Environmental Assessment and Review Framework

Project Number: 47176
July 2017

Proposed Multitranche Financing Facility
India: Delhi Water Supply Improvement Investment Program

Prepared by the Delhi Jal Board for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 18 July 2017)

Currency Unit	–	Indian Rupees (INR)
INR1.00	=	$ 0.01555
$1.00	=	INR 64.2835

ABBREVIATIONS

ADB	–	Asian Development Bank
ASI	–	Archeological Survey of India
AP	–	Affected Persons
CPPI	–	consultation and participation plan implementation
CCL	–	Chief Commissioner of Labour
CFE	–	Consent for Establishment
CFO	–	Consent for Operation
DJB	–	Delhi Jal Board
DoF	–	Department of Forest
DoL	–	Department of Labour
DPCC	–	Delhi Pollution Control Committee
DWSIIP	–	Delhi Water Supply Improvement Investment Program
EA	–	executing agency
EAC	–	Expert Appraisal Committee
EARF	–	Environmental Assessment and Review Framework
EC	–	Environmental Clearance
EIA	–	Environmental Impact Assessment
EHS	–	Environment, Health and Safety
EMP	–	environmental management plan
GNCTD	–	Government of the National Capital Territory of Delhi
GRM	–	Grievance redress mechanism
IA	–	Implementing agency
IEE	–	Initial environmental examination
IFC	–	International Finance Corporation
LARRA	–	Land Acquisition, Rehabilitation and Resettlement Authority
MFF	–	multitranche financing facility
MoEF	–	Ministry of Environment and Forest
NCTD	–	National Capital Territory of Delhi
NMA	–	National Monument Authority
PIU	–	Program Implementation Unit
PMC	–	project management consultancy
PMU	–	Program Management Unit
RF	–	Resettlement Framework
RPIA	–	resettlement plan implementation assistance
SO	–	Safeguards Officer
SPS	–	Safeguard Policy Statement
TOR	–	terms of reference
UGR	–	underground service reservoir
WHO	–	World Health Organization
WTP	–	water treatment plant

NOTES

(i) The fiscal year (FY) of the Government of India and its agencies ends on 31 March.
(ii) In this report, "$" refers to US dollars.

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APPENDIXES

I. INTRODUCTION

A. Overview of the Investment Program

1. The Delhi Water Supply Improvement Investment Program (DWSIIP) will complement past and ongoing efforts of the Government of National Capital Territory of Delhi (NCTD) to improve water supply services. DWSIIP will help achieve the NCTD Water Supply Master Plan objectives of reduced non-revenue water (NRW) and equitable access to water supply services. DWSIIP targets a complete improvement to water treatment, transmission and distribution network improvements to Wazirabad Water Treatment Plant (WTP) command area located in northern part of Delhi. It aims to benefit 2.64 million population in terms of 24x7 and quality supply of water.

2. DWSIIP will be implemented as a multi-tranche financing facility (MFF) having two tranches and with each tranche constituting a project loan. Table 1 provides the summary of civil works packages under DWSIIP. Figures 1 and 2 show the project area and Wazirabad WTP command area.

3. Project 1 will include (i) project management consultant (PMC); (ii) civil works package (DWSIIP/01) for distribution network improvement, including underground reservoir (UGR), clear water pumping station, district metering area (DMA) feeder mains and distribution pipes, bulk flow meters and house service connections for UGR command areas in C-02 (Chitranjan Das Park Jahangirpuri) and C-03 (Model Town); (iii) civil works package (DWSIIP/01) for distribution network improvement, including UGR, clear water pumping station, DMA feeder mains and distribution pipes, bulk flow meters and house service connections for UGR command areas in G-02 (Punjabi Bagh), H-07 (Shakur Basti) and H-08 (Lawrence Road); and (iii) civil works package (DWSIIP/04) for transmission mains and clear water pumping stations, and instrumentation and automation (SCADA). Project 2 DWSIIP will include (i) rehabilitation or construction of the Wazirabad WTP (Package No. DWSIIP/03); (ii) civil works package (DWSIIP/05) for distribution network improvement, including UGR, clear water pumping station, DMA feeder mains and distribution pipes, bulk flow meters and house service connections for UGR command areas in G-01 (Piragarhi), H-05 (Avantika), and H-06 (Pitampura); (iii) civil works package (DWSIIP/06) for distribution network improvement, including UGR, clear water pumping station, DMA feeder mains and distribution pipes, bulk flow meters and house service connections for UGR command areas in C-01 (Sanjay Gandhi Transport Nagar), P-09 (Burari-A) and P-10 (Burari Transport Planning Authority).

4. Project 2 will also support a PDF to enhance readiness of future investment projects by taking advance actions to prepare the projects. Specifically, the facility can be used for: (i) feasibility studies including techno economic assessments; (ii) surveys and investigations; (iii) engineering design of projects; (iv) preparation of bidding documents; (v) support for policy, regulatory, and governance reforms; and (vi) capacity building support to the government agencies.

Table 1: Summary of Works Packages

S. No	Package No	Description	Tranche
1	DWSIIP /01	Distribution Network Improvement in UGR Command Areas C-02 and C-03 Targeting Continuous Pressurized Water Supply and DMA Based NRW Reduction and Providing House Service Connections.	1
2	DWSIIP /02	Distribution Network Improvement in UGR Command Areas G-02, H-07 and H-08 Targeting Continuous Pressurized Water Supply and DMA Based NRW Reduction and Providing House Service Connections.	1

S. No	Package No	Description	Tranche
3	DWSIIP /03	Augmentation of water supply – Modernization and Operational Improvements of Wazirabad Water Treatment Plant, :	2
4	DWSIIP /04	Transmission System Improvements - Providing, Laying and Maintaining New DI Transmission Pipelines from Wazirabad WTP to Various UGRs and Providing, Installing and Maintaining SCADA System in 11 UGR Command Areas.	1
5	DWSIIP /05	Distribution Network Improvement in UGR Command Areas G-01, H-05 and H-06 Targeting Continuous Pressurized Water Supply and DMA Based NRW Reduction and Providing House Service Connections.	2
6	DWSIIP /06	Distribution Network Improvement in UGR Command Areas C-01, P-09 and P-10 Targeting Continuous Pressurized Water Supply and DMA Based NRW Reduction and Providing House Service Connections.	2

Figure 1: Location of the Investment Program Area in the NCTD

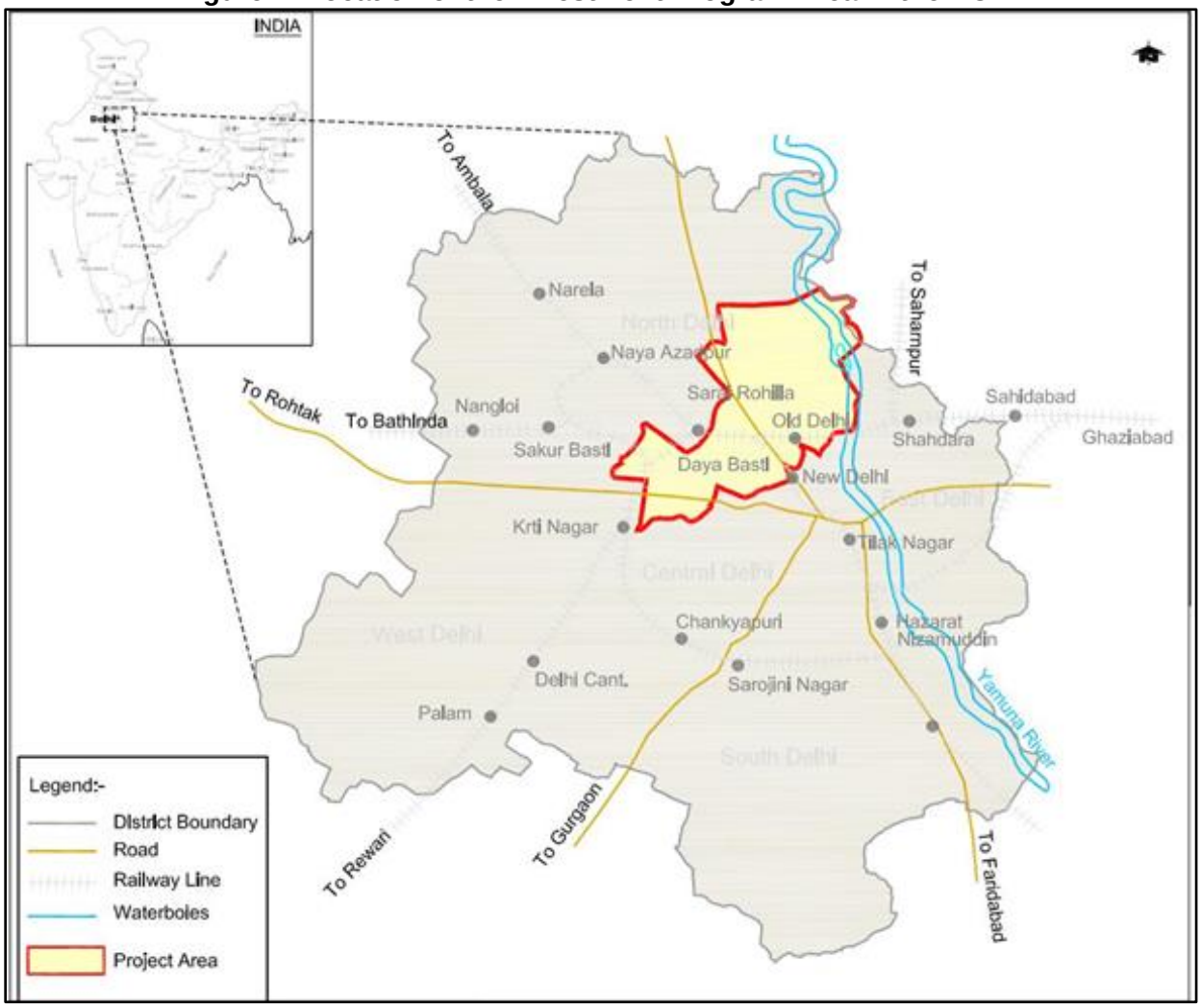
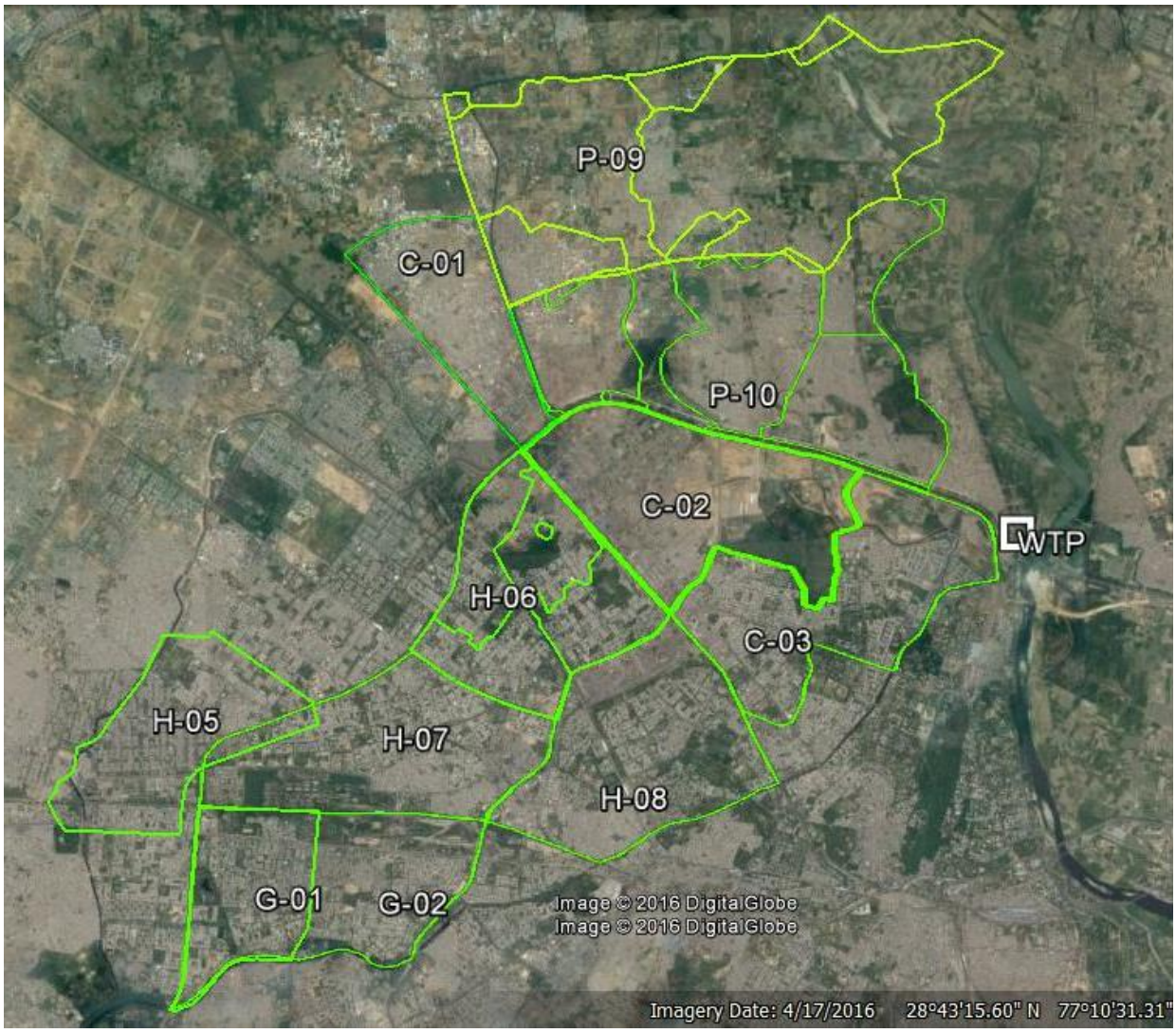


Figure 2: Underground Reservoir Command Areas & WTP



B. Impact, Outcome, and Outputs

5. The impact of the proposed investment program will be improved coverage, quality and continuity of urban water supply services in alignment with national, state and Delhi Jal Board (DJB) water supply service levels. The outcome will be improved access to reliable, continuous, and sustainable water services in the Wazirabad WTP command area. DWSIIP will have three outputs: (i) distribution network improved in the Wazirabad water treatment plant command area and functional DMAs established; (ii) water treatment and transmission system improved in the Wazirabad WTP command area; and (iii) institutional capacities for sustainable management of the DMAs and the program strengthened.

C. Implementation Arrangements

6. The DWSIIP will be carried out under the supervision of the GNCTD. The DJB has been appointed as the executing agency (EA) and will be responsible for the management, coordination and execution of all the activities funded under the MFF. DJB has established a Project Steering

Committee (PSC) headed by Member Water to provide overall guidance and strategic directions to the program. Program Management Unit (PMU), which headed by the Chief Engineer (Water Projects) will oversee program implementation and a Program Implementation Unit (PIU) has been established under the overall management of the PMU as the implementing agency (IA). The Project Manager of the be responsible for the day-to-day management and implementation.

7. The Project Manager will be an Executive Engineer (Civil) rank officer and will be supported by technical, financial, safeguards and administrative staff. The PIU staff will mostly be drawn from DJB, and if required, will also be seconded from the other government departments on deputation. The PIU will be assisted by a PMC in the implementation, management and monitoring of the investment program. The PMC will design the infrastructure, manage the tendering of contracts, supervise the construction process, assure the technical quality of design and construction, and provide advice/assistance on institutional capacity development. The PIU will appoint the contractors to build the infrastructure elements and will manage the construction and commissioning activities. The PIU will also appoint the CMRC to assist in program implementation.

8. For safeguards, a qualified Environmental/Civil Engineer of Assistant Engineer rank will be posted to the PIU and designated as the Safeguards Officer (SO). The SO will oversee the environmental and social safeguard tasks which include the preparation, implementation, monitoring and overall safeguard compliance by DWSIIP. PMC will support PIU in all safeguard activities during the implementation of DWSIIP.

D. Purpose of the Environmental Assessment and Review Framework

9. For MFFs with potential environmental impacts, ADB Safeguard Policy Statement, 2009 (SPS, 2009) requires preparation of an environmental assessment and review framework (EARF) to clarify safeguard principles and requirements governing screening and categorization, environmental assessment, and preparation and implementation of safeguard plans of components, projects and subprojects to be prepared after MFF approval.

10. ADB-financed projects must comply with SPS, 2009 and also with the borrower country's social and environmental laws including the international laws/conventions to which the country is a signatory. Specifically, ADB's SPS 2009 environment safeguard requirements are to ensure the environmental soundness and sustainability of projects and support the integration of environmental considerations into the project decision-making process.

11. This EARF seeks to establish screening, categorization, assessment and review procedures and methodologies to assist PMU and PIU in implementing environmental safeguards in DWSIIP. In particular, the purpose of the EARF includes:

- (i) categorization system to screen potential environmental impacts;
- (ii) identification of subprojects with potential and significant adverse environmental impacts;
- (iii) examination of national, state and local environmental laws and regulations applicable to DWSIIP;
- (iv) Guidance in undertaking meaningful consultations and information disclosure;
- (v) Guidance for PMU and PIU personnel in preparing and monitoring the implementation of initial environmental examinations (IEEs) and environmental management plans (EMPs);
- (vi) Guidance in monitoring and reporting including undertaking of corrective action where required;

(vii) Roles and responsibilities of the PMU, PIU and consultants in DWSIIP; and
(viii) Strengthens institutional capacity for safeguards compliance during the implementation.

12. **Environmental Category**. The scope of DWSIIP primarily concerns improvements to existing water supply infrastructure in Wazirabad WTP command area. Due to the nature and location of the components, DWSIIP is likely to have only small-scale, localized impacts on the environment which can be readily mitigated. The potential adverse environmental impacts are mainly related to the construction period, which can be minimized by applying mitigating measures and environmentally sound engineering and construction practices. DWSIIP has therefore been classified as Environmental Category B. No category A-type works (having significant impacts) will be considered in DWSIIP.

