Draft Initial Environmental Examination

Project Number: 53067-004

Loan 4106-IND: Inclusive, Resilient, and Sustainable Housing for Urban Poor Sector Project in Tamil Nadu

October 2024

IND: Industrial Housing Project, Cheyyar by Tamil Nadu Industrial Housing Pvt Ltd, Tamil Nadu

Prepared by Tamil Nadu Infrastructure Fund Management Corporation (TNIFMC) for the Asian Development Bank.

ABBREVIATIONS

ADB	:	Asian Development Bank
ASI	:	Archaeological Survey of India
CPCB	:	Central Pollution Control Board
CtE	:	Consent to Establish
CtO	:	Consent to Operate
EA	:	Executing Agency
EAC	:	Expert Appraisal Committee
EARF	:	Environmental Assessment and Review Framework
EC	:	Environmental Clearance
EHS	:	Environmental Health and Safety
EIA	:	Environmental Impact Assessment
EMP	:	Environmental Management Plan
ESS	:	Environmental and Social Safeguards
GOI	:	Government of India
GoTN	:	Government of Tamil Nadu
GHG	:	Greenhouse Gases
GRM	:	Grievance Redressal Mechanism
IA	:	Implementing Agency
IEE	:	Initial Environmental Examination
MOEFCC	:	Ministry of Environment, Forests and Climate Change
NOC	:	No Objection Certificate
PMU	:	Project Management Unit
PCR	:	Physical Cultural Resources
PMC	:	Project Implementation Division
PPE	:	Personal Protective Equipment
REA	:	Rapid Environmental Assessment
RF	:	Housing Framework
RoW	:	Right of Way
SEIAA	:	State Environmental Impact Assessment Authority
SPS	:	Safeguard Policy Statement
STP	:	Sewage Treatment Plant
TNPCB	:	Tamil Nadu Pollution Control Board
TNSCB	:	Tamil Nadu Slum Clearance Board
ULB	:	Urban Local Body

WEIGHTS AND MEASURES

°C	Degree Celsius
km	kilometre
lpcd	Litres per capita per day
m	metre
Mgd	Million gallons per day
Mld	Million Litres per day
mm	millimetre
Nos	Numbers
sq.km	Square Kilometre
dBA	A-weighted decibels
LAeq	Equivalent Continuous Sound Pressure Level
$\mu g/m^3$	Micrograms Per Cubic Meter
KLD	Kilo Liters per Day
LPCD	Litre Per Capita Per Day

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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EXECUTIVE SUMMARY

1. **Project Background.** The 'Industrial Housing Project at Cheyyar is a residential project, to be developed by M/s Tamil Nadu Industrial Housing Private Limited (TNIHPL), in Perumpulimedu Village, Vembakkam Taluka, Tiruvannamalai District, Tamil Nadu. The project involves the construction of a G+3 floor structure over a land of 2.02 acres. The total built-up area proposed (FSI + non-FSI) is 44,171 sq. ft (4,104 sqm). The overall project shall comprise of 441 beds for men employees working in SIPCOT and in the nearby localities. The project is proposed to be located within the SIPCOT Industrial Complex, Cheyyar. SIPCOT acts as a Nodal Agency of Government of Tamil Nadu in the sanction / disbursement of structured package of assistance to large industrial units and provides basic and comprehensive infrastructure facilities.

2. **Subproject Scope.**

3. **Project Categorization**. As per the ADB's Safeguard Policy Statement (SPS, 2009), this subproject is categorized as "B" (please refer REA checklist in **Appendix 1**), for environmental safeguards. The categorization is based on the proposed construction activities and anticipated environmental impacts at the time of construction in the project area and its surrounding environment. For Category B projects, the SPS 2009 mandates preparation of Initial Environmental Examination (IEE) including Environmental Management Plan (EMP has been prepared.

4. As per the Government of India's EIA notification 2006 and its subsequent amendments, this subproject is exempted from obtaining environmental clearance (EC), this is due to the total built-up area comes around 4,104 sq.m (construction of a G+3 floor structure with a designated community area and commercial space over a land area over 2.02 acres), which is less that the stipulated requirement of 20,000 sq.m for category B2 projects (project schedule 8(a) for Building and Construction Projects).

5. **Project implementation arrangements.** Tamil Nadu Industrial Housing Private Limited (TNIHPL) will be responsible for the management, coordination and execution of project activities funded by TNIFMC. A PMC will be on-board to assist TNIHPL, in implementation of the environmental safeguard requirements incompliance with ADB SPS 2009, TNSF ESG and loan covenants. The Contractors will appoint a qualified and experienced Environment, Health and Safety (EHS) officer, who will be responsible for EMP implementation, health and safety related issued including environmental safeguards related grievances noticed (if any) during implementation of the project. The contractor will prepare the site specific EMP during the construction stage which will be approved by TNIHPL/TNIFMC.

6. **Description of the Environment.** The project is located in Cheyyar SIPCOT area, beside Cheyyar-Kanchipuram Road, Tiruvannamalai District, Tamil Nadu. Tiruvannamalai is a Selection Grade Municipality, as per G.O. (Ms) No. 283 of Municipal Administration and Water Supply Department, dated 02.12.2008. It lies at a latitude of 12.2253° N and a longitude of 79.0747° E. Tiruvannamalai town is located at an altitude of 171 meters above mean sea level. It is situated along the State Highways, connecting important cities in Tamil Nadu such as Chennai, Vellore, and Villupuram. The mean maximum and minimum temperatures during summer and winter range between 40°C and 15°C respectively. The highest temperature ever recorded is 42°C, and the lowest is 12°C. The humidity ranges from 40% to 70% during summer and 60% to 85% during winter. The maximum rainfall occurs during the Northeast

monsoon (October to December), with significant rainfall also occurring during the Southwest monsoon. The average annual rainfall in Tiruvannamalai is around 985 mm. The wind direction is predominantly towards the Southwest, but during the winter season, it changes direction from the North to East, and in summer, it shifts from the South to West. The topography of Tiruvannamalai is mostly plain, with a gentle slope towards the North, near the foothills of the Annamalai hills.

7. For further investigation, a 5 km buffer around the subproject site was defined and studied. From the assessment, the buffer area contains mostly tree cover, shrub lands, cropland and built-up areas.

8. As per the Tiruvannamalai Town Planning section, the land is classified as dry land. The land use surrounding the subproject site are mostly private agricultural lands and informal household settlements. There are no water bodies surrounding the site or any ecologically sensitive zones. The due diligence study confirms that there are no forest areas within 5 km of the subproject area and hence there will not be any impact due to the implementation of the proposed subproject.

9. **Potential environmental impacts and mitigation measures.** The subproject is unlikely to cause any significant adverse impacts that are irreversible, because: (i) there are no significant sensitive environmental features along the project site and (ii) predicted impacts are site-specific and likely to be associated with the construction process.

10. Pre-construction impacts are associated with (i) sourcing of construction materials. Construction materials have to be identified before any construction commences and a proposed mitigation measure is to procure construction materials from government-authorized/permitted quarries and vendors in compliance with environmental regulations of the country; (ii) site selection of construction work camps, stockpile areas, storage areas, and disposal areas. These should be located 500 m away from the nearby settlements. Residential areas will not be considered for setting up construction camps to protect the human environment; (iii) Construction traffic will utilise existing roads, which may lead to increase in traffic, however most of the work areas are accessible from the existing roads, potential impacts will be of short duration, localized and can be mitigated.

11. Construction-related impacts are standard and site-specific to the construction activities and are not expected to be significant. Key impacts during construction are envisaged on the following aspects: (i) transportation of materials, (ii) dust generation, air and noise pollution from construction activities, (iii) sourcing of water for construction activities, (iv) handling of construction materials at site and, (v) adoption of safety measures during construction. There are no water bodies surrounding the site and hence impact due to runoff from the construction site is not envisaged.

12. Air quality impacts due to the construction activity on the site are not expected to have a major health impact to the surroundings, due to scattered habitations near the project site. However, the movement of vehicles transporting construction materials and debris will have minor impact on the roads due to the generation of dust, which is site-specific, low magnitude, short, and can be easily mitigated.

13. For noise impacts, most of the construction activities (including pre-construction site cleaning works) shall be done involving minimal heavy equipment usage and hence noise is not expected to be significant.

14. During the project construction and operation, a moderate negative impact is anticipated on the water resources. This is due to the utilisation of water for construction purposes and use of water for domestic purposes during operation, which will have a moderate stress on the available water resources. For construction and operation purposes, the water shall be provided by SIPCOT. The estimated water demand of 60 KLD will be sourced from the SIPCOT.

15. Impact on the flora and fauna during the project construction and operation will be negligible. There is no forest around the project area. Further, tree cutting is not envisaged in the subproject area and there are no protected areas or environmentally sensitive areas surrounding the subproject site.

16. Impact on Occupational, Health and Safety (OHS) including exposure to work-related chemical, physical, biological and social hazard is likely to occur during proposed construction works. Potential impacts are negative and short-term but reversible by mitigation measures including provision of PPE's, preparation of comprehensive site-specific health and safety (H&S) plan provided with management strategy (including training) and applying practices that are intended to eliminate, or reduce, fatalities, injuries and illnesses for workers.

17. Major post-construction impacts are specific to site clean-up activities including backfill of any excavation and trenches; reuse of topsoil; re-establishing the drain pattern if impacted; and removal of all tools, equipment, barricades, surplus materials, debris, and rubbish.

18. Major project operation impacts are specific to (i) municipal solid waste generation, and (ii) wastewater generation from the site. (iii) health and safety issues (including communicable diseases, fire hazards etc.) and (iv) operation of infrastructures/ amenities including STP, rainwater harvesting structures, and maintenance of lawn/ green belt. The generated MSW generated within the project location will be handled by the operations and maintenance team appointed by TNIHPL.

19. The main project risk is the low institutional capacity of the contractors. These risks will be mitigated by: (i) hiring a qualified and experienced environmental specialist at the Developer level; (ii) providing training and capacity building on environmental safeguards to the contractors and workers, (iii) developing and implementing site-specific EMPs (iv) following appropriate project implementation, mitigation, monitoring and reporting arrangements, and (iv) adequate site supervision including audits of contractor's environmental, health and safety (EHS) performance. Monitoring parameters will be identified in the environmental monitoring plan to check the effectiveness of EMP measures and to ensure any unidentified impacts can be readily addressed. The project risks will also be mitigated through the inclusion of environmental specifications/EMP in the bid document and contractor's contract agreement.

20. For the identified impacts, mitigation measures have been provided (in the EMP) to reduce all negative impacts to acceptable levels during pre-construction, construction, and post-construction/ operation phases. The environmental monitoring program will ensure that all mitigation measures are implemented and will determine whether the environment is protected as intended. It will include observations on- and off-site, document checks, and consultation with workers and beneficiaries. Any requirements for corrective action will be reported to the ADB.

21. **Environmental Management Plan**. The identified potential environmental impacts can be managed through effective implementation of the Environmental Management Plan (EMP).

An EMP is included as part of this IEE, which includes (i) mitigation measures for environmental impacts identified during the implementation stage; (ii) an environmental monitoring program, and the responsible entities for mitigating, monitoring and reporting; (iii) public consultation and information disclosure procedure; and (iv) grievance redress mechanism. A number of impacts and their significance have already been reduced by amending subproject design. The EMP will be included in the civil work bidding and contract documents. The Environmental Management Plan (EMP) Budget has been estimated to be INR 1.82 Lakh.

22. **Consultation, Disclosure, and Grievance Redress**. During the course of preparing IEE, meetings with the public and other relevant government stakeholders have been conducted. The subproject components and associated clearances/ permissions/ NoCs requirements as well as the way forward for the project were discussed. The feedback and suggestions from the consultations were collected and were utilized in the design of the project, and environmental assessment plan preparation. Consultations will continue throughout the project implementation period. This IEE report including EMP will be disclosed on TNIFMC and ADB websites.

23. A Grievance Redress Mechanism (GRM) is described within the IEE to ensure any public grievances are addressed quickly. The Tamil Nadu Industrial Housing Private Limited (TNIHPL) will set up a 3-tier common GRM acceptable to ADB at project and divisional levels to address any environmental and/or social issues that arise due to subproject activity. The GRM will constitute a suitable systematic process to receive, evaluate, and facilitate the resolution of affected persons and other stakeholders' complaints and grievances about subproject environmental (and social) safeguards performance. It will aim to provide a time-bound, trusted, and transparent mechanism to voice and resolve issues and concerns associated with the subproject implementation. The GRM will address concerns and complaints promptly via a transparent process. Complaints and their resolution will be documented and reported in semi-annual safeguard reports submitted to ADB.

24. **Monitoring and Reporting**. The key institutions involved in the IEE and EMP implementation will be the TNIHPL and PMC. To ensure effective implementation of environmental safeguards procedures, the PMC will include designated and trained staff and focal point persons. The TNIHPL will be responsible for the overall supervision and compliance with (i) environmental safeguards requirements including resubmission of revised documentation (for any location/design changes) for ADB concurrence, (ii) coordinate the project GRM, (iii) coordinate with line departments to ensure smooth implementation of the project, (iv) supervise the procurement process, and (v) report to the ADB. In particular, the TNIHPL will ensure consistency of safeguard documents with government policy, legal and administrative framework across all jurisdictions national, state and local level. The PMC will be responsible for day-to-day activity and compliance with safeguards during project implementation in the field including engaging in project GRM, meaningful consultations, and oversight of the contractors or any third-party consultants.

25. The TNIHPL/ PMC will be responsible for overall safeguards reporting and monitoring, including final approval of the site-specific environmental management plan (SEMP) prepared by the contractors. The contractor will conduct environmental monitoring for the project and provide the environmental input into reporting based on-site inspections, and compliance checks and prepare the Semi-annual Environmental Monitoring Report (SEMR) for submission to the PMU. Further, the PMU will submit the semi-annual EMR to ADB for review

and clearance since commencement to closure of the Project. During the operation and maintenance period, the EMR shall be submitted by the PMU to ADB on annual basis till issuance of project completion report (PCR) by ADB. Environmental monitoring reports will be required to be submitted to ADB within 30 days from the end of the relevant period. The ADB-cleared EMRs will be disclosed on the ADB and TNIFMC website.

26. The PMC will be responsible for environmental safeguards related issues during implementation of the Project. Further, will support in preparation of contractor's site-specific EMP before submission to the TNIHPL for final approval. The TNIHPL, will coordinate and interact with the TNIFMC on compliance with ADB's safeguards requirements and with relevant government agencies and local authorities on permits and clearances. During the project implementation, the PMC will conduct regular field visits to ensure EMP implementation, to avoid noncompliance, and prepare a suitable Action Taken Report (ATR) with a time-bound corrective action plan, if non-compliance pertaining to EMP implementation is noticed during execution of the Project. The ATR will be shared with the Contractor for effective implementation of the EMP and included in the quarterly and semi-annual monitoring reports.

27. On completion of the construction stage/operation stage, the facility operator/ contractor will continue to submit annual EMR to TNIFMC and subsequently it shall be submitted to ADB till issuance of PCR by ADB.

28. **Conclusions and Recommendations**. The IEE report including EMP has been prepared based on Feasibility Report and Detailed Project Report (DPR). Based on the reports, the proposed project is unlikely to cause adverse environmental impacts. Additionally, the site specific EMP shall be prepared by the contractor during construction stage of the Project and the potential impacts that are associated with design, construction, and operation can be mitigated without difficulty through proper engineering design and the incorporation or application of recommended mitigation measures and procedures. Based on the findings of the IEE, there are no significant impacts, and the classification of the subproject as Category "B" is confirmed. For any change of scope, the draft IEE report will be updated covering the associated impacts and mitigation measures and clearance shall be obtained from ADB before execution of the work. No further study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS, 2009, or the Government of India EIA Notification, 2006.

I. INTRODUCTION

A. Background

29. Tamil Nadu is among India's large states having an acute housing shortage. Issues affecting the demand for housing include (i) lack of access by the poor to existing housing programs because these are unaffordable and have stringent qualification requirements; (ii) designs are not gender-sensitive; and (iii) housing projects experience low demand and occupancy because they are located far from the city centers.

30. Factors affecting the housing supply include (i) inadequate public resources for urban housing, (ii) difficulty in attracting private investment because of low investment returns and lack of incentives, (iii) mismatch between housing policies and procedures of central and state government and capacity of the poor, and (iv) weaknesses in regional planning resulting in areas that are strong economically but lacking a supply of affordable housing.

31. The state's housing deficit accounts for 6.66% of the national housing shortfall. National data shows that, when the housing shortage is mapped against income levels, EWS households account for 56% of the total shortage, and LIG households for 39%. Only 4% of the national housing shortage is borne by households in the middle-income group or those with higher income, as current housing stocks cater to middle- and higher-income groups.

32. Tamil Nadu is the sixth most populous state in India with a population of over 72 million. The state contributes 8.54% of India's gross domestic product, with strong economic growth accompanied by increased rural-urban migration. Tamil Nadu has one of the highest rates of urbanization in India with 48% of the population living in urban areas. The supply of urban infrastructure and services does not meet high and sharply increasing demand.

33. As per the National Urban Housing and Habitat Policy (NUHHP), several comprehensive urban initiatives have been undertaken. The most recent being the Pradhan Mantri Awas Yojana- Housing for All (PMAY-HFA). Affordable housing also needs to be made accessible to low-income migrant workers, working women, and female-headed low-income households to ensure sustainable urban development.

34. The project will promote access to inclusive, resilient, and sustainable housing and urban development in Tamil Nadu by supporting the state in; (i) mobilizing private sector financing to construct affordable housing units for urban poor households, migrant workers from the economically weaker section (EWS) and lower-income group (LIG) and other populations that are underserved by the housing market.

B. Subproject location and Outputs of the subproject

35. Based on the land availability, the TNIHPL has selected the Cheyyar site (Geo-coordinates 12°43'25.1"N 79°38'39.2"E) as a potential Affordable Housing Project site (Refer figure 1).

36. **Project Selection Criteria**. As per the Asian Development Bank (ADB) Safeguard Policy Statement (SPS) 2009 and prevailing rules and regulations, the project selection criteria have been prepared and included in the TNSF ESG which shall act as a guideline for subproject selection.

Figure 1: Map Showing the Subproject site (5km Buffer form the site)

37. The project involves the construction of a G+3 floor structure over a land of 2.02 acres. The overall project shall comprise of 441 beds for men employees working in SIPCOT and in the nearby localities.

Table 2: Proposed Project TNIHPL

Sl. No	Blocks	Capacity	Rent/Bed/Month
1	6-Seater Beds	438	2,750
2	Individual Beds	3	2,750
3	Total	441	2,750

Source: TNFIMC

38. **Output**: ADB financing for this output will be deployed as Government of Tamil Nadu (GoTN's) equity into the Tamil Nadu Shelter Fund (TNSF). The TNSF will leverage private sector investment, and utilize such financing for risk capital, equity investment, or participating instruments investment, through specific special purpose vehicles for undertaking affordable housing subprojects that benefit populations underserved by the housing market. Examples of such subprojects include industrial housing and working women's hostels for low-income and migrant workers, resulting in an anticipated additional 500 beds for working women and 5,000 beds for industrial workers. To be eligible for financing, subprojects must be financially and economically viable affordable housing projects that increase the supply of housing for households within EWS and LIG segments and other segments of the population that are currently underserved by the housing market. Additional eligibility criteria cover safeguards, gender, and sustainability.

C. Purpose/ Objectives of IEE

39. ADB requires the consideration of environmental issues in all aspects of the Bank's operations, and the requirements for environmental assessment are described in ADB's Safeguard Policy Statement (SPS), 2009. The potential environmental impacts of the project

have been assessed using the ADB Rapid Environmental Assessment (REA) checklist for Urban Development Projects. The potential impacts were then identified in relation to (i) pre-construction, (ii) construction, and (iii) operation of the subproject, the result of the assessment shows that the subproject is unlikely to cause significant adverse impacts that are irreversible, diverse or unprecedented. Thus, this initial environmental examination (IEE) has been prepared in accordance with the ADB SPS, 2009 requirements and TNSF ESG for environment category “B” projects.

40. This IEE is based on the master plan, site layout plan, building plan, and other related documents prepared by Tamil Nadu Industrial Housing Private Limited (TNIHPL). The IEE is based mainly on field reconnaissance surveys and secondary sources of information from the Feasibility Report and DPR conducted by external consultants. Baseline environmental monitoring was conducted to prepare the IEE, and the environmental monitoring program developed as part of the Environmental Management Plan (EMP).

D. Report Structure

41. This report contains the following 10 chapters, excluding the Executive Summary of the report:

Chapter 1 : Introduction, which includes the Background, Subproject location and Outputs of the subproject, Purpose of the IEE, and Structure of the Report;

Chapter 2 : Policy Legal and Administrative Framework, which includes ADB Safeguard Policy Statement, Environment Legislation Framework, National Environmental Act and Legislation, Legislation relating to Occupational Health and Safety, Relevant International Conventions and Treaties, Gaps in Legal and Guiding Instruments, Permits and Clearances and Applicable Environmental Standards;

Chapter 3 : Description of the Subproject, which focuses primarily on subproject location and area, subproject rationale, subproject alternatives, subproject development plan and subproject components, subproject phase, and schedule and resource utilization;

Chapter 4 : Description of the Environment, which includes a description of the baseline information, subproject influence area, land environment, water environment, air environment, noise environment, ecological environment, socio-economic environment, and physical and cultural resources;

Chapter 5 : Anticipated Environmental Impact and Mitigation Measures, which include introduction, impact assessment, anticipated impacts and mitigation measures during pre-construction, construction, and operation phases, cumulative impacts and mitigation, environmental benefits, and enhancement measures, and a summary of impacts and mitigation;

Chapter 6 : Analysis of Alternatives, which discusses how the alternatives were assessed in terms of site location, design and technology, environmental implications of alternatives, including the implication of No-Project alternative;

Chapter 7 : Information, Disclosure, Consultation, and Participation, which details the process approach, and methodology for preliminary consultations,

and discusses future consultations during the detailed design stage and information disclosure;

Chapter 8 : Grievance Redress Mechanism for the Project;

Chapter 9 : Environmental Management Plan, which includes the institutional arrangement, roles and responsibilities of stakeholders including contractors and environmental performance criteria; Monitoring and Reporting, which includes capacity building, cost and other reporting obligations;

Chapter 10 : Conclusion, which provides overall analysis, conclusion and recommendations of the IEE

II. POLICIES, LEGAL AND INSTITUTIONAL FRAMEWORK

A. ADB Policy

42. 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 an environmental assessment of all ADB investments.

