards this end, the Contractor shall adopt the following measures:
- To minimize the adverse impact on flora and vegetation, only ground cover/shrubs that impinge directly on the permanent works shall be removed.
- In locations where erosion or sedimentation is likely to be a problem, clearing and grubbing operations should be so scheduled and performed that grading operations and permanent erosion and sedimentation control features can follow immediately, if the project conditions permit.
- The disposal of wastes shall be in accordance with the provisions of ECoP 4: Waste Management.
- All regulatory clearances shall be obtained before actual start of work.

ECop 3: Construction Camp

Project activity/ Impact source	**Environmental Impact**	**Mitigation Measures/ Management Guidelines**
Siting and Location of construction camps	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 • Locate the construction camps at areas which are acceptable from environmental, cultural or social point of view. • Consider the location of construction camps 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 camps on the surrounding communities. • 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 generate substandard living standards and health hazards.	Contractor shall provide the following facilities in the campsites • A perimeter security fence at least 1.5m in height constructed from appropriate materials. • Adequate housing for all workers • A sickbay and first aid station • Safe and reliable water supply. Water supply from deep tube wells of 300 m depth that meets the national standards • Hygienic sanitary facilities and sewerage system. The toilets and domestic wastewater will be

Project activity/ Impact source	Environmental Impact	Mitigation Measures/ Management Guidelines
		collected through a common sewerage. Provide separate latrines and bathing places for males and females with total isolation by wall or by location. The minimum number of toilet facilities required is one toilet for every ten persons. • Provide in-house community/common entertainment facilities. Dependence of local entertainment outlets by the construction camps to be discouraged/prohibited to the extent possible. • All camp facilities shall be maintained in a safe clean and or appropriate condition throughout the construction period.
Disposal of wastes	Management of wastes is crucial to minimize impacts on the environment	The Contractor should • Ensure proper collection and disposal of solid wastes within the construction camps • Insist waste separation by source; organic wastes in one pot and inorganic wastes in another pot 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. • Dispose organic wastes in a designated safe place on daily basis. At the end of the day cover the organic wastes with a thin layer of sand so that flies, mosquitoes, dogs, cats, rats, are not attracted. • Locate the garbage pit/waste disposal site min 500 m away from the residence so that peoples are not disturbed with the odor likely to be produced from anaerobic decomposition of wastes at the waste dumping places. Encompass the waste dumping place by fencing and tree plantation to prevent children to enter and play with. • Do not establish site specific landfill sites. All solid waste will be collected and removed from the work camps and disposed in approval waste disposal sites.
Health and Hygiene	There will be a potential for diseases to be transmitted including malaria, exacerbated by inadequate health and safety practices.	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 laborers during emergency to be transported to nearest hospitals.

Project activity/ Impact source	Environmental Impact	Mitigation Measures/ Management Guidelines
		• Initial health screening of the laborers 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 adequate drainage facilities throughout the camps to ensure that disease vectors such as stagnant water bodies and puddles do not form. Regular mosquito repellant sprays during monsoon. • Carryout short training sessions on best hygiene practices to be mandatorily participated by all workers. Place display boards at strategic locations within the camps containing messages on best hygienic practices.
Safety	In adequate safety facilities to the construction camps may create security problems and fire hazards	The Contractor shall • Provide appropriate security personnel (police/home guard or private security guards) and enclosures to prevent unauthorized entry into 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 labor housing/site 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 camps. • Display emergency contact numbers clearly and prominently at strategic places in camps. • Communicate the roles and responsibilities of laborers in case of emergency in the monthly meetings with contractors.
Site Restoration	Restoration of the construction camps to original condition requires demolition of construction camps	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 camps in phases and as the work gets decreased and not wait for the entire work to be completed. • Give prior notice to the laborers before demolishing their camps/units. • Maintain the noise levels within the national standards during demolition activities. • Different contractors shall be hired to demolish different structures to promote recycling or reuse of demolished material.

Project activity/ Impact source	Environmental Impact	Mitigation Measures/ Management Guidelines
		• Reuse the demolition debris to a maximum extent. Dispose remaining debris at the designated waste disposal site. • Handover the construction camps 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. • Not make false promises to the laborers for future employment in O&M of the project.

ECoP 4: Waste Management

Project activity/ Impact source	Environmental Impact	Mitigation Measures/ Management Guidelines
General Waste	Soil, air and water pollution from the improper management of wastes and excess materials from the construction sites.	The Contractor shall • Develop 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 PMU for approval. • Organize disposal of all wastes generated during construction in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact. • Adopt national 3R (Reduce, Recycle and Reuse) approach to minimize the production of wastes. • Segregate and reuse/recycle of all the wastes, wherever practical. • Prohibit burning of solid wastes at the construction site. • Collect and transport non-hazardous wastes to all the approved disposal sites. Vehicles transporting solid wastes shall be covered with tarps or nets to prevent spilling wastes or liquid along the route during transport. • 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 appropriate facilities as temporary storage of all wastes before transportation and final disposal.
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 labeled 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 bounded areas away from water courses. • Make available Material Safety Data Sheets (MSDS) 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.
Construction Wastes	Health hazards, air and water pollution and environmental impacts due to improper waste management practices.	The contractor shall • either re-use or dispose the waste generated during construction depending upon the nature of waste. • The contractor shall dispose off the wastes in designated place that could not be re-used safely. • The waste management practices adopted by the Contractor shall be reviewed by the PMU during the progress of construction.

ECoP 5: Fuels and Hazardous Goods Management

Project activity/ Impact source	**Environmental Impact**	**Mitigation Measures/ Management Guidelines**
Fuels and hazardous goods.	Materials used in construction have a potential 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 protocol and submit the plan to PMU for approval. • Train the relevant construction personnel in handling of fuels and spill control procedures. • Store dangerous goods in bounded areas on a top of a sealed plastic sheet away from watercourses. • Refueling shall occur only within bounded areas. • Make available MSDS for chemicals and dangerous goods on-site.

Project activity/ Impact source	Environmental Impact	Mitigation Measures/ Management Guidelines
		• Transport waste of dangerous goods, which cannot be recycled to a designated disposal site approved by DoE. • Provide absorbent and containment material (e.g., absorbent matting) where hazardous material are used and stored and personnel trained in the correct use. • Provide PPEs like protective clothing, safety boots, helmets, masks, gloves, goggles etc. to the construction personnel assigned to handle the wastes. • Make sure all containers, drums, and tanks that are used for storage are in good condition and are labeled 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 hazardous materials above flood plain level. • 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. • Put containers and drums in permanent storage areas on an impermeable floor that slopes to a safe collection area in the event of a spill or leak. • 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. • Return the gas cylinders to the supplier. However, if they are not empty prior to their return, they must be labeled with the name of the gas, they contained, information of the supplier, cylinder serial number, pressure, their last hydrostatic test date, and any additional identification marking that may be considered necessary.

ECoP 6: Water Resources Management

Project activity/ Impact source	Environmental Impact	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 wastes management guidelines proposed in ECoP 5 and 6. • Minimize the generation of sediment, slurry, oil and grease, organic matter, litter, debris and any form of waste (particularly petroleum and chemical wastes). These substances must not enter into waterways, storm water systems or underground water table.
Discharge from construction sites	During construction both surface and groundwater quality may be deteriorated due to construction activities of trunk main and sewer network installation. The construction works will modify ground cover and topography changing the surface water drainage patterns of the area including infiltration and storage of storm water. These changes in hydrological regime lead to increased rate of runoff, increase in sediment and contaminant loading, increased flooding, groundwater contamination, and effect habitat of fish and other aquatic biology.	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. • 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 bounded 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 shall 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 sediment. • Spray water on material stockpiles, access roads and bare soils at required basis to minimize dust. Increase the watering

Project activity/ Impact source	Environmental Impact	Mitigation Measures/ Management Guidelines
		frequency during periods of high risk (e.g. high winds, high temperature, etc.).

ECoP 7: Drainage Management

Project activity/ Impact source	Environmental Impact	Mitigation Measures/ Management Guidelines
Excavation and earthworks 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 a program for prevent/avoid standing waters, which PMU 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 the relevant standards provided by DoE, before it being discharged into the recipient water bodies. • Ensure the internal roads/hard surfaces in the construction yards/construction camps that generate storm water drainage to accommodate high runoff during downpour and that there is no stagnant water in the area at the end of the downpour. • Construct wide drains instead of deep drains to avoid sand deposition in the drains that require frequent cleaning. • Provide appropriate silt collector and silt screen at the inlet and manholes and periodically clean the drainage system to avoid drainage congestion.

Project activity/ Impact source	Environmental Impact	Mitigation Measures/ Management Guidelines
		• 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. • Reduce infiltration of contaminated drainage through storm water management design.
Ponding of water	Health hazards due to mosquito breeding.	• Do not allow ponding of water especially near the waste storage areas and construction and labor camps. • Discard all the storage containers that are capable of storing of water, after use or store them in inverted position.

ECoP 8: Erosion and Sediment Control

Project activity/ Impact source	Environmental Impact	Mitigation Measures/ Management Guidelines
Clearing of construction sites	Cleared areas and slopes are susceptible for erosion of top soils.	• Reinstate and protect cleared areas as soon as possible. • Mulch to protect batter slopes before planting. • Cover unused area of disturbed or exposed surfaces immediately with mulch/grass turfings/tree plantations.
Construction activities and material stockpiles	The impact of soil erosion are (i) increased run off and sedimentation causing a greater flood hazard to the downstream, (ii) destruction of aquatic environment in nearby lakes, streams, and reservoirs caused by erosion and/or deposition of sediment damaging the spawning grounds of fish, and (iii) destruction of vegetation by burying or gullying.	The Contractor shall • Locate stockpiles away from drainage lines. • Protect the toe of all stockpiles, where erosion is likely to occur, with silt fences, straw bales or bunds. • Remove debris from drainage paths and sediment control structures. • Cover the loose sediments and then spray water, if required. • Divert natural runoff around construction areas prior to any site disturbance. • Install protective measures on site prior to construction, for example, sediment traps • Control drainage through a site in protected channels or slope drains. • Install 'cut off drains' on large cut/fill batter slopes to control water runoff speed and hence erosion. • Make sure to clean the sediment deposits and vegetation from the drainage structures before rainy season.

