Environmental Assessment and Review Framework

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IND: Assam Urban Infrastructure Investment Program (AUIIP)

Tranche 1 & 2

Prepared by Guwahati Development Department and Urban Development Department of the State Government of Assam for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 28 August 2017)

Currency unit – Indian rupee (₹)
₹1.00 = $0.01566
$1.00 = ₹64.8615

ABBREVIATIONS

ADB	-	Asian Development Bank
APCB	-	Assam Pollution Control Board
AUIIP	-	Assam Urban Infrastructure Investment Program
CFE	-	Consent for Establishment
CFO	-	Consent for Operation
CITES	-	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	-	Convention on Migratory Species of Wild Animals
DPR	-	detailed project report
DMSC	-	design, management and supervision consultant
EAC	-	Environmental Appraisal Committee
EARF	-	environmental assessment and review framework
EIA	-	environmental impact assessment
EMP	-	environmental management plan
FAM	-	Facility Administration Memorandum
GRC	-	Grievance Redress Committee
GRM	-	grievance redress mechanism
IUCN	-	International Union for Conservation of Nature and Natural Resources
JNNURM	-	Jawaharlal Nehru National Urban Renewal Mission
MFF	-	multitranche financing facility
MoEFCC	-	Ministry of Environment, Forest and Climate Change
NOC	-	no objection certificate
PIU	-	project implementation unit
PMU	-	program management unit
REA	-	rapid environmental assessment
SCMU	-	Safeguards Compliance and Monitoring Unit
SEIAA	-	State Environmental Impact Assessment Authority
SPS	-	Safeguard Policy Statement
UDD	-	Urban Development Department
ULB	-	urban local body

WEIGHTS AND MEASURES

cm	–	centimeter
dbA	–	decibels
dia.	–	diameter
ha	–	hectare

kg	–	kilogram
km	–	kilometer
l	–	liter
m	–	meter
m^2	–	square meter
m^3	–	cubic meter
mg/L	–	milligrams per liter
ml	–	milliliter
MLD	–	million liters per day
mm	–	millimeter
sq. km.	–	square kilometers
sq. m.	–	square meters
$\mu g/m^3$	–	micrograms per cubic meter

NOTES

(i) The fiscal year (FY) of the Government of India and its agencies ends on 31 March. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2017 ends on 31 March 2017.

(ii) In this report, "$" refers to US dollars.

CONTENTS

I. INTRODUCTION

A. Overview of the Project

1. The Assam Urban Infrastructure Investment Program (Project) is a key urban infrastructure initiative of the State Government of Assam, and aims to improve the urban environment and quality of life in the cities of Guwahati and Dibrugarh through the delivery of improved water supply, solid waste management (SWM) and drainage infrastructure. The project uses a multitranche financing facility (MFF) modality and is being implemented over a 9-year period from 2012 to 2021 (December). Investments under the MFF are delivered in two tranches. In accordance with ADB's Safeguard Policy Statement (SPS, 2009), all MFF programs require the preparation of an environmental assessment and review framework (EARF).[1]

2. The major outputs of the Project include: (i) for Guwahati, improved water supply, and drainage and (ii) for Dibrugarh, improved drainage, and comprehensive SWM. A summary of the urban infrastructure projects and services improvement components and associated tranche for EARF consideration are shown in **Table 1.**

Table 1: Summary of Infrastructure and Tranches

Project	Component	Details
Tranche 1		
Guwahati	**Water Supply**	Construction of transmission water supply pipelines and allied works at Guwahati.
		Construction of storage reservoirs of various capacities at 6 locations at Guwahati, approach road and allied works.
Dibrugarh	**Drainage**	Construction of DTP drain, box culverts and allied works in Dibrugarh from chainage 0 to 9500 M
	Solid Waste Management	(i) Build and operation of 100 MT processing plant and 60 MT sanitary landfill site and allied works at Dibrugarh. (ii) Procurement of equipment for primary, secondary collection and transportation vehicles for municipal solid waste management at Dibrugarh. (iii) Construction of compound wall, river protection wall, access roads, security guard room and allied works of landfill site at Dibrugarh.
Tranche 2		
Guwahati	**Water Supply**	(i) Design, build and operation of intake works, raw water rising main, WTP, distribution network and associated works at South East Guwahati.
	Drainage	Improved drainage system for South Guwahati.
Dibrugarh	**Drainage**	DTP drain outfall, secondary drainage and allied works in Dibrugarh.

Notes: DTP= Dibrugarh Town Protection, WTP = Water Treatment Plant.

B. Purpose of EARF

3. This EARF aims to provide guidance on safeguard screening, assessment, institutional

[1] The preparation of safeguard frameworks aim to clarify safeguard principles and requirements governing screening and categorization, environmental assessment, and preparation and implementation of environmental plans of subprojects to be prepared after MFF approval.

arrangements, and processes to be followed for subprojects, where design takes place after Board approval. The purpose of this EARF is to do the following: (i) describe the proposed subprojects in Tranches 1 and 2; (ii) explain the general anticipated environmental impacts of the subprojects to be financed under the proposed MFF; (iii) specify the requirements that will be followed in relation to subproject screening and categorization, assessment, and planning, including arrangements for meaningful consultation with affected people and other stakeholders and information disclosure requirements and, where applicable, safeguard criteria that are to be used in selecting subprojects and/or components; (iv) assess the adequacy of the client's capacity to implement national laws and ADB's requirements and identify needs for capacity building; (v) specify implementation procedures, including the budget, institutional arrangements, and capacity development requirements; (vi) specify monitoring and reporting requirements; and (vii) describe the responsibilities of the client and of ADB in relation to the preparation, implementation, and progress review of safeguard documents of subprojects. The subproject selection shall be in accordance with the environmental subproject selection criteria as outlined in this EARF and in Schedule 4 of the framework financing agreement (FFA).

4. This EARF is prepared based on (i) ADB's SPS (2009), and (ii) the Government of India Environment (Protection) Act Environment (Protection) Rules and amendments. All environmental assessment is required to follow the procedures outlined in this EARF. Any component included in the Project shall comply with the environmental requirements of the Government of India, the State Government of Assam, and ADB. All environmental documents will be endorsed and approved by the executing agency and cleared by ADB as required by ADB policy and national law.

5. The EARF ensures that all subprojects under the MFF, in the entirety of their project cycle, will not deteriorate or interfere with the environmental sensitivity of a subproject area but rather improve environmental quality through development of infrastructure facilities.

C. Project Components

6. The Project will consist of two parts. Part A covers urban infrastructure and services improvement including the rehabilitation, improvement and expansion of: (i) water supply; (ii) solid waste management, and (iii) drainage and flood protection. Part B covers provision of project management support, institutional development, capacity building and project administration. A detailed description of each component is presented in **Appendix 1.**

1. Part A–Urban Infrastructure and Services Improvement Components

7. **Water supply.** In Guwahati**,** only 40% of the population has access to central piped water supply system while totally absent in Dibrugarh. Both cities get their water not only from the central piped water supply systems operated by Public Health Engineering Departments (PHEDs) and urban local bodies (ULBs), but also from wells, springs, rivers, rainwater, tankers and vendors. Both cities are on the banks of the River Brahmaputra and experience a tropical monsoon climate, with rainfall of around 2,000 mm per year. Lack of adequate water supplies is causing inconvenience and hardship in Guwahati while water requirement in Dibrugarh is met through pumping ground water. The key issues pertaining to the present systems can be summarized as follows: (i) limited coverage of the system, and dependence on non-potable water sources; (ii) non-uniform distribution, both in terms of quality and quantity of water supplied; (iii) high levels of unaccounted-for-water, and leakages in the distribution system; and (iv) low levels of cost recovery. Improvement in the water supply system in the uncovered areas in the South Guwahati

East Zone[2] is considered for implementation in the Project.

8. **Solid waste management.** According to the Municipal Solid Wastes (Management and Handling) Rules of 2000 and 2016 (MSW Rules), the ULBs are mandated to manage solid wastes. Conformance to the MSW Rules is non-existent in the project cities. Only 30-50% of wastes are collected and disposed by open dumping with a substantial proportion of households regularly dumping wastes in the nearest open space or drain. The problems of solid waste management are magnified in low income areas and designated slum pockets.

9. Guwahati is currently implementing its Integrated Solid Waste Management Project under Jawaharlal Nehru National Urban Renewal Mission (JNNURM). The project comprises of improvements in collection, transportation, treatment and disposal of wastes by establishment of sanitary landfill sites and compost plants. In Dibrugarh, designing and implementing a similar comprehensive solid waste management system are considered for implementation under the Project.

10. **Drainage and flood protection.** Guwahati and Dibrugarh are vulnerable to recurrent flooding. Dibrugarh, located on the south bank of Dibru River, a tributary of the Brahmaputra River, is vulnerable to recurrent flooding. To protect the city, an 8.62kilometer (km) dyke called the Dibrugarh Town Protection (DTP) dyke was constructed in 1955 which closed all the drainage channels resulting in rain water inundation in the town and its adjoining area. To get rid of the drainage congestion, a 22.40 km long drainage channel was constructed from Jalan nagar (now Paltan Bazar) to the outfall in Brahmaputra River. However, the huge sediment load of Brahmaputra River has resulted in continuous deposition of silt in its bed resulting to significant raised level. This has worsened the drainage system because at present, the level of Dibrugarh town is 1.5 meters below the bed level of Brahmaputra River. Drainage and flood protection interventions in Dibrugarh are considered for implementation in the Project.

11. Guwahati Metropolitan Area does not have a comprehensive storm water drainage facility. As a result, the area suffers from flooding and water logging particularly during the monsoon period. Untreated or semi-treated sewage is also disposed off into the storm water drains due to lack of proper sewerage and sanitation system in the city

12. Existing storm water drainage system in Guwahati City suffers from following shortcomings and resultant problem conditions:

(i) Storm water drainages in many cases are not connected to final outfalls.
(ii) Vertical profile of existing drains, in many cases, has not been maintained with falling gradient. This leads to stagnation, silt deposition and reduction of carrying capacity of the drain.
(iii) Large quantity of silt ingress from hills catchments due to denudation.
(iv) Inadequate inlet sizes of the existing drains.
(v) Illegal encroachment over existing storm water drains.
(vi) Disposal of sewage and garbage in the drains.
(vii) Inadequate sizes of some drains.

[2] The city has been divided into four distribution zones (i) North Guwahati Zone (ii) South Guwahati West Zone (iii) South Guwahati Central Zone and South Guwahati East Zone. Jawaharlal Nehru National Urban Renewal Mission (JNNURM) is financing the south-west zone, JICA is providing funding assistance for the north and south-central zone. The proposed AUIP will develop the south-east zone. The different zones are well defined and that there would be no duplication of effort.

(viii) Choked or non-functioning underground drains.
(ix) In some locations, closed-type inspection manholes have been provided over storm drains. These do not allow proper ingress of storm water nor proper maintenance access.
(x) High flood level of river Brahmaputra and resultant backflow into the connecting primary drains.

13. The Brahmaputra River is the main disposal point of all the storm water from the city. The cause of the flooding mainly during the monsoon season is due to the backflow or influx of water from the river Brahmaputra into the connecting storm water disposal drainage network system. High flood level of the river is much higher than the full supply level of the connecting drainage system.

14. A number of wetlands and ponds such as Dipor Beel, Silsako Beel, Barasola Beel in South Guwahati are acting as storage reservoir of storm water runoff during rainy season as well as in the lean period and are the integral part of the existing Storm water disposal system. These water bodies finally get connected to the river Brahmaputra.

15. Degenerations of these wet lands have taken place due to rapid urbanizations, growth of commercial establishments, and encroachments of the natural drains. Siltation and disposal of solid wastes to the drains led to the decrease in the carrying/ storage capacity of the existing drainage system. These are the root causes of artificial flooding of the city. The Anil Nagar, Lachit Nagar, Nabin Nagar, Kumarpara, R G Baruah road near AIDC campus, Assam Secretariate/ MLA hostel, and Hathigaon areas critically suffer from flooding and remain water logged for 6-7 hours even from a short duration of rainfall in monsoon period when Bharalu Mukh sluice gate is opened i.e. when river Brahmaputra is in low spate. In case of heavy shower, the Anil Nagar, Lachit Nagar, and Nabin Nagar areas remain water logged for 3 to 4 days, sometimes even more when River Brahmaputra is in high spate and when Bharalu Mukh sluice gate is closed.

16. **Tranche 1 Subprojects**. Tranche 1 is categorized as Category B in accordance with ADB's SPS, 2009. During project preparation for Tranche 1, initial environmental examinations (IEEs) and environmental management plans (EMPs) were prepared (later revised because of change in detailed designs) for each subproject covering (i) Guwahati water supply works (construction of transmission water supply pipelines and allied works at Guwahati and construction of storage reservoirs of various capacities at 6 locations at Guwahati, approach road and allied works for the South Guwahati East Zone); (ii) Dibrugarh solid waste management works (supply of equipment and vehicles for solid waste collection and transportation, construction of treatment and disposal site, capping of existing dumpsite); and (iii) Dibrugarh drainage improvement works (construction of DTP drain, box culverts and allied works in Dibrugarh from chainage 0 to 9500 m).

17. **Tranche 2 Subprojects**. Like Tranche 1, subprojects under Tranche 2 are categorized as Category B in accordance with ADB's SPS, 2009. Accordingly, for Tranche 2, IEEs and EMPs were prepared for each subproject[3] **Table 2** below shows the list of subprojects under Tranche 2.

[3] For any subprojects that will be identified in the future, IEEs and EMPs will be prepared once the detailed designs are finalized, and will follow the guidelines in this EARF. Any proposed subproject that is categorized as category a in accordance with ADB SPS, 2009 will not be considered for funding under project.