II. ASSESSMENT OF THE LEGAL FRAMEWORK AND INSTITUTIONAL CAPACITY

A. Environmental Legislation

13. Implementation of DWSIIP will be governed by environmental acts, rules, policies, and regulations of the Government of India and GNCTD. These regulations impose restrictions on development activities in order to minimize/mitigate likely impacts on the environment. Many of these are cross-sector and several of them are directly related to environmental issues. Appendix 1 details the salient features and applicability of acts, rules and regulations currently in force that could apply to DWSIIP. Table 2 presents the specific requirements applicable to DWSIIP subprojects. Appendix 2 includes environmental standards for air, surface water, groundwater, emissions, noise, vehicular exhaust and disposal to land/agricultural, use of sludge and bio-solids. Appendix 3 provides the applicable drinking water standards as per Indian and World Health Organization (WHO) drinking water guideline values.[1]

Table 2: Applicable Government of India Environmental Legislation and Specific Requirements for DWSIIP

Ref.	Legislation	Requirements
1.	National Environment Policy, 2006.	- DWSIIP should adhere to the National Environment Policy principle of "enhancing and conservation of environmental resources and abatement of pollution".
2.	EIA Notification, 2006.	- Environmental Clearance (EC) however DWSIIP subprojects are not included in the list of project requiring EC
3.	Water (Prevention and Control of Pollution) Act, 1974, amended 1988 and its Rules, 1975.	- Applicable for the construction and operation of the WTP; - Consent for establishment (CFE) and consent for operation (CFO) from the Delhi Pollution Control Committee (DPCC); - Compliance to conditions and disposal standards stipulated in the CFE and CFO.
4.	Air (Prevention and Control of Pollution) Act, 1981, amended 1987 and its Rules, 1982.	- Applicable for equipment and machinery's potential to emit air pollution (including but not limited to diesel generators and vehicles); - CFE and CFO from DPCC; - Compliance to conditions and emissions standards stipulated in the CFE and CFO.

[1] ADB SPS requires applying 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. When Government of India regulations differ from these levels or measures, DWSIIP will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of DWSIIP circumstances, DJB will provide full and detailed justification for any proposed alternatives that are consistent with ADB SPS requirements.

Ref.	Legislation	Requirements
		- DPCC also issues directions on need basis to control air pollution in Delhi. As per the direction dated 6-Nov-2016, and further amendments, operation of electricity generator sets run on diesel / petrol / kerosene of all capacities banned up to 28-Feb-2017 in Delhi
5.	Environmental (Protection) Act, 1986 amended 1991 and the following rules/notifications:	
5a.	Environment (Protection) Rules, 1986 including amendments.	- WTPs should be designed and operated with appropriate wastewater and sludge treatment and disposal facilities; - compliance with emission and disposal standards during construction.
5b.	Municipal Solid Wastes (Management and Handling) Rules, 2000.	- Solid waste generated at the proposed facilities shall be disposed of in accordance with the Rules.
5c.	Noise Pollution (Regulation and Control) Rules, 2000.	- Compliance with noise standards.
5d.	Environmental Standards of the Central Pollution Control Board.	- Compliance to environmental standards (discharge of effluents).
5e.	Notification of Eco Sensitive Zones.	- Restriction of activities (including construction, tree cutting, etc.) in the notified zones; - There are no eco sensitive zones in DWSIIP area.
5f	Notification on Groundwater Regulation and Management in Delhi, 2010	-Groundwater abstraction in NCT Delhi for any purpose (domestic, agriculture, commercial, industrial etc,) is subject to prior permission of competent authority (Delhi Jal Board) - Competent Authority deals with the permission through the Authorized Officer(Deputy Commissioner of the district) in respective jurisdictional revenue areas - Groundwater abstraction for the project – for supply or for construction requires prior permission - There is no proposal to use groundwater for the project; even during the construction, the contractor shall avoid groundwater usage for construction
5f	Wetland (Conservation and Management) Rules, 2010	- Applies to protected wetlands (Ramsar sites, wetlands in eco sensitive areas, United Nations Educational, Scientific and Cultural Organization heritage sites, in high altitudes and wetlands notified by the Government of India); - Prohibits/ regulates activities within and near the wetlands; - There are no Ramsar sites in DWSIIP area.
6.	Indian Wildlife (Protection) Act, 1972 amended 1993 and Rules 1995 Wildlife (Protection) Amendment Act, 2002	- Applicable to subprojects located within the core or buffer zone of protected areas (wildlife sanctuaries, national parks, biosphere reserves etc.); - Permission from the Chief Wildlife Warden/ State Wildlife Board/ National Board of Wildlife; -No protected areas are located in or close to DWSIIP area.
7.	Indian Forest Act, 1927	- Declaration of forest areas (reserved, protected and village forests), and regulation of activities within the forests; - Applicable to subprojects located in the forest lands.
8.	Forest (Conservation) Act, 1980 amendment 1988 and the following rules/notifications:	
8a.	Forest (Conservation) Rules, 1981 amended 1992 and 2003.	- Applicable to subprojects located in forest lands; - Prior permission for the use of forest land for program proposes is required from Ministry of Environment and Forest (MoEF).
8b.	Guidelines for diversion of forest lands for non-forest purpose.	- Approval of MoEF for any acquisition of forest land; - Applicable to subprojects located in forests; - Application for the use of forest land to be made to the Department of Forest (DoF), GNCTD; - Project proponent to identify non-forest land which is to be transferred to DoF for taking up afforestation program; - Net present value of the forest land to be used, cost of

Ref.	Legislation	Requirements
		afforestation, tree cutting, etc. to be paid to DoF.
9.	Ancient Monuments and Archaeological Sites and Remains Acts, 1958, its Rules,1959 and notification, 1992.	- Applicable to subprojects located in proximity of the protected monuments/ sites; - Notifies 100m around the monument as prohibited area and 100 to 300m as regulated area for construction works; - No excavation/construction work is allowed within 100m of the boundary of the protected monument; - Requires prior permission of Archaeological Survey of India (ASI) for taking works within 100-300m of the boundary of protected monuments.
10.	Contract Labour (Regulation and Abolition) Act, 1970; The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979.	- Applicable to all construction works under DWSIIP; - DJB to obtain a Certificate of Registration, Department of Labour (DoL), GNCTD as the principle employer; - Contractors to obtain license from the designated Labour Officer; - Contractors shall register with DoL, if Inter-state migrant workmen are engaged; - Adequate and appropriate amenities and facilities shall be provided to workers including housing, medical aid, traveling expenses to/from home etc.
11.	The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and the Cess Act of 1996.	- Applicable to any building or other construction work employing 10 or more workers; - Cess should be paid at a notified rate; - The employer is required to provide safety measures at the building or construction work and other welfare measures, such as canteens, first-aid facilities, ambulance, housing accommodation for workers near the workplace etc.; -The employer has to obtain a registration certificate from the Registering Officer.
12.	The Child Labour (Prohibition and Regulation) Act, 1986.	- No child labour shall be employed.
13.	Minimum Wages Act, 1948.	- Applicable to all construction works under DWSIIPDWSIIP - All construction workers should be paid not less than the prescribed minimum wage[2].
14.	Workmen Compensation Act, 1923.	- Compensation for workers in case of injury by accident.
15.	Equal Remuneration Act, 1979.	- Equal wages for work of equal nature to male and female workers.
16.	The Delhi Preservation of Trees Act, 1994.	-Imposes restrictions on the felling and removal of trees on any land in NCTD irrespective of land ownership; -Prior permission is required from the Tree Officer to cut/prune trees if necessary under DWSIIP; -Plant trees as per the direction of the Tree Officer.
17.	Delhi Wildlife (Protection) Rules, 1973.	-Notified under the Wildlife (Protection) Act, 1972; -Establishes wildlife advisory board, and provides rules for the hunting of wild animals, trade or commerce in wild animals, and animal articles.
18	Delhi Climate Change Agenda.	- Under the water component, the Agenda suggests alternative water supply source development; - energy efficiency design.
19.	Delhi Ancient and Historical Monuments and Archaeological Sites and Remains Act, 2004.	- An Act to provide for the preservation, protection, upkeep, maintenance, acquisition and regulation of, and control over, ancient and historical monuments and archaeological sites in Delhi; - Under the Act, State Government declares various monuments, sites etc. as protected monument/sites; - Requires prior permission of the Department of Archeology if the construction work is situated within 100m of any monument or if the site is declared as protected by the Government of NCTD under this Act; - Department provides conditional permission, including time for

[2] http://www.delhi.gov.in/wps/wcm/connect/doit_labour/Labour/Home/Minimum+Wages/

Ref.	Legislation	Requirements
		completion, procedures to be followed during the work and for chance finds etc.
20	The Delhi Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Rules, 2001.	- Applicable for all investment program construction activities - Rules stipulates hours of work, night work, welfare, payment of wages, registers and records, facilities to be provided, and safety and health - To be complied by program contractors during the construction, and registered with the DoL

14. Locating subproject facilities in forest lands will, wherever possible, be avoided. However, in unavoidable cases such as the non-availability of suitable non-forest lands, and water supply transmission/trunk distribution mains traversing forest lands, the forest land conversion will follow the "Guidelines for Diversion of Forest Lands for Non-Forest Purpose" under the Forest (Conservation) Act, 1980[3]. The proposal for conversion and compensatory afforestation should be submitted by the project proponent (DJB) to the DoF, Government of NCT of Delhi, which will then forward it to the MoEF for approval. The following guidelines will be adhered to in the process:

(i) An equivalent area of non-forest land will be made available for afforestation;
(ii) As far as possible, the non-forest land for compensatory afforestation should be identified contiguous to, or in the proximity of, a reserved forest or protected forest. If non-forest lands are not available in the same district, other non-forest land may be identified elsewhere in the State; and
(iii) Where non-forest lands are not available, compensatory afforestation may be carried out over degraded forest regions twice in extent to the area being diverted.

15. Conversion of forest lands that are part of national parks/sanctuaries and tiger reserve areas (notified under Indian Wildlife (Protection) Act, 1972) is not permitted. In exceptional cases, the State Government[4] requires the consent of the National Board for Wildlife and Central Empowered Committee of Supreme Court for obtaining wildlife clearance from MoEF. There is one protected area (Asola Bhatti wildlife sanctuary) located in southern part of the NCTD but it is far from DWSIIP area, which is located in northern part of the NCTD.

16. The cutting of trees in non-forest land, irrespective of land ownership, also requires permission from the Tree Authority. Afforestation to the extent of two trees per each tree felled is mandatory.

B. Government of India Environmental Assessment Procedures

17. The EIA Notification, 2006, sets out the requirements for environmental assessment in India. This states that prior EC is mandatory for the development activities listed in its schedule and must be obtained before any construction work or land preparation (except land acquisition) may commence. Projects are categorized as A or B depending on the scale of the project and the nature of its impacts:

(i) **Category A** projects require an EC from the MoEF. The proponent is required to provide preliminary details of the project in the prescribed form, after which an Expert Appraisal Committee (EAC) of the MoEF prepares comprehensive terms of reference (TOR) for the EIA study within 60 days. On completion of the study and

[3] (i) Forest land involving up to 5ha will cleared by MoEF Regional Office; and (ii) Forest land involving more than 5ha and up to 40ha will be cleared by the MoEF Regional Office after referring the case to Central MoEF.

[4] the program proponent can approach the National Board for Wildlife and the Central Empowered Committee only through the respective State Government.

review of the report by the EAC, MoEF considers the recommendation of the EAC and provides the EC if appropriate; and

(ii) **Category B** projects require EC from the State Environment Impact Assessment Authority. The State-level EAC categorizes the project as either B1 (requiring an EIA study) or B2 (no EIA study), and prepares the TOR for B1 projects within 60 days. On completion of the study and review of the report by the EAC, the State Environment Impact Assessment Authority issues the EC based on the EAC recommendation. The Notification also provides that any project or activity classified as category B will be treated as category A if it is located in whole, or in part, within 10km of the boundary of protected areas, notified areas or inter-state or international boundaries.

18. None of the proposed water supply infrastructure components under DWSIIP are included in the EIA Notification Schedule, and therefore EC is not required.

C. Applicable International Environmental Agreements / Conventions.

19. India is a party to various international agreements and conventions related to environment.

(i) 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 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.

(ii) 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. 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.

(iii) 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. 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. 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.

(iv) 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.

(v) Convention on the Transboundary Movements of Hazardous Wastes and Their Disposal, 1989. Convention to protect human health and the environment against the adverse effects of hazardous wastes. This aims at (i) reduction of hazardous waste generation, promotion of environmentally sound management (ii) restriction of transboundary movements, and (iii) a regulatory system for transboundary movements.

(vi) UN Convention to Combat Desertification (CCD):- Signed in 1994 and entered into force in 1996, this convention aims to combat the desertification and mitigate the effects of drought through national action programs that incorporate long-term strategies supported by international cooperation and partnership arrangements. As an impact of this treaty, the year 2006 was declared as "International Year of Deserts and Desertification" to spread awareness about the desert areas of the world and especially the problem of desertification.

(vii) The Convention on Biological Diversity. Commonly referred to as the Biodiversity Treaty, 1992, defines biodiversity as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems." Parties to the Biodiversity Treaty "affirm sovereign rights over the biological resources found within their countries, while accepting responsibility for conserving biological diversity and using biological resources in a sustainable manner".

(viii) United Nations Framework Convention for Climate Change. The UNFCCC objective is to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. India signed the UNFCCC in 1992 and ratified in 1993. The framework set no binding limits on greenhouse gas emissions for individual countries and contains no enforcement mechanisms. Instead, the framework outlines how specific international treaties (called "protocols" or "Agreements") may be negotiated to set binding limits on greenhouse gases. The Ministry of Environment and Forests is the nodal agency for climate change issues in India.

(ix) The Kyoto Protocol to the UNFCCC was adopted in 1997 that commits State Parties to reduce greenhouse gas emissions, based on the premise that (a) global warming exists and (b) human-made CO2 emissions have caused it. Developed countries and economies in transition listed in Annex B of the Protocol, to reduce their GHG emissions by an average of 5.2% below 1990 levels. Article 12 of the Kyoto Protocol provides for the Clean Development Mechanism (CDM). India acceded to the Kyoto Protocol in 2002. India has taken various initiatives to improve understanding of climate change, and comply with the requirements of the UNFCCC.

(x) Paris Agreement. The Paris Agreement to the UNFCCC deals with greenhouse gases emissions mitigation, adaptation and finance starting in the year 2020. The contribution that each individual country should make in order to achieve the worldwide goal are determined by all countries individually and called "nationally determined contributions" (NDCs). India signed convention in April 2016 and ratified in October 2016.

20. Except the treaties related to climate change (e.g. UNFCCC), none of the above agreements are linked to project development or operation due to the nature and location of DWSIIP. In compliance with the requirement of UNFCCC, DWSIIP will be designed, constructed and operated with consideration to reduction in greenhouse gas (GHG) emissions and that all infrastructure be built as climate resilient.

D. ADB Environmental Safeguard Policies

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

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

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

23. **Environmental Audit of Existing Facilities**. ADB SPS requires an environmental audit, if a subproject involves facilities and/or business activities that already exist or are under construction, including an on-site assessment to identify past or present concerns related to impacts on the environment. The objective of this compliance audit is to determine whether actions were in accordance with ADB's safeguard principles and requirements for borrowers/clients, and to identify and plan appropriate measures to address outstanding compliance issues.

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

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

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

26. **Clearances and permits**. ADB SPS requires compliance of all project activities with the national, state and local legislations, and that all statutory clearances, permits, consent etc., as required shall be obtained prior to invitation of bids/award of contract as applicable. Following are the indicative clearances / permissions requirements, and PIU shall review the requirements during project preparation, and built into implementation schedule. Delay in obtaining clearances will result in delay in implementation including cost overruns.

Table 3: Indicative Statutory Clearance Requirements

S. No	Subproject Component	Statutory Requirements	Applicable fee	Time required for obtaining clearance
1.	Water Treatment Plant (new / rehabilitation / augmentation)	- Consent for establishment prior to start of construction - consent for operation prior to start of operation - Submit online application https://www.dpcc.delhigovt.nic.in/indexdup.php/	INR 600,000 INR 600,000 per year (based on the estimated package cost of WTP)	45 days 30 days
2	For all components that require tree cutting / pruning	- prior permission from Tree Officer, Department of Environment and Forest, GNCTD -Application form and procedure is available at the following web link; http://delhi.gov.in/wps/wcm/connect/9288ae004f06d0c8aeb4bee1feedd58c/Procedure+for+obtaining+tree+cutting+permission.pdf?MOD=AJPERES&lmod=-1526989464&CACHEID=9288ae004f06d0c8aeb4bee1feedd58c	-	60 days
3	For all components located in the regulated zone of ASI protected monuments	-Prior permission from National Monument Authority (NMA) -Application available at following weblink http://www.nma.gov.in:8080/documents/10157/bdfcc912-4c2c-4d48-b612-712c20e400c4	-	90 days
4	Other clearances required for linear components (pipelines) based on the alignment location	- Permission from National Highway Authority of India, Municipal Corporation of Delhi, Public Works Department, Delhi Metro Rail Corporation, Irrigation & Flood Control Department etc., as the case may be.	-	-

27. **International best practice**. During the design, construction, and operation of the project PMU, PIU and DJB will be required to 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[5]. These standards contain performance levels and measures that are normally acceptable and applicable to projects. 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

[5] http://www.ifc.org/wps/wcm/connect/a99ab8804365b27aa60fb6d3e9bda932/EHS-Guidelines+101-Webinar.pdf?MOD=AJPERES

detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

Table 4: 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 5: 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

E. Institutional Capacity

1. PMU and PIU

28. The DJB, through the PIU, is responsible for preparing the EIA or IEE reports, monitoring of safeguards issues and overall compliance with the laws and regulations of Government of India, and GNCTD, in addition to compliance with ADB SPS 2009, and loan covenants.

29. Under the current government regulations, there is no need for the preparation of environmental assessment reports for water supply or sewerage projects, and therefore the capacity of DJB to deal with environmental assessment studies and the preparation of an EIA is limited. Review and monitoring of safeguard issues is currently limited to the operation of sewage treatment plants where DJB monitors compliance as per the disposal standards and other conditions laid out by the DPCC in its consent orders.