ECoP 9: Top Soil Management

Project activity/ Impact source	Environmental Impact	Mitigation Measures/ Management Guidelines
Land clearing and earthworks	Earthworks will impact the topsoil and cause erosion of the topsoil.	The Contractor shall • Strip the top soil to a depth of 15 cm and store in stock piles of height not exceeding 2m. • Remove unwanted materials from top soil like grass, roots of trees and similar others. • The stockpiles will be done in slopes of 2:1 to reduce surface runoff and enhance percolation through the mass of stored soil. • Locate topsoil stockpiles in areas outside drainage lines and protect from erosion. • Construct diversion channels and silt fences around the topsoil stockpiles to prevent erosion and loss of topsoil. • Spread the topsoil to maintain the physico-chemical and biological activity of the soil. The stored top soil will be utilized for covering all disturbed area and along the proposed plantation sites. • Prior to the re-spreading of topsoil, the ground surface will be ripped to assist the bounding of the soil layers, water penetration and re-vegetation.

ECoP 10: Borrow Areas Management

- Not relevant to the anticipated subproject activities

ECoP 11: Air Quality Management

Project activity/ Impact source	Environmental Impact	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Air quality can be adversely affected by vehicle exhaust emissions and combustion of fuels.	The Contractor shall • 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. • Spray water on construction materials prior to loading and transport.

Project activity/ Impact source	Environmental Impact	Mitigation Measures/ Management Guidelines
		• 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. Undertake servicing of 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 and others.
Construction activities	Dust generation from construction sites, material stockpiles and access roads is a nuisance in the environment, cause air pollution and can be health hazard of the workers and surrounding local communities.	• Water the material stockpiles, access roads and bare soils as required to minimize the potential for environmental nuisance due to dust. Increase the watering frequency during periods of high risk (e.g. high winds, high temperature). 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. • Reschedule earthwork activities or vegetation clearing activities, where practical, if necessary to avoid during periods of high wind and if visible dust is blowing off-site. • Restore disturbed areas as soon as practicable by vegetation/grass-turfing. • 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. • Crushing of rocky and aggregate materials shall be wet-crushed, or performed with particle emission control systems.

ECoP 12: Noise and Vibration Management

Project activity/ Impact source	Environmental Impact	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Noise quality will be deteriorated due to vehicular traffic	The Contractor shall • Maintain all vehicles in good working condition in accordance with manufactures maintenance procedures/protocols. • Make sure all drivers 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 for all noise generating activities to avoid noise pollution of local residents. • Use the quietest available plant and equipment • Modify equipment to reduce noise (for example, noise control kits, lining of truck trays or pipelines). • Maintain all equipment in good working condition in accordance with manufactures maintenance procedures/protocols. Equipment suppliers and contractors shall present the 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 in the construction sites.
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. • 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. pile driving. • 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.

ECoP 13: Road Transport and Road Traffic Management

Project activity/ Impact source	Environmental Impact	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 and submit a traffic management plan to the PMU for approval at least 30 days before commencing work on any project component involved in traffic diversion and management. • Include in the traffic management 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, and road signs. • Provide signs at strategic locations of the roads complying with the schedules of signs contained in the Bangladesh Traffic Regulations. • Install and maintain a display board at each important road intersection to be used during construction, which shall clearly show the following information in Bangla: • Location and types of construction of ongoing works • Duration of construction period • Period of proposed detour/alternative route • Suggested detour route map • Name and contact address/telephone number of the concerned personnel • Name and contact address/telephone number of the Contractor • Inconvenience is sincerely regretted.
	Accidents and spillage of fuels and chemicals	• Restrict truck deliveries, where practicable to day time working hours. • Restrict the transport of oversize loads. • Operate road traffics/transport vehicles, if possible, to non-peak periods to minimize traffic disruptions. • Enforce on-site speed limit.

ECoP 14: Cultural and Religious Issues

Project activity/ Impact source	Environmental Impact	Mitigation Measures/ Management Guidelines
Construction activities near religious and cultural sites	Disturbance from construction works to the cultural and religious sites, and contractors lack of knowledge on cultural issues cause social disturbances.	The Contractor shall • Communicate to the public through community consultation and newspaper announcements regarding the scope and schedule of construction, as well as certain construction activities causing disruptions or access restriction. • Do not block access to cultural and religious sites, wherever possible • Restrict all construction activities within the foot prints of the construction sites. • Stop construction works that produce noise (particularly during prayer time) should there be any mosque/religious/educational institutions close to the construction sites and users make objections. • Take special care and use appropriate equipment when working next to a cultural/religious institution. • Show appropriate behavior with all construction workers especially women and elderly people • Resolve cultural issues in consultation with local leaders and supervision consultants • Establish a mechanism that allows local people to raise grievances arising from the construction process.

ECoP 15: Occupational Health and Safety

Project activity/ Impact source	Environmental Impact	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, wastewater, vector transmitted diseases etc.), (and (ii) road accidents from construction traffic.	The Contractor shall • 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 Labor Office guideline on 'Safety and Health in Construction; World Bank Group's 'Environmental Health and Safety Guidelines') and contractor's own national standards or statutory regulations, in addition to complying with the national standards of the Government of Bangladesh (e.g. `The Bangladesh Labor Code, 2006') • 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 protective equipment (PPE) for workers, such as safety boots, helmets, masks, gloves, protective clothing, goggles, full-face eye

Project activity/ Impact source	Environmental Impact	Mitigation Measures/ Management Guidelines
		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 environment, health and safety manager to look after the health and safety of the workers.
Accidents	Lack of first aid facilities and health care facilities in the immediate vicinity will aggravate the health conditions of the victims	Provide 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 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 to strictly follow the driving rules • Provide adequate lighting in the construction area and along the roads.
Water and sanitation facilities at the construction sites	Lack of Water sanitation facilities at construction sites cause inconvenience to the construction workers and affect their personal hygiene.	The contractor should provide portable toilets at the construction sites, if about 25 people are working the whole day for a month. Location of portable facilities should be at least 6m away from storm drain system and surface waters. These portable toilets should be cleaned once a day and all the sewerage should be pumped from the collection tank once a day and should be brought to the common septic tank for further treatment. Contractor should provide bottled drinking water facilities to the construction workers at all the construction sites.
Shallow depth or open excavation for sewer trunk main	safety for excavation works	• for 1.5 m or more depth, scaffolding to be ensured to protect soil collapse situation, • excavated soils to be disposed to safe places • traffic management, around, in a controlled way ensuring drainage after a rainfall
Micro tunneling for sewer trunk main	safety for excavation works	• proper loading arrangement on oscillator for evenly pressing the steel pipes (each casing pipe is with 20 mm thick, 3 m dia and 2.5 m long pipe)

Project activity/ Impact source	Environmental Impact	Mitigation Measures/ Management Guidelines
		• safe disposal of excavated slurry (earlier arrangement of disposal is essential) • during excavation boring use of bentonite/ super-bentonite or chemical use and later on de-sanding machine use should be done in efficient way, • the disposal of chemicals used in solidification of soil shall be done in efficient way • use of oxygen mask for every laborer in the excavated pit to be ensured • proper lightening and air flow shall be ensured in the excavated hole, • regular monitoring of sulphur or ammonia is to be ensured, • a total canopy on the excavation hole is to be prepared and fenced earlier to start working • welding arrangement (for the piling sheets) should be proper
Sewage Treatment Plant's interventions	Safety for sludge separation	• odor control during separation (screening) • BOD control (allowing required settlement time) • controlling sludge drying beds • disposal of effluents controlling BOD • Odor control in all cases, • mosquito and other vermeils' control
Installation of sewage collection lines	Safety for connection with houses	• house collection lines should be in proper way (scientific way of connection) to avoid fracture of collection lines • proper sloping between house (latrines/septic tank points) and collection lines to be maintained • proper inspection pits for house connections
Sewage management for non-sewer areas	Collection of septage from the septic tanks	• preparation of septic tanks' pits before extracting septage by the vacuum-truck, • control of vermeils during collection • evenly disposal of septage from vacuum truck to the sludge treatment (Cake making areas at STP) • checking of harmful pollutants after drying to cake • proper measures during fertilizer composting (if any) • management of extracted/ separated liquid from the vacuum-truck.

ECoP 16: Community/Public Health and Safety

The safety and health of the public is impacted due to the hazards created during the construction period. This code of practice describes the measures that need to be taken to mitigate the impacts.

Pre-construction Stage

In order to incorporate public health and safety concerns, the PMU and the Contractor shall disseminate the following information to the community:

- Location of subproject activities,
- Borrow areas,

- Extent of work
- Time of construction
- Involvement of local labors in subproject construction
- Health issues - exposure to dust, communicable diseases etc.

Construction Stage

- Proper safety/warning signs are to be installed by the contractor to inform the public of potential health and safety hazard situations during the construction phase in the vicinity of the project.
- The PMU shall carry out periodic inspections in order to ensure that all the measures are being undertaken as per this ECoP.

Post-construction Stage

- The construction site shall be cleaned of all debris, scrap materials and machinery on completion of construction for the safety of public and users.

ECoP 17: Accident and Emergency Plan

Tractors, Motor Vehicles and other Self-Propelled Implements:

- These and all other vehicles must be immobilized when not in use.

Machinery, Plant and Equipment

- Sharp points, spikes and sharp edges must be protected. Adequate support must be given to prevent moving or tipping up. Cutter bars, knives or other cutters must have their blades removed or approved guards covering them. Belts, gearing and other moving parts must be guarded so that there is no danger whatsoever and the public must be kept well clear. Hydraulics must be immobilized.