Table 2: Subproject Packages under Tranche 2

Package Number	General Description
AUIIP/ PR-2/ GUW/ WS/03	Design, build and operation of intake works, raw water rising main, WTP, clear water pumping station, distribution network and associated works in South-East zone of Guwahati.
AUIIP/ PR-2/ DIB/DR/ 02	DTP drain outfall, secondary drainage and allied works in Dibrugarh.
AUIIP/ PR-2/ GUW/ DR/01-02	Priority works for drain intercepts and pumping for flood control[4].
AUIIP/ PR-2/ GUW/ DR/03	Procurement of machinery, equipment and transport vehicles for cleaning of the existing drainage system.

18. The IEEs concluded that the subprojects would have only small-scale, localized impacts on the environment which are readily mitigated; therefore, no significant environmental impacts are anticipated. Mitigation measures and monitoring plans are proposed in the EMPs which form part of the IEE reports.

2. Part B–Project Management and Capacity Building Components

19. While the Project will involve provision of urban infrastructure and services in the capital cities, long-term sustainability of the assets created, and effective planning and management of urban basic services in general, requires that key urban management issues be addressed by the Program.

20. Management of the implementation of the Project will be undertaken by the Program Management Unit (PMU) and the Project Implementation Units (PIUs) in each city. Provision is made under the Project for funding the costs of PMU and PIUs, as well as the cost of consultants[5] to provide assistance in project management and related capacity building. Such support is considered essential to the implementation of the Project, particularly in light of the lack of experience of the proposed executing and implementing agencies with projects this large, implemented through separate design and construction contracts.

21. The design, management and supervision consultant (DMSC) team will have safeguards staff with expertise in environmental assessment and management to train, build capacity, and monitor the safeguards work overseen under the PMU and PIUs. Environmental management training programs with specific modules focusing on ADB and government environmental assessment procedures and monitor.

22. Moreover, effective and sustained delivery of urban services will require that the existing ULBs be strengthened and new ULBs be created, that water supply, sewerage and solid waste management operations be operated in a much more effective and efficient manner, that own source funding of all urban services be very substantially enhanced and that urban land management be improved. These will require a variety of actions which are expected to range from conduct of community consultations and institutional surveys to preparation and implementation of legislation and regulations, reorganization of departments, modernization of human resource management systems and improvement of financial management systems. Some of the measures, such as creation of a new ULB or a new water supply and sanitation agency, involve major changes and these will have to be conducted over a longer period of time. Support will be

[4] IEE of this subproject/package will be prepared once the detailed design is finalized and will follow the guidelines in this EARF. Guwahati smart city limited is developing flood control plans for Guwahati city under smart cities mission. The priority works for drain intercepts and pumping will be identified by end-2017 after completion of studies being undertaken by Tata consulting engineers limited, who has been appointed by Guwahati smart city.

[5] Design, management and supervision consultant (DMSC).

provided under the project for the necessary measures.[6]

II. ASSESSMENT OF LEGAL FRAMEWORK AND INSTITUTIONAL CAPACITY

A. Applicable Legislations

23. The implementation of subprojects proposed under the Program will be governed by the Government of India's environmental acts, rules, policies, and regulations. 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 subprojects are consistent with the legal framework, whether national, state or municipal/local. In addition, subprojects shall also be consistent with ADB's SPS. The following are applicable to the Project:

(i) Environmental (Protection) Act of 1986;
(ii) Environmental (Protection) Rules of 1986;
(iii) Environmental Impact Assessment (EIA) Notification of 2006 and Amendments 2009;
(iv) Water (Prevention and Control of Pollution) Act of 1974, its Rules, and amendments;
(v) Air (Prevention and Control of Pollution) Act of 1981, its Rules and amendments;
(vi) Municipal Solid Wastes Management Rules, 2016;
(vii) Central Pollution Control Board (CPCB) Environmental Standards;
(viii) Construction & Demolition Waste Management Rules, 2016;
(ix) Wildlife (Protection) Act of 1972, its Rules and amendments;
(x) Indian Forest Act of 1927;
(xi) Forest (Conservation) Act of 1980, its amendments;
(xii) Forest (Conservation) Rules of 1981 and its amendments;
(xiii) Assam Forest Regulation of 1891;
(xiv) Assam Forest Policy of 2004;
(xv) Guidelines for Diversion of Forest Lands for Non-Forest Purpose under the Forest (Conservation) Act of 1980;
(xvi) Ancient Monuments and Archaeological Sites and Remains Rules of 1959

24. Key standards include those related to drinking water quality, air quality, effluent discharge, and protected areas. Compliance is required in all stages of the project including design, construction, and operation and maintenance.

B. Environmental Assessment Requirements

25. The Government of India has a comprehensive and clearly formulated environmental assessment system in place. The EIA Notification requires environmental clearance for certain defined activities/projects. This Notification classifies the projects/activities that require environmental clearance into 'A' and 'B' categories (and further into B1 and B2) depending on the impact potential and/or scale of project. For both category projects, prior EC is mandatory before any construction work, or preparation of land except for securing the land, is started. Clearance provisions are as follows:

[6] The proposed project management and capacity development for each city include: (i) safeguards compliance studies; (ii) community awareness programs, (iii) compost marketing studies; (iv) non-revenue reduction programs, power and water audits; (v) support for migration to a double entry accounting basis system in ULB; (vi) support for preparation of a GIS-based property tax system; (vii) private sector participation opportunities studies; (viii) water utility reform program focusing on asset management improvement.

(i) Category 'A' projects requires prior environmental clearance from the Government of India's Ministry of Environment, Forest and Climate Change (MoEFCC);[7]
(ii) Category 'B' projects require prior environmental clearance from the State Environmental Impact Assessment Authority (SEIAA).[8]

26. This Notification provides that, any project or activity specified in Category 'B' will be treated as Category A, if located in whole or in part within 10 km from the boundary of: (i) protected areas notified under the Wild Life (Protection) Act, 1972, (ii) critically polluted areas as notified by the Central Pollution Control Board from time to time, (iii) notified eco-sensitive areas, (iv) inter-state boundaries and international boundaries. Also, in the case where a SEIAA does not exist, Category B project will be reviewed by the MoEFCC and reclassified as Category A.

27. Consequently, the only relevant subproject under the Investment Program listed in the EIA Notification's "Schedule of Projects Requiring Prior Environmental Clearance" is solid waste management. Municipal solid waste management facilities qualify as Category B projects and are thus reviewed by the SEIAA. In the state of Assam, SEIAA recently formed and environmental clearance process was done for Dibrugarh town. Accordingly, an accredited EIA consultant, as required by the MoEFCC/SEIAA, prepared an EIA in accordance with the Government of India's EIA Notification for obtaining the Environmental Clearance from the SEIAA in Guwahati, Assam. Environmental clearance for Solid Waste Landfill site at Dibrugarh under Tranche 1 was obtained from SEIAA, Assam.

C. National Legal Requirements

28. **Water (Prevention and Control of Pollution) Act of 1974.** Any component of the Program having potential to generate sewage or trade effluent will come under the purview of the Water (Prevention and Control of Pollution) Act of 1974. Such projects have to obtain Consent for Establishment (CFE) under Section 25 of the Act from Assam Pollution Control Board (APCB) before starting implementation and Consent to Operate (CTO) before commissioning. The Water Act also requires the occupier of such subprojects to take measures for abating the possible pollution of receiving water bodies. Under the Water (Prevention and Control of Pollution) Act of 1974 the following subprojects require CFE and CFO from APCB:

(i) New or augmentation of WTPs; and
(ii) Solid waste composting and landfills

29. **Air (Prevention and Control of Pollution) Act of 1981.** The subprojects having potential to emit air pollutants into the atmosphere have to obtain (CFE under Section 21 of the Air (Prevention and Control of Pollution) Act of 1981 from APCB before starting implementation and CTO before commissioning the project. The occupier of the project/facility has the responsibility to adopt necessary air pollution control measures for abating air pollution. Under the Air (Prevention and Control of Pollution) Act of 1974 the following plants/ machinery require CFE and CFO from APCB:

(i) Diesel generators; and

[7] For Category A projects, based on the preliminary details provided by the project proponent, the Expert Appraisal Committee (EAC) of MoEFCC, determines a comprehensive Terms of Reference (TOR) for the environmental impact assessment (EIA) studies. This TOR will be finalized within 60 days. On the recommendation of the EAC based on EIA studies, MoEFCC provides the EC.

[8] The B category projects will be further divided by the State Level Environmental Assessment Committee (EAC) into 'B1' – that require EIA studies and 'B2' – no EIA studies. The State Level EAC will determine TOR for EIA studies for B1 projects within 60 days. On the recommendation of the State Level EAC based on EIA studies, SEIAA provides the EC.

(ii) Hot mix plants, wet mix plants, stone crushers etc., if installed for construction

30. **CPCB Standards.** Emissions and discharges shall comply with standards notified by the CPCB. **Appendix 2** provides applicable standards for effluents, receiving water bodies, air quality, water quality, and noise levels.

31. **Forest Legislations.** Forest legislation in India dates back to enactment of the Indian Forest Act of 1927. The Act allows government control over forest lands[9] and lands not being the property of the government. For reserved forests and village-forests, activities like (i) clearing or breaking up of any land for cultivation or for any other purpose, (ii) damage to vegetation/trees, and (iii) quarrying or removing any forest produce are prohibited. For protected forests, with the provision of the Act, the government makes rules to regulate activities like: (i) cutting of trees and removal of forest produce, (ii) clearing or breaking up of land for cultivation or any other purpose, and (iii) for protection and management of any portion of protected forest.

32. Government of India's Forest (Conservation) Act of 1980 (amended in 1988) restricts the deforestation of forests for use of non-forest purposes. According to the Act, the government requires prior approval of MoEFCC for the use of forest land for non-forest purposes (means the breaking up or clearing of any forest land) or for assigning lease to any private person or agency not controlled by government. The Forest (Conservation) Rules issued under this Act, provide specific procedures to be followed for obtaining Forest Clearance in conversion of forest land for non-forest purposes (**Appendix 3**). Compensatory afforestation is one of the most important conditions stipulated for diversion of forest land. For obtaining approval involving 5 hectares (ha), cost of 10 times the number of trees to be removed, subject to maximum of 2500 trees per ha shall have to be paid. In case of plain areas, the area of the land required for compensatory afforestation, shall be equal to that of the affected forest land. In case of hills, the area of land required for compensatory afforestation shall be twice or double the area of the affected forest land.

33. The subprojects under this MFF are not located within the forest land.

34. Conversion of forest lands that are part of National Parks/Sanctuaries and Tiger Reserve areas (notified under Indian Wildlife (Protection) Act) is not permitted. In exceptional case, the government requires consent of the Indian Board of Wildlife for obtaining approval of the State Legislature for de-notification of the area as a sanctuary.

35. **Municipal Solid Waste (Management and Handling) Rules of 2000, 2016.** The Government of India notified MSW Rules in exercise of the powers conferred by Sections 3, 6, and 25 of the Environment (Protection) Act with the objective of regulating the management and handling of the municipal solid waste. Under the MSW Rules, the municipal authority is required to:

(i) Take all steps to ensure that the municipal solid wastes generated in their jurisdiction are handled and disposed of without causing any adverse impact on human health or environment;

(ii) Obtain authorization for setting up waste processing and disposal facility (including landfills) from the Assam Pollution Control Board (APCB); and

[9] The term 'forest land' mentioned in Section 2 of the Act refers to reserved forest, protected forest or any area recorded as forest in the Government records. Lands which are notified under Section 4 of the India Forest Act would also come within the purview of the Act (Supreme Court's Judgment in the National Thermal Power Corporation's case). It would also include "forest" as understood in the dictionary sense (Supreme Court order dated 12.12.1996 in WP No. 202/1995-Annexure-I). All proposals for diversions of such areas to any non-forest purpose, irrespective of its ownership, would require the prior approval of the Central Government.

(iii) Meet design and operation specifications/standards specified for solid waste processing and landfills. These include site and facility design specifications, output compost characteristics, pollution control and monitoring programs, and closure of landfill site and post-care.

36. **Ancient Monuments and Archaeological Sites and Remains Rules, of 1959.** The Rules designate areas within a radius of 100 m and 300 m from the "protected property" as "protected area" and "controlled area" respectively. No development activity (including mining operations and construction) is permitted in the "protected area" and all development activities likely to damage the protected property are not permitted in the "controlled area" without prior permission of the Archaeological Survey of India (ASI). Protected property includes the site, remains, and monuments protected by ASI or the State Department of Archaeology.

37. Under the Investment Program, subproject activities within Archaeologically Protected Areas will be avoided. If activities are to be done in the controlled area of protected properties, then the executing and implementing agencies and the line department will take the necessary NOCs from ASI and other relevant state agencies.

38. **Land Acquisition, Rehabilitation and Resettlement Act, 2013.** The Act shall come into force on January 1, 2014 as notified by the Central Government. The Act will replace the Land Acquisition Act, 1894, a nearly 120-year-old law enacted during British rule and lays emphasis on Rehabilitation & Resettlement in cases of land acquisition. Private land acquisition is guided by the provisions and procedures under this Act. Before the acquisition of any land, the Government is required to consult the concerned Panchayat or Municipal Corporation and carry out a Social Impact Assessment in consultation with them. The Act provides a transparent process for land acquisition for industrialization, development of essential infrastructural facilities and urbanization by giving adequate financial compensation to the affected people.

39. The District Collector or any other officer designated will function as the Land Acquisition Officer on behalf of the Government. There is a provision for consent award to reduce the time for processing if the land owners are willing to agree on the price fixed by the Land Acquisition Officer. The option of acquiring lands through private negotiations is also available.

40. For the Project, land acquisition shall comply with all national and state laws and regulations including this Act. It will also comply with ADB SPS and for that reason, a Resettlement Framework has to be developed to guide land acquisition and resettlement for the Program in accordance with both government and ADB policies.

D. State Legal Requirements

41. According to the Assam Forest Regulation of 1891 and Assam Forest Policy of 2004; cutting of trees[10] in non-forest land, regardless of land ownership, also requires permission from the Assam Environment and Forest Department. Following the Forest (Conservation) Act and Rules, Assam Environment and Forest Department requires afforestation to the extent of two trees per each tree felled is mandatory.