43. **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; 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.

a. **Category A.** a proposed project is classified as category 'A' if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An Environmental Impact Assessment (EIA) is required.

b. **Category B.** a proposed project is classified as category 'B' if its potentially adverse environmental impacts are less adverse than those of category 'A' projects. These impacts are site-specific, few of them are irreversible, and in most cases, mitigation measures can be designed more readily than for category 'A' projects. An Initial Environmental Examination (IEE) is required.

c. **Category C.** a proposed project is classified as category 'C' if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.

d. **Category FI.** a proposed project is classified as category 'FI' if it involves an investment of ADB funds to or through a Financial Intermediary (FI). An Environmental and Social Management System (ESMS) is required.

As per the ADB's Safeguard Policy Statement (SPS, 2009), this subproject is categorized as "B" (please refer REA checklist in Appendix 1), for environmental safeguards. The categorization is based on the proposed construction activities and anticipated environmental impacts at the time of construction in the project area and its surrounding environment. Accordingly, this IEE report including the environmental management plan (EMP) has been prepared.

44. **Analysis of Alternatives.** The best fit option should be identified for the implementation of the project in terms of location, design, technology and/or components that would avoid, and, if avoidance is not possible, minimize adverse environmental impacts and risks.

45. **Anticipated Adverse Impact Mitigation and Management**. When the potentially significant adverse impacts and risks cannot be avoided or prevented, appropriate mitigation measures and management actions have to be identified so that the project / subprojects are designed, constructed, and operated in compliance with ADB SPS 2009.

46. **Environmental Management Plan (EMP):** 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.

47. **Public Consultation.** Carry out meaningful consultation with affected persons and facilitate their informed participation. Ensure women's participation in consultation. Involve stakeholders, including affected persons and concerned NGOs, early in the project preparation process and ensure that their views and concerns are made known and understood by decision makers and taken into account.

48. **Grievance Redressal Mechanism (GRM).** Establish a grievance redressal mechanism (GRM) to receive and facilitate resolution of the affected person's concerns and grievances regarding the project's environmental performance.

49. **Public Disclosure:** ADB will post the safeguard documents on its website as well as disclose relevant information in an accessible manner to local communities:

(i) Final IEE upon receipt; and
(ii) Environmental monitoring reports submitted by the implementing agency during project implementation upon receipt.

B. National and State Environmental Regulations

50. **Environmental assessment**. The Government of India EIA Notification of 2006 (replacing the EIA Notification of 1994) sets out the requirements for Environmental Assessment in India. This states that Environmental Clearance is required for specified activities/projects, and this 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.

a) **Category A** projects require Environmental Clearance from the central Ministry of Environment, Forests and Climate Change (MoEF&CC). The proponent is required to provide preliminary details of the project in the prescribed manner with all requisite details, after which an Expert Appraisal Committee (EAC) of the MoEF&CC prepares comprehensive Terms of Reference (TOR) for the EIA study. On completion of the study and review of the report by the EAC, MoEF&CC considers the recommendation of the EAC and provides the Environmental Clearance if appropriate.
b) **Category B**[1] projects require environmental clearance from the State Environment Impact Assessment Authority (SEIAA). The state-level EAC categorizes the project

51. The proposed subproject involves the construction of G+3 floor structure to accommodate 441 beds for men employees working in SIPCOT and in the nearby localities The total built-up / saleable area is 4,104 sq.m (44,171 sq. ft). As per the EIA notification 2006, any construction project that exceeds 20,000 sq.m built up area needs an environmental clearance from the SEIAA along with all the other permissions from the local authorities and service providers. Since, this subproject has a total built up of only 4,104 sq.m, (which is less than the stipulated built-up area), it does not require an Environmental Clearance (EC).

[1] Building and Construction projects category "B" ≥20000 sq.mtrs and <1,50,000 sq.mtrs. of built-up area. On completion of the study and review of the report by the EAC, the SEIAA issues the Environmental Clearance 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 10 km from the boundary of protected areas, critically polluted areas,eco-sensitive areas or interstate or international boundaries.

Table 3: Environmental Regulatory Compliance for project

Law, Policy, Regulation	Description	Requirement
Environmental Impact Assessment Notification, 2006	The Notification imposes restrictions and prohibitions on new projects or activities and also on the expansion or modernization of existing projects or activities based on their potential environmental impacts.	Any construction project that exceeds 20,000 square meters built up area needs clearance from the SEIAA along with all the other permissions from the local authorities and service providers. This subproject has a total built up area of 4,104 sq.m (less than the stipulated built-up area), therefore, the requisite Environmental Clearance, as per EIA notification, 2006 and its amendments thereof is not applicable to the project.
ADB's Safeguard PolicyStatement 2009	Categorization of project components into A, B or C and developing required level of environmental assessment foreach component.	This project has been "Categorized as B" and accordingly, this IEE has been prepared.
Central Ground Water Authority Notification, 1997	It provides for the regulation and control of groundwater development and management	Water is supplied by SIPCOT. Not applicable.
The Environment Protection Act, 1986 The Environment Protection Rules, 1986	Emissions and discharges from the facilities to be created or refurbished oraugmented shall comply with the notified standards	To comply with applicable notified standards (including Water Act 1974, Air Act 1981 and acts relating to Biological Diversity)
Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments	The Act was enacted to provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water. Control of water pollution is achieved through administering conditions imposed in consent issued under this Act. All pollution potential activities will require consent to establish (CtE) from Tamil Nadu Pollution Control Board (TNPCB) before starting implementation and consent to operate.	To obtain CtE and CtO prior to the start of construction for (i) hot mix plant /batching plant; (ii) construction (workers) camps Compliance to the conditionsand effluent disposal standards stipulated in CtE and CtO

Law, Policy, Regulation	Description	Requirement
	(CtO) before commissioning.	
Air (Prevention and Control of Pollution) Act, 1981, amended 1987 and its Rules, 1982.	The Act was enacted to achieve prevention, control and abatement ofair pollution activities by assigning regulatory powers to CPCB and SPCB's for all such functions. Establishes ambient air quality standards	To obtain CtE and CtO prior to the start of construction for (i) diesel generators; (ii) hot mix units / batching units; Compliance to conditions and emissions standards stipulated in the CtE and CtO.
Noise Pollution (Regulation and Control) Rules, 2000 and further amended	It provides for regulations to control ambient noise levels in public places from sources such as industries/ construction works/ community events,etc.	To comply with the noise standards (refer to Table 6).
The Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008	It provides for regulation and control of indiscriminate disposal of Hazardous waste; and its sound management to reduce risks to environmental and human health	Applicable for the project if it deals with generation/ handling/ storage/ processing of hazardous waste which should take cognizance of the provisions/schedules of these Rules and obtain authorization from the TNSPCB.
Municipal Solid Waste Management Rules, 2016	Rules to manage municipal solid wastegenerated; provides rules for segregation, storage, collection, processing and disposal.	Solid waste generated at the proposed facilities / construction camps / housing units shall be managed and disposed in accordance with the MSW Rules
Construction and Demolition (C&D) Waste Management Rules, 2016	Rules to manage construction and waste resulting from construction, re- modelling, repair and demolition of civilstructure. Rules define C&D waste as comprising of building materials, debris resulting from demolition / re-modellingor repairs	Construction and demolition waste generated due to civil works at project construction site shall be managed and disposed as per these Rules

Law, Policy, Regulation	Description	Requirement
The Ancient Monuments and Archaeological Sites and Remains Act, 1958, and the rules, 1959	Provide guidance for carrying out activities, including conservation, construction and reuse in and aroundthe protected monuments.	Not applicable. The subproject site is not close to any of the archeological / protected monuments
Tamil Nadu State Ground Water (Development and Management) Act, 2003	This Act is to protect groundwater resources and provide safeguards against groundwater overexploitation, and to ensure its planned development and management; notifies areas for development, regulation and control ofgroundwater; prohibits digging of wells and groundwater transport in notified areas without prior permission of the designated authority; requires all wells to be registered.	Groundwater abstraction in any of the notified areas requires State Groundwater Board permission
Labor Laws	The contractor shall not make employment decisions based upon personal characteristics unrelated tojob requirements. The contractor shall base the employment relationship upon equal opportunity and fair treatment and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment or retirement, and discipline. The contractor shall provide equal wages and benefits to men and women for work of equal value or type.	Provides applicable labor laws including amendments issued from time to time applicable to establishments engaged in construction of civil works, which will need to be followed by the subproject.
Minimum Wages Act, 1948	The employer is supposed to pay not less than the minimum wages fixed by appropriate government agency as per the provisions of this Act if the employment is a “scheduled employment” such as construction of Roads, Runways,	All construction / operation and maintenance workers should be paid not less than the stipulated wages under this Act.

Law, Policy, Regulation	Description	Requirement
	and Buildings.	
Equal Remuneration Act, 1979	The Act provides for payment of equal wages for work of equal nature to male and female workers and for not making discrimination against genders.	
Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979	Act is applicable to any establishment that employs 5 or more inter-state migrant workers through an intermediary (who has recruited workers in one state for employment at an establishment situated in another state).	Contractors should register with the Labour Department in case of hiring inter-state migrant workers. As per the act adequate and appropriate amenities and facilities are to be provided to workers including housing, sanitation, portable water, medical aid, traveling expenses from home to workplace, etc.
Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996	It regulates the employment and conditions of service of building and other construction workers and provides for their safety, health and welfare.	The subproject shall comply with the provisions of this Act
Tamil Nadu State Groundwater (Development and Management) Act, 2003	This Act is to protect groundwater resources and provide safeguards against groundwater over exploitation	Groundwater abstraction in any notified areas will be subject to the provisions of this Act.
Tamil Nadu Minor Mineral Concession Rules, 1959 (amended up to 31 March 2001)	Applicable for sand mining, quarrying and borrow areas	All projects/activities being implemented and/or funded under the sector loan shall take cognizance and comply with the provisions of this Act
Tamil Nadu Building and Other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and Rules, 2006	Regulates the employment and conditions of service of building and other construction workers and to provide for their safety, health and welfare measures; Provides various benefits for the registered workers	The subproject shall comply with the provisions of this Act

Source: MoEF&CC, CPCB, Government of Tamil Nadu

52. **Clearance/Permissions to be obtained by the TNIHPL.** The following table depicts the statutory clearances/permissions (but not limited to) for the use of land, providing public utility services to the site. The TNIHPL shall verify and support to ensure all necessary clearances/permission have been obtained prior to the start of construction.

Table 4: Clearances and Permissions required by the TNIHPL for Construction

Sl. no	Permission/ Clearances/ Declaration	Competent Authority	Remarks	Status
1.	Environmental Clearance as per the EIA notification 2006	State Environment Impact Assessment Authority (SEIAA)	This subproject has a total built up area of 4,104 sq.m. (less than the stipulated built-up area), therefore, the requisite Environmental Clearance from the SEIAA is not required.	Not applicable
2.	Acceptance letter for collection of Municipal Solid Waste	Cheyyar Municipality	Collection and transportation of Municipal Solid Waste generated from the site.	To be obtained
3.	SIPCOT acceptance/ acknowledge for the supply of water and sewage connection to the site	SIPCOT	SIPCOT has confirmed the supply of water.	To be obtained
4.	Permission letter for discharge of treated sewage	SIPCOT	Proposed for zero liquid discharge (ZLD).	To be obtained
5.	Confirmation for Collection and disposal of Sludge generated from STP	TNSPCB	Consent to establish (CTE) and consent to operate (CTO) for STP has to be obtained from TNSPCB.	To be obtained

53. **Other Environmental Clearance conditions requirements**. TNIHPL will reuse the 51 KLD STP for gardening, flushing and excess water, if any, will be redirected to the rainwater harvesting pit. Further, the STP design has been provided by external consultant, which is approved by the Tamil Nadu Police Housing Corporation. This IEE also covers the environmental assessment of STP site.

54. **Clearances/permissions to be obtained by the Contractor.** Following table shows the list of clearances/permissions (but not limited to) required for project construction. The contractor should ascertain the requirements prior to start of the construction and obtain all necessary clearances/permission prior to start of construction.

Table 5: Clearances and Permissions Required by the Contractor for Project

Sl.no	Construction Activity	Statutory Authority	Statute under which Clearance is Required	Implementation	Supervision
1.	Batching plants, Crushers and Hot mix plants	Tamil Nadu Pollution Control Board (TNPCB)	Consent to establish and consent to operate under Air Act, 1981	Contractor	TNIHPL
2.	Waste water Discharges from Construction activities	TNPCB	Consent to establish and consent to operate under Water Act, 1974	Contractor	TNIHPL
3.	Storage, handling and transport of hazardous materials	TNPCB	Hazardous Wastes (Management and Handling) Rules. 1989 Manufacturing, Storage and Import of Hazardous Chemicals Rules, 1989	Contractor	TNIHPL
4.	Sand mining, quarries and borrow areas	Department of Geology and Mining, Government of Tamil Nadu	Contractor to obtain material from the existing government licensed mines/ quarries in compliant with environmental regulations of the country. Contractor will require prior approval of PMC for obtaining material from a particular source. PMC to review and approve only existing licensed mines in complaint with environmental regulation of the country.	Contractor	TNIHPL
5.	Groundwater extraction	Public Works Department	Tamil Nadu Groundwater Development and Management Act 2000	Contractor	TNIHPL

Sl.no	Construction Activity	Statutory Authority	Statute under which Clearance is Required	Implementation	Supervision
6.	Disposal of Construction and Demolition waste	TNPCB	Construction and Demolition (C&D) Waste Management Rules, 2016	Contractor	TNIHPL
7.	Labour license	Labour dept.	The Contract Labour (Regulation and Abolition) Act, 1970; and Contract Labour (Regulation & Abolition) Central Rules, 1971	Contractor	TNIHPL
8.	Workmen Insurance	Insurance company	Workmen Compensation Act, 1923	Contractor	TNIHPL

Source: MoEF&CC, CPCB, Government of Tamil Nadu

C. Applicable International Standards and Best Practices

55. During the design, construction, and operation of the project the TNIHPL will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the International Finance Corporation's (IFC) Environmental, Health and Safety (EHS) Guidelines Guidance Notes and standards of the World Health Organization (WHO). These standards contain performance levels and measures that are normally acceptable and applicable to projects. When the Government of India's regulations differ from these levels and measures, the TNIHPL will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the TNIHPL will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS, 2009.

56. The following IFC (World Bank Group) EHS and WHO Guidelines will be adopted in the EMP for the subprojects such as:

- WHO Guidelines on Air Emissions and Ambient Air Quality, Noise Management, Wastewater and Ambient Water Quality,
- Guidelines for Construction and Decommissioning (2007)
- Guidelines for Hazardous Material Management and Waste Management
- Guidance Note on Workers Accommodation: Processes and Standards, August 2006[2]
- Guidelines on Occupational Health and Safety and Community Health and Safety (2007)

57. Comparison of national emissions standards and International Standards / Best Practices is provided in Table 5, Table 6 and Table 7. Due to different measuring conditions, the emissionvalues are not directly comparable. However, IFC Guidelines / WHO standards are stricter than the national standards if converted to comparable values.

[2] IFC Guidance Note: Workers Accommodation

Table 6: National Ambient Air Quality Standards and WHO Guidelines

Parameter	Location [a]	National Ambient Air Quality Standards [b]	WHO Air Quality Guidelines (µg/m³)		Applicable Per ADB SPS (µg/m³) [e]
			Global Update 2005 [c]	Second Edition 2000 [d]	
Particulate Matter PM_{10} (µg/m³)	Industrial	60 (Annual)	20 (Annual)	-	20 (Annual)
	Residential, Rural and Other Areas	100 (24-hr)	50 (24-hr)		50 (24-hr)
	Sensitive Area	60 (Annual) 100 (24-hr)	20 (Annual) 50 (24-hr)	-	20 (Annual) 50 (24-hr)
Particulate Matter $PM_{2.5}$ (µg/m³)	Industrial	40 (Annual)	10 (Annual)	-	10 (Annual)
	Residential, Rural and Other Areas	60 (24-hr)	25 (24-hr)		25 (24-hr)
	Sensitive Area	40 (Annual) 60 (24-hr)	10 (Annual) 25 (24-hr)		10 (Annual) 25 (24-hr)
Sulfur Dioxide SO_2 (µg/m³)	Industrial	50 (Annual)	20 (24-hr)	-	50 (Annual)
	Residential, Rural and Other Areas	80 (24-hr)	500 (10-min)		20 (24-hr) 500 (10-min)
	Sensitive Area	20 (Annual) 80 (24-hr)	20 (24-hr) 500 (10-min)	-	20 (Annual) 20 (24-hr) 500 (10-min)
Nitrogen Dioxide NO_2 (µg/m³)	Industrial	40 (Annual)	40 (Annual)	-	40 (Annual)
	Residential, Rural and Other Areas	80 (24-hr)	200 (1-hr)		80 (24-hr) 200 (1-hr)
	Sensitive Area	30 (Annual) 80 (24-hr)	40 (Annual) 200 (1-hr)	-	30 (Annual) 80 (24-hr) 200 (1-hr)
Carbon Monoxide CO (µg/m³)	Industrial	2,000 (8-hr)	-	10,000 (8-hr)	2,000 (8-hr)
	Residential, Rural and Other Areas	4,000 (1-hr)		100,000 (15-min)	4,000 (1-hr) 100,000 (15-min)
	Sensitive Area	2,000 (8-hr) 4,000 (1-hr)	-	10,000 (8-hr) 100,000 (15-min)	2,000 (8-hr) 4,000 (1-hr) 100,000 (15-min)
Ozone (O_3) (µg/m³)	Industrial	100 (8-hr)	100 (8-hr)	-	100 (8-hr)
	Residential, Rural and Other Areas	180 (1-hr)			180 (1-hr)
	Sensitive Area	100 (8-hr) 180 (1-hr)	100 (8-hr)	-	100 (8-hr) 180 (1-hr)
Lead (Pb) (µg/m³)	Industrial,	0.5 (Annual)	-	0.5 (Annual)	0.5 (Annual)
	Residential, Rural and Other Areas	1.0 (24-hr)			1.0 (24-hr)
	Sensitive Area	0.5 (Annual) 1.0 (24-hr)	-	0.5 (Annual)	0.5 (Annual) 1.0 (24-hr)
Ammonia (NH_3) (µg/m³)	Industrial	100 (Annual)	-		100 (Annual)
	Residential, Rural and Other Areas	400 (24-hr)			400 (24-hr)
	Sensitive Area	100 (Annual) 400 (24-hr)	-	-	100 (Annual) 400 (24-hr)
Benzene (C_6H_6) (µg/m³)	Industrial	5 (Annual)	-	-	5 (Annual)
	Residential, Rural and Other Areas				
	Sensitive Area	5 (Annual)	-	-	5 (Annual)
Benzo(o) Pyrene (BaP)	Industrial	1 (Annual)	-	-	1 (Annual)
	Residential, Rural and Other Areas				

Parameter	Location [a]	National Ambient Air Quality Standards [b]	WHO Air Quality Guidelines (µg/m^3)		Applicable Per ADB SPS (µg/m^3) [e]
			Global Update 2005 [c]	Second Edition 2000 [d]	
(ng/m^3)	Sensitive Area	1 (Annual)	-	-	1 (Annual)
Arsenic (As) (ng/m^3)	Industrial	6 (Annual)	-	-	6 (Annual)
	Residential, Rural and Other Areas				
	Sensitive Area	60 (Annual)	-	-	60 (Annual)
Nickel (Ni) (ng/m^3)	Industrial	20 (Annual)	-	-	20 (Annual)
	Residential, Rural and Other Areas				
	Sensitive Area	20 (Annual)	-	-	20 (Annual)

[a] Sensitive area refers to Ecologically sensitive areas notified by the India Central Government

[b] http://cpcb.nic.in/uploads/National_Ambient_Air_Quality_Standards.pdf

[c] WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide. *Global update 2005*. WHO. 2006.

[d] Air Quality Guidelines for Europe Second Edition. WHO 2000.

[e] As per ADB SPS, the government shall achieve whichever of the ambient air quality standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the executing agency of the government will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

Table 7: National Noise Standards and WHO Guidelines

Receptor/ Source	Noise Level Standards [a] (dBA)		WHO Guidelines Value for Noise Levels Measured Out of Doors[b] (One Hour LAeq in dBA)		Applicable Per ADB SPS [c] (dBA)	
	Day	Night	07:00 - 22:00	22:00 – 07:00	Day time	Nighttime
Industrial area	75	70	70	70	70	70
Commercial area	65	55			65	55
Residential Area	55	45	55	45	55	45
Silent Zone	50	40			50	40

a Noise Pollution (Regulation and Control) Rules, 2002 as amended up to 2010 (http://cpcb.nic.in/displaypdf.php?id=Tm9pc2UtU3RhbmRhcmRzL25vaXNlX3J1bGVzXzIwMDAucGRm)

b Guidelines for Community Noise. WHO. 1999.

c As per ADB SPS, the project proponent shall achieve whichever of the ambient air quality standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the project proponent will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS, 2009.

