Initial Environmental Examination

March 2016

SRI: Additional Financing of Local Government Enhancement Sector Project – Minneriya WTP Subproject

Prepared by the Ministry of Provincial Councils and Local Government for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 15 March 2016)

Currency unit	–	Sri Lankan Rupee (Rs)
Rs1.00	=	$0.0069
$1.00	=	Rs145

ABBREVIATIONS

ADB	-	Asian Development Bank
AF	-	Additional Financing
BPL	-	below poverty line
CEA	-	Central Environmental Authority
CKD	-	chronic kidney disease
DCCCRM	-	Department of Coast Conservation and Coastal Resource Management
DSC	-	Design and Supervision Consultants
EDP	-	Economically Displaced Person
EIA	-	environmental impact assessment
EMP	-	Environmental Management Plan
EPL	-	Environmental Protection License
FGD	-	focus group discussion
IEE	-	initial environmental examination
IGS	-	Income Generating Schemes
IOL	-	Inventory of Losses
GRC	-	Grievance Redress Committee
GRM	-	grievance redress mechanism
GSMB	-	Geological Service and Mine Bureau
LGESP	-	Local Government Enhancement Sector Project
LGIIP	-	Local Government Infrastructure Improvement Project
MIS	-	Management Information System
MPR	-	Monthly Progress Report
MPCLG	-	Ministry Provincial Councils and Local Government
NCP	-	North Central province
NGO	-	nongovernment organization
NWSDB	-	National Water Supply and Drainage Board
NIRP	-	National Involuntary Resettlement Policy
O&M	-	operation and maintenance
PS	-	Pradeshiya Shabha
PAM	-	project administration manual
PMU	-	project management unit
PPTA	-	project preparatory technical assistance
PMC	-	Project Management Consultants
RDA	-	Road Development Authority
PRDA	-	Provincial Road Development Authority
SPCU	-	subproject coordination unit
SPS	-	Safeguard Policy Statement

GLOSSARY

Pradeshiya Sabha	–	Local authorities established under the Pradeshiya Sabhas Act Number 15 of 1987. Smallest political unit in periurban and rural areas.

NOTE

In this report, "$" refers to US dollars.

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EXECUTIVE SUMMARY

1. The Local Government Enhancement Sector Project (LGESP) was approved by ADB on 29 September 2012 with an amount of $59 million equivalent from ADB's Special Fund Resources. The loan became effective on 29 November 2011 and the loan closing date is 31 December 2016. Ministry of Provincial Council and Local Government (MPCLG) is the executing agency, and subproject coordination unit (SPCU) is established in each provincial council (total seven) to supervise and coordinate and project implementation. LGESP has been supporting local infrastructure improvement and basic service delivery in less-developed areas in seven provinces (excluding the Northern and Eastern Provinces), based on a bottom-up, demand-driven approach. The additional financing is required to scale up a well-performing project. It includes (i) improvement of water supply systems in areas affected by chronic kidney diseases (CKD); (ii) improvement of local infrastructure and basic services delivery; and (iii) advancing policy reform of local government and strengthening their capacity.

2. **Additional Financing.** The additional financing will scale up the project that is performing well, by supporting water supply systems improvement in CKD-affected areas, and improving local infrastructure and basic services delivery and advancing local government policy reform and capacity strengthening in *Pradeshiya Sabhas* not supported previously.

3. **Impact and Outcome.** The impact will be local authorities' capacity financially and technically strengthened in less-developed areas of seven provinces in Sri Lanka. The outcome will be improved local infrastructure and services delivered effectively by local authorities or NWSDB in less-developed areas of seven provinces in Sri Lanka. The impact statement is unchanged. The outcome statement was changed because most of the water supply schemes in areas affected by CKD will be operated by NWSDB.

4. The additional financing has three outputs. Output 1 has been added for the additional financing.

5. **Output 1: Water supply systems in CKD-affected areas improved**. The additional financing will finance development and expansion of water supply systems in CKD-affected areas in the four provinces (Central, North Central, North Western, and Uva) to provide safe drinking water. The schemes include development of new water supply systems and expansion of existing systems, mostly run by NWSDB. Facilities such as raw water intakes, water treatment plants, overhead tanks, and transmission and distribution networks are eligible for financing. About 30 schemes will be developed or expanded, and will be implemented by respective provincial councils with technical inputs and supervision support from NWSDB. Considering the nature and complexity of the schemes, the piped-network will be operated by NWSDB, except in local authorities which have adequate operational capacity. If local authorities are identified to be the appropriate entity to implement the subprojects, such local authorities will first have to submit a reform plan, as practiced in the original project, prior to the subproject implementation. PMU, through design and supervision consultants (DSCs), will provide capacity augmentation for construction supervision, when the resources available from NWSDB are insufficient.

6. **Output 2: Local infrastructure and basic service delivery improved.** Social and economic infrastructure will be improved by newly participating local authorities. The approach will remain the same: 29 new *Pradeshiya Sabhas* from five provinces (Central, North Western, Southern, Uva, and Western) which have not been supported under the LGIIP and LGESP will first have to submit a reform plan approved through a council resolution, which will be reviewed

and confirmed by the Ministerial Committee of MPCLG to ensure that the minimum reform requirements are met. Then they will be qualified for the provision of a capital grant for infrastructure improvement. Eligible subprojects include (i) environmental infrastructure, (ii) economic infrastructure, (iii) public health infrastructure, and (iv) other local authority facilities. PMU, through DSCs, will support preparation of design and ensure the quality of the work. For both outputs 1 and 2, only the subprojects that meet the subproject selection criteria will be implemented.

7. **Output 3: Local government policy reform advanced and capacity strengthened**. The additional financing will support establishment of IT solutions, which were developed under the original project and installed in the original 108 *Pradeshiya Sabhas*, in 29 new *Pradeshiya Sabhas*, and further advance business process reengineering in both original and new *Pradeshiya Sabhas.* The activities will include (i) implementation support of the guidelines developed under the capacity development TA (CDTA), (ii) development and installation of additional software to simplify and increase efficiency of local administration, and (iii) capacity building programs to strengthen technical, financial, and administrative capacity of the original and new *Pradeshiya Sabhas*, provincial councils, and MPCLG.

8. **The subproject.**The Minneriya WTP Subproject will involve construction of four 15m by 17m rapid sand filters with total filtration capacity of 9,000 m^3/day. There are about 1,020 CKD patients in the Higurakgoda and Thamanakaduwa Divisional Secretariat divisions. Simultaneously, the rapid increase of CKD patients in Higurakgoda and Thamanakaduwa Divisional Secretariat areas has demanded the quality drinking water from National Water Supply and Drainage Board (NWSDB). The people are afraid of drinking dug well water as it contains a lot of pathogens, high fluoride and other heavy elements. The health authorities have recommended providing clean drinking water to all the people in the area including CKD affected people. Currently, Minneriya Water Treatment Plant (MWTP) is supplying water to households in Higurakgoda and Thamanakaduwa Divisional Secretariat areas. Under the project, it is proposed to expand the capacity of MWTP to provide pipe-borne water to about 65,000 people in Minneriya and surrounding areas of the Higurakgoda Divisional Secretariat. To meet the demands, NWSDB is modernizing MWTP by installing an aeration unit, flocculation unit, sedimentation basin, and filtration unit and water sump. The four rapid sand filters with total filtration capacity of 9,000 m^3/day are required to be augmented to meet the required 13,500m^3/day.

9. **Screening and assessment of potential impacts.** ADB requires the consideration of environmental issues in all aspects of the Bank's operations, and the requirements for environmental assessment are described in ADB's Safeguard Policy Statement (SPS), 2009. The subproject is a considered small-scale project and potential environmental impacts have been assessed using ADB Rapid Environmental Assessment Checklist for Water Supply. Then potential negative impacts were identified in relation to pre-construction, construction and operation of the improved infrastructure.

10. **Categorization.** Based on results of the assessment and ADB SPS, the subproject is classified as environmental Category B, i.e., the subproject is judged to be unlikely to have significant adverse environmental impacts. An initial environmental examination (IEE) is required to determine whether significant environmental impacts warranting an environmental impact assessment are likely.

11. This IEE aims to (i) provide critical facts, significant finding, and recommended actions; (ii) present the national and local legal and institutional framework within which the

environmental assessment has been carried out; (iii) provide information on existing geographic, ecological, social and temporal context including associated facilities within the subproject's area of influence; (iv) assess the subproject's likely positive and negative direct and indirect impacts to physical, biological, socioeconomic, and physical cultural resources in the subproject's area of influence; (v) identify mitigation measures and any residual negative impacts that cannot be mitigated; (vi) describe the process undertaken during project design to engage stakeholders and the planned information disclosure measures and the process for carrying out consultation with affected people and facilitating their participation during project implementation; (vii) describe the subproject's grievance redress mechanism for resolving complaints about environmental performance; (viii) present the set of mitigation measures to be undertaken to avoid, reduce, mitigate, or compensate for adverse environmental impacts; (ix) to describe the monitoring measures and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures; and (x) identify indicative costs and who is responsible for carrying out the mitigation and monitoring measures.

12. **Location of the subproject.** MWTP is located about 2 km away from the Minneriya town area and situated in about 3 acres of land extent. Out of 3 acres, only 1 acre is occupied by the WTP thus no additional land is required. There are no environmentally sensitive areas within or adjacent to MWTP. Only a few residences are situated around MWTP and expected not to be disturbed during construction and operations as works will be confined in existing MWTP and access will be through the Habarana–Kaduruwela main road.

13. **Environmental Management Plan.** The subproject is unlikely to cause significant adverse impacts because: (i) the rapid sand filters will involve straightforward construction and operation, so impacts will be mainly localized; (ii) predicted impacts are localized and likely to be associated with the construction process and are produced because the process is invasive, involving excavation and earth movements; and (iii) being located mainly in an existing built-up area, will not cause direct impact on terrestrial biodiversity values. An environmental management plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable levels.

14. The EMP will guide the environmentally-sound construction of the subproject and ensure efficient lines of communication between PMU, SPMU, consultants and contractors. The EMP will (i) ensure that the activities are undertaken in a responsible non-detrimental manner; (i) provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site; (ii) guide and control the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iii) detail specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (iv) ensure that safety recommendations are complied with. The EMP includes a monitoring program to measure the environmental condition and effectiveness of implementation of the mitigation measures.

15. The contractor will be required to submit to SPMU, for review and approval, a site environmental plan (EMAP) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program as per EMAP; and (iv) budget for EMAP implementation. No works are allowed to commence prior to approval of EMAP.

16. A copy of the EMP/approved EMAP will be kept on site during the construction period at all times. The EMP included in the bid and contract documents. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

17. **Consultations and disclosure.** Consultations with stakeholders, NWSDB engineers, and Central Environmental Authority (CEA) have been conducted to discuss engineering and potential environmental issues. The main comments discussed at the meetings include requirement to carry out maintenance plan as scheduled by qualified staff, speed up the construction process, supply of water to all households, continuous supply of water, reduction of CKD affected people in the future and formation of committee on project monitoring. CEA confirms environmental clearance is not required for the subproject as the capacity and activities do not fall under category of "Prescribed Projects" in the National Environmental Act (NEA) of CEA. The public participation processes undertaken during project detailed design ensure that stakeholders and affected people are engaged during the preparation/finalization of the IEE. The planned information disclosure measures and process for carrying out consultation with affected people will facilitate their participation during project implementation. This IEE and any update/s and environmental monitoring reports will be publicly disclosed in ways and languages understood by stakeholders and affected people.

18. **Grievance Redress Mechanism.** The subproject will follow the existing GRM process established in the on-going LGESP. Assessment of the existing GRM shows that it has provided citizens with an effective platform for redress of their grievances. This IEE describes the existing GRM including informal and formal channels, time frame and mechanisms for resolving complaints about environmental performance.

19. **Findings and Recommendations.** The long term socio–economic and health benefits to be derived from the subproject are much higher and valued than the negative environmental impacts which can be mitigated to standard levels without difficulty through proper engineering design and the incorporation or application of recommended mitigation measures and procedures as per EMP. It is recommended that (i) IEE be made part of the bid and contract documents to ensure that mitigation measures are appropriately budgeted and legally binding to the contractors; (ii) monitor diligently contractor/s EMP implementation by PMU, SPMU and consultants on EMP implementation by contractors; (iii) involve stakeholders in all phases of implementation and disclose relevant project related documents; and (iv) continue existing GRM process.

20. **Conclusion.** The subproject is unlikely to cause significant adverse impacts. As per ADB SPS, the subproject is classified as environmental Category B and does not require further EIA.

I. INTRODUCTION

A. Introduction

1. The Local Government Enhancement Sector Project (LGESP) was approved by ADB on 29 September 2012 with an amount of $59 million equivalent from ADB's Special Fund Resources. The loan became effective on 29 November 2011 and the loan closing date is 31 December 2016. Ministry of Provincial Council and Local Government (MPCLG) is the executing agency, and subproject coordination unit (SPCU) is established in each provincial council (total seven) to supervise and coordinate and project implementation. LGESP has been supporting local infrastructure improvement and basic service delivery in less-developed areas in seven provinces (excluding the Northern and Eastern Provinces), based on a bottom-up, demand-driven approach. The additional financing is required to scale up a well-performing project. It includes (i) improvement of water supply systems in areas affected by chronic kidney diseases (CKD); (ii) improvement of local infrastructure and basic services delivery; and (iii) advancing policy reform of local government and strengthening their capacity.

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(i) **Output 1**: Water supply systems in CKD-affected areas improved. The additional financing will finance development and expansion of water supply systems in CKD-affected areas in the four provinces (Central, North Central, North Western, and Uva) to provide safe drinking water. The schemes include development of new water supply systems and expansion of existing systems, mostly run by NWSDB. Facilities such as raw water intakes, water treatment plants, overhead tanks, and transmission and distribution networks are eligible for financing. About 30 schemes will be developed or expanded, and will be implemented by respective provincial councils with technical inputs and supervision support from NWSDB. Considering the nature and complexity of the schemes, the piped-network will be operated by NWSDB, except in local authorities which have adequate operational capacity. If local authorities are identified to be the appropriate entity to implement the subprojects, such local authorities will first have to submit a reform plan, as practiced in the original project, prior to the subproject implementation. PMU, through design and supervision consultants (DSCs), will provide capacity augmentation for construction supervision, when the resources available from NWSDB are insufficient.

(ii) **Output 2**: Local infrastructure and basic service delivery improved. Social and economic infrastructure will be improved by newly participating local authorities.

The approach will remain the same: 29 new Pradeshiya Sabhasfrom five provinces (Central, North Western, Southern, Uva, and Western) which have not been supported under the LGIIP and LGESP will first have to submit a reform plan approved through a council resolution, which will be reviewed and confirmed by the Ministerial Committee of MPCLG to ensure that the minimum reform requirements are met. Then they will be qualified for the provision of a capital grant for infrastructure improvement. Eligible subprojects include (i) environmental infrastructure, (ii) economic infrastructure, (iii) public health infrastructure, and (iv) other local authority facilities. PMU, through DSCs, will support preparation of design and ensure the quality of the work. For both outputs 1 and 2, only the subprojects that meet the subproject selection criteria will be implemented.

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B. Background of the IEE

6. **Screening and assessment of potential impacts.** ADB requires the consideration of environmental issues in all aspects of the Bank's operations, and the requirements for environmental assessment are described in ADB's Safeguard Policy Statement (SPS), 2009. The subproject is considered small-scale and potential environmental impacts have been assessed using ADB Rapid Environmental Assessment Checklist for Water Supply then potential negative impacts were identified in relation to pre-, construction and operation of the improved infrastructure.

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significant adverse environmental impacts. An initial environmental examination (IEE) is required to determine whether significant environmental impacts warranting an environmental impact assessment are likely.

8. This IEE aims to (i) provide critical facts, significant finding, and recommended actions; (ii) present the national and local legal and institutional framework within which the environmental assessment has been carried out; (iii) provide information on existing geographic, ecological, social and temporal context including associated facilities within the subproject's area of influence; (iv) assess the subproject's likely positive and negative direct and indirect impacts to physical, biological, socioeconomic, and physical cultural resources in the subproject's area of influence; (v) identify mitigation measures and any residual negative impacts that cannot be mitigated; (vi) describe the process undertaken during project design to engage stakeholders and the planned information disclosure measures and the process for carrying out consultation with affected people and facilitating their participation during project implementation; (vii) describe the subproject's grievance redress mechanism for resolving complaints about environmental performance; (viii) present the set of mitigation measures to be undertaken to avoid, reduce, mitigate, or compensate for adverse environmental impacts; (ix) to describe the monitoring measures and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures; and (x) identify indicative costs and who is responsible for carrying out the mitigation and monitoring measures.

9. **Scope of IEE.** The IEE was based mainly on secondary sources of information and field reconnaissance surveys; as the subproject is of small scale, construction of the rapid sand filters will involve straight forward construction methods and impacts were assessed to be site-specific, short in duration and limited mostly to construction phase only, no field monitoring (environmental) survey was conducted. However, baseline monitoring on noise and dust levels will be conducted by the contractors prior to start of civil works to activities will be limited within permissible values, or not above the background values if these are above the permissible limits. Stakeholder consultation was an integral part of the IEE.

II. DESCRIPTION OF THE SUBPROJECT

A. Present Status

10. Due to geochemical condition of the province and use of agrochemicals in the agricultural sector of the NCP, the ground water quality and surface water quality have been dramatically deteriorated causing CKD to considerable number of people living in the Pollonnaruwa district and the people in adjoining villages of the Eastern province. The fluoride in soils is high and it gets dissolved and readily available in the groundwater. The main cause for CKD is due to consumption of inferior quality of water with high fluoride content by the poor farming community in these areas. It is crucial to mention that CKD is spreading very fast in the NCP and with the objective of avoiding and minimizing the spread of CKD affected people in the NCP, Government of Sri Lanka requested ADB to extend the existing ADB funded "Puraneguma project" giving more priority to expand large scale water supply projects in the NCP in collaboration with NWSDB who has established and are managing large scale water supply schemes in the NCP.

11. NWSDB Pollonnaruwa Office has been managing the Pollonnnaruwa Water Supply scheme since 1990 and has already expanded the water supply to many areas including Minneriya and Higuralkkgoda areas. Minneriya water supply scheme has the capacity of 13,500 m^3/day to purify and deliver the water with the support of borehole water currently taped by the

NWSDB. It mostly taps the water from the Minneriya water tank situated along the Kaduruwela-Habarana road. The Minneriya water supply scheme is providing water to Higurakgoda areas, Minneriya town areas and adjacent rural areas as the population that hasgrown up rapidly demandshuge amount of water by about 63,686 people in the area. This includes the demands made by different institutions, commercial entities and industrial ventures for last 10 years.

12. The main water treatment plant located at Minneriya operates under following steps to purify the water

(i.) Aeration
(ii.) Flocculation
(iii.) Sedimentation
(iv.) Filtration
(v.) Chlorination

13. Appendix 1 provides the detailed water treatment process. The water quality of treated water complies with given Sri Lanka Institute for standards (SLS) for drinking water as shown in Appendix 2.