E. Applicable International Environmental Agreements

42. In addition to national and state rules and regulations, international conventions such as

[10] As defined in the Assam forest regulation, "tree" includes palms, bamboos, stumps, brushwood, and canes.

the International Union for Conservation of Nature and Natural Resources (IUCN), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Convention on Migratory Species of Wild Animals (CMS) and Ramsar Convention on Wetlands of International Importance are applicable for selection and screening of subprojects under restricted/sensitive areas. India is a party to these conventions.

43. **International Union for Conservation of Nature and Natural Resources (IUCN).** The IUCN Red List of Threatened Species (also known as the IUCN Red List or Red Data List), founded in 1963, is a comprehensive inventory of the global conservation status of plant and animal species. The IUCN is an authority on the conservation status of species. A series of Regional Red Lists are produced by countries or organizations, which assess the risk of extinction to species within a political management unit. The IUCN Red List is set upon precise criteria to evaluate the extinction risk of thousands of species and subspecies. These criteria are relevant to all species and all regions of the world. The aim is to convey the urgency of conservation issues to the public and policy makers, as well as help the international community to try to reduce species extinction.

44. **Convention on Migratory Species of Wild Animals (CMS).** CMS was adopted in 1979 and entered into force on 1 November 1983. CMS, also known as the Bonn Convention, recognizes that states must be the protectors of migratory species that live within or pass through their national jurisdictions, and aims to conserve terrestrial, marine and avian migratory species throughout their ranges. Migratory species threatened with extinction are listed on Appendix I of the Convention. CMS Parties strive towards strictly protecting these species, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them. Migratory species that need or would significantly benefit from international cooperation are listed in Appendix II of the Convention, and CMS encourages the Range States to conclude global or regional agreements.

45. **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).** It is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. CITES were first formed, in the 1960s. Annually, international wildlife trade is estimated to be worth billions of dollars and to include hundreds of millions of plant and animal specimens. The trade is diverse, ranging from live animals and plants to a vast array of wildlife products derived from them, including food products, exotic leather goods, wooden musical instruments, timber, tourist curios and medicines. Levels of exploitation of some animal and plant species are high and the trade in them, together with other factors, such as habitat loss, is capable of heavily depleting their populations and even bringing some species close to extinction. Many wildlife species in trade are not endangered, but the existence of an agreement to ensure the sustainability of the trade is important in order to safeguard these resources for the future. Because the trade in wild animals and plants crosses borders between countries, the effort to regulate it requires international cooperation to safeguard certain species from over-exploitation.

46. **Ramsar Convention on Wetlands of International Importance 1971.** The Convention on Wetlands of International Importance, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The Ramsar Convention is an international treaty for the conservation and sustainable utilization of wetlands The Ramsar Convention is the only global environmental treaty that deals with a particular ecosystem. According to the Ramsar list of Wetlands of International Importance, there are 25 designated wetlands in India which are required to be protected. Activities undertaken in the proximity of Ramsar wetlands shall follow the guidelines of the convention.

47. Under both **Tranche 1 and 2,** there are no Ramsar designated wetlands reported within the subproject areas. In subsequent tranches if any floral and faunal habitation, listed under Ramsar, IUCN, CMS or CITES are reported within the subproject influence area then the responsibility for taking necessary actions in accordance with these international conventions will lie with the executing and implementing agencies.

48. A summary of Government and State environmental compliance requirements applicable to the Project is presented in **Table 3**.

Table 3: Summary of Environmental Compliance Requirements of the Project Components for EARF Consideration

S. No.	Component	Sub component	Applicable Legislation	Statutory Requirement	Authorizing Body	Action Required
1	Water Supply	WTP	1.Water (Prevention and Control) Act of 1984 2.Air (Prevention and Control) Act of 1984	1. CFE 2. CFO	APCB	Based on project review and site inspection the APCB provides CFE before construction. The disposal standards to be met during the operation will be stipulated. Subsequent to completion of construction, CFO is issued confirming compliance of CFE conditions, if any. CFE is obtained for WTP.
				Renewal of CFO during operation	APCB	Based on the performance of the WTP and its compliance with the disposal standards CFO will be renewed every year.
		All subcomponents that require forest	1. Forest (Conservation) Act of 1980;	Approval	Government of India MoEFCC	1. Identification of non-forest

S. No.	Component	Sub component	Applicable Legislation	Statutory Requirement	Authorizing Body	Action Required
		land acquisition	and 2. Wildlife Act, 1972		through State Government of Assam	land 2. Formulation of afforestation program 3. Obtain Forest Clearance from Assam Environment and Forest Department
		All subcomponents that require cutting of trees	Forest (Conservation) Act of 1980	Approval	State Forest and Environment Department	1. Cutting of trees in non-forest land, irrespective of land ownership. 2. Afforestation to the extent of two trees per each tree felled is mandatory
2	Drainage	All subcomponents that require cutting of trees	Forest (Conservation) Act of 1980	Approval	State Forest and Environment Department	1. Cutting of trees in non-forest land, irrespective of land ownership 2. Afforestation to the extent of two trees per each tree felled is mandatory
3	Solid waste management	Landfill, compost plant, and all associated facilities	MSW Rules	Authorization of proposed site	APCB	Based on land use and surrounding surface and groundwater conditions authorization is issued
			EIA Notification	EC	SEIAA/ MoEFCC	SEIAA is formed in Assam, EC has been obtained from SEIAA
			1. Water (Prevention	1. CFE 2. CFO	APCB	Based on project review

S. No.	Component	Sub component	Applicable Legislation	Statutory Requirement	Authorizing Body	Action Required
			and Control) Act of 1984 2. Air (Prevention and Control) Act of 1984			and site inspection the APCB provides CFE before construction.
				Renewal of CFO during operation	APCB	Based on the performance of the landfill leachate treatment plant, composting plant and compliance with the disposal standards CFO will be renewed every year.
		All subcomponents that require cutting of trees	Forest (Conservation) Act of 1980	Approval	State Forest and Environment Department	1. Cutting of trees in non-forest land, irrespective of land ownership. 2. Afforestation to the extent of two trees per each tree felled is mandatory.
4	Others	1. Diesel generators; and 2. Hot mix plants, wet mix plants, stone crushers etc., if installed for construction	Air (Prevention and Control) Act of 1984	1. CFE 2. CFO	APCB	Based on project review and site inspection the APCB provides CFE before construction. The emission standards to be met during the operation of the generators, hot mix and wet mix plants, stone crushers, and other potential

S. No.	Component	Sub component	Applicable Legislation	Statutory Requirement	Authorizing Body	Action Required
						sources of air pollution will be stipulated. Subsequent to completion of construction, CFO is issued confirming compliance of CFE conditions, if any.
				CFO	APCB	If subproject will have standby diesel generator/s, CFO will be renewed every year.

CFE = Consent for Establishment; CFO = Consent for Operation; APCB = Assam Pollution Control Board; GoI = Government of India; GoA = State Government of Assam; MoEFCC = Ministry of Environment, Forest and Climate Change; MSW = Municipal Solid Waste; EIA = environmental impact assessment; EC = Environmental Clearance; SEIAA = State Environment Impact Assessment Authority.

49. State Government of Assam with inputs from the PIUs and PMU is responsible for the preparation of each subproject environmental assessment report and monitoring of safeguards issues with support from the consultants recruited to support them under the Program. Currently, State Government of Assam and the PIUs do not have any environmental staff and have very limited experience, resources, and equipment for environmental management and monitoring. The role of the Assam Pollution Control Board (APCB) in environmental monitoring of the subprojects is mostly limited to review of the monitoring reports to be submitted by State Government of Assam and PIUs.

50. All implementing agencies of the Project require capacity building measures for (i) a better understanding of the project-related environmental issues; and (ii) strengthen their role in implementation of mitigation measures and subsequent monitoring. Training programs are included in each subproject, a sample of which is provided in **Table 7**. The primary focus of the training is to enable staff to conduct impact assessments and carry out environmental monitoring and implement the EMP. After participating in such training, the participants should be able to make environmental assessments for their respective subprojects, conduct monitoring of environmental plans, understand government and ADB requirements for environmental assessment, management, and monitoring (short and long term), and incorporate environmental features into future subproject designs, specifications, and tender/contract documents.

III. ANTICIPATED ENVIRONMENTAL IMPACTS

51. The lists of subprojects have been identified for Tranche 2 (see Section I). Environmental impacts during design, pre-construction, construction, and operation were reviewed and assessed for each subproject that has already been identified. The IEEs were prepared for the following packages: (i) AUIIP/PR-2/GUW/WS/03 (Design, build and operate for intake works, raw water

rising main, WTP, clear water pumping station, distribution network and associated works in South-East zone of Guwahati); (ii) AUIIP/PR-2/DIB/DR/02 (DTP drain outfall, secondary drainage and allied works in Dibrugarh); (iii) AUIIP/PR-2/GUW/DR/01-02 (Priority works for drain intercepts and pumping for flood control); and (iv) AUIIP/PR-2/GUW/DR/03 (Procurement of machinery, equipment and transport vehicles for cleaning of the existing drainage system). During subproject construction and implementation, impacts on the physical environment such as water, air, soil, noise; and on the biological environment, like flora and fauna and socio-economic environment will be carefully assessed by the project which includes environmental specialists. For any subproject that will be identified in the future, the IEE will be prepared following this EARF once the detailed design is completed.

52. For urban infrastructure and service improvement subprojects it is anticipated that impacts will be temporary and of short duration. In such cases, mitigation measures i.e. control of air, dust pollution, checking of water and noise pollution, protection of biological environment can address impacts. Other measures such as preparation and implementation of traffic management plans during laying of pipes shall also be done in coordination with consultant team, ULBs, local police, contractors, and the public. Safety measures, both occupational and social are will be considered and impacts and mitigation measures will be elaborated in the environmental management plans.

53. Anticipated environmental impacts for the Tranche 2 subproject are provided in the IEE reports and summarized in **Table 4.** The IEE for any future subprojects will be prepared following this EARF once the detailed design is completed.

Table 4: Anticipated Environmental Impacts Due to Project Implementation

Impact Field	Impact to Environment
Design Phase	
Environmental clearances	CFE and CFO are required from the APCB in order to implement the project. Land allotment letter required. If not pursued on timely basis, this can delay the Project.
Utilities	Telephone lines, electric poles and wires, water pipe (old) existing within ROW require shifting without disruption to services
Water supply	Health risk due to closure of existing water supply such as community tankers, water stations and privately-owned small water pipes
Social and cultural resources	Ground disturbance can uncover and damage archaeological and historical remains. Impact on sites of cultural/religious importance during pipe laying.
Construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas	Disruption to traffic flow and sensitive receptors.
Land for, WTP, landfill	Land use impact, conversion of present land use (Faring, Salitoli {cultivable} and Jalduba {low lying} to landfill site
Traffic	Traffic will be disturbed during construction period requiring carefully planned traffic management plans.
Construction Phase	
Sources of materials	Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution.
Air quality	Emissions from construction vehicles, equipment, and machinery used for excavation and construction resulting to dust and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons.

Impact Field	Impact to Environment
Surface water quality	Mobilization of settled silt materials, run-off from stockpiled materials, and chemical contamination from fuels and lubricants during construction works can contaminate downstream surface water quality.
Noise levels	Increase in noise level due to earth-moving and excavation equipment, and the transportation of equipment, materials, and people.
Generated muck	Improper disposal of muck from cleaning of drainage canals causing environmental pollution.
Ecological resources	Felling of the trees–affect terrestrial ecological balance and affect terrestrial and aquatic fauna/wildlife.
Existing infrastructure and facilities	Disruption of service and damage to existing infrastructure located alongside roads, in particular water supply pipes.
Landscape and aesthetics	Solid wastes as well as excess construction materials create unacceptable aesthetic condition.
Accessibility	Traffic problems and conflicts in ROW. Roads/people/business may be disturbed by repeated trenching.
Socio-economic–Income	Impede the access of residents and customers to nearby shops. Shops may lose business temporarily
Socio-economic–Employment	Generation of contractual employment and increase in local revenue.
Occupational health and safety	Occupational hazards which can arise during project implementation. (e.g. deep trenching, falling objects, etc.)
Construction waste	Trenching will produce additional amounts of waste soil.
Community health and safety	Community hazards which can arise during construction (e.g., open trenches, air quality, noise, falling objects, etc.). Trenching on concrete roads using pneumatic drills will cause noise and air pollution. Traffic accidents and vehicle collision with pedestrians during material and waste transportation
Work camps	Temporary air and noise pollution from machine operation, water pollution from storage and use of fuels, oils, solvents, and lubricants.
Social and cultural resources	Risk of archaeological chance finds. Sites of social/cultural importance (schools, hospitals, religious place, tourism sites) may be disturbed by noise, dust, vibration and impeded access. Trenching on concrete roads using pneumatic drills will cause noise and air pollution.
Clean-up operations, restoration and rehabilitation	Impacts on social or sensitive receptors when post construction requirements are not undertaken, e.g. proper closure of camp, disposal of solid waste, and restoration of land after subproject construction.
Operation & Maintenance Phase	
Occupational health and safety	Exposure of workers to hazardous materials during drainage cleaning, operation of WTP, operations of compost plant and landfill
Waste water quality	Deterioration of surface and groundwater quality from unmanaged leachate
Solid wastes–sludge	Environmental pollution–potential impact on soil, groundwater, and surface water nearby the disposal site
Hazardous chemicals	Release to nature from treatment plant causing air, water, and soil pollution
Air emissions	Air pollution from gaseous or volatile chemicals used for disinfection processes at WTP
General maintenance	May cause disturbance to sensitive receptors, dusts, increase in noise level

Impact Field	Impact to Environment
Community health and safety	Leaking sewers can damage human health and contaminate soil and groundwater
Economic development	Impediments to residents and businesses
Social and cultural resources	Temporary disruption of activities
Land use pattern	Areas will be developed (conversion of agriculture/forest land to residential and commercial land) with better infrastructure facility like improved water supply, and sewerage and sanitation

Notes: APCB – Assam Pollution Control Board; CFE – Consent for Establishment; CFO – Consent for Operation; ROW – right-of-way; WTP - Water Treatment Plant.