Table 8: National Drinking Water Quality Standards and WHO Guidelines

Group	National Standards for Drinking Water [a, b]			WHO Guidelines for Drinking Water Quality, 4th Edition, 2011[c]	Applicable Per ADB SPS [d, e]
	Parameter	Unit	Max. Concentration Limit		
Physical	Turbidity	NTU	1 (5)	-	1 (5)
	pH		6.5 – 8.5	None	6.5 – 8.5
	Color	Hazen Units	5 (15)	None	5 (15)
	Taste and Odor		Agreeable	-	Agreeable
	TDS	mg/l	500 (2,000)	-	500 (2,000)
	Iron	mg/l	0.3	-	0.3
	Manganese	mg/l	0.1 (0.3)	-	0.1 (0.3)

Group	National Standards for Drinking Water [a, b]			WHO Guidelines for Drinking Water Quality, 4th Edition, 2011[c]	Applicable Per ADB SPS [d, e]
	Parameter	Unit	Max. Concentration Limit		
	Arsenic	mg/l	0.01 (0.05)	0.01	0.01
	Cadmium	mg/l	0.003	0.003	0.003
	Chromium	mg/l	0.05	0.05	0.05
	Cyanide	mg/l	0.05	None	0.05
	Fluoride	mg/l	1 (1.5)	1.5	1 (1.5)
	Lead	mg/l	0.01	0.01	0.01
	Ammonia	mg/l	0.5	none established	0.5
Chemical	Chloride	mg/l	250 (1,000)	none established	250 (1,000)
	Barium	mg/l	0.7	None	0.7
	Sulphate	mg/l	200 (400)	None	200 (400)
	Nitrate	mg/l	45	50	45
	Copper	mg/l	0.05 (1.5)	2	0.05 (1.5)
	Total Hardness	mg/l	200 (600)	-	200 (600)
	Calcium	mg/l	75 (200)	-	75 (200)
	Zinc	mg/l	5 (15)	none established	5 (15)
	Mercury	mg/l	0.001	0.006	0.001
	Aluminum	mg/l	0.1 (0.3)	none established	0.1 (0.3)
	Anionic Detergents	mg/l	0.2 (1.0)	None	0.2 (1.0)
	Phenolic Compounds	mg/l	0.001(0.002)	None	0.001(0.002)
	Residual Chlorine	mg/l	0.2	5	0.2
Microbial indicator	E-coli	MPN/100ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml Sample
	Total Coliform	MPN/100ml			

[a] http://cgwb.gov.in/Documents/WQ-standards.pdf.

[b] Bureau of India Standard 10500: 2012 (Indian Standard, Drinking Water — Specification (Second Revision).

[c] Health-based guideline values.

[d] As per ADB SPS, the government shall achieve whichever of the drinking quality standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the executing agency of the government will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS, 2009.

[e] Figures in parenthesis are maximum limits allowed in the absence of alternate source.

58. **Core Labor Standards**. ADB is committed to due consideration of Core Labor Standards (CLS) in the design and implementation of subprojects. A CLS handbook has been developed by ADB with cooperation of International Labor Organization (ILO). The TNIHPL will ensure compliance to applicable CLS of ADB-ILO during project implementation including:

- Freedom of association and the effective recognition of the right to collective bargaining
- Elimination of all forms of forced or compulsory labor
- Effective abolition of child labor
- Elimination of discrimination in respect of employment and occupation

D. International Treaties/Conventions/Declarations on Environment Management

59. India is a signatory to the following international treaties/ conventions/ declarations on environment, social, safety and occupational issues that are relevant for the project. The list of international agreements is provided in Table 8.

Table 9: International Treaties/ Conventions/ Declarations on Environment

Sl. no	International Treaties/ Conventions/Declarations	Description
1.	United Nations Conference on the Human Environment - Stockholm 1972	To coordinate global efforts to promote sustainability and safeguard the natural environment
2.	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1975	Its aim is to ensure that international trade in specimen of wild animals and plants does not threaten their survival
3.	Ramsar Convention, 1971, 1975	The Convention on Wetlands is the intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources
4.	The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes, 1989	The Convention aims to protect human health and the environment against the adverse effects resulting from the generation, transboundary movements and management of hazardous wastesand other wastes
5.	Strategic Approach to International Chemicals Management (SAICM)	SAICM is an international non-binding policy framework to support efforts to achieve the Johannesburg Plan of Implementation (WSSD) goalfor chemicals, notably “achieve by 2020 that chemicals are used & produced in ways that lead tothe minimization of adverse effects on human health & the environment”
6.	United Nations Conference on Environment and Development (UNCED), 1992, 2002	The conference had three objectives (Agenda – 21, Rio Declaration and Millennium Development Goals), to secure renewed political commitment for sustainable development, to assess the progress and implementation gaps in meeting previous commitments, and to address new and emergingchallenges
7.	United Nations Framework Convention on Climate Change (UNFCCC), 1992 • Kyoto Protocol, 1997	It operationalizes the United Nations Framework Convention on Climate Change by committing industrialized countries to limit and reduce greenhouse gases (GHG) emissions in accordancewith agreed individual targets

Sl. no	International Treaties/ Conventions/Declarations	Description
8.	The Vienna Convention, 1985 • Montreal Protocol on Ozone depleting substances, 1992	It sets binding progressive phase out obligations for developed and developing countries for all the major ozone depleting substances, including chlorofluorocarbons (CFCs), halons and less damaging transitional chemicals such as hydrochlorofluorocarbons (HCFCs)
9.	Convention on Biological Diversity, 1992 • Cartagena Protocol on Biosafety, Ratified on 17th January, 2003	It is an international treaty governing the movement of living modified organism (LMO) resulting from modern biotechnology from one country to another
10.	Convention to Combat Desertification, 1994	It is the only binding international agreement linking environment and development to sustainable soil management
11.	Rotterdam Convention on Prior Informed Consent Procedure for certain Hazardous Chemicals in International Trade, 2002	It is a multilateral treaty to promote shared responsibilities in relation to importation of hazardous chemicals
12.	Stockholm Convention on Persistent Organic Pollutants (POPs), 2001	It aims to eliminate or restrict the production and use of Persistent Organic Pollutants (POPs)

III. DESCRIPTION OF THE PROJECT

A. Subproject Overview

60. The Tamil Nadu Infrastructure Fund Management Corporation (hereafter referred to as TNIFMC), is an Asset Management Company (AMC) promoted by the Government of Tamil Nadu (GoTN) for the purpose of raising and managing alternative investment funds focused on sectors like infrastructure, affordable housing etc. TNIFMC is managing the Tamil Nadu Shelter Fund (TNSF) which is registered as a Category I (Social Venture) Alternative Investment Fund, with a mandate to invest in affordable housing projects in Tamil Nadu.

61. The primary focus of TNSF is to provide affordable housing with a focus on housing for the Economically Weaker Sections (EWS) and Low-Income Groups (LIG), which includes

a. Hostels - for Working Women from all sections of the society.
b. Industrial Housing for workers in and around Industrial Complexes/ Parks/ Clusters
c. Senior and Assisted Living

62. Tamil Nadu Industrial Housing Private Limited (TNIHPL) is developing an affordable housing project in Cheyyar municipality, Tamil Nadu. The TNSF is planning to invest in the proposed project and is committed to integrate ESG principles into this project. As per the TNSF ESG screening tool and ADB's SPS 2009, this project has been categorized as a B for environmental safeguards. The selection of sites is based on the following ADB ESG screening criteria:

a. **Key Exclusion Criteria**. The sites do not fall under the exclusion criteria as suggested in the ESGMS

- None of the subproject activities are falling under the Environmental category "A" (as per the ADB SPS 2009 categorisation or the EIA notification 2006 requirements)
- The subproject areas are not located within the 10km radius national park,sanctuary, wetland, mangrove reserve, biodiversity hotspot, reserve or protected forest area and CRZ zone.
- The subproject is not falling under the ADB Prohibited Investment Activities List (ADB SPS, 2009, Appendix 5)
- The subproject is not highly complex and sensitive
- The subproject activities do not affect the PCRs e.g., local heritage sites / archaeological sites, places of worship, etc.,
- The subproject is not located near electricity substations, high voltage transmission lines, underground cables, solid waste dumping yards, Oil and Gas pipelines, Coastal Regulatory Zone hazard line and/or polluting (heavy emissions / noisy) industrial activities.
- Subproject sites are not in flood prone areas, areas with a history of flooding.

B. Environmental guidelines for Subproject Selection criteria.

The subproject activities including the construction, are as per the environmental guidelines for subproject selection criteria:

- New site should provide comprehensive infrastructure and supporting services, generate new optimally sited open spaces of adequate size, and community spaces including space for training and community enterprise.
- The site is in conformation to the land use, relevant development control regulations

and DTCPapproved master plan

- No new construction of Landfills, electricity generation/ electricity high voltage transmission line and distribution substations are proposed under this subproject
- Potable water supply is through Cheyyar SIPCOT, and the quality of the water is as per the IS 10500 (drinking water standard). During the summer seasons, if there is a drought condition, as an alternate source to meet the water demand, water shall be sourced through private vendors. For which all regulatory requirements like permission from PWD for extraction of ground/ surface water, authorisation letter / NoC etc. shall be verified before procurement of water by the TNPHC.
- 51 KLD capacity Sewage Treatment Plant (STP) is proposed to treat the sewage generated from the site, the treated water shall be utilized for gardening, recharging to rainwater harvesting.

C. Proposed Subproject Interventions

63. The scope of this subproject includes the construction, operation and maintenance of 441 bedded units and associated facilities at the site, which shall be achieved through the construction of G+3 floor structure with designated community area and commercial spaces over a land area of 2.02 acres.

64. Proposed layout plan for the site is shown in Figure 2. The total area of the site is estimated to be 2.02 acre with the proposed land use land allocation is presented in Table 9.

Table 10 : Proposed Land use of the Area

Sl. no	Description	Area (m^2)
1.	Space reserved for STP	50
Total Area		**50**

Source: TNIHPL

65. Based on consultations, the design requirement for the communities have been identified and accordingly TNIHPL with ADB assistance has engaged consultants in the preparation of master plan for the site. As per the concept master plan, the subproject interventions as indicated in

66. Table 11 has been proposed

Table 11 : Subproject Interventions at the site

Sl.no	Subproject	Subproject Interventions
1	Construction of 441 bed units and supporting services	• Pedestrian Pathway • Sewage Treatment Plant (51 KLD capacity) • Vehicle Parking area

Source: TNIHPL

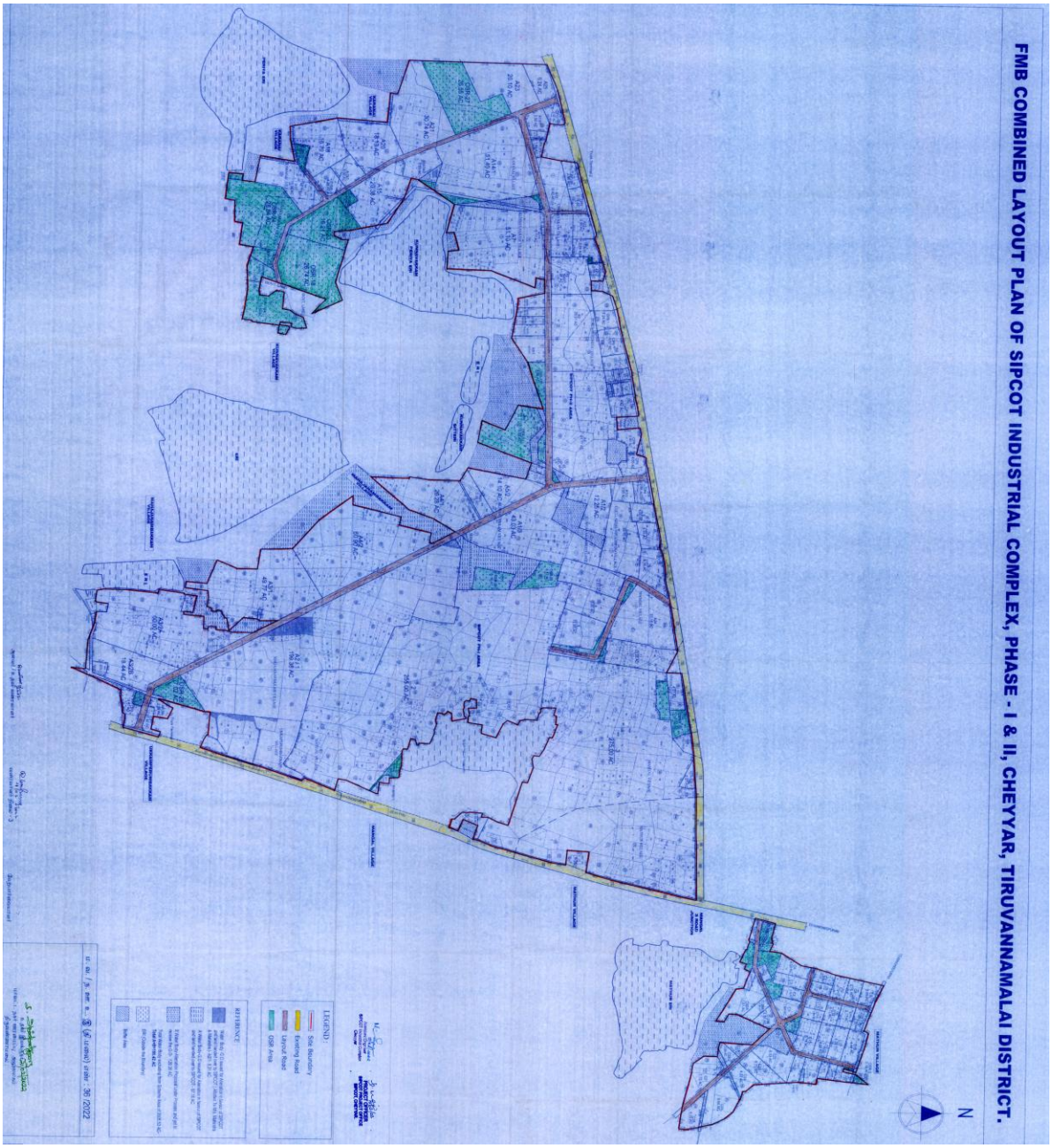


Figure 2: Layout Plan for IH Cheyyar

67. **Power Requirement.** The power requirement during the project construction will be met through a temporary connection from TANGEDCO by the contractor and power generators may be used as a backup unit (ranging between 5 kW to 200 kW). The generators having emission under control certificates will be permitted in the construction site. The power requirement during the operation is about 600 kW and it will be sourced from the TNEB grid via 11 kV lines and the final electrification to buildings (including residential units) will be 11/0.4 kV distribution transformers within the premises with an end user connection voltage of 240V. Street lights will be solar powered, providing an energy saving of approximately 6 kW.

Table 12 : Power Requirement at the Site

Sl. no	Particulars	Quantity	Unit
1	**Residential Use**		
	No. of residential units proposed	441	Nos.

Sl. no	Particulars	Quantity	Unit
	Power requirement per residential unit (Assuming 1 kWper 1 residential unit)	441	kW
2	**Pump Room**		
	No. of Pump Rooms	1	Nos.
	Power requirement for the Pump Room (Assuming 16 kWper Pump Room)	16	kW
3	**STP**		
	Power requirement for STP is in the range of 10 kW to 15kW	15	kW
4	**Streetlight**		
	No. of streetlights	5	Nos.
	Power required for the streetlights (Assuming 50 W perStreet Lamp)	0.25	kW
Total Power Requirement		**477.25**	**kW**

Source: TNIHPL

68. In the event of power outages, an onsite Diesel Generator (DG Set) of 80 KVA, 415V, 3 Phase, 50 Hz @ 1500 RPM will be used to support STP operation. Stack height of 2 m shall be maintained for 80 KVA DG Set as per TNPCB norms, the height of the stack should be 2m fromthe height of the building (height of the building +2 m).

69. **Water Requirement and Supply**. The total water requirement during construction is estimated to be 10000 L/Day; the source of water for construction shall be arranged by the Contractor through the SIPCOT. The water requirement during operation is estimated to be 60 KLD, which shall be supplied by the SIPCOT, and relevant calculations can be found in Table 12.

70. During operation, the wastewater generation from the project is estimated to be about 51 KLD, which will be treated in a proposed Sewage Treatment Plant (STP) with a capacity of 51 KLD. Treated wastewater will be reused for flushing and gardening. The assumptions for estimating the water requirement are given in the following table.

Table 13: Water Requirement at the Site

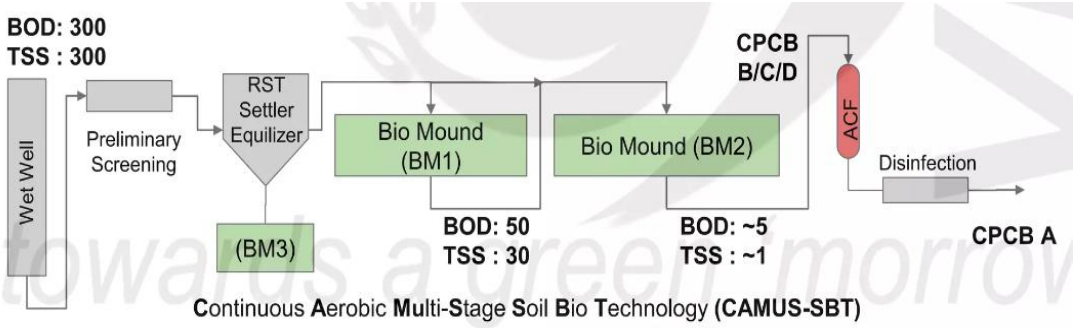
S No	Project Components	No of Units	Occupancy rate @	Total Occupancy No's
1	Residential	441	1 person per unit	441
	Total			**441**
	As per the National Commission on Integrated Water Resources Development (NCIWRD) norms rural area shall be provided with 75 to150 Litre Per Capita Per Day (LPCD) have been recommended for theyear 2025 and 2050. For this subproject 135 lpcd has been proposed. Hence the estimated water requirement is 0.06 MLD.			441 x 135 lcpd = 0.06 MLD (60 KLD Approx.)

Source: TNIHPL

71. For the wastewater generated from the site a 51 KLD (0.06 MLD) capacity STP with Soil biotechnology (SBT) is proposed. The SBT will have two mounts for treating wastewater. The STP process flow chart and SBT structure is presented in Figure . Nearly 1.73 KLD (3.4%) of treated water will be used for green belt area/ landscaping purposes. From the remaining

19.38 KLD, nearly 38% of the treated water (after ultra-filtration and UV disinfection) will be recycled for flushing and gardening purposes with the remaining 29.89 KLD (58.6%) to be disposed into the rainwater harvesting pits for groundwater recharge.

Figure 3: STP Process Flow Diagram and SBT – Water Balance for Site



72. **Storm water drainage**. Storm water drainage system in a site shall be designed in such a way to harvest cent percent of it to recharge groundwater table. The design factors of rainwater harvesting structures within a site shall include type of soil and its absorption capacity, ground slope, intensity and duration of rain fall for the design period etc. However, there shall also be a provision for carrying any excess storm water which was not absorbed during an exceptional rain fall, to drain or discharge into the street or public storm water drainage system.

73. **Water Conservation**. Effective measures shall be taken within each premise for conservation of rainwater, and rainwater-harvesting structures shall be provided. In view of this, TNIHPL have designed 2 RWH structures/pits and with rainwater harvesting trenches in the project area. The following sections will detail the assumptions and estimations that underpin the design.

a. **Rainwater volume estimation**

i. As per the secondary information the project district receives annual rainfall of 985 mm

ii. The rainfall intensity has been estimated to be 2.70 mm /day

iii. The total built-up area is worked out to be 4,104 m^2.

iv. Assuming the coefficient of runoff (c) to be 0.90 for concrete surface area,it is expected that Q=c.i.a= 0.90 x 2.70 x 10 878= **3.69 m^3/day**

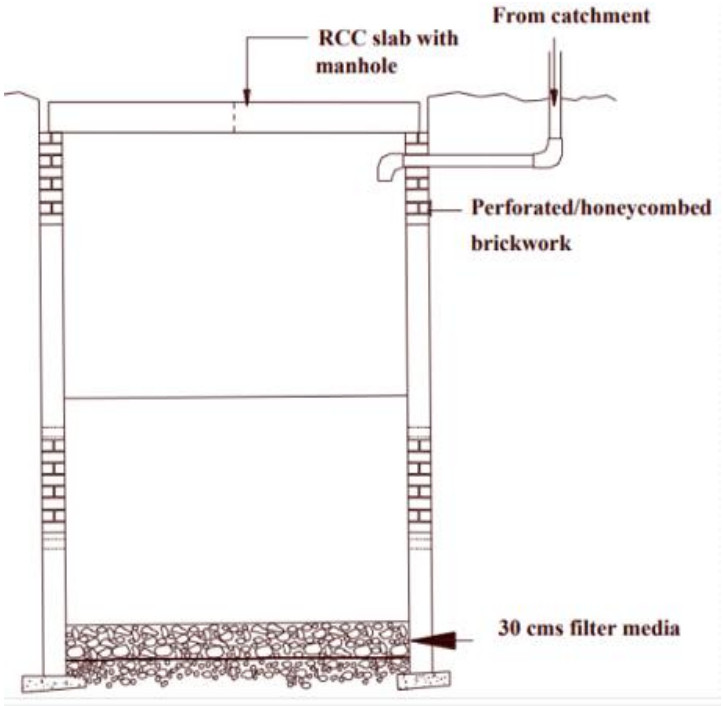
74. Based on the estimated rainwater volume, 2 RWH structures/pits and 985m of rainwater trenches are proposed. The design specifications for the RWH are as follows:

b. **Rainwater Harvesting Structure**[3]. It is proposed to construct 4 RWH structures/pits with a diameter of 1.2 m (clear) and a height of 3 m. The building will be connected to the RWH structure/pit.

- The total volume of rainwater that can be collected by an RWH structure/ pitis estimated to be 3.40 m^3, hence 4 RWH structures/ pits will collect 13.60m^3 of rainwater. The structure of the RWH is shown in Figure 4.

[3] Tamil Nadu Combined Development and Building Rules, 2019 have made it mandatory to provide Rainwater Harvesting (RWH) structures in all new buildings.

Figure 4 : Rainwater Harvesting Structure



c. **Rainwater Harvesting Trenches**. The site will be provided with 177m of rainwater harvesting trenches along the perimeter of the site. The trench will be 1 m wide by 1.5 m deep filled with pebbles. The volume of rainwater that can be collected in the trench is estimated to be 265.50m^3.