14. Liquid sludge is being generated at 50 tons per year[1] since the operation of MWTP. The liquid sludge is allowed to settle for 8 hours in the settlement tank. After 8 hours, 75% of the liquid sludge, which is about 37,500 m^3/year (18,750 x 2 sedimentation tanks) of clear water is allowed to be released to the nearby canal. The remaining 25% or about 13 tons/year is allowed to dry on-site and disposed in the forested area. The current WTP has no capacity to treat and analyze sludge and supernatant thus Stage 2 of the Project will include a component to manage the sludge, supernatant and backwash water to ensure potential environmental impacts due to untreated disposal are avoided and mitigated. The photos depicting the different sections of the WTP have been attached in the Appendix 3. It was observed and proved through discussions with the water engineers of NWSDB that MWTP has been operated without creating any environmental hazards and social disharmony due to disposing of sludge and treated water to outside waters. As well, it was found that no complaints received so far on the operation of the existing water supply scheme and due to malfunctioning of MWTP.

B. Need for the Subproject

15. In order to fulfill the demands of water, the filtration capacity of MWTP has to be improved from 6,000 m^3/day to 13,500 m^3/day by installing additional rapid sand filters.

C. Details of the Subproject

16. NWSDB has prepared the details of the subproject and has first submitted to the office of the Commissioner of Local Government (CLG) in the Provincial Council (PC) along with the brief project report. A detailed project report (DPR) including detail designs, bill of quantities and cost estimates will be submitted to the CLG with the assistance of the subproject coordinating unit (SPCU) in the PC office and the Resource Development Consultant Ltd (RDC) who work as the Consultants of the subproject.

[1] There are 2 sedimentation tanks and each operates one at a time. Desludging is being conducted one time per day for one sedimentation tank. There are no records of exact quantity of sludge generation, however WTP engineers estimate about 70 cubic meters (m^3) per day or approximately 25,000 m^3 per year (25 tons/year) of liquid sludge is generated from each sedimentation tank or 50 tons per year for the WTP.

17. The DPR is then submitted to the office of LGESP for its appraisal and approval of the subproject. Once the Project is approved, SPCU initiates the tender procedure to select a contractor to carry out the work. The work will be supervised by the technical staff of the NWSDB with the assistance of the staff of SPCU. The NWSDB will be responsible for the management of the construction work of the subproject. Select a contractor to carry out the work. The work will be supervised by the technical staff of the NWSDB with the assistance of the staff of SPCU. The NWSDB will be responsible for the management of the construction work of the subproject.

18. **Location.** MWTP is located about 2 km away from the Minneriya town area and situated in about 3 acres of land extent. Out of 3 acres, only 1 acre is occupied by the WTP thus no additional land is required. There are no environmentally sensitive areas within or adjacent to MWTP. Only a few residences are situated around MWTP and expected not to be disturbed during construction and operations as works will be confined in existing MWTP and access will be through the Habarana–Kaduruwela main road. The location map describing the existing land use system is attached as Figure 1.

19. **Details of the components.** MWTP Subproject will involve construction of four 15m by 17m rapid sand filters with total filtration capacity of 9,000 m^3/day. The detailed design has been made and relevant Bill of Quantities (BOQ) has been finalized for bidding process. The detailed design was finalized after meeting with the local community other stake holders at the consultation meeting held on 8th March 2016. Figure 1provides the layout of the four rapid sand filters as per detailed design. Table 1 provides the major features of the subproject.

Table 1: Major Features of the Proposed Water Supply Subproject

Major Features	Description	Location
Building the chambers of the filter	The dimension of the chamber is 15mx 17m and it is to be built on the ground adjacent to the existing two rapid sand filter beds chambers. The soil on the construction site is reddish brown earth which is stable at the site will ensure the stability of the site resisting to soil erosion. The location selected is not sloppy and open land area.	Minneriya Water Treatment Plant premises at Minneriya
Arrangement beds	Four base beds will be in built and movable mechanical plates will be arranged along with sand layer and pebble layers to filter the water in to the water collecting chamber in the bottom.	In the Rapid sand filter
Pipe fittings	The suitable size of pipes mostly 160mm pipes will be used to transmit the water from the bed to water collecting chambers.	
Chlorination	Chlorine is added to the sump to disinfect the biological properties of water prior to distribution. Additional residual chlorine (RCL) is added to meet the standards of the Sri Lanka Standards Institute (SLSI) (0.2mg/l) at the last dead end of the distribution system. 20 minutes of retention period is provided for RCL at the storage tank.	At identified points of the storage tank/sump

D. Implementation Schedule

20. The subproject is to be implemented over a period of 9months. This includes 1 month of finalization of design and 1 month for bidding and engagement of contractors, 7months of construction and finally commissioning of the new rapid sand filters.

III. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

A. ADB Policy

21. ADB requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment are described in ADB SPS, 2009. This states that ADB requires environmental assessment of all ADB investments.

22. **Screening and categorization.** The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project; the sensitivity, scale, nature, and magnitude of its potential impacts; and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impacts, and are assigned to one of the following four categories:

(i.) **Category A.** Projects could have significant adverse environmental impacts. An EIA is required to address significant impacts.
(ii.) **Category B.** Projects could have some adverse environmental impacts, but of lesser degree or significance than those in category A. An IEE is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
(iii.) **Category C.** Projects are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.
(iv.) **Category FI.** Projects involve a credit line through a financial intermediary or an equity investment in a financial intermediary. The financial intermediary must apply an environmental management system, unless all projects will result in insignificant impacts.

23. ADB Rapid Environmental Assessment (REA) Checklist for water supply and for urban development for municipal infrastructures will be used for the screening and categorization.

24. **Environmental Management Plan.** An EMP, which addresses the potential impacts and risks identified by the environmental assessment, shall be prepared. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the project's impact and risks.

25. **Public disclosure.** ADB will post thee safeguard documents on its website as well as disclose relevant information in accessible manner in local communities:

(i.) for environmental category A projects, draft EIA report at least 120 days before Board consideration;
(ii.) final or updated EIA and/or IEE upon receipt; and
(iii.) Environmental monitoring reports submitted by the Project Management Unit (PMU) during project implementation upon receipt.

26. LGESP will not consider Category A subprojects. Preparation of IEE for Category B and Due Diligence Report for Category C subproject will follow the updated environmental assessment and review framework.

B. National Laws

27. **Responsibility of Environmental Management in Sri Lanka.** The National Environmental Act (NEA) was passed in 1981, and in 1982 the Central Environmental Authority (CEA) as a regulatory and enforcement agency was created. A cabinet-level ministry with the appointment of a Minister of Environment was created in 1990to handle the subject of environment and to ensure that environmental issues are given the required attention. The Ministry of Environment and Natural Resources (MENR) was set up in 1999 and formulated a National Environment Policy (NEP) in 2003, which is now being implemented. This policy set out the course of action needed in order to maintain Sri Lanka's natural resources and the living environment whilst allowing development projects to be implemented. Ministry of Mahaweli Development and Environment has been established on January 2015 and the mandate of environmental management of the country is now held with this new Ministry.

28. **Applicable environmental legislations:** The implementation of LGESP Additional Financing will be governed by Government of Sri Lanka environmental acts, rules, regulations, and standards. These regulations impose restrictions on the activities to minimize/mitigate likely impacts on the environment. It is the responsibility of the project executing and implementing agencies to ensure that projects are consistent with the legal framework whether national, state, or municipal/local. Compliance is required in all stages of the project, including design, construction, and operation and maintenance. National laws and regulations that can be relevant to the project are briefly described in the Table below.

Table 2: Applicable National Laws and Regulations

Laws and Regulations	Provisions and Main Content
National Environmental Act No.47 of 1980, Amendment No.56 of 1988, and other Amendments	The NEA is a framework environmental statue that makes provision for the protection, management and enhancement of the environment, for the regulation, maintenance and control of the quality of the environment, and for the prevention and control of pollution by implementing the subproject.
National Environmental (Noise Control) Regulations No. 01 of 1996	Regulates maximum allowable noise levels for construction activities during subproject activities
National Environmental (Protection & Quality) Regulations, No. 01 of 1990	Provides standards for discharging effluents into inland surface water during subproject activities.
Fauna and Flora Protection Act (1993)	An act to amend the fauna and flora protection ordinance (Chapter 469) of 1938, which provide for the protection and conservation of the fauna and flora of Sri Lanka and their habitats; for the prevention of commercial and other misuse of such fauna and flora and their habitats, for the conservation of the biodiversity of Sri Lanka; and to provide for matters connected there with or incidental there to.
Felling of Trees Control Act No. 09 of 1951 as Amended through Act No. 30 of 1953	This Act sought to prohibit and control the felling of specified trees (mainly intended to stop indiscriminate felling of specified trees) in the country.
Water Resources Board Act No. 29 of 1964, Amendment No.42 of 1999	Control, regulation and development (including the conservation and utilization) of the water resources; the prevention of the pollution of rivers, streams and other water resources; the formulation of national policies relating to the control and use of the water resources.
The Soil Conservation Act, No. 25 of 1951 Amended in	An act to make provisions for the enhancement and substances of productive capacity of the soil, to restore degraded land for the

Laws and Regulations	Provisions and Main Content
24 of 1996	prevention and mitigation of soil erosion, for the conservation of soil resources and protection of land against damage by floods, salinity, alkalinity and drought and to provide for matters connected there with or incidental there to
Explosive Act No. 36 of 1976	To provide the control of explosions and regulations of matters connected with explosive activities.
Fisheries and Aquatic Resources Act 1996	The Act addresses the management, regulation, conservation and development of fisheries and aquatic resources during subproject activities.
Flood Protection Ordinance No. 04 of 1924	An ordinance for the protection of areas subjected to damage from floods. This includes declaration of flood areas, preparation of schemes for flood protection and other rules and regulations regarding flood in the country.
Geological Survey and Mines Bureau (GSMB) Act No. 33 of 1992	Regulates the exploration for minerals, mining, transportation, processing, trading in export of mineral products and usage of quarries and sand mines in the country.
Crown Land Ordinance Act No. 1947	The act dealing with allocation and control of Crown lands In Sri Lanka for private and government activities.
Irrigation Act No. 23 of 1983	An act to formulate policies and programs in regard to the subjects of irrigation, reservoirs, water resources management and prevention of pollution of rivers, streams and other water recourses. Promotion, construction, operation and maintenance of irrigation schemes, drainage and flood control in the country.
Regulations of Local Authorities	Regulates and control actions and methods taken place within the command area relevant to the government laws and regulations.
National Water Supply and Drainage Board Act No 2 of 1974	This Act governs the supply and distribution of quality and safe drinking water to the Sri Lankan community. There are amendments made to this Act at different times.

29. **Applicability to the subproject.** The Minneriya WTP Subproject does not fall within the category of “Prescribed Projects” listed in Gazette Extra-ordinary No. 772/22 of 24th June 1993 and subsequent amendments, which needs to go through the EIA process and subsequent conditional approval from the CEA of the Ministry of Environment and Natural Resource (MENR). These may, however be subjected to an environmental review, if the Project Approving Agency (PAA) and the CEA deem it necessary. Further,

(i.) The subproject is not located within 100 m from the boundaries of or within any area declared under the National Heritage Wilderness Act no 4 of 1988.
(ii.) The subproject is not located within 100 m from the boundaries of or within any area declared under the Forest Ordinance (Chapter 451).
(iii.) The subproject is not located within coastal zone as defined in the Coast Conservation Act No 57 of 1981.
(iv.) The subproject is not located within any erodible area under the Soil Conservation Act (Chapter 450).
(v.) The subproject is not located within flood prone areas declared under Flood Protection Ordinance (Chapter 449).
(vi.) The subproject is not located within low lying area of North Central Province which is a flood protection area declared under the Sri Lanka Land Reclamation and Development Corporation Act 15 of 1968 as amended by Act No 52 of 1982.

(vii.) The subproject is not located within 60 meters from the bank of a public stream as defined in the Crowns Lands Ordinance (Chapter 454) and having width of more than 25 meters at any point of its course.
(viii.) There are no reservations beyond the full supply level of a reservoir within the proposed subproject site.
(ix.) The subproject is not located within any archaeological reserve, ancient or protected monument as defined or declared under the Antiquities Ordinance (Chapter 188).
(x.) The subproject is not located within any area declared under the Botanic Gardens Ordinance (Chapter 446).
(xi.) The subproject is not located within100 meters from the boundaries of, or within, any area declared as a Sanctuary under the Fauna and Flora protection Ordinance (Chapter 454).
(xii.) The subproject is not located within 100m from high flood level contour of a public lake as defined by the Crown Land Ordinance (1947, 1949, and 1956) including those declared under Section 71 of the ordinance.
(xiii.) The subproject is not located within 100m from the boundaries of or within any area declared under the Forest Ordinance (Chapter 451)
(xiv.) The subproject is not located within the area declared under the Urban Development Authority Act No. 41 of 1978 and Act No. 4 of 1982 Section 29.

30. Table 3 summarizes the permits required for the subproject relevant to its implementation and activities.

Table 3: Key Permits Needed for the Subproject activities

Project stage	Clearance and Permits	Activity	Relevant Agency
Pre-construction stage (Although the clearances and approval should be obtained during the pre-construction stage and it is not valid throughout the project cycle. However this should be renewed once before the expiry date)	Industrial Mining License (IML)	Operation of borrow areas (material extraction sites)	GS&MB
	Environmental Protection License (EPL)	Operation of borrow areas (material extraction sites)	CEA
	Explosive Permits	Blasting activities	MoD
	Local Government Authorities Trade License	Operation of metal quarries, crushers, borrow areas, dispersal sites, labour camps	LAs
	Approval for removal of trees	Laying of main pipe lines along the ROW of roads	DS, DoF, DWLC,

DoF-Department of Forests, DWLC-Department of Wild Life Conservation, DS-Divisional secretariat, LAs-Local Authority, MOD-Ministry of Defense

C. Environmental Standards

31. **Environmental Protection License (EPL).** Discharge of waste to the environment is controlled by the National Environmental (Protection & Quality) Regulations No. 01 1990 (Gazette 595/16, 1990) and the amendments published in Gazette 1159/22 of 2000, under the NEA. These regulations establish the need for any person discharging waste to do so only under a license (Environmental Protection License or EPL) issued by the CEA, and in

accordance with the gazetted discharge standards and criteria. The EPL can be issued up to three years (Gazette 1159/22).

32. **Status of EPL.** NWSDB does not need to obtain the EPL for operation of MWTP because the capacity is less than 500,000 m^3/day, which is the minimum capacity required to obtain an EPL. As the subproject will only involve with construction of rapid sand filter beds and the capacity of 13,500 m^3/day is unchanged, the subproject will not require an EPL.

33. **Drinking Water Quality Parameters.** Appendix 4 provides the applicable SLI guideline values to be complied with prior distribution of the water supply. The design of the subproject has taken into consideration the guideline values. It should be noted that results of water testing on treated water from MWTP conducted by NWSDB show compliance SLI standards. Results further show E-coli and Coli-form bacteria are not present in the treated water being delivered to consumers in the existing water supply areas.

IV. DESCRIPTION OF THE EXISTING ENVIRONMENT

A. Methodology Used for the Baseline Study

34. The IEE was based mainly on secondary sources of information and field reconnaissance surveys; as the subproject is of small scale, construction of the rapid sand filters will involve straight forward construction methods and the impacts were assessed to be site-specific, short in duration and limited mostly to construction phase only, no field monitoring (environmental) survey was conducted. However, baseline monitoring on noise and dust levels will be conducted by the contractors prior to start of civil works and they will be limited within permissible values, or not above the background values. If these are above the permissible limits. Stakeholder consultation was an integral part of the IEE.

35. Resource Development Consultants (RDC) conducted the field assessments on 2nd March 2016. The line transects method and sampling was carried out at the immediate neighbourhood of the MWTP. The land use pattern in the surroundings of MWTP was studied through site inspections. The plant species, bird species were identified and recorded, and biodiversity species were identified using taxonomic booklets. Group and individual interviews were conducted to collect views of people in the area. Government institutions like RDA, PRDA, PS and Forest Department were consulted to get their views for implementation of the subproject.

36. The literature survey broadly covered the following:

(i.) Project details, reports, maps, and other documents available with the Design and Supervision Consultant (DSC) team of the on-going ADB-funded LGESP
(ii.) Discussions with Feasibility Study team
(iii.) Secondary data from previous project reports and published articles, and
(iv.) Literature on land use, soil, geology, hydrology, climate, socioeconomic profiles, and environmental planning documents collected from Government of Sri Lanka agencies and websites.

37. A separate socioeconomic study was conducted to determine the demographic information, archaeological and religious places, densely populated pockets, and settlements.

38. The data collected was analyzed and interpretations made to assess the physical, biological, and socioeconomic features of the subproject site. The relevant information is presented in the succeeding paragraphs.

B. Physical Characteristics of the Subproject Area

39. **Location.** MWTP is located about 2 km away from the Minneriya town area and situated in about 3 acres of land extent. Out of 3 acres, only 1 acre is occupied by the WTP thus no additional land is required. There are no environmentally sensitive areas within or adjacent to MWTP. Only a few residences are situated around MWTP and expected not to be disturbed during construction and operations as works will be confined in existing MWTP and access will be through the Habarana–Kaduruwela main road.

40. **Geology, Geomorphology and Soil.** Most of the Sri Lankan crystalline rocks belong to Precambrian ages (older than 570 million years) while others are of more recent origin. This Precambrian age metamorphic rocks are sub divided into three major litho logical groups as High land, Wanni complex and Vijayan complex. Therefore, according to this categorization, a majority of the Pollunnaruwa district belong to the Wanni complex where Precambrian metamorphic rocks are prominent. Metasediments, Charnockitic gneisses, basic rocks, migmatites and graniticgneisses, granites and pegmatites are particularly present in this region.

41. Reddish brown earth is the prominent soil type in the Pollonnaruwa district. Sri Lanka has been sub divided in to different agro- ecological zones considering soil type, temperature, rainfall and land use etc. In the subproject site, Reddish Brown earth, Low Humic Gley soils and Grumusol soils are present. Alluvial soil is very common at river basins and catchment areas. Reddish Brown Earth and Low Humic Gley soils are highly fertile soils suitable for agricultural operations and located more or less in undulating land scape. This reddish brown earth soil category falls within the well-drained to moderately drained soil type. However, the Low HumicGley soil is suitable for growing paddy.

42. **Topography and Climate.** The topography of the Pollonnaruwa district is flat and gently undulating with 3-4 percent slope except few hills and isolated outcrops of bare rocks. The elevation of hills is ranging from 1000feet to 500 feet; however, about 75% of the hills are below 500 feet in elevation. The area gently slopes from south -west to North –East. The subproject site is bit hilly area covered with trees and shrubs.