IV. ENVIRONMENTAL ASSESSMENT FOR SUBPROJECTS AND COMPONENTS

A. Environmental Guidelines for Subproject Selection

54. Tranche 2 subprojects are not anticipated to have significant environmental impacts. **Subprojects will be primarily designed to improve public and environmental health and quality of** life for both poor and non-poor residents as well as visitors. Guidelines for subproject selection is shown in **Table 5** provide further guidance to avoid or minimize adverse impacts during the identification and finalization of Tranche 2 subprojects.

Table 5: Environmental Criteria for Subproject Selection

S. No.	Components	Environmental Selection Guidelines	Remarks
1	**Overall Selection Guideline (applicable to all components)**	Comply with all requirements of relevant national, state and local laws, rules and regulations	See Section II of this EARF
		Site selection process will avoid involuntary resettlement and impacts on vulnerable persons including indigenous peoples (If unavoidable the extent of impacts will be minimized.	See Resettlement Framework (RF) and Indigenous Peoples Planning Framework (IPPF).
		Site selection will not result in destruction and avoid being sited in protected areas, including notified reserved forests or biodiversity conservation hotspots (sanctuary/national park etc.)	Approval (NOC) from concerned authority if unavoidable
		Sub-project location should not result in destruction/disturbance to historical and cultural places/values	
		The subproject will avoid where possible, and minimize to extent feasible facilities in locations with social conflicts	
		The subproject will avoid where possible tree cutting and if any trees have to be removed, will plant two new trees for every one that is lost.	
		It will reflect inputs from public consultation and disclosure for site selection	
		Retain mature roadside trees, and if any trees have to be removed, plant two new trees for every one that is lost.	
2	**Water Supply**	Comply with all requirements of relevant national and state law, including the Water (Prevention and Control of Pollution) Act 1974	

S. No.	Components	Environmental Selection Guidelines	Remarks
		Avoid environmentally sensitive locations including sites with national or international designation (e.g. for ecological/biological conservation i.e. reserved and protected forest, historical or cultural importance sites, etc.)	
		Site selection will not result in excessive abstraction of water affecting downstream water uses and other beneficial water uses for surface and ground water Utilize water sources at sustainable levels of abstraction only (i.e. without significant reductions in the quantity or quality of the source overall)	For this water availability data/water reserve status of the subproject area is required
		Not to utilize raw water of very poor quality evidenced by presence of high levels of pathogens/mineral contents	
		Avoid using water sources that may be polluted by upstream users	In case of planning of water withdrawal from river/stream, If any polluting sources like sewage channel, thermal power plant discharge or other industrial discharge in upstream nearby the intake site that source should be avoided Review of surface water quality data of intake point is necessary for designing and environmental assessment
		Avoid water-use conflicts by not abstracting water that is used for other purposes (e.g. irrigation)	
		Locate all new facilities (WTP, PS etc.) at least 50m from houses, shops or any other premises used by people, thus establishing a buffer zone to reduce the effects of noise, dust and the visual appearance of the site	Distance restriction may be reviewed depending on the technology adopted, land availability and buffer zone planning
		Ensure location of water treatment plant will take into account the present and future demands, direction and rate of growth of the service area and potential deterioration of source quality in the future	
		Locate intake, WTP at sites where there is no risk of flooding or other hazards that might impair functioning of the plant or present a risk of damage to the plant or its environs	Flood statistics data of the project area needs to be reviewed
		Locate pipelines within ROW of other linear structures (roads, irrigation canals), to reduce the acquisition of new land	Minimize land acquisition

S. No.	Components	Environmental Selection Guidelines	Remarks
		Ensure that pipeline routes do not require the acquisition of land from individual farmers in amounts that are a significant proportion of their total land holding (>10%)	
		Ensure that improvements in the water supply system are combined with improvements in sewerage and drainage to deal with the increased discharge of domestic wastewater	
		Ensure occupational safety measures for the safe handling of chlorine, including wash area, as well as proper handling as not to result in inadequate/poor treatment and chlorination	
		Include treatment of all backwash and sludge resulting from water treatment plants and acceptable to discharge standards of the Assam Pollution Control Board before disposal	
4	**Urban Drainage**	Continue the established practice of laying new drains within existing roads to avoid land acquisition and involuntary resettlement	See Resettlement Framework
		Include measures to ensure the safe disposal of canal dredge without causing an environmental hazard.	
		Retain mature roadside trees, and if any trees have to be removed, plant two new trees for every one that is lost.	

Notes: EIA – Environmental Impact Assessment; NOC – No Objection Certificate, ROW – right of way; WTP – water treatment plant.

B. Environmental Assessment Procedures for Subprojects

55. Subprojects must comply with national and state legislation (Section II) and ADB's SPS (2009). For subproject processing, the steps to be followed are shown in **Table 6**.

Table 6: Environmental Procedures for Subproject Processing

Project Stage	ADB Procedure	Government of India
Sub-project Identification	REA checklist submitted to ADB by PMU for review	Categorization (A or B) according to Schedule and General/Specific Conditions in Government of India EIA Notification, 2006, Amended in 2009
	Categorization (A/B/C) submitted to ADB by PMU for review	Application for Prior Environmental Clearance (EC) after the identification of the prospective site, or before commencing any construction, or land preparation. Category A requires EC from MOEF. Category B requires EC from SEIAA. In the absence of SEIAA or SEAC, Category B treated as Category A and will be cleared from MoEF.
	ADB to review REA checklists to ensure subprojects meet subproject	Screening (for Category B) subject by SEAC. Categorized as B1 (requires

Project Stage	ADB Procedure	Government of India
	selection criteria in EARF and Schedule 4 of FFA	full EIA) or B2 (does not require full EIA).
Detailed Design	IEE/EIA (with EMP) based on detailed design	Scoping and TOR for EIA (A or B1) with scrutiny by EAC. TOR (or rejection of EC) finalized by EAC or SEAC within 60 days. Approved TOR posted on MOEF or concerned SEIAA website.
	Public Consultation: Consultation will be carried out in a manner commensurate with the impacts of affected communities. The consultation process and its results are to be documented and reflected in the environmental assessment report.	Public Consultation for Category A and B1 projects and consists of two components: (i) public hearing conducted by APCB within 45 days of a request from the applicant, and (ii) Obtain written responses. Draft EIA publicized widely before hearing. Notice of public hearing within 7 days of date. 30 days for public responses. Incorporate concerns expressed into the draft EIA and EMP.
	Disclosure: For *Category A*: Disclosure on ADB's website of a draft full EIA (including the draft EMP) at least 120 days prior to the ADB Board consideration, and/or EARF before project appraisal where applicable; the final EIA; updated EIAs and corrective action plans; and environmental monitoring reports. For *Category B*: Disclosure on ADB's website of the final IEE; updated IEEs and corrective action plans; and environmental monitoring reports. EARF: Disclosure of EARF before project appraisal. Government to send written endorsement of all EIAs/IEEs to ADB for disclosure to ADB website. In addition for all categories, environmental information in an accessible place and in a form or language understandable to affected people and other stakeholders. For illiterate people, other suitable communication methods will be used.	Draft EIA publicized widely before hearing. Notice of public hearing within 7 days of date. 30 days for public responses. Incorporate concerns expressed into the draft EIA and EMP.
	Mitigation measures specified in IEE/EIA study incorporated in project design.	
	Identify and incorporate environmental mitigation and monitoring measures (including the EMP) into bid/contract documents.	

Project Stage	ADB Procedure	Government of India
Appraisal	EMP and other environmental covenants are incorporated into the Facility Framework Agreement, Loan/Project Agreement, and Facility Administration Memorandum (FAM)	Appraisal of application completed by EAC or SEAC within 60 days of receipt of final EIA report.
Approval	ADB to review and clear EIA/IEE prior to approval and issuance of tender documents during detailed design stage.	Appraisal of application completed by EAC or SEAC within 60 days of receipt of final EIA report
Contract Award	No contract award until: a. Environmental clearances required by the Government have been obtained. b. EIA/IEE has been finalized, disclosed to public. c. Confirm that the safeguard requirements are included in bidding documents and civil works contracts. EMP implementation reflected in FAM.	Necessary EC obtained prior to commencing any construction, or land preparation. NOCs, CFE and CFO from APCB; and Forest clearances (if any) from DFO
Implementation	Contractors submit Environmental Implementation Plans (EIP) based on EIA/IEE findings to be incorporated into bidding documents and civil award contracts. Semiannual monitoring report from Project Management Unit submitted to ADB for review and posting on ADB's website.	As per EIA Notification Item 10 paras (i) and (ii): Project must submit half-yearly compliance monitoring reports on 1st July and 1st January. All compliance reports are public documents and displayed on website of concerned regulatory authority Certificate for Operation required for WTP

APCB – Assam Pollution Control Board; CFE – Consent for Establishment, CFO – Consent for Operation, DFO – Divisional Forest Officer, DMSC – design, management and supervision consultant, EAC – Environmental Appraisal Committee, EARF – Environmental Assessment and Review Framework, EC – Environmental Clearance, EIA – Environmental Impact Assessment, EMP – Environmental Management Plan, FAM – Facility Administration Memorandum, FFA – framework financing agreement, IEE – Initial Environmental Examination, MoEFCC – Ministry of Environment, Forest and Climate Change, NOC – No Objection Certificate, , REA – Rapid Environmental Assessment, SEAC – State Environment Assessment Committee, SEIAA – State Environment Impact Assessment Authority, TOR – Terms of Reference.

1. Screening and Classification/Categorization

56. ADB screening and categorization procedures will be followed for the Program. For MFFs, only individual tranches are categorized. Both Tranche 1 and 2 have been categorized as environmental category B as no significant impacts to the environment or human health are envisioned. After Board Approval, project design should avoid and/or minimize to extent possible any Category A type subprojects.

57. Subproject screening and categorization is done at the earliest stage of project preparation when sufficient information is available for this purpose. Screening and categorization is undertaken to (i) reflect the significance of potential impacts or risks that a project might present; (ii) identify the level of assessment and institutional resources required for the safeguard measures; and (iii) determine disclosure requirements.

58. A subproject's category is determined by the category of its most environmentally sensitive component, including direct, indirect, cumulative, and induced impacts in the subproject's area of

influence. Each proposed subproject is scrutinized as to its type, location, scale, and sensitivity and the magnitude of its potential environmental impacts. Subprojects are assigned to one of the following four categories:

(i) **Category A.** Subproject components that are projected to have potentially significant adverse environmental impacts. An environmental impact assessment (EIA) is required;
(ii) **Category B.** Subproject components that are projected to have some adverse environmental impacts, but they are expected to be less significant than those associated with category A projects. An IEE is required to determine whether an EIA is warranted. If an EIA is not needed, the IEE is regarded as the final environmental assessment report;
(iii) **Category C.** Subproject components that are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are still reviewed; and
(iv) **Category FI.** Subproject components that 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.

59. The ADB Rapid Environmental Assessment (REA) Checklists for shall be accomplished during screening. Basic environmental information relating to subproject location and project preliminary design needs to be collected for completing the checklist. Appropriate REA Checklists based on nature of subprojects (e.g. water supply, SWM, general urban development subproject) are in **Appendix 4**.

2. Preparation of Environmental Assessment Report

60. After subproject categorization, the environmental assessment requirement can be determined. Annex 1 to Appendix 1 of the *ADB Safeguards Policy Statement (2009)* provides the specific outlines and contents to be followed while preparing IEEs. Also, the IEEs prepared in Tranche I provide good samples which can be followed for preparation of environmental assessments in subsequent tranches.

61. For preparing IEE relevant primary data will be generated and secondary data will be collected for project-influenced sites. An assessment of project impacts and risks on biodiversity and natural resources will also be undertaken. Issues regarding natural and critical habitats will be covered in the IEE report. In case of subprojects located within buffer zone of protected areas, a review of management plans and consultation with concerned management staff of the protected area, local communities, and key stakeholders will be undertaken and reflected in IEE report. Pollution prevention for conservation of resources particularly technology for management of process wastes will be addressed in the IEE report. Occupational health safety and community health safety will be properly addressed in the EMP section of the IEE report. In case subprojects are likely to have adverse impacts on physical cultural resources, appropriate mitigation measures will to be planned and reflected in the IEE. IEE will also reflect meaningful consultation and disclosure process with a provision of grievance redress mechanism.

62. ADB requires that an EMP must be developed as part of the IEEs. EMPs describe the environmental management measures that will be carried out to mitigate negative impacts or enhance the environment during implementation of a project, and the environmental monitoring to be conducted to ensure that mitigation is provided and is effective in reducing impacts, or to

determine the long-term impacts of a project. EMPs shall outline specific mitigation measures, environmental monitoring requirements, and related institutional arrangements, including budget requirements for implementation. Where impacts and risks cannot be avoided or prevented, mitigation measures and actions will be identified so that the project is designed, constructed, and operated in compliance with applicable laws and regulations and meets the requirements specified in this document. The level of detail and complexity of the environmental planning documents and the priority of the identified measures and actions will be commensurate with the project's impacts and risks. Key considerations include mitigation of potential adverse impacts to the level of "no significant harm to third parties," the polluter pays principle, the precautionary approach, and adaptive management.

63. If some residual impacts are likely to remain significant after mitigation, the EMP will also include appropriate compensatory measures (offset) that aim to ensure that the project does not cause significant net degradation to the environment. Such measures may relate, for instance, to conservation of habitat and biodiversity, preservation of ambient conditions, and greenhouse gas emissions. Monetary compensation in lieu of offset is acceptable in exceptional circumstances, provided that the compensation is used to provide environmental benefits of the same nature and is commensurate with the project's residual impact.