30. Consequently, at present, there is no institutional set-up within the DJB to specifically deal with environmental safeguard issues. However, it is worthwhile to note that DJB, to its credit, has initiated several activities in its day-to-day operations which are environmentally friendly and aimed at conserving and protecting environmental resources. These include: (i) generation, capture and supply of biogas from sewage treatment plants and its supply to households for usage; (ii) treated water reuse from sewage treatment plants; (iii) rain water harvesting; and (iv) tree plantation and the greening of DJB facilities. Furthermore, since the majority of DJB's works are conducted in densely populated areas and/or along busy roads, DJB has experience in implementing measures to minimize the disturbance and inconvenience to the public and traffic including public and worker safety. For instance, DJB has been employing trenchless technology for laying pipelines in busy areas to avoid construction impacts.

31. The existing technical staff of DJB includes civil engineers and laboratory chemists engaged in water and sewage treatment plants, laboratories, etc. DJB has the capability to conduct laboratory tests for water, wastewater and sludge quality.

32. Subsequent to completion and commissioning, DJB will be responsible for the operation and maintenance of the improved infrastructure, either directly or through private contracting agencies. During the operation phase, considering the nature of proposed projects, the impacts are likely to be minimal. An Environment, Health and Safety Officer will be part of the operating contractor's team.

2. Environmental Regulatory Agency

33. The DPCC is the main state-level regulatory agency responsible for environment protection and pollution control in the NCTD. However, the involvement of the DPCC in monitoring of the environmental safeguards of DWSIIP activities is limited to the WTPs. Only WTPs will require CFE and CFO from the DPCC. The DPCC will monitor compliance with consent conditions during the operation phase of the WTPs. Nevertheless, the DPCC mandate covers overall pollution control and DPCC deals with public complaints related to pollution and environmental degradation due to any activity including construction activities.

3. Capacity Needs

34. To comply with ADB SPS 2009, EA and IA need to have a sustained capacity to manage and monitor environmental safeguards. Therefore, the EA and IA require capacity building measures to develop a better understanding of the program-related environmental issues and to strengthen their role in the implementation of mitigation measures and subsequent monitoring. Training and awareness workshops are included in the program with the primary focus of enabling DJB and PIU staff to conduct impact assessments, update existing safeguard documents, carry out environmental monitoring and implement EMPs. After partaking in such activities, the participants will be able to make environmental assessments for subsequent subprojects, conduct monitoring of EMPs, understand government and ADB requirements for environmental

assessment, management, and monitoring (short and long-term), incorporate environmental features into future project designs, specifications, and tender/contract documents and carry out the necessary checks and balances during project implementation.

III. ANTICIPATED ENVIRONMENTAL IMPACTS

35. DWSIIP will finance improvements in water supply infrastructure and services management in the Wazirabad WTP command area. The primary focus is on the improvement, replacement and/or rehabilitation of the WTP, clear water pumping stations, transmission mains, UGRs, booster stations, distribution mains and customer connections, with a strong emphasis on minimizing system losses and improving the overall efficiency of the water supply system.

36. Once the subprojects and components are finalized, environmental impacts during design, pre-construction, construction, and operation will be reviewed and assessed for each works package. During construction and implementation, impacts on the physical environment such as water, air, soil, and noise, and on the biological environment, like flora and fauna and on the socio-economic environment, will be carefully monitored by DWSIIP environmental specialists.

37. The subprojects are primarily designed to improve environmental quality and living conditions of DWSIIP area through the provision of improved water supply services. The net environmental benefits will be positive and will include: (i) increased availability of potable water at an appropriate pressure; (ii) improved public health through the reduction of waterborne and infectious diseases, and (iii) improvement in environmental performance of the water supply service via reduction in water losses, energy conservation and more appropriate WTP liquid and sludge disposal.

38. The negative impacts of improving urban water supply infrastructure are mostly due to construction work, although the WTPs may also have operational impacts which will be managed through incorporation of environmental consideration early in the design and development of O&M manuals. It is therefore anticipated that the impacts will, in general, be temporary and of short duration.

39. The main construction impacts will relate to the invasive nature of trench excavation work for linear infrastructure (water pipelines) the majority of which will be buried within the road corridors in the Wazirabad command area. Most parts of Wazirabad are densely populated and the thoroughfares are congested with pedestrians, traffic and business activities. Impacts will primarily arise from the disturbance to residents (restricted access, interrupted services, noise and air quality), businesses, traffic and important buildings by the construction work, together with the need to dispose of large quantities of surplus soil. Under dry weather conditions, dust pollution from construction activities will be considerable.

40. These are common impacts of construction in urban areas and there are well developed methods for their mitigation including the preparation and implementation of traffic management plans in coordination of the contractors with the local police and the public. Occupational and community health and safety measures and other health and hygienic conditions, including careful handling of public utilities along with social aspects, will be considered, and impacts and mitigation measures elaborated on in the EMPs.

41. Construction of DWSIIP facilities is not expected to have major adverse impacts. The WTP will be built within the existing WTP compound, and for smaller facilities such as pumping stations

and underground reservoirs, the construction work will be confined to selected sites and will not interfere with the surrounding land use, except for the transport of materials and machinery.

42. Due to presence of asbestos cement pipes in the existing water supply system, there is a risk of workers and the public being exposed to carcinogenic dust if they are disturbed. It is therefore proposed that asbestos cement pipes will be left in the ground untouched and that the PIU should confirm the location of asbestos cement pipes prior to trench excavation. A further consideration is that the NCT Delhi is an area with a long and rich history and there is a risk that ground disturbance may uncover important remains and relics.

43. Most of the proposed water infrastructure facilities will work with routine maintenance, which should not affect the environment during the operation phase. In the case of the WTP and pumping facilities, energy efficiency design and complying with standard operating procedures will optimize the energy use. These measures will be incorporated into DWSIIP designs.

44. Operation of the WTPs may have certain adverse impacts if the facility is not appropriately located, designed and/or operated. Inadequate treatment of backwash water and sludge may adversely affect the receiving waters and pollute land and groundwater resources. Improper handling of chemicals such as chlorine gas may have impacts on worker and public health. The following measures will mitigate the potential negative impacts of the WTPs:

(i) Design to recirculate backwash water;
(ii) Design with appropriate sludge treatment and disposal facilities;
(iii) Design with appropriate technology to suit local conditions; and
(iv) Operate as per the standard operating procedures.
(v) Chorine handling shall confirm to the applicable national /international standards (such as IS 4263 Code of Safety for Chlorine and WHO's Safety for Operators Handling Chlorine[6])

45. Anticipated environmental impacts during design, construction, and operation are identified in Appendix 4. During detailed design, subproject- and site-specific environmental impacts will be assessed and mitigations measure will be formulated to reduce impacts to acceptable levels.

IV. ENVIRONMENTAL ASSESSMENT FOR SUBPROJECTS AND/OR COMPONENTS

A. Environmental Guidelines for Subproject Selection

46. The following criteria will be used for excluding sites which might have significant negative environmental impacts:

(i) Ecologically sensitive areas such as national parks, wildlife sanctuaries, biosphere reserves and internationally recognized areas, etc.;
(ii) The potential for disrupting the life and property of the indigenous or tribal population;
(iii) The need for significant amounts of land acquisition and resultant compensation; and
(iv) Potential encroachment on historic and cultural features such as international, central or state protected monuments and archeological/historical sites.

47. The criteria presented in Table 6 provide further guidance to avoid or minimize adverse impacts during the preparation of subprojects.

[6] http://www.who.int/water_sanitation_health/sanitation-waste/fs2_23.pdf?ua=1

Table 6: Environmental Criteria for Subproject Selection

Environmental Selection Criteria	Remarks
i. Comply with all requirements of relevant national and local laws, rules, and guidelines.	- Refer to Section II of this EARF; - CFE and CFO for WTP.
ii. Avoid significant environmental impacts.	
iii. Avoid and/or minimize involuntary resettlement by prioritizing rehabilitation over new construction, using vacant government land where possible, and taking all possible measures in the design and selection of sites and alignment to avoid resettlement impacts.	- Refer to DWSIIP Resettlement Framework (RF).
iv. Locate pipelines within the road right of way as far as possible, to reduce the acquisition of new land. Ensure that pipeline routes do not require the acquisition of land from private owners in amounts that represent a significant proportion of their total land holding (>10%).	- Refer to the RF.
v. Avoid locating subprojects in forest areas.	- Approval from MoEF is required if unavoidable.
vi. Utilize existing water supply sources only; abstraction from existing sources should not be increased from pre-DWSIIP levels and no new source development should be included.	
vii. If asbestos cement pipes are utilized within the existing water supply system, the project design should ensure that they are left undisturbed in the ground.	- Prior to site clearance and trench excavation for pipelines the exact location of underground asbestos cement pipes should be ascertained wherever possible.
viii. Ensure energy efficient system planning and design.	
ix. Avoid, where possible, but at least minimize locating facilities in areas with potential social conflicts.	- Refer to the RF.
x. Avoid where possible, locations that will result in destruction of, or disturbance to, historical and cultural places.	- Provide for the inclusion of “chance find” procedures in the EMP that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.
xi. Avoid tree-cutting wherever possible. Retain mature roadside trees which are important/valuable or of historic significance. If any trees have to be removed, plant two new trees for every one that is lost.	- Permission is required from the DoF (if trees are in forest areas) or from the local administration if trees are on lands other than forests.
xii. Ensure all planning and design interventions and decisions are made in consultation with local communities and include women. Reflect inputs from public consultation and disclosure in the site selection process.	- All consultations should be documented and concerns expressed by the public addressed in the IEEs.
xiii. Locate all new facilities/buildings at sites where there is no risk of flooding or other hazards that might impair the functioning of, or present a risk of damage to, the facilities.	- If the location has a flood history or potential, flood statistics data needs to be reviewed.
xiv. Ensure that communities who relinquish land needed for pipelines or other facilities are provided with an improved water supply as part of the scheme.	
xv. No pipes that are manufactured from asbestos cement should be used in DWSIIP.	
xvi. Ensure that the water to be supplied to consumers will meet the national drinking water standards at all times.	- See Appendix 3 for drinking water standards
xvii. Ensure that improvements in the water supply system are combined with improvements in the sewerage system which can deal with the increased discharge of domestic wastewater.	- IEEs should analyze whether sewage generation will increase as a result of the program, and if yes, IEEs should describe how the increased sewage flows will be managed in the future, even though sewerage infrastructure is not included under DWSIIP.
xviii Ensure appropriate training will be provided to DJB staff on the operation and maintenance of the facilities.	

Environmental Selection Criteria	Remarks
xiv Ensure sludge management facilities are included in the WTP works package.	- Include design measures and follow guidelines[7] to ensure the safe disposal of sludge without causing environmental hazards.

B. Environmental Assessment Procedures for Subprojects

1. Screening and Categorization

48. When sufficient information on a subproject is available, DWSIIP Environmental Specialists will conduct screening to determine the works' environmental category by completing ADB's rapid environmental assessment checklists (see Appendix 5) and submitting this for review to the PIU. This will determine the required environmental assessment and environmental consents as per national and state requirements.

49. DJB will submit completed rapid environmental assessment checklists to ADB for review. To ensure that the project meets ADB's environmental safeguard requirements, as stipulated in the SPS 2009, projects will be screened, and the level of environmental assessment required (EIA or IEE) will be determined. It is anticipated that most eligible projects will fall into either category B or C, as projects will often involve the improvement or rehabilitation of the existing system/facilities and relatively straightforward construction. While category C projects will not require an environmental assessment, environmental implications will still be reviewed.

2. Preparation of Environmental Assessment Reports

50. Environmental assessment documents prepared under DWSIIP will, to the extent possible, meet both ADB and Government of India requirements in order to streamline the environmental procedures required by both ADB and the Government.

51. For subprojects projected to have potentially significant adverse environmental impacts (categorized as A), an EIA will be prepared. For subprojects with some adverse environmental impacts, but which are expected to be less significant than those of category A projects, an IEE is required. Appendix 1 of ADB's SPS, 2009 provides the specific outlines and contents to be followed while preparing EIAs and IEEs. Appendix 6 provides the outline of an ADB EIA or IEE report. Environmental specialists will conduct environmental assessment studies and prepare IEE reports as per the ADB SPS 2009.

52. Pollution prevention through appropriate management of WTP wastewater and sludge, together with occupational and community health and safety at all construction sites and facilities, will be addressed in the EIAs/IEEs. The EIAs/IEEs will also reflect a meaningful consultation and disclosure process with provision for a grievance redress mechanism (GRM).

53. ADB requires that an EMP must be developed as part of an EIA/IEE. The EMP will 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 subproject is designed, constructed, and operated in compliance with the applicable laws and regulations and meets the requirements specified in the EMP. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the

[7] http://www.ifc.org/wps/wcm/connect/e22c050048855ae0875cd76a6515bb18/Final%2B-%2BWater%2Band%2BSanitation.pdf?MOD=AJPERES

subproject's impacts and risks. Key considerations should include the 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.

54. 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.

55. All EIAs/IEEs will be conducted and EMPs prepared prior to the award of construction contracts. The bid documents will include the requirement to incorporate necessary resources to implement the EMP. The EMP will form part of the contract document and, if required, will need to be further updated during the construction phase of a subproject.

3. Environmental Audit of Existing Facilities

56. For subprojects involving facilities and/or business activities that already exist or are under construction, the PIU will undertake an environmental audit, including an on-site assessment to identify past or present concerns related to impacts on the environment. The objective of this compliance audit is to determine whether actions were in accordance with ADB's safeguard principles and requirements for borrowers/clients, and to identify and plan appropriate measures to address outstanding compliance issues. Where noncompliance is identified, a corrective action plan agreed on by ADB and the PIU will be prepared. The plan will define the necessary remedial actions, the budget for such actions, and the timeframe for resolution of noncompliance. The audit report (including the corrective action plan, if any) will be made available to the public in accordance with the information disclosure requirements of ADB SPS, 2009. For environment category A projects involving facilities and/or business activities that already exist or are under construction, the PIU will submit the audit report to ADB to disclose on ADB's website. If a project involves an upgrade or expansion of existing facilities that has potential impacts on the environment, the requirements for environmental assessments and planning specified in ADB SPS, 2009 will apply in addition to compliance audit.

4. Updating of the environmental assessment report including EMP

57. IEE should be updated based on detailed design, if there is any change in scope, components, change in location/alignment, etc., and if any unanticipated impacts during implementation. The contractor will be required to prepare and submit subproject specific site environmental plan (SEP) in coordination of PMC, and the SEP so developed should not be lesser than the approved EMP. PIU has the responsibility to approve the SEP and monitoring its implementation by Contractor during the construction.

C. Review of Environmental Assessment Reports

58. EIAs/IEEs will be reviewed initially by the PIU SO. The PIU will then forward the EIAs/IEEs for ADB's review. ADB will review draft final reports of: (i) EIAs or IEEs of any new subproject classified as Category A or B, and (ii) EIAs or IEEs of any subprojects that have been updated due to changes in design after ADB's approval.

59. For subproject processing, the steps to be followed are shown in Table 7. It is the responsibility of the PIU to ensure subprojects are consistent with the legal framework, whether national or state/local. Compliance is required at all stages of the project including design, construction, and operation and maintenance.

Table 7: Environmental Procedures for Project Processing

Project Stage	ADB Procedure	Government of India
Subproject identification	Rapid environmental assessment checklist.	Categorization according to schedule and general/specific conditions of EIA Notification, 2006. None of the subprojects to be financed under DWSIIP are currently listed in the Schedule, and therefore EIA Notification 2006 will not be applicable. The EA (DJB) should liaise with the State Environment Impact Assessment Authority/MoEF regularly in order to confirm the legal status in case any new amendments are notified.
	Categorization (A/B/C): PIU to review the rapid environmental assessment checklists and submit to ADB for approval of category.	
Detailed design	Preparation of EIA/IEE	Submit CFE application along with the Project Report to DPCC
	For projects involving facilities and/or business activities that already exist or are under construction, the EA will undertake an environment and/or social compliance audit, including an on-site assessment, to identify past or present concerns related to impacts on the environment, and involuntary resettlement. Where non-compliance is identified, a corrective action plan agreed on by ADB and the EA will be prepared.	Incorporate appropriate compliance conditions, modifications and suggestions into the project design, and finalize the Detailed Project Report
	Public consultation will be carried out in a manner commensurate with the impacts on the communities. The consultation process and its results are to be documented and reflected in the EIA/IEE.	
	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. In addition, for all categories, environmental information will be in an accessible place and in a form or language understandable to affected persons and other stakeholders. For illiterate people, other suitable communication methods will be used.	
	Mitigation measures specified in the EIA/IEE study are to be incorporated into subproject designs	

Project Stage	ADB Procedure	Government of India
	Identify and incorporate environmental mitigation and monitoring measures (including the EMP) into bid/contract documents.	
Appraisal	The EMP and other environmental covenants are incorporated into the facility framework agreement, loan/project agreement, and program administration manual.	
Approval	ADB to review and clear the EIA/IEE prior to approval and issuance of tender documents during detailed design stage. Complete EIA/IEE disclosed to public	
Bidding	ADB requires inclusion of safeguards related clauses in the bid & contract documents as appropriate to ensure compliance during the implementation. The following shall be included in the bid / contract: (i) The Contractor shall (a) comply with the measures relevant to the package set forth in the Initial Environmental Examination (IEE), the Environmental Management Plan (EMP) and, any corrective or preventative actions set forth in a Safeguards Monitoring Report that the PIU will prepare from time to time to monitor implementation, (b) make available a budget for all such environmental and social measures, (c) provide the PIU with a written notice of any unanticipated environmental or resettlement risks or impacts that arise during construction, implementation or operation of the Project that were not considered in the lEE, the EMP, or the RP, (d) adequately record the condition of roads, agricultural land and other infrastructure prior to starting to transport materials and construction, (e) reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction, and (f) submit to Employer monthly monitoring report on EMP implementation. (ii) IEE / EIA and EMP shall form part the contract and its implementation during the implementation will be binding on the contractor (iii) Contractor personnel shall include a qualified Environment, Health and Safety (EHS) Supervisor, who shall be available throughout the implementation phase at the site (iv) During the implementation, pollution prevention and control technologies and practices adopted by contractor be consistent with international good	Bid document shall include clauses related to workers safety & welfare, and general safety, health and environment as per the regulations in force.