43. The northeast monsoon rain brings relatively high rain fall to Minneriya and Higurakgoda areas in the Pollonnaruwa district while the conventional rain from March to May brings relatively low rainfall especially in afternoons of the day. Hence the balance period of the year is experienced with the drought period causing lot of problems to people finding water as a scare resource. The average temperature in the subproject site varies from 27C0 to 31 C0. The highest temperature recorded is 34 C0 from June to August of the year as shown in the Table 4.

Table 4: Climate Data of the Area

Parameter	Figures
Temperature (C0)	29C0-33 C0
Precipitation (mm)	1250-1960mm

44. **Hydrology and Drainage.** The high rainfall of certain years is followed by low rainfall of years inducing the cause of water need in the district. The evapo-transpiration is high as the

high temperature is present almost throughout the year. Therefore, ancient people damned the natural water collection locations and built reservoirs and small type of water tanks. The Minneriya tank is one of the most important water bodies supporting to operate the water treatment plant at Minneriya. During the drought condition too, water level in the Minneriya tank is relatively high.

45. In addition, few water streams and Mahaweli river flow across the district nourishing the water need of the people and environment. The Minneriya water tank located in the Thamnakaduwa area is the water sources for the proposed water supply scheme in the area. The Thabalawewa is fed by the Girithalewawa while the Girithaleis fed by the natural rain fall.

46. Surface drainage system in the Pollonnaruwa district is well existent as established drains, canals and natural and man-made water bodies are present in most parts of the district. Adjacent to the subproject site, both side drains are present along roads up to the Minneriya town. As well, the surface run off generated during rains is drained off to water bodies, Villus, streams and other low land inland areas. Hence, there will not be any drainage issues in the event of the subproject being implemented in the area.

47. **Surface Water Quality.** The surface water is highly polluted due to addition of Agrochemicals, human fecal matters and accumulation of geochemically dissolved element like Mn, Cu, fluoride and chloride. The water quality parameters like low dissolved oxygen, high electric conductivity; high Ecoli bacteria and total Coli form bacteria have been noticed in surface water samples.

48. It could be observed that two surface water bodies namely Minneriya tank and Girithale tank are located within 1Km of the project boundary. Therefore, contamination of surface water could occur due to addition of agrochemicals, and other geological factors embedded in the ground. People of the area believe that surface water is highly contaminated and unsuitable for drinking.

49. **Ground Water Quality.** The water quality parameters of ground water include high fluoride and chloride contents, increased total solids and high electrical conductivity as per the water quality reports published by WHO and NWSDB in 2010 and 2014. Geochemically, Na/K with CL (Chloride) - is high in the ground water in the Minneriya and Higurakgoda areas. It is also believed that high fluoride content in ground water has affected to cause dental fluorosis and Chronic Kidney Disease (CKD). Number of people suffering from CKD is 1020 in the Higurakgoda and Thamankaduwa DS divisions. It was found that heavy elements like Cr, Mn and Cu are high in ground water too.

50. **Air Quality and Noise Level.** Habarana –Pollonnaruwa main road is passing through dense forests, paddy lands, home gardens, residential areas and water tanks up to the Minneriya town. This main road is wide enough to pass vehicles without traffic flows up to the Minneriya town and beyond. The vehicle emissions are easily dissipated along the road during the day time. The Air quality in the Minneriya is very high as compared to Colombo and Kandy as no complaint on air quality deterioration issue has come up for investigation.

51. A green belt is well established to absorb vehicle emissions and prevent drifting of dust along the subproject site and the Minneriya town. As per air quality reports published in websites, there are no records on investigating on air quality in the Minneriya town or Kaduruwela town areas. As the subproject site is rich in vegetation, all such emissions will be very well dissipated.

52. Vehicle Emission Test (VET) became mandatory with effect from 15th July 2008 to enforce environmental regulations and conform to the environmental standards on vehicle emission as per the Motor Traffic Act (Emission control) Regulation of 1994, 817/6, Part I, Section I. This move is a part of the efforts to improve the air quality in the island and this regulation is applicable for all construction sites if air quality is going to be deteriorated.

53. The subproject site mostly includes rural setting with a good vegetation cover. Therefore, the noise levels are relatively low. According to Schedules I and II of National environmental (Noise Control) regulations No.1 1996 (924/12), the study area belongs to “Low noise area”. Therefore, the ambient noise level of the area can be considered as 55 dB (A) during day time (06.00 hrs-18.00 hrs) and 45 dB (A) night time (18.00 hrs - 06.00 hrs). Rich vegetation in the subproject site acts as an efficient noise absorbent.

C. Ecological Characteristics of the Project Area

54. **Forests and ecological sensitive areas.** The major forest type observed in the Minneriya forest reserve is the dry mixed ever green forests or monsoon forests. There are few patches of thorny scrubland forests, riverine forests, and abandoned degraded forest lands along the Minneriya water tank. The major tree species living in the subproject site are Kanda, Kottamba, Kohomba, Mara and Atteriya, However, only few Kaluwera and Burutha trees are situated along the main road from Minneriya town to Habaran town. There are endemic fish and other aquatic species in the Minneriya natural water tank and Girithale tank. The main biodiversity spot is the Minneriya-Girithale sanctuary and Elahera-Girithale sanctuary located within 2 km of the subproject site. These forests contribute immeasurably to the ecosystem balance by supporting to preserve vast extent of watershed areas in the area. However, there are no endangered and threatened animals and plant species sheltering in the subproject site.

55. **Distribution of faunal species.** The variety of biodiversity species have found the shelter in dry evergreen forest and subproject site. Among animals, monkeys, variety of birds, snakes and reptiles are also living in the subproject site. However, a list of existing fauna and flora is attached in the Appendix 5 for more information. There are no endangered, extinct or protected species found in the subproject site.

56. **Wetlands.** There are some villus and semi-marshy area situated in the Minneriya area. However, no wetlands are naturally located as specified in the Convention on Wetlands of UNEP. The subproject site is not located close to a marshy land too.

57. **Coastal Marine Environment.** The subproject is not located close to a coastal marine environment.

D. Socio Economic Profile

58. According to the information available at the Divisional Secretary’s Office, the Hingurakgoda Divisional secretariat area covers about 53 Grama Niladhari Division (GN) Divisions expanded in about 709.4 km2. Table 05 gives a clear picture of the land area and population of the area comes under the preview of the Hingurakgoda Divisional Secretaries area, according to the survey conducted in 2014.

Table 5: Basic Population Data

Number of GN Division.	Land Area in Square Kilometer	Number of Families	Population
53	709.4	18,658	68,759

59. Table 7 shows age wise distribution of the population. This information prove that there are large number of members in the vulnerable group (small children and elderly people.) According to the information available at NWSDB about 1,020 CKD patients have been identified in this area. According to the information revealed by Doctors and Public Health Inspectors in Hingurakgoda and Thamankaduwa, when they screen about 200 community members, about seven community members are being referred medical clinic for further investigations. Information on availability of drinking water shows that majority of community members have been compelled to take drinking water from unprotected sources. At present with the danger of getting CKD, almost all the community members have been accustomed to buy purified water from Reverse Osmosis (RO) plants. Further considerable numbers of people are using bottled drinking water. Under these circumstances it is justifiable to make immediate arrangements to provide safe and pure drinking water to these areas.

Table 6: Availability of Drinking Water Facility

Protected wells	Unprotected wells	Tube wells	Pipe born	Natural sources	Other	Total
7,437	1,475	125	400	84	22	9,543

Table 7: Age-wise Distribution of Population

Bellow 1year		1-5		6-18		19-30		31-60		60-70		Above 70		Total	
F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M
985	889	2931	2688	7780	7831	7546	7166	11848	11182	3034	2712	1171	986	35305	33454

60. Information on the ethnic and religious wise distribution shows that there are small numbers of people other than Sinhala Buddhist and it is about 1.12% and 2.74% respectively by Tamils and Muslims. However it is observed that all the community members live in the area working collectively to solve their common problems rather than emphasizing the ethnic or religious identity. Further it is observed that there are no symptoms of religious or ethnic discrimination in delivering the services by service delivery agencies.

Table 8: Ethnic-wise Distribution of Population

Singhala			Tamil			Muslim			Total		
F	M	Total	F	M	Total	F	M	Total	F	M	Total
34909	33072	67981	74	91	165	320	290	610	35305	33454	68759

Table 9: Religious-wise Distribution of Population

Buddhist			Hindu			Slam			Christian			Total		
F	M	Total	F	M	Total	F	M	Total	F	M	Total	F	M	Total
34212	32501	66713	75	74	149	391	391	782	563	486	1049	35305	33454	68759

61. **Health Status**. Under normal conditions, community members enjoy satisfactory health situation. There are health clinics conducted by officers from MOH office for child and maternal care. For other ailments community members go to hospitals in Jayanthipura, Hingurakgoda and Polonnaruwa. In addition, there are about three health centers where the doctors come for private practice in the evening. However attention has been drawn to the CKD issue and health authorities play an active role in creating awareness on CKD and referring positive cases for further investigation.

62. **Housing Status.** Information on housing status shows that community living in this area is maintaining a satisfactory living standard. Majority of houses are built with permanent materials and almost all the families own their own house. Information on availability of toilet facilities also gives a picture of satisfactory situation. Only a very few use common toilets while a large majority use individual toilets. Community leaders mentioned that those who do not have individual toilets have their plans to build them in the near future. It is observed that all community members are aware and concern about the maintenance of good and practical attitudes and behavior in relation to health related matters.

Table 10: Housing Status

Walls			Roof			
Bricks	**Cement/Stone**	**Other**	**Roof tile**	**Asbestos**	**Tagrams**	**Other**
14299	3310	218	7410	9419	992	163.

63. **Sanitation Status.** As shown in Table 11, majority of the residences have own their toilets. With the provision of water supply to many residences, the sewage collection and impact on the environment will be negligible.

Table 11: Availability of Toilet Facility

Separate Toilet for the House	Sharing Toilet Facility with a Family	Using Common. Toilet
17481	346	113

64. **Employment Status.** Information available on employment status shows that almost all the people in working age are engaged in some kind of employment. It is clear that majority of community members are engaged in agriculture or agriculture related activity for earning their income. According to these figures, considerable number has gone abroad for employment. However, the number of 849 women is working as house maids in abroad.

Table 12: Employment Status

Government Sector		Private Sector		Self-Employment				Labor/ Other		Foreign		Total.	
				Agriculture		Non-Agriculture							
F	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**
2054	2621	3624	3992	2253	5855	1441	2053	1627	2336	849	332	11848	17189

65. **Marketing.** Hingurakgoda town is functioning as the main marketing center for the area. All the government offices such as DS, PS, MOH, hospital, are situated in Hingurakgoda town. As such majority of community members use to come to the town for marketing as well as attending to their needs in relation to servicers delivered by government offices.

66. **Availability of Electricity.** According to the information available at the DS and PS offices about 98% of the houses have got electricity connection. At present the government has launched a special program to provide electricity to all dwelling places.

67. **Communication.** According to the information given by officers in DS and PS about 55% have got land line connections. But all the people are using mobile phones for their communication needs.

E. Social and Cultural Characteristics

68. **Transport Service.** About half of the total area in Hingurakgoda DS Division is connected to Colombo-Polonnaruwa main road. In addition, there are bus services to all divisions. However the community members are not happy about the bus service. There are remote areas where the services are weak and people cannot depend on. With the expansion of the economy community members in these villages also have been able to own private mode of transport such as motor cycle or three wheelers.

69. **Temples.** 69. 97.5% of the people in the subproject site are Buddhists and are going to Buddhist temples once a month. There are 15 Buddhist temples, two small temples forTamils and one mosque for Muslims.

70. **Schools.** Two schools namely Minneriya Maha Vidyalaya and Vijithapura Mahavidyayalaya are located in the subproject town. These two schools are not adjacent to the MWTP.

F. Site Specific Description of Environmental Conditions

71. Both man-made habitats such as home gardens and natural and semi natural habitats like, water tank, scrubland and forest patches could be observed within 1 km of the subproject site. Many of natural habitats within the subproject site have been subjected to disturbances due to natural and anthropogenic activities and resulted in loss of mosaic of patches of forest cover in the past. However, they retain some degree of naturalness despite numerous impacts.

72. MWTP is located in bit hilly area which could be accessed through a gravel road from the Minneriya-Pollonnaruwa main road. The treatment plant was established in 1985 to treat the raw water with Chlorine powder. The WTP has been now equipped with modern facilities including Aeration unit, flocculation unit, sedimentation unit and chlorination unit. In addition, there are established small concrete chambers to divert wastewater from the sedimentation tank and filtration unit. The filtration unit consists of rapid sand filter with two sand beds. The back of the WTP, the abandoned and highly disturbed forest land is present. This is not a natural forest. The environmental hazards are not observable at the proposed site as the probability for soil erosion is very less.

V. ANTICIPATED IMPACTS AND MITIGATION MEASURES

73. **Screening and assessment of potential impacts.** The subproject is considered small-scale and potential environmental impacts have been assessed using ADB Rapid Environmental Assessment Checklist for Water Supply (Appendix 5) then potential negative impacts were identified in relation to pre-, construction and operation of the improved infrastructure.

A. Pre-Construction

74. Discussions were carried out with design engineers about technical solutions to mitigate environmental impacts arising during implementation period of the subproject. Subsequently the subproject was looked at in the light of environmental concerns and construction methodologies complying with CEA and ADB SPS 2009.

75. Although there are some potential adverse environmental impacts, they are mostly temporary and localized. The net environmental impacts are positive and large. However, Potential negative impacts for subproject categories are summarized in Table 13. These can largely be avoided through proper subproject design or mitigated through adopting proper mitigation measures and management of the project which will be incorporated into contractors' contract documents.

B. Construction

76. Based on the REA Checklist, the subproject is unlikely to cause significant adverse impacts because: (i) the rapid sand filters will involve straightforward construction so impacts will be mainly localized; (ii) predicted impacts during construction are localized and likely to be associated with the construction process and are produced because the process is invasive, involving excavation and earth movements; and (iii) being located mainly in an existing built-up area, will not cause direct impact on terrestrial biodiversity values. The potential impacts identified include impact on air quality due to increased dust generation, increased noise levels, and increased soil erosion due to excavation works.

77. To prevent emissions of dust, water spraying should be done to the surroundings.

78. Noise level should be below 75dB(A). Machines used for drilling and mixing of concretes should not produce the sound level above 75db(A) and it should be measured using relevant equipment. Additionally, sound controlled devices on machineries and equipment need to be adopted as per CEA environmental regulations.

79. The foundation will be dug by the workforce as per engineering designs and as a result, the excavated soil is loaded to a lorry by a backhoe once the back filling is completed. Excavated soil will be covered with a tarpaulin cover while transporting. It will minimize the impacts on the environment and health of the people due to emissions of dust in the wind.

80. It is advised to carry out the construction activities during the dry season especially from June to September of the year and avoid the construction during the rainy season as it will induce soil erosion and create run off condition on the site. Therefore to avoid soil erosion and increased silt run-off, excavated soil should not be stockpiled at the site and taken away as soon as the back filing is finished.

81. There will be no damage and interruption on the public utilities: electricity, telecommunications and water supply as the subproject will not impact on such utilities during the construction process. However, as per field observations, two small trees will have to be uprooted to construct the proposed RSF.

82. Space is available in the MWTP for construction materials storage and staging area. Thus stock piling of construction materials, natural drainage paths at the site and surrounding will not be disturbed.

83. Access to the construction site will be through existing road. Also there will not be any temporary traffic condition since the subproject is located within the existing MWTP.

84. The construction activities will be conducted during daylight hours to minimize the disturbances to local residents.

85. All organic and other forms of solid wastes generated will be disposed to CEA approved disposal yards.

86. Construction activities may cause harm and danger to the lives and welfare of workers. Potential impacts are negative and long-term but reversible with the implementation of mitigation measures.

87. Construction materials like sand, bricks, quarries and other materials like mechanical plates will be sourced from registered suppliers only and no extraction of such material will be made from surrounding areas. Therefore, there will be no negative environmental impacts due to sourcing of materials.

88. **Mitigation measures.** As discussed above, the potential impacts identified during construction include impact on air quality due to increased dust generation, increased noise levels, increased soil erosion due to excavation works, and occupational health and safety. Measures to mitigate the potential impacts are presented in Table 14. Both the contractor and NWSDB will be responsible for mitigation activities and monitoring of effectiveness of these measures. Supervision of the activities has to be done mainly through the respective SPCU and CLG.

89. Employers and supervisors are obliged to implement all reasonable precautions to protect the health and safety of workers. Preventive and protective measures should be introduced according to the following order of priority:

(i) Eliminating the hazard by removing the activity from the work process. Examples include substitution with less hazardous chemicals, using different manufacturing processes, etc;
(ii) Controlling the hazard at its source through use of engineering controls.
(iii) Minimizing the hazard through design of safe work systems and administrative or institutional control measures. Examples include job rotation, training safe work procedures, lock-out and tag-out, workplace monitoring, limiting exposure or work duration, etc.
(iv) Providing appropriate personal protective equipment (PPE) in conjunction with training, use, and maintenance of the PPE.

C. Operation and Maintenance

90. MWTP will be operated and maintained by NWSDB. A sound operational and maintenance plan and schedules will be formulated by NWSDB prior to commissioning of the rapid sand filters.

91. Potential environmental impacts during operations and maintenance of MWTP include (i) backwash water to be discharged; (ii) generation of sludge; (iii) increased sewage due to improved water supply system; (iv) waste materials due to maintenance activities; and (v) occupational health and safety.

92. Backwashing is a form of preventive maintenance so that the filter media does not come down with backwash in rapid sand filters. It will be conducted once 24 hours depending on the accumulation of the solid particles after filtration. The backwash water is collected in an underground chamber. Only the tiny wastes are collected through the backwash operations. Solid particles will be allowed to settle down for about 24 hours, once particles settle down, the water is passed through a pipe line to the open water body located in the neighborhood. The sediments in the sedimentation beds are washed once every 2 days and allowed to go to the wastewater tank (thickener) within the existing MWTP. The farmers in the area would like to use the backwash water coming to the water body as the water could be used for paddy farming during the dry season. At the first phase of the capacity improvement of MWTP, the subproject will increase the water filtration while the second phase of will construct the sludge dry beds and recovery sump. Once the second stage is completed, backwash water will be recirculated in the system and the minimal sludge from the process will be treated prior to use as soil conditioning or spreading in the greenbelt and/or forested area near MWTP.

93. Sludge will be generated during operation phase. Historically, only minimal sludge has been generated since operation of MWTP. Removed sludge is spread over the nearby forested area (not protected forest). The second stage of the MWTP capacity improvement includes construction of sludge drying beds as part of the overall sludge management. There is sufficient space in MWTP to construct sludge dewatering and drying beds. Dried sludge will be used as soil conditioning and fertilizers for MWTP greenbelt and adjacent forested (non-protected) areas.

94. Increased in sewage is anticipated due to improved water supply system. However, this impact is assessed to be not significant and can be mitigated as results of the socio-economic survey shows availability of sanitation facilities in households.