Figure 5 : Rainwater Harvesting Trenches

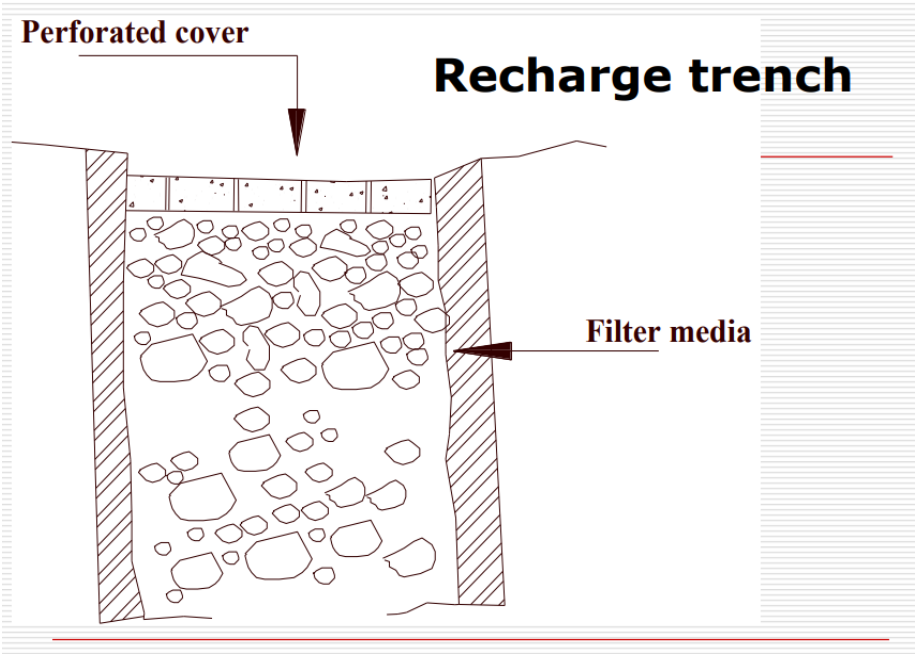


Table 14 : Rainwater estimate

Sl.no	Infrastructure	Quantity	Volume of rainwater that can beCollected
1.	Rainwater Harvesting	4 nos.	13.60 m^3

	Structures/Pits		
2.	Rainwater Harvesting Trenches	177 m	265.50 m^3
Total			279.10 m^3 = **2.791 Lakh Liters**

Source: TNIHPL

75. **Solid Waste Management.** Wastes generated from the project site will be segregated into bio-degradable waste and non-biodegradable waste at the source itself (by the residents) in separate bins. The waste from such bins is planned to be collected separately on a daily basis and taken to a separate centralized collection facility by the TNIHPL dealing with collection and disposal of garbage. It is also estimated to generate 30 kg of sludge waste per day from the STP. This sludge is considered a non-hazardous waste without treatment. Hence a sludge digester with a digestion tank will be provided in the STP. This will treat the sludge into a dry form, which will be pathogen free, the sludge will be used as manure for gardening and remaining sludge will be disposed along with the organic waste. The table 14 illustrates the quantity of solid waste likely to be generated during the operation phase.

Table 15 : Solid Waste Generation at the Site

Sl.no	Project Components	Total Occupancy Nos.	Per capita Generation (kg/day)	Total Solid waste generation (kg/day)	Total Bio-degradable Waste (kg/day)	Total Non-Biodegradable Waste (kg/day)
1	Residential	441	0.2	88.2	52.04	36.16
2	Sludge from STP			30	30	0
Total				**118.2**	**82.04**	**36.16**

Source: TNIHPL

76. **Approach Road.** The approach road to the project site has already been built by the SIPCOT.

77. **Erection of solar photo voltaic panels**: As per the Tamil Nadu Combined Development and Building Rules, 2019 Installation of Solar Energy System is mandatory in all buildings in the category of High-Rise Buildings and Non-High-Rise Buildings exceeding 16 dwelling units and 300 sq.m of commercial building, accordingly

i. Minimum terrace area to be reserved for erecting solar photo voltaic panels shall be 1/3rd of total terrae area.

ii. The space required for erecting solar photo voltaic panels is about 10sq.m. For generating 1 KW of electricity.

iii. The electricity generated from solar photo voltaic system so erected will be used for common electricity requirements like staircase lights, setback lights, lifts, pumps and non-floor space index areas, etc.

iv. Net metering guidelines of Tamil Nadu Energy Regulatory Commission shall apply to all such installation of solar photo voltaic system.

78. The proposed unit plan and details with respect to the blocks and other amenities are detailed in the master plan.

79. **Project Implementation Schedule.** The construction period for the housing site is expected to take 24 months.

IV. DESCRIPTION OF THE ENVIRONMENT

A. Area of Impact

80. The primary areas of impact are (i) subproject location due to the implementation of the proposed project components; (ii) main routes/intersections which will be traversed by construction vehicles; and (iii) quarries and borrow pits as sources of construction materials. The secondary areas of impact are: (i) other than the delineated primary impact area; and (ii) the area surrounding the subproject location in terms of over-all environmental and socio-economic improvement.

B. Methodology used for Environment Baseline Study

81. **Data collection and stakeholder consultations.** Data for this study has been primarily collected through comprehensive literature survey, discussion with TNIHPL, and field visits to the proposed subproject sites. The literature survey has broadly covered the following:

a) Project details, reports, maps and other documents prepared by TNIHPL;

b) Discussions with technical experts of the ADB team, TNIFMC, and other relevant government agencies;

c) Secondary data from project reports and published articles; and

d) Literature on land use, soil, geology, hydrology, climate, socioeconomic profiles,and other planning documents collected from government agencies and websites.

82. **Ocular inspection.** Several visits to the project sites were made during IEE preparation to assess the existing environment (physical, biological, and socioeconomic) and gather information with regard to the proposed sites and scale of the proposed project. A separate socioeconomic study was conducted to determine the demographic information, existing service levels, stakeholder needs and priorities.

C. Physical Environment

1. Location area and connectivity

83. The project is located in Cheyyar SIPCOT area, beside Cheyyar-Kanchipuram Road, Tiruvannamalai District, Tamil Nadu. Cheyyar was upgraded to Second Grade Municipality on 22.05.1998. (Government Order No. 85. dated. 22.05.1998). It lies at a latitude of 12.6618° N and a longitude of 79.5435° E. Tiruvannamalai town is located at an altitude of 123 meters above mean sea level. It is situated along the State Highways, connecting important cities in Tamil Nadu such as Chennai, Vellore, and Villupuram.

2. Topography, Soils and Geology

84. The topography of Cheyyar is generally flat, with a gentle slope towards the south, near the foothills of the Eastern Ghats. The town is situated approximately 123 meters above mean sea level. Cheyyar experiences a tropical wet and dry climate, characterized by high temperatures during the summer months and a relatively wet monsoon season. The region receives light to moderate rainfall primarily during the Southwest Monsoon. The area is mainly covered by red loamy soil with some patches of black soil. There are no significant mineral resources found in Cheyyar

85. The geology of the area constituted by Charnockites of Archeaen age, Epidote-hornblende Gneiss and Hornblende-Biotite Gneiss with Sand, silt ang Graval of sedimentary

rocks. The predominant Geomorphologic feature in the study area is pediments, shallow pediments, flood plains, buried pediments, Sedimentary low land, Denudation hills and river basin

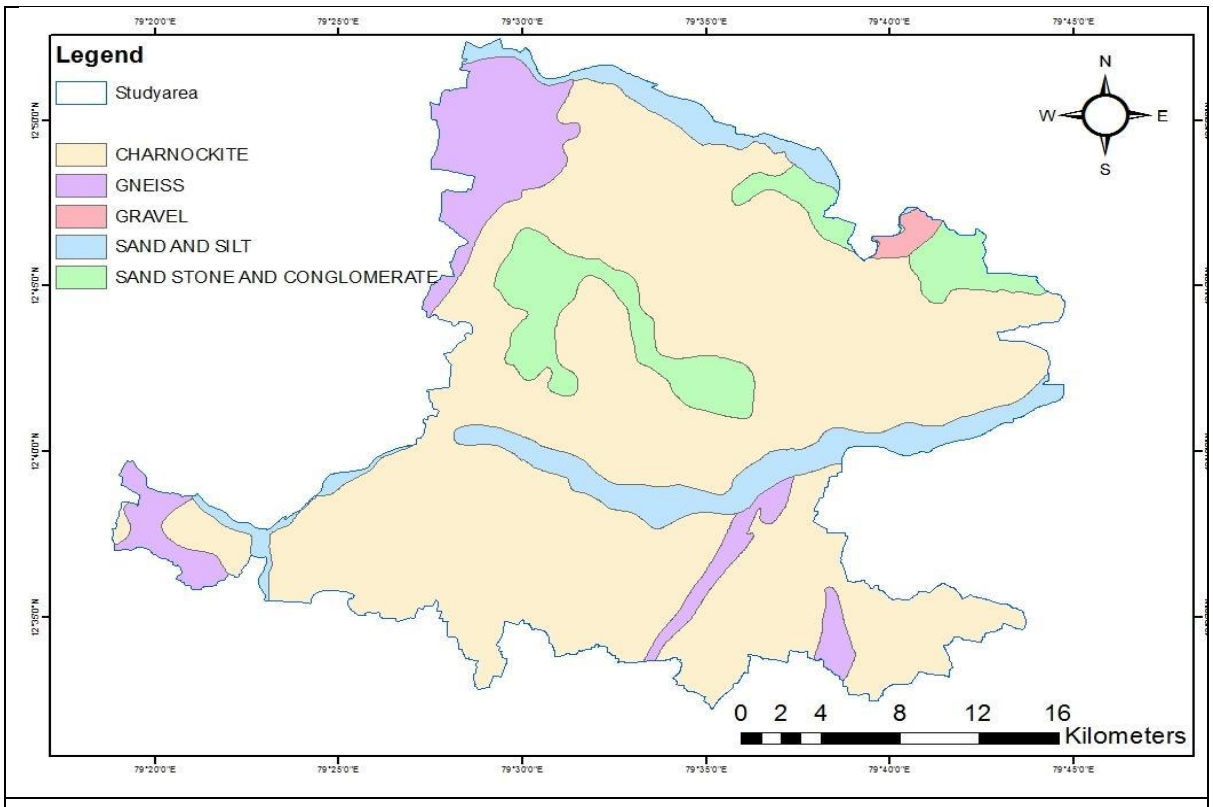


Figure 6: Geomorphology of Project Area

3. Seismology

86. As per the seismic zoning map of India, Cheyyar falls under Zone II, which is considered a low to moderate earthquake risk zone. This indicates that the area has a relatively lower risk of seismic activity compared to higher seismic zones.

4. Climatic Conditions

87. Tiruvannamalai has a tropical wet and dry climate, characterized by high temperatures during the summer and a wet winter. The area experiences significant rainfall during the Northeast Monsoon (October to December) and lighter rainfall during the Southwest Monsoon (June to September). The mean maximum temperature during summer ranges from 35°C to 40°C, and the mean minimum temperature during winter ranges from 18°C to 22°C. The highest temperature ever recorded is around 42°C, and the lowest is approximately 16°C. Humidity levels range from 45% to 65% during summer and 50% to 70% during winter. The average annual rainfall is approximately 985 mm. The predominant wind direction is from the Southwest, although it shifts to Northeast during winter and from South to West during summer.

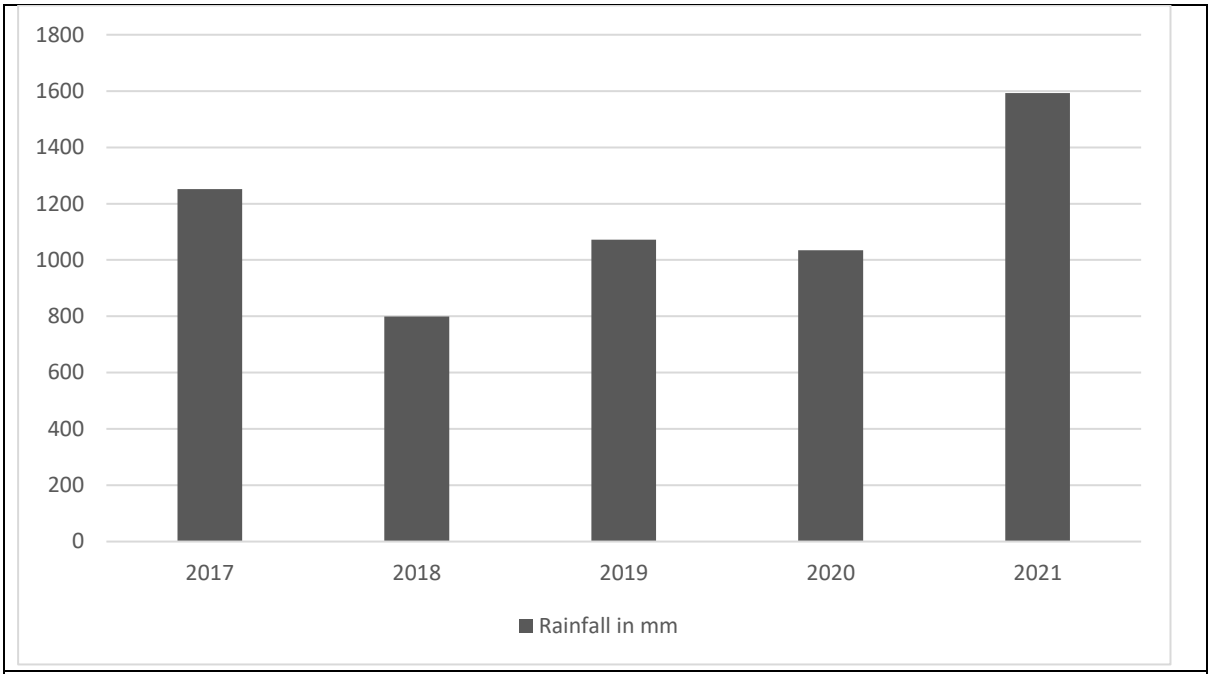


Figure 7: Annual Seasonal Rainfall in Project Area

Table 16: Monthly Max and Min Average Temperature

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg. Temp (°C)	25.0	26.5	29.0	32.0	34.0	32.5	31.0	30.5	30.0	28.5	26.5	25.0
Min. Temp (°C)	20.0	21.0	23.0	26.0	29.0	28.0	35.0	27.0	26.0	25.0	23.0	21.0
Max. Temp (°C)	30.0	32.0	35.0	38.0	39.0	37.0	27.0	34.0	34.0	32.0	30.0	29.0
Avg. Temp (°F)	77.0	79.7	84.2	89.6	93.2	90.5	87.8	86.9	86.0	83.3	79.7	77.0
Min. Temp (°F)	68.0	69.8	73.4	78.8	84.2	82.4	80.6	80.6	78.8	77.0	73.4	69.8
Max. Temp (°F)	86.0	89.6	95.0	100.4	102.2	90.5	95.0	93.2	93.2	89.6	86.0	84.2

5. Surface Water

88. Cheyyar is primarily associated with the Palar River, which flows through the region. But the other major rivers traversing the area are Thenpennaiyar, Cheyyar and Kamandala Naganadhi. A major part of the town falls under the Palar sub catchment and the extreme southern part of the district falls under Thenpennaiyar sub catchment. However, it's worth noting that the river's flow can be intermittent, often influenced by seasonal rainfall patterns and other climatic factors.

6. Groundwater

89. Ground water occurs under phreatic conditions in the weathered zone and under semi-confided conditions in the fractures. The thickness of weathered zone varies from less than a meter to about 15 m in the area depending on the topography. Potential aquifer zones are also developed in these rocks by fractures persisting to depths, particularly along lineaments and their inter sections. The depth of dug wells in crystalline formations varies from 8 – 19.5m bgl. Fracture zones have been encountered in the well down to a depth of 116 m bgl in the borehole drilled by CGWB. The thickness of alluvium along the course of Palar River ranges from 8 – 12 m.

90. Tiruvannamalai district is underlain by geological formations ranging in age from Archaean age in the crystalline formations comprising Charnockite, Granitic gneiss, Epidote

Hornblende Gneiss, Amphibolite, Pyroxenite, Dunite, Migmatites, Banded Magnetite Quartzite, Shale and Clay. In the consolidated formations, primary depositional features such as grain size are the major controlling factors.

D. Biological Environment

91. There are no sensitive ecological areas, biospheres, national parks, or sanctuaries located in 10km radius from the subproject location. There is the Mamandur Tank water body from the site location. Cheyyar river (5.8 km) and Palar River (8.6 km) are also in close proximity beyond the 5 km buffer area.

Figure 8: No RF near the project location

E. Socio-Economic Features

7. Land use

92. The Regional Directorate of Town and Country Planning had conducted the land use survey for Cheyyar Town. The Land use Analysis for Cheyyar town is given in table 16. Based on the outcome of the survey, the town land use is classified as.

- Forest.
- Uncultivable waste.
- Land put to non-agricultural uses.
- Cultivable waste land.
- Permanent Pasture & Grass Land.
- Misc. Tree Crops & Groves.

Table 16: Land use Analysis for Cheyyar town.

Sl. No	Land use	Area in Hectares	Percentage over total area
1	Forest	0.00	0.00
2	Uncultivable waste	223.04	3.12

Sl. No	Land use	Area in Hectares	Percentage over total area
1	Forest	0.00	0.00
3	Land put to non-agri uses	6066.03	83.6
4	Cultivable waste land	266.13	3.67
5	Permanent pasture and grass land	251.68	3.46
6	Misc. Tree Crops and Groves	446.59	6.15
	Total	**7253.47**	**100.00**

8. Industry and Agriculture

93. Cheyyar is an industrially forward town and directly linked to Delhi-Kanchipuram-Chennai by NH48. Major employment in the municipality is provided by leather industry, agricultural trading and industries located in and around the Municipality. Agriculture is generally practiced along the Palar River banks and in the outskirts of the city. Other common industries such as beedi factories also exist. The workforce depending on agriculture is insignificant when compared to secondary and tertiary sectors.

9. Infrastructure

- **Water Supply:** Water is supplied to SIPCOT Cheyyar through the SIPCOT.
- **Source**: The water to SIPCOT is received through local water sources, Cheyyar and Palar River.
- **Existing Sewerage System:** SIPCOT has its own sewer system and is maintained by SIPCOT.

94. **Solid Waste Management**. The solid waste management system of Cheyyar SIPCOT does not fall under the Cheyyar municipality. Hence, the waste produced by the IH Cheyyar is collected at door-step through lorry and it will be processed and treated by a designated vendor/contractor towards the project completion phase.

F. Socio Cultural Resources

10. Demography

95. According to 2011 census, Cheyyar has a population of 37,802 of which 18,773 are males while 19,029 are females. In Tiruvethipuram Municipality, Female Sex Ratio is of 1014 against state average of 996. Schedule Caste (SC) constitutes 12.81% while Schedule Tribe (ST) were 0.56 % of total population in Cheyyar.

96. In Cheyyar, male literacy is around 91.25 % while female literacy rate is 78.94 %. The city had a total of 9,162 households. Out of total population, 14,580 were engaged in work or business activity. Of total 14,580 working population, 90.78 % were engaged in Main Work while 9.22 % of total workers were engaged in Marginal Work. Cheyyar has 88.60% Hindus, 9.40% Muslims, 1.1% Christians and 0.7% other religions. Percentage wise of working population – Cheyyar is given in table 17

Table 17: Percentage of working population - Cheyyar

Description	**Worker** (Among total population)
Total	38.5%
Male	27.9%
Female	10.6%

Source: https://www.census2011.co.in/data/town/803413-tiruvethipuram-tamil-nadu.html

11. History, Culture and Tourism

97. Cheyyar in Tiruvannamalai District is located in the southwest part of Kalrayan and Jawadhi hills in the part of Eastern Ghats. The important archaeological evidence are found in the banks of Thenpennaiyar, Cheyyar and Palar rivers. Paleolithic tools like Axes, cleavers and other tools are found in a channel lead to Palar river in Pillanthangal village in Vembakkam Taluk. The 5000 years old Neolithic tools and traces are found in Pathiri and Kizhanoor villages, megalithic burial sites like Carin circle, Cist, Dolmens are found in Mel Sipili, Kanamalai and many more places in Jawadhu malai region. Megalithic sites are found in various places in the district like T.Mottur, Tanagoundan Pudur, Veeranam, Sambandanur, Thondamanur.

V. ANALYSIS OF ALTERNATIVES

98. This subproject (Affordable Housing Project for Economically Weaker Sections) is a Greenfield project, hence there are not many alternatives available for further assessment. This chapter has been developed based on the "with project scenario" and "without project scenario" options.

A. "With" and "Without" Project scenario.

99. The "with project scenario" has positive beneficial impacts for Economically Weaker Sections (EWS), the beneficiaries can avail clean, safe and affordable housing near the working area. The subproject site is screened to avoid any natural disasters including flooding[4], erosion etc. Along with 305 residential units and supporting services, the subproject has also proposed to have various infrastructures including (i) Pedestrian Pathway, (ii) Sewage Treatment Plant (51 KLD capacity), and (iii) Vehicle Parking area. In comparison, the "without project scenario" will have negative impact on the EWS, the increasing housing price in the real estate market will be a burden for the EWS to afford a housing unit provided by an individual real estate housing developer. Other factors like project location, and other project benefits were also taken into consideration in analysing the "with" and "without" project scenarios.

B. With Project Scenario

100. **Project location benefits**. As per the assessment, the subproject site has the following location benefits.

(i) The subproject is located 17 Kms off from Chennai Bangalore National Highway (NH 48) and nearest State Highway is 3.5 Kms.

(ii) The primary access to the subproject site is 15 m and has easy access to public transport system as the NH 48 is in close proximity. Also, the Bus Terminal and Kanchipuram Railway station is located at distance of about 4.25 km & 16 km from the subproject site.

(iii) The site is contiguous with excellent frontage and visibility

(iv) The nearest hospital/healthcare facilities and colleges & Schools (G.K College of Education, Indo-American College, Wisodm College of Arts, Arulmigu Meenakshi Amman College of Engineering and Science Chithathur Higher Secondary School, Chozhavaram school, Sangford Schooll) is located at a distance of about 3 km from subproject site.

101. **Expected developments/ opportunities in the subproject vicinity,** which includes

(i) The envisaged development will be first of its kind in Cheyyar and will have first mover advantage in the region with significant positive impact.

(ii) Various Industrial units (Leather processing, Tanning & Shoes factories, Foam, Construction & Steel based) offer captive demand for the proposed development on the subproject site.

102. **Subproject benefits**. The proposed STP will treat the wastewater generated from the housing units and has been designed to recycle the treated water for flushing and gardening

[4] The project is in the Low-risk Zone for floods according to the BMTPC Flood Hazard Map.

purposes, which will reduce the actual water demand and have beneficial impacts on the environment (through recycling and reuse). Solar powered streetlights have been proposed, which will marginally reduce the use of TANGEDCO power supply. Sufficient slope is provided for the internal roads that will prevent flooding/ ponding of water within the subproject site. It is proposed to have rainwater harvesting pits/ structures surrounding the residential blocks as well as in common areas to tap the rainwater to increase the groundwater recharge potential. It is planned to have native floral species in the green area/ landscaping areas.