Hydraulics

- Any equipment operated by hydraulics, i.e. trailers, tractor buckets, fork lifts, chutes must be suitably propped with steel props and at separate stages if in multi-stage rams. Any steam or pressure vessel or lifting appliance used must have undergone a recent inspection by a competent person.

Tower Cranes and Hoists

- The area over which the crane is exhibited must be protected in case of collapse.

Digging of Holes and Other Excavations

- No post holes are to be bored nor is any other digging or excavation to take place anywhere without written authorization

Fencing

- Single rope or post and rail fencing will normally suffice as providing minimum protection however, where there is a need to prevent total public access to a site or part thereof, secure wire mesh or vertical barrier rail type fences should be used.

Storage of Flammable Liquids and Gas

- Storage of these materials will not normally be permitted. These must be secured to prevent theft or misuse, they should be supported so that they cannot fall over and valves and pipes are to be kept clear of obstructions and free from external pressures.

Protective Clothing

- Standardized protective clothing should be used wherever there is a requirement.

Electricity

- The contractor will inspect all pre-wired installations when connecting the supply and a charge will be made should further testing be required. Contractors will be held responsible for the safekeeping of fittings and installations on their sites.

Traffic

- All vehicles used must comply with the relevant safety and road traffic regulations.

Site safety rules for contractors

- Appropriate personnel protective equipment (PPE) e.g. hard hats, vests, ear protection and safety boots to be worn when required.
- No persons are to use lifting equipment of any description unless they have undergone the relevant training
- All lifting equipment to be accompanied by current certificate of inspection
- Exclusion zones are to be put into place around all heavy and or awkward lifting operations
- All tools and equipment to be kept in good working order and only to be used for the purpose for which they were intended, any defects in tools or equipment should be reported as soon as possible to the relevant contractor's supervisor, or if deemed necessary to the site office immediately.
- All equipment and tools not in use must be safely and securely stored in the appropriate area, so that they may only be accessed by authorized persons and do not pose any danger to other workers or members of the public.
- All walkways, access points and emergency exits to be free from obstruction at all times.
- All contractors should ensure that they do not obstruct any emergency exits, thoroughfares or access points with any articles or materials.
- All contractors, sub-contractors and other staff are to ensure they are familiar with procedures to be followed in the event of an emergency or major incident.
- All incidents resulting in injury and any near misses to be reported to relevant project manager.
- Exclusion zones to be established around areas where work at height is being carried out, or where overhead loads are being slung.
- Any worker found, or suspected to be, under the influence of alcohol or illegal drugs will be asked to leave the site.
- Health & safety compliance will be monitored by designated safety manager of the contractor who will liaise with suppliers, site management to ensure that the above rules are being followed.

Fire Safety

- All workers should be aware of the location of firefighting equipment, fire alarm points and the locations of emergency exits and routes in the area in which they are working.

Noise at Work

- The contractor has a duty to ensure that their staff are adequately protected against the harmful effects of noise. The contractor will supply their staff with appropriate noise projection gear.

Loading/Unloading of Vehicles

- ALL vehicles must observe the site speed limit at all times.
- All workers and visitors to wear hi-vis waistcoats at all times whilst on site.
- All goods vehicles must have their vehicle height clearly marked if in doubt of height clearance, should be seen to the site by a competent person from the contractor's team.
- All delivery vehicles should be seen into and away from their unloading position by a competent person to avoid collisions, particularly with people.

- All workers should be aware of traffic in the vicinity of the unloading areas and on the roadways.
- Make sure when lifting articles and materials or equipment from vehicles or trailers, and or releasing load bars/straps/ties be aware that other equipment may have become dislodged which could fall.
- Be aware of slippery areas and trip hazards
- Try to ensure that adequate lighting is available both inside and out of the immediate loading/unloading area.
- An exclusion zone should be made around unloading areas to avoid unnecessary danger to crew and or public.
- Continual monitoring of ramps and loading bays should be carried out to alleviate the potential of harm.
- Equipment must not block any designated fire/ambulance lanes at any time.
- Appropriate signage should be used to make people aware of the dangers of the area.

Mechanical Handling

- Vehicles must observe the site speed limit at all times.
- All vehicles must comply with any current and or relevant standards
- Vehicles must be parked in a safe place ensuring that no emergency routes are blocked.

Construction and Dismantling of Structures

- Be aware of other work going on around you.

Accident Procedure

- If an accident occurs firstly make sure that nobody is in any immediate danger i.e. from electrocution, traffic, falling truss etc.
- Do not move the patient unless they are in further danger.
- Send someone to call for medical help.
- If trained, administer first aid, or otherwise summon a trained first-aider.
- Clear by-standers and onlookers from the area

Annex 6: Chance Find Procedures

(Ref: The World Bank Operational Manual, 1999 OP4.11)

Works could impact sites of social, sacred, religious, or heritage value. “Chance find” procedures would apply when those sites are identified during the design phase or during the actual construction period and the related activity will not be eligible for financing under the project.

Cultural property includes monuments, structures, works of art, or sites of significant points of view, and are defined as sites and structures having archaeological, historical, architectural, or religious significance, and natural sites with cultural values. This includes cemeteries, graveyards and graves.

The list of negative subproject attributes which would make a subproject ineligible for support includes any activity that would adversely impact cultural property.

In the event of finding of properties of cultural value during construction, the following procedures for identification, protection from theft, and treatment of discovered artifacts should be followed and included in standard bidding document.

(a) Stop the construction activities in the area of the chance find;

(b) Delineate the discovered site or area;

(c) Secure the site to prevent any damage or loss of removable objects.

(d) Notify the supervisory Engineer who in turn will notify the responsible local authorities;

(e) Responsible local authorities and the relevant Ministry would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures.

(f) Decisions on how to handle the finding shall be taken by the responsible authorities and the relevant Ministry. This could include changes in the layout (such as when finding an irremovable remain of cultural or archeological importance), conservation, restoration and salvage.

(g) Implementation of the authority decision concerning the management of the finding shall be communicated in writing by the relevant Ministry.

(h) Construction work could resume only after permission is given from the responsible local authorities and the relevant Ministry concerning safeguard of the heritage.

These procedures must be referred to as standard provisions in construction contracts. During project supervision, the Site Engineer shall monitor the above regulations relating to the treatment of any chance find encountered.

Relevant findings will be recorded in World Bank Supervision Reports and Implementation Completion Reports will assess the overall effectiveness of the project’s cultural property mitigation, management, and activities, as appropriate.

Annex 7: Sample Environmental Monitoring Plan

Monitoring	Location	Parameters to be Monitored	Monitoring Frequency and Responsibility	Resources Required
Baseline Data before the Preparatory Works for Construction Commences				
Noise Level	At construction sites of drop shafts for micro-tunnelling, earth excavation sites for trenches, pump station sites, FSM treatment plant site, sludge disposal site	Equivalent Sound Level (Leq) with GPS location of measuring site and wind speed and direction	Measurement during night-time and day-time by the contractor	Noise Level Meter, GPS, Anemometer
Air Quality	At general area of construction works	PM2.5, PM10 with GPS location, wind speed and direction	At least 8 hours continuous in wet season and dry season by the DWASA/contractor	Particulate matter sampling device, GPS, Anemometer
Surface Water Quality	Water sample from natural khals or water bodies adjacent to the construction sites	TDS, Turbidity, pH, DO, BOD, COD, Ammonia, E.coli	One set each during dry season and wet season by the DWASA/contractor	DWASA water quality laboratory facilities
Groundwater Quality	Water samples from DWASA production wells adjacent to the construction sites	EC, E.coli	One set by the DWASA/contractor	DWASA water quality laboratory facilities
Site Condition	At general area of construction works	General site condition, traffic condition, pedestrian movement, vegetation clearance etc. by visual survey (photographs)	Once before preparatory work for construction commences by the DWASA/contractor	Digital Camera
During Construction				

Noise Level	At construction sites of drop shafts for micro-tunnelling, earth excavation sites for trenches, pump station sites, FSM treatment plant site, sludge disposal site	Equivalent Sound Level (Leq) with GPS location of measuring site and wind speed and direction	Measurement during night-time and day-time by the contractor	Noise Level Meter, GPS, Anemometer
Air Quality	At construction sites of drop shafts for micro-tunnelling, earth excavation sites for trenches, pump station sites, FSM treatment plant site, sludge disposal site	PM2.5, PM10 with GPS location, wind speed and direction	At least 8 hours continuous in wet season and dry season by the DWASA/contractor	Particulate matter sampling device, GPS, Anemometer
Surface Water Quality	Water sample from same locations during baseline monitoring	TDS, Turbidity, pH, DO, BOD, COD, Ammonia, E.coli	Monthly by contractor	DWASA water quality laboratory facilities
Groundwater Quality	Water sample from same locations during baseline monitoring	EC, E.coli	Monthly by contractor	DWASA water quality laboratory facilities
Site Condition	At all construction sites	General site condition, traffic condition, pedestrian movement, vegetation clearance etc. by visual survey (photographs)	Minimum weekly report or as may be directed by the PMU/Supervision Consultant	Digital Camera
Treated wastewater including septic wastes	At all construction sites	EC, E.coli	Weekly by contractor	DWASA water quality laboratory facilities

Sanitation and Waste Management	Labour shed, site offices	Visual inspection of sanitation situation, collection, and disposal of solid waste as per guidelines	Weekly by contractor, PMU/Supervision Consultant	
Reinstatement of work sites	All work sites	Visual inspection of reinstatement works as per guidelines (photographs)	After completion of works by the PMU/Supervision Consultant	Camera
Occupational Health & Safety	All construction sites, labour shed	Routine health check-up Usage of personal protective gears and equipment	Health check-up every one year, random inspection of safety requirements	Designated Specialist/Laboratories for health check-up
During O&M				
Noise Level	At pumping stations, treatment plants	Equivalent Sound Level (Leq) with GPS location of measuring site and wind speed and direction	Yearly by DWASA	Noise Level Meter, GPS, Anemometer
Air Quality	At pumping stations, treatment plants	PM2.5, PM10 with GPS location, wind speed and direction	Yearly by DWASA	Particulate matter sampling device, GPS, Anemometer
Surface Water Quality	Water sample from same locations during baseline monitoring	TDS, Turbidity, pH, DO, BOD, COD, Ammonia, E.coli	Monthly by DWASA	DWASA water quality laboratory facilities
Groundwater Quality	Water sample from same locations during baseline monitoring	EC, E.coli	Monthly by DWASA	DWASA water quality laboratory facilities
Site Condition	At pumping stations, treatment plants	General condition (photographs)	Monthly by DWASA	Digital Camera

Annex 8: DWASA DSIP: Screening Form for Social Safeguards Issues

[To be filled in jointly by DWASA and Consultant for each Work/Contract package/Subproject, or sections/spots of the pipelines, as well as the sites of existing and new Lifting Pump Stations, where private lands are to be acquired, or public lands (including DWASA's own) are to be resumed from authorized and unauthorized private uses. The consultant will include a summary of the impacts and mitigation requirements for each subproject in the Screening Report. Impacts identification and the mitigation eligibility and requirements should follow the principles adopted in this ERSMF (Chapter 7.]