64. The Government of India requirements relating to national environmental laws and rules that apply to the subprojects are summarized in Section II. In terms of compliance, subprojects may be of three types: (i) subprojects that attract the EIA Notification; (ii) subprojects that require clearances or NOCs or consents from relevant government agencies; and (iii) subprojects that require no environmental authorization. **Table 6** provides the complete government procedures. Environmental assessment documents prepared under the Program should, to the extent possible, meet both ADB and government requirements in order to streamline the environmental procedures required by both ADB and government.

65. **Additional Requirements on Pollution Control, Health & Safety**. During the design, construction, and operation of the project the PMU and PIUs will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines. These standards contain performance levels and measures that are normally acceptable and applicable to projects. **Table 7** shows the applicable WHO ambient air quality guidelines and **Table 8** shows the World Bank Group's noise level guidelines. When Government of India regulations differ from these levels and measures, the PMU and PIUs will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the PMU and PIUs will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

Table 7. Applicable WHO Ambient Air Quality Guidelines

Table 1.1.1: WHO Ambient Air Quality Guidelines[7,8]		
	Averaging Period	Guideline value in µg/m³
Sulfur dioxide (SO_2)	24-hour 10 minute	125 (Interim target-1) 50 (Interim target-2) 20 (guideline) 500 (guideline)
Nitrogen dioxide (NO_2)	1-year 1-hour	40 (guideline) 200 (guideline)
Particulate Matter PM_{10}	1-year 24-hour	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline) 150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter $PM_{2.5}$	1-year 24-hour	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline) 75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

Table 8. World Bank Group's Noise Level Guidelines

Table 1.7.1- Noise Level Guidelines[54]		
	One Hour L_{Aeq} (dBA)	
Receptor	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Residential; institutional; educational[55]	55	45
Industrial; commercial	70	70

66. After documentation of IEE report the project approval follows the procedure as shown in **Table 6**.

V. CONSULTATION, INFORMATION DISCLOSURE, AND GRIEVANCE REDRESS MECHANISM

A. Public Consultation and Information Disclosure

67. Meaningful stakeholder consultation and participation is part of the project preparation and implementation strategy. A Consultation and Participation has been prepared for the Project and will be implemented with the assistance of a nongovernment organization (NGO). By addressing stakeholder needs, there is greater awareness of the benefits, and 'ownership' of the Project among stakeholders, which in turn contributes to project sustainability. The consultation process so far has solicited inputs from a wide range of stakeholders, including state- and ULB-level government officials, NGOs, elected representatives, residents of project cities, marginalized or vulnerable beneficiary groups, and project affected persons (APs).

68. Consultation, participation and disclosure will ensure that information is provided and feedback on proposed subproject design is sought early, right from the project preparation phase, so that the views/preferences of stakeholders including potential beneficiaries and affected people can be adequately considered in project design, and continue at each stage of project preparation, processing, and implementation. Affected persons will be consulted at various stages in the project cycle to ensure: (i) incorporation of views/concerns of APs on compensation/resettlement assistance and environmental impacts and mitigation measures; (ii) inclusion of vulnerable in project benefits; (iii) identification of help required by APs during rehabilitation, if any; and (iv) avoidance of potential conflicts/smooth project implementation. It will also provide adequate opportunities for consultation/participation to all stakeholders and inclusion of the poor/vulnerable/marginalized and project-affected persons in the project process. Relevant information about any major changes to project scope shall be shared with beneficiaries, affected persons, vulnerable groups, and other stakeholders.

69. A variety of approaches can be adopted. At minimum, stakeholders shall be consulted regarding the scope of the environmental and social impact study before work is commenced and they shall be informed of the likely impacts of the subproject and proposed mitigation once the draft IEE, RP, and IPP reports are prepared. The reports shall record the views of stakeholders and indicate how these have been taken into account in project development. Consultations will be held with a special focus on vulnerable groups.

70. The key stakeholders to be consulted during subproject preparation, EMP implementation and project implementation include:

(i) beneficiaries;
(ii) elected representatives, community leaders, religious leaders and representatives of community based organizations;
(iii) local NGOs;
(iv) local government and relevant government agency representatives, including state and local authorities responsible for land acquisition, protection and conservation of forests and environment, archaeological sites, religious sites, and other relevant government departments;
(v) residents, shopkeepers and business people who live and work alongside the roads where pipes will be lay and near sites where facilities will be built; custodians, and users of socially and culturally important buildings;
(vi) PIU staff, implementing NGO and consultants, and
(v) ADB and Government of India.

71. **Disclosure**. Information is disclosed through public consultation and making relevant documents public locations. The following documents will be submitted to ADB for disclosure on its website:

(i) draft IEE;
(ii) Final IEE and RP/IPP;
(iii) A new or updated IEE and RP/IPP and corrective action plan prepared during project implementation, if any; and
(iv) Semi-annual environmental monitoring reports and semi-annual social monitoring reports.

72. The executing agency should send written endorsement to ADB for disclosing these documents on ADB's website. They will also provide relevant safeguards information in a timely manner, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. For illiterate people, other suitable communication methods will be used.

B. Grievance Redress Mechanism

73. A project-specific grievance redress mechanism (GRM) has been established to receive, evaluate and facilitate the resolution of affected people's concerns, complaints and grievances about the social and environmental performance at the level of the Project. The GRM will aim to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the project. The grievance redress mechanism and procedure is depicted in **Figure 1** below. The project-specific GRM is 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.

74. The PMU and PIUs 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 5)** or by phone with any member of the PMU or PIU. The contact phone number of the respective PIUs and the PMU will serve as a hotline for complaints and will be publicized through the media and placed 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 PIUs with support from the NGO engaged to implement the Consultation and Participation activity.

75. **First tier of GRM.** The PIU is the first tier of GRM which offers the fastest and most accessible mechanism for resolution of grievances. The Resettlement and Environmental Officer in each PIU will be designated as the key officers for grievance redress. Resolution of complaints will be done within seven working (7) days. At this stage, the Resettlement Officer and Environmental Officer will inform the PMU's Safeguards Compliance and Monitoring Unit (SCMU) for additional support and guidance in grievance redress matters. Investigation of grievances will involve site visits and consultations with relevant parties (e.g., affected persons, contractors, traffic police, etc.). 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) Initial grievance sheet (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, one copy of which will be handed to the complainant after he/she has agreed to the resolution and signed-off.

76. The updated register of grievances and complaints will be available to the public at the PIU office, construction sites, and other key public offices along the project corridor. Should the grievance remain unresolved it will be escalated to the second tier.

77. **Second Tier of GRM.** The Resettlement Officer and Environmental Officer in each PIU will activate the second tier of GRM by referring the unresolved issue (with written documentation) to the PMU's SCMU who will pass unresolved complaints upward to the Grievance Redress Committee (GRC).[11] The GRC will be established by the PMU's Environment and Social Safeguard Unit before commencement of site works. A hearing will be called with the GRC, if necessary, where the affected person can present his/her concern/issues. The process will facilitate resolution through mediation. The 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 within fifteen (15) working days. 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.

78. The PMU Environment and Social Safeguard Unit officer 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.

79. Third tier of GRM. In the event that a grievance cannot be resolved directly by the PIUs (first tier) or GRC (second tier), the affected person can seek alternative redress through the union Parishad or ward committees or in the appropriate court of law. The PIUs or GRC will be kept informed by the district, municipal or national authority.

80. 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).

81. GRM and GRC for Guwahati and Dibrugarh have been established for AUIIP.

82. The GRM notwithstanding, an aggrieved person shall have access to the country's legal system at any stage. This can run parallel to accessing the GRM and is not dependent on the

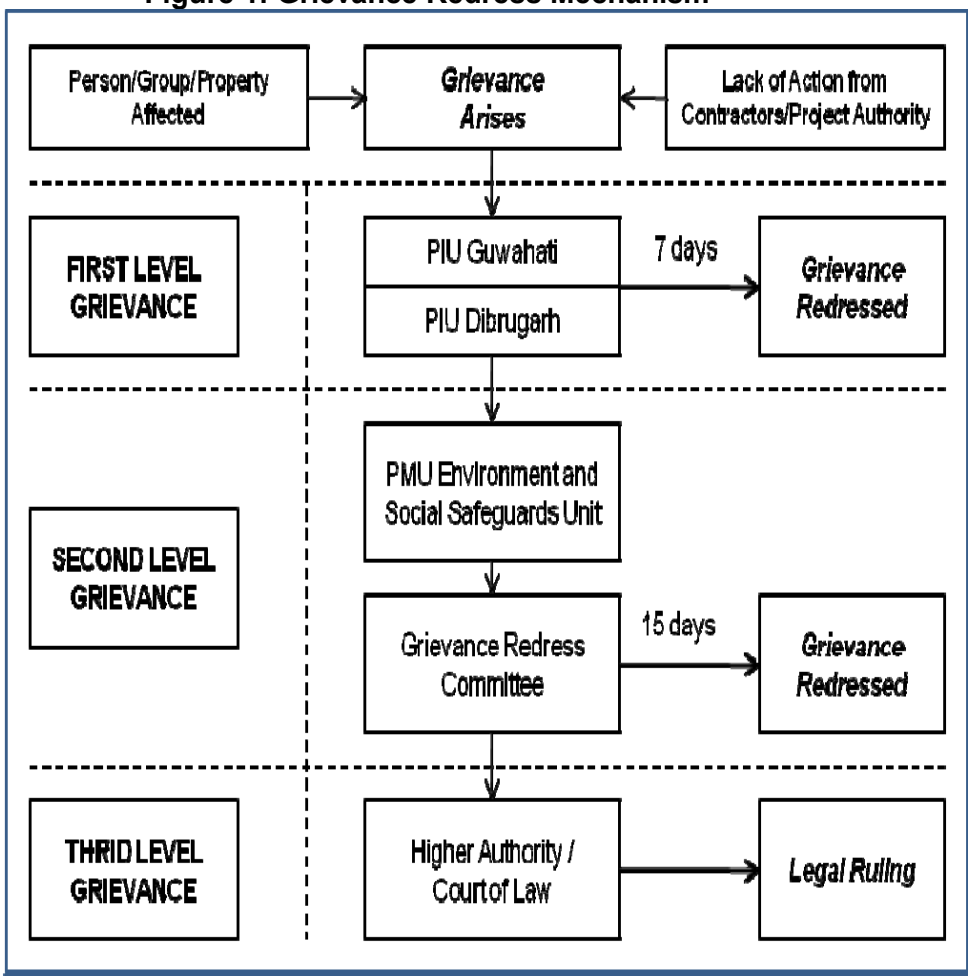
[11] The GRC will consist of the following persons: (i) Project Director; (ii) representative of the affected person(s); (iv) representative of the local Deputy Commissioners office (land); and (v) representative of APCB (for environmental-related grievances). The functions of the local GRC are as follows: (i) resolve problems quickly and provide support to affected persons arising from various environmental issues and including dust, noise, utilities, power and water supply, waste disposal, traffic interference and public safety as well as social and resettlement related issues such as land acquisition (temporary or permanent); asset acquisition; and eligibility for entitlements, compensation and assistance; (ii) reconfirm grievances of displaced persons, categorize and prioritize them and aim to provide solutions within a month; and (iii) report to the aggrieved parties about developments regarding their grievances and decisions of the GRC.

negative outcome of the GRM.

83. In the event that the established GRM is not in a position to resolved the issue, the affected persons can also use the ADB Accountability Mechanism through directly contacting (in writing) the Complaint Receiving Officer at ADB headquarters or the ADB India Resident Mission. The complaint can be submitted in any of the official languages of ADB's Developing Member Countries. The ADB Accountability Mechanism information will be included in the Project Information Document to be distributed to the affected communities, as part of the project GRM.

84. **Costs:** All costs involved in resolving the complaints (meetings, consultations, communication and reporting / information dissemination) will be borne by the PMU.

Figure 1: Grievance Redress Mechanism



VI. INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES

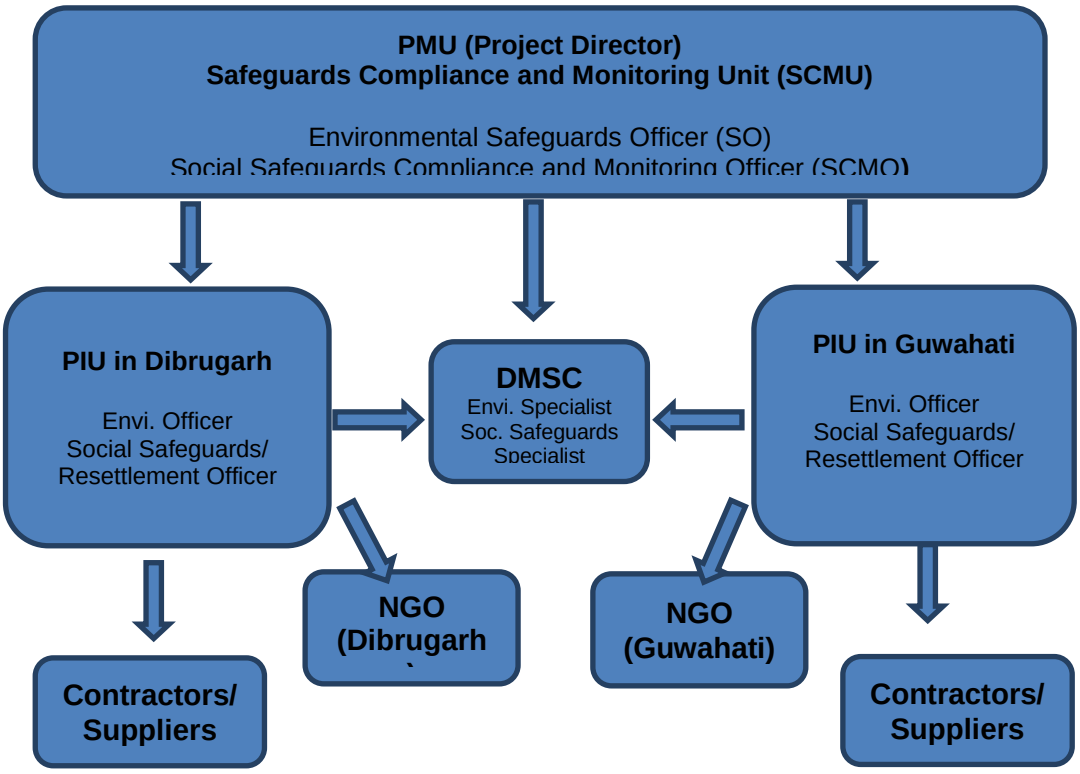
A. Implementation Arrangements

85. **Overall implementation arrangement.** The State Government of Assam's Guwahati Development Department is the executing agency. PMU has been established to manage Program through the PIUs, one each in Guwahati and Dibrugarh. The PMU functions as the implementing

agency for project administration and coordination and monitor all the project implementation activities with a focus on performance and achievement of results. PMU reports to the Empowered Committee (the Committee) of the State Government of Assam headed by the Chief Secretary, who is responsible for the project results on behalf of State Government of Assam. The PIUs will be responsible for the day-to-day activities of project implementation in the field and will be under the direct administrative control of the PMU.