95. Waste materials are expected to be generated during operation and maintenance activities. However, these will be minimal and not significant as MWTP is considered as small-scale. Any waste that will be generated will be segregated. Reusable and recyclable materials will not be disposed. Only the residuals will be disposed to designated disposal sites.

96. Occupational health and safety impacts associated with the operational phase of the subproject may include the following: (i) accidents and injuries; (ii) chemical exposure; and (iii) noise. Work at the WTP may be physically demanding and may involve hazards such as open water, trenches, slippery walkways, working at heights, energized circuits, and heavy equipment. However, workers will be provided with adequate training on H&S and chemical handling prior to start of the work and on a continuous basis as part of the O&M program. Thus the impacts are expected to be short-term and temporary.

97. **Mitigation measures.** As discussed above, the potential impacts identified during operation and maintenance include (ii) generation of sludge; (iii) increased sewage due to improved water supply system; (iv) waste materials due to maintenance activities; and (v) occupational health and safety. Measures to mitigate the potential impacts are presented in Table 14. NWSDB will be responsible for mitigation activities and monitoring of effectiveness of these measures.

98. Table13 summarizes the potential impacts at different phases of subproject implementation, severity and duration. It can be seen that the potential impacts are during construction and operation and maintenance are not significant and temporary in duration.

Table 14 provides the mitigation measures to ensure that impacts are within acceptable limits and remain insignificant throughout subproject implementation.

Table 13: Environmental Impacts during Construction and Operational Phases

Activity	Potential Negative Impacts	Severity	Duration
Pre-Construction Phase	Permits to be obtained for cutting trees	N	T
	Approvals obtained for burrowing of earth	N	T+P
Construction Phase	Dust generation	N	T
	Increased noise level	N	T
	Waste generation	N	T
	Occupational Health and Safety	M	P
Operation and Maintenance Phase	Discharge the impurities and other solids collected due to filtration and back wash of the RSF	N	T
	Sludge generation	N	T
	Increased in sewage generation	N	T
	Generation of waste materials	N	T
	Occupational Health and Safety	N	T

N - Negligible, M - Moderate, S - Severe, T - Temporary, P - Permanent

Table 14: Mitigation Measures for Potential Environmental Impacts

Activity	Potential Negative Impacts	Mitigation Measures
Pre-Construction Phase	Permits to be obtained for cutting trees	Cut down branches of trees rather than removing.
	Approvals obtained for burrowing of earth	Source the materials from qualified suppliers.
Construction Phase	Dust generation	Regularly spray water on excavated soil surface to minimize generation of dust.
		When transporting all materials such as earth, sand and cement, cover them with tarpaulin to avoid spillage of materials and production of dust due to wind.
		Appropriate measures shall be in place to minimize the emissions of dust while handling, loading/unloading of materials
		Avoid transporting of excavated soils and mud during rainy days
	Increased noise level	Construction activities be carried out only during day time from 7am to 5.pm every day and limited night work be done for the concrete slabs. All machineries used in this regard will have noise control devices to reduce the sound level below 75 db as specified by CEA environmental regulations and as shown in the Appendix 8.

Activity	Potential Negative Impacts	Mitigation Measures
	Waste generation	The solid wastes generated need to be removed to appropriate disposal yards
	Occupational health and safety	Prepare occupational health and safety plan (OHSP) which will be part of the contractor's contract documents. The occupational safety plan should have provisions on (a) PPE like hard hats, safety gloves, ear mufflers to all workers; (b) occupational health and safety (H&S) training to all workers; (c) safety procedures to be followed for all construction site activities including provisions on penalties and sanctions for non-compliance; (d) records of accident and the corrective actions implemented; and (e) emergency response plan during fire, earthquake and other incidents.
		First-aid facilities should be present in the project area and at least one safety and health officer should be assigned in the construction area.
		Provide medical insurance coverage for workers.
		Secure all installations from unauthorized intrusion and accident risks.
		Provide adequate, portable or permanent sanitation facilities serving all workers.
		Provide supplies of potable drinking water.
		Provide clean eating areas where workers are not exposed to hazardous or noxious substances.
		Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers;
		Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter

Activity	Potential Negative Impacts	Mitigation Measures
		hazardous areas unescorted.
		Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas.
		Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate.
		Disallow worker exposure to noise level greater than 85 dBA for a duration of more than eight hours per day without hearing protection. The use of hearing protection shall be enforced actively.
Operation and Maintenance Phase	Discharge the impurities and other solids collected due to filtration and back wash of the RSF	Once every 24 hours, back wash operation needs to be carried out using pressurized air flow and upward back operation.
		Maintain the mechanical parts as per the maintenance plan to avoid any hazards in the RSF
	Sludge generation	Collect in an underground chamber and allow for settling and remove the solid sludge to abandoned forest areas
	Increased in sewage generation	The local community has well-built sanitation facilities and will manage the sewage generated
	Generation of waste materials	Collect solid wastes and dispose to CEA approved disposal yards
	Occupational health and safety	Provide appropriate PPE and training on its proper use and maintenance.
		Use fall protection equipment when working at heights.
		Maintain work areas to minimize slipping and tripping hazards.
		Implement a training program for operators who work with chlorine regarding safe handling practices and emergency response procedures.

Activity	Potential Negative Impacts	Mitigation Measures
		Prepare escape plans from areas where there might be a chlorine emission.
		Install safety showers and eye wash stations near the chlorine equipment and other areas where hazardous chemicals are stored or used.
		Prohibit eating, smoking, and drinking except in designated areas.

VI. PUBLIC CONSULTATION AND INFORMATIONDISCLOUSURE

A. Consultations Conducted

99. Consultations with stakeholders, NWSDB engineers, and CEA have been conducted to discuss engineering and potential environmental issues. The main comments discussed at the meetings include requirement to carry out maintenance plan as scheduled by qualified staff, speed up the construction process, supply of water to all households, continuous supply of water, reduction of CKD affected people in the future and formation of committee on project monitoring. CEA confirms environmental clearance is not required for the subproject as the capacity and activities do not fall under the purview of the "prescribed project category "of the National Environmental Act (NEA). As per NEA, the environmental clearance (EC) is not required if the Capacity of a WTP is less than the stipulated Capacity of 500,000 m^3/day. Hence the MWTP is 13,500 m^3/day, obtaining EC is not a requirement for construction of the WTP or part of it as per discussion held with NWSDB staff who had been involved with the construction of the MWTP.

100. In order to gather the public views on shaping the technical design and community friendly implementation process, public consultation meeting was held with the participation of all relevant stakeholders and in the presence of NWSDB staff at Pradeshiya Sabha conference hall, ,Higurakgodaa PS on8th March 2016. NWSDB has explained technical, social and environmental aspects and health benefits to be delivered due to execution of the subproject in the area. Appendix 6 provides the report on public consultation.

101. The public comments received at the meeting include request of clean drinking water from NWSDB, take measures to prevent increase of CKD patients, support to be extended from the local community, increase of Capacity of WTP, maintenance of the Rapid Sand Filter the pain of CKD patients and dangers of getting CKD to children as future generations, release of waste water to open natural water bodies, disposal of solid wastes generated from the back wash operation and request of awareness programs to be conducted, extension of the water supply system, request of water connections to all the households, efficient communication for water pipe repairs and renovation of pipes and joints in the future.

102. Recommendations of the public consultation

(i.) It is required to provide water connections to all households in the area.
(ii.) It is required to maintain the rapid sand filter of the MWTP.
(iii.) It is required to dispose the solid wastes generated from backwash operations to environmental friendly and socially acceptable locations/disposal yards.

(iv.) The environmental and social issues will be resolved with the participation of localcommunity.

Table 15: Summary of the Public Consultation Conducted

Date Of Consultation Meeting	Place Held	Consultation Tool	Aim Of The Meeting	Participants	Issues Raised
08/03/2016	Pradeshiya Saba Conference Hall-Hingurakgoda.	Group discussion and individual interviews	To educate the People of Minneriya about the construction of rapid sand filter in the MWTP and the potential environmental and social issues and delivery of pure drinking water with the support of NWSDB and PMU	Local residents of Minneriya and officers from Higurakgoda PS, DS,NWSDB from Minneriyaand SPCU, RDC, public health inspector, GramaNiladari	Water connections to all households, maintenance failures, operation of back wash activities, discharge of waste water, bad ground water quality, and reducing CKD patients in the future

B. Future Consultation and Disclosure

103. The public consultation and disclosure program with stakeholders will remain as a continuous process throughout the project implementation. During the construction and operation of the project, public consultation and institutional consultation will take place if there would be any necessity for discussing issues in respect of change of designs in association with Contractor and NWSDB. In order to avoid undue delays in implementation and completion of the project, it is required to identify the issues and points to be discussed at this stage and hold discussions with relevant organizations, institutions, CBOs and NGOs in the subproject site.

104. As well, minutes of the meeting recorded need to be attached to IEE report and the progress reports produced during the project period. The points discussed for adoption in the construction and operation activities has to be performed for enhancing the trust and mutual understanding of all stakeholders of the project.

C. Disclosure of information

105. Disclosure of information at an early stage of the project has many benefits such as to avoid any objections by the public towards successful project implementation, passing of misinformation in to the hands of public through ignited groups and local NGOs.

106. While disclosure of information can be done through the Divisional Secretariat and the Grama Niladari (village administrative officer) of the area, Farmer Based Organizations (FBOs), Community Based Organizations (CBO) and village societies are also possible sources of disseminating project related information.

107. Village leaders such as the head priest of the temple can also be resource persons for such an activity. The use of mass media to advertise the availability of the report could help information disclosure to other interested groups outside the subproject site.

108. According to the requirements of the ADB SPS, the draft IEE will be disclosed in ADB website before the Management Review Meeting (MRM) is held. The IEE report in Tamil/Sinhala versions also will be kept open for the public and other interested parties for comments at offices of NWSDB, DS secretary and PMU.

VII. GRIEVANCE REDRESS MECHANISM

109. A project-specific grievance redress mechanism (GRM) has been established to receive, evaluate, and facilitate the resolution of affected person's concerns, complaints and grievances about the social and environmental performance of LGESP. The GRM of the project has been prepared and accepted by ADB and disclosed in the project website The GRM chart providing information on receipt of complaints and levels of redressal is displayed in all subproject sites, local authorities offices, SPCU offices and other important places. The SPCU records all grievances received and address them on priority. To date all grievances are addressed at the stage of first tier.

110. The GRM aims to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the project. The GRM is project-specific and not intended to bypass the government's own redress process; rather it is intended to address affected people's concerns and complaints promptly, making it readily accessible to all segments of the affected people and is scaled to the risks and impacts of the project.

111. The PMU and SPCUs will make the public aware of the GRM through public awareness campaigns. Grievances can be filed in writing using the Complaint Register and Complaint Forms (Appendix 7) or by phone with any member of the PMU or SPCU. The contact details of the respective SPCUs will serve as a main avenue for complaints and will be publicized through display on notice boards outside their offices and at construction sites. The safeguard documents made available to the public in an accessible version will include information on the GRM and will be widely disseminated throughout the corridor by the safeguards officers in the PMU and SPCUs.

112. **First tier of GRM.** The SPCU is the first tier of GRM which offers the fastest and most accessible mechanism for resolution of grievances. The Safeguards Manager – Social and Gender in the SPCU will be designated as the key officer for grievance redress. Resolution of complaints will be done at the earliest. Investigation of grievances will involve site visits and consultations with relevant parties (e.g., affected persons, contractors, traffic police, etc.). The Community Development Officer of the local authority or in the absence of Community Development Officer, any officer who is given the responsibility of this, would coordinate with the safeguards and gender manager of SPCU in redressing the grievances. Grievances will be documented and personal details (name, address, date of complaint, etc.) will be included unless anonymity is requested. A tracking number will be assigned for each grievance, including the following elements:

(i.) Complaint Register and Complaint Forms (including the description of the grievance) with an acknowledgement of receipt given to the complainant when the complaint is registered;

(ii.) Grievance monitoring sheet with actions taken (investigation, corrective measures); and
(iii.) Closure sheet (Result of Grievance Redressal), one copy of which will be handed to the complainant after he/she has agreed to the resolution and signed-off.

113. The updated register of grievances and complaints will be available to the public at the SPCU office, construction sites, and other key public offices. Shall the grievance remain unresolved it will be escalated to the second tier.

114. **Second Tier of GRM.** The Social Safeguards and Gender Manager of SPCU will activate the second tier of GRM[2] by referring the unresolved issue (with written documentation), The Grievance Redress Committee (GRC) will be established before commencement of site works. A hearing will be called with the GRC, if necessary, where the affected person can present his and/or her concern or issues. The process will facilitate resolution through mediation. This local GRC will meet as necessary when there are grievances to be addressed. The local GRC will suggest corrective measures at the field level and assign clear responsibilities for implementing its decision at the earliest. The contractor will have observer status on GRC. If unsatisfied with the decision, the existence of the GRC will not impede the complainant's access to the Government's judicial or administrative remedies.

115. The safeguards and gender manager of SPCUs will be responsible for processing and placing all papers before the GRC, maintaining database of complaints, recording decisions, issuing minutes of the meetings and monitoring to see that formal orders are issued and the decisions carried out.

116. **Third tier of GRM.** In the event that a grievance cannot be resolved directly by the SPCUs (first tier) or GRC (second tier), the affected person can seek redress through third tier at the central level. The third tier - Central Grievance Redressal Committee consists of (i) Project Director as Chairman; and (ii) Legal Officer of MPCLG as member and Social Safeguard and Gender Officer of PMU as Member Secretary.

117. In case the grievance is not solved at this level, then the complainant can refer the same to the court of law.

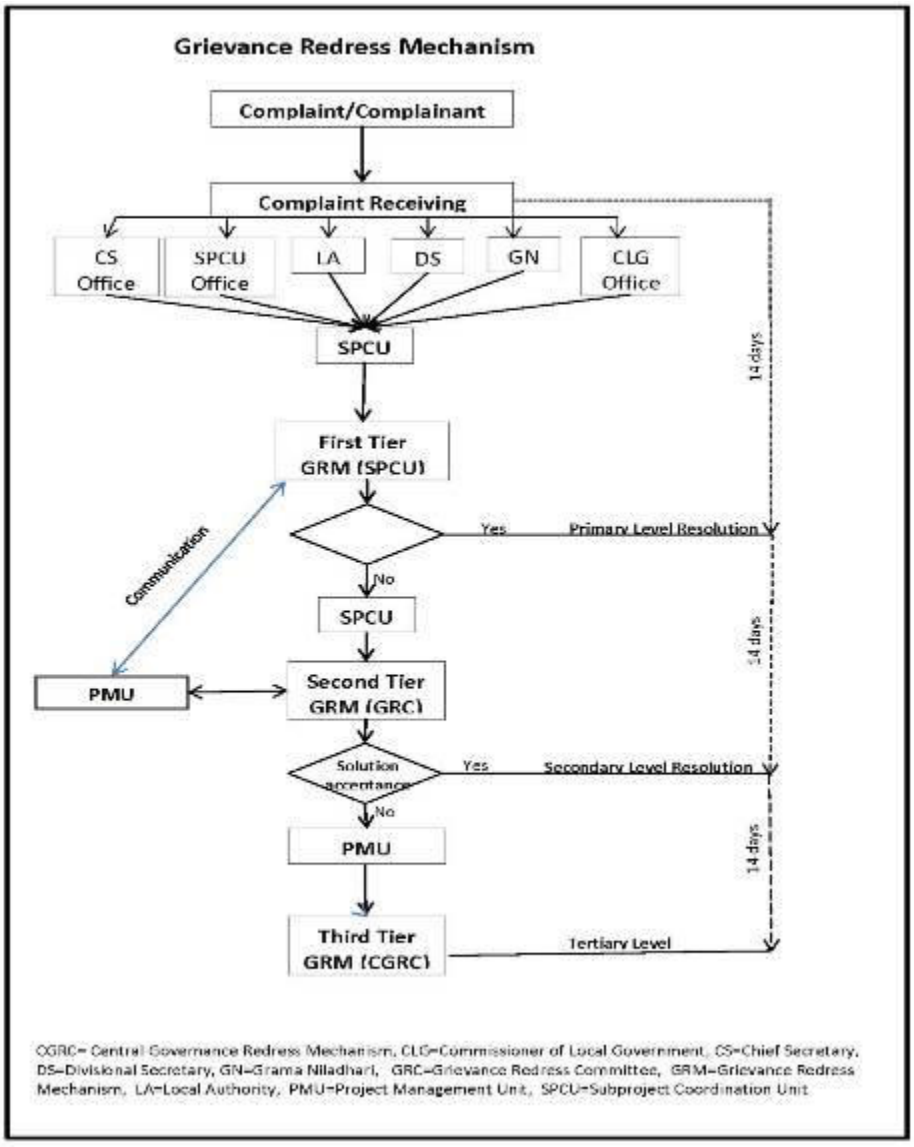
118. The detailed GRM is hosted in the project website.

119. The safeguard monitoring reports will include the following aspects pertaining to progress on grievances: (i) number of cases registered with the GRC, level of jurisdiction (first, second and third tiers), number of hearings held, decisions made, and the status of pending cases; and (ii) lists of cases in process and already decided upon may be prepared with details such as name, ID with unique serial number, date of notice, date of application, date of hearing, decisions, remarks, actions taken to resolve issues, and status of grievance (i.e. open, closed, pending).

[2] The GRC will consist of the following persons (i) Commissioner of Local Government of the Province as Chairman, (ii) Divisional Secretary of the area; (iii) Chairman of the respective Pradeshiya Sabha; (iv) representative of nongovernment organizations and/or community based organizations working in the area as nominated by CLG; (v) Member of clergy of pradeshesiya area; (vi) Chairman of Samathamandal; (vii) Grama Niladhari of the area; (vii) Social Safeguard and gender Manager - as Member Secretary of the GRC. The functions of the local GRC are as follows: (i) resolve problems quickly and provide support to affected persons arising from various issues including environmental and social issues.

120. All costs involved in resolving the complaints (meetings, consultations, communication and reporting and/or information dissemination) will be borne by the executing agency.

Figure 1: Tiers of GRM



VIII. ENVIRONMENTAL MANAGEMENT PLAN

121. An environmental management plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable levels.

122. The EMP will guide the environmentally-sound construction of the subproject and ensure efficient lines of communication between PMU, SPMU, consultants and contractors. The EMP will (i) ensure that the activities are undertaken in a responsible non-detrimental manner; (i) provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site; (ii) guide and control the implementation of findings and recommendations of the environmental assessment conducted for the subproject;

(iii) detail specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (iv) ensure that safety recommendations are complied with. The EMP includes a monitoring program to measure the environmental condition and effectiveness of implementation of the mitigation measures.

123. The contractor will be required to submit to SPMU, for review and approval, a Environmental Management Action Plan (EMAP) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program as per EMAP; and (iv) budget for EMAP implementation. No works are allowed to commence prior to approval of EMAP.