Project Stage	ADB Procedure	Government of India
	practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines, (v) The contractor will be required to submit to PIU, for review and approval, a site environmental plan (SEP) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program as per SEP; and (iv) budget for SEP implementation. No works are allowed to commence prior to approval of SEP. (vi) A copy of the EMP and approved SEP will be kept on site during the construction period at all times. The EMP forms part of the of contract agreement. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance. (vii) For civil works, the contractor will be required to (i) carry out all of the mitigation and monitoring measures set forth in the approved SEP; and (ii) implement any corrective or preventative actions set out in safeguards monitoring reports that the employer will prepare from time to time to monitor implementation of this IEE and SEP. The contractor shall allocate budget for compliance with these SEP measures, requirements and actions	
Contract award	Obtain necessary environmental clearances, consents, and no-objection certificates prior to contract award. Implementation of the EMP, including monitoring plans based on the EIA/IEE findings, are to be incorporated into the civil works contracts.	Ensure that the CFE is issued prior to award of contract
Implementation	Submission of semi-annual monitoring reports to ADB including corrective action plan where non-compliance is identified.	Monitoring and reporting as per conditions stipulated in the CFE (during construction phase) and CFO (during commissioning and operation phases). CFOs must be renewed every year.

V. CONSULTATION, INFORMATION DISCLOSURE, AND GRIEVANCE REDRESS MECHANISM

A. Public Consultation and Information Disclosure

60. Meaningful stakeholder consultation and participation is part of the investment program preparation and implementation strategy. A consultation and participation program will be

implemented with the assistance of the PMC. By addressing stakeholder needs, there is a greater awareness of the benefits and "ownership" of the program among stakeholders, which in turn contributes to sustainability. The consultation process during the program preparation will solicit inputs from a wide range of stakeholders, including government officials, non-governmental organizations (NGOs) residents of DWSIIP area, marginalized/vulnerable beneficiary groups, and affected persons (APs).

61. Consultation, participation, and disclosure will ensure that information is provided and feedback on proposed subproject design is sought early, right from the subproject preparation phase, so that the views and preferences of stakeholders including potential beneficiaries and APs can be adequately considered, and continue at each stage of the subproject preparation, processing, and implementation.

62. APs will be consulted at various stages in the implementation cycle to ensure: (i) incorporation of their views and concerns on compensation and resettlement assistance and environmental impacts and mitigation measures; (ii) inclusion of vulnerable groups in program benefits; (iii) identification of help required by APs during rehabilitation, if any; and (iv) avoidance of potential conflicts for smooth program implementation. It will also provide adequate opportunities for consultation and participation to all stakeholders and inclusion of the poor, vulnerable, marginalized, and APs in DWSIIP process.

63. Relevant information about any major changes to program scope will be shared with beneficiaries, APs, vulnerable groups, and other stakeholders.

64. A variety of approaches can be adopted. As a minimum, stakeholders will be consulted regarding the scope of the environmental and social impact studies before work commences and they will be informed of the likely impacts of the program and proposed mitigation once the draft EIA/IEE and resettlement plan reports are prepared. The reports will record the views of stakeholders and indicate how these have been taken into account in program development. Consultations will be held with a special focus on vulnerable groups.

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

(i) Program beneficiaries;
(ii) Elected representatives, community leaders, religious leaders, and representatives of community-based organizations and resident welfare associations;
(iii) Local NGOs working in relevant sectors
(iv) Local government and relevant government agency representatives, including local authorities responsible for land acquisition, protection and conservation of forests and the environment, archaeological sites, religious sites and other relevant government departments;
(v) Residents, shopkeepers, and business people who live and work alongside the roads where pipelines will be laid and near sites where facilities will be built; custodians, and users of socially and culturally important buildings;
(vi) DJB, PIU staff and consultants; and
(vii) ADB, GNCTD and the Government of India

66. Consultation will be a continuing process throughout activity implementation and in environmental monitoring activities. Additional consultations will include key informant interviews and random interviews with affected persons/households.

67. During the construction, the contractor, in coordination with CMRC and PIU, is required to inform the community or affected people about the construction work 7 days in advance, and again 1 day before start of excavation / construction in that particular area.

B. Information Disclosure

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

(i) For category A projects:
   a. Draft EIA (including the draft EMP) at least 120 days prior to management approval of the periodic financing request report;
   b. Final EIA;
   c. A new or updated EIA and corrective action plan prepared during project implementation, if any;
   d. Environmental monitoring reports; and
   e. For projects involving facilities and/or business activities that already exist or are under construction, an environmental audit report.

(ii) For category B projects:
   a. Final IEE;
   b. A new or updated IEE and corrective action plan, if any, prepared during project implementation; and
   c. environmental monitoring reports.

69. DJB will send written endorsement to ADB for disclosing these documents on ADB's website. DJB will also provide relevant safeguards information in a timely manner, in an accessible place and in a form and languages understandable to APs and other stakeholders. For illiterate people, other suitable communication methods will be used.

C. Grievance Redress Mechanism

70. A program-specific GRM will be established to receive, evaluate, and facilitate the resolution of APs' 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 DWSIIP.

71. A common GRM will be in place for social, environmental, or any other grievances related to DWSIIP. The resettlement plans and IEEs will follow the GRM described below. The GRM will provide an accessible and trusted platform for receiving and facilitating the resolution of APs' grievances related to DWSIIP. The multi-tier GRM for DWSIIP is outlined below, each tier having time-bound schedules and with responsible persons identified to address grievances and seek appropriate persons' advice at each stage, as required.

72. Investment program area-wide public awareness campaigns will ensure that knowledge of the grievance redress procedures is generated. The PIU will, through the PMC and the appointed Community Mobilization & Resettlement Consultant (CMRC) conduct awareness campaigns to ensure that poor and vulnerable households are made aware of the grievance redress procedures and their entitlements.

73. APs will have the flexibility of conveying grievances/suggestions by dropping grievance redress/suggestion forms in complaints/suggestion boxes to be installed by DJB or by e-mail, or by registering complaints on the DJB website or by post, or by writing in a complaints register in the PIU office or at construction site offices. Careful documentation of the name of the complainant, date of receipt of the complaint, address/contact details of the person, location of the problem area, and how the problem was resolved will be undertaken. The PIU SO will have the overall responsibility for timely grievance redressal on environmental and social safeguards issues and for registration of grievances, related disclosure, and communication with the aggrieved party.

74. **Exiting GRM.** DJB currently has an established Public GRM and has established 25 complaint receiving cells called Water Emergencies. There is also a central control room for coordination. The concerned DJB engineers/officials contact details are publicized and made available to the public to register complaints. Alternatively, the public can 'call', 'send a message', 'register' a complaint through the DJB website or through GNCTD grievances websites. Complaints are forwarded to concerned engineers for their action. After taking feedback from concerned engineers on redress, an Action Taken Report will be posted on the website. If no action is taken in 21 days, then the complaint is taken *suo moto* by the Public Grievance Commission for hearing.

75. **Proposed DWSIIP GRM**. In case of grievances that are immediate and urgent in the perception of the complainant, the contractor, and supervision personnel from the PIU and the PMC on-site supervision staff will provide the most easily accessible or first level of contact for the quick resolution of grievances. Contact phone numbers and names of the concerned staff and contractors, will be posted at all construction sites in visible locations.

(i) **1st level grievance**. The CPPI NGO or on-site Junior Engineer of the PIU will receive and record the complaint at the site. Alternatively, the complaint can be registered by phone call, message, email, or on website. The complaint will be reviewed and, if necessary, forwarded to the contractor and PMC supervision staff for immediate resolution of the issue on-site in consultation with CMRC and will be required to do so within 7 days of receipt of a complaint/grievance.

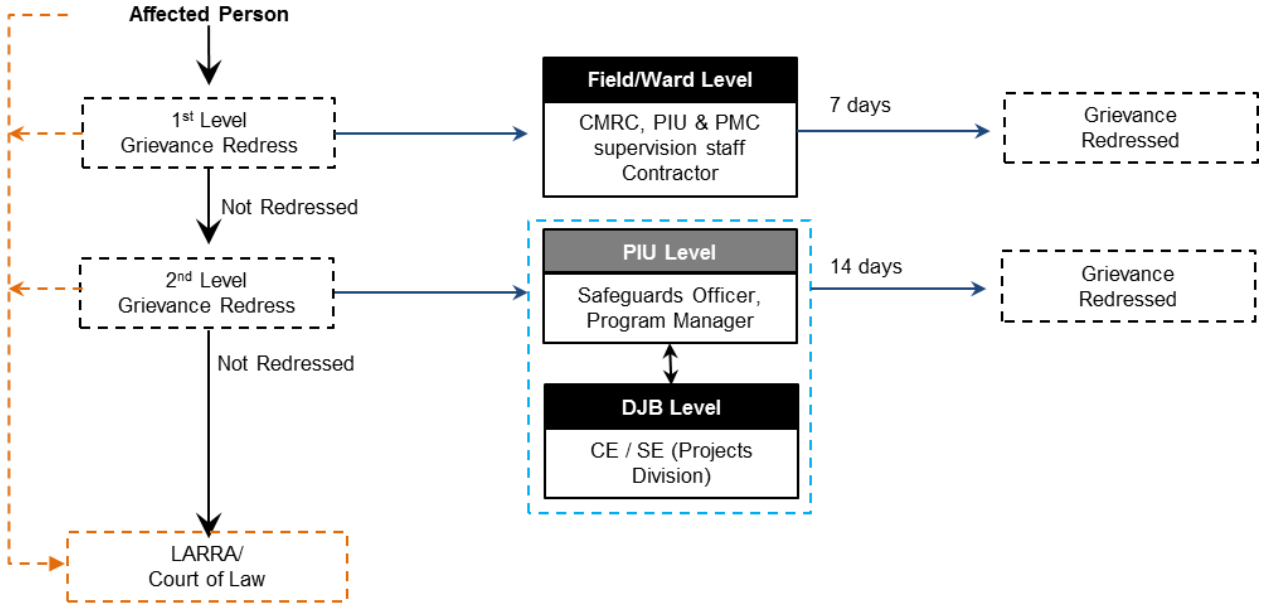
(ii) **2nd level grievance**. All grievances that cannot be redressed within 7 days at the field/ward level will be brought to the notice of the SO of the PIU, and the PMC Environmental Specialist. The PIU SO will resolve the grievance within 14 days of receipt of a complaint/grievance in discussion with CMRC and under the direction of the PIU Program Manager. If the grievance is not resolved at Program Manager level, the grievance will be referred internally to the Superintending Engineer, and the Chief Engineer in the projects division of DJB. Notwithstanding the referral to Superintending Engineer/Chief Engineer, the grievance at this 2nd level should be resolved in 14 days of its receipt.

76. The program 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 negative outcome of the GRM. Alternatively, if the grievance is related to land acquisition or resettlement and rehabilitation[8], the APs can approach the Land Acquisition, Rehabilitation and Resettlement Authority (LARRA). As per the recently implemented Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation, and Resettlement Act, 2013, the GNCTD will establish the LARRA to address grievances during implementation.

[8] LARRA admits grievances only with reference to the land acquisition and resettlement and rehabilitation issues under the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act

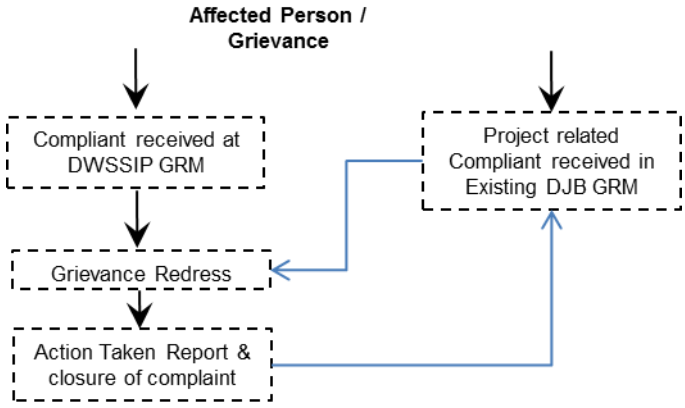
77. In the event that the established GRM is not in a position to resolve the issue, the APs can also use the ADB Accountability Mechanism through directly contacting (in writing) the Complaint Receiving Officer at ADB headquarters or the ADB India Resident Mission. The complaint can be submitted in 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.

Figure 2: Grievance Redress Mechanism



CMRC = community mobilization & resettlement consultant, CE = Chief Engineer, DJB = Delhi Jal Board, LARRA = Land Acquisition Rehabilitation and Resettlement Authority, NGO = non-governmental organization, PIU = Program Implementation Unit, PMC = Project Management Consultant, SE = Superintending Engineer

78. **Integration of DWSIIP GRM with the Existing DJB GRM**. To facilitate quick and easy redress of grievances, both GRMs will be linked so that the affected persons have the flexibility to approach either of the channels to redress their grievances. Any complaints/ grievances regarding the project activities received at the general DJB GRM will be referred internally to DWSIIP GRM for redress. After redress, the Action Taken Report will be uploaded in the general system as per current procedures.



79. **Record-keeping.** The PIU will keep records of grievances received, including contact details of the complainant, the date the complaint was received, the nature of the grievance, agreed corrective actions and the date these were affected and the final outcome. The number of grievances recorded and resolved and the outcomes will be displayed/disclosed in the PIU office,

and on the DJB website, as well as reported in monitoring reports submitted to ADB on a semi-annual basis.

80. **Periodic review and documentation of lessons learned**. The PMU will periodically review the functioning of the GRM and record information on the effectiveness of the mechanism, especially on the program's ability to prevent and address grievances.

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

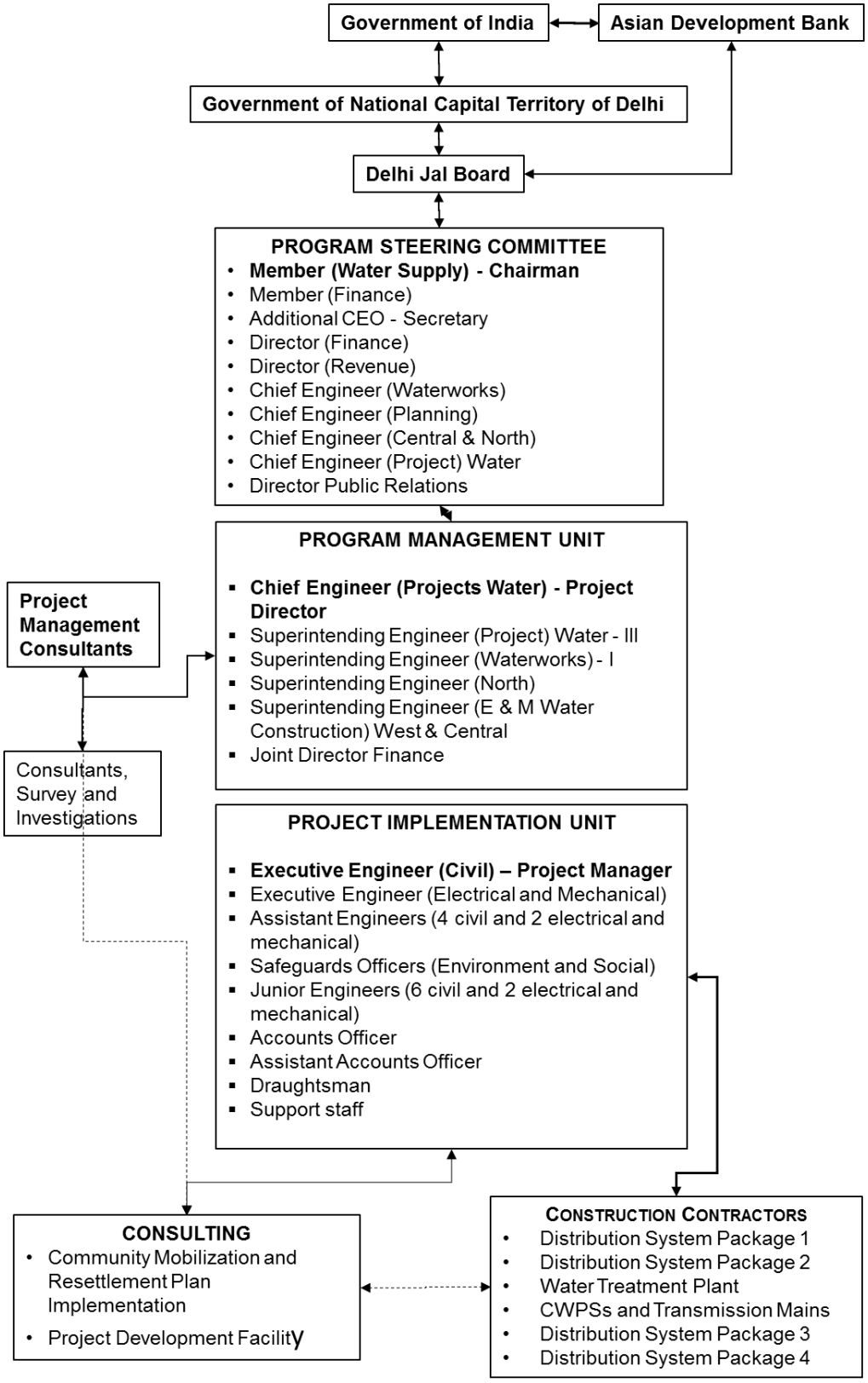
VI. INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES

82. The DWSIIP will be carried out under the supervision of the GNCTD. The DJB has been appointed as the executing agency (EA) and will be responsible for the management, coordination and execution of all the activities funded under the MFF. DJB has established a Project Steering Committee (PSC) headed by Member Water to provide overall guidance and strategic directions to the program. Program Management Unit (PMU), which headed by the Chief Engineer (Water Projects) will oversee program implementation and a Program Implementation Unit (PIU) has been established under the overall management of the PMU as the implementing agency (IA). The Project Manager of the be responsible for the day-to-day management and implementation.