Screening will be carried out with reference to the Pipeline layout plans. If there are no changes in the alignment of existing Trunk Mains, screening will be based on the previous layout plans.

A. Identification

Screening Date:……..

1. **Trunk Main**:…… Contract Number(s)::……..
2. Trunk Main section screened & its length and location (Use chainage, holding numbers, etc. to identify the location later):.....

   ……

   ……
3. Brief description of the planned civil works: of the planned civil works:……..

   ……

   ……

   ……
4. **Lifting Pump Station (LPS)**: Location:…..…… Contract Number(s):…..……

   [ ] Existing [ ] New
5. Brief description of planned civil works for this LPS:……..

   ……

   ……

B. Participation in Screening

6. Names of <u>Consultant's representatives</u> who screened this Contract package/Subproject:…….

   ……

   ……
7. Names of <u>DWASA officials</u> participated in screening:……..

   ……

   ……
8. <u>Local Government representatives and community members & organizations</u> participated in screening: *List them in separate pages with names and addresses, in terms of road sections/spots and any other information to identify them during preparation of impact mitigation plans.*

9. Would-be affected persons participated in screening*: List them in separate pages with names, addresses in terms of pipeline sections/spots where they would be affected, and any other information to identify them during preparation of impact mitigation plans.*

C. Land Requirements & Ownership

10. According to the *Pipeline Layout Plan* prepared for the DSIP, will there be a need for additional lands beyond the carriageways, sidewalks and road shoulders?

    [ ] Yes [ ] No If "Yes", approximate amount of land required:…….

11. The required lands presently belong to (Indicate all that apply): [ ] Private citizens

    [ ] DWASA [ ] DSCC [ ] Other GOB agencies (Mention):……..

12. *Existing LPS*: Is there a need for additional lands outside the existing site?

    [ ] Yes [ ] No If "Yes", approximate amount of land required:……

13. The required lands presently belong to (Indicate all that apply): [ ] Private citizens

    [ ] DWASA [ ] DSCC [ ] Other GOB agencies (Mention):…….

14. *New LPS:* Total amount of lands required:…….

15. The required lands presently belong to (Indicate all that apply): [ ] Private citizens

    [ ] DWASA [ ] DSCC [ ] Other GOB agencies (Mention):…….

D. Current Land Use & Potential Impacts

16. If the required lands belong to **Private Citizens**, they are currently used for following purposes:

    [ ] **Commercial** [ ] Owner is the only user [ ] Used by owner and tenants

    Number of business units:…… Number of tenants:.....

    [ ] **Residential** [ ] Owner is the only user [ ] Used by owner and tenants

    Number of residential units:……

    [ ] **Other uses** (Mention):..... # of users:……

17. If the required lands belong to DWASA and/or other GOB agencies, they are currently used for (Indicate all that apply):

    [ ] Commercial purposes # of persons using them:…….# of shops:……

    [ ] Residential purposes # of households living on them:……..

    [ ] Other uses (Mention……) # of users:……..

18. How many of the present *users have lease agreements with DWASA and other government agencies?*

    With DWASA:…….. With other Government agencies:……

19. Number of homesteads that would be affected on private lands:

    Entirely, requiring relocation:…… *Partially,* but can still live on present homestead:……

[It is to be noted that where buildings are partially affected and dismantled, DWASA will have to get their structural designs examined by expert engineers to determine whether the remainders of the

buildings are safe for further use. DWASA/Consultant will list all such buildings during social screening.]

20. Number of **Business premises/buildings** that would be affected **on private lands**: ……..

Entirely affected, and will require relocation:.....

# of businesses housed in these structures:……..

# of persons presently employed in the above businesses: ……

# of these structures built with brick, RCC, & other durable materials: ……

# of structure built with inexpensive salvageable materials (bamboo, GI sheets, etc): ……..

Partially affected, but can still use the premises:……..

# of businesses housed in these structures: …….

# of persons presently employed in these businesses: ……

# of these structures built with brick, RCC, & other durable materials: ……

# of structure built with inexpensive salvageable materials (bamboo, GI sheets, etc): ……..

21. Is there a possibility that some of the businesses, even though they are not physically affected, may have to temporarily but completely close down because excavation would make them inaccessible?

[ ] Yes [ ] No

If "Yes", approximate number of businesses that face such temporary closure:.....

(These establishments must be recorded with names of owners, phone numbers, holding numbers and other information to find them later for re-assessment.)

22. Number of **Residential households** will be affected **on DWASA's own & other public lands**:…….

Entirely affected and will require relocation: # of such structures:.....

# of structures built with brick, RCC, & other expensive and durable materials: ……..

# of structures built with inexpensive salvageable materials (bamboo, GI sheets, etc): ……

Partially affected, but can still live on the present homestead: # of structures:.....

# of structures built with brick, RCC, & other expensive and durable materials: ……..

# of structures built with inexpensive salvageable materials (bamboo, GI sheets, etc: ……..

23. Number of **Non-titled households** squatting on sidewalks/other lands which will be displaced permanently/temporarily during pipeline laying works:

Permanently:…….. Temporarily:……..

What are the three major occupations they have been engaged in:

(a) .....

(b) .....

(c) .....

24. Number of Vulnerable households (headed by poor women, households with disabled members, and others) would be displaced permanently/temporarily during pipe laying works:

Permanently:…… Temporarily:……

What are the three major occupations they have been engaed in:

(a) ……..

(b) ……

(c) ……

25 Small-scale businesses/trading activities conducted on sidewalks and road shoulders. (These are expected to operate in the open -- sometimes using makeshift movable structures made of bamboo poles, plastic sheets, etc. They can be moved and rebuilt in a matter of few hours. There are others who use mobile vans and keep moving from one spot to another.)

Number of such vendors/traders found on the day of safeguard screening of the parts of the proposed pipeline alignments:……..

26. Number of **Community facilities** that will be affected in this section:……

Schools/Colleges:…… Madrasas:…… Mosques:……

Temples:…… Cemeteries:……

Brief description of how the planned civil works will affect them:……

……

……

……

……

27. Describe any other impacts that have NOT been covered in this questionnaire?

……

……

……

……

28. Describe alternatives, if any, to avoid or minimize the potential adverse impacts identified during screening of this part of the subproject/contract package:……..

……

……

……

……

29. Describe the feedback, if any, received from the local persons who have participated in screening

……

……

……

……

On behalf of the consultants, this Screening Form has been filled in by:

Name:…….. Designation:……

Signature:…… Date:……

Name:…… Designation:……

Signature:…… Date:……

Annex 9: Table of contents of RAP

1. Introduction
    1. Brief Introduction of the subproject
    2. Description of Component(s) that cause land acquisition/alienation and resettlement
    3. Overall Estimates of Land Acquisition and R&R
2. Measures to Minimize Resettlement
    1. Description of Efforts Made for Minimizing Displacement
    2. Description of the Results of these Efforts
    3. Description of Mechanisms to Minimize Displacement and Loss of Livelihood/Income during Implementation
3. Census and Socio-Economic Surveys
    1. Provide the results of the census and socio-economic surveys
    2. Identify all categories of impacts and the extent of impact on each affected
4. Consultation and involvement of PAPs
    1. Describe various Stakeholders
    2. Summarize process of consultation on the results of socio-economic surveys
    3. Describe the need and mechanisms to conduct updates to socio-economic surveys
    4. Describe how this process of consultation would be continued through implementation and monitoring
    5. Describe the plan for disseminating information to Project Affected Persons
5. Entitlement Framework
    1. Provide a definition of PAFs and PAPs together with their categorization based on impacts
    2. Describe R&R entitlements for each category of impact
    3. Describe method of valuation used for affected land, structures and other assets
    4. Using Entitlement Matrix, present a table of all PAFs/PAPs and their losses/ impacts and entitlements
6. Relocation (if applicable)
    1. Does the Project need community relocation sites? If yes, have they been inspected and accepted by PAPs?
    2. Have the Project Affected Persons agreed to the strategy for housing replacement? Will new housing be constructed/allocated? If PAPs are to construct houses, explain if compensation entitlement for housing is sufficient to help them construct houses.
    3. List of proposed sites along with number of affected families to be relocated
    4. Describe respective mechanisms for (i) procuring/acquiring/alienating ; (ii) developing and (iii) allotting resettlement sites

5. Provide detailed description of arrangements for development of resettlement sites including provision of social infrastructure

6. Describe the feasibility studies conducted to determine the suitability of the development of sites.

7. Income Restoration

1. Are the compensation entitlements sufficient to restore income streams for each category of impact? If not, what additional economic rehabilitation measures are necessary?