124. A copy of the EMP/approved EMAP will be kept on site during the construction period at all times. The EMP included in the bid and contract documents. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

A. Safeguards Implementation Arrangements

125. The MPCLG is the executing agency. A National Steering Committee, headed by the Secretary of MPCLG, will provide policy guidance to the project. A ministerial committee, also headed by the Secretary of MPCLG, will be responsible for decisions on overall approvals and operational policies of the project.

126. A PMU in the MLGPC, headed by a Project Director, will be responsible for overall coordination, management, administration, project implementation, monitoring, and supervision. The PMU will function as the project office of the executing agency, will be in-charge of subproject appraisal and approval, and will ensure compliance with ADB loan covenants. An Environment Safeguards Officer (PMU ESO) will have the following responsibilities: (i) support project director in addressing all environment-related safeguards issues of the project; (ii) implement the EARF; (iii) monitor physical and on-physical activities under the Project; (iv) monitor implementation of safeguards plans; (v) guide the SPCUs as and when necessary; and (vi) endorse and/or submit periodic monitoring reports[3] received from SPCU to the PMU , project director, who will then submit these to ADB. It will also coordinate with national and state agencies to resolve inter-departmental issues, if any.

127. The PMU will be assisted by PMC Safeguard Specialist (PMC SS). The PMC SS will (i) review and finalize all reports in consultation with the PMU ESO; (ii) provide project management support, (iii) assure the technical quality of design and construction; (iv) review EIA/IEE/resettlement plan/indigenous peoples plan reports submitted by SPCUs; and (v) provide advice on policy reforms. In addition, the PMC SS will assist the PMU on the procurement needs and other project implementation aspects and shall play a central role in ensuring capacity building on environmental management of the PMU, contractors, and line departments through capacity development support and training.

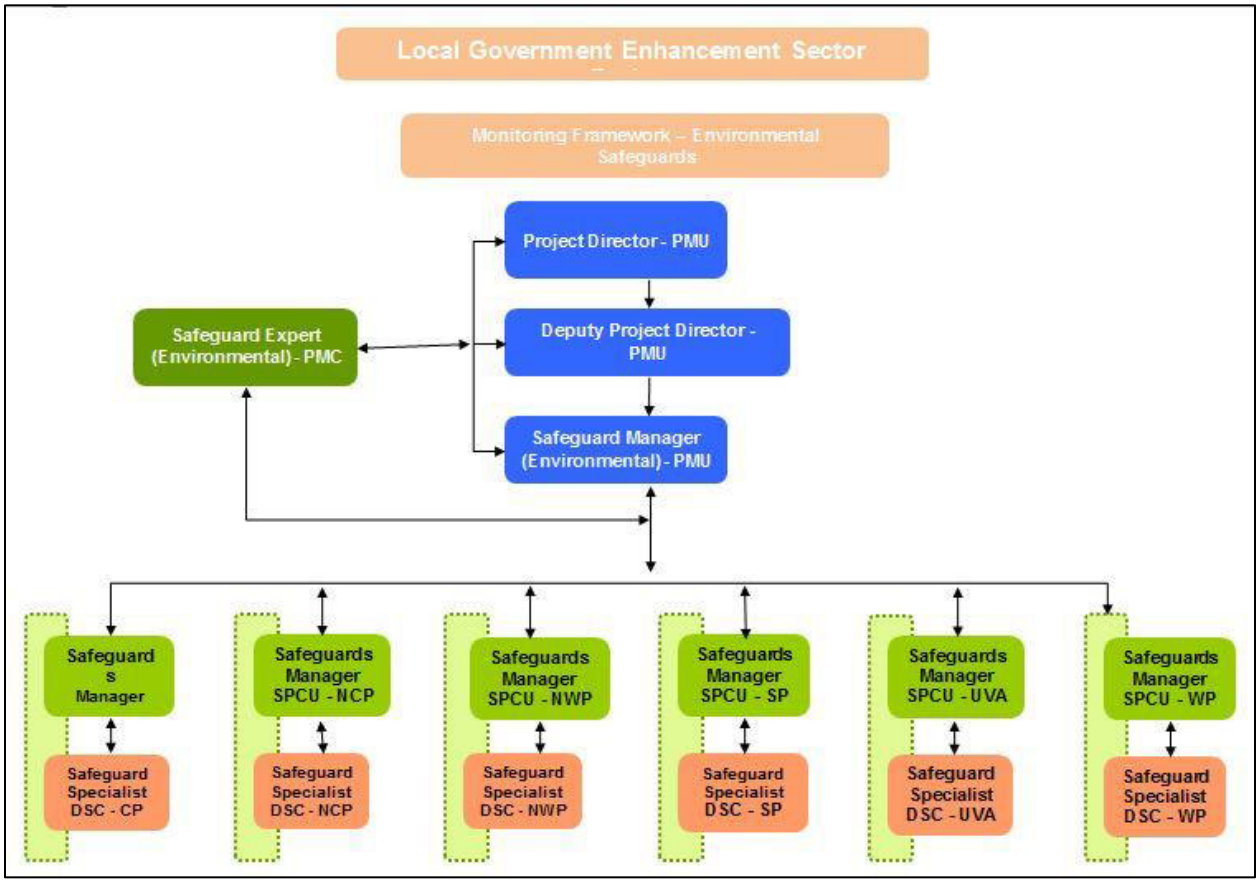
128. SPCU in each of the seven provinces will take responsibility for supporting subproject preparation, screening and endorsement, procurement, implementation monitoring including quality control and assurance and ensuring safeguards compliance. It is essential that Provincial

[3] The monitoring report will focus on the progress of implementation of the IEE/EIA and EARF, issues encountered and measures adopted, follow-up actions required, if any, as well as the status of compliance with subproject selection criteria, and relevant loan covenants.

Councils provide clear guidance to the target Pradeshiya Sabhas in their development planning and subproject identification process, to ensure coherence with the provincial physical development plans and facilitate collaboration among neighboring local authorities possibly for joint infrastructure development. Each SPCU will be headed by the Commissioner of Local Government who will be assigned as the Provincial Project Director and will be the administrative head. For each SPCU, a senior engineer will be appointed as the executive head and will be in-charge of the day-to-day activities of the unit. The Safeguard Manager of SPCU will be responsible for: (i) review of the EIAs/IEEs prepared by DSCs as well as the implementation of the EMP provided in each EIA/IEE; (ii) undertake surveys and record their observations throughout the construction period to ensure that safeguards and mitigation measures are provided as intended; (iii) implement and monitor safeguards compliance activities, public relations activities, gender mainstreaming activities and community participation activities; (iv) obtain statutory clearances from government agencies/other entities; and (v) coordinate for obtaining ROW clearances with related provincial and national agencies.

129. Environment Specialists will also be appointed as part of the DSC teams to (i) prepare IEEs in the detailed design stage; (ii) assist in the monitoring of EMP during construction stage; and (iii) prepare EIAs/IEEs for new subprojects, where required to comply with national law and/or ADB procedure.

Figure 2: Safeguards Implementation Arrangement



B. Institutional Capacity Development Program

130. The PMC SS will be responsible for training of PMU and SPCUs staff on environmental awareness and management in accordance with both ADB and government requirements. Specific modules customized for the available skill set shall be devised after assessing the capabilities of the target participants and the requirements of the project. The entire training will cover basic principles of environmental assessment and management; mitigation plans and programs, implementation techniques, monitoring methods and tools. Typical modules that will be present for the training session would be as follows: (i) sensitization; (ii) introduction to environment and environmental considerations in urban development projects; (iii) review of IEEs and integration into the subproject detailed design; (iv) improved coordination within nodal departments; and (v) monitoring and reporting system. The proposed training program along with the frequency of sessions is presented in Table 16.

Table 16: Training Program for Environmental Management

Program	Description	Participants	Form of Training	Duration/ Location	Conducting Agency
A. Pre-Construction Stage					
Awareness Workshop	Awareness of requirements of environmental safeguard s in design, execution and managing the assets created under the project including procedures to be followed and approvals to be obtained.	Senior officers of MPCLG, NSC members and elected representatives of Pradeshiya Sabhas	Workshop	½ day	PMU with support of PMC and ADB (SLRM)
Sensitizatio n Workshop	Introduction to Environment: Basic Concept of environment Environmental Regulations and Statutory requirements as per Government and ADB	Pradeshiya Sabhas, SPCU Staff	Workshop	½ Working Day	SPCU, DSC, PMU
Session I					
Module I	Introduction to Environment: Basic Concept of environment Environmental Regulations and Statutory requirements as	Pradeshiya Sabhas, SPCU Staff	Lecture	½ Working Day	SPCU, DSC, PMU

Program	Description	Participants	Form of Training	Duration/ Location	Conducting Agency
	per Government and ADB				
Module II	Environmental Considerations in Urban Development Projects: Environmental components affected by urban development in construction and operation stages Activities causing pollution during construction and operation stages Environmental Management Good Practices in Urban Infrastructure Projects	Pradeshiya Sabhas, SPCU Staff	Workshop		SPCU, DSC, PMU
Module III	Review of IEE and its Integration into Designs: IEE Methodology Environmental Provisions in the EMPs Implementation Arrangements Methodology of Assessment of Pollution Monitoring Methodology for site selection of burrow areas, waste disposal areas etc.	Pradeshiya Sabhas, SPCU Staff	Lecture and Field Visit	½ Working Day	SPCU, DSC, PMU
Module IV	Improved Coordination with other Institutions: Overview of the Project Environmental and Social	Pradeshiya Sabhas, SPCU Staff	Lecture and/or Interactive Sessions		SPCU, DSC, PMU

Program	Description	Participants	Form of Training	Duration/ Location	Conducting Agency
	Impacts Statutory Permissions Procedural Requirements Cooperation and Coordination with other Institutions. Requirement of target setting, team work and team building				
Module V	Special Issues in the Project Bio-Diversity Assessment and Conservation Geomorphological Assessment and Soil and Erosion Protection Statutory Permissions – Procedural Requirements Consultation and Counseling	Pradeshiya Sabhas, SPCU Staff	Lecture	½ Working Day	SPCU, DSC, PMU
	Working out responsibility chart and plan of action			½ Working Day	
B. Construction Stage					
Session II					
Module VI	Role during Construction Roles and Responsibilities of officials/ contractors/ consultants towards protection of environment Implementation Arrangements Monitoring mechanisms Introducing	Pradeshiya Sabhas, SPCU Staff	Lecture and/or Interactive Sessions	½ Working Day	SPCU, DSC, PMU

Program	Description	Participants	Form of Training	Duration/ Location	Conducting Agency
	necessities of auditing, checks and balances				
Module VII	Monitoring and Reporting System	Pradeshiya Sabhas, SPCU Staff	Lecture and/or Interactive Sessions	½ Working Day	SPCU, DSC, PMU

ADB = Asian Development Bank, DSC = Design and Supervision Consultants, MPCLG = Ministry of Provincial Councils and Local Government, PMU = project management unit, SLRM = Sri Lanka Resident Mission, SPCU = subproject coordination unit.

C. Staffing Requirement and Budget

131. The costs for environmental safeguard activities which are responsibilities of the PMC and DSC are included in respective consultant packages. The cost of mitigation measures during construction stage will be incorporated into the contractor's costs. Thus, remaining costs related to environmental safeguards cover the following activities:

(i.) Conduct of IEE or EIA studies, preparing and submitting reports and public consultation and disclosure;
(ii.) EPL applications, if required;
(iii.) Conduct of environmental monitoring for baseline data generation and long-term surveys along with GIS based mapping and infrastructure system;
(iv.) Replacement and maintenance of trees, if required; and
(v.) Conduct of environmental capacity-building lectures and workshops for creating awareness.

132. The indicative costs of these various inputs are shown in Table 17.

Table 17: Indicative Cost of EMP Implementation

Item	Quantity	Unit Cost (US$)	Sub-total Cost (US$)	Source of Funds
Administrative Cost				
(i) Public Consultations	Lump sum per province (7 provinces)	$1,000	$7,000	Project Cost - PMU Costs (to be paid under incremental administration cost)
(ii) Environmental Monitoring				
(a) Design Stage to establish baseline environmental data	Lump sum per province (7 provinces)	$3,000	$21,000	Project Cost - PMU Costs (to be done under the guidance of PMC / SPCU by SPCU staff and accounted under incremental administration cost.
(b) Construction Phase		-	-	Civil Works Contractor Costs

Item	Quantity	Unit Cost (US$)	Sub-total Cost (US$)	Source of Funds
(c) O&M		-	-	Pradeshiya Sabhas' cost
(iii) Landscaping and tree-planting	Lump sum per province (7 provinces)	$2, 000	$14,000	Civil Works Contractor Costs
(iv) Capacity Building Expenses	Lump sum per province (7 provinces)	$1,000	$7,000	On job training is done by PMC / DSC - Any other workshops and/or sessions on these will be under Project Cost - PMU Costs and accounted under Capacity Building expenditure.

*This costs are for overall project. Subproject specific costs will be spent under the respective contracts.

D. Environmental Management Plan

133. The contractor will be required to submit to SPMU, for review and approval, a site environmental plan (EMAP) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program as per EMAP; and (iv) budget for EMAP implementation. No works are allowed to commence prior to approval of EMAP.

E. Environmental Monitoring Program

134. Table 19 shows the proposed environmental program for the project. It includes all relevant parameters, location, responsibility of mitigation and monitoring, method and frequency of monitoring.

Table 18: Environmental Management Plan

Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Source of Funds
Pre-Construction Phase	Permits to be obtained for cutting trees	Cut down branches of trees rather than removing.	Contractor	NWSDB, SPCU and CLG	Left trees in the project area	Contractor's, cost
	Approvals obtained for burrowing of earth	Source the materials from qualified suppliers.	Contractor	NWSDB SPCU and CLG	Field reports and observations	Contractor's, cost
Construction Phase	Dust generation	Regularly spray water on excavated soil surface to minimize generation of dust.	Contractor	NWSDB SPCU and CLG	Field report and complaints if any	Contractor's, cost
		When transporting all materials such as earth, sand and cement, cover them with tarpaulin to avoid spillage of materials and production of dust due to wind.	Suppliers	NWSDB SPCU and CLG	Field report and complaints if any	Contractor's, cost
		Appropriate measures shall be in place to minimize the emissions of dust while handling, loading/unloading of materials	Contractor	NWSDB	Field report and complaints if any	Contractor's, cost
		Avoid transporting of excavated soils and mud during rainy days	Contractor/ Engineer/ Consultant	NWSDB SPCU and CLG	Field report and complaints if any	No cost
	Increased noise level	Construction activities be carried out only during day time from 7am to 5.pm every day and limited night work be done for the concrete slabs. All machineries used in this regard will have noise control devices to reduce the sound level below 75 db as specified by CEA environmental regulations and as shown in	Contractor	NWSDB SPCU and CLG	Noise reports	Contractor's cost

Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Source of Funds
		the Appendix 8.				
	Occupational health and safety	Prepare occupational health and safety plan (OHSP) which will be part of the contractor's contract documents. The occupational safety plan should have provisions on (a) PPE like hard hats, safety gloves, ear mufflers to all workers; (b) occupational health and safety (H&S) training to all workers; (c) safety procedures to be followed for all construction site activities including provisions on penalties and sanctions for non-compliance; (d) records of accident and the corrective actions implemented; and (e) emergency response plan during fire, earthquake and other incidents.	Contractor	NWSDB SPCU and CLG	OHSP	Contractor's cost
		First-aid facilities should be present in the project area and at least one safety and health officer should be assigned in the construction area.	Contractor	NWSDB SPCU and CLG	First aid facility	Contractor's cost
		Provide medical insurance coverage for workers.	Contractor	NWSDB SPCU and CLG	Workers' medical insurance	Contractor's cost
		Secure all installations from unauthorized intrusion and accident risks.	Contractor	NWSDB SPCU and CLG	Barricade and access control measures	Contractor's cost
		Provide adequate, portable or permanent sanitation facilities serving all workers.	Contractor	NWSDB SPCU and CLG	Workers sanitation facilites	Contractor's cost

Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Source of Funds
		Provide supplies of potable drinking water.	Contractor	NWSDB SPCU and CLG	Potable drinking water for workers	Contractor's cost
		Provide clean eating areas where workers are not exposed to hazardous or noxious substances.	Contractor	NWSDB SPCU and CLG	Noise reports	Contractor's cost
		Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers;	Contractor	NWSDB SPCU and CLG	Record of H&S trainings conducted	Contractor's cost
		Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazardous areas unescorted.	Contractor	NWSDB SPCU and CLG	Records of visitors	Contractor's cost
		Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas.	Contractor	NWSDB SPCU and CLG	Records on issuance to workers of PPE and frequency of use	Contractor's cost
		Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily	Contractor	NWSDB SPCU and CLG	Sign boards	Contractor's cost

Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Source of Funds
		understood by workers, visitors, and the general public as appropriate.				
		Disallow worker exposure to noise level greater than 85 dBA for a duration of more than eight hours per day without hearing protection. The use of hearing protection shall be enforced actively.	Contractor	NWSDB SPCU and CLG	Noise levels	Contractor's cost
	Waste generation	The solid wastes generated need to be removed to appropriate disposal yards	Contractor	NWSDB, SPCU and CLG	Field reports	Contractor's cost
Operation and Maintenance Phase	Discharge the impurities and other solids collected due to filtration and back wash of the RSF	Once every 24 hours, back wash operation needs to be carried out using pressurised air flow and upward back operation.	NWSDB	NWSDB	Reports on maintenance operation	Operational cost borne by NWSDB
		Maintain the mechanical parts as per the maintenance plan to avoid any hazards in the RSF	NWSDB	NWSDB	Reports on maintenance operation	Operational cost borne by NWSDB
	Sludge generation	Collect in an underground chamber and allow for settling and remove the solid sludge to abandoned forest areas	NWSDB	NWSDB	Maintenance reports	Operational cost borne by NWSDB
	Increased in sewage generation	The local community has well-built sanitation facilities and will manage the sewage generated	Local community	Public health inspectors	Field reports and public health inspector's report	Not required
	Generation of waste materials	Collect solid wastes and dispose to CEA approved disposal yards	NWSDB	NWSDB	Field reports	Pradeshiya shabhas cost
	Occupational health and safety	Provide appropriate PPE and training on its proper use and maintenance.	NWSDB	NWSDB	Records of PPEs and trainings on use	Operational cost borne by NWSDB

Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Source of Funds
					of PPEs	
		Use fall protection equipment when working at heights.	NWSDB	NWSDB	Fall protection equipment and records of accidents	Operational cost borne by NWSDB
		Maintain work areas to minimize slipping and tripping hazards.	NWSDB	NWSDB	Records of accidents	Operational cost borne by NWSDB
		Implement a training program for operators who work with chlorine regarding safe handling practices and emergency response procedures.	NWSDB	NWSDB	Training programs on chemical handling and emergency response procedures	Operational cost borne by NWSDB
		Prepare escape plans from areas where there might be a chlorine emission.	NWSDB	NWSDB	Escape plans	Operational cost borne by NWSDB
		Install safety showers and eye wash stations near the chlorine equipment and other areas where hazardous chemicals are stored or used.	NWSDB	NWSDB	Safety showers and eye wash station	Operational cost borne by NWSDB
		Prohibit eating, smoking, and drinking except in designated areas.	NWSDB	NWSDB	Daily records	Operational cost borne by NWSDB