C. Without Project Scenario.

103. As per the current situation, it would be difficult for EWS to access affordable and safe residential space as per the real estate market price.

104. As per the current situation the people will continue to live without proper access for drinking water and lack of proper hygienic facilities at home.

105. The goals (Housing for All) set by the Ministry of Housing & Urban Affairs; Government of India shall be only dependent on public agencies.

VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

106. This chapter on the anticipated environmental impacts and mitigation measures is based on the detailed project design prepared for the housing project at Cheyyar.

107. Screening of potential environmental impacts is categorized into four categories considering project phases viz. (i) location impacts and (ii) design impacts (pre-construction phase), (iii) construction phase impacts and (iv) operations and maintenance phase impacts:

a. **Location impacts**. Impacts associated with site selection, including impacts on environment

b. **Design impacts**. Impacts arising from project design, including the technology used, scale of operations etc.

c. **Construction impacts**. Impacts resulting from construction activities including site clearance, earthworks, civil works, etc.

d. **O&M impacts**. Impacts associated with the operation and maintenance of the infrastructure built in the project.

108. The proposal envisages construction, operation and maintenance of 441 beds and essential amenities (Pedestrian Pathway, Connecting Pathways, Sewage Treatment Plant-51 KLD capacity, Vehicle Parking area) and hence this would result in some environmental impacts typical to construction activities.

109. Other impacts related to construction activities such as generation of dust and noise, removal of construction debris and demolition wastes etc. are envisaged which shall be minimized and addressed by adopting safe engineering practices and appropriate methodology for demolishing works. Caution will be exercised in planning for safe construction and operations phase to minimize disturbance to the adjoining existing activities. Water for construction will be provided through SIPCOT or through private mobile water tankers in summers.

110. **Land Acquisition and Resettlement.** As indicated earlier, the land proposed (2.02 acres) for construction of 441 beds and associated services belongs to the SIPCOT and hence land acquisition and resettlement issues are not envisaged.

111. **Design Considerations to Avoid Environmental Impacts** The following are design considerations to avoid environmental impacts:

- Incorporation of adequate drainage provisions
- Provision for adequate cross ventilation
- Adoption of design compatible with the natural environment and suitable selection of materials to enhance the aesthetic appeal and to blend with the natural surroundings.
- Straight lines and simple geometry in the proposed landscape and architectural features.
- Natural tree species in the proposed landscape
- Ensure water demand can be met sustainably and reused wherever possible. The STP and treated water is proposed to be utilised for flushing and gardening purposes by reducing the water demand.

112. The results of interventions are unobtrusive and will be integral part of the ambience of the site. The physical components have been proposed with minimalist design treatment.

A. Assessment of Environmental Impacts

113. **Determination of Area of Influence**. The primary impact areas are (i) sites for proposed project components; (ii) main routes/intersections which will be traversed by construction vehicles;and (iii) quarries and borrow pits as sources of construction materials. The secondary impact areas are: (i) Other than the delineated primary impact area; and (ii) entire Cheyyar Municipality interms of overall environmental and socioeconomic improvement.

114. In the case of this subproject the components will involve straight forward construction and operation, and impacts will be mainly localized, short in duration and expected during construction and operation period.

B. Pre-construction Impacts and Mitigation Measures

115. **Consents, permits, clearances, no objection certificate (NOC),** etc. Necessary consents/NOC as per

116. Table 5 will be required during pre-construction phase and before any civil works commence. A copy of Consent/Permission/Clearance/ NoC shall be included in the monitoring reports, which will be prepared by the PMC and submitted to the TNIHPL and TNIFMC. Failure in obtaining the same will result in the delay of work and may lead to stoppage of works.

117. **Mitigation measures**. The following measures will be conducted during the detailed design phase prior to construction (civil works):

- Obtain all necessary consents, permits, clearance, NOCs, etc. prior to start of civil works.
- Acknowledge in writing and provide report on compliance of all obtained consents, permits, clearance, NOCs, etc.
- Submission and approval of SEMP prior to starting of civil works.
- Include in detailed design drawings and documents all conditions (e.g. the location of the STP should be away from the building area and the treated water should meet the discharge standards as per the TNPCB and provisions if necessary).
- In compliance to the Noise Standards, the proposed construction activities should be implemented in a controlled manner, the dB(A) levels for residential area (daytime noise level 55 dB(A) and night time noise level 45 dB(A)) should be maintained.
- Pre-construction environmental monitoring will be conducted by the Contractor under the supervision of the PMC. The outcome of the analysis shall be referred as baseline information for key environmental parameters (such as ambient air quality, ambient noise level, and water quality).
- Conduct consultation with the local communities and provide detail in the local language that is understandable to the local community regarding project activities and the anticipated impacts as part of the project information dissemination (prior to the start of the construction activity).

118. **Utilities**. Though the water supply and sewerage drain facilities are provided by the SIPCOT, the construction related environmental and social impacts will be considered as part of this housing construction activities. To mitigate impacts, PMC will:

- Identify and include locations and operators of these utilities in the DPR to prevent unnecessary disruption of services during the construction phase.
- Require contractors to prepare a contingency plan to include actions to be taken in

case of unintentional interruption of services.

- Require contractor to obtain from the PMC, the list of affected utilities and operators.
- If relocations are necessary, contractors along with PMC will coordinate with the providers/line agencies to relocate the utility.

119. **Social and Cultural Resources**. Though the subproject site is not historically or culturally important location, there is a risk that any work involving ground disturbance can uncover and damage archaeological and historical remains. To mitigate impacts, PMC will:

- Ensure the ADB SPS, 2009 requirements are met while dealing with physical cultural resources
- Continually consult Archaeological Survey of India and/or State Department of Archaeology to obtain an expert assessment of the archaeological potential of the site.
- Consider alternatives if the site is found to be of medium or high risk.
- Include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available.
- Develop a chance find protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognized, and measures are taken to ensure they are protected and conserved, this must include stopping work if any suspected cultural heritage item is found.

120. **Site selection of construction work camps, stockpile areas, storage areas, and disposal areas.** Priority is to locate these near the subproject location. However, if it is deemed necessary to locate elsewhere, sites to be considered will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems. Residential areas will not be considered for setting up construction camps to protect the human environment(i.e., to curb accident risks, health risks due to air and water pollution and dust, noise, and to prevent social conflicts, shortages of amenities, and crime). Extreme care will be taken to avoid disposals near forest areas or in water bodies.

121. **Site selection of sources of materials**. Significant quantities of bricks, coarse aggregateand fine aggregate will be required for construction works. The contractor should procure these materials only from the quarries permitted/licensed by the Department of Geology and Mining. The contractor should, to the maximum extent possible, procure material from existing quarries, and the creation of new quarry areas should be avoided as far as possible. If new quarries are required then the contractor will be responsible for obtaining all permissions and clearances, including environmental clearance for mining. It will be the construction contractor's responsibility to verify the suitability and legal status of all material sources and to obtain the approval of the Department of Geology and Mining and local revenue administration, as required.

122. **Erosion control.** Most of the impacts will occur due to excavation and earth movements during the construction phase. Prior to the commencement of civil works, the contractor will be required to:

- Develop an erosion control and re-vegetation plan to minimize soil loss and reduce

sedimentation.

- Minimize the potential for erosion by balancing cuts and fills to the extent feasible.
- Identify and avoid areas with unstable slopes and local factors that can cause slope instability (groundwater conditions, precipitation, seismic activity, slope angles, and geologic structure).
- Minimize the amount of land disturbed as much as possible. Use existing roads, disturbed areas, and borrow pits and quarries when possible. Minimize vegetation removal. Stage construction to limit the exposed area at any one time.

123. **Access**. Hauling of construction materials and operation of equipment on-site can cause traffic problems. Construction traffic will access most work areas from the existing roads therefore potential impacts will be of short duration, localized and can be mitigated. The Contractor will need to adopt the following mitigation measures:

- Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites.
- Schedule transport and hauling activities during non-peak hours.
- Locate entry and exit points in areas where there is low potential for traffic congestion.
- Keep the site free from all unnecessary obstructions.
- Drive vehicles in a considerate manner

C. Construction Impacts and Mitigation Measures

124. The impacts during the proposed construction works are standard and site-specific to the construction activities and are not expected to be significant. The Environmental Management Plan (EMP) specifies the necessary mitigation measures to be strictly followed by the contractor and supervised by the PMC. Key impacts during construction are envisaged on the following aspects: (i) transportation of materials, (ii) dust generation, air and noise pollution from construction activities, (iii) sourcing of water for construction activities, (iv) handling of construction materials at site and, (v) adoption of safety measures during construction. The contractor will prepare and submit to a Site-specific Environmental Management Plan (SEMP) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for debris, solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; and (iii) monitoring program as per EMP to the PMC, for review and approval, and (iv) a team to monitor health and safety-related issues shall be approved by the PMC before the commencement of construction work.

125. **Construction Schedule and Method**. As per the detailed design, construction activities in the site are expected to take approximately 24 months for completion. Materials will be brought to site by trucks and will be stored on unused areas within the subproject site. The working hours will be 8 hours daily. Night works will be avoided except on an emergency basis or due to high day-time traffic as per prevailing conditions at the time of construction. This shall be further considered by the PMC but only in consultation with the local communities.

126. There is sufficient space for a staging area, construction equipment, and stockpiling of materials. However, the contractor will need to remove all construction wastes on a daily basis.

127. **Impacts on Water Quality.** The contractor will be required to undertake the following:

- Schedule civil works during non-monsoon season, to the maximum extent possible.
- Ensure drainages within the construction zones are kept free of obstructions.
- Keep loose soil material and stockpiles out of drains and flow lines.
- Avoid stockpiling of excavated and construction materials (sand, gravel, cement, etc.) unless covered by tarpaulins or plastic sheets.
- Conduct periodic Environmental Monitoring to check the water quality as indicated in Table 21.
- Use a silt trap for the surface runoff to prevent sediments from entering the nearby irrigation tank/ water bodies.
- Re-use/utilize, to the maximum extent possible, excavated materials.
- Dispose of any residuals at the identified disposal site (PMC will identify approved sites).
- Dispose of waste oil and lubricants generated as per provisions of Hazardous Waste (Management and Handling) Rules, 1989.

128. **Impacts on Air Quality**. There is potential for increased dust, particularly during the summer/dry season due to various construction activities including stockpiling of construction materials. Emissions from vehicles transporting construction materials and debris/materials to be disposed of since they may cause an increase in air pollutants within the construction zone. These are inherent impacts which are site-specific, low magnitude, short in duration and can be easily mitigated. The contractor will be required to undertake the following:

- Conduct regular water spraying on earth piles, trenches and sand piles.
- Conduct regular visual inspections in the construction zones to ensure that there are no excessive dust emissions.
- Spreading crushed gravel over backfilled surfaces if re-surfacing of disturbed areas cannot be done immediately.
- Maintain construction vehicles and obtain “Pollution Under Control” (PUC) certificate from Emission Testing Centres.
- Obtain CtE and CtO for batching plants, crushers, diesel generators, etc., if is to be used in the project from Tamil Nadu Pollution Control Board.
- Conduct periodical environmental monitoring for ambient air as per the Environmental Monitoring Plan (Table 21).

129. **Noise Impacts**. The site is not located near any archaeological/ heritage buildings. Most of the construction activities shall be carried out manually with minimum use of machinery and equipment and with necessary safety precautions. Hence the chances for significant noise impacts are not envisaged. Nevertheless, the contractors will be required to undertake the following:

- Plan activities in consultation with the PMC so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in the least disturbance.
- Minimize noise from construction equipment by using vehicle silencers and fitting jack hammers with noise-reducing mufflers.
- Create awareness among drivers not to use horns unless it is necessary to warn other road users or animals of the vehicle’s approach. Shut off idling equipment.

- Night-time construction activities should be avoided, and only be considered on an emergency basis or due to high day-time traffic as per prevailing conditions at the time of construction
- Follow daytime ambient noise levels as per Noise Pollution (Regulation and Control) Rules and conduct periodical environmental monitoring for ambient noise as per schedules given in the EMP Table 21.
- Ensure vehicles comply with the Government of India noise limits for vehicles. PUC should be available for every construction equipment and vehicle.

130. **Impacts on Flora and Fauna**. As per the detailed design, tree-cutting is not required. This will be reassessed during the pre-construction phase. There are no protected areas in the direct and indirect impact zones and no diverse ecological biodiversity is found within the project area (construction and demolition sites). Thus, there are no significant impacts on flora and fauna. But ingeneral, the Contractor will be required to:

- Conduct site induction and environmental awareness.
- Limit activities within the work area.
- Do not remove or harm existing vegetation except those required under proposed contract.
- Strictly instruct workers not to cut trees for fuel wood.
- Replant trees in the area using minimum ratio of 10 trees for every 1 tree cut, if any. Replacement species must be approved by District Forest Department.

131. **Impact due to Waste Generation**. Construction activities will produce excess excavated soils, excess construction materials, and solid wastes (such as wood, packaging materials, empty containers, oils, lubricants, and other similar items). These impacts are minimal and reversible by mitigation measures. The contractor will need to adopt the following mitigation measures:

- Prepare and implement a Waste Management Plan.
- Manage solid waste according to the following hierarchy: reuse, recycling and disposal. Include designated/approved disposal areas in waste management plan.
- Recover used oil and lubricants and reuse; or remove from the sites.
- Avoid stockpiling and remove immediately the excess construction materials and solid waste (wood, packaging materials, empty containers, oils, lubricants, and other similar items).
- Prohibit disposal of any material or wastes (including human waste) into drainage, nallah, or watercourse.

132. **Impacts on Occupational Health and Safety**. Workers need to be aware of occupational hazards which can arise during the proposed construction activities. Exposure to work-related chemical, physical, biological and social hazard is likely to occur during construction works. Potential impacts are negative and short-term but reversible by mitigation measures. Overall, the contractor should comply with all the mitigation measures as per best international practices which include but not limited to:

- Disallow worker exposure to noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.
- Develop a comprehensive site-specific health and safety (H&S) plan. The overall

objective is to provide guidance to Contractor on establishing a management strategy and applying practices that are intended to eliminate, or reduce, fatalities, injuries and illnesses for workers performing activities and tasks associated with the project.

- Include in H&S plan measures such as: (i) type of hazards during excavation works; (ii) corresponding personal protective equipment for each identified hazard; (iii) H&S training for all site personnel; (iv) procedures to be followed for all site activities; and (v) documentation of work-related accidents.
- The working hours will be 8 hours daily. Night works should be avoided; however, it may be considered on an emergency basis or due to high day-time traffic as per prevailing conditions at the time of construction. During such requirements, appropriate consultation with the local communities will be conducted.
- Provide H&S orientation training to all new workers to ensure that they are appraised of the rules of work at the site, personal protective protection, and preventing injury to fellow workers.
- Ensure that first aid kit is available at site, and it should be easily accessible for all workers in terms of emergency.
- Provide medical insurance coverage for workers.
- Secure construction zone from unauthorized intrusion and accident risks through provision of barriers, guards and warning signs.
- Ensure the core labour standards are adopted (i). Universal and indivisible human rights, (ii) Freedom from forced labour (iii) Freedom from child labour (iv) Freedom from discrimination at work
- Provide adequate supply of potable drinking water.
- Provide clean eating areas where workers are not exposed to hazardous or noxious substances.
- Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted.
- Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas.
- Ensure moving equipment is outfitted with audible back-up alarms.
- Mark and provide sign boards in the construction zone, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate.

133. The estimated water demand of 60KLD of water for 441 bed units shall be supplied by the SIPCOT. During the summer season, if there is a drought condition, as an alternate source to meet the water demand, water shall be sourced through private vendors. For which all regulatory requirements like permission from PWD for extraction of ground/ surface water, authorisation letter / NoC etc. shall be verified before procurement of water by the TNIHPL.

134. The sewer line will be provided by the SIPCOT from the subproject site. In the initial stage, for both water supply pipeline laying activity and sewer line laying activity may direct air and noise impacts to the public.

135. The prepared EMP will be adopted by the contractor, who undertakes the pipeline laying works (for both water supply and sewer line). This EMP shall be monitored and reported

by PMC. The key observations should be reflected in the quarterly project progress reports and semi-annual safeguard reports to ADB.

D. Post-Construction Impacts and Mitigation Measures

136. **Site clean-up after construction activities** The Contractor will be required to:

- Backfill any excavation and trenches, preferably with excess excavation material generated during the construction phase.
- Use to remove topsoil to reclaim disturbed areas.
- Re-establish the original grade and drainage pattern to the extent practicable.
- Stabilize all areas of disturbed vegetation using weed-free native shrubs, grasses, and trees.
- Restore staging areas and temporary work areas.
- Remove all tools, equipment, barricades, signs, surplus materials, debris, and rubbish. Demolish buildings/structures not required for O&M. Dispose in designated disposal sites.
- Request in writing from PMC that construction zones have been restored.
- Solid waste (debris, excavated soils, etc.) from the demolishing sites and restoration of the water body site should be disposed of by the contractor as per the guidance of the Environmental specialist of PMC.

137. **Operation and maintenance activities**. The TNIHPL in support from the service providers will operate and maintain the infrastructure facilities at the site. The maintenance activities at the site include:

- Rainwater Harvesting Pit Management.
    - Regular inspection and cleaning of catchment, gutters, filters and tanks to reduce the likelihood of contamination.
    - Water from other sources should not be mixed with that in the tank.
    - TNIHPL will carry out routine management of the RWH pits.
- Management of the STP
    - Management of the STP will be handled either by the construction contractor or a separate contractor, as determined by TNIHPL at the end of the construction phase. . During the operation period, the STP will be operated by a skilled operator, who will be required to wear all the essential PPE's (including but not limited to gloves, masks, safety shoes and safety eyewear) to safeguard themselves from any hazards likely occurring from the STP.
    - TNIHPL will carry out regular inspections of the STP to prevent any impacts, including pollution of groundwater and nearby water courses (including the irrigation tank located near the Housing site).
- Maintenance of sanitation facilities, solid waste collection and regular maintenance of constructed amenities.
    - TNIHPL will appoint a contractor to carry out maintenance of the sewer system (including the pipeline, collection system etc.), carry out the regular collection of wastes, and also ensure that:
        - Sanitation facilities do not result in pollution of groundwater.
        - Sanitation facilities do not interfere with other utilities and block access to buildings, causing a nuisance to neighbouring areas.

    - Municipal Solid Waste will be segregated as organic waste and inorganic waste. Both organic and inorganic waste shall be collected by the appointed contractor, organic waste will be composted in the vermicomposting/biodegradation process and will be used as manure. The inorganic waste will be disposed of in the MSW dumping area.
    - No spillage will happen during the transfer of waste and all wastes will be transported to a designated solid waste treatment site.
    - Staff collecting the MSW will be provided with necessary PPE's (including gloves, masks and boots).
- Firefighting equipment including the fire extinguisher and sand buckets has to be regularly maintained. Fire extinguishers have to be regularly checked for the expiry date and have to be refilled or replaced as required prior to the expiry date. Any wet sand (if any) in the bucket should be replaced with dry sand
- Other amenities including landscaping, children's play area and streetlights shall be handed over to SIPCOT for maintenance and operation.

VII. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

A. Consultation and Participation

138. The active participation of stakeholders including local community, NGOs, etc., in all stages of project preparation and implementation is essential for successful implementation of the project. It will ensure that the subprojects are designed, constructed, and operated with utmost consideration to local needs, ensures community acceptance, and will bring maximum benefits to the people. Public consultation and information disclosure is a must as per the ADB policy.

B. Public Consultation

139. The public consultation and disclosure program is a continuous process throughout the project implementation, including project planning, design and construction.

a) Consultation during Project Preparation

140. Several formal and informal consultations were carried out to understand the likely issues and feedback from the public on the subproject. The table 18 lists out few meetings/ discussions between various stakeholders.

Table 18: Meetings/Discussions between various stake holders

Consultation Summary							
S. No	**Date / Time / Venue of Meetings**	**Stakeholders**	**No. of Participants**			**Issues discussed**	**Project responses**
			Male	**Female**	**Total**		
1	15-05-2024 Project site	Community Person	1		1	• Knowledge of project • Boons and Bane of project development • Air and Water Pollution • Traffic	No major concerns have been noted.
2	15-05-2024 Project site	Community Person	1		1	• Current Role • Current mode of stay • Safety of the place • Issues at work	No major concerns have been noted.

b) Consultation during Construction

141. Prior to start of construction, PMC will conduct information dissemination sessions and further consultations and solicit the help of the local community, leaders/prominent for the project work. Focus group meetings will be conducted to discuss and plan construction work with local communities to reduce disturbance and other impacts and also regarding the project grievance redress mechanism. Project information and construction schedule will be provided to the public via mass media (newspapers, ULB websites etc,).

142. A constant communication will be established with the affected communities to redress the environmental issues likely to surface during construction phase, if any. The contractor will be required to provide public information about the construction work in the area prior to any construction commencing. At a minimum this should be at least 7 days prior to the start of work and again a day before the start of work via pamphlets. At the work sites, public

information boards will also be provided to disseminate project related information.

C. Information Disclosure and Future Consultations

143. Executive summary of the IEE will be made available at the offices of TNIFMC, PMC and also displayed on their notice boards. Hard copies of the IEE will be accessible to citizens to disclose the document and at the same time create wider public awareness. Stakeholders will also be made aware of the grievance register and redress mechanism.

144. Public information campaigns to explain the subproject details to a wider population will be conducted. Public disclosure meetings will be conducted at key project stages to inform the public of the progress and future plans project information brochures/ pamphlets will be issued to the local communities for better understanding, and the brochure/ pamphlets shall include the EMP cost. A board showing the details of the project will be displayed at the construction sites for the information of the general public. Local communities will be continuously consulted regarding the location of construction camps, access and hauling routes and other likely disturbances during construction.