2. Briefly spell out the restoration strategies for each category of impacts, and describe institutional, financial and technical arrangements/aspects involved

3. Describe the process of consultation with PAPs to finalize strategies for income restoration

4. How do strategies for restoration vary with the area/locality of impact

5. If income restoration involves change in livelihoods or other economic activities allow substantial amount of time for capacity building, accessing institutional funds/credits/markets, preparation and implementation. Work out the rate of returns for each of the economic activities opted by the entitled person.

6. How are the risks of impoverishment proposed to be addressed?

7. Explain the main institutional and other risks for effective implementation of plans for restoration of livelihood

8. Describe the process for monitoring the effectiveness of income restoration activities

8. Institutional Arrangements

1. Describe institution(s) responsible for: (a) delivery of each item/activity in the entitlement policy; (b) implementation of resettlement and rehabilitation programs and (c) coordination of all other activities as described in the Rehabilitation Action Plan

2. State how coordination issues will be addressed in cases where resettlement and rehabilitation are spread over a number of institutional/departmental jurisdictions

3. Indicate the agency that will coordinate all implementing agencies – do they have the necessary mandate and the resources

4. Describe the external (non-Project) institutions/departments involved in the process of resettlement and restoration of income such as land development, land allocation, credit, training for capacity building and the mechanisms in place to ensure adequate cooperation and performance of these institutions/departments

5. Describe the results of the institutional capacity assessment and give the institutional development plans including staffing schedule and training requirements

6. Discuss institutional capacity for, and commitment to, resettlement and rehabilitation

9. Monitoring and Evaluation

1. Describe the internal monitoring process

2. Define key monitoring indicators for resettlement, rehabilitation and participation and provide a list of these indicators which would be used for internal monitoring

3. Describe institutional (including financial) arrangement

4. Describe frequency of reporting and contents of reports

5. Describe the process for integrating feedback from internal monitoring into implementation

6. Describe financial arrangements for external monitoring including process for awarding and maintenance of contracts for the entire duration of R&R

7. Describe the methodology for external monitoring

8. Describe frequency of external reporting and its contents

10. Redress of Grievances

1. Describe the structure and process of grievances mechanisms at various levels including step-by-step process for registering and addressing grievances and provide specific details regarding registering complaints, discussing them with PAPs, response time, communication modes etc.

2. Describe the mechanism for appeal

3. Describe the provision, if any, to enable PAPs to approach civil courts in case these provisions fail.

11. Implementation Schedule

1. List the chronological steps in implementation of R&R Action Plan including identification of agencies responsible for each activity along with a brief explanation of each activity

2. A month-wise implementation schedule (Gantt chart) of activities to be taken as part of R&R Action Plan

3. Description of the linkage between R&R implementation and initiation of civil works for each of the Project component

12. Costs and Budgets

1. Clear statement of financial responsibility and authority

2. List the sources of funds for R&R and describe the flow of funds

3. Indicate if costs of R&R are included in the overall Project costs

4. Identify R&R costs, if any, to be funded by the WB

5. Provide a cost-wise, item-wise budget estimate for the entire R&R costs including administrative expenses, monitoring and evaluation and contingencies

6. Describe the specific mechanisms to adjust cost estimates by inflation factor

7. Describe provisions to account for different types of contingencies

I3 Documentation on Public consultations

Annex 10: Terms of References for Environmental and Social Specialists in the PMU

Senior Environmental and Social Specialist

Senior Environmental and Social Specialist of the PMU will be responsible to oversee the implementation of ESMP/RAPs of proposed subprojects. Detailed scope of work of this specialist will include, but not limited to:

a) Assist the Project Director (PD) in conducting environmental screening and categorization of each subproject;
b) Assist the PD in implementation of the EMF during the project implementation period;
c) Assist the Project Director in finalizing the terms of references and request for proposals for various environmental consulting firms or to be hired for carrying out the ESIA/ESMP/RAPs of the proposed subprojects in Component 2 and 3 Assist the Project Director in review and approval of these document in close co-ordination with the World Bank;
d) Assist the PD in drafting the Environmental, Social, Health and Safety requirements in the bidding and contract documents in accordance with the ESMP, and integrating the ESMP into contract documents.
e) Assist the PD in review and approval of the various documents prepared by the contractor such as environmental action plans, code of conduct, labour policy, method statements, monitoring reports, and so on.
f) Supervise the contractor's work to ensure compliance with the environmental, social, health and safety requirements of the bidding documents and ESMP. Provide recommendations for implementation of corrective actions for any non-compliances and suggest improvements for contractor's performance.
g) Assist the DWASA Engineers at site by providing appropriate environmental advice, and developing appropriate environmental mitigation measures for each intervention;
h) Assist DSIP consultant's and DWASA community organizer to carryout participatory consultation during planning, design and implementation;
i) Investigate and report all incidents related to environmental, social and health aspects. Carry out root cause analysis for all major incidents, and Recommended actions to be taken to rectify the failure that led to these incidents.
j) Provide regular training programs to the contractor's labour on environmental, social, health and safety aspects associated with the construction activities.
k) Prepare quarterly progress reports on the implementation of the ESMP for transmission to the World Bank throughout the project implementation period.
l) Liaison with the Contracts, supervision consultants for the Implementation of the ESMP;
m) Liaison with the DOE on environmental and other regulatory matters; including renewal of environmental clearance documents as and when required
n) Dialogue with the project affected persons (PAPs) and ensure that the environmental concerns and suggestions are incorporated and implemented in the project;
o) Undertaking environmental monitoring and reporting to the Project Director and follow-up activities;
p) Assist the PD to arrange for the Environmental Auditing and follow up action on the Audit recommendation.
q) Report to the PD on the environmental aspects pertaining to the project.
r) Maintaining project-specific Database for Environmental and Social Management

s) Capacity Building of the responsible officers responsible for environmental sustainability assurance of DWASA project
t) Any other tasks specified by the PD

Assist Environmental and Social Specialist

Responsibilities of the Assistant Environmental and Social specialist will include, but not limited to:

a) Assist the Design Consultants in Environmental screening process

Assist the PMU in Environmental Assessments for the projects;
Assist PMU in obtaining of requisite Environmental Clearances for the project;
Assist the Executive Engineer /Senior Environment Specialist and the Environmental Specialist of the Design and supervision Consultants in preparation of the training materials and in conducting training;
Review the contractor's Implementation Plan for the environmental measures, as per the EMP with assistance from the Environmental Specialist of the consultant;
Liaison with the contractors and supervision consultant on the implementation of the EMF and EMP;
Carry out consultations with the NGOs and Community groups to be involved in the project;
Ensure that the environmental concerns and suggestions are incorporated and implemented in the project;
Carry out site inspections, check and undertake periodic environmental monitoring and initiate necessary follow-up actions;
Document the good practices in the project on incorporation and integration of environmental issues into engineering design;
Report to the Executive Engineer (Environment Monitoring division) / PD on the environmental aspects pertaining to the project;
Assist in the preparation of periodic reports for dissemination to the PMU, World Bank, etc.

Annex 11: Public Consultation Meetings - Photographs

Consultation at Matuail Union Parisad 23-05-2018

Consultation at Dania Union Parisad 23-05-2018

Discussion by UP Chairman, Dania UP 23-05-2018

Consultation at Armanitola Councilor Office 24-05-2018

Consultation at Narinda Councillor Office 24-05-2018

Presentation of project overview at Narinda Councillor Office 24-05-2018

	
Consultation at Maradia Govt. Primary School 26-05-18	Consultation at Maradia Govt. Primary School 26-05-18
	
Consultation at Manda UP 27-05-2018	Consultation at Mugda Community Center 02-06-2018
	
Consultation at Shahjahanpur Councilor Office 27-05-2018	Consultation at Shyampur Councilor Office 30-05-2018

	
Consultation at Shyampur Councilor Office 30-05-2018	Consultation at Mugda Union Parishad office 02-06-2018
	
Consultation at Lalbagh Primary School 02-06-2018	Consultation at Lalbagh Primary School 02-06-2018

ANNEX 12: Applicable National Policies, Legislations and Regulations

	Themes and General Objectives
Constitution of Bangladesh	Article 18A of the constitution refers to one of the fundamental principles of the state policy regarding protection and improvement of the environment and biodiversity: it states that the State shall endeavour to protect and improve the environment and to preserve and safeguard the natural resources, biodiversity, wetlands, forests and wild life for the present and future citizens.
National Environmental Policy, 1992 replaced in 2013	The National Environment Policy sets the policy framework for environmental action, in combination with a set of broad sectoral guidelines. It emphasizes inter alia: • Maintenance of the ecological balance and overall progress and development of the country through protection and improvement of the environment: • Protection of the country against natural disasters; • Identification and control of all types of activities related to pollution and degradation of environment; • Environmentally sound development in all sectors; • Sustainable, long term and environmentally congenial utilization of all-natural resources; and • Active association with all environmental-related international initiatives. The National Environmental Policy forms the basis of all subsequent laws, rules, strategies and plan concerning the protection and conservation of the environment in the country.
The Penal Code, 1860 [section 277]	Under the Code if anybody corrupts or fouls the water of any public spring or reservoir, so as to render it less fit for the purpose for which it is ordinarily used, shall be punished with imprisonment for a term not exceeding three months, or with fine which may extend to five hundred taka or with both. Comment: Being general penal law, the law is not functional over other special laws. *Enforcing Institution: Bangladesh Police*
The Protection and Conservation of Fish Act, 1950 and Rule 1985 [Rule 6]	In the Act, 1950 there is no specific provisions to control water quality or to prevent water pollution in river. However, under the Rule 1985 it is prohibited to catch fish by poisoning inland water or depleting fisheries by pollution. Violation of the rule is punishable with rigorous imprisonment for a term not be less than one year and may extend to two years, or fine which may extend to 5000 Taka, or with both. The Act has No provision to assess environmental or ecosystem damage caused by poisoning the water. *Enforcing Institution: Department of Fisheries*
Bangladesh Environment Conservation Act 1995 (amended 2002) & Rules 1997 (amended 2003)	The Act is the sole legislation for the purpose of conserving, preserving and protecting various component of environment from various sources of pollutions. Under the law it is prohibited to filling or changing the class of the lands which is already specified as water reservoir. To protect natural resources DoE can control transport, disposal, dumping of hazardous waste and can declare any area as ecologically critical area. DoE has also duty to take remedial measures for injury to ecosystem and can impose compensation or direct wrongdoer to take corrective