83. The Project Manager will be an Executive Engineer (Civil) rank officer and will be supported by technical, financial, safeguards and administrative staff. The PIU staff will mostly be drawn from DJB, and if required, will also be seconded from the other government departments on deputation. The PIU will be assisted by a PMC in the implementation, management and monitoring of the investment program. The PMC will design the infrastructure, manage the tendering of contracts, supervise the construction process, assure the technical quality of design and construction, and provide advice/assistance on institutional capacity development. The PIU will appoint the contractors to build the infrastructure elements and will manage the construction and commissioning activities. The PIU will also appoint the CRMC to assist in program implementation. The PIU will also appoint the CRMC to assist in program implementation.

84. For safeguards, a qualified Environmental/Civil Engineer of Assistant Engineer rank will be posted to the PIU and designated as the Safeguards Officer (SO). The SO will oversee the environmental and social safeguard tasks which include the preparation, implementation, monitoring and overall safeguard compliance by DWSIIP. PMC will support PIU in all safeguard activities during the implementation of DWSIIP.

Figure 3: DWSIIP Implementation Arrangements



A. Safeguard Implementation Arrangement

85. The PIU staff will include a SO, who will be an Assistant Engineer rank officer, and will be responsible for all environment, health and safety, social, and grievance redress tasks. The SO will be a qualified engineer (preferably an environmental engineer). The SO can also be deputed from other government organizations such as the DPCC. Environmental and Social Safeguard Specialists of the PMC will assist the SO. The following are the key environmental safeguard tasks of the SO:

(i) Classify projects as per ADB SPS 2009, and identify environmental related clearances/approvals required from the government for the program;
(ii) Preparation of the IEEs/EIAs as per the EARF and ADB SPS 2009
(iii) Ensure IEEs/EMPs are based on approved detailed designs, and that IEEs/EMPs are prepared in accordance with the EARF and subproject selection criteria related to safeguards;
(iv) Update draft IEEs based on detailed design
(v) For DBO contract/s, coordinate with contractor/s in the updating of the draft IEE once detailed design is available
(vi) Ensure timely disclosure of final IEEs/EMPs in locations and form accessible to the public.
(vii) Include IEEs/EMPs in bidding documents and civil works contracts;
(viii) Ensure that EHS supervisor is mobilized immediately after award of contract
(ix) Review & approve EMP updated by the contractor
(x) Review and approved method statement, traffic management plan, construction waste management plan and occupation health and safety plan etc., prepared by the contractor; take feedback, and involve other technical experts of PIU in review and approval process
(xi) Oversee day-to-day implementation of EMPs by contractors, including contractors' compliance with all government rules and regulations;
(xii) Ensure overall compliance with all government rules and regulations regarding site and environmental clearances, as well as any other environmental requirements (e.g., location clearance certificates, environmental clearance certificates, etc.), as relevant;
(xiii) Take necessary action for obtaining right of ways;
(xiv) Oversee implementation of environmental monitoring plan by contractors;
(xv) Take corrective actions when necessary to ensure no environmental impacts;
(xvi) Conduct continuous public consultation and awareness;
(xvii) Address any grievances brought about through the GRM in a timely manner as per the IEEs;
(xviii) Organize an induction course for contractors prior to mobilization
(xix) Organize workshops/seminars on EMP implementation, environmental monitoring requirements related to mitigation measures, and on taking immediate action to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation;
(xx) Review and approve monthly environmental monitoring reports submitted by contractor; consolidate monthly reports and submit semi-annual monitoring reports to the ADB
(xxi) Take corrective action as necessary in case of non-compliance

86. EMPs are to be included in bidding and contract documents and verified by the PIU. Contractors will be required to appoint an Environment, Health and Safety Supervisor to ensure

implementation of the EMP during civil works. Contractors are to carry out all environmental mitigation and monitoring measures outlined in their contract.

87. The DJB will ensure that bidding and contract documents include specific provisions requiring contractors to comply with: (i) all applicable labor laws and core labor standards on: (i) prohibition of child labor as defined in national legislation for construction and maintenance activities; (ii) equal pay for equal work of equal value regardless of gender, ethnicity, or caste; and (iii) elimination of forced labor; and (iv) the requirement to disseminate information on sexually transmitted diseases, including HIV/AIDS, to employees and local communities surrounding the project sites.

Figure 4: Safeguard Implementation Process

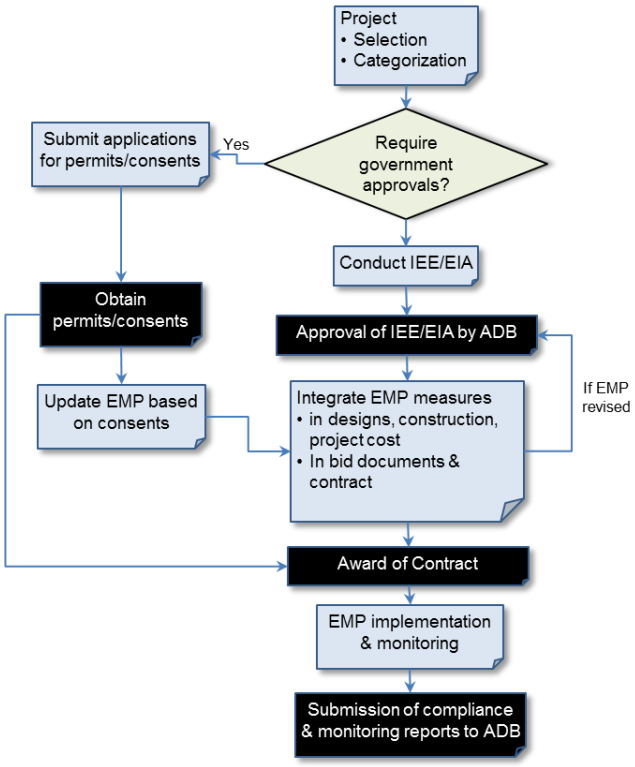
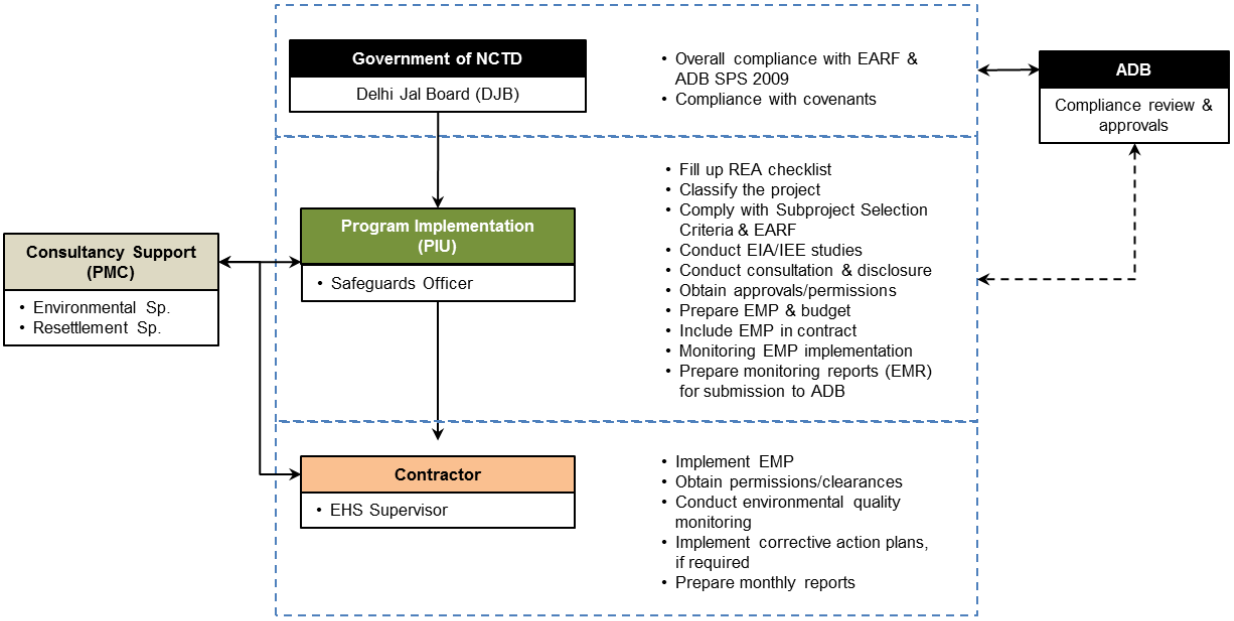


Figure 5: Safeguard Implementation Arrangements



ADB – Asian Development Bank; DJB = Delhi Jal Board; EARF – Environmental Assessment and Review Framework; EHS – Environment, Health & Safety, EIA – Environmental Impact Assessment; EMP – Environmental Management Plan; IA – Implementing Agency; IEE – Initial Environmental Examination; NCT = National Capital Territory; PMC – Project Management Consultant; REA – Rapid Environmental Assessment; SPS – Safeguard Policy Statement, 2009,

B. Institutional Capacity and Development

88. As stated above, the SO will be drawn from DJB's engineering staff, although it should be noted that DJB staff have limited experience in dealing with environmental safeguard issues. It is therefore essential that the SO is provided with the necessary training to deal with environmental and social safeguard tasks following ADB SPS 2009. The SO will be trained through a series of programs periodically conducted by ADB for EAs and IAs on safeguards.

89. At the project level, the PMC Environmental Specialist will be responsible for training the PIU SO and other DJB and PIU staff on environmental awareness and management in accordance with both ADB and government requirements. Training will also be provided to contractors and staff. Typical modules would include: (i) sensitization; (ii) introduction to environment and environmental considerations in water supply projects; (iii) review of IEEs and integration into the project detailed design; and (iv) monitoring and reporting systems. Specific modules customized for the available skill set will be devised after assessing the capabilities of the target participants and the requirements of the program. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites. The proposed training program, along with the frequency of sessions, is presented in Table 8.

Table 8: Training Program for Environmental Management

Description	Contents	Schedule	Participants
Pre-construction stage			
Orientation program .	- DWSIIP Environmental safeguard requirements - Implementation arrangement -monitoring & reporting -Corrective actions	½ day orientation workshop - at the start of the program	DJB, PSC, PMU, and PIU – all senior and mid-level officials and engineers involved in DWSSIP

Description	Contents	Schedule	Participants
Training program on EMP implementation & monitoring	Module 1 – Orientation - ADB SPS; - Government of India Environmental Laws and Regulations. Module 2 – Environmental Assessment Process. - Environmental process, identification of impacts and mitigation measures, formulation of an EMP, implementation, and monitoring requirements; - Review & approval of environmental assessment reports Module 3: EMP Implementation, monitoring & reporting - Incorporation of safeguard clauses and EMP in bid and contract documents -Pollution prevention and abatement (IFC EHS Guidelines) -.Monitoring & evaluation - Formulation of corrective action plans (CAP) -Reporting Module 4: Consultation & disclosure - Grievance redress mechanism	2 day training program - .prior to invitation of any bids for civil works under the Program	PMU & PIU staff
Construction stage			
Orientation program	- Contractual requirements -Legal & regulatory requirements -EHS requirements -Site Environment Plan (SEP) preparation, EMP implementation and reporting -roles and responsibilities	½ day orientation course to during mobilization	Contractors and PIU, PMC supervising staff
Training program/ workshop for contractors and supervisory staff.	- Environmental issues during construction; - Site specific SEP - EMP Implementation - Day to day monitoring - Periodic ambient monitoring - Reporting -Consultation & grievance redress	1 day workshop immediately after mobilization	Contractors and PIU, PMC supervising staff
Periodic refresher training workshop	Same as above	½ day workshop thrice a year	Contractors and PIU, PMC supervising staff
Stakeholder workshop Experience and best practices sharing.	- Experience of EMP implementation – issues and challenges; - Best practices followed.	½ day workshop Once in a year during implementation	PMU, PIU, and stakeholder agencies (DPCC, PWD, Municipal Corporation, Delhi Police etc.,)

C. Staffing and Budget

90. Budgets for implementing the EARF will cover the following activities:

(i) Conducting environmental assessments of new subprojects, preparing and submitting reports, and public consultation and disclosure;
(ii) Applications for government regulatory consents and approvals; and
(iii) Implementation of EMPs and long-term surveys.

91. For budgeting purposes, it is assumed that all subprojects will be classified by ADB as category B (requiring IEE).

92. A typical IEE requires an input of 1 month by an experienced environmental specialist, conducting the following activities: (i) site visit to assess environmental conditions and potential impacts of the scheme; (ii) liaison with relevant government agencies and others to obtain any environmental/social data that might be available locally such as population figures, designated sites, etc.; (iii) consultation with the local community to inform them about the scheme and identify their views and concerns; (iv) assessment of impacts and the development of mitigation measures; and (v) desk study and report preparation.

93. The infrastructure involved in each scheme under DWSIIP is generally straightforward. Environmental monitoring during construction will also be straightforward and will involve periodic site observations and interviews with workers and others, plus checks of reports and other documents. This will be conducted by the PMC Environmental Specialist and will be overseen by the PIU SO. The PMC Environmental Specialist will prepare EIAs, IEEs, or environmental reviews for new subprojects.

94. The cost of mitigation measures and surveys during construction will be incorporated into the contractor's costs, which will be binding on the contractor for implementation. The environmental quality monitoring surveys will be conducted by the contractors.

95. The operation phase mitigation measures should follow good operating practices and will be the responsibility of the DJB. All monitoring during the operation and maintenance phase will be conducted by government regulatory agencies such as DPCC as per their mandate and therefore there are no additional costs.

96. The indicative costs of EARF implementation are presented in Table 9. The total costs are estimated at US $ 5.8 million spread over the entire program, comprising six construction packages.

Table 9: Indicative Cost of EARF Implementation

Component	Description	Number	Cost Per Unit	Cost	Source of Funds
A. Consultants Costs					
PMC Environmental Safeguards Specialist.	Responsible for environmental safeguards of the program.	20 person months (spread over entire project implementation period).[9]	$8,000	$160,000	Remuneration and budget for travel covered in the PMC contract.
B. Administrative Costs					
Legislation, permits, and agreements.	Consent fee for the WTP etc.,	Lump sum	$50,000	$50,000	Included in the overall program cost.

[9] To be reviewed during implementation

Component	Description	Number	Cost Per Unit	Cost	Source of Funds
					The approvals and permits that are to be obtained by contractors at his own expense are not included here.
C. Environmental Management Costs					
EHS supervisors (contractor's personnel)	Responsible for EMP implementation on site	One EHS supervisor for each contract package	36x6x $1250	$270,000	Part of project cost
Mitigation measures	Traffic management, barricading, plain cement concrete layer over trenches to control dust, compensatory tree plantation, etc.,	Lump sum as per the sample IEEs	-	$5,000,000	Part of project cost
C. Environmental Monitoring Costs					
Baseline monitoring prior to construction (noise, ambient air quality, receiving/adjacent body of water).	During detailed design stage to establish existing environmental conditions.	Lump sum	$10,000	$10,000	Included in the PMC contract provisional sums
	Before start of construction works	Lump sum	$10,000	$10,000	Contractors' costs
Monitoring during construction.	Sampling sites near sensitive areas (schools, hospitals, places of worship, historical/cultural areas).	Noise, ambient air quality, and water quality - monitoring points and frequency will be finalized before construction.	$100,000	$ 100,000	Contractors' costs.
D. Other Costs					
Public consultations and information disclosure.	Information disclosure and consultations during pre-construction and construction phase, including public awareness campaign through media.	As per requirement.	Lump sum.	$100,000	Included in the PMC contract provisional sums.
Capacity building.	Orientation programs, workshops and trainings	6 years	$10,000 per year	$60,000	Included in the PMC contract provisional sums.
GRM implementation.	Costs involved in resolving complaints (meetings, consultations, communication, and reporting/information dissemination).	6 year	$10,000 per year	$60,000	PIU cost.
Any unanticipated impact due to project implementation	Mitigation of any unanticipated impact arising during construction phase and	Lump sum	Lump sum	As per insurance requirement.	Contractor's insurance.

Component	Description	Number	Cost Per Unit	Cost	Source of Funds
	the defects liability period.				
Total				**$5,820,000**	

VII. MONITORING AND REPORTING

97. Through the PIU, the DJB will monitor and measure the progress of EMP implementation. The monitoring activities will correspond with the program's risks and impacts. In addition to recording information on the work and deviation of work components from the original scope, the PIU and PMC will undertake site inspections and document review to verify compliance with the EMP and progress toward the final outcome.

98. The PMC will submit monthly and quarterly monitoring and implementation reports to the PIU, who will take appropriate follow-up actions, if necessary. DJB will submit semi-annual monitoring reports to the ADB. The suggested monitoring report format is presented in Appendix 7A. A construction site checklist is attached as Appendix 7B, which is to be completed by the PMC/PIU supervising staff, and attached to monthly reports. Subproject 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.

99. Compliance with loan covenants will be screened by the DJB. ADB will review project performance against the DJB 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 subprojects 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 the PIU to ensure that adverse impacts and risks are mitigated, as planned and agreed with ADB;
(iv) Work with the DJB to rectify to the extent possible any failures to comply with their safeguard commitments, as covenanted in the legal agreements, and exercise remedies to reestablish 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.