VIII. GRIEVANCE REDRESSAL MECHANISM

145. The TNIHPL will establish the Grievance Redressal Committee and to ensure that the proper functioning of the GRC, officers and focal points will be established within the PMC and Contractor. The majority of complaints will be the responsibility of the site level contractor and TNIHPL. It will be addressed via procedures described in the ESGMS. Records of complaints (refer Appendix 2 – sample grievance form) received and how they are addressed will be maintained by the TNIHPL and reported in the monitoring reports. Contact phone numbers and names of the concerned staff and contractors, will be posted at all construction sites in visible locations. The following GRM shall be followed.

146. **Field level**. The Contractor will designate an on-site Grievance Redress Officer (GRO)-1 in consultation with the PMC and TNIHPL. The field level GRC will be theTier-1 committee, and it may consist of nominated member from the labour group, EHS Officer, senior engineer, safety engineer and chaired by assistant engineer of TNPHC. The Tier-2 GRC will be chaired by the MD of TNIHPL and consist of Business Head, and project engineer from TNIHPL. The Tier-3 GRC will receive and record the complaint of the subproject site, and it will be headed by the TNSF Fund Manager assisted by the ESG Analyst and Investment Analyst. Alternatively, the complaint can be registered by phone call, message, email to GRO-1 and any complaints received by the contractor or site engineers will be reverted to the onsite GRO-1 for 1st level resolution. The complaint will be reviewed and on-site GRO-1 with assistance from the Site engineer of the Contractor will try to resolve the issue on-site in consultation with the aggrieved party. This will be done within 7 days of receipt of a complaint/ grievance.

147. **Subproject level**. All grievances that cannot be redressed within 7 days on-site level will be brought to the notice of the subproject level, tier 2 GRO officer. The subproject GRO-2 will resolve the grievance within 14 days of receipt of a complaint/ grievance with support of safety engineers and senior level engineers. The grievance at this tier 2 must be resolved in 14 days of its receipt.

148. **Fund level**. If the grievance is not resolved in tier 2 level, the grievance will be referred to tier 3 committee at TNFIMC level. The grievance at this level must be resolved in 14 days of its receipt.

149. The project 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.

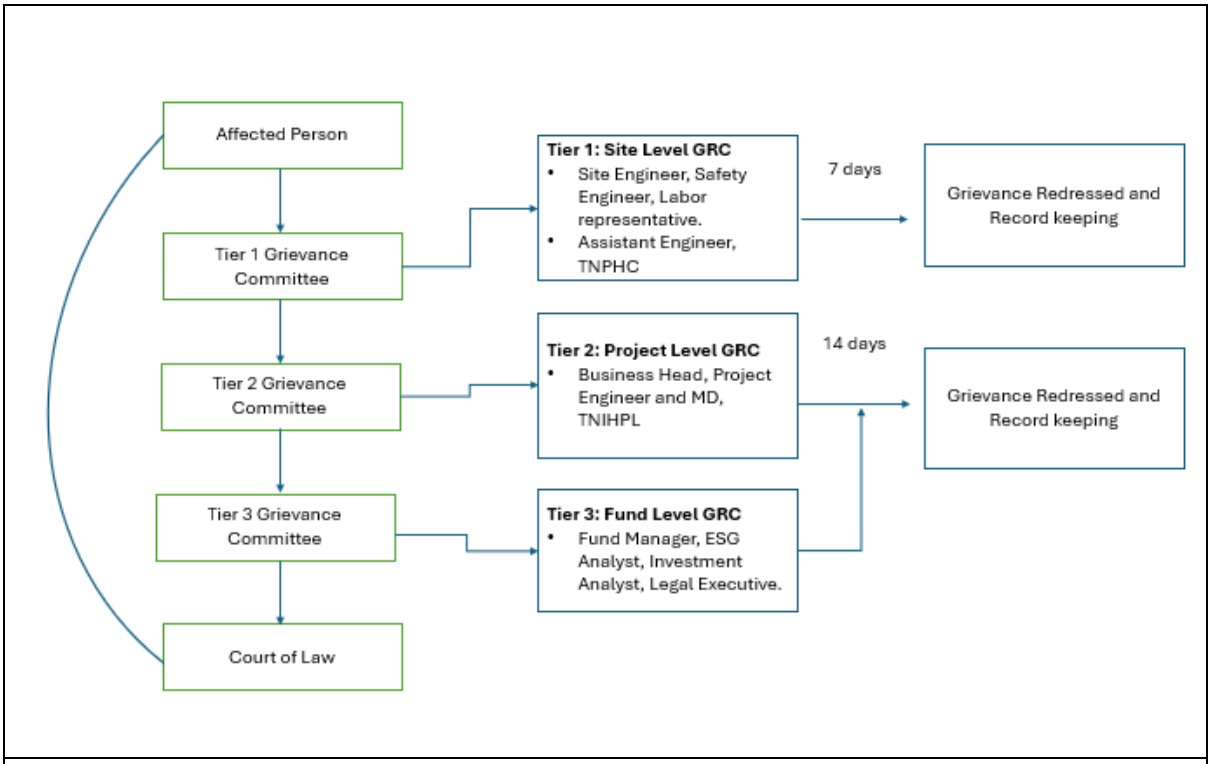


Figure 9: GRM for TNSF

150. **ADB's Accountability Mechanism**. If the established GRM is not in a position to resolve the issue, the affected persons can also use the ADB Accountability Mechanism by 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.

151. **Periodic review and documentation of lessons learned**. The PMC,TNIHPL and TNIFMC 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.

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

IX. ENVIRONMENTAL MANAGEMENT PLAN

A. Environmental Management Plan

153. The environmental management plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable levels. The EMP is prepared based on the subproject activities, which are planned to be implemented at various stages.

(i) Environmental Management Plan for Pre-Construction Site
(ii) Environmental Management Plan for Construction Site
(iii) Environmental Management Plan for Operation/ Maintenance

154. The EMP will guide environmentally sound practices at the time of construction and operation of the subproject and ensure efficient lines of communication between TNIHPL, PMC, and contractor. The EMP will (i) ensure that the activities are undertaken in a responsible non-detrimental manner; (ii) provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site; (iii) guide and control the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iv) detail specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (v) ensure that safety recommendations are complied with. The EMP includes a monitoring program to measure the environmental condition and effectiveness of implementation of the mitigation measures. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries. The IEE and EMP will be included in the bid and contract documents to ensure compliance to the conditions set out in this document.

155. The contractor will prepare and submit to a Site-specific Environmental Management Plan (SEMP) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for debris, solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; and (iii) monitoring program as per EMP to the PMC, for review and approval, and (iv) a team to monitor health and safety-related issues. No works are allowed to commence prior to approval of SEMP. A copy of the EMP and approved SEMP will be always kept on site during the construction period.

156. As indicated in Chapter III (Description of the project), Water supply and sewer line shall be provided by SIPCOT. The EMP for pre-construction, construction and post-construction stages have been prepared and additionally, site specific EMP shall be prepared by the contractor and the PMC environmental specialist shall approve the site-specific EMP. The prepared EMP and site specific EMP will be monitored and reported by PMC to TNIHPL. The key observations should be reflected in the quarterly safeguard reports to ADB.

157. For civil works, the contractor will be required to (i) carry out all the mitigation and monitoring measures set forth in the approved EMP and SEMP; and (ii) implement any corrective or preventative actions set out in environmental monitoring reports that the employer will prepare from time to time to monitor implementation of EMP covered in this IEE report and SEMP. The contractor shall allocate budget for compliance with SEMP measures, requirements and actions. The EMP for various stages of the subproject construction is given in the following table.

B. Table 19: EMP for Pre-Construction and Construction Phase

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
	Pre-construction Impacts				
1.	**Location Impacts**				
1.1	Location impacts pertain to siting of facilities for construction of Affordable Housing Project at Cheyyar • Clearing of wild vegetation • Maintain slope for natural drain • Excess earth disposal	• The siting of facilities will be in line with the DTCP approved Master Plan. • The site allotted for the construction is allotted as a hostel facility. Hence there are no land related issues anticipated. • There are currently no trees present within the project site, as reported. Wild vegetation shall be cleared before construction.	• List of tree species • Tree cutting permit / permission from the Revenue department • Identification of Disposal site for disposing debris and excavated soil	PMC	TNIHPL
1.2	Lack of sufficient planning to assure long term sustainability of the developments	• In accordance with the provisions in the project selection criteria, the project design shall include adequate provisions for ensuring effective maintenance and protection of the assets created so to ensure the long-term sustainability of the sites. • The designs will be worked out and implemented in accordance with the provisions.	• DPR and designs approved from competent authority. • Work plan prepared and approved by PMC	Contractor/PMC	TNIHPL
1.3	Land acquisition (Socio economic Impacts)	• No additional land will be required. • Also, the sites are free without any inhabitation. • Resettlement and/or land acquisition problems are not applicable since construction activities are in vacant site.	• NA		
1.4	Clearing of trees/ Removal ofvegetation	• There are currently no trees present within the	• Tree count	Contractor	TNIHPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		project site. As reported, the tree covers adjacent to the site would be retained in the site. • All reasonable measures shall be undertaken to ensure that no native fauna is harmed or placed at risk during the clearing activities.	information and compensation ratio		
2.	**Design Impacts**				
2.1	Increased storm water runoff from alterations of the site's natural drainage patterns due to excavation works in the site, construction of residential units, addition of paved surfaces and approach roads	• Design of proposed building components will enable efficient drainage of the sites and maintain natural drainage patterns. The siting of the project components, involving physical construction shall be done to ensure no disruption of natural drainage patterns or flows into the nearby drain/nallah. • Adequate size and number of Recharge pits will ensure that no storm water is drained out of the site.	• Site drainage plan to be prepared and applied. • Construction of drains and recharge pits to prevent water logging at site during rains	PMC	TNIHPL
2.2	Consents, permits, clearances, NOCs, etc.	• All the necessary approvals/ permissions/ clearances/ NoCs as required from DTCP/Local bodies should be obtained before the start of the construction activities. • The company is required to obtain Environment Clearance and Consent to Operate (CtO) for the project. The CtE and CtO shall be separately obtained for batching plant if it is planned to be installed on site.	• Refer table 3 and table 4 • Consultation meeting outcomes and records	PMC	TNIHPL
2.3	Integration of energy/water efficiency and energy/water	• The environmental footprint of the project in terms of water consumption, energy consumption and utilization of materials should be in the most efficient form.	• DPR and designs approved from competent authority. • Use of energy efficient	PMC	TNIHPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
	conservation programs in design of building components	• Use of water-efficient fixtures and dual-flushing systems.	and ISO certified equipment in construction works		
2.4	Odour / smell from Sewage Treatment Plant (wherever provided), Solid waste collection area	• The STP detailed design/ layout should ensure any odour/smell in the facility or nearby areas.	• Designs approved by the competent authority. • MSW is designed for regular collection.	PMC	TNIHPL
2.5	Noise pollution from the pumps used for lifting water	• Pump house should be acoustic proof.	• Regular maintenance is required. • Conducting frequent Noise monitoring	PMC	TNIHPL
2.6	Sourcing of water for construction activities	• TNIHPL proposes to utilize water provided by SIPCOT for construction purposes. • Use of groundwater for construction purposes should be avoided/ restricted. • Water demand during construction should be reduced by use of premixed concrete, curing agents and other best practices prevalent.	• Regular monitoring is required. • Complaints, if any, from the local communities • Ground water level monitoring	Contractor and PMC	TNIHPL
2.7	Installation of Diesel Generators	• TNIHPL proposes to utilize water provided by SIPCOT for construction purposes.	• Standards prescribed by the CPCB	Contractor and PMC	TNIHPL
3.	**Pre-Construction Activities by Contractor**				
3.1	Submission of EMP/ SEMP; EMP implementation and reporting	• Appoint Environment, Health and Safety Supervisor to ensure EMP implementation. • Submission of EMP/ SEMP prior to starting of work, • Timely submission of monthly monitoring	• Unsatisfactory compliance with EMP • Contractor consultation records	Contractor and PMC	TNIHPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		reports including documentary evidence on EMP implementation such as photographs and consultation records. • SEMP documents shall include information about site restoration, noise and dust control, wastewater management, spills response, community and site health and safety, traffic control, tree cutting, construction of labour camps, storage areas, hauling roads, regulatory permissions, disposal areas for solid and hazardous wastes, sensitive features like schools and hospitals. • Provide project-related information to stakeholders, communities and/or affected people before and during construction works including at least 7 days prior to the start of works and again at least 1 day prior to works through issuing a pamphlet booklet to affected persons.			
3.2	Consents, permits, clearances, NOCs, etc.	• Obtain all necessary consents, permits, clearance, NOCs, etc. prior to the award of civil works. • Ensure that all necessary approvals for construction to be obtained by the contractor are in place before the start of construction. • Acknowledge in writing and provide a report on compliance of all obtained consents, permits, clearance, NOCs, etc.	All the project related clearances should be obtained as indicated	Contractor	TNIHPL
3.3	Sources of construction materials	• Maximize the re-use of earth-cut materials, spoils, and construction debris/wastes.	Contractor to prepare a list of approved quarry	Contractor	TNIHPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
	(Impact on natural land contours, vegetation, and disturbance to natural drainage patterns, water logging, and water pollution.)	• Specify materials that are recycled, have recycled content or are from sustainable sources. • Obtain construction materials only from government-approved quarries with prior approval of PMC • PMC to review, and ensure that proposed quarry sources have all necessary clearances/ permissions in place prior to approval • Contractor to submit to PMC the documentation every month with the details of the material obtained from each source (quarry/ borrow pit) • Avoid the creation of new borrow areas, quarries, etc., for the project; if unavoidable, contractor to obtain all clearances and permissions as required under law, including Environmental Clearance (EC) prior to approval by PMC	sites and sources of materials with the approval of PMC before any construction commences		
3.4	Construction Camps – Location, Selection, Designand Layout	• The construction camps will be located 500m away from settlements and water bodies. The construction camps including separate female and male sanitation facilities, shelter, electricity, canteen, potable water (as per IS 10500), first aid, health care, day crèche facilities must be adequately drained, and must not be subject to periodic flooding. • The camps must be located such that the drainage from and through the camps will not risk any domestic or public water supply.	• Location of construction camp approved by PMC. Construction camp having all the basic amenities with proper sanitary conditions drainage and watery supply	Contractor	TNIHPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		• All sites must be graded, ditched and rendered free from depressions such that water may not get stagnant and cause a nuisance. • The contractor shall provide the dispenser for the disposal of Sanitary Napkins • MSW and domestic sewage generated from the construction camp should be collected and disposed on day-to-day basis. The collection of waste and sewage shall be collected by SIPCOT. • Potable water (as per IS 10500 standard) to the labours/ construction workers should be provided by the Contractor. • Comply with the ban on one time use and throwaway plastics under Tamil Nadu Government Order • First Aid Room shall be provided in the project site during the entire construction and operation phases of the project			
3.5	Stockpiling of materials	• Storage of construction material confined to work sites in a way to ensure that there is no obstruction to natural drainage pattern, efficient drainage is maintained. • Stockpiles to be covered to reduce dust generation. • Develop and implement the Materials Management Plan (including warehouses / storage)	• Location of construction camp approved by PMC. • Approved materials management plan	Contractor	TNIHPL
3.6	Establishment of baseline	• Conduct documentation of location of components, areas for construction zone	Baseline environmental profile including	Contractor	TNIHPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
	environmental conditions prior to start of civil works	(camps, staging, storage, stockpiling, etc.) and surroundings (within direct impact zones), locations of environmental monitoring Include photos and GPS coordinates • The monitoring parameters and thefrequency of the monitoring should comply with the Environmental Monitoring Plan (Table 21, and 22)	ambient air, noise, water quality as perthe standards indicted in the monitoring plan (Table 21)		
3.7	Drinking water availability and water arrangement	• The contractor will be responsible for the arrangement of water in every workplace in a suitable and easily accessible place for the whole construction period. • Sufficient supply of cold potable water (as per IS 10500) to be provided and maintained. • If the drinking water is obtained from an intermittent public water supply, then, storage tanks will be provided.	• Records of drinking water supply to workers Feedback from workers	Contractor	TNIHPL
3.8	Identification of disposal sites	• Location of disposal sites will be finalized by the Environmental Specialist of the PMC, and he will confirm that disposal of the material does not impact natural drainage courses or surface water bodies or low-lying areas and that no endangered / rare flora is impacted by such materials • The disposal sites shall be identified in consultation with SIPCOT. • Information on the disposal site should be included in the IEE	• Disposal site selected and approved by PMC. • Records of materials disposed at disposal site. • Logbook maintained for debris disposal	Contractor	TNIHPL
3.9	Shifting of Utilities	• Identify and include locations and operators of these utilities in the detailed design documents	• List showing utilities to be shifted	Contractor	TNIHPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		to prevent unnecessary disruption of services during the construction phase. • Require contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services. • Obtain from the PMC the list of affected utilities and operators. • If relocation is necessary, Contractor will coordinate with the providers to relocate the utility and communicate the dates and duration in advance to affected communities / persons / businesses.	Contingency planfor services disruption		
3.10	Social and Cultural Resources	• No cultural properties or religious structures shall be removed or relocated without the knowledge and written confirmation of the concerned parties or communities and local administration as the case may be. Sites for the relocation of these religious structures shall be identified following the choice of the community • As far as possible, the architectural elements of the structure should be conserved/ reflected/ translated into the design of new structures following the wishes of the community. • For any Chance find, consult Archaeological Survey of India (ASI) or Tamil Nadu Archaeology Department to obtain an expert assessment of the archaeological potential of the site.	Conduct consultation as necessary	Contractor	TNIHPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		• Consider alternatives if the site is found to be of medium or high risk. • Include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available. • Develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognized, and measures are taken to ensure they are protected and conserved.			
3.11	Circulation plan during construction in the densely populated areas	• Prior to mobilization and commencement of site activities, contractor has to prepare site work plan approved by PMC so that no works or activities shall interrupt safe passage of local residents/ road users during construction stage, including development of alternative access routes, traffic regulations, signage etc., during construction. • The sensitive receptors like residential settlements, schools and hospitals in the close proximity of the subproject site have to be consulted to discuss the site work plan for their suggestions and feedback, accordingly the plan shall be modified.	• Site work plan prepared by contractor and approved by PMC. • Traffic plan and records of road signage's	Contractor	TNIHPL
3.12	Access	• Traffic congestion near the entry and exit points from the roads adjoining the proposed project site must be avoided. • Plan transportation routes so that heavy vehicles do not use narrow local roads, except	• Temporary Traffic management Plan	Contractor	TNIHPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		in the immediate vicinity of delivery sites. • Schedule transport and hauling activities during non-peak hours. • Locate entry and exit points in areas where there is low potential for traffic congestion. • Keep the site free from all unnecessary obstructions. • Drive vehicles in a considerate manner.			
3.13	Occupational health andsafety	• Comply with IFC EHS Guidelines on Occupational Health and Safety • Develop comprehensive site-specific health and safety (H&S) plan. The overall objective is to provide guidance to Contractors on establishing a management strategy and applying practices that are intended to eliminate, or reduce, fatalities, injuries and illnesses for workers performing activities and tasks associated with theproject. • Include in H&S plan measures such as: (i) type of hazards in the construction site; corresponding personal protective equipment for each identified hazard. (ii) H&S training for all site personnel (including labours). (iii) procedures to be followed for all site activities; and (iv) Documentation of work-related accidents. • Provide medical insurance coverage for workers. • Contractor to nominate an on-site	• Health and safety (H&S) plan	Contractor	TNIHPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		environment, health and safety officer.			
3.14	Site clearance activities including delineation of construction areas	• Commencements of site clearance activities shall be undertaken after permissions of PMC to minimize environmental impacts. • All areas used for construction and camp activities shall be restored to their former conditions after project completion and no impact to the baseline environment indicators have been confirmed.	• Construction and workers camp sites should be restored as per the original situation	Contractor	TNIHPL
3.15	Excessive disturbance to communities due to prolonged construction	• Meaningful consultations with communities to keep them informed of anticipated activities, in particular those that may result in disruption with respect to area access, utilities, and noisy or dust-generating activities that are likely to result in significant disturbance. • Identify and adhere to strict construction schedule. • Liaise with schools that are in close proximity to construction sites on school examination periods and scale down construction activities and avoid noisy activities (including piling) during such periods. • Alert communities and residents if nighttime construction work shall occur nearby (no nighttime construction within 500m of the nearest household) and ensure safe alternative access is provided • Ensure communities are aware of Grievance Redress Mechanism (GRM) entry points. • Create awareness of health & safety risks of	• Community Health and Safety Plan • Contractor consultation records	Contractor	TNIHPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		transmittable diseases (HIV/AIDs / COVID-19), child labor, bonded labor or forced labor. • Develop and implement the Community Health and Safety Plan			
4.	**Construction Impacts**				
4.1	Improper stockpiling of construction materials cause impacts starting from obstruction of drainage, disturbance/ safety hazard etc.	• Adequate safety precautions will be ensured during transportation of quarry material from quarries to the construction site. • Vehicles transporting material will be covered to prevent spillage. • Operations to be undertaken by the contractor as per the direction and satisfaction of PMC.	• Proper stockpiling of construction materials • Vehicles transporting construction materials to be covered to prevent spillage	Contractor	PMC
4.2	Impacts due to Batching Plant operation	• Batching plant shall comply with the requirements and specifications of the relevant current emission control legislation. • Batching plant shall be located within the project construction area and as far as possible from residential/ settlements/ commercial establishments, at least 300m in the downwind direction. • The Contractor shall submit a detailed layout plan for all such sites and seek prior approval of PMC before entering into a formal agreement with a landowner for setting up such sites. • Actions by PMC against any non- compliance shall be borne by the Contractor at his own cost.	• Batching Plants should be kept/ stationed away from residential. • /settlements and at least 300m in the downwind direction from nearby sensitive receptors.	Contractor	PMC