86. **Safeguards implementation arrangement. Figure 2** shows the implementation arrangement for environment and resettlement safeguards. It shows PMU includes a full-time Safeguard Compliance & Monitoring Officer while the PIUs to include respective Safeguard Compliance & Monitoring Officers. On date, the position in PMU and PIU (Dibrugarh) are filled up.

Figure 2: AUIIP Safeguards Implementation Arrangement



87. DMSC is assisting PMU and has engaged a Safeguards Specialist (Environment). DMSC is also assisting the PIUs through its engaged Environment Specialist who reports in PIU offices in Guwahati on continuous basis and in Dibrugarh every month.

B. Institutional Capacity Development Program

88. There is low capacity to implement projects in accordance with ADB safeguard requirements in both project cities. The ULBs do not have environmental/social safeguards personnel, capacity to handle environmental/IR/IP impacts, gender and vulnerability issues. The DMSC will be responsible for training of PMU and PIUs staff on aspects such as environmental planning/resettlement planning/implementation, social protection and gender, including the specific recording, reporting and disclosure requirements.

89. The DMSC team will provide the basic training required for 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; (v) monitoring and reporting system. The proposed training program along with the frequency of sessions is presented in **Table 9**.

Table 9: Training Program for Environmental Management

Program	Description	Participants	Form of Training	Duration/ Location	Conducting Agency
A. Pre-Construction Stage					
Sensitization Workshop	**Introduction to Environment:** ✓ Basic Concept of environment ✓ Environmental Regulations and Statutory requirements as per Government of India and ADB	Secretaries, Chief Engineer, Superintendent Engineers of PWD, PHED and UDD, the Development Commissioner, Chairman, CEO of DMB and Project Director (PD) and PIUs Environmental Officers (EOs)	Workshop	½ Working Day	DMSC Team
Session I					
Module I	**Introduction to Environment:** ✓ Basic Concept of environment ✓ Environmental Regulations and Statutory requirements as per Government of India	Engineers of PWD, PHED and UDD, ULBs, PMU (Technical Unit) and PIUs EOs	Lecture	¼ Working Day	DMSC Team

Program	Description	Participants	Form of Training	Duration/ Location	Conducting Agency
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	Engineers of PWD, PHED and UDD, ULBs, PMU (Technical Unit) and PIUs EOs	Workshop	¼ Working Day	DMSC Team
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 borrow areas, waste disposal areas etc.	Engineers of PWD, PHED and UDD, ULBs, PMU (Technical Unit) and PIUs EOs	Lecture and Field Visit	½ Working Day	DMSC Team
Module IV	**Improved Coordination with other Departments:** ✓ Overview of the Project ✓ Environmental and Social Impacts ✓ Statutory Permissions ✓ Procedural Requirements ✓ Cooperation and Coordination with other Departments.	Engineers of PWD, PHED and UDD, ULBs, PMU (Technical Unit) and PIUs EOs	Lecture / Interactive Sessions	½ Working Day	DMSC Team

Program	Description	Participants	Form of Training	Duration/ Location	Conducting Agency
Module V	**Special Issues in the Project** ✓ Bio-Diversity Assessment and Conservation ✓ Geomorphological Assessment and Slope Protection ✓ Statutory Permissions– Procedural Requirements ✓ Consultation and Counseling	Engineers of PWD, PHED and UDD, ULBs, PMU (Technical Unit) and PIUs EOs	Lecture	½ Working Day	DMSC Team
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	Engineers of PWD, PHED and UDD, ULBs, PMU (Technical Unit) and PIUs EOs	Lecture / Interactive Sessions	½ Working Day	DMSC Team
Module VII	Monitoring and Reporting System	PMU (Technical Unit) and PIUs EOs	Lecture / Interactive Sessions	½ Working Day	DMSC Team

APCB – Assam Pollution Control Board; CFE – Consent for Establishment, CFO – Consent for Operation, DFO – Divisional Forest Officer, DMB – Dibrugarh Municipal Board, DMSC – Design, Management and Supervision Consultant, EAC – Environmental Appraisal Committee, EARF – Environmental Assessment and Review Framework, EC – Environmental Clearance, EIA – Environmental Impact Assessment, EMP – Environmental Management Plan, FAM – Facility Administration Memorandum, IEE – Initial Environmental Examination, MoEFCC – Ministry of Environment, Forest and Climate Change, NOC – No Objection Certificate, PHED - Public Health Engineering Department, PIU - Project Implementation Unit, PMU - Program Management Unit, REA – Rapid Environmental Assessment, SEAC – State Environment Assessment Committee, SEIAA – State Environment Impact Assessment Authority, TOR – Terms of Reference, UDD - Urban Development Department, ULB - Urban Local Body.

C. Staffing Requirement and Budget

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

(i) Conducting government IEE or EIA studies, preparing and submitting reports and public consultation and disclosure;

(ii) Application for Consent to Establish and Operate where required (currently for WTP);

(iii) Implementation and monitoring of environmental management plans (EMPs) (including tree re-plantation, long-term surveys/monitoring/ data generation,

capacity building, etc.)

91. The costs of these various inputs are shown in **Table 10**.

Table 10: Indicative Cost of EARF Implementation

Item	Quantity	Unit Cost (US$)	Total Cost (US$)	Sub-total (US$)	Source of Funds
Government	Tranche 1:	$31,000	31,000	31,000	PMU
Public Consultations	Tranche 2 (2 cities)	$3,000 per consultation	6,000	6,000	PMU
Consent for Establishment	Lump sum: 2 subprojects (WTP, and Landfill)	$7,000 per subproject	14,000	14,000	PMU
Consent for Operation	Lump sum: 2 subprojects (WTP, and Landfill)	$7,000 per subproject	14,000	14,000	PMU
Monitoring Expenses during Construction	Tranche 1: air, noise and water quality monitoring	Quarterly for 36 months total construction @ $5,000 per quarter	60,000	120,000	Contractor
	Tranche 2: Air, noise and water quality monitoring	Quarterly for 36 months total construction @ $5,000 per quarter	60,000		Contractor
Tree planting	Tranche 1: Lumpsum	$10,000	10,000	18,000	PMU
	Tranche 2: Lumpsum	$8,000	8,000		PMU
Capacity Building – Workshop/ Training Expenses	Tranche 1: Four workshop per city @ 2 cities	$3,000	24,000	48,000	PMU
	Tranche 2: Four workshop per city @ 2 cities	$3000	24,000		PMU
Total				**2,51,000**	

VII. MONITORING AND REPORTING

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

93. DMSC will submit monthly monitoring and implementation reports to PIU, who will take follow-up actions, if necessary. PIU will submit the quarterly monitoring and implementation reports to PMU who will then submit to the PD. The PMU (with the help of DMSC) will submit

semi-annual monitoring reports to ADB. The suggested monitoring report format is in **Appendix 6**. Project budgets will reflect the costs of monitoring and reporting requirements. For projects 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.

94. For projects likely to have significant adverse environmental impacts, the EA will retain qualified and experienced external experts to verify its monitoring information[12]. The EA will document monitoring results, identify the necessary corrective actions, and reflect them in a corrective action plan. The EA, 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 EA.

95. ADB will review project performance against the EA'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.

[12] Experts not involved in day-to-day project implementation or supervision.

APPENDIX 1: DETAILS OF THE AUIIP COMPONENTS FOR EARF CONSIDERATION

A. Water Supply

1. The proposed subcomponents for the Guwahati water supply subproject include, (i) Construction of transmission clear water supply pipe lines and allied works at Guwahati, (ii) Construction of storage reservoirs of various capacities at 6 locations at Guwahati, approach road and allied works, (iii) Design, Build and operation (DBO) of Intake works, Raw water rising man, 98 MLD WTP, clear water pumping station and associated works at Guwahati, (iv) Distribution pipelines in South-East zone, and (v) supply of water meters.

1. The primary source of water for Guwahati is the Brahmaputra River which has a flow of about 4,500 cubic meters per second. Raw water is drawn from various intake points along the river and supplied after treatment to the other zones. The civil works for the water intake and WTP will be limited on approximately 4.8 ha of land earmarked specifically for the subproject. The sites will be fenced and secured prior to construction work and no other further infrastructure development will be allowed to prevent encroachments.

2. The clear water reservoirs will be constructed on a maximum of 0.8 ha of land. Construction, sites have been selected for six numbers of Ground Level Service Reservoirs (GLSR) of different capacities (2.8 to 17 million litter) at Gopal Nagar, North Jyotinagar, Kenduguri, Jonaki Nagar, Naba Jyotinagar and Basistha. The sites will be fenced and secured prior to construction works.

3. As far as possible, the transmission mains and feeder mains will follow the alignment within the existing ROWs of lanes/roads in densely populated areas. Pipelines following road alignment will be buried in trenches with minimum of 1 meter (m) clear cover within the ROW, on or adjacent to the road

4. Water distribution package will be considered in Tranche 2 to cover south east zone of Guwahati.

B. Storm Water Drainage

5. Poor drainage in Dibrugarh is an age-old problem. The entire drainage system is based on the Dibrugarh Town Protection (DTP) drain constructed in 1955-56. Encroachment and siltation of this primary drain plus dumping of garbage has made the drain incapable of effectively draining the town. With an ineffective primary drain, the connecting secondary and tertiary drainage systems become in-operative with resultant public health. DTP drain started at Jalan Nagar, it originally had an outfall at Naharani/ VBogibeel area with a length of 22.4 km. But, due to siltation at the mouth of the drain it was later linked with the Laura Jamira drain which ultimately discharges to the Sessa river that eventually flows into the Brahmaputra. Total length of the drain, including the Laura Jamira drain, is 32 km.

6. Under AUIIP sub project “Construction of DTP Drain, Box Culverts and allied Works in Dibrugarh from Chainage 0 to 9500 M” has been considered under Tranche 1. In Tranche 2 DTP drain outfall, secondary drainage and allied works in Dibrugarh.

7. Also under Tranche 2 funding Improved Drainage System for South Guwahati will be taken up.

C. Solid Waste Management

8. The proposed subcomponents for the Dibrugarh solid waste management subproject include: (i) supply of equipment and vehicles for solid waste collection and transportation; and (ii) construction of treatment and disposal site.

9. **Supply of equipment and vehicles for solid waste collection and transportation.** Solid wastes will be segregated at source and collection will be expanded to unapproachable areas and slums, commercial areas and markets. The collection efficiencies will be improved through setting up of program for house to house collection of waste, selection of agency for collection, and decision on charges.

10. **Solid waste treatment and disposal site.** In conformance to the MSW Rules, sanitary landfilling will be adopted in Dibrugarh. The subproject will include a sanitary landfill, compost plant, and associated facilities such as Compound wall, weighbridge, administrative offices, collection bins, and garage/workshop facility. The landfill will be strictly for inert and rejects from the compost plant. The proposed landfill site is considered in 30-ha land in Ghoramara Village of Dibrugarh.

APPENDIX 2: CENTRAL POLLUTION CONTROL BOARD APPLICABLE ENVIRONMENTAL STANDARDS

General Standards for Discharge of Environmental Pollutants: Effluents

S. No	Parameter	Standards			
		Inland surface	Public sewer	Land of irrigatio	Marine/coastal areas
	(a)	(b)	(c)	(d)	
1.	Colour and odour	remove as far as practicable			
2.	Suspended solids mg/L max.	100	600	200	(a) For process waste water100 (b) For cooling water effluent 10% above total suspended matter
3.	Particle size of suspended solids	shall pass 850 microns IS Sieve			(a)Floatable solids, max. 3mm. (b)Settable solids (max 850 micron)
4.	pH value	5.5. to 9.0	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
5.	Temperature	shall not exceed 5^0C above the receiving water			shall not exceed 5^0C above the receiving water temperature
6.	Oil and grease, mg./l, max.	10	20	10	20
7.	Total residual chlorine, mg/L max.	1.0			1.0
8.	Ammonical nitrogen (as N.) mg/L max	50	50		50
9.	Total Kjeldahl Nitrogen (as NH_3) mg/L max	100			100
10.	Free ammonia (as NH_3), mg/L max	5.0			5.0
11.	Biochemical oxygen demand (3 days at 27^0C), mg/L max.	30	350	100	100
12.	Chemical oxygen demand, mg/L, max.	250			250
13.	Arsenic (as As) mg/L,	0.2	0.2	0.2	0.2
14.	Mercury (As Hg), mg/L, max.	0.01	0.01		0.01
15.	Lead (as Pb) mg/L, max	0.1	1.0		2.0
16.	Cadmium (as Cd) mg/L max	2.0	1.0		2.0
17.	Hexavalent chromium (as Cr. +6).	0.1	2.0		1.0
18.	Total Chromium (as Cr) mg/L, max	2.0	2.0		2.0
19.	Copper (as Cu) mg/L, max	3.0	3.0		3.0

S. No	Parameter	Standards			
		Inland surface	Public sewer	Land of irrigatio	Marine/coastal areas
	(a)	(b)	(c)	(d)	
20.	Zinc (as Zn) mg/L, max	5.0	15		15
21.	Selenium (as Se) mg/L, max	0.05	0.05		0.05
22.	Nickel (as Ni) mg/L, max	3.0	3.0		5.0
23.	Cyanide (as CN) mg/L, max	0.2	2.0	0.2	0.2
24.	Fluoride (as F) mg/L,	2.0	15		15
25.	Dissolved phosphates (as P)	5.0			
26.	Sulfide (as S) mg/L, max	2.0			5.0
27.	Phenolic compounds (as	1.0	5.0		5.0
28.	Radioactive materials: (a)Alfa emitters microcurie/ml, max. (b)Beta emitters micro curie/ml, max.	10^{-7} 10^{-6}	10^{-7} 10^{-6}	10^{-8} 10^{-7}	10^{-7} 10^{-6}
29.	Bio-assay test	90% Survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent
30.	Manganese (as Mn)	2 mg/L	2 mg/L		2 mg/L
31.	Iron (as Fe)	3 mg/L	3 mg/L		3 mg/L
32.	Vanadium (as V)	0.2 mg/L	0.2 mg/L		0.2 mg/L
33.	Nitrate Nitrogen	10 mg/L			20 mg/L

These standards shall be applicable for industries, operations or process other than those industries operations or process for which standards have been specified in schedule of the Environment Protection Rules, 1989.