Table 19: Environmental Monitoring Program

Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Location	Frequency
Pre-Construction Phase	Permits to be obtained for cutting trees	Cut down branches of trees rather than removing.	Contractor	NWSDB, SPCU and CLG	Left trees in the project area	Project area	Before commencing
	Approvals obtained for	Source the materials from qualified suppliers rather	Contractor	NWSDB SPCU and	Field reports and	Location around	Before commencing

Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Location	Frequency
	burrowing of earth	attempting to burrowing from sites		CLG	observations		
Construction Phase	Dust generation	Regularly spray water on excavated soil surface to minimize generation of dust.	Contractor	NWSDB SPCU and CLG	Field report and complaints if any	Project area	weekly
		When transporting all materials such as earth, sand and cement, cover them with tarpaulin to avoid spillage of materials and production of dust due to wind.	Suppliers	NWSDB SPCU and CLG	Field report and complaints if any	Off the project site	weekly
		Appropriate measures shall be in place to minimize the emissions of dust while handling, loading/unloading of materials	Contractor	NWSDB	Field report and complaints if any	Project site	weekly
		Avoid transporting of excavated soils and mud during rainy days	Contractor/ Engineer/ Consultant	NWSDB SPCU and CLG	Field report and complaints if any	Project site and off the site	monthly
	Increased noise level	Construction activities be carried out only during day time from 7 am to 5.pm every day and limited night work be done for the concrete slabs. All machineries used in this regard will have noise control devices to reduce the sound level below 75 db as specified by CEA environmental regulations and as shown in the Appendix 8.	Contractor	NWSDB SPCU and CLG	Noise reports	Project site	Daily

Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Location	Frequency
	Waste generation	The solid wastes generated need to be removed to appropriate disposal yards	Contractor	NWSDB SPCU and CLG	Field reports	Project site	weekly
	Occupational health and safety	Prepare occupational health and safety plan (OHSP) which will be part of the contractor's contract documents. The occupational safety plan should have provisions on (a) PPE like hard hats, safety gloves, ear mufflers to all workers; (b) occupational health and safety (H&S) training to all workers; (c) safety procedures to be followed for all construction site activities including provisions on penalties and sanctions for non-compliance; (d) records of accident and the corrective actions implemented; and (e) emergency response plan during fire, earthquake and other incidents.	Contractor	NWSDB SPCU and CLG	OHSP	Project site	Prior to start of civil works
		First-aid facilities should be present in the project area and at least one safety and health officer should be assigned in the construction area.	Contractor	NWSDB SPCU and CLG	First aid facility	Project site	Prior to start of civil works
		Provide medical insurance coverage for workers.	Contractor	NWSDB SPCU and	Workers' medical	Project site	Prior to start of civil works

Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Location	Frequency
				CLG	insurance		
		Secure all installations from unauthorized intrusion and accident risks.	Contractor	NWSDB SPCU and CLG	Barricade and access control measures	Project site	Prior to start of civil works
		Provide adequate, portable or permanent sanitation facilities serving all workers.	Contractor	NWSDB SPCU and CLG	Workers sanitation facilites	Project site	Prior to start of civil works
		Provide supplies of potable drinking water.	Contractor	NWSDB SPCU and CLG	Potable drinking water for workers	Project site	During civil works
		Provide clean eating areas where workers are not exposed to hazardous or noxious substances.	Contractor	NWSDB SPCU and CLG	Noise reports	Project site	Prior to start of civil works During civil works
		Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers;	Contractor	NWSDB SPCU and CLG	Record of H&S trainings conducted	Project site	Prior to start of civil works
		Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazardous areas unescorted.	Contractor	NWSDB SPCU and CLG	Records of visitors	Project site	As needed.
		Ensure the visibility of workers through their use	Contractor	NWSDB SPCU and	Records on issuance to	Project site	Prior to start of civil works

Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Location	Frequency
		of high visibility vests when working in or walking through heavy equipment operating areas.		CLG	workers of PPE and frequency of use		
		Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate.	Contractor	NWSDB SPCU and CLG	Sign boards	Project site	Prior to start of civil works
		Disallow worker exposure to noise level greater than 85 dBA for a duration of more than eight hours per day without hearing protection. The use of hearing protection shall be enforced actively.	Contractor	NWSDB SPCU and CLG	Noise levels	Project site	During civil works
Operation and Maintenance Phase	Discharge the impurities and other solids collected due to filtration and back wash of the RSF	Once every 24 hours, back wash operation needs to be carried out using pressurised air flow and upward back operation.	NWSDB	NWSDB	Reports on maintenance operation	Project site	24 hours
		Maintain the mechanical parts as per the	NWSDB	NWSDB	Reports on maintenance	Project site	Monthly

Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Location	Frequency
		maintenance plan to avoid any hazards in the RSF			operation		
	Sludge generation	Collect in an underground chamber and allow for settling and remove the solid sludge to abandoned forest areas	NWSDB	NWSDB	Maintenance reports	Project site	Daily
	Increased in sewage generation	The local community has well-built sanitation facilities and will manage the sewage generated	Local Community	NWSDB	Field reports and public health inspector's report	Off the project site	Monthly
	Generation of waste materials	Collect solid wastes and dispose to CEA approved disposal yards	NWSDB	NWSDB	Field reports	Project site	Monthly
	Occupational health and safety	Provide appropriate PPE and training on its proper use and maintenance.	NWSDB	NWSDB	Records of PPEs and trainings on use of PPEs	Project site	Monthly
		Use fall protection equipment when working at heights.	NWSDB	NWSDB	Fall protection equipment and records of accidents	Project site	Monthly
		Maintain work areas to minimize slipping and tripping hazards.	NWSDB	NWSDB	Records of accidents	Project site	Monthly
		Implement a training program for operators who work with chlorine regarding safe handling practices and emergency response procedures.	NWSDB	NWSDB	Training programs on chemical handling and emergency response procedures	Project site	Monthly
		Prepare escape plans from areas where there might be a chlorine	NWSDB	NWSDB	Escape plans	Project site	Monthly

Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Location	Frequency
		emission.					
		Install safety showers and eye wash stations near the chlorine equipment and other areas where hazardous chemicals are stored or used.	NWSDB	NWSDB	Safety showers and eye wash station	Project site	Monthly
		Prohibit eating, smoking, and drinking except in designated areas.	NWSDB	NWSDB	Daily records	Project site	Monthly

IX. MONITORING AND REPORTING

135. The PMU will continue to monitor and measure the progress of EMP implementation. The monitoring activities will be corresponding with the subproject's risks and impacts and will be identified in the EIAs/IEEs for the subprojects. The PMU and SPCUs will continue to undertake site inspections, document review to verify compliance with the EMP and progress toward the final outcome and recording information of the work, deviation of work components from original scope.

136. DSC will submit monthly monitoring and implementation reports to SPCU, who will take follow-up actions, if necessary. SPCU will submit the quarterly monitoring and implementation reports to PMU who will then submit to the project director. The PMU will submit semi-annual monitoring reports to ADB. The suggested monitoring report format is in Appendix 9. Project budgets will reflect the costs of monitoring and reporting requirements. For subprojects likely to have significant adverse environmental impacts during operation, reporting will continue at the minimum on an annual basis. Monitoring reports will be posted in a location accessible to the public.

137. For projects likely to have significant adverse environmental impacts, the executing agency will retain qualified and experienced external experts to verify its monitoring information. The executing agency will document monitoring results, identify the necessary corrective actions, and reflect them in a corrective action plan. The executing agency, in each quarter, will study the compliance with the action plan developed in the previous quarter. Compliance with loan covenants will be screened by the executing agency.

138. ADB will review project performance against the executing agency's commitments as agreed in the legal documents. The extent of ADB's monitoring and supervision activities will be commensurate with the project's risks and impacts. Monitoring and supervising of social and environmental safeguards will be integrated into the project performance management system. ADB will monitor projects on an ongoing basis until a project completion report is issued. ADB will carry out the following monitoring actions to supervise project implementation:

(i) conduct periodic site visits for projects with adverse environmental or social impacts;
(ii) conduct supervision missions with detailed review by ADB's safeguard specialists/officers or consultants for projects with significant adverse social or environmental impacts;
(iii) review the periodic monitoring reports submitted by executing agency to ensure that adverse impacts and risks are mitigated as planned and as agreed with ADB;
(iv) work with executing agency to rectify to the extent possible any failures to comply with their safeguard commitments, as covenanted in the legal agreements, and exercise remedies to re-establish compliance as appropriate; and
(v) Prepare a project completion report that assesses whether the objective and desired outcomes of the safeguard plans have been achieved, taking into account the baseline conditions and the results of monitoring.

X. CONCLUSIONS AND RECOMMENDATIONS

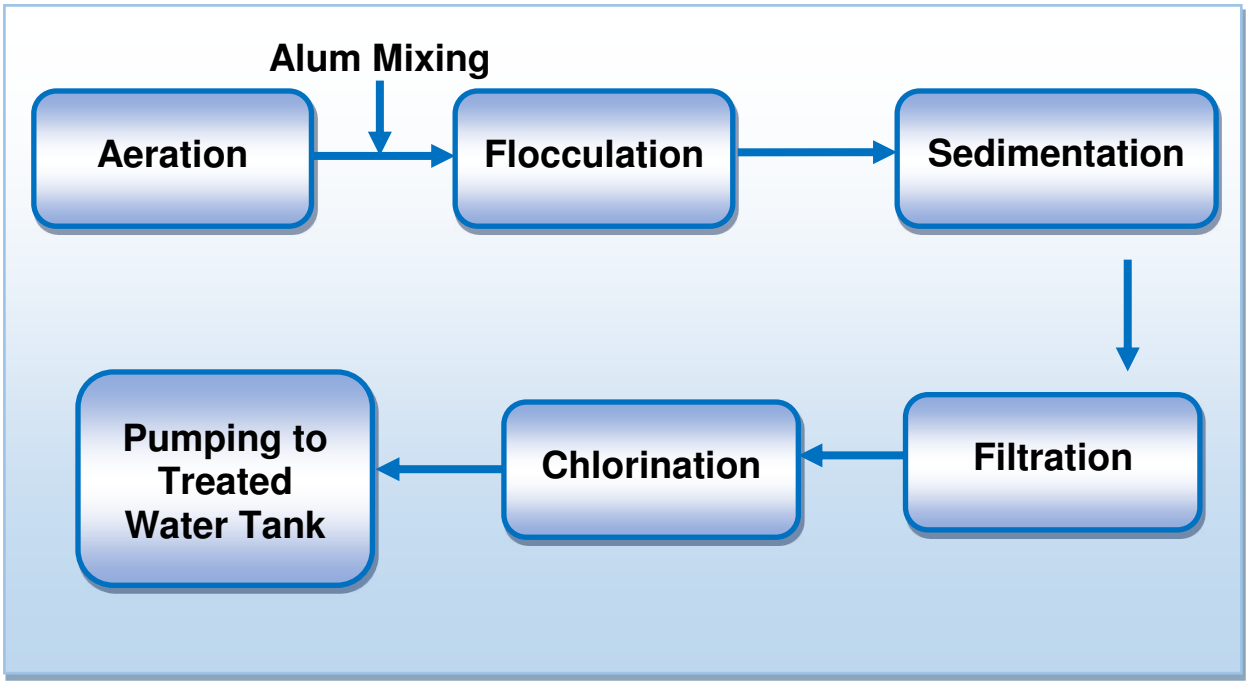
139. The long term socio–economic and health benefits to be derived from the subproject are much higher and valued than the negative environmental impacts which can be mitigated to standard levels without difficulty through proper engineering design and the incorporation or application of recommended mitigation measures and procedures as per EMP.

140. It is recommended that (i) IEE be made part of the bid and contract documents to ensure mitigation measures are appropriately budgeted and legally binding to the contractors; (ii) monitor diligently contractor/s EMP implementation by PMU, SPMU and consultants on EMP implementation by contractors; (iii) involve stakeholders in all phases of implementation and disclose relevant project related documents; and (iv) continue existing GRM process.

141. **Conclusion.** The subproject is unlikely to cause significant adverse impacts. As per ADB SPS, the subproject is classified as environmental Category B and does not require further EIA.

Appendix 1: Detailed Water Treatment Process

Figure 3: Detailed Water Treatment Process



Aeration:

The Minneriya water treatment plant is a conventional surface water treatment plant that has a fairly standard sequence of processes. At the same time, the process of aeration takes place by pumping the Pre-Chlorinated water through a special structure to mix with sufficient amount of Air/Oxygen. This aeration will dispel the bad odour, gases dissolved in water and reduce the water hardness to some extent. Depending on the PH value of water, lime liquid is added to increase the pH value. In addition, pre Chlorination is done to disinfect the raw water at the inception of the treatment process. By Pre-Chlorination, algae, biological matter like Bacteria and viruses are killed or neutralized in their Capacity to activate.

Flocculation:

After screening out large objects like fish and sticks, coagulant chemicals/ Alum (Aluminium Sulfate) are added to the water to cause the tiny particles suspended in the water. The coagulants make the water cloudy to be attracted to each other and form “flocs.” Flocculation—the formation of larger flocs from smaller flocs—is typically achieved using gentle, constant mixing of the water to encourage particles and small floc to “bump” into each other, stick, and form larger floc. Once the flocs are large and heavy enough to be settled, the water moves into quiet sedimentation or settling basins.

Sedimentation:

Waters exiting in the flocculation basin enter the sedimentation basin or called it as a clarifier or settling basin. It is a large tank with low water velocities, allowing floc to settle to the

bottom. The sedimentation basin is best located close to the flocculation basin. Hence, the transition between two processes does not permit the settlement or flocs to break up. The sedimentation basins are generally rectangular flowing from one end to another end for the effective sedimentation process. The particles settled down in the bottom are washed to the waste water tank called “Thinker” where the water is allowed to settle for 24 hours. After 24 hours, the supernated water is passed through another pipe to a separate chamber where supernated water is released to a nearby natural water body after testing the water quality. This water analysis has proved that the water released after treatments meets the surface water quality standards of CEA. The sludge produced due to sedimentation is discharged to the forest areas where it can be absorbed to the surface of the soil. This forest area has sufficient ground cover to disperse the sludge in the area. However, the sludge lagoons or the dry beds need to be built up in order to remove the water and make the sludge dry in dry beds. It has been planned to establish dry beds in the second phase of the Capacity improvement of the Minneriya water treatment plant.

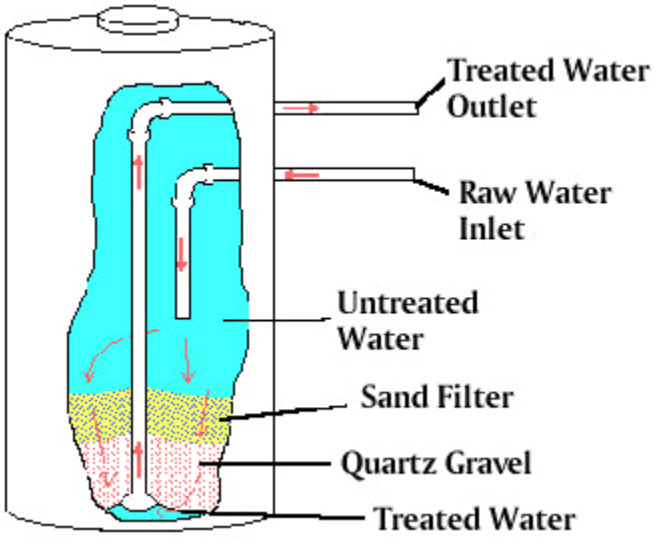
Filtration:

When most of the solids have settled out, the water is passed through rapid sand filters (RSF) that consist of top sand layer and granular or pebble type layer down the sand layer. This is a conventional shallow sand bed structure allowing to filter the water. The larger particles in the water retain on the top of the sand layer while the small particles of organic sediment left in the rapid sand filter are eaten by microscopic organisms including bacteria and protozoans which 'stick' in the layers of slime that form around the sand particles. The clean water which passes through the filter is safe to drink.

This RSF has much greater water treatment filtration rate and the ability to clean automatically using back wash system. The RSF does not use biological filtration and depends primarily on mechanical straining, sedimentation, impaction, interception, adhesion and physical adsorption. In the rapid sand water filter, the complete filtration cycle (filtration and back washing) occurs sequentially.

This rapid sand filters can be cleaned by passing water upward through the filter after blowing compressed air up through the bottom. This air blowing process breaks up the clog and allows to back wash with the water. The back wash water is passed through pipes and ends in a waste water tank where it can retain for about 2 hours. After settling the impurities, the water is released to the natural open water body. This water is much cleaner and meets the surface water quality standards of CEA as per required criteria.

Figure 4: Rapid Sand Filter



Chlorination:

Chlorination is used for disinfection of water and in the Minneriya treatment Plant, gas chlorination is used. Neutralization plant has been installed to overcome any hazardous accidents. 1000kg gas Chlorine tunners are being used in the treatment plant. Chlorine is added to the sump to disinfect the biological properties of water prior to distribution. Additional residual chlorine (RCL) is added to meet the standards of the Sri Lanka Standards Institute (SLSI) (0.2mg/l) at the last dead end of the distribution system. 20 minutes of retention period is provided for RCL at the storage tank.