	Themes and General Objectives
[Section: 4, 5, 6C, 6E, 7, 9; Rule 12 & 13]	measures to cure environmental damages. Under the Act the Rule 1997 set forth standards for air, water, sound, odor and other components of the environment under the Schedules 2, 3, 4, 5, 6,7 and 8. It also set forth specific standard limits of the discharge of liquid waste like Sewage discharge, waste from Industrial Units or Projects Waste. Before any new project can go ahead, as stipulated under the ECA, the project promoter must obtain Environmental Clearance from the Director General (DG), Department of Environment (DoE). An appeal procedure does exist for those promoters who fail to obtain clearance. Failure to comply with any part of this Act may result in punishment to a maximum of 5 years imprisonment or a maximum fine of Tk.100,000 or both. For the Environmental Clearance for a project the proponent is to apply for it in prescribed form, together with a covering letter, to the Director/Deputy Director of respective DoE divisional offices. The application should include a project feasibility study report, the EIA report, No Objection Certificate (NOC) of the local authority; Mitigation Plan for minimizing potential environmental impacts; and appropriate amount of fees. The DOE authority reserves the right to request additional information, supporting documents, or other additional materials for the proposed project. Under the conditions specified in the Environment Conservation Rules-1997, the DoE divisional authority must issue environmental site clearance certificates within 60 working days from the date of submitting the application, or the refusal letter with appropriate reasons for such refusal. The clearance issued remains valid for a one-year period and is required to be renewed 30 days prior to its expiry date. For the purpose of issuance of Environmental Clearance Certificate, the industrial units and projects shall, in consideration of their site and impact on the environment, be classified into the following four categories, • Green – Industries and projects which are relatively pollution free • Orange-A, and (ii) Orange-B: do have adverse environmental impacts but not so significant as the Red category • Red – industries and projects which can cause significant adverse environmental impacts. Industries and projects included in the various categories as specified in rule 7(2) of ECR, 1997 have been described in Schedule-1 (Environment Conservation Rules, 1997). Environmental Clearance for Green category industries and projects is provided through comparatively simple procedure. In case of Orange-A, Orange-B and Red Category industries and projects, Site Clearance is mandatory at the beginning, then EIA approval and finally Environmental Clearance is issued. The Environment Clearance is to be renewed after three (03) years for Green category and one (01) year for Orange-A, Orange-B and Red category industries respectively. Environmental Clearance Certificate's shall be issued to all existing industrial units and projects and to all proposed industrial units and projects falling in the Green Category. For industrial units and projects falling in the Orange-A, Orange-B, first a Site Clearance Certificate and thereafter an Environmental Clearance Certificate shall be issued. In case of Red category industries, firstly a Location Clearance Certificate, then Environment Impact Assessment (EIA) approval and thereafter an Environmental Clearance Certificate shall be issued. The DOE executes the Act under the leadership of the DG. The Project will be undertaken in line with the aims and objectives of the Act by conserving the

	Themes and General Objectives
	environment and controlling and mitigating potential impacts throughout the drilling program. The DG of DoE has the overall power to – Identify of different types and causes of environmental degradation and pollution; Instigate and research regarding environmental conservation, development and pollution. Close down the activities considered harmful to human life or the environment. Declare an area affected by pollution as an Ecologically Critical Area. Under the Act, operators of industries/projects must inform the Director General of any pollution incident. In the event of an accidental pollution, the Director General may take control of an operation and the respective operator is bound to help. The operator is responsible for the costs incurred and possible payments for compensation. Comment: The Act is more focused to prevent industrial pollution. However, pollution from other sources is not well addressed here. Moreover, the Act set forth no specific rules or restriction focused on disposal of wastes into the rivers. The weakness in industrial site clearance, environmental clearance, discretionary power of DG to issue certificate without following strict rules need correction. Damage assessment as a result of pollution need to be included in the Rules. *Enforcing Institution: Department of Environment*
National Water Policy, 1999	The National Water Policy 1999 aims to provide guidance to the major players in water sector for ensuring optimal development and management of water. According to the policy, all agencies and departments entrusted with water resource management responsibilities (regulation, planning, construction, operation, and maintenance) will have to enhance environmental amenities and ensure that environmental resources are protected and restored in executing their tasks. Some pertinent clauses in the policy are described below. Clause 4.5b: Planning and feasibility studies of all projects will follow the Guidelines for Project Assessment, the Guidelines for People's Participation (GPP), the Guidelines for Environmental Impact Assessment, and all other instructions that may be issued from time to time by the Government. Clause 4.9b: Measures will be taken to minimize disruption to the natural aquatic environment in streams and water channels. Clause 4.12a: Give full consideration to environmental protection, restoration and enhancement measures consistent with National Environmental Management Action Plan and the National Water Management Plan Clause 4.12b: Adhere to a formal environmental impact assessment (EIA) process, as set out in EIA guidelines and manuals for water sector projects, in each water resources development project or rehabilitation program of size and scope specified by the Government from time to time. Clause 4.13b: Only those water related projects will be taken up for execution that will not interfere with aquatic characteristics of those water bodies.
Environment Court Act, 2000	The aim and objective of the Act is to materialize the Environmental Conservation Act, 1995 through judicial activities. This Act established Environmental Courts (one or more in every division), set the jurisdiction of the courts, and outlined the procedure of activities and power of the courts, right of entry for judicial inspection and for appeal as well as the constitution of Appeal Court.
National Strategy for	The strategy for solid waste management is essential in order to minimize the environmental, social and economic problems. To minimize these problems, recently the GoB has taken some initiatives and accordingly in December 2010, the

	Themes and General Objectives
Waste Management	DoE under MOEF has formulated a national '3R' strategy for waste management in a draft form. It is the latest strategy which will take time to implement globally. For the proposed project, the '3R' strategy shall be followed to minimize the waste impact on environment. The concept of this strategy is minimizing waste impacts in terms of quantity or ill-effects, by reducing the quantity of waste products with simple treatments and recycling the wastes by using it as resources to produce same or modified products. The principle of '3R' is stated as reducing waste, reusing and recycling resources and products
Dhaka Mohanagar Imarot Nirman Bidhimala, 2008 Rule 59 (d)	The Rule 59 (d) set forth building construction-related regulations applicable within the Dhaka city. Under the Rule wastes, no matter what the nature of it, shall not be directly dispose to the water bodies, river and cannel. The Rule 59 (c) states that drainage and sanitation system of every building shall be connected with the government sewerage system. If there is no government sewerage system or if the authority doesn't permit to give the connection with the government sewerage system, the owner of the building shall construct septic tank to dispose sewerage wastes and soak pit to dispose drain or wastewater. Comment: Neither the Rule 2008 nor the Act i.e Town Improvement Act, 1953 (under which the rule is adopted) specifies provision regarding penalty for violating Rule 59(c or d). Enforcing Institution: RAJUK
Local Government (Municipal) Act 2009 Schedule 2	The Act set forth law related with the power and function of Municipality. Under the Act, Municipality may, with the previous sanction of the Prescribed Authority, declare any source of water, spring, river, tank, pond, or public stream, or any part thereof within the municipality, which is not private property, to be a public water-course. If anybody or bodies try to pollute or involved in polluting water course, then municipality may take attempts to punish them. If the source of pollution is outside of the municipality area, the municipality can take legal procedures. Comment: The Act authorize municipality to take legal action if anybody pollute or attempt to pollute water. The section is wide in terms of its interpretation as it did not define the term pollution. However, the Act is silent to specify the type of punishment that can be given for polluting the watercourse. *Enforcing Institution: Municipality authority*
Bangladesh Water Act 2013 Section 28 [Water Pollution Control]	The Act provides provisions for integrated development, management, abstraction, distribution, use, protection and conservation of water resources. The Act authorized DoE to prevent water pollution. The Act denotes water pollution as 'direct and indirect harmful changes of physical, chemical and organic properties of water'. Comment: Section 22 set forth rules for the conservation of water source in haor, baor, dighi, pond or any other similar water source. The section made no reference for the conservation of water source in river. Enforcing Institution: Executive Committee of National Water Resource Council (ECNWRC); WARPO