Central Pollution Control Board Primary Water Quality Criteria

Designated-Best-Use	Class of Water	Criteria
Drinking Water Source without conventional treatment but after disinfection	**A**	Total Coliform Organisms: MPN 50 per 100Ml 6.5 pH 8.5 Dissolved Oxygen: 6 mg/L Biochemical Oxygen Demand (5 days @
Outdoor bathing (organized)	**B**	Total Coliform Organisms: MPN 500 per 100mL 6.5 pH 8.5 Dissolved Oxygen: 5 mg/L Biochemical Oxygen Demand (5 days @ 20°C): 3 mg/L
Drinking water sources after conventional treatment and disinfection	**C**	Total Coliform Organisms: MPN 5000 per 100mL 6 pH 9 Dissolved Oxygen: 4 mg/L Biochemical Oxygen Demand (5 days @ 20°C): 3 mg/L
Propagation of wildlife and fisheries	**D**	❖ 6.5 pH 8.5 ❖ Dissolved Oxygen: 4 mg/L ❖ Free ammonia (as N): 1.2 mg/L
Irrigation, industrial cooling, controlled waste disposal	**E**	pH 8.5 Electrical conductivity at 25°C: 2250 micro mhos/cm Sodium absorption ratio: Max 26 Boron: Max 2 mg/L

Indian Standards for Drinking Water - Specification (BIS 10500: 1991)

Sl. No	Substance or Characteristic	Requirement (Desirable Limit)	Permissible Limit in the absence of Alternate source
Essential characteristics			
1.	Colour, (Hazen units, Max)	5	25
2.	Odour	Unobjectionable	Unobjectionable
3.	Taste	Agreeable	Agreeable
4.	Turbidity (NTU, Max)	5	10
5.	pH Value	6.5 to 8.5	No Relaxation
6.	Total Hardness (as $CaCo_3$) mg/L., Max	300	600
7.	Iron (as Fe) mg/L Max	0.3	1.0
8.	Chlorides (as Cl) mg/L, Max.	250	1000
9.	Residual, free chlorine, mg/L, Min	0.2	--
			Desirable Characteristics
10.	Dissolved solids mg/L, Max	500	2000
11.	Calcium (as Ca) mg/L, Max	75	200
12.	Magnesium (as Mg)mg/L, Max.	30	100
13.	Copper (as Cu) mg/L, Max	0.05	1.5
14.	Manganese (as Mn)mg/L, Max	0.10	0.3
15.	Sulfate (as SO_4) mg/L, Max	200	400
16.	Nitrate (as NO_3) mg/L, Max	45	100

Sl. No	Substance or Characteristic	Requirement (Desirable Limit)	Permissible Limit in the absence of Alternate source
17.	Fluoride (as F) mg/L, Max	1.0	1.5
18.	Phenolic Compounds (as C_6H_5OH) mg/L, Max.	0.001	0.002
19.	Mercury (as Hg)mg/L, Max	0.001	No relaxation
20.	Cadmiun (as Cd)mg/L, Max	0.01	No relaxation
21.	Selenium (as Se)mg/L, Max	0.01	No relaxation
22.	Arsenic (as As) mg/L, Max	0.05	No relaxation
23.	Cyanide (as CN) mg/L, Max	0.05	No relaxation
24.	Lead (as Pb) mg/L, Max	0.05	No relaxation
25.	Zinc (as Zn) mg/L, Max	5	15
26.	Anionic detergents (as MBAS) mg/L, Max	0.2	1.0
27.	Chromium (as Cr^{6+}) mg/L, Max	0.05	No relaxation
28.	Polynuclear aromatic hydro Carbons (as PAH) g/lit, Max	--	--
29.	Mineral Oil mg/L, Max	0.01	0.03
30.	Pesticides mg/L, Max	Absent	0.001
31	Radioactive Materials		
	i. Alpha emitters Bq/l, Max	--	0.1
	ii. Beta emitters pci/l, Max	--	1.0
32	Alkalinity mg/L. Max	200	600
33	Aluminium (as Al) mg/L, Max	0.03	0.2
34	Boron mg/L, Max	1	5

Ambient Air Quality Standards

Pollutant	Time Weighted Average	Industrial, Residential, Rural and Other Areas	Sensitive Area (Notified by Central Govt.)	Method of Measurement
ulphur Dioxide (SO_2)	Annual Average *	50 µg / m^3	20 µg / m^3	□ Improved West and Gaeke method
	24 hours Average**	80 µg/m^3	80 µg/m^3	□ Ultraviolet Fluorescence
Oxides of Nitrogen (NO_X)	Annual Average *	40 µg / m^3	30 µg / m^3	□ Jacobs and Hochheiser modified (NaoH – $NaAsO_2$) method
	24 hours Average**	80 µg/m^3	80 µg/m^3	□ Gas Chemiluminiscence
Particulate Matter (PM_{10}) (Size <10 µm)	Annual Average *	60 µg / m^3	60 µg / m^3	□ Gravimetric □ TOEM
	24 hours Average**	100 µg/m^3	100 µg/m^3	□ Beta Attenuation
Particulate Matter (PM 2.5) (Size <2.5 µm)	Annual Average *	40 µg / m^3	40 µg / m^3	□ Gravimetric □ TOEM
	24 hours Average**	60 µg/m^3	60 µg/m^3	□ Beta Attenuation
Ozone (O_3)	8 hours average **	100 µg/m^3	100 µg/m^3	□ UV photometric
	1 hour **	180 µg/m^3	180 µg/m^3	□ Chemiluminiscence □ Chemical method
Lead (Pb)	Annual Average *	0.5 µg / m^3	0.5 µg/m^3	□ AAS method after sampling using EPM 2000 or equivalent filter paper
	24 hours Average**	1.0 µg / m^3	1.0 µg/m^3	

Pollutant	Time Weighted Average	Industrial, Residential, Rural and Other Areas	Sensitive Area (Notified by Central Govt.)	Method of Measurement
Carbon Monoxide (CO)	8 hours Average** 1 hour **	2.0 mg/ m^3 4.0 mg/ m^3	2.0 mg/ m^3 4.0 mg/ m^3	Non Dispersive Infrared Spectroscopy
Ammonia (NH_3)	Annual Average * 24 hours Average**	100 µg / m^3 400 µg / m^3	100 µg / m^3 400 µg / m^3	Chemiluminiscence Indophenol blue method
Benzene (C_6H_6)	Annual Average *	5 ng/ m^3	5 ng/ m^3	Gas Chromatography continuous analyzer Adsorption and
Benzo(o)pyrene particulate phase only	Annual Average *	1 ng/ m^3	1 ng/ m^3	Solvent extraction followed by GC/HPLC analysis
Arsenic (As)	Annual Average *	6 ng/ m^3	6 ng/ m^3	AAS/ICP method after sampling using EPM 2000 or
Nickel (Ni)	Annual Average *	20 ng/ m^3	20 ng/ m^3	AAS/ICP method after sampling using EPM 2000 or equivalent filter paper

Notes:

1. *Indicate Annual Arithmetic Mean of Minimum 104 measurement in a year measured twice a week, 24 hourly at uniform intervals.
2. **24 hourly / 8 hourly/1 hourly values should be met 98% of the time in a year. However, 2% of the time, it may exceed by not on two consecutive days.

Source: Central Pollution Control Board, New Delhi, Notification dated 18th November 2009).

Standards for Diesel Generator Sets: Stack Height

The minimum height of stack to be provided with each generator set can be worked out using the following formula:

H = h+0.2x ÖKVA

H = Total height of stack in metre

h = Height of the building in metres where the generator set is installed

KVA = Total generator capacity of the set in KVA

Based on the above formula the minimum stack height to be provided with different range of generator sets may be categorized as follows:

For Generator Sets	Total Height of stack in metre
50 KVA	Ht. of the building + 1.5 metre
50-100 KVA	Ht. of the building + 2.0 metre
100-150 KVA	Ht. of the building + 2.5 metre
150-200 KVA	Ht. of the building + 3.0 metre
200-250 KVA	Ht. of the building + 3.5 metre
250-300 KVA	Ht. of the building + 3.5 metre

Similarly, for higher KVA ratings a stack height can be worked out using the above formula.

Noise Standards

Noise limits for domestic appliances and construction equipment at the manufacturing stage in dB(A).

Window air conditioners of 1 -1.5 ton	68
Air coolers	60
Refrigerators	46
Diesel generator for domestic purposes	85
Compactors (rollers), front loaders, concentrate mixers, cranes (movable),	75

National Ambient Noise Standards
The Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area	Limit in dB(A) Leq*	
		Day Time	Night
A.	Industrial	75	7
B.	Commercial area	65	5
C.	Residential area	55	4
D.	Silence	50	4

Note-1 Day time is reckoned in between 6 a.m. and 10 p.m.

Note-2 Night time is reckoned in between 10 p.m. and 6 a.m.

Note-3 Silence zone is an area comprising not less than 100 m around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority

Note-4 Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

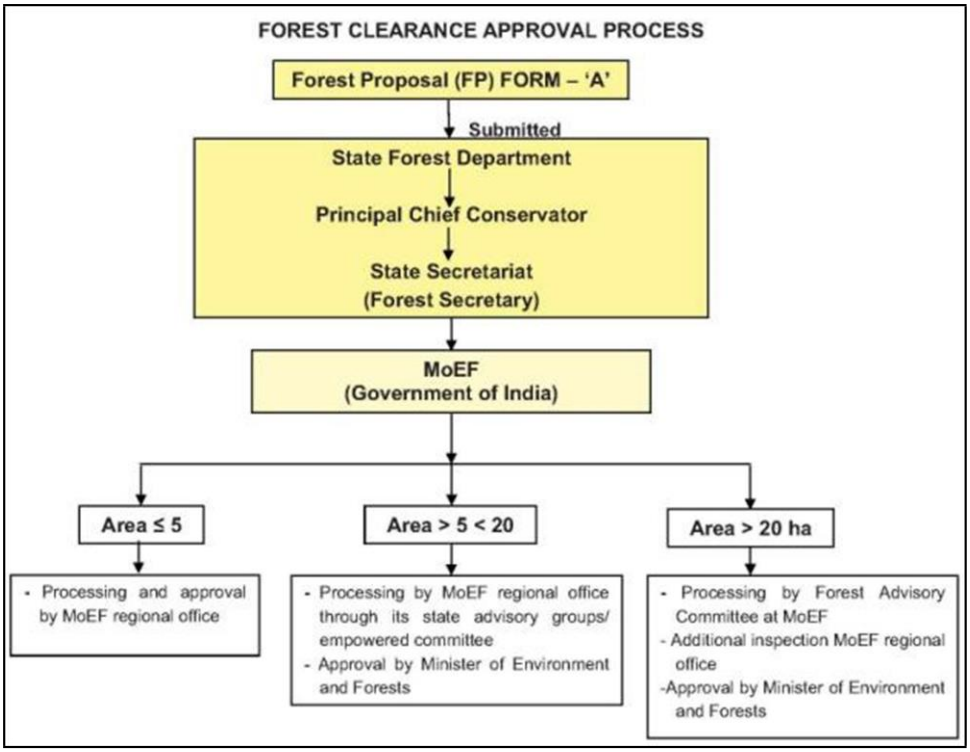
* dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

A “decibel” is a unit in which noise is measured.

“A”, in dB(A) Leq, denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.

Leq: It is an energy mean of the noise level over a specified period.