Appendix 2: Results of Treated Water Quality Testing

NATIONAL WATER SUPPLY & DRAINAGE BOARD
REGIONAL LABORATORY, POLONNARUWA.
Tel : 027 2226652, Fax : 027 2226652, E mail : polonnaruwalab@gmail.com

1. **WATER SUPPLY SCHEME** : **Minneriya**
2. **SAMPLE COLLECTED DATE** : **2015.12.15**
3. **LABORATORY REG. NO. & SAMPLING POINT** :

No.	Time of sampling	Sampling Point
833	14.46	Bore hole
834	14.49	Minneriya Raw water
835	15.03	Settled water
836	15.10	Filtered water
837	15.12	Sump
838	15.29	Tap near the School (Nagalakanda M.V.)
839	15.45	Tap at Puranagama
840	15.22	Tap at Batuoya
841	15.37	Tap at Kahatagahapitiya rd

4. **SAMPLE COLLECTED BY** : **Chemist, Polonnaruwa.**
5. **REPORT REQUIRED BY** : **1. District Engineer (Polonnaruwa)**
   2. OIC Minneriya

Results:

Sri Lanka Standards SLS - 614 - 2013	Units	Maximum Requirement	833	834	835	836	837	838	839	840	841
Colour	Hazen	15	4.3	6.9	6.2	2.6	0.9	0.8	0.6	0.5	0.8
Turbidity	NTU	2	2.20	3.75	3.48	1.46	0.34	0.38	0.30	0.22	0.62
Electrical Conductivity	µs/cm		494	230	225	219	234	236	242	276	262
pH		6.5 - 8.5	6.98	7.46	7.66	7.67	7.36	7.26	7.23	7.41	7.43
Chloride(as Cl)	mg / l	250	16	6	-	-	6	-	-	-	-
Total Alkalinity (as $CaCO_3$)	mg / l	200	180	100	-	-	100	-	-	-	-
Total Hardness (as $CaCO_3$)	mg / l	250	160	90	-	-	100	-	-	-	-
Nitrates as N	mg / l	50	0.6	0.9	-	-	0.7	-	-	-	-
Nitrites as N	mg / l	3	0.005	0.027	-	-	0.003	-	-	-	-
Sulphate(as SO_4^{2-})	mg / l	250	12	03	-	-	11	-	-	-	-
Fluorides (as F)	mg / l	1.0	0.66	0.24	-	-	0.21	-	-	-	-
Total phosphate (as PO_4)	mg / l	2.0	1.47	0.27	-	-	0.23	-	-	-	-
Total Iron	mg / l	0.3	0.04	0.08	-	-	0.08	-	-	-	-
Free Ammonia	mg / l	0.06	-	0.16	-	-	0.02	-	-	-	-
Manganese	mg / l	0.1	0.70	-	-	-	-	-	-	-	-
Residual Alum	mg / l	0.2	-	-	-	-	0.068	-	-	-	-
Total Dissolved Solids	mg / l	500	284	174	144	140	150	150	184	177	168
Residual Chlorine	mg / l	1.0	-		-	-	0.82	0.98	0.12	0.52	0.23
BACTERIOLOGICAL QUALITY (SLS 614 - 2013)											
Coliform bacteria	Per 100 ml	0	0	360	-	-	0	0	0	0	0
E-Coli Bacteria	Per 100 ml	0	0	80	-	-	0	0	0	0	0

< : Less than

Recommendation:

Bacteriological, tested basic physical and chemical quality of the sample(Treated water) is satisfactory.

NATIONAL WATER SUPPLY & DRAINAGE BOARD
REGIONAL LABORATORY, POLONNARUWA.
Tel : 027 2226652, Fax : 027 2226652, E mail : polonnaruwalab@gmail.com

1. **WATER SUPPLY SCHEME** : **Minneriya**
2. **SAMPLE COLLECTED DATE** : **2015.11.11**
3. **LABORATORY REG. NO. & SAMPLING POINT** :

No.	Time of sampling	Sampling Point
782	14.38	Bore hole
783	14.44	Minneriya Raw water
784	14.50	Settled water
785	14.54	Filtered water
786	14.58	Sump
787	14.30	Tap near the School (Nagalakanda M.V.)
788	14.36	Tap at Puranagama
789	15.10	Tap at Batuoya
790	15.22	Tap at Kahatagahapitiya rd

4. **SAMPLE COLLECTED BY** : **Chemist, Polonnaruwa.**
5. **REPORT REQUIRED BY** : **1. District Engineer (Polonnaruwa)**
2. OIC Minneriya

Results:

Sri Lanka Standards SLS - 614 - 2013	Units	Maximum Requirement	782	783	784	785	786	787	788	789	790
Colour	Hazen	15	5.3	7.5	1.6	0.8	0.7	0.6	0.1	0.3	0.5
Turbidity	NTU	2	2.80	3.38	1.14	0.42	0.31	0.38	0.18	0.29	0.33
Electrical Conductivity	µs/cm		452	184	193	193	207	203	240	205	215
pH		6.5 - 8.5	6.83	7.33	7.27	7.35	7.17	7.23	7.37	7.32	7.28
Chloride(as Cl)	mg / l	250	12	6	-	-	6	-	-	-	-
Total Alkalinity (as $CaCO_3$)	mg / l	200	180	80	-	-	80	-	-	-	-
Total Hardness (as $CaCO_3$)	mg / l	250	170	60	-	-	70	-	-	-	-
Nitrates as N	mg / l	50	0.3	0.6	-	-	0.4	-	-	-	-
Nitrites as N	mg / l	3	0.004	0.002	-	-	0.002	-	-	-	-
Sulphate(as SO_4^{2-})	mg / l	250	09	01	-	-	12	-	-	-	-
Fluorides (as F)	mg / l	1.0	0.71	0.26	-	-	0.23	-	-	-	-
Total phosphate (as PO_4)	mg / l	2.0	0.98	0.36	-	-	0.37	-	-	-	-
Total Iron	mg / l	0.3	0.02	0.04	-	-	0.04	-	-	-	-
Free Ammonia	mg / l	0.06	-	0.10	-	-	<0.01	-	-	-	-
Manganese	mg / l	0.1	0.80	-	-	-	-	-	-	-	-
Residual Alum	mg / l	0.2	-	-	-	-	0.054	-	-	-	-
Total Dissolved Solids	mg / l	500	284	174	124	124	132	132	184	131	138
Residual Chlorine	mg / l	1.0	-	-	-	-	0.98	0.57	0.13	0.52	0.13
BACTERIOLOGICAL QUALITY (SLS 614 - 2013)											
Coliform bacteria	Per 100 ml	0	0	620	-	-	0	0	0	0	0
E-Coli Bacteria	Per 100 ml	0	0	244	-	-	0	0	0	0	0

< : Less than

Recommendation:

Bacteriological, tested basic physical and chemical quality of the sample(Treated water) is satisfactory.

09.12.2015

Appendix 3: Drinking Water Quality Standards

DRINKING WATER QUALITY PARAMETERS

PHYSICAL AND CHEMICAL QUAILTY (SLS 614 : 2013)

No.	Sri Lanka Standards SLS 614 : 2013	Units	Maximum Requirement
1	Appearance		
2	Colour	Hazen	15
3	Turbidity	NTU	2
4	pH Value		6.5 – 8.5
5	Electrical Conductivity	µs/cm	-
6	Chloride (as Cl^-)	mg / l	250
7	Total Alkalinity (as $CaCO_3$)	mg / l	200
8	Total Hardness (as $CaCO_3$)	mg / l	250
9	Nitrate (as NO_3^-)	mg / l	50
10	Nitrite (as NO_2^-)	mg / l	3
11	Sulphate (as SO_4^{2-})	mg / l	250
12	Fluoride (as F^-)	mg / l	1.0
13	Total Phosphate (as PO_4^{3-})	mg / l	2.0
14	Total Iron as Fe	mg / l	0.3
15	Total Dissolved Solids	mg / l	500
16	Residual Chlorine (as OCl/HOCl)	mg / l	1.0
17	Manganese (as Mn)	mg / l	0.1
18	Magnesium (as Mg)	mg / l	30
19	Calcium (as Ca)	mg / l	100

BACTERIOLOGICAL QUAILTY (SLS 614: 2013)

No.	Type of Bacteria	SLS 614:2013	
		Pipe born water	Well water
1	Total number of all types of Coli form bacteria present in 100 ml sample at 37 °C	< 3	< 10
2	Number of *E. coli* in 100 ml of sample at 44 °C	0	0

PARAMETERS CONCERNING TOXIC SUBSTANCES

01	Arsenic (as As)	mg / l	0.01
02	Cadmium (as Cd)	mg / l	0.003
03	Total Chromium (as Cr)	mg / l	0.05
04	Cyanide (as CN)	mg / l	0.05
05	Lead (as Pb)	mg / l	0.01
06	Mercury (as Hg)	mg / l	0.001
07	Selenium (as Se)	mg / l	0.01

Appendix 4: List of Flora and Fauna Found in the Vicinity of the Subproject Site

(a) The common faunal species identified in the project area

Group	Species Name	Common Name	Local Name	Status
Mammals	*Herpestessmithi*	Mongoose	Hothambuwa	Indigenous
	Susscrofa	Wild boar	WalUra	Indigenous
Birds	*Gallus lafayetii*	Sri Lanka Jungle fowl	Walikukula	Endemic
	Magalaimazeylanica	Brown headed Barbet	PolosKottaruwa	BrR
	Oriolusxanthomus	Black-hooded Oriole	Kahakurulla	BrR
	Lonchuramalacca	Balck-headed Munia	HisakaluWeekurulla	BrR
	Streptopeliachinensis	Spotted Dove	AluKobeiyya	BrR
	Loriculusberyllinus	Sri Lanka Hanging parrot	GiraMalitta	BrR
Reptiles	*Varanusbengalensis*	Land monitor	Thalagoya	Indigenous
	Varanussalvator	Water monitor	Kabaragoya	Indigenous
	Daboiarusselli	Russell,s viper	Tithpolonga	Indigenous

(b) List of Flora in the project area

Species Name	Common name	Life form	Conservation Status
Phyllanthusemblica	Nelli	Tree	
Azadirachtaindica	Kohomba	Tree	Native
Dimocarpuslongan	Mora	Tree	Native
Wattakakavolubilis	Anguna	Herb	Native
Cocciniagrandis	Kowakka	Herb	Native
Sapium insigne	Tel-kaduru	Small tree	Native
Flueggealeucopyrs	Katu pila	Shrub	Native
Tamarindusindica	Siyabala	Tree	Introduced
Ziziphusoenoplia	Eraminiya	Liana	Native
Limoniaacidissima	Divul	Tree	Native

BrR-Breeding Resident

Appendix 5: Completed ADB REA Checklist for Water Supply

Screening questions	Yes	No	Remarks
A. PROJECT SITING IS THE PROJECT AREA…			
• Densely populated?		✓	The population distribution shows that the project area is not densely populated.
• Heavy with development activities?		✓	
• Adjacent to or within any environmentally sensitive areas?		✓	MWTP is not within or adjacent to any environmentally sensitive area. All works will be done within existing MWTP site.
• Cultural heritage site		✓	
• Protected area		✓	
• Wetland		✓	
• Mangrove		✓	
• Estuarine		✓	
• Buffer zone of protected area		✓	
• Special area for protecting biodiversity		✓	
• Bay		✓	
B. POTENTIAL ENVIRONMENTAL IMPACTS Will the project cause…			
• Pollution of raw water supply from upstream wastewater discharge from communities, industries, agriculture, and soil erosion runoff?		✓	Not applicable.
• Impairment of historical/cultural monuments/areas and loss/damage to these sites?		✓	Not applicable. There are no historical/cultural monuments/areas within or adjacent to subproject sites.
• Hazard of land subsidence caused by excessive ground water pumping?		✓	Not applicable.
• Social conflicts arising from displacement of communities?		✓	No displacements required. Subproject sites are government-owned lands
• Conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?		✓	Not applicable.
• Unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents)?	✓		Raw water is purified through addition of chlorine
• Delivery of unsafe water to distribution system?		✓	The distributed water will be treated and ensured to comply with the National Drinking Water Quality Standards.
• Inadequate protection of intake works or wells, leading to pollution of water supply?		✓	Not applicable. Well-protected Patapilikanda water sump has been established.
• Over pumping of ground water, leading to salinization and ground subsidence?		✓	Not applicable.
• Excessive algal growth in storage reservoir?		✓	The water is chlorinated and there is no chance for algal growth
• Increase in production of sewage beyond capabilities of community		✓	Not anticipated. Community is having good sanitation facilities.

Screening questions	Yes	No	Remarks
facilities?			
• Inadequate disposal of sludge from water treatment plants?		✓	Minimal sludge to be generated. Dried sludge will be used as soil conditioner and fertilizer in the MWTP greenbelt and nearby forested areas.
• Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances and protect facilities?		✓	Residences are located away from the WTP.
• Impairments associated with transmission lines and access roads?		✓	Not applicable.
• Health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.	✓		Adequate design of facilities needed for chlorine and chemicals used in coagulation/flocculation.
• Health and safety hazards to workers from handling and management of chlorine used for disinfection, other contaminants, and biological and physical hazards during project construction and operation?	✓		Measures are needed for health and safety of workers.
• Dislocation or involuntary resettlement of people?		✓	No involuntary resettlement impacts envisioned. Lands for the subproject are government-owned
• Disproportionate impacts on the poor, women and children, indigenous peoples or other vulnerable groups?		✓	Not anticipated. The contractor will be encouraged to hire local workers from the local labor force.
• Noise and dust from construction activities?	✓		Anticipated during construction activities. Temporary increase in noise level and dusts may be caused by excavation equipment, and the transportation of equipment, materials, and people. The impacts are negative but short-term and site-specific within a relatively small area. and reversible through mitigation measures. Good construction practices will mitigate noise and dust, and will be specified in the EMP.
• Increased road traffic due to interference of construction activities?		✓	Not anticipated as this is a small subproject in the MWTP area
• Continuing soil erosion/silt runoff from construction operations?	✓		Due to excavation and run-off from stockpiled materials. The impacts are negative but short-term and site-specific within a relatively small area and reversible through mitigation measures. Good construction practices will mitigate soil erosion and silt runoff and will be specified in the EMP.
• Delivery of unsafe water due to poor O&M treatment processes (especially mud accumulations in filters) and inadequate chlorination due to lack of adequate monitoring of chlorine	✓		Measures are needed for proper O&M of WTP.

Screening questions	Yes	No	Remarks
residuals in distribution systems?			
• Delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?		✓	The project will include development of O&M manuals to ensure facilities are kept in working condition, including checking and maintenance of distribution network. Any distributed water must comply with the National Drinking Water Quality Standards.
• Accidental leakage of chlorine gas?		✓	Not applicable. Chlorine gas will not be used.
• Excessive abstraction of water affecting downstream water users?		✓	Not applicable.
• Competing uses of water?		✓	
• Increased sewage flow due to increased water supply		✓	Not applicable. Households have adequate sanitation facilities
• Increased volume of sullage (wastewater from cooking and washing) and sludge from wastewater treatment plant		✓	
• Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	Improved management systems through capacity building and institutional development will ensure reduced burden on services and infrastructure.
• Social conflicts if workers from other regions or countries are hired?		✓	Priority in employment will be given to local residents.
• Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?		✓	Not applicable. Construction will not involve use of explosives and chemicals.
• Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	✓		Work areas will be clearly demarcated with signage and safety barriers, and access will be controlled. Only workers and project concerned members will be allowed to visit the operational sites.

Screening Checklist Prepared By: W.M.Lalith Perera

Position: Environmental Specialist

Date Prepared: 02.03 2016

Appendix 6: Records of Public Consultation

Community Consultation Meeting for Head work Improvement at Minneriya Water Treatment Plant

Date Conducted. March 8, 2016
Time. 2:00 pm
Venue. Pradeshiya Saba Conference Hall- Hingurakgoda.

Participants.

- U.G.SagarikaKumari- Development Officer- DS Office- Thamankaduwa.
- H.M.D.B. Herath.- Engineer Assistant- Bandiwewa Water tower.
- A.M.Abeyratne.- Safe Guard Consultant.- RDC.(Puranaguma Project office.)
- L.D.T.S. Liyanage.- Technical Officer- Hingurakgoda PS.
- M.P.R.N. Ananda.- Technical Officer. Hingurakgoda PS.
- M.G.S. Chandrasena.- Technical Asistant. Minneriya Irrigation Office.
- E.G.Karunaratne.-GramaNiladhari- Rotawewa GN Division.
- Samurdhi Officer- Thambalawewa.
- L.L.Kusumalatha- Pre- School Teacher-Thambalawewa.
- AshokaPriyadharshani- Secretary- Water committee.
- P.U.Chaminda.- Chairman- Water Committee.
- Community Members- Attendance sheets attached.

The community consultation meeting was organized with the assistance of District engineer-Water Board, OICs of water supply schemes at Bandiwewa, Hingurakgoda and Minneriya and the technical officer at Pradeshiya Saba at Hingurakgoda. Divisional secretary's offices at Thamankaduwa and Hingurakgoda.

Main topics discussed

- Objectives of the water supply project and contribution of LGESP and ADB
- Design and the process of water treatment plant.
- Services provided by the subproject especially in relation to CKD
- GRM mechanism

Process of the meeting

The meeting was commenced with the welcome address by the technical officer of the Hingurakgoda Pradeshiya Sabah. Then, the safe guard consultant explained the objectives of the meeting and the social aspect of the water supply scheme. Officer in charge of the Bandiwewa water supply scheme explained the design and the technical aspect of the proposed construction.

Ideas came from the community level was limited because the proposed project did not have direct contact with the community as it will be an internal construction at the Minneriya water treatment plant.

However, chairman of the water committee at Minneriya expressed the gratitude of the community to the ADB and the officers at Puranaguma project office for taking initiative to increase the volume of water being distributed by the water board from 3MGD from existing 2MGD level with the expectation of providing safe drinking water to all community members. Another lady who came from Singha Udagama mentioned that their villagers are very happy

because they are going to get safe and pure drinking water with the line expansion from the Thamblawewa water supply scheme. Further she mentioned that this subproject will help increase the number of people who get safe drinking water in remote villages such as Rotawewa. Ms. Asoka Priyadarshani mentioned that the subproject will help avoid and irradiate the CKD issue which has been developed in to threatening epidemic to the people living in these areas.

Finally the Safe guard consultant explained the GRM process that has been developed by the project. However the OIC from Water Board mentioned that there will not be any incidences of grievances as the project will be implemented at a secluded place belonging to the water board.

Community committee was formed with the participation of community members to help the smooth implementation of the project and maintain better coordination between the community and the water board during the construction and operational stages.

Appendix 7: Complaint Register and Complaint Forms

(To be available in Local Language)

The _____Project welcomes complaints, suggestions, queries and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback.

Shall you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing *(CONFIDENTIAL)* above your name. Thank you.

Date	Place of registration		
Contact Information/Personal Details			
Name:		Gender: __Male ___ Female	Age:
Home Address			
Village / Town			
District			
Phone no.			
E-mail			
Complaint/Suggestion/Comment/Question Please provide the details (who, what, where and how) of your grievance below: If included as attachment/note/letter, please tick here: ___			
How do you want us to reach you for feedback or update on your comment/grievance?			

FOR OFFICIAL USE ONLY

Registered by: (Name of Official registering grievance)			
Verified thru:	___ Note/Letter	___ E-mail	___ Verbal/Telephonic
Reviewed by: (Names/Positions of Official(s) reviewing grievance)			
Action Taken:			
Whether Action Taken Disclosed:		____ Yes	___ No
Means of Disclosure:			

Appendix 8: Applicable Noise Level Standards

PERMISSIBLE NOISE LEVELS IN ACCORDANCE WITH NOISE CONTROL REGULATIONS

Maximum Permissible Noise Levels (as L_{Acq} T) at Boundaries of the land in which the noise source is located shall not exceed the limits set out below.

Area	L_{Acq} T, dB(A)	
	Day Time	**Night Time**
Low Noise (Pradeshiya Sabha area)	50	45
Medium Noise (Municipal Council/Urban Council area)	63*	50
High Noise (EPZZ of BOI & Industrial Estates approved under part IVC of the NEA)	70	60
Silent Zone (100 m from the boundary of a courthouse, hospital, public library, school, zoo, sacred areas and areas set apart for recreation or environmental purposes)	50	45

* Provided that the noise level should not exceed 60 dB (A) inside existing houses, during day time.