APPENDIX 1: RELEVANT GOVERNMENT OF INDIA ENVIRONMENTAL LEGISLATION

Ref	Legislation	Description	Regulator	Requirements for the Program
1.	National Environment Policy, 2006.	• The National Environment Policy is a comprehensive guiding document in India for all environmental conservation programs and legislations by Central, State and Local Government. The dominant theme of this policy is to promote betterment of livelihoods without compromising or degrading the environmental resources. The policy also advocates the collaboration of different stakeholders to harness potential resources and strengthen environmental management.	Not applicable	- Design and implementation of infrastructure elements under the program should enhance and conserve environmental resources and abate pollution
2.	EIA Notification, 2006.	• The publication of the EIA notification put forth that the required construction of new projects, expansion or modernization of existing projects and activities listed in the Schedule to this notification entailing capacity addition with change in process and or technology shall be undertaken in any part of India only after the prior environmental clearance from the Central Government or by the State Level Environment Impact Assessment Authority, duly constituted by the Central Government; • The environmental clearance process for new projects will comprise of a maximum of four stages given in sequential order: Stage (1) Screening; Stage (2) Scoping; Stage (3) Public Consultation and Stage (4) Appraisal.	MoEF	- Environmental clearances
3.	Water (Prevention and Control of Pollution) Act, 1974 amended 1988 and its Rules, 1975.	• The Act was established to provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water, by Central and State Boards and for conferring on and assigning to such Boards powers and functions relating thereto and for matters connected therewith.	DPCC	- Applicable for construction and operation of the WTP; - CFE; - CFO; - Compliance to conditions and disposal standards stipulated in the CFE and CFO.
4.	Air (Prevention and Control of Pollution) Act, 1981, amended 1987 and its Rules, 1982.	• An agreement for the preservation of the natural resources which included air and water preservation was finalized at the United Nations Conference on the Human Environment held in Stockholm in June, 1972, in which India participated. Following this the Air (Prevention and Control of Pollution) Act was enacted to achieve prevention, control and abatement of air pollution activities by assigning regulatory powers to Central and State boards for all such functions; • Establishes ambient air quality standards.	DPCC	- Applicable for equipment and machinery's potential to emit air pollution; - CFE; - CFO; - Compliance to conditions and emissions standards stipulated in the CFE and CFO; - comply with AAQ standards.
5.	Environmental (Protection) Act, 1986 amended 1991 and the following rules and	Following the United Nations Conference on the Human Environment held at Stockholm in June, 1972, an Act to provide for the protection and improvement of the environment and for matters connected therewith was framed in India. This would cover the protection and improvement of environment and the	-	-

Ref	Legislation	Description	Regulator	Requirements for the Program
	notifications:	prevention of hazards to human beings, other living creatures, plants and property.		
5a.	Environment (Protection Rules, 1986 including amendments.	In exercise of the powers conferred by the Environment (Protection) Act, 1906 (29 of 1986), the Central Government formulated rules, which include the following: • Standards for emissions or discharge of environmental pollutants; • Prohibitions and restrictions on the location of industries and the carrying on processes and operations in different areas; • Procedure for taking samples and submission of samples for analysis, and the form of environmental laboratory corresponding government analyst qualifications; • Service of Notice and manner of giving notice; • Furnishing of information to authorities and agencies in certain cases; • Prohibition and restriction on the handling of hazardous substances in different areas; and • Submission of environmental reports.	DPCC, Dept. of Environm't	- wastewater disposal designed and operated to meet disposal standards; - compliance with emission and disposal standards during construction.
5b.	Municipal Solid Wastes (Management and Handling) Rules, 2000.	• The Municipal Solid Wastes (Management and Handling) Rules, 2000 apply to every municipal authority responsible for collection, segregation, storage, transportation, processing and disposal of municipal solid wastes. • The State Board shall monitor the compliance of the standards regarding ground water, ambient air, leachate quality and the compost quality including incineration standards as specified. • The Central Pollution Control Board shall co-ordinate with the State Boards and the Committees with particular reference to implementation and review of standards and guidelines and compilation of monitoring data.	DPCC	- Solid waste generated at the WTP shall be disposed in accordance with the Rules
5c.	Noise Pollution (Regulation and Control) Rules, 2000	• The increasing noise level in public places from various sources have delirious effects on humans and thereby it is considered necessary to regulate and control noise generating sources to maintain ambient air quality standards through a set of rules. • The ambient air quality standards are achieved through enforcement of noise pollution control measures and restrictions on the use sound producing instruments. Further the consequences in the case of any violation in silence zone area, complaints to be made to authority in this regards and power to prohibit continuance of music sound or noise also falls under these rules.	DPCC	- Compliance with noise quality standards.
5d.	Wetland (Conservation and Management) Rules, 2010	• Wetland (Conservation and Management) Rules, 2010 were framed for the protection of wetlands and restriction of certain activities within wetlands; • Subsequently in exercise of the powers conferred under the Environmental Protection Act 1986 a regulatory mechanism was set up;	Central Wetlands Regulatory Authority	- Applies to protected wetlands (Ramsar sites, wetlands in eco-sensitive areas and United Nations Educational, Scientific and Cultural

Ref	Legislation	Description	Regulator	Requirements for the Program
		• Following this the Central Government identified certain wetlands for conservation and management and provided financial and technical assistance to State governments and Union territories for various conservation activities.		Organization heritage sites and in high altitudes, and wetlands notified by the Government of India); - Prohibits/ regulates activities within and near the wetlands; - No such wetlands are in the project areas.
6.	Indian Wildlife (protection) Act, 1972 amended 1993 and Rules 1995 Wildlife (Protection) Amendment Act, 2002	• An Act to provide for the comprehensive protection of wild animals, birds and plants. This would cover matters concerning appointment of forest authorities, hunting of wild animals, protection of specified plants, conservation of national parks and sanctuaries, trade commerce in relation to plants and animals and the prevention of any offences.		- Applicable to subprojects located within core or buffer zone of Protected Areas (wildlife sanctuaries, national parks, biosphere reserves etc.) - Permission from Chief Wildlife Warden/ State Wildlife Board/ National Board of Wildlife.
7.	Indian Forest Act, 1927.	• The Indian Forest Act 1972 was enacted to consolidate the law relating to forests, the transit of forest-produce and the duty leviable on timber and other forest produce. This would apply to reserved forests, village forests, and protected forests. In addition to control over forests this act also concerns lands not being the property of government. The penalties and procedures with regard to all property, cattle trespasses and powers of Forest Officers in relation to all such matters are discussed under the Act.	MoEF (at Central level); DoF (at State-level).	- Declaration of forest areas (reserved, protected and village forests), and regulation of activities within the forests; - Applicable to subprojects located in the forests.
8.	Forest (Conservation) Act, 1980 amendment 1988 and the following rules/ notifications:	• Act provides for conservation of forests • Restricts the de-reservation of forests or use of forest lands for non-forest purposes • Non-forest purposes means breaking up or clearing of any forest land	MoEF (at Central level); DoF (at State-level).	- Applicable to subprojects located in forests; requires prior permission to take up the works.
a.	Forest (Conservation) Rules, 1981 amended 1992 and 2003	• Rules for conversion / use of forest lands for non-forest purposes	MoEF (at Central level) DoF (at State-level)	- Applicable to subprojects located in forest lands; - Prior permission for use of forest land for project purpose from MoEF
b.	Guidelines for diversion of forest lands for non-forest purposes.	• Provided operational guidelines under the above rules for conversion / use of forest lands for non-forest purposes.	MoEF (at Central level); DoF (at State-level).	- Approval of MoEF for any acquisition of forest land; - Applicable to subprojects located in forests; - Application for use of forest of land to be made to DoF;

Ref	Legislation	Description	Regulator	Requirements for the Program
				- Project proponent to identify non-forest land which is to be transferred to DoF for taking up afforestation program; - Net present value of the forest land to be used, cost of afforestation, tree cutting, etc., as determined by DoF, is to be paid.
9.	Ancient Monuments and Archaeological Sites and Remains Acts, 1958, its Rules,1959 and notification, 1992.	• Act for better and effective preservation of the archaeological wealth of the country, on par with constitutional provisions; • This Act provides for the preservation of ancient and historical monuments and archaeological sites and remains of national importance, for the regulation of archaeological excavations and for the protection of sculptures, carvings and other like objects; • Notifies 100m around the monument as prohibited area and 100 to 300m as regulated area for construction works.	Chief Commissio-ner of Labour (CCL)	- Applicable to subprojects located in proximity with the protected monuments and sites; - No excavation or construction work is allowed within 300 m boundary of the protected monument; - Requires prior permission of ASI for taking works within 500 m of boundary of the protected monuments.
10.	Contract Labour (Regulation and Abolition) Act, 1970.	• The Act provides for certain welfare measures to be provided by the Contractor to contract labor and in case the Contractor fails to provide, the same are required to be provided by the Principal Employer by Law. The principal employer is required to take Certificate of Registration and the Contractor is required to take a License from the designated Officer. The Act is applicable to the establishments or Contractor of principal employer if they employ 20 or more contract labor.	CCL	- Applicable to all construction works in the project; - Contractor should obtain license; - DJB to obtain Certificate of Registration, DoL as principle employer; - Contractor to obtain license from designated Labour Officer.
11	The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979.	• The Act is applicable to an establishment which employs five or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The inter-state migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home to the establishment and back.	CCL	- Contractor shall register with DoL if Inter-state migrant workmen are engaged; - Adequate and appropriate amenities and facilities shall be provided to workers
12.	The Building and Other Construction Workers (Regulation of Employment and	• All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under this Act. All such establishments are required to pay Cess at a rate not exceeding 2% of the cost of construction as may be notified by the Government. The employer of the	CCL	- Compliance with the stated requirements.

Ref	Legislation	Description	Regulator	Requirements for the Program
	Conditions of Service) Act, 1996 and the Cess Act of 1996.	establishment is required to provide safety measures at the building or construction work and other welfare measures, such as canteens, first-aid facilities, ambulance, housing accommodation for workers near the workplace etc. The employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government		
13.	The Child Labour (Prohibition and Regulation) Act, 1986.	• The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of child labor is prohibited in the Building and Construction Industry.	CCL	- No child labor shall be employed.
14.	Minimum Wages Act, 1948.	• The employer is supposed to pay not less than the Minimum Wages fixed by the appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of buildings, roads, runways etc. are scheduled employment.	CCL	- Applicable to all construction works in the project; - All construction workers should be paid not less than the prescribed minimum wage.
15.	Workmen Compensation Act, 1923.	• The Act provides for compensation in case of injury by accident arising out of and during the course of employment.	CCL	- Compliance with the stated requirements.
16.	Equal Remuneration Act, 1979	• The Act provides for payment of equal wages for work of equal nature to Male and Female workers and not for making discrimination against Female employees in the matters of transfers, training and promotions etc.	CCL	Compliance with the stated requirements.
17.	Delhi Ancient and Historical Monuments and Archaeological Sites and Remains Act, 2004.	• State-level Act enacted in line with the Central Act (Ancient Monuments and Archaeological Sites & Remains Acts, 1958); • An Act to provide for the preservation, protection, upkeep, maintenance, acquisition and regulation of, and control over, ancient and historical monuments, archaeological sites and antiquities in Delhi; • Empowers State Government to declare monuments/sites/antiquities as “protected. • Empowers for making rules to protection and conservation of protected monuments, areas, antiquities; • Notifies 50m around the monument as prohibited area and 50 to 100m as regulated area for construction works.	Dept. of Archaeology	- Require prior permission of Dept. of Archaeology if the construction work is situated within 100 m of any monument or site declared as protected by Government of Delhi under this Act - Department provides conditional permission, including time for completion, procedures to be followed during the work and for chance finds etc.
18	The Delhi Preservation of Trees Act, 1994	• Established tree authority; • Imposes restrictions on felling and removal of trees on any land in NCTD irrespective of land ownership; • Liabilities for presentation of trees; • Provides procedures for obtaining permission to fell, cut, remove or dispose of a tree; • Penalties and procedures for violation; • Obligation to plant trees.	Tree Authority	-Preserve trees; -Prior permission from Tree Officer to cut/prune trees if required for the project; -Plant trees as per the directions of the Tree Officer.

Ref	Legislation	Description	Regulator	Requirements for the Program
19	Delhi Wildlife (Protection) Rules, 1973.	• Notified under the Wildlife (Protection) Act, 1972; • Establishes Wildlife Advisory Board; • Rules for hunting of wild animals; • Granting of licenses; • Shooting blocks; • Trade or commerce in wild animals, animal articles.	Wildlife Advisory Board.	- Compliance with the stated requirements.
20	The Delhi Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Rules, 2001.	• Rules established under the Central Act (the Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996); • Applicable to all the establishments who carry on any building or other construction work and employ 10 or more workers; • All such establishments are required to pay Cess; • Provide for workers safety measures and other welfare measures, such as canteens, first-aid facilities, ambulance, housing accommodation for workers near the workplace etc.; • Employer to obtain a registration certificate from the state government's registering officer.	CCL	- Applicable for all project construction activities; - To be complied with by the contractor during the construction, and registered with the Labour Department; - Rules stipulates hours of work, night work, welfare, payment of wages, registers and records, facilities to be provided, and safety & health.

APPENDIX 2: ENVIRONMENTAL STANDARDS

General Standards for Discharge of Environmental Pollutants (Wastewater)

S. No.	Parameter	Inland surface water	Public sewers	Land for irrigation
	.	(a)	(b)	(c)
1	Suspended solids mg/l, max.	100	600	200
2	Particle size of suspended solids	shall pass 850 micron IS Sieve	-	-
3	pH value	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
4	Temperature	shall not exceed 5oC above the receiving water temperature		
5	Oil and grease, mg/l max,	10	20	10
6	Total residual chlorine, mg/l max	1.0	-	-
7	Ammonical nitrogen (as N),mg/l, max.	50	50	-
8	Total kjeldahl nitrogen (as N);mg/l, max. mg/l, max.	100	-	-
9	Free ammonia (as NH3), mg/l,max.	5.0	-	-
10	Biochemical oxygen demand (3 days at 27oC), mg/l, max.	30	350	100
11	Chemical oxygen demand, mg/l, max.	250	-	-
12	Arsenic(as As).	0.2	0.2	0.2
13	Mercury (As Hg), mg/l, max.	0.01	0.01	-
14	Lead (as Pb) mg/l, max	0.1	1.0	-
15	Cadmium (as Cd) mg/l, max	2.0	1.0	-
16	Hexavalent chromium (as Cr + 6),mg/l, max.	0.1	2.0	-
17	Total chromium (as Cr) mg/l, max.	2.0	2.0	-
18	Copper (as Cu)mg/l, max.	3.0	3.0	-
19	Zinc (as Zn) mg/l, max.	5.0	15	-
20	Selenium (as Se)	0.05	0.05	-
21	Nickel (as Ni) mg/l, max.	3.0	3.0	-
22	Cyanide (as CN) mg/l, max.	0.2	2.0	0.2
23	Fluoride (as F) mg/l, max.	2.0	15	-
24	Dissolved phos- phates (as P),mg/l, max.	5.0	-	-
25	Sulphide (as S) mg/l, max.	2.0	-	-
26	Phenolic compounds (as C6H50H)mg/l, max.	1.0	5.0	-
27	Radioactive materials: (a) Alpha emitters micro curie mg/l, max. (b)Beta emittersmicro curie mg/l	10^{-7} 10^{-6}	10^{-7} 10^{-6}	10^{-8} 10^{-7}
28	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
29	Manganese	2 mg/l	2 mg/l	-
30	Iron (as Fe)	3mg/l	3mg/l	-
31	Vanadium (as V)	0.2mg/l	0.2mg/l	-
32	Nitrate Nitrogen	10 mg/l	-	-

National Ambient Air Quality Standards

S. No.	Pollutant	Time Weighted Average	Concentration in Ambient Air		
			Industrial, Residential, Rural and Other Area	Ecologically Sensitive Area (notified by Central Government)	Methods of Measurement
(1)	(2)	(3)	(4)	(5)	(6)
1	Sulphur Dioxide (SO_2), µg/m³	Annual*	50	20	- Improved West and Gaeke
		24 hours**	80	80	-Ultraviolet fluorescence
2	Nitrogen Dioxide (NO_2), µg/m³	Annual*	40	30	- Modified Jacob & Hochheiser (Na-Arsenite)
		24 hours**	80	80	- Chemiluminescence
3	Particulate Matter (size less than 10µm) or PM_{10} µg/m³	Annual*	60	60	- Gravimetric - TOEM
		24 hours**	100	100	- Beta attenuation
4	Particulate Matter (size less than 2.5µm) or $PM_{2.5}$ µg/m³	Annual*	40	40	- Gravimetric - TOEM
		24 hours**	60	60	- Beta attenuation
5	Ozone (O_3) µg/m³	8 hours**	100	100	- UV photometric - Chemilminescence
		1 hour**	180	180	- Chemical Method
6	Lead (Pb) µg/m³	Annual*	0.50	0.50	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper - ED-XRF using Teflon filter
		24 hours**	1.0	1.0	
7	Carbon Monoxide (CO) mg/m³	8 hours**	02	02	- Non Dispersive Infra Red (NDIR) spectroscopy
		1 hour**	04	04	
8	Ammonia (NH_3) µg/m³	Annual*	100	100	-Chemiluminescence
		24 hours**	400	400	-Indophenol blue method
9	Benzene (C_6H_6) µg/m³	Annual*	05	05	- Gas chromatography based continuous analyzer - Adsorption and Desorption followed by GC analysis
10	Benzo(a)Pyrene (BaP) - particulate phase only, ng/m³	Annual*	01	01	- Solvent extraction followed by HPLC/GC analysis
11	Arsenic (As), ng/m³	Annual*	06	06	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper
12	Nickel (Ni), ng/m³	Annual*	20	20	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper

* Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 08 hourly or 01 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

Note. — Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigation.

Ambient Noise Standards

Area Code	Category of Area / Zone	Limits in dB(A) Leq*	
		Day Time	Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

Note:- 1. Day time shall mean from 6.00 a.m. to 10.00 p.m.
2. Night time shall mean from 10.00 p.m. to 6.00 a.m.
3. Silence zone is an area comprising not less than 100 metres around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority
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.