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		• Arrangements to minimize dust pollution through the provision of windscreens, mist spray units, and dust encapsulation shall have to be provided at all such sites. • Specifications of batching plant shall comply with the requirements of the relevant current emission control legislation and Consent / NOC for such plant shall be submitted to the PMC • No such installation by the Contractor shall be allowed till all the required legal clearances are obtained from the competent authority and the same is submitted to the PMC.			
4.3	Stripping, stocking and preservation of top soil	• The topsoil from areas of cutting and areas to be permanently covered (proposed site construction of building) will be stripped to a specified depth of 150mm and stored in stockpiles. • The stockpiles will be covered with gunny bags or tarpaulin. It will be ensured by the contractor that the topsoil will not be unnecessarily trafficked either before stripping or when in stockpiles. Such stockpiled topsoil will be returned to cover the disturbed area and cut slopes.	• Top soil preservation plan prepared and approved by PMC • Record of top soil excavated, preserved and reutilized	Contractor	PMC
4.4	Soil and water pollution due to storage of fuels, lubricants, construction vehicles	• Fuel and lubricant storage areas shall be designed in such a way that oil may not contaminate soil or water. • The floor of storage area shall be protected by an impermeable membrane and covered by	• Proper storage of fuel and lubricants • Impermeable membrane used in flooring of storage	Contractor	PMC

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
	and construction wastes	roof so that it is not affected by rain. • Oil pumps should be used to take out the oil from the container and no oil spillage should take place. • All the construction waste should be disposed properly after the end of the day so that it may not create nuisance at site. • Soil and water pollution parameters shall be monitored as per the monitoring plan. • Dispose of waste oil and lubricants that have been generated as per provisions of Hazardous Waste (Management and Handling) Rules, 1989. • Inspect all vehicles daily for fluid leaks before leaving the vehicle staging area, and repair any leaks before the vehicle resumes operation. • Strictly prohibit open defecation by workers in nearby areas	yard to prevent soil and water pollution. • Construction waste disposal records • Waste management plan		
4.5	Siltation of drains/ water bodies due to spillage of construction wastes	• Silt fencing to be provided at construction sites during rain period to prevent sediments from the construction site to enter into the watercourses/ nearby settlements. The number of units of silt fencing to be installed is to be decided by the PMC. • Haul roads on the site and approaches to the watercourse (or drains leading to watercourses) will be regularly cleaned to prevent the build-up of mud; areas of bare soil will be kept to a practical minimum to reduce	• Site fencing • Numbers of Silt traps constructed at site. • Proper drainage system provided at site. • Regular cleaning of drains during rain period	Contractor	PMC

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		silt runoff. • Extraneous construction wastes will be transported to the pre-identified disposal site for safe disposal.			
4.6	Emission from Construction vehicles, Equipment and Machinery	• The discharge standards promulgated under the Environmental Protection Act will be strictly adhered to. • All vehicles, equipment and machinery used for construction will conform to the relevant Standard. • All vehicles, equipment and machinery used for construction will be regularly maintained to ensure that pollution emission levels comply with the relevant requirements. • All the construction vehicles shall have Pollution Under Control (PUC) certificates to check air pollution.	• PUC available for all vehicles • Maintenance record of construction vehicles and equipment	Contractor	PMC
4.7	Erosion Hazards	• The existing topography of the sites are to be maintained as far as possible. Other measure include: • Save topsoil removed during excavation and use to reclaim disturbed areas, as soon as it is possible to do so. • Use dust abatement such as water spraying to minimize windblown erosion. • Provide temporary stabilization of disturbed/excavated areas that are not active under construction. • Apply erosion controls (e.g., silt traps) along the drainage leading to the water drains.	• Slope stability. • Frequent monitoring during the piling operation • Monitoring noise and vibration	Contractor	PMC

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		• Maintain vegetative cover within unused land to prevent erosion and periodically monitor the area to assess erosion. • Clean and maintain catch basins, drainage ditches and culverts regularly. • Conduct routine site inspection (refer Appendix 3 – site inspection form) to assess the effectiveness and the maintenance requirements for erosion and sediment control systems			
4.8	Pilling Operation (Noise and Vibration Impacts)	• The Contractor should perform construction activities in a phased manner especially during drilling the piles, which may disturb the surrounding area due to vibration	• Frequent monitoring during the piling operation • Monitoring noise and vibration	Contractor	PMC
4.9	Generation of Dust	• The contractor will take every precaution to reduce the levels of dust at construction sites to the satisfaction of the PMC. • All earth works to be protected / covered in a manner acceptable to the satisfaction of the PMC to minimize dust generation. • Clearance will be affected immediately by manual sweeping and removal of debris, or if so, directed by the PMC, the road surfaces will be hosed or watered using necessary equipment. • Construction sites shall regularly be wetted by sprinkling of water during dusty conditions especially during summer seasons and winds. • Ambient Air Quality monitoring has to be	• Records of housekeeping • Records of water sprinkling at site • Vehicles carrying excavated soil covered. • AAQ parameters (Particulate matter (PM_{10} & $PM_{2.5}$), SO_x, NO_x, CO) to be monitored.	Contractor	PMC

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		performed as per the Environmental Monitoring Program as indicated in the Table 21, and 22.			
4.10	Noise from construction activities and equipment	• The Contractor will ensure appropriate noise monitoring is carried out continuously especially during piling works. • Prior to any heavy equipment/machinery /piling works, the contractor should inform surrounding areas as well and it will be prohibited at night. Specify the limit for noise for the piling works. • Maintenance of vehicles, equipment and machinery will be regular and to the satisfaction of the PMC, to keep noise from these at a minimum. • All vehicles and equipment used for construction will be fitted with exhaust silencers. During routine servicing operations, the effectiveness of exhaust silencers will be checked and if found to be defective will be replaced. • Noise limits for construction equipment used in this project (measured at one meter from the edge of the equipment in free field) such as compactors, rollers, front loaders, concrete mixers, cranes (movable), vibrators and saws will not exceed 75 dB (A). • Notwithstanding any other conditions of contract, noise level from any item of plant(s) will comply with the noise standards specified	• Maintenance record of construction vehicles and equipment • Exhaust silencers working properly. • Use of proper PPEs as work sites • Records of noise monitoring as per EMP.	Contractor	PMC

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		by CPCB. • If specific noise complaints are received during construction, the Contractor may be required to implement one or more of the following noise mitigation measures, as directed by the PMC: • Shut off idling equipment. • Reschedule construction operations to avoid periods of noise annoyance identified in the complaint. • Notify nearby residents whenever extremely noisy work is occurring. • The Contractor shall provide necessary PPEs as per the direction of the environmental specialist (PMC) • The Contractor shall adopt IS 5121-1969 (Indian standard Safety Code for Piling • and Other Deep Foundation Works) to ensure safety is maintained during the piling operations. • Ambient Noise levels have to be monitored as per the Environmental Monitoring Program			
4.11	Impacts on flora and fauna	• Strictly instruct workers not to cut trees for fuel wood. • Do not harm existing vegetation in the area except for those indicated in site plan. • Limit activities within the work area. • Strictly prohibit poaching of birds and animals in the vicinity of work sites	• Baseline information of the flora and fauna for the project area	Contractor	PMC
4.12	Material Handling at	• All workers employed in mixing asphaltic	• Use of proper PPEs	Contractor	PMC

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
	Site	material, cement, concrete etc., will be provided with protective footwear and protective goggles. Workers who are engaged in welding works, will be provided with welder's protective eye-shields. Workers engaged in stone breaking activities will be provided with protective goggles and clothing and will be seated at sufficiently safe intervals.	as work sites • Records of PPEs procured and issued for use		
4.13	Disposal of Construction Waste /Debris / Cut Material	• The waste generated will be reused in the construction activities, either as a fill material or otherwise, based on its suitability of reuse to the maximum extent possible. • Safe disposal of the extraneous material will be ensured in the pre-identified disposal locations. In no case, any construction waste will be disposed around the project locations indiscriminately. • Burning of municipal solid waste or hazardous waste will be prohibited.	• Records of excavated soil and • Records of reuse and disposal of excavated soil • Disposal site identified and approved • AAQ parameters (Particulate matter (PM_{10} & $PM_{2.5}$), SO_x, NO_x, CO) tobe monitored	Contractor	PMC
4.14	Safety Measures During Construction	• Personal Protective Equipment (PPE) for workers on the project and adequate safety measures for workers during handling of materials at site will be taken up. • The contractor has to comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress.	• Use of PPEs • Records of PPEs procured and issued for use Compliance of all regulations regarding scaffolding, ladders and work at height	Contractor	PMC

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		• Appropriate safety measures (including hard barriers) have to be adopted for the construction during the night time (Lux level shall be equivalent to a minimum of two 500 watt flood lights)			
4.15	Risk caused by Force Majeure	• All reasonable precaution will be taken to prevent danger to the workers and the public from fire, flood, drowning, etc. • All necessary steps will be taken for prompt first aid treatment of all injuries likely to be sustained during the course of work.	• Records of first aid facilities at site • Records of safety training to workers	Contractor	PMC
4.16	Malaria Risk	• The Contractor will, at his own expense, conform to all anti-malarial instructions given to him by the PMC; mosquito prevention at site should be done. • The frequency of the testing for malaria should be increased during the monsoon season	• Records of use of mosquito prevention measures at site and work camps • Anti-malaria instructions to workers	Contractor	PMC
4.17	Clearing of Construction Camps & Restoration	• Contractor to prepare site restoration plans for approval by the PMC. The plan is to be implemented by the contractor prior to demobilization. • On completion of the works, all temporary structures will be cleared away, all rubbish should be removed excreta or other disposal pits or trenches filled in and effectively sealed off and the site left clean and tidy, at the Contractor's expense, to the entire satisfaction of the PMC.	• Restoration plan for site and work camps prepared. • Restoration of site and work camps as per plan	Contractor	PMC

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
4.18	Influx of migrant workers	• Local laborers should be given preference for job opportunities and each contractor should be bound by this commitment. • The Contractor must adopt a Code of Conduct for the migrant labor to resolve any issues with locals. • Ensure labor-related regulations are met. • In case of hiring outside labor, ensure that their working conditions as well as camps meet local regulations and the best practices of the industry (refer to IFC Workers' Accommodation: Processes and Standards)	• Health and safety risks • Chances of spread of sexually transmittable diseases like AIDS. • Water pollution • Health & Safety Risks due to Transmittable diseases (HIV/AID and COVID-19) / awareness plan	Contractor	PMC

C. Table 20 : EMP for Operation and Maintenance Phase

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
1.	**Operation and Maintenance Impacts**				
1.1	Solid waste (debris, excavatedsoils, etc.)	• Re-establish the original grade and drainage pattern to the extent practicable. • Restore access roads, staging areas, and temporary work areas. • Remove all tools, equipment, barricades, signs, surplus materials, debris, and rubbish. Demolish buildings/structures not required for O&M. Dispose in designated disposal sites. • Request in writing from PMC that construction zones have been restored.	• Pre-existing condition	Contractor (till the DLP period) and TNIHPL	TNIHPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
1.2	Proposed Buildings/ Dwelling units may result congestion, increased pollution.	• Creating awareness through Consultation • The 3 Rs (Reduce, Reuse, and Recycle) approaches have to be explained to the settled communities in order to reduce the pollution level (waste minimization, water minimization etc.,) • The environmental monitoring action plan during the operation stage will result in monitoring of the environmental impacts after project implementation.	• Conducting regular consultations • Monitoring plan during project operation	TNIHPL	TNIHPL
1.3	Rainwater Harvesting Pitmanagement	• Regular inspection and cleaning of catchment, gutters, filters and tanks reduce the likelihood of contamination. • Water from other sources should not bemixed with that in the tank. • Storm water drains will be maintained periodically to maintain free flow of stormwater without any obstacles	• Monitoring plan during project operation	TNIHPL	TNIHPL
1.4	Management of the STP	• TNIHPL will carry out regular maintenance of the STP to prevent any impacts, including pollution of ground water and nearby water courses. • TNIHPL shall appoint an Environmental Engineer with the necessary qualification for the operation and maintenance of STP, All the necessary PPE's should be provided to the STP operator. • It is the sole responsibility of the TNIHPL that the treated sewage water disposed (as per	• Proper sanitation and solid waste management	STP service provider through TNIHPL / SIPCOT	TNIHPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		PART A Schedule VI of the Environmental Protection Rules 1986) for green belt development/ avenue plantation should not pollute the soil/ ground water/ adjacent canals/ lakes/ ponds, etc. • The excess treated water will be discharged into the sewer line provided by SIPCOT. • Any sludge after anaerobic treatment and drying will be disposed with the municipal solid waste (organic waste). The treated sludge shall be as per compost quality standard given in the Solid waste management rules 2006 (schedule II A, standards for composting). • Workers who interact with any sludge will be provided all appropriate PPE's including gloves, safety shoes, protective eyewear and masks.			
1.5	Unhygienic condition due to poor maintenance of sanitation facilities and irregular solid waste collection in the project site necessitate regular maintenance of constructed amenities.	• TNIHPL will carry out maintenance of the sewer system (including the pipeline, collection system etc.,), and carry out the regular collection of wastes, and will also ensure that Sanitation improvements proposed do not result in pollution of groundwater. • Sanitary facilities do not interfere with other utilities and block access to buildings, causing nuisance to neighboring areas. • Household hazardous waste such as batteries, small electronics, CFL bulbs, expired medicines and used cleaning solvent bottles should be segregated at source, collected once in a month	Proper sanitation and solid waste management	SIPCOT	TNIHPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		from residences and disposed as per the SWM Rules 2016. • Municipal Solid Waste will be segregated as organic waste and inorganic waste. Both organic and Inorganic waste will be collected by SIPCOT. • The transfer of waste will also ensure that no spillage and all wastes will be transported to a designated solid waste treatment site.			
1.6	Firefighting / Emergency preparedness	• Firefighting equipment, including the fire extinguisher and sand buckets has to be annually maintained. Fire extinguishers have to be checked regularly for the expiry date and has to be refilled or replaced accordingly. Wet sand (if any) in the bucket should be replaced with dry sand. • Fire mock drills should be conducted asa part of emergency preparedness to create awareness among the residents	• Fire extinguisher expiry date. • Emergency preparedness plan • Training records	Contractor (during the DLP) and TNIHPL	TNIHPL

D. Table 17: Pre-construction and Construction Stage Environmental Monitoring Plan

Monitoring Field	Monitoring Location	Monitoring Parameters	Frequency	Responsibility
Construction disturbances, nuisances, public and worker safety	Subproject Construction site at Cheyyar	(i) Implementation of construction stage EMP including dust control, noise control, traffic management, and safety measures. (ii) Site inspection checklist to review implementation	Weekly during construction	Contractor under the supervision of PMC (sampling locations shall be identified by the Environment specialist of PMC)
Ambient air quality	Pre-Construction Stage: one sample in the subproject location Construction stage: two samples in the subproject location Sampling method: At the work sites during pre-construction stage and 50 m downwind direction near the work sites during the construction stage	PM_{10}, $PM_{2.5}$ NO_2, SO_2 and CO	(i) Once before start of construction (pre- construction) (ii) Quarterly monitoring (till the project completion).	Contractor under the supervision of PMC (sampling locations shall be identified by the Environment specialist of PMC). The environment specialist (PMC) shall decide the frequency of the monitoring as per the construction schedule. The NABL agency shall be engaged by the contractor to complete the testing of environmental parameters.
Ambient noise	Similar to ambient air quality locations and sample size including methodology.	Day time and nighttime noise levels	(i) Once before start of construction (pre- construction) (ii) Quarterly monitoring (till the project completion).	Contractor under the supervision of PMC (sampling locations shall be identified by the Environment specialist of PMC). The environment specialist

Monitoring Field	Monitoring Location	Monitoring Parameters	Frequency	Responsibility
				(PMC) shall decide the frequency of the monitoring as per the construction schedule. The NABL agency shall be engaged by the contractor to complete the testing of environmental parameters.
Surface water quality	Pre-Construction Stage: one sample in the irrigation pond (located adjacent to the subproject location) Construction stage: Two samples in the irrigation pond (located adjacent to the subproject location)	pH, Oil and grease, Cl, F,NO_3, TC, FC, Hardness, Turbidity BOD, COD, DO, E-coli, Total Alkalinity, Heavy metals and Pesticides.	Every quarter during construction stage (till the project completion)	Contractor under the supervision of PMC (sampling locations shall be identified by the Environment specialist of PMC). The NABL agency shall be engaged by the contractor to complete the testing of environmental parameters.

E. Table 22 : Operation Stage Environmental Monitoring Plan

Monitoringfield	Monitoring location	Monitoring parameters	Frequency	Responsibility
Ambient air quality	Two samples in the subproject location Sampling method: one sampling location should be located at 50 m downwind direction from the site and another sampling location should be located within the premises.	PM_{10}, $PM_{2.5}$ NO_2, SO_2 and CO	Every quarter during operation	Contractor under the supervision of PMC during the DLP
Ambient noise	Similar to ambient air quality location and sample size and same methodology.	Day time and night time noise levels	Every quarter during operation	Contractor under the supervision of PMC during the DLP

Monitoringfield	Monitoring location	Monitoring parameters	Frequency	Responsibility
Surface water quality	One sample in the irrigation pond (located adjacent to the subproject location)	pH, Oil and grease, Cl, F, NO_3, TC,FC, Hardness, Turbidity BOD, COD, DO, E-coli, Total Alkalinity, Heavy metals and Pesticides.	Every quarter during operation	Contractor under the supervision of PMC during the DLP
Water quality (potable water supplied by SIPCOT).	One sample in each water sump	pH, Oil and grease, Cl, F, NO_3, TC,FC, Hardness, Turbidity BOD, COD, DO, E-coli, Total Alkalinity, heavy metals and pesticides.	Monthly monitoring	Contractor under the supervision of PMC (Cost for monitoring should be borne by the TNIHPL)
STP (Treated Water)	Operation Stage: Two water samples to be collected at (i) Inlet and (ii) outlet from the STP. One sludge sample should be collected	• Total suspended solids, pH, Oil and grease, Ammonical nitrogen, Biochemical Oxygen, and Dissolved Oxygen, and Phenolic compounds (as C_6H_5OH) • Sludge sample should be tested for Fecal Coliforms/ pathogenic bacteria	Monthly monitoring	STP service provider/ third party monitoring under the supervision of PMC (Cost for monitoring should be borne by the STP service provider)

F. Implementation Arrangements

158. **Project Implementation Unit (PIU), TNIFMC/TNSF.** The PIU of TNIFMC / TNSF activities will consist of an ESG Team with a dedicated and trained ESG Analyst(s) within the Fund, one Senior Environment Expert (independent hire, as part of the ADB TA, part time), one Senior Social Expert (full-time) and one Governance Expert, independent hire by TNIFMC, part time. The ESG Team will oversee safeguards implementation at PIU level, including stakeholder consultations, information disclosure, regulatory clearances and approvals, implementation of resettlement plans, EMP implementation, and grievance redressal. The ESG Team will report to the Principal, Shelter Fund, who will be ultimately responsible for the ESGMS implementation and also advise the grievance redress committee in the PIU regarding any unresolved grievances.

159. In this subproject TNIHPL shall be supported by Project Monitoring Consultancy Services (PMC) hired by the TNIHPL for environmental and social safeguards implementation. The ESG team of TNSF will ensure all safeguards compliances through the Project Monitoring Consultancy Services (PMC) for the project.

160. **Roles and Responsibilities.** The PIU ESG team will:

- Undertake due diligence of all investment proposals as per ESGMS.
- Develop and maintain stakeholder consultation and engagement plan.
- Lead impact evaluation and categorization of TNSF's investments separately for environment, involuntary resettlement, and indigenous peoples; contribute to impact monitoring of TNSF's investments; and
- Ensure disclosure of ESGMS performance to ADB in accordance with timeline stipulated in the agreed Action plan and as well as in the public domain; and supervise and monitor investment implementation.

161. **Project Management Consultant (PMC)**. The PMC will manage the construction and commissioning activities. They also provide advice/ assistance on institutional capacity development and ensure subproject safeguard compliance to ADB 2009, ESGMS, and loan covenants. To ensure EMP related issues, an environmental expert (on intermittent basis for 12 months out of 24-month construction period) since commencement to closure of the project shall be engaged within PMC. The PMC will be responsible for the following environmental safeguard activities:

- Ensure subproject compliance to GOI, GoTN statutory and legal environmental requirements, ADB SPS 2009, ESGMS, and loan covenants
- Ensure projects conforms to exclusion criteria and subproject selection guidelines as stipulated in the ESG
- Review and approve subproject IEE studies and reports and EMPs; ensure that subproject IEEs and EMPs reflect final project detailed design and submit to ADB for approval
- Check whether all relevant permits / environmental clearances /approvals as per GoI and GoTN are obtained in a timely manner
- Ensure that full IEE studies and EMPs are included in bidding documents, contract clauses and civil works
- Ensure an efficient subproject implementation in line with IEE studies and reports and EMPs with adequate budget

- Review and approve semi-annually environmental monitoring reports submitted by contractors and submit to ADB
- Support the preparation of quarterly and semi-annual monitoring reports and submit to ADB
- Ensure effective GRM set up and monitor grievances redress process and ensure timely redress
- Ensure adequate awareness campaigns, information disclosure and additional consultations are conducted during the subproject implementation.
- Periodical review of safeguards related loan covenants, and the compliance in project implementation
- Organize periodic capacity building and training programs for subproject staff in safeguards
- Ensure that subproject activities are synchronized between the EMP implementation
- Ensure availability of budget for safeguards activities
- Ensuring disclosure of ESGMS, IEEs and EMPs, and monitoring documents

162. **Contractor.** Contractor will appoint a qualified and experienced Environment, Health and Safety (EHS) staff on full time basis for the construction works. The contractor will be required to prepare a site-specific EMP (SEMP). The contractor will bear the costs of preparing these site- specific plans included in the SEMP. The contract will not be awarded until all environmental clearances, other relevant permits have been obtained, ADB will approve the project IEEs and EMPs and corresponding subproject for inclusion in the bid and contract documents. The following are the key safeguards tasks for contractors:

- Submit site specific EMP for construction activities and individual sub-plans (as indicated in the EMP) to PMC
- Attend training and capacity building sessions
- Conduct orientation and daily briefing sessions to workers on EHS
- Ensure that appropriate worker facilities (workers accommodation / camps) are provided at the work sites in line with this ESGMS
- Register and maintain records of all work-related accidents, and undertake remedial actions to mitigate/minimize recurrence
- Implement EMP measures and report to PMC if any new impacts are surfaced; seek guidance from PMC as required in EMP implementation
- Conduct environmental monitoring (air, noise, etc.) as per the monitoring plan
- Prepare monthly EMP monitoring reports and submit to PMC
- Address any grievances effectively and in a timely manner

163. The PMC will ensure that the contractor is aware of their obligations including specific provisions requiring contractors to comply with: (i) all applicable labour laws and core labour standards on (a) prohibition of child labour as defined in national legislation for construction and maintenance activities; construction site should not hire any child below 18 years of age; (b) equal pay for equal work of equal value regardless of gender, ethnicity, or caste including no discrimination against pregnant women and (c) prohibition of forced labour; and with (ii) the requirement to disseminate information on health & safety risks due to transmittable diseases, including HIV/AIDS and COVID-19, to employees.