Maximum permissible Noise levels at Boundaries of the land in which the source of noise is located in L_{Acq} T for construction activities.

Construction Activities

L_{Acq} T, dB (A)

Day Time	Night time
75	50

The following noise levels will be allowed where the background noise level exceed or is marginal to the given levels in the above table.

(a) For low noise areas in which the background noise level exceeds or is marginal to the given level	Measured Background Noise level + 3dB (A)
(b) For medium noise areas in which the background noise level exceeds or is marginal to the given level	Measured Background Noise level + 3dB (A)
(c) For silent zone in which the background noise level exceeds or is marginal to the given level	Measured Background Noise Level + 3dB (A)

BOARD OF INVESTMENT OF SRI LANKA

Appendix 9: Suggested Monitoring Report Format

SAMPLE Semi-Annual Environmental Monitoring Report Template

This template must be included as an appendix in the EIA/IEE that will be prepared for the project. It can be adapted to the specific project as necessary.

Introduction

- Overall project description and objectives
- Description of sub-projects
- Environmental category of the sub-projects
- Details of site personnel and/or consultants responsible for environmental monitoring
- Overall project and sub-project progress and status

No.	Sub-Project Name	Status of Sub-Project				List of Works	Progress of Works
		Design	Pre-Construction	Construction	Operational Phase		
		☐	☐	☐	☐		
		☐	☐	☐	☐		
		☐	☐	☐	☐		

Compliance status with National/ State/ Local statutory environmental requirements

No.	Sub-Project Name	Statutory Environmental Requirements	Status of Compliance	Action Required

Compliance status with environmental loan covenants

No. (List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required

Compliance status with the environmental management and monitoring plan

- Provide the monitoring results as per the parameters outlined in the EMP. Append supporting documents where applicable, including Environmental Site Inspection Reports.
- There should be reporting on the following items which can be incorporated in the checklist of routine Environmental Site Inspection Report followed with a summary in the semi-annual report send to ADB. Visual assessment and review of relevant site documentation during routine site inspection needs to note and record the following:
    - What are the dust suppression techniques followed for site and if any dust was noted to escape the site boundaries;
    - If muddy water was escaping site boundaries or muddy tracks were seen on adjacent roads;

- adequacy of type of erosion and sediment control measures installed on site, condition of erosion and sediment control measures including if these were intact following heavy rain;
- Are their designated areas for concrete works, and refuelling;
- Are their spill kits on site and if there are site procedure for handling emergencies;
- Is there any chemical stored on site and what is the storage condition?
- Is there any dewatering activities if yes, where is the water being discharged;
- How are the stockpiles being managed;
- How is solid and liquid waste being handled on site;
- Review of the complaint management system;
- Checking if there are any activities being under taken out of working hours and how that is being managed.

Appendix 10: Summary Monitoring Table

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

Overall Compliance with CEMP/ EMP

No.	Sub-Project Name	EMP/ CEMP Part of Contract Documents (Y/N)	CEMP/ EMP Being Implemented (Y/N)	Status of Implementation (Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)	Action Proposed and Additional Measures Required

Approach and methodology for environmental monitoring of the project

- Brief description on the approach and methodology used for environmental monitoring of each sub-project

Monitoring of environmental Impacts on Project Surroundings (ambient air, water quality and noise levels)

- Brief discussion on the basis for monitoring
- Indicate type and location of environmental parameters to be monitored
- Indicate the method of monitoring and equipment to be used
- Provide monitoring results and an analysis of results in relation to baseline data and statutory requirements

As a minimum the results should be presented as per the tables below.a

Air Quality Results

Site No.	Date of Testing	Site Location	Parameters (Government Standards)		
			PM10 µg/m3	SO2 µg/m3	NO2 µg/m3

Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM10 µg/m3	SO2 µg/m3	NO2 µg/m3

Water Quality Results

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L

Site No.	Date of Sampling	Site Location	Parameters (Monitoring Results)					
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L

Noise Quality Results

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Government Standard)	
			Day Time	Night Time

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Monitoring Results)	
			Day Time	Night Time

SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT

Project Name
Contract Number

NAME: _____ DATE: _____
TITLE: _____ DMA: _____
LOCATION: _____ GROUP: _____

WEATHER CONDITION:
_____

INITIAL SITE CONDITION: _____

CONCLUDING SITE CONDITION:

Satisfactory _____ Unsatisfactory _____ Incident _____Resolved _____ Unresolved _____

INCIDENT:
Nature of incident:
_____

_____

Incident Issues

Resolution

Project Activity Stage	Survey	
	Design	
	Implementation	
	Pre-Commissioning	
	Guarantee Period	

Inspection

Emissions	Waste Minimization
Air Quality	Reuse and Recycling
Noise pollution	Dust and Litter Control
Hazardous Substances	Trees and Vegetation

Site Restored to Original Condition	Yes		No	

Signature
_____

Sign off

_____ _____

Name **Name**
Position **Position**

Appendix 11: References

1. ADB safeguards policy Statement, 2009
2. Forest Department, 2010. Integrated Strategic Environmental Assessment project, Northern Province, Forest Cover Assessment and Identification of Forests and Other Ecological Sensitive Areas for Conservation funded by UNDP.
3. National Environmental Act No 47 of 1980 and its amendments/Rules and regulations published in the Extraordinary Gazette Notifications in 1992 and 2006.
4. Sampath Pethikade of Thamankaduwa Divisional secretariat, 2014

Appendix 12: Maps related to the water supply sub project

Figure 5: Schematic diagram of the RSF of MWTP

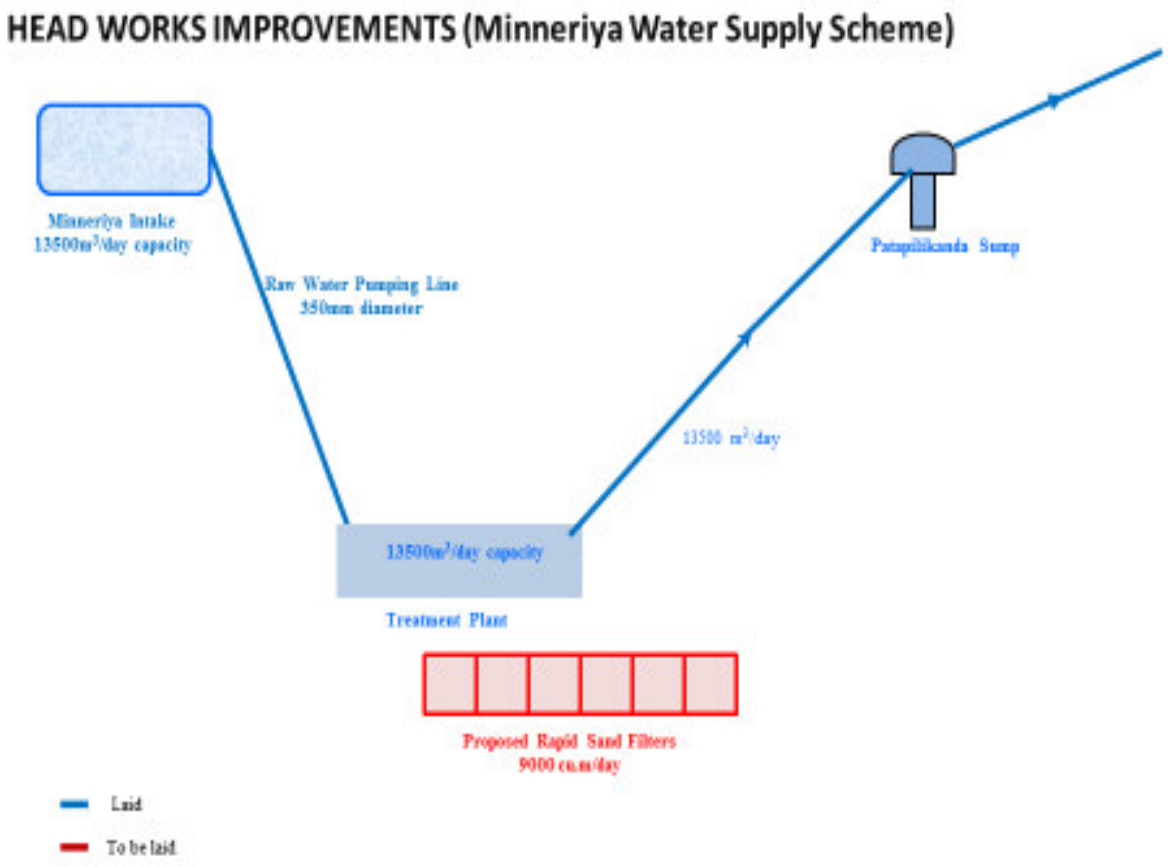
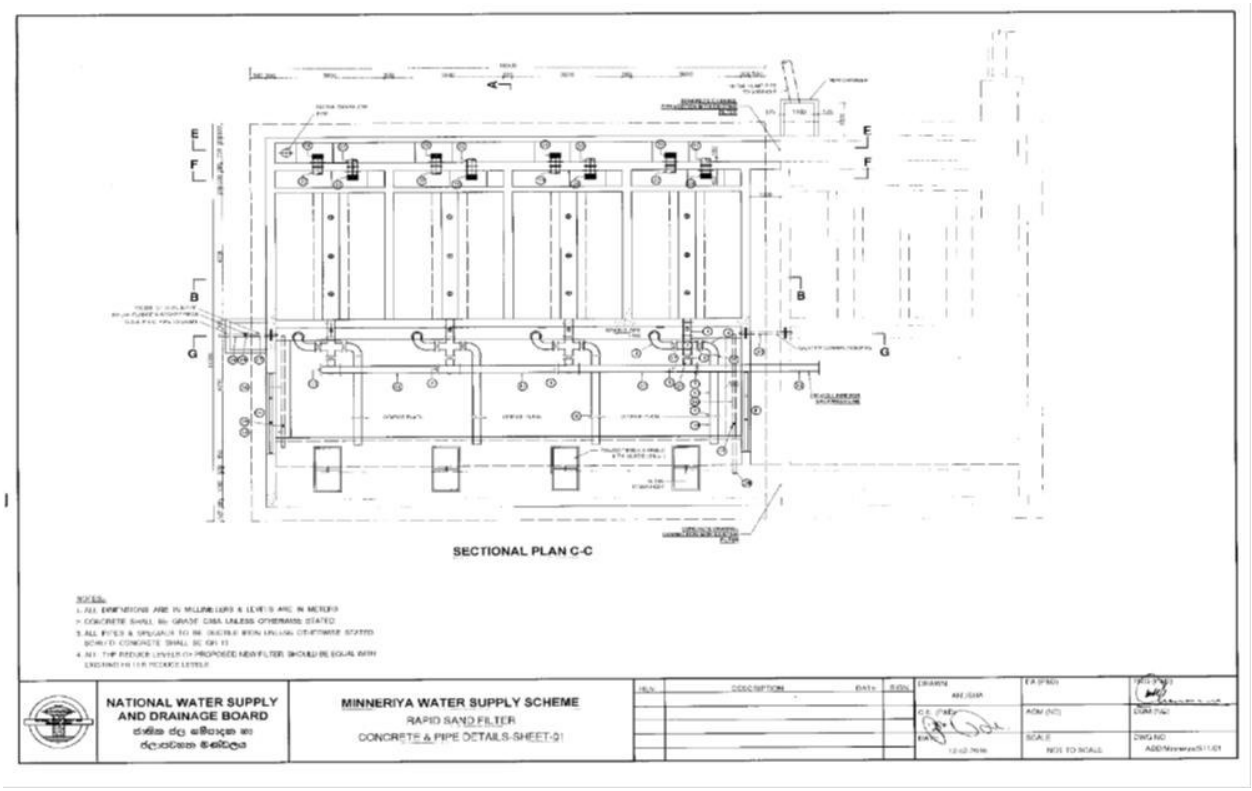


Figure 6: Final Designs of the Rapid sand Filter



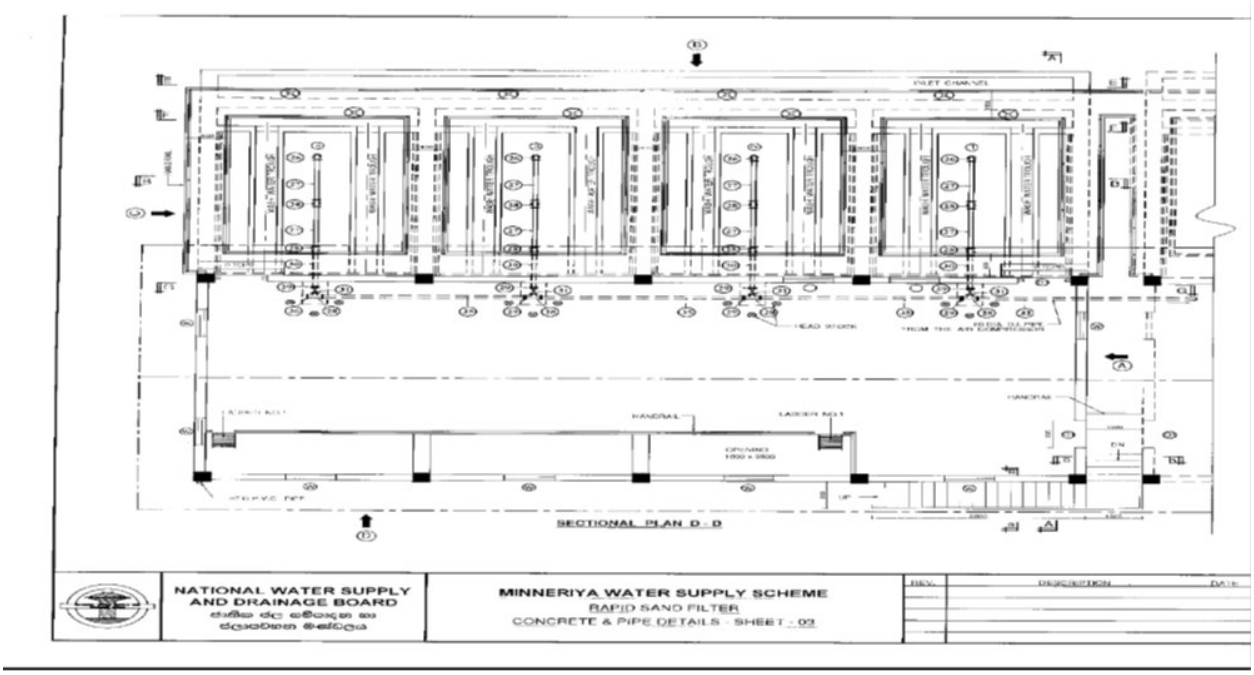
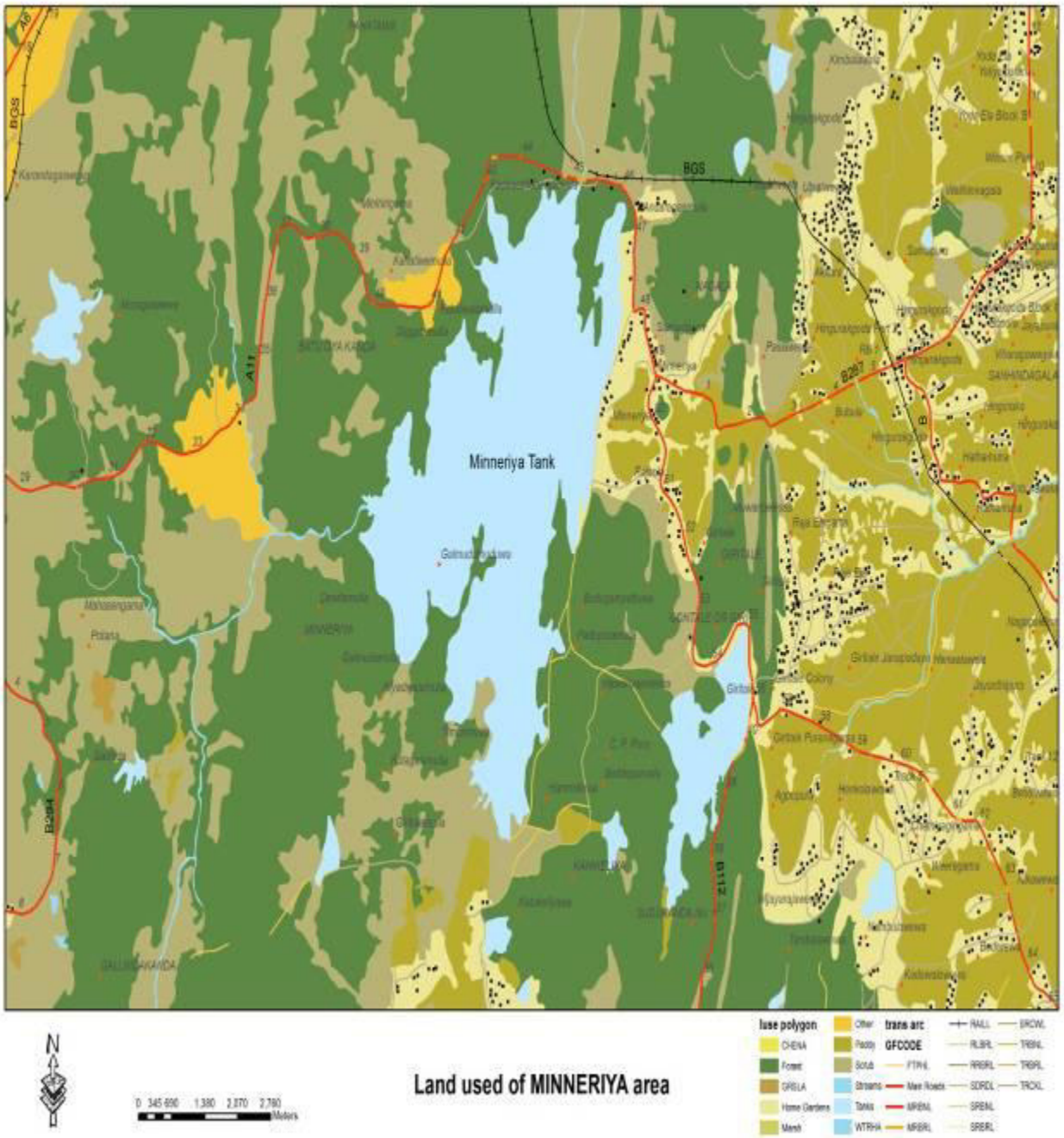


Figure 7: Map showing the Land use pattern in the proposed area



Appendix 13: Photographs of the Existing WTP

Figure 8: Aeration

Figure 7: Flocculation tank

Figure 9: Sedimentation tank

Figure 10: Rapid sand filter

Figure 11: Addition of Allum

Figure 12: Chlorination room

Figure 13: Thinker (waste water tank)

Figure 14: Water sump

Figure15: Proposed location for RSF

Figure 16: Proposed location

Figure 17: Back wash section

Figure 18: Public Consultation