APPENDIX 3: SUMMARY OF PROCESS FOR OBTAINING FOREST CLEARANCE
Diversion of Forest Lands to Non-Forest Use



Step	Action Required	Remarks
STEP 1	Identification of Forest Area Involved (Location of Project) For selection of optimum proposal, the following criteria should be taken into consideration: a) any monument of cultural or historical importance is not affected by the project; b) the proposed alignment of the project line does not create any threat to the survival of any community with special reference to Tribal Community; c) the proposed alignment of the project does not affect any public utility services such as playgrounds, schools and other establishments; d) the alignment of the project does not pass through any sanctuaries, National Park, Biosphere reserves or eco-sensitive zones; and e) the alignment of the project does not infringe with area of natural resources.	Selection of forest area involved is undertaken in close consultation of the project proponent with representatives from the State forest departments and the Department of Revenue.
STEP 2	Submission of Application Form After finalization of forest area involved for project location, applicant submits details in prescribed proforma to the respective Divisional Forest Officer (DFO) /Nodal Officer (Forest) of concerned State Government.	Application Form to be prepared by project proponent. If the forest is rich in wildlife, then the Chief Wildlife Warden also

Step	Action Required	Remarks
		gets a detailed assessment report prepared including measures to protect the wildlife, which is submitted with the proposal.
STEP 3	Formulation of Compensatory Afforestation DFO/Nodal Officer forwards the application form and details to the concerned DFO/Conservator of Forest. Applicant provides undertaking/ certificate to meet the cost of compensatory afforestation and the Net Present Value of forestland diverted.	Forest authorities survey the relevant forest area required for the construction of project under the possible alternatives. Then conduct a cost-benefit analysis to assess the loss of forest produce, loss to environment vis-à-vis benefits of project. Compensatory Afforestation (CA) scheme is prepared to compensate loss of vegetation. For CA, the forest authorities identify degraded forestland of twice the area of affected land.
STEP 4	Project proponent provides undertaking/ certificate to meet the cost of compensatory afforestation and the Net Present Value of forestland diverted.	
STEP 5	Approval of proposal The proposal is submitted to the state forest department and then forwarded to the principal chief conservator of forests in the state and finally to the state secretariat.	To facilitate speedy approval of forest proposal involving lesser area, Ministry of Environment and Forests had established Regional Offices in each region for processing and approving these proposals. As per the amended Forest (Conservation) Rules in force now, the Regional Chief Conservator of Forests have the powers to decide proposals involving forest land up to 5 hectares. Proposals involving forest land between 5 to 40 hectares shall be processed by the Regional Chief Conservator consultation with a State Advisory

Step	Action Required	Remarks
		Group consisting of representatives of the concerned State Government.

APPENDIX 4: ADB RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLISTS

REA Checklist for Water Supply Subprojects:

Instructions:

(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (SDES) for endorsement by the Director, SDES and for approval by the Chief Compliance Officer.

(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.

(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:

Sector Division:

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area…			
▪ Densely populated?			
▪ Heavy with development activities?			
▪ Adjacent to or within any environmentally sensitive areas?			
• Cultural heritage site			
• Protected Area			
• Wetland			
• Mangrove			
• Estuarine			
• Buffer zone of protected area			
• Special area for protecting biodiversity			
• Bay			

Screening Questions	Yes	No	Remarks
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?			
▪ impairment of historical/cultural monuments/areas and loss/damage to these sites?			
▪ hazard of land subsidence caused by excessive ground water pumping?			
▪ social conflicts arising from displacement of communities?			
▪ conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?			
▪ unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents)?			
▪ delivery of unsafe water to distribution system?			
▪ inadequate protection of intake works or wells, leading to pollution of water supply?			
▪ over pumping of ground water, leading to salinization and ground subsidence?			
▪ excessive algal growth in storage reservoir?			
▪ increase in production of sewage beyond capabilities of community facilities?			
▪ inadequate disposal of sludge from water treatment plants?			
▪ inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances and protect facilities?			
▪ impairments associated with transmission lines and access roads?			
▪ health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.			

Screening Questions	Yes	No	Remarks
▪ 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?			
▪ dislocation or involuntary resettlement of people?			
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			
▪ noise and dust from construction activities?			
▪ increased road traffic due to interference of construction activities?			
▪ continuing soil erosion/silt runoff from construction operations?			
▪ 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 residuals in distribution systems?			
▪ delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?			
▪ accidental leakage of chlorine gas?			
▪ excessive abstraction of water affecting downstream water users?			
▪ competing uses of water?			
▪ increased sewage flow due to increased water supply			
▪ 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)?			
▪ social conflicts if workers from other regions or countries are hired?			

Screening Questions	Yes	No	Remarks
▪ 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?			
▪ 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?			

A Checklist for Preliminary Climate Risk Screening

Country/Project Title:

Sector:

Subsector:

Division/Department:

Screening Questions		Score	Remarks[13]
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?		
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc.)?		
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?		
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?		
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?		

Options for answers and corresponding score are provided below:

[13] If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High): _____

Other Comments:

_____
_____

Prepared by: _____

REA Checklist for Solid Waste Management Subprojects:

Instructions:

(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by the Director, RSES and for approval by the Chief Compliance Officer.

(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.

(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:

Sector Division:

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area…			
▪ Densely populated?			
▪ Heavy with development activities?			
▪ Adjacent to or within any environmentally sensitive areas?			
• Cultural heritage site			

Screening Questions	Yes	No	Remarks
• Protected Area			
• Wetland			
• Mangrove			
• Estuarine			
• Buffer zone of protected area			
• Special area for protecting biodiversity			
• Bay			
B. Potential Environmental Impacts Will the Project cause…			
▪ impacts associated with transport of wastes to the disposal site or treatment facility			
▪ impairment of historical/cultural monuments/areas and loss/damage to these sites?			
▪ degradation of aesthetic and property value loss?			
▪ nuisance to neighboring areas due to foul odor and influx of insects, rodents, etc.?			
▪ dislocation or involuntary resettlement of people?			
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			
▪ risks and vulnerabilities related occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?			
▪ public health hazards from odor, smoke from fire, and diseases transmitted by flies, insects, birds and rats?			
▪ deterioration of water quality as a result of contamination of receiving waters by leachate from land disposal system?			
▪ contamination of ground and/or surface water by leach ate from land disposal system?			
▪ land use conflicts?			

Screening Questions	Yes	No	Remarks
▪ pollution of surface and ground water from leach ate coming from sanitary landfill sites or methane gas produced from decomposition of solid wastes in the absence of air, which could enter the aquifer or escape through soil fissures at places far from the landfill site?			
▪ inadequate buffer zone around landfill site to alleviate nuisances?			
▪ road blocking and/or increased traffic during construction of facilities?			
▪ noise and dust from construction activities?			
▪ temporary silt runoff due to construction?			
▪ hazards to public health due to inadequate management of landfill site caused by inadequate institutional and financial capabilities for the management of the landfill operation?			
▪ emission of potentially toxic volatile organics from land disposal site?			
▪ surface and ground water pollution from leach ate and methane gas migration?			
▪ loss of deep-rooted vegetation (e.g. tress) from landfill gas?			
▪ explosion of toxic response from accumulated landfill gas in buildings?			
▪ contamination of air quality from incineration?			
▪ public health hazards from odor, smoke from fire, and diseases transmitted by flies, rodents, insects and birds, etc.?			
▪ health and safety hazards to workers from toxic gases and hazardous materials in the site?			
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ social conflicts if workers from other regions or countries are hired?			

Screening Questions	Yes	No	Remarks
▪ 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 construction and operation?			
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components (e.g., landfill or incinerator) 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?			

A Checklist for Preliminary Climate Risk Screening

Country/Project Title:

Sector:

Subsector:

Division/Department:

Screening Questions		Score	Remarks[14]
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?		
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc.)?		
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?		
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?		
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?		

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High): _____

Other Comments:

_____

_____

Prepared by: _____

[14] If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

REA Checklist for General Urban Development Subprojects:

Instructions:

(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (SDES) for endorsement by the Director, SDES and for approval by the Chief Compliance Officer.

(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.

(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:

Sector Division:

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area…			
▪ Densely populated?			
▪ Heavy with development activities?			
▪ Adjacent to or within any environmentally sensitive areas?			
• 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…			

Screening Questions	Yes	No	Remarks
▪ impacts on the sustainability of associated sanitation and solid waste disposal systems and their interactions with other urban services.			
▪ deterioration of surrounding environmental conditions due to rapid urban population growth, commercial and industrial activity, and increased waste generation to the point that both manmade and natural systems are overloaded and the capacities to manage these systems are overwhelmed?			
▪ degradation of land and ecosystems (e.g. loss of wetlands and wild lands, coastal zones, watersheds and forests)?			
▪ dislocation or involuntary resettlement of people?			
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable group?			
▪ degradation of cultural property, and loss of cultural heritage and tourism revenues?			
▪ occupation of low-lying lands, floodplains and steep hillsides by squatters and low-income groups, and their exposure to increased health hazards and risks due to pollutive industries?			
▪ water resource problems (e.g. depletion/degradation of available water supply, deterioration for surface and ground water quality, and pollution of receiving waters?			
▪ air pollution due to urban emissions?			
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical and biological hazards during project construction and operation?			
▪ road blocking and temporary flooding due to land excavation during rainy season?			
▪ noise and dust from construction activities?			
▪ traffic disturbances due to construction material transport and wastes?			
▪ temporary silt runoff due to construction?			

Screening Questions	Yes	No	Remarks
▪ hazards to public health due to ambient, household and occupational pollution, thermal inversion, and smog formation?			
▪ water depletion and/or degradation?			
▪ overpaying of ground water, leading to land subsidence, lowered ground water table, and salinization?			
▪ contamination of surface and ground waters due to improper waste disposal?			
▪ pollution of receiving waters resulting in amenity losses, fisheries and marine resource depletion, and health problems?			
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ social conflicts if workers from other regions or countries are hired?			
▪ 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?			
▪ 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?			

A Checklist for Preliminary Climate Risk Screening

Country/Project Title:

Sector:

Subsector:

Division/Department:

Screening Questions	Score	Remarks[15]

[15] If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters

Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?		
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc.)?		
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?		
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?		
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?		

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High): _____

Other Comments:

_____

_____

Prepared by: _____

and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

APPENDIX 5: SAMPLE GRIEVANCE REGISTRATION FORM

(To be available in Hindi, Urdu and Other Local Language, if any)

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.

Should 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)	
If ver: ▪ **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 6: ENVIRONMENTAL MONITORING REPORT FORMAT

Introduction

- Overall project description and objectives
- Environmental category as per ADB Safeguard Policy Statement, 2009
- Environmental category of each subproject as per national laws and regulations
- Project Safeguards Team

Name	Designation/Office	Email Address	Contact Number	Roles
1. PMU				
2. PIUs				
3. Consultants				

- Overall project and sub-project progress and status
- Description of subprojects (package-wise) and status of implementation (preliminary, detailed design, on-going construction, completed, and/or O&M stage)

Package Number	Components/ List of Works	Contract Status (specify if under bidding or contract awarded)	Status of Implementation (Preliminary Design/Detailed Design/On-going Construction/Completed/O&M)[16]	If On-going Construction	
				%Physical Progress	Expected Completion Date

[16] If on-going construction, include %physical progress and expected date of completion

Compliance status with National/State/Local statutory environmental requirements[17]

Package No.	Subproject Name	Statutory Environmental Requirements[18]	Status of Compliance[19]	Validity if obtained	Action Required	Specific Conditions that will require environmental monitoring as per Environment Clearance, Consent/Permit to Establish[20]

- **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 plan (refer to EMP TaBLES in APPROVED IEE/S)

- Confirm if IEE/s require contractors to submit site-specific EMP/construction EMPs. If not, describe the methodology of monitoring each package under implementation.

Package-wise IEE Documentation Status

Package Number	Final IEE based on Detailed Design				Site-specific EMP (or Construction EMP) approved by Project Director? (Yes/No)	Remarks
	Not yet due (detailed design not yet completed)	Submitted to ADB (Provide Date of Submission)	Disclosed on project website (Provide Link)	Final IEE provided to Contractor/s (Yes/No)		

- For each package, provide name/s and contact details of contractor/s' nodal person/s for environmental safeguards.

[17] All statutory clearance/s, no-objection certificates, permit/s, etc. should be obtained prior to award of contract/s. Attach as appendix all clearance obtained during the reporting period. If already reported, specify in the "remarks" column.
[18] Specify (environmental clearance? Permit/consent to establish? Forest clearance? Etc.)
[19] Specify if obtained, submitted and awaiting approval, application not yet submitted
[20] *Example: Environmental Clearance requires ambient air quality monitoring, Forest Clearance/Tree-cutting Permit requires 2 trees for every tree, etc.*

Package-wise Contractor/s' Nodal Persons for Environmental Safeguards

Package Name	Contractor	Nodal Person	Email Address	Contact Number

- With reference to approved EMP/site-specific EMP/construction EMP, complete the table below

Summary of Environmental Monitoring Activities (for the Reporting Period)[21]

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						

[21] Attach Laboratory Results and Sampling Map/Locations

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

- Briefly describe 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)

- Discuss the general condition of surroundings at the project site, with consideration of the following, whichever are applicable:
    - Confirm if any dust was noted to escape the site boundaries and identify dust suppression techniques followed for site/s.
    - Identify if muddy water is escaping site boundaries or if muddy tracks are seen on adjacent roads.
    - Identify type of erosion and sediment control measures installed on site/s, condition of erosion and sediment control measures including if these are intact following heavy rain;
    - Identify designated areas for concrete works, chemical storage, construction materials, and refueling. Attach photographs of each area in the Appendix.
    - Confirm spill kits on site and site procedure for handling emergencies.
    - Identify any chemical stored on site and provide information on storage condition. Attach photograph.
    - Describe management of stockpiles (construction materials, excavated soils, spoils, etc.). Provide photographs.
    - Describe management of solid and liquid wastes on-site (quantity generated, transport, storage and disposal). Provide photographs.
    - Provide information on barricades, signages, and on-site boards. Provide photographs in the Appendix.
    - Indicate if there are any activities being under taken out of working hours and how that is being managed.

- Briefly discuss the basis for environmental parameters monitoring.
- Indicate type of environmental parameters to be monitored and identify the location.
- Indicate the method of monitoring and equipment 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.
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

- **GRIEVANCE REDRESS MECHANISM**

- Provide information on establishment of grievance redress mechanism and capacity of Grievance Redress Committee to address project-related issues/complaints. Include as appendix Notification of the GRM (town-wise if applicable).

- **COMPLAINTS RECEIVED DURING THE REPORTING PERIOD**

- Provide information on number, nature, and resolution of complaints received during reporting period. Attach records as per GRM in the approved IEE. Identify safeguards team member/s involved in the GRM process. Attach minutes of meetings (ensure English translation is provided).

- **SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS**

- Summary of follow up time-bound actions to be taken within a set timeframe.

- **APPENDIXES**

- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection report
- all supporting documents including **signed** monthly environmental site inspection reports prepared by consultants and/or contractors
- Others