	Themes and General Objectives
Water Supply and Sewerage Authority Act 1996 Section 17(2)(kha)	DWASA can take up projects for collection, treatment and disposing sanitary sewerage and industrial waste. The Act is not explicit enough regarding conserving, preserving and protecting various component of environment. Under the Act, DWASA is the key institution, responsible to manage Sewerage waste in Dhaka. To strengthen DWASA enforcement power now they can use mobile court under the Mobile Court Act, 2009. However, the WASA Act 1996 does not specifically mention about responsibility of the Authority with regard to on-site sanitation system or any activity related to emptying of pits and septic tanks, collection, transportation, treatment and disposal and/ or reuse of fecal sludge from on-site facilities. *Enforcing Institution: Dhaka Water and Sanitation Corporation (DWASA)*
The Local Government (City Corporation) Act, 2009 Schedule 3	DNCC and DSCC shall be responsible to collect and remove all waste from its controlled roads, public toilet, urinal, drain and building. DNCC and DSCC shall also provide required number of garbage bin to throw wastes and shall construct drainage for proper drain water disposal. Under the Act, all buildings and land owner/occupier shall be responsible to remove wastes and failure to do so shall be punished with fine up to five thousand taka and for the repetition of the same offence five hundred taka additionally can be imposed for each day (Section 93). Schedule 3, Sub-clause 1.10 states that the City Corporation shall serve notice to the owners of households having no latrine or urinal, or having inadequate arrangements, or having latrines and urinals at improper places, to (a) make necessary arrangements for latrines and urinals, (b) change/ improve latrines and urinals, (c) remove latrines and urinals where necessary, and (d) connect appropriately cleanable latrines and urinals to sub-surface sewer network where available. Comment: The Act specifies no provisions to prevent untreated solid waste or fecal sludge disposal or dumping directly in water bodies or land. *Enforcing Institution: Dhaka North City Corporation (DNCC), and Dhaka South City Corporation (DSCC)*
Bangladesh National Building Code, 2020	Under the Code, all premises are expected to have basic minimum sanitary waste and excreta disposal facilities. The code mandatorily required all buildings to have sufficient water and sanitation facilities. However, drainage and sanitation system shall not be installed until a permit for such work has been issued by the Authority for existing (only for addition or for alteration) or new building or for any other premises. The building official shall examine or cause to be examined all applications for permits and, amendments thereto within 45 days. The Code also required obtaining a written approval of the Authority or the appropriate drainage and sanitation authority for connecting any soil or surface water drain to the sewer line. Enforcing Institution: Under the Code, Bangladesh Building Regulatory Authority (BBRA) is supposed to be the enforcing agency, although the Authority is yet to be set up. . According to the Code, areas falling under the master plan control of Rajdhani Unnayan Kartipokhkha (RAJUK) shall be under the control and jurisdiction of BRA Building officials. However, due to the absence of BBRA, RAJUK is now enforcing the code.

	Themes and General Objectives
National Environment Management Plan [NEMAP], 1995	NEMAP expresses the BoG's commitments under Agenda 21 at UNCED in Rio de Janeiro, 1992. The NEMAP initiative was a consultative process which enabled communities to define their environment, identify the issues and concerns, prioritize problems and provide solutions. NEMAP identified the key environmental concerns to Bangladesh and provided an action plan to halt/reduce the rate of environmental degradation, improve the natural and manmade environment, conserve habitats and biodiversity, promoting sustainable development and improving quality indicators of human life. Key elements of the plan initiative include institutional, sectoral, location specific and long-term issues. Elements of NEMAP which are relevant for this project includes its provisions for prevention and control of dumping of raw sewage and other human wastes as well as raw organic waste into the open water. *Enforcement Institution: Department of Environment (DoE)*
National Policy for Safe Water Supply & Sanitation 1998	WASA shall be responsible for sewerage and drainage systems [Clause 8.4.2] and measures will be taken to recycle, as much as possible, waste materials and to prevent contamination of ground water by sewerage and drainage [Clause 8.4.9]. The policy objective is to improve public health and safer environment by (i) ensuring proper storage, management and use of surface water and preventing its contamination; and (ii) promote the use of surface water over groundwater. The proposed activities under DSIP will contribute to meeting these objectives by improving sewage management and reducing surface water contamination.
Urban Management Policy Statement, 1998.	The policy statement recommended the municipalities for privatization of services as well as giving priority facilities to slum dwellers for sanitation.
Seventh Five Year Plan (2016 – 2020) & Eighth Five Year Plan (2021-2025)	SFYP & EFYP suggest adoption of program to design & implement environmentally sound sewerage collection & treatment systems [Chapter 8].
Dhaka Sewerage Master Plan, 2012	The objective of the Master Plan is to recommend a policy framework for the management of sanitation and wastewater and to prepare a sewerage master plan for Dhaka city. The master plan provided sanitation strategy for phased implementation of sanitation including for areas not likely to be covered by centralised sewerage systems, and a phased development of affordable sewerage services, especially for the central region.
Institutional and Regulatory Framework for Fecal Sludge Management (FSM): Mega City Dhaka, 2015	According to the FSM Framework 2015, DNCC and DSCC shall be responsible for fecal sludge management (FSM) in areas within their jurisdiction, including planning for and implementation of FSM services (including financial/business model for service delivery). The MLGRD&C ministry will ensure that the relevant national laws, policies, strategies and guidelines are followed in providing FSM services and will arrange funding support for DNCC and DSCC. The City Corporations shall collaborate with the Dhaka Water Supply and Sewerage Authority (DWASA), RAJUK, DPHE/LGED, development partners, the private sector, the I/NGOs in planning and implementation of FSM infrastructure and services in accordance with the provisions of the Act.

	Themes and General Objectives
	The City Corporations shall collaborate with DWASA for possible treatment of fecal sludge at the sewage treatment plants operated by DWASA. DWASA shall be responsible for proper treatment of "sewage sludge" generated at its sewage treatment plants before discharge or end use. The City Corporations shall make sure that the collected fecal sludge is transported to the designated site(s) for treatment and disposal, and that the collected fecal sludge is never disposed in open space or water bodies or storm drains or sewers (which is a punishable offence according to the City Corporation Act 2009). The City Corporations shall ensure mechanical pit emptying (desludging) services for ensuring health and safety of emptier and protection of the public health and environment. However, the City Corporations shall make sure that the manual emptier (traditional pit emptier/cleaner) community is integrated in the collection (emptying) and transportation services of faecal sludge. In accordance with Clause 82 and Schedule 4 of the City Corporation Act 2009, the City Corporations may fix fees/charges for collection and transportation of faecal sludge from sanitation facilities. RAJUK and private developers shall facilitate availability of land for the City Corporations for fecal sludge treatment and related facilities. Until treatment facility for fecal sludge are built, fecal sludge (e.g., those desludged from onsite sanitation facilities) shall be disposed in a land/area designated by the City Corporations by digging pits/trenches in a ground and covering the pit with soil after it is filled with sludge. The City Corporations shall form a Standing Committee on "Fecal Sludge Management" in accordance to Sub-clause (2) of Section 50 of the City Corporation Act 2009. This Standing Committee shall oversee the activities related to planning and implementation of FSM services. Depending on need and availability, the Committee would co-opt a sanitation/ FSM expert in the Committee [in accordance with Sub-clause (9) of Clause 50 of the City Corporation Act 2009]. Comment: These provisions if approved are expected to harmonize the responsibilities of the three service providers in away. However, responsibility under two different Ministries would still be a problem. *Enforcing Institution: City Corporations*
Bangladesh Standards and Guidelines for Sludge Management (2015)	As described in the standards and guidelines document, the responsibility for sludge management lies with the producer of the sludge. The holder of the sludge must also comply with the requirements mentioned in this document. The producer of the sludge is required to submit a sludge management plan to the Department of Environment (DOE) as part of the environmental clearance application. The producer of sludge can only proceed to use or dispose of the sludge with written permission of the DoE. According to this document, depending upon the origin of the wastewater, sludge is be classified as: • Category A: Municipal sludge including comparable sludge from domestic wastewater treatment • Category B: Sludge from industry including sludge from CETP

	Themes and General Objectives
	• Category C: Sludge from industry including sludge from CETP belonging to the • Category of hazardous waste. In cases where wastewater producing a type of sludge that is classified as Category C is mixed with other types of wastewater and treated together (for example in a CETP), the resulting sludge is to be classified as Category C. In cases where wastewater producing a type of sludge classified as Category B is mixed with wastewater producing sludge classified as Category A and both are treated together, the resulting sludge is to be classified as Category B. If different classes of sludge are mixed during collection, transport, treatment, or during other stages of sludge management, then the method of classification described above is to be applied. Depending on the category of the sludge, specific sludge management options may be chosen, provided that they are in compliance with the requirements given in this document. The options include: anaerobic digestion, land application, thermal incineration, controlled landfill, and recycling in formation of construction materials. Sludge from municipal wastewater or comparable industry may be composted and used in agriculture provided that it complies with the standard for reuse stipulated in this document. Sludge from hazardous industries/CETP must either be treated using thermal incineration or landfilled to protect human health and the environment. Any alternative disposal options may be employed only with prior consent of the Department of Environment. Comment: The Bangladesh Standards and Guidelines for Sludge Management document has clearly defined the role of stakeholders in management of sludge. It also provides clear directives regarding the classifications of different types of sludge along with their management and disposal options. The success of the document depends upon proper implementation, monitoring, and enforcement. *Enforcing Institution: Department of Environment (DoE)*
Bangladesh Labor Act, 2006	The Bangladesh Labour Act, 2006 provides the guidance of employer's extent of responsibility and workmen's extent of right to get compensation in case of injury by accident while working. Some of the relevant Sections are: Section 150. Employer's Liability for Compensation: (1) If personal injury is caused to a workman by accident arising out of and in the course of his employment, his employer shall be liable to pay compensation in accordance with the provisions of this Act; and (2) Provided that the employer shall not be so liable - (a) in respect of any injury which does not result in the total or partial disablement of the workman for a period exceeding three days; (b) in respect of any injury, not resulting in death or permanent total disablement, caused by an accident which is directly attributable to - (i) the workman having been at the time thereof under the influence of drink or drugs, or (ii) the wilful disobedience of the workman to an order expressly given, or to a rule expressly framed, for the purpose of securing the safety of workmen, or (iii) the wilful removal or disregard by the workman of any safety guard or other device which he knew to have been provided for the purpose of securing the safety of workmen.