Surface Water Quality Classification Criteria

Designated-Best-Use	Class of water	Criteria
Drinking water source without conventional treatment but after disinfection	A	Total Coliforms Organism MPN/100ml shall be 50 or less pH between 6.5 and 8.5 Dissolved Oxygen (DO) 6mg/l or more Biochemical Oxygen Demand (BOD) 5 days 20°C 2mg/l or less
Outdoor bathing (Organised)	B	Total Coliforms Organism MPN/100ml shall be 500 or less pH between 6.5 and 8.5 DO 5mg/l or more BOD 20°C 3mg/l or less
Drinking water source after conventional treatment and disinfection	C	Total Coliforms Organism MPN/100ml shall be 5000 or less pH between 6 to 9 DO 4mg/l or more BOD 3mg/l or less
Propagation of wildlife and fisheries	D	pH between 6.5 to 8.5 DO 4mg/l or more Free Ammonia (as N) 1.2 mg/l or less
Irrigation, industrial cooling, controlled waste disposal	E	pH between 6.0 to 8.5 Electrical Conductivity at 25°C micro mhos/cm Max.2250 Sodium absorption Ratio Max. 26 Boron Max. 2mg/l

Source: Central Pollution Control Board
MPN = Most Probable Number

Vehicle Exhaust Emission Norms

1. Passenger Cars

Norms	Carbon Monoxide (CO, g/km)	Hydrocarbons + oxides of Nitrogen (HC+ NOx, g/km)
1991Norms	14.3-27.1	2.0(Only HC)
1996 Norms	8.68-12.40	3.00-4.36
1998Norms	4.34-6.20	1.50-2.18
India stage 2000 norms	2.72	0.97
Bharat stage-II	2.2	0.5
Bharat Stage-III	2.3	0.35(combined)
Bharat Stage-IV	1.0	0.18(combined)

Source: Central Pollution Control Board
g/km = Grams per kilometer

2. Heavy Diesel Vehicles

Norms	CO(g/kmhr)	HC (g/kmhr)	NOx (g/kmhr)	PM(g/kmhr)
1991Norms	14	3.5	18	-
1996 Norms	11.2	2.4	14.4	-
India stage 2000 norms	4.5	1.1	8.0	0.36
Bharat stage-II	4.0	1.1	7.0	0.15
Bharat Stage-III	2.1	1.6	5.0	0.10
Bharat Stage-IV	1.5	0.96	3.5	0.02

Source: Central Pollution Control Board
PM = Particulates Matter

APPENDIX 3: DRINKING WATER STANDARDS

No.	Substance or characteristic	Indian Standards				WHO Guideline
		Requirement Desirable limit	Undesirable effect outside the desirable limit	Permissible limit in the absence of alternate Source	Remarks	
	Essential Characteristics					
1.	Color Hazen Units, Max	5	Above 5, consumer acceptance decreases	25	Extended to 25 only if toxic Substance are not suspect in absence of alternate sources	
2.	Odour	Unobjectionable	-	-	a) test cold and when heated b) test are several dilutions	
3.	Taste	Agreeable	-	-	Test to be conducted only after safety has been established	
4.	Turbidity (NTU) Max	5	Above 5, consumer acceptance decreases	10	-	1 NTU
5.	pH value	6.5 to 8.5	Beyond this range the water will affect the mucous membrane and/or water supply system	No relaxation	-	6.5 – 8.5
6.	Total Hardness (mg/L) CaCO3	300	Encrustation in water supply structure and adverse effects on domestic use	600	-	200 mg/l
7.	Iron (mg/L, Fe) Max	0.3	Beyond this limit taste/appearance are affected; has adverse effects on domestic uses and water supply structure and promotes iron bacteria	1.0	-	0.3 mg/l
8.	Chlorides 250 (mg/L, Cl) Max	250	Beyond this limit taste, corrosion and palatability are affected.	1000	-	
9.	Residual free Chlorine (mg/L), Max	0.2	-	-	To be applicable only when water is chlorinated. Tested at customer end. When protection	0.2 mg/l

					against viral infection is required, it should be min. 0.5 mg/L.	
	Desirable Characteristics					
10.	Dissolved solids mg/L. Max	500	Beyond this, palatability decreases and may cause gastrointestinal irritation.	2000	-	
11.	Calcium (mg/L, Ca) Max.	75	Encrustation in water supply structure and adverse effects on domestic use.	200	-	
12.	Magnesium (mg/L, Mg) Max	30	Encrustation in water supply structure and adverse effects on domestic use.	100	-	
13.	Copper (mg/L, Cu) Max	0.05	Astringent taste dis coloration and corrosion of pipes fittings and utensils will be caused beyond this.	1.5	-	
14.	Manganese (mg/L, Mn) Max	0.1	Beyond this limit taste/appearance are affected, has adverse effect on domestic use and water supply structure	0.3	-	0.1 mg/l
15.	Sulphate (mg/L, SO4) Max.	200	Beyond this causes gastro intestinal irritation when magnesium or sodium are present	400	May be extended up to 400 provided magnesium (as Mg) does not exceed 30	250 mg/l
16.	Nitrate (mg/L, NO3) Max.	45	Beyond this methaemo globinemia takes place.	100	-	50 mg/l
17.	Fluoride (mg/L, F) Max.	1.0	Fluoride may be kept as low as possible. High fluoride may cause fluorosis.	1.5	-	1.5 mg/l
18.	Phenolic Compounds (mg/L C6H5OH) Max.	0.001	Beyond this, it may cause objectionable taste and odour	0.002	-	
19.	Mercury (mg/L Hg) Max	0.001	Beyond this the water becomes toxic	No Relaxation.	To be tested when pollution is suspected	0.006 mg/l
20	Cadmium (mg/L, Cd) Max	0.003	Beyond this the water becomes toxic	No Relaxation.	To be tested when pollution is suspected	0.003 mg/l
21.	Selenium (mg/L, Se) Max	0.01	Beyond this the water becomes toxic.	No Relaxation.	To be tested when pollution is suspected	0.04 mg/l

22.	Arsenic (mg/L, As) Max.	0.01	Beyond this the water becomes toxic	No Relaxation	To be tested when pollution is suspected	0.01 mg/l
23.	Cyanide	0.05	Beyond this the water becomes toxic	No Relaxation	To be tested when pollution is suspected	
24.	Lead (mg/L Pb) Max.	0.01	Beyond this the water becomes toxic	No Relaxation	To be tested when pollution is suspected	0.01 mg/l
25.	Zinc (mg/L, Zn) Max.	5	Beyond this limit it can cause astringent taste and an opalescence in water	15	To be tested when pollution is suspected	4 mg/l
26.	Anionic detergents (mg/L, MBAS) Max	0.2	Beyond this limit it can cause a light froth in water	1.0	To be tested when pollution is suspected	
27.	Chromium (mg/L, Cr6+	0.05	May be carcinogenic above this limit	-	-	0.05 mg/l
28.	Polynuclear Aromatic Hydrocarbons (mg/l, PAH) Max	-	May be carcinogenic	-	-	
29.	Mineral oil (mg/L)	0.01	Beyond this limit, undesirable taste and odour after chlorination takes place	0.03	To be tested when pollution is suspected	
30.	Pesticides (mg/L) max	Absent	Toxic	0.001	-	
	Radioactive materials					
31.	Alpha emitters Bq/L Max	-	-	0.1	-	
32.	Beta emitters Pci/L Max	-	-	1.0	-	
33.	Alkalinity (mg/L,) Max	200	Beyond this limit, taste becomes unpleasant	600	-	
34.	Aluminum (mg/L, Al) Max	0.03	Cumulative effect is reported to cause dementia	0.2		
35.	Boron (mg/L) Max	1.0	-	5.0	-	2.4 mg/l

APPENDIX 4: ANTICIPATED ENVIRONMENTAL IMPACTS DUE TO PROJECT IMPLEMENTATION

Impact Field	Anticipated Impact on the Environment
Design phase	
Environmental clearances	No environmental clearance is required for the subprojects Requires other approvals/consents (Section II of the EARF) in order to implement the project. If not pursued on time, this can delay the project. Necessary consent/permits have to be obtained and must follow the guidelines issued by the concerned authorities.
Construction phase	
Air quality	Emissions from construction vehicles, equipment, and machinery used for excavation and construction, resulting in dust and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons
Surface water quality	Mobilization of settled silt materials, runoff 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. Operation of heavy equipment and machines in the nighttime can cause nuisance to the surrounding environment/ people.
Ecological resources	Felling of trees affects the terrestrial ecological balance.
Sources of materials	Extraction of materials can disrupt natural land contours and vegetation, resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and waterlogging, and water pollution.
Existing infrastructure, facilities, and utilities	Telephone lines, electric poles and wires, and old water pipes existing within right-of-way require shifting without disruption to services. Health risk due to closure of existing water supply, such as community tanks, water stations, and privately-owned small water pipes
Construction work camps, stockpile areas, storage areas, and disposal areas	Locations may cause encroachment/impact either directly or indirectly on adjacent environments. It may also include impacts on the people who might lose their homes or livelihoods due to the project activities. Temporary air and noise pollution from machine operation, and water pollution from storage and use of fuels, oils, solvents, and lubricants. This may cause conflict with residents and problem of waste disposal and disruptions to residents.
Construction waste	Excavation works, cleaning of drainage and trenching will produce additional amounts of waste soil. Accumulation of debris waste materials and stockpiling can cause environmental visual pollution.
Social and cultural resources	Sites of social/cultural importance (schools, hospitals, religious places, tourism sites) may be disturbed by noise, dust, vibration, and impeded access. Ground disturbance can uncover and damage archaeological and historical remains.
Landscape and aesthetics	Solid wastes as well as excess construction materials create unacceptable aesthetic conditions.
Traffic	Traffic flow will be disrupted if routes for delivery of construction materials and temporary blockages during construction activities are not planned and coordinated.
Accessibility	Traffic problems and conflicts in right of ways. roads, people, and businesses may be disturbed by repeated trench work.
Income	Blocking the access of residents and customers to nearby shops. Shops may temporarily lose business.
Occupational health and safety	Occupational hazards can arise during construction (e.g., trenching, falling objects, etc.). Risk of exposing to carcinogenic dust due to presence of asbestos cement pipes in the existing water supply system if disturbed during excavation
Community health and safety	Community hazards can arise during construction (e.g., open trenches, air quality, noise, falling objects, etc.). Trench work on concrete roads using pneumatic drills will cause noise and air pollution. Traffic accidents and vehicle collisions with pedestrians during material and waste transportation

Impact Field	Anticipated Impact on the Environment
	Risk of exposure to carcinogenic dust due to presence of asbestos cement pipes
Post-construction phase	
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 project construction.
Operation and maintenance phase	
Consent for operation from DPCC for WTP	WTPs are classified as “Orange Category” by DPCC and requires a CFO to start operation; the CFO is to be renewed every year
General maintenance	Maintenance activities may cause disturbance to sensitive receptors, dust, and increase in noise level.
Economic development	Impediments to residents and businesses during routine maintenance
Biodiversity fauna and flora	The proposed development is situated within an existing built-up area where the water supply infrastructure already exists. No areas of ecological diversity occur within the project location. Due to the nature and locality of the project, there is unlikely to be any significant impacts on biodiversity within the area during maintenance works. The use of fertilizers and herbicides in maintenance of newly planted trees, landscape and vegetation may, however, affect the environment.
Health and safety	Danger of operations and maintenance-related injuries Safety of workers and general public must be ensured. Poor waste management practices and unhygienic conditions at the improved facilities can breed diseases. Standing water due to inadequate storm water drainage systems and inadequate waste management practices pose a health hazard by providing breeding grounds for disease vectors such as mosquitoes, flies, and rats.
Solid waste	Solid waste residuals which may be generated during operations and maintenance activities. Sludge will be generated from water treatment plants. Solid waste sludge will be generated from WTPs

APPENDIX 5: RAPID ENVIRONMENTAL ASSESSMENT CHECKLISTS

1. Water Supply

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…			
▪ 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.			
▪ health and safety hazards to workers from the management of chlorine used for disinfection and other contaminants?			
▪ dislocation or involuntary resettlement of people			
▪ social conflicts between construction workers from other areas and community workers?			
▪ 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?			
▪ 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?			
Climate Change and Disaster Risk Questions The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.	Yes	No	Remarks
▪ Is the Project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes (see Appendix 5A below)			
▪ Could changes in temperature, precipitation, or extreme events patterns over the Project lifespan affect technical or financial sustainability (e.g., changes in rainfall patterns disrupt reliability of water supply; sea level rise creates salinity intrusion into proposed water supply source)?			
▪ Are there any demographic or socio-economic aspects of the Project area that are already vulnerable (e.g. High incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)?			
▪ Could the Project potentially increase the climate or disaster vulnerability of the surrounding area (e.g., by using water from a vulnerable source that is relied upon by many user groups, or encouraging settlement in earthquake zones)?			
▪ * Hazards are potentially damaging physical events.			

APPENDIX 6: OUTLINE OF AN ADB EIA OR IEE REPORT

An environmental assessment report is required for all environment category A and B projects. Its level of detail and comprehensiveness is commensurate with the significance of potential environmental impacts and risks. A typical EIA report contains the following major elements, and an IEE may have a narrower scope depending on the nature of the project. The substantive aspects of this outline will guide the preparation of environmental impact assessment reports, although not necessarily in the order shown.

A. Executive Summary

This section describes concisely the critical facts, significant findings, and recommended actions.

B. Policy, Legal, and Administrative Framework

This section discusses the national and local legal and institutional framework within which the environmental assessment is carried out. It also identifies project-relevant international environmental agreements to which the country is a party.

C. Description of the Project

This section describes the proposed project; its major components; and its geographic, ecological, social, and temporal context, including any associated facility required by and for the project (for example, access roads, power plants, water supply, quarries and borrow pits, and spoil disposal). It normally includes drawings and maps showing the project's layout and components, the project site, and the project's area of influence.

D. Description of the Environment (Baseline Data)

This section describes relevant physical, biological, and socioeconomic conditions within the study area. It also looks at current and proposed development activities within the project's area of influence, including those not directly connected to the project. It indicates the accuracy, reliability, and sources of the data.

E. Anticipated Environmental Impacts and Mitigation Measures

This section predicts and assesses the project's likely positive and negative direct and indirect impacts to physical, biological, socioeconomic (including occupational health and safety, community health and safety, vulnerable groups and gender issues, and impacts on livelihoods through environmental media [Appendix 2, para. 6]), and physical cultural resources in the project's area of influence, in quantitative terms to the extent possible; identifies mitigation measures and any residual negative impacts that cannot be mitigated; explores opportunities for enhancement; identifies and estimates the extent and quality of available data, key data gaps, and uncertainties associated with predictions and specifies topics that do not require further attention; and examines global, transboundary, and cumulative impacts as appropriate.

F. Analysis of Alternatives

This section examines alternatives to the proposed project site, technology, design, and operation including the no project alternative in terms of their potential environmental suitability

under local conditions; and their institutional, training, and monitoring requirements. It also states the basis for selecting the particular project design proposed and, justifies recommended emission levels and approaches to pollution prevention and abatement.

G. Information Disclosure, Consultation, and Participation

This section:

(i) describes the process undertaken during project design and preparation for engaging stakeholders, including information disclosure and consultation with APs and other stakeholders;
(ii) summarizes comments and concerns received from APs and other stakeholders and how these comments have been addressed in project design and mitigation measures, with special attention paid to the needs and concerns of vulnerable groups, including women, the poor, and Indigenous Peoples; and
(iii) describes the planned information disclosure measures (including the type of information to be disseminated and the method of dissemination) and the process for carrying out consultation with APs and facilitating their participation during project implementation.

H. Grievance Redress Mechanism

This section describes the grievance redress framework (both informal and formal channels), setting out the time frame and mechanisms for resolving complaints about environmental performance.

I. Environmental Management Plan

This section deals with the set of mitigation and management measures to be taken during project implementation to avoid, reduce, mitigate, or compensate for adverse environmental impacts (in that order of priority). It may include multiple management plans and actions. It includes the following key components (with the level of detail commensurate with the project's impacts and risks):

(i) Mitigation:
- identifies and summarizes anticipated significant adverse environmental impacts and risks;
- describes each mitigation measure with technical details, including the type of impact to which it relates and the conditions under which it is required (for instance, continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate; and
- provides links to any other mitigation plans (for example, for involuntary resettlement, Indigenous Peoples, or emergency response) required for the project.

(ii) Monitoring:
- describes monitoring measures with technical details, including parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits and definition of thresholds that will signal the need for corrective actions; and

- describes monitoring and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures and document the progress and results of mitigation.

(iii) Implementation arrangements:

- specifies the implementation schedule showing phasing and coordination with overall project implementation;
- describes institutional or organizational arrangements, namely, who is responsible for carrying out the mitigation and monitoring measures, which may include one or more of the following additional topics to strengthen environmental management capability: technical assistance programs, training programs, procurement of equipment and supplies related to environmental management and monitoring, and organizational changes; and
- estimates capital and recurrent costs and describes sources of funds for implementing the environmental management plan.

(iv) Performance indicators: describes the desired outcomes as measurable events to the extent possible, such as performance indicators, targets, or acceptance criteria that can be tracked over defined time periods.

J. Conclusion and Recommendation

This section provides the conclusions drawn from the assessment and provides recommendations**.**

APPENDIX 7A: SAMPLE SEMI-ANNUAL ENVIRONMENTAL MONITORING REPORT TEMPLATE

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)[1]	If On-going Construction	
				%Physical Progress	Expected Completion Date

Compliance status with National/State/Local statutory environmental requirements[2]

Package No.	Subproject Name	Statutory Environmental Requirements[3]	Status of Compliance[4]	Validity if obtained	Action Required	Specific Conditions that will require environmental monitoring as per Environment Clearance, Consent/Permit to Establish[5]

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

[2] 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.

[3] Specify (environmental clearance? Permit/consent to establish? Forest clearance? Etc.)

[4] Specify if obtained, submitted and awaiting approval, application not yet submitted

[5] *Example: Environmental Clearance requires ambient air quality monitoring, Forest Clearance/Tree-cutting Permit requires 2 trees for every tree, etc.*

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.

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)[6]

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						

[6] Attach Laboratory Results and Sampling Map/Locations

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
Operational Phase						

Overall Compliance with CEMP/ EMP

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

Approach and Methodology for Environmental Monitoring of the Project

- 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

Solid Waste Generation & Disposal

- Provide details of solid waste generated (site/facility-wise) during the reporting period (quantity and composition)
- Provide details of storage, transfer and disposal of entire solid waste generated

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

APPENDIX 7B: SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT

Project Name
Contract Number

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

WEATHER CONDITION:
_____

INITIAL SITE CONDITION: _____

CONCLUDING SITE CONDITION:

Satisfactory _____ Unsatisfactory _____ Incident _____ Resolved _____ Unresolved _____

INCIDENT:
Nature of incident:
_____

Intervention steps:
_____

Incident issues:

Resolution

Project activity stage	Survey	
	Design	
	Implementation	
	Pre-commissioning	
	Guarantee period	

Inspection

Emissions	Waste minimization
Air quality	Reuse and recycling
Noise pollution	Dust and litter control
Hazardous substances	Trees and vegetation

Site restored to original condition Yes ☐ No ☐

Signature
_____

Sign off

_____ _____
Name **Name**
Position **Position**

APPENDIX 8: SAMPLE OUTLINE TRAFFIC MANAGEMENT PLAN

A. Principles for TMP around the Water Pipes Construction Sites

1. One of the prime objectives of this TMP is to ensure the safety of all the road users along the work zone, and to address the following issues:

(i) the safety of pedestrians, bicyclists, and motorists travelling through the construction zone;
(ii) protection of work crews from hazards associated with moving traffic;
(iii) mitigation of the adverse impact on road capacity and delays to the road users;
(iv) maintenance of access to adjoining properties; and
(v) addressing issues that may delay the project.