	Themes and General Objectives
	Section 151. Amount of Compensation: Subject to the provisions of this Act, the amount of compensation shall be as follows, namely: - (a) where death results an amount equal to fifty from the injury cent of the monthly wages of the deceased workman multiplied by the relevant factor; or an amount of fifty thousand rupees, whichever is more; (b) where permanent total an amount equal to disablement results from sixty the injury per cent of the monthly wages of the injured workman multiplied by the relevant.
Public Procurement Rule (PPR), 2008	This rule shall apply to the Procurement of Goods, Works or Services by any government, semi-government or any statutory body established under any law. The rule includes the adequate measure regarding the "Safety, Security and Protection of the Environment' in the construction works. This clause includes mainly, the contractor shall take all reasonable steps to (i) safeguard the health and safety of all workers working on the site and other persons entitled to be on it, and to keep the site in an orderly state and (ii) protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of the Contractors methods of operation.
Bangladesh Climate Change Strategy and Action Plan, 2009	The GOB also prepared the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) in 2008 and revised in 2009. This is a comprehensive strategy to address climate change challenges in Bangladesh. There are 44 specific programs proposed in the BCCSAP under six themes.
Right to Information Act, 2009	The Act makes provisions for ensuring free flow of information and people's right to information. Section 4 of the RTIA states that every citizen has a right to information from the Authority and the Authority shall on demand from a citizen be bound to provide information, however, certain information shall not be disclosed as per the information categories listed in the Act.
Noise Pollution Control Rules, 2006	The Noise Pollution Control Rules have been established in order to manage noise generating activities which have the potential to impact the health and wellbeing of workers and the surrounding communities. Under this legislation, control zones are listed as: Quiet Area – for example school or hospital; Residential Area – an area primarily occupied by dwellings; Mixed Area – area with a mix of residential, commercial and industrial land uses; Commercial Area – an area primarily occupied by businesses and officers; and Industrial Area – and area used for industry or manufacturing. Day-time and night-time noise level restrictions are provided for these areas. Additionally, limits are provided for noise emissions from motor vehicles and boats.
Antiquities Act, 1968	**This Act provides the modes of protection and preservation of things, which are part of national history and heritage. Article 24 states that if the Government is of the opinion that for the purpose of protecting or preserving any immovable antiquity it is necessary so to do, it may, by notification in the official Gazette, prohibit or restrict, within such area as may be specified therein, mining, quarrying, excavating, blasting and other operations of a like nature, or the movement of heavy vehicles, except under and in accordance with the terms of a license granted and rules, if any, made in this behalf.**

Annex 13: Environmental Clearance Certificate for Dhaka Sanitation Improvement Project (DSIP)

Government of the People's Republic of Bangladesh
Department of Environment
Head Office, Paribesh Bhaban
E-16 Agargaon, Dhaka-1207
www.doe.gov.bd

Memo No: 22.02.0000.018.72.44.18.494 Date: 23 / 10/2019

Subject: Environmental Clearance for Dhaka Sanitation Improvement Project under Dhaka WASA.

Ref: Your application dated 30/06/2019 and 19/08/2019.

Dear Sir,

Please refer to your letter of 30th June 2019 and 19th August 2019 on the captioned subject, I have the pleasure to convey the approval of Environmental Impact Assessment (EIA) Report as well as provide Environmental Clearance in favor of Dhaka Sanitation Improvement Project under Dhaka WASA.

A copy of the said Environmental Clearance Certificate is attached herewith for your kind information and necessary action at your end.

23.10.19

(Syed Nazmul Ahsan)
Director (Environmental Clearance)
Phone: 8181673

Project Director
Dhaka Sanitation Improvement Project
Dhaka WASA, WASA Bhaban (3rd Floor)
98, Kazi Nazrul Islam Avenue, Kawran Bazar
Dhaka-1215.

Copy Forwarded to :

1) Private Secretary to the Hon'ble Secretary, Ministry of Environment, Forest and Climate Change, Bangladesh Secretariat, Dhaka.
2) Director, Department of Environment, Dhaka Metropolitan office, Dhaka.
3) Assistant Director, Office of the Director General, Department of Environment, Head Office, Dhaka.

Government of the People's Republic of Bangladesh
Department of Environment
Paribesh Bhaban, E-16, Agargaon
Sher-e-Bangla Nagar, Dhaka-1207
www.doe.gov.bd

Environmental Clearance Certificate

Section 12 of the Environment Conservation Act, 1995 (Amended 2002)

Clearance Certificate Number: 494

File number: 22.02.0000.018.72.44.18. 494

Clearance Certificate Issue Date: 23 October 2019

Renewal date not later than: 22 October 2020

A. Clearance Certificate Type
Environmental Clearance Certificate

B. Clearance Certificate Holder
Project Director Dhaka Sanitation Improvement Project Dhaka WASA, WASA Bhaban (3rd Floor) 98, Kazi Nazrul Islam Avenue, Kawran Bazar Dhaka-1215.

C. Premises to which this Clearance Certificate Applies
Construction of Eastern trunk main from Madhubagh to Pagla STP and Western trunk main from New Market Pump Station to Narinda Pump Station .

D. Activities for which this Clearance Certificate Authorizes and Regulates
The following components will be implemented through Dhaka Sanitation Improvement Project under Dhaka WASA - • Component 1: Institutional Support for Sanitation Service Delivery, which aims to Strengthen the DWASA for sustainable sanitation service delivery • Component 2: Sewerage and Wastewater Treatment which consists of replacement, rehabilitation of existing sewerage and wastewater treatment facilities of Pagla Sewerage Treatment Plant (STP) and to improve its sewerage network • Component 3: Non-Network Sanitation which consists of development of non-network sanitation services in the Pagla STP network area where sewers are not feasible • Component 4: Project Implementation and Management Support

E. Terms and Conditions for Environmental Clearance Certificate

1. **Limit Condition for Discharges to Air and Water:** The Environmental Clearance Certificate must comply with schedule 2 and 10, rule 12 of the Environment Conservation Rules, 1997.

2. **Noise Limit:** The Environmental Clearance Certificate must comply with the Noise Pollution (Control) Rules, 2006.

In case of non-coverage of ECR 1997 the World Bank Environment, Health and Safety Guideline shall be adhered to.

3. **Operating conditions:**

3.1 Activities must be carried out in a competent manner. This includes:
(a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
(b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

3.2 All plant and equipment installed at the premises or used in connection with the Environmental Clearance activity:
(a) must be maintained in a proper and efficient condition; and
(b) must be operated in a proper and efficient manner.

3.3 Construction works shall be restricted to day time hours so as to avoid/mitigate the disturbance of local lives as well as implementation schedules of the works shall be notified in advance to nearby residents.

3.4 Storage area for soils and other construction materials shall be carefully selected to avoid disturbance of the natural drainage.

3.5 This shall be ensured that soil is obtained from nearby areas, which are free of invasive plants. Re-vegetation and replanting shall be undertaken if rehabilitation works involve extensive vegetation clearance.

3.6 Vegetation clearance shall be minimizing at the construction phase as to minimize soil erosion. Soils for embankments shall be properly tested and compacted to ensure stability.

3.7 Proper construction practices shall be followed that minimize loss of habitats and fish breeding, feeding & nursery sites.

3.8 Proper and adequate sanitation facilities shall be ensured in labor camps throughout the proposed project period.

3.9 In order to control noise pollution, vehicles & equipment shall be maintained regularly; working during sensitive hours and locating machinery close to sensitive receptor shall be avoided.

3.10 No solid waste can be burnt in the project area. An environment friendly solid waste management should be in place during whole the period of the project in the field.

3.11 Proper and adequate on-site precautionary measures and safety measures shall be ensured so that no habitat of any flora and fauna would be demolished or destructed.

3.12 All the required mitigation measures suggested in the EIA report are to be strictly implemented and kept operative/functioning on a continuous basis.

3.13 Any heritage sight, ecological critical area, and other environmentally and/or religious sensitive places shall be avoided during project construction phase.

3.14 Resettlement plan should be properly implemented and people should be adequately compensated, where necessary.

3.15 Construction material should be properly disposed off after the construction work is over.

3.16 The Environmental Management Plan included in the EIA report shall strictly be implemented and kept functioning on a continuous basis.

4.1 **Monitoring and Recording conditions:**

4.1.1 The results of any monitoring required to be conducted by this Clearance Certificate must be recorded.

4.1.2 The following records must be kept in respect of any samples required to be collected for the purposes of this Clearance Certificate:
(a) the date(s) on which the sample was taken;
(b) the time(s) at which the sample was collected;
(c) the point at which the sample was taken; and
(d) the name of the person who collected the sample.

4.2 **Requirement to monitor concentration of pollutants discharged**

For each monitoring, the Clearance Certificate holder must monitor (by sampling and obtaining results by analysis) the following parameter: air quality, water quality and Noise.

5. **Reporting Conditions:** Environmental Monitoring Reports shall be made available simultaneously to Head quarters and Dhaka Metropolitan office of the Department of Environment on a quarterly basis during the whole period of the project.

6. **Notification of environmental harm:** The Clearance Certificate holder or its employees must notify the Department of Environment of incidents causing or threatening material harm to the environment as soon as practicable after the person becomes aware of the incident.

F. **Recording of pollution complaints**

The certificate holder must keep a legible record of all complaints made to the certificate holder or any employee or agent of the certificate holder in relation to pollution arising from any activity to which this Environmental certificate applies. The record must include details of the following:

(a) the date and time of the complaint;
(b) the method by which the complaint was made;
(c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
(d) the nature of the complaint;
(e) the action taken by the certificate holder in relation to the complaint, including any follow-up contact with the complainant; and

(f) if no action was taken by the certificate holder, the reasons why no action was taken.

The record of a complaint must be kept for at least 4 years after the complaint was made. The record must be produced to any authorized officer of the DOE who asks to see them.

G. **Validity of the Clearance Certificate**

This Environmental Clearance is valid for one year from the date of issuance and the project authority shall apply for renewal to the Dhaka Metropolitan office with a copy to Head Office of DOE at least 30 days ahead of expiry.

Violation of any of the above conditions shall render this clearance void.

23.10.19

(Syed Nazmul Ahsan)
Director (Environmental Clearance)
Phone: 8181673