B. Operating Policies for TMP

2. The following principles will help promote safe and efficient movement for all road users (motorists, bicyclists, and pedestrians, including persons with disabilities) through and around work zones while reasonably protecting workers and equipment.

(i) Make traffic safety and temporary traffic control an integral and high-priority element of project from planning through design, construction, and maintenance.
(ii) Inhibit traffic movement as little as possible.
(iii) Provide clear and positive guidance to drivers, bicyclists, and pedestrians as they approach and travel through the temporary traffic control zone.
(iv) Inspect traffic control elements routinely, both day and night, and make modifications when necessary.
(v) Pay increased attention to roadside safety in the vicinity of temporary traffic control zones.
(vi) Train all persons that select, place, and maintain temporary traffic control devices.
(vii) Keep the public well informed.
(viii) Make appropriate accommodation for abutting property owners, residents, businesses, emergency services, railroads, commercial vehicles, and transit operations.

3. **Figure A8.1 to Figure A8.12** illustrates the operating policy for TMP for the construction of water pipes and the sewers along various types of roads.

C. Analyze the impact due to street closure

4. Apart from the capacity analysis, a final decision to close a particular street and divert the traffic should involve the following steps:

(i) approval from the ULB/Public Works Department (PWD) to use the local streets as detours;
(ii) consultation with businesses, community members, traffic police, PWD, etc, regarding the mitigation measures necessary at the detours where the road is diverted during the construction;
(iii) determining of the maximum number of days allowed for road closure, and incorporation of such provisions into the contract documents;
(iv) determining if additional traffic control or temporary improvements are needed along the detour route;
(v) considering how access will be provided to the worksite;

(vi) contacting emergency service, school officials, and transit authorities to determine if there are impacts to their operations; and

(vii) developing a notification program to the public so that the closure is not a surprise. As part of this program, the public should be advised of alternate routes that commuters can take or will have to take as result of the traffic diversion.

5. If full road-closure of certain streets within the area is not feasible due to inadequate capacity of the detour street or public opposition, the full closure can be restricted to weekends with the construction commencing on Saturday night and ending on Monday morning prior to the morning peak period.

Figure A8.1: Policy Steps for the TMP

D. Public awareness and notifications

6. As per discussions in the previous sections, there will be travel delays during the constructions, as is the case with most construction projects, albeit on a reduced scale if utilities and traffic management are properly coordinated. There are additional grounds for travel delays in the area, as most of the streets lack sufficient capacity to accommodate additional traffic from diverted traffic as a result of street closures to accommodate the works.

7. The awareness campaign and the prior notification for the public will be a continuous activity which the project will carry out to compensate for the above delays and minimize public claims as result of these problems. These activities will take place sufficiently in advance of the time when the roadblocks or traffic diversions take place at the particular streets. The reason for

this is to allow sufficient time for the public and residents to understand the changes to their travel plans. The project will notify the public about the roadblocks and traffic diversion through public notices, ward level meetings and city level meeting with the elected representatives.

8. The PIU will also conduct an awareness campaign to educate the public about the following issues:

(i) traffic control devices in place at the work zones (signs, traffic cones, barriers, etc.);
(ii) defensive driving behaviour along the work zones; and
(iii) reduced speeds enforced at the work zones and traffic diversions.

9. It may be necessary to conduct the awareness programs/campaigns on road safety during construction.

10. The campaign will cater to all types of target groups i.e. children, adults, and drivers. Therefore, these campaigns will be conducted in schools and community centres. In addition, the project will publish a brochure for public information. These brochures will be widely circulated around the area and will also be available at the PIU, and the contractor's site office. The text of the brochure should be concise to be effective, with a lot of graphics. It will serve the following purpose:

(i) explain why the brochure was prepared, along with a brief description of the project;
(ii) advise the public to expect the unexpected;
(iii) educate the public about the various traffic control devices and safety measures adopted at the work zones;
(iv) educate the public about the safe road user behaviour to emulate at the work zones;
(v) tell the public how to stay informed or where to inquire about road safety issues at the work zones (name, telephone, mobile number of the contact person; and
(vi) indicate the office hours of relevant offices.

E. Install traffic control devices at the work zones and traffic diversion routes

11. The purpose of installing traffic control devices at the work zones is to delineate these areas to warn, inform, and direct the road users about a hazard ahead, and to protect them as well as the workers. As proper delineation is a key to achieve the above objective, it is important to install good traffic signs at the work zones. The following traffic control devices are used in work zones:

- Signs
- Pavement Markings
- Channelizing Devices
- Arrow Panels
- Warning Lights

12. Procedures for installing traffic control devices at any work zone vary, depending on road configuration, location of the work, construction activity, duration, traffic speed and volume, and pedestrian traffic. Work will take place along major roads, and the minor internal roads. As such, the traffic volume and road geometry vary. The main roads carry considerable traffic; internal

roads in the new city areas are wide but in old city roads very narrow and carry considerable traffic. However, regardless of where the construction takes place, all the work zones should be cordoned off, and traffic shifted away at least with traffic cones, barricades, and temporary signs (temporary “STOP” and “GO”).

13**.** **Figure A8.2 to Figure A8.6** illustrates a typical set-up for installing traffic control devices at the work zone of the area, depending on the location of work on the road way, and road geometrics:

- Work on shoulder or parking lane
- Shoulder or parking lane closed on divided road
- Work in Travel lane
- Lane closure on road with low volume
- Street closure with detour

14. The work zone should take into consideration the space required for a buffer zone between the workers and the traffic (lateral and longitudinal) and the transition space required for delineation, as applicable. For the works, a 30 cm clearance between the traffic and the temporary STOP and GO signs should be provided. In addition, at least 60 cm is necessary to install the temporary traffic signs and cones.

15. Traffic police should regulate traffic away from the work zone and enforce the traffic diversion result from full street closure in certain areas during construction. Flagggers/ personnel should be equipped with reflective jackets at all times and have traffic control batons (preferably the LED type) for regulating the traffic during night time.

16. In addition to the delineation devices, all the construction workers should wear fluorescent safety vests and helmets in order to be visible to the motorists at all times. There should be provision for lighting beacons and illumination for night constructions.

Figure A8.2 & A8.3: Work on shoulder or parking lane & Shoulder or parking lane closed on divided road

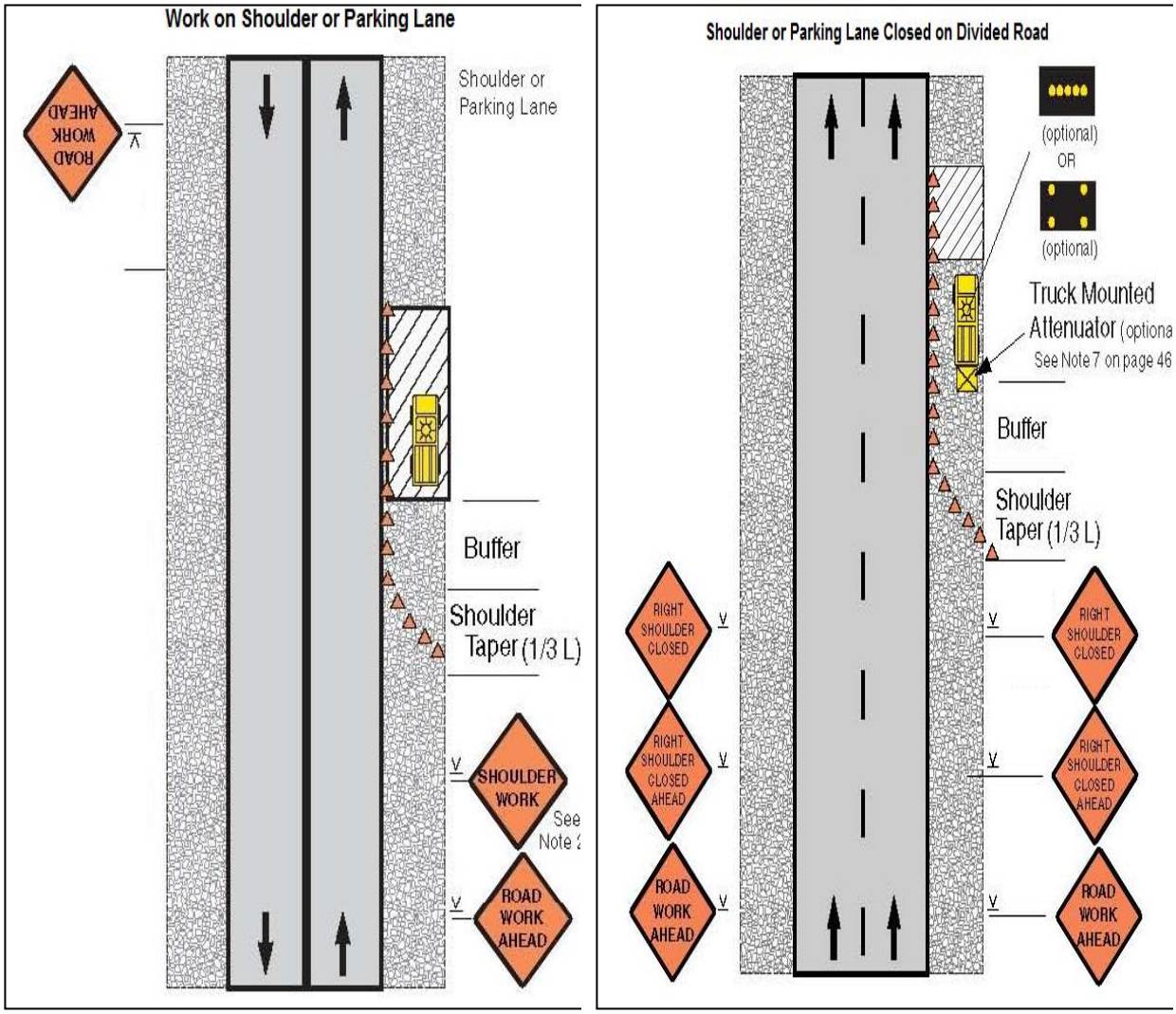


Figure A8.4 & A8.5: Work in Travel lane & Lane closure on road with low volume

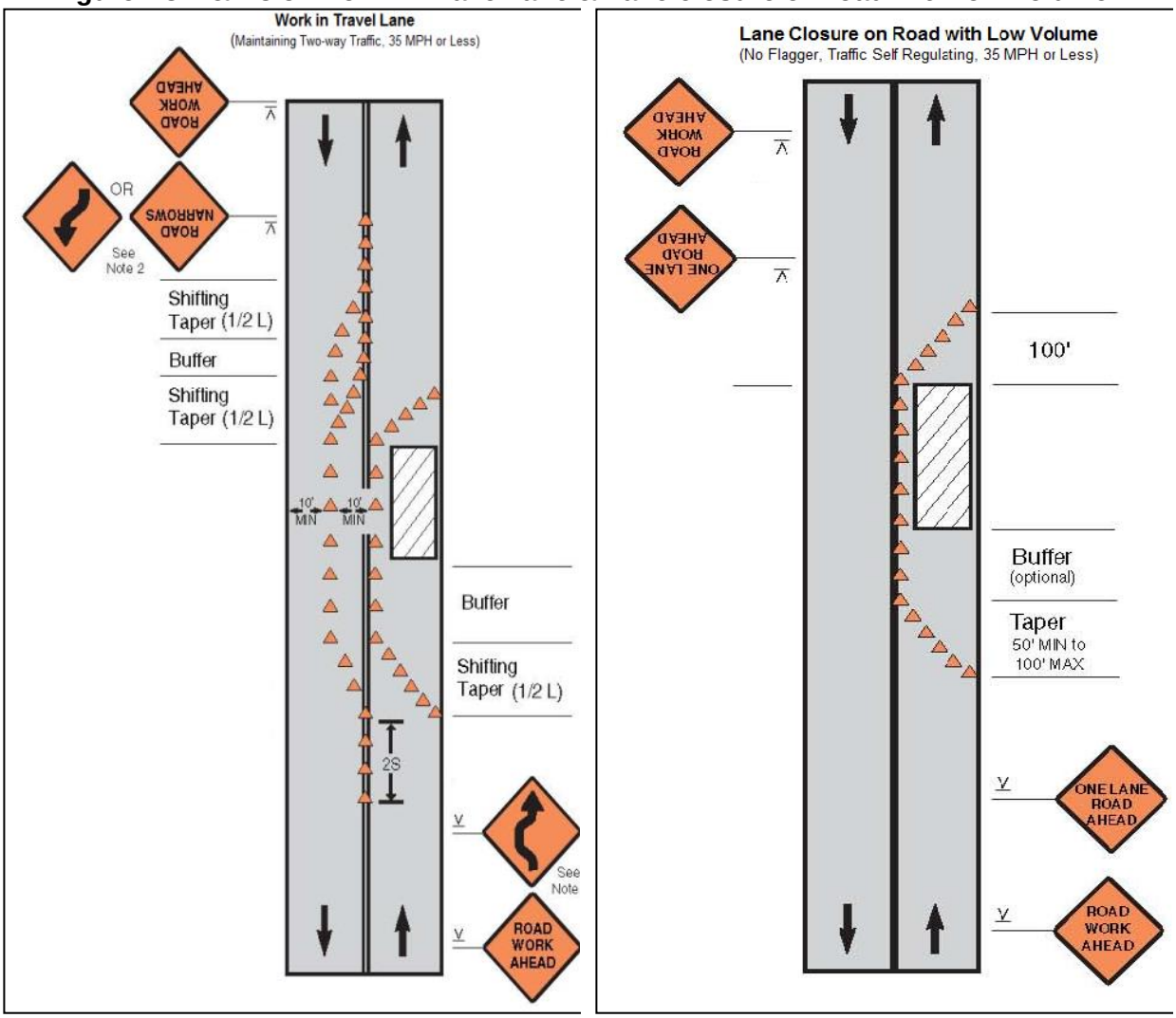
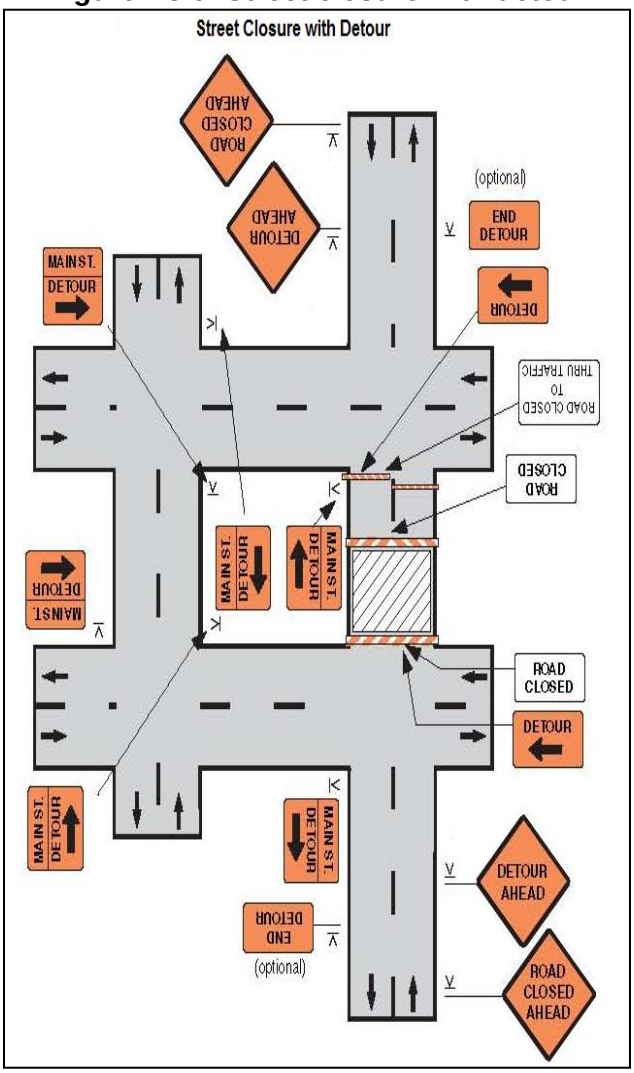


Figure A8.6: Street closure with detour



APPENDIX 9: SAMPLE OUTLINE SPOILS (CONSTRUCTION WASTE) MANAGEMENT PLAN

The Spoil Management Plan should be site specific and be part of the monthly Construction Management Plan.

- The contractor, in consultation with the PIU, has to find out appropriate location/s for the disposal of the excess soil generated. The spoils should be deposited only at these sites.
- Further precautions need to be taken in case of the contaminated spoils
- The vehicle carrying the spoil should be covered properly.
- The spoils generating from each site should be removed on the same day or immediately after the work is complete. The site / road should be restored to the original condition.

I. Spoils information

The spoil information contains the details like a) The type / material, b) Potential contamination by that type, c) Expected volume (site / component specific), d) Spoil Classification etc.

II. Spoils management

The Spoil Management section gives the details of a) Transportation of spoil b) disposal site details c) Precautions taken d) Volume of contaminated spoil, if present, d) Suggested reuse of disposal of the spoil

III. Documentation

The volume of spoil generated (site specific, date wise), site disposed, reuse / disposal details should be documented properly.

APPENDIX 10: SAMPLE GRIEVANCE REGISTRATION FORM

(To be available in Hindi and English)

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	Project:			
Contact information/personal details					
Name		Gender	* Male * Female	Age	
Home address					
Place					
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)	
Mode of communication: Note/letter E-mail Verbal/telephonic	
Reviewed by: (Names/positions of officials reviewing grievance)	
Action taken:	
Whether action taken disclosed:	Yes No
Means of disclosure:	