164. If the TNIHPL fails to comply with the loan and legal agreements on safeguards

requirements, ADB will seek corrective measures and work with the TNIFMC to achieve compliance. If TNIFMC fails to re-establish compliance, then ADB may exercise remedies, including suspension, cancellation or acceleration of maturity that are available under ADB legal agreements. Before resorting to such measures, ADB will use other available means to rectify the situation satisfactory to all parties.

G. ESGMS Monitoring, Reporting and Disclosure

165. TNIFMC for TNSF will conduct monitoring and reporting, and public disclosure of safeguard documentation in line with the ESGMS framework and the agreed action plan. Semi-annual monitoring reports (refer Appendix 4) on ESGMS implementation and the agreed action plan will be submitted to ADB on a semi-annual basis during project implementation

H. EMP Implementation Cost

166. As part of good engineering practices in the project, there have been several measures such as safety, signage, dust suppression, procurement of personal protective equipment, provision of drains, etc. and the costs for which will be included in the design costs of specific subprojects. Therefore, these items of costs have not been included in the IEE budget.

167. Although this is a construction project, its impact on air, noise, water is minimal, the implementation of the mitigation measures and required environmental reporting and monitoring in line with the environmental monitoring plan are included within the bidding and contract documents as separate line items. An appropriate Environmental Management Budget has also been estimated to carry out the monitoring requirements.

168. The cost of water sprinkling for dust suppression and providing personal protective equipment to construction workers shall be borne by contractor as part of conditions of contract. In addition, the sources of funds for mitigation measures including monitoring during the construction stage are also to be borne by the contractor. These are deemed to be included as part of the contract price amount quoted by the contractor for the works. The EMP cost is given in Table 23.

Table 23: Indicative EMP Budget

Sl. no	Particulars	Stages	Unit	Total Nos.	Rate (₹)	Amount (₹)
1	Air quality	Pre-Construction stage	Sample	1	11000	11000
2	Water quality			1	5000	5000
3	Soil quality			1	5000	5000
4	Noise level			1	5000	5000
5	Air quality	Construction stage	Sample	5	11000	55000
6	Water quality			5	5000	25000
7	Soil quality			5	5000	25000
8	Noise level			5	5000	25000
9	Air quality	Operation stage	Sample	1	11000	11000
10	Water quality			1	5000	5000
11	Soil quality			1	5000	5000
12	Noise level			1	5000	5000
					Total	**1,82,000**

X. CONCLUSION AND RECOMMENDATIONS

169. The proposed 'Industrial Housing Project at Cheyyar is a residential project, to be developed by M/s Tamil Nadu Industrial Housing Private Limited (TNIHPL), in Perumpulimedu Village, Vembakkam Taluka, Tiruvannamalai District, Tamil Nadu. The project involves the construction of a G+3 floor structure over a land of 2.02 acres. The total built-up area proposed (FSI + non-FSI) is 44,171 sq. ft (4,104 sqm). The overall project shall comprise of 441 beds for men employees working in SIPCOT and in the nearby localities.

170. The proposed project is unlikely to cause adverse environmental impacts. The potential impacts that are associated with design, construction, and operation can be mitigated without difficulty through proper engineering design and the incorporation or application of recommended mitigation measures and procedures. Based on the findings of the IEE, there are no significant impacts, and the classification of the subproject as Category "B" is confirmed.

171. Furthermore, to mitigate the environmental impacts during the project construction, phase, the specific management measures are laid down in the EMP which will effectively address any likely environmental impacts due to the subproject implementation. The effective implementation of the measures proposed will be ensured through building enhanced capacity through training on environmental management. Further, the environmental monitoring plan ensures the sub project receives all the necessary permits and provides adequate opportunity towards course correction to address any residual impacts during construction or operation stages.

172. The IEE carried out for the project shows that the proposed subproject components/ interventions will result in net environmental benefits, and that any likely environmental impact can be addressed through proper location, planning and design of the proposed subproject, control of construction activity and mitigation measures. The EMP provide for mitigation of all identified impacts and reflected within the contract clauses for the environmental provisions will be part of the civil works contracts. Further, consultation on the proposed designs have been undertaken with stakeholders and no significant issues requiring in terms of environmental safeguards are known to exist at present.

173. The estimated water demand of 60 KLD of water for 441 bedded units shall be supplied by the SIPCOT. The water will be supplied by connecting to the nearby OHT (located at a distance of 1 Km). Similarly, the sewer line shall be provided by the SIPCOT to the subproject site. For both water supply pipeline laying activity and sewer line laying activity may have direct air and noise impacts to the public.

174. The positive benefit of this project is to provide industrial housing for low-income groups. Based on the climate risk and heat modelling, the building plan has been developed to withstand the climate change including the high temperature. The proposed infrastructure including the provision of toilets, water supply, electric connection, commercial shops and play areas shall provide an improved standard of living.

175. Based on the findings of the IEE, there are no significant impacts and the classification of the subproject as Category "B" is confirmed. No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS (2009).

Appendix

Appendix 1: Rapid Environment Assessment Checklist

Country/Project Title:	Industrial Housing Project, Cheyyar by Tamil Nadu Industrial Housing Pvt Ltd, Tamil Nadu
Sector Division:	Urban Development

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area			
• Densely populated?		**X**	The site is located in Cheyyar SIPCOT, Perumpulimedu Village, Vembakkam Taluka, Tiruvannamalai District, Tamil Nadu. The project area is at present uninhabited.
• Heavy with development activities?		**X**	The project location is in SIPCOT Industrial Complex in Cheyyar and is surrounded by mostly open land and few industries.
• Adjacent to or within any environmentally sensitive areas?			
○ Cultural heritage site		**X**	The nearest site of cultural importance is Sri Saibaba Temple which is located approximately 0.93 kms Northwest from the project site.
○ Protected Area		**X**	Vedanthangal and Karikili Bird Sanctuary is the nearest notified Eco-Sensitive Zone (ESZ) as per the Ministry of Environment, Forest, and Climate Change (MoEFCC) from the project site and is located at an approx. aerial distance of approximately 25 km south-west from the project site.
○ Wetland		**X**	There is no wetland in and around the project site
○ Mangrove		**X**	There are no coastal areas around the site.
○ Estuarine		**X**	There are no coastal areas around the site.
○ Buffer zone of protected area		**X**	Vedanthangal and Karikili Bird Sanctuary is the nearest notified Eco-Sensitive Zone (ESZ) as per the Ministry of Environment, Forest, and Climate Change (MoEFCC) from the project site and is located at an

			approx. aerial distance of approximately 25 km south-west from the project site.
○ Special area for protecting biodiversity		**X**	There is no special area for protecting biodiversity in and around the area.
○ Bay		**X**	There are no coastal areas around the site.
B. Potential Environmental Impacts Will the Project cause…			
• Impacts on the sustainability of associated sanitation and solid waste disposal systems and their interactions with other urban services.	**X**		The project shall comprise of 441 bed units of different typologies in a G+3 structure. The project will generate municipal solid waste during the construction phase. The construction waste should be reused to the maximum and the excess should be disposed to through authorized vendors.
• Deterioration of surrounding environmental conditions due to rapid urban population growth, commercial and industrial activity, and increased waste generation to the point that both manmade and natural systems are overloaded and the capacities to manage these systems are overwhelmed?		**X**	The activity is within the permissible development activity and the local area plan.
• Degradation of land and ecosystems (e.g., loss of wetlands and wild lands, coastal zones, watersheds and forests)?		**X**	The project site is far from these types of ecosystems.
• Dislocation or involuntary resettlement of people?		**X**	The project does not involve any dislocation or involuntary resettlement of the people.
• Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable group?		**X**	The project is not located near any place of cultural importance.
• Degradation of cultural property, and loss of cultural heritage and tourism revenues?		**X**	The site has been proposed to be used for residential purposes. The nearest site of cultural importance is Mohamed Sathak AJ Masjid that is located approximately 0.9 kms Northwest from the project site. However, the impact of the project will not degrade the cultural property, or the loss of cultural heritage and tourism

			revenues.
• Degradation of aesthetic and property value loss?		X	The land is barren and vacant, so any loss of aesthetic and property value is very unlikely
• Occupation of low-lying lands, floodplains and steep hillsides by squatters and low-income groups, and their exposure to increased health hazards and risks due to pollutive industries?		X	The project will be used for residential purpose.
• water resource problems (e.g., depletion/degradation of available water supply, deterioration for surface and ground water quality, and pollution of receiving waters?		X	The total water requirement for the proposed housing facility is 60KLD. It will be sourced from SIPCOT's 17 open wells. The project site is located Egattur Village, Thiruporur Taluk, Kanchipuram District, which is classified as 'Safe' in terms of Ground Water Development Status by the Central Ground Water Board (CGWB). Therefore, the risk to the project from depleting ground water levels will be low.
• Air pollution due to urban emissions?	X		This is anticipated during construction phase. The sources of air pollution will be from trucks transporting materials to the site, operation of diesel engine, and machinery use. The project should conduct regular ambient air quality monitoring tests and DG stack emission tests at the project site.
• Risks and vulnerabilities related to occupational health and safety due to physical, chemical, and biological hazards during project construction and operation?	X		This is anticipated during construction phase. Occupational health and safety hazards from construction works should be mitigated through the OHS measures, many of which are mandatory by regulation. The Environmental Management Plan (EMP) of the project will provide measures to mitigate this impact.
• Road blocking and temporary flooding due to land excavation during rainy season?	X		This could be anticipated during construction. Excavation works should be limited within the site boundary, so it is not expected to cause any roadblock.
• Noise and dust from construction activities?	X		This is anticipated but will be temporary during construction phase and limited to the project site. The monitoring of the ambient noise levels should be performed regularly on the project site through an NABL certified third party laboratory during

			the construction phase.
• Traffic disturbances due to construction material transport and wastes?	X		The main road for SIPCOT IT Park will be utilized for the transportation of material and personnel during the construction phase. The impact on traffic disturbance will be temporary during construction phase only. During the construction activity, utmost care should be taken to control the noise levels within the standards. Negligible noise will be generated during operational phase.
• Temporary silt runoff due to construction?	X		This is anticipated if excavation works are undertaken during the rainy season. The EMP of the project will provide measures to avoid or minimize runoff, such as for example, avoiding or minimizing heavy excavation works during monsoon season, providing silt traps or canals around the site, etc.
• Hazards to public health due to ambient, household and occupational pollution, thermal inversion, and smog formation?		X	Not anticipated for this housing development project.
• Water depletion and/or degradation?		X	During construction phase, there will be demand for water use for domestic purposes. The proposed WTP and STP will help store and recycle the available water resources. The treated water can be reused for flushing and watering the OSR, and landscaped areas.
• Overpaying of ground water, leading to land subsidence, lowered ground water table, and salinization?		X	The project site is in Perumpulimedu Village, Vembakkam Taluka, Tiruvannamalai District, which is classified as 'Safe' in terms of Ground Water Development Status by the Central Ground Water Board (CGWB). Therefore, the risk to the project from depleting ground water levels will be low.
• Contamination of surface and ground waters due to improper waste disposal?		X	The pollution preventive and control measures as mentioned in EC and CtO will be applied and will comply with prescribed statutory norms. The wastewater shall be discharged to the STP.
• Pollution of receiving waters resulting in amenity losses, fisheries and marine resource		X	This is not anticipated. The project site is not near receiving bodies of water used for livelihood activities or drinking water

depletion, and health problems?			supply.
• Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		**X**	Temporary influx of construction workers during the construction phase will happen. Although the project may recruit migrant workers during the construction phase, the number will not be as many. Therefore, this project will not cause significant burden to the infrastructure such as the water supply and sanitation during construction phase. During the operation phase water requirement will be sourced through SIPCOT.
• Social conflicts if workers from other regions or countries are hired?		**X**	Not anticipated as most workers will be local
• 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?		**X**	The proposed project is only construction of affordable housing facility and there will not be any storage of hazardous chemicals (as per MSIHC rules). However, HSD might be used for DG sets and the waste/residue from the DG sets will be stored in the HDPE drums as per the hazardous guidelines.
• 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?	**X**		Anticipated during construction phase. During accidental spills if any, spill contingency plan should be adopted to prevent the release of pollutant into the environment and will be managed as per the MSIHC guidelines. The study area is not much susceptible to floods, landslides, cloud bursts, and cyclones. The project site falls under the Seismic Zone-III (Moderate Damage Risk Zone) according to the Indian Standard Seismic Zoning Map. Therefore, suitable earthquake design will be followed

ASBESTOS SCREENING TOOL

Screening Questions	**Yes***	**May be***	**No**	**Remarks** ***For those with answers of YES and MAY be, document the potential likelihood of asbestos being encountered.**
Does the proposed project involve, or potentially involve, any of the following				

activities that are commonly associated with asbestos use:				
• Construction/commissioning of a new asset?			**X**	The project does not involve any such activity associated with asbestos
• Refurbishment / demolition of an existing asset?			**X**	The project does not involve any such activity associated with asbestos
• Post-disaster response, involving reconstruction, repair, or removal of damaged asset?			**X**	The project does not involve any such activity associated with asbestos
• Maritime activities?			**X**	The project does not involve any such activity associated with asbestos
• Water supply, water sanitation, wastewater, sewerage, or water hygiene initiatives?			**X**	The project does not involve any such activity associated with asbestos
• Earthworks, remedial activities, or solid waste management?			**X**	The project does not involve any such activity associated with asbestos
• Power, telecommunications, or energy supply infrastructure?			**X**	The project does not involve any such activity associated with asbestos
• Maintenance, demolition, transportation, or disposal of wastes associated with the above activities?			**X**	The project does not involve any such activity associated with asbestos

Checklist for Preliminary Climate Risk Screening

Country/Project Title	Industrial Housing Project, Cheyyar by Tamil Nadu Industrial Housing Pvt Ltd, Tamil Nadu Cheyyar, Tamil Nadu.
Sector	Urban Development
Sub-sector	Urban Housing

Screening Questions		**Score**	**Remarks**
Location andDesign of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather-related events such as floods, droughts, storms, landslides?	1	The site is not vulnerable to earthquakes, floods, landslides, cloud bursts.

			However, the project does not fall in a cyclone prone zone.
	Would the project design (e.g., the clearance for bridges) need to consider any hydro- meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	0	No such effect envisaged.
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life ofproject outputs (e.g. construction material)?	0	No such effect envisaged.
	Would weather, current and likely future climateconditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?	0	No such effect envisaged.
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g.hydro-power generation facilities) throughout their design life time?	0	No such effect envisaged.
	Cumulative score	**1**	

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

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

Result of Initial Screening (Low, Medium, High): Medium
Other Comments: Exposure of the site to climate change related hazard is medium.

Appendix 2: Sample Grievance Form

(To be made available in Tamil)

The Proposed Inclusive, Resilient and Sustainable Housing for the Urban Poor Project welcomes complaints, suggestions, queries, and comments regarding program implementation. We encourage persons with a grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback. In case you want to include your personal details but want information to remain confidential, please type CONFIDENTIAL above your name.

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

FOR OFFICIAL USE ONLY

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

Appendix 3: 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

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 4: Semi-annual Environmental Monitoring Report Template

Introduction

- Overall project description and objectives
- Environmental categorization of each subproject as per ADB Safeguard Policy Statement (SPS 2009)

Project Safeguards Team

- Identify the role/s of Safeguards Team including schedule of on-site verification of reports submitted by consultants and contractors.

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

Overall Project and Subproject/Package Progress and Status

- Description of Sub-projects and Indicate
  - Status of design – preliminary design or final design,
  - Status of implementation - under bidding, contract awarded but no works yet, contract awarded with works (on-going construction), civil works completed, and/or Operation & Maintenance (O&M)

Package Number	Subproject Name / List of Works	Type of Contract (specify if DBO, DB or civil works)	Status of Design (specify if Preliminary Design, Final Detailed Design	Contract Status (specify if under bidding or contract awarded)	Status of Implementation (specify if Contract awarded with works (On-going Construction), Completed Works, or O&M phase)[5]	If On-going Construction	
						%Physical Progress	Expected Completion Date

  - For package with “Contract Awarded”, provide name/s and contact details of contractor/s’ nodal person/s for environmental safeguards.

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

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

Package Name	IEE Cleared by ADB (provide date)	Contractor	EHS Nodal Person	Email Address	Contact Number

Status of IEE per Subproject/Package

- Provide status of final IEE[6] per package.

Package-wise Implementation Status

Package Number	Final IEE based on Detailed Design				Site-specific EMP or Construction (C-EMP) approved by Project Director?[7] (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)		

Compliance Status with National/State/Local Statutory Environmental Requirements[8]

Package Number	Statutory Environmental Requirements[9]	Status of Compliance (Specify if obtained, submitted and awaiting approval, application not yet submitted)	Validity Date(s) (if already obtained)	Action Required	Specific Conditions that will require environmental monitoring as per environmental clearance, consent / permit to establish[10]

Compliance Status with Environmental Loan Covenants

Schedule No. and Item (see Project Loan Agreement and list provisions / paragraph relevant to environmental safeguards, core labor standards,	Covenant	Status of Compliance	Action Required

[6] IEE prepared based on preliminary design and cleared by ADB
[7] Works will not be allowed until C-EMP is approved by the PMU and/or Concerned division.
[8] All statutory clearance/s, no-objection certificates, permit/s, etc. should be obtained prior to award of contract/s. Attach as Appendix all clearances obtained during the reporting period. If already reported, specify in the "remarks" column.
[9] Specify statutory requirements: environmental clearance? Permit/consent to establish? Forest clearance? Workers/Labor permit, etc.
[10] Example: Environmental Clearance requires ambient air quality monitoring, Forest Clearance/Tree-cutting Permit requires 10 trees for every tree, etc.

occupational EHS, community health and safety)			

Compliance Status with the Environmental Management Plan (refer to EMP tables in approved IEE/s)

- Confirm in IEE/s if contractors are required to submit construction EMPs (C-EMP). If not, describe the methodology of monitoring each package under implementation.

- Provide over-all compliance of the contractors with C-EMP. This should be supported by contractors' monthly monitoring reports to Salem PID Division (s) and/or verification reports of Salem PID Division (s) or project consultants. Include as an Appendix supporting documents such as **signed** monthly environmental site inspection reports prepared by consultants and/or contractors.

Overall Compliance with C-EMP

Package Number	Status of C-EMP Implementation *(Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)*	Action Proposed and Additional Measures Required

- Provide description based on site observations and records:
  - Confirm if any dust was noted to escape the site boundaries and identify dust suppression techniques followed for site/s.
  - Identify muddy water was escaping site boundaries or muddy tracks were 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 were intact following heavy rain.
  - Identify designated areas for concrete works, chemical storage, construction materials, and re-fuelling. Attach photographs of each area.
  - 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 in each work site (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.
  - Provide information on construction / workers camp(s). Provide photographs.
  - Provide information on work-related accidents and incidents. Describe actions implemented.
  - Provide information on if there are any activities being undertaken out of working hours and how that is being managed.

- Provide list of trainings on environmental safeguards, core labor standards, and Occupational environment, health and safety conducted during the reporting period. Include ADB-organized workshop, trainings, seminars, etc)

Trainings, Workshops and Seminars Conducted

Date	Topic	Conducted by	No. of Participants (Total)	No. of Participants (Female)	Remarks

- Provide the monitoring results as per the parameters outlined in the approved EMP (or SEMP when applicable).

Summary of Environmental Monitoring Activities (for the Reporting Period)[11]

Impacts (List from EMP)	Mitigation Measures (List from EMP)	Parameters Monitored (As identified in the EMP)	Method of Monitoring (Visual, Actual Sampling, etc.)	Location of Monitoring (Provide GPS Coordinates)[12]	Date of Monitoring Conducted	Person Who Conducted the Monitoring
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

Monitoring of Environmental Impacts on Project Surroundings

- Confirm records of pre-work condition of roads, agricultural land or other infrastructure prior to starting to transport materials and construction.

Package Number.	Status of Pre-Work Conditions (Recorded / Not Recorded)	Baseline Environmental Conditions (air, water, noise) Documented (Yes / No)	Action Proposed and Additional Measures Required

[11] Attach Laboratory Results and Sampling Map/Locations
[12] If GPS coordinate is not available, provide landmark(s) and/or chainage.

- Provide information on monitoring activities conducted during reporting period. If not conducted, provide justification. Compare results with baseline and internationally recognized standards.[13]

Air Quality Monitoring Results

Site No.	Date of Testing	Site Location (Provide GPS Coordinates)[14]	Parameters (as required by statutory clearances or as mentioned in the IEE)			Remarks
			PM_{10} µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	

Water Quality Monitoring Results

Site No.	Date of Sampling	Site Location	Parameters (as required by statutory clearances or as mentioned in the IEE)						Remarks
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L	

Noise Quality Monitoring Results

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (as required by statutory clearances or as mentioned in the IEE)		Remarks
			Day Time	Night Time	

Information Disclosure, Participation and Consultations

- Confirm PMU/ Division/contractors provide project-related information to stakeholders, communities and/or affected people before and during construction works.[15]
- Provide information on consultations conducted during reporting period such dates, topics discussed, type of consultation, issues/concerns raised, safeguards team

[13] ADB Safeguard Policy Statement (SPS) Appendix 1, para 33: During the design, construction, and operation of the project the borrower/client will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When host country regulations differ from these levels and measures, the borrower/client will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the borrower/client will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in the SPS.

[14] If GPS coordinate is not available, provide landmark(s) and/or chainage.

[15] Check EMP requirement on information disclosure. At a minimum, concerned division through the contractor should notify communities/affected persons/sensitive receptors 7 days and again 1 day before start of works.

member present. Attach minutes of meetings (ensure English translation is provided), attendance sheet, and photos.

Date of Consultation	Location	Number of Participants (specify total, male and female)	Issues/Concerns Raised	Response to issues/concerns

Grievance Redressal Mechanism

- **Grievance Redressal Mechanism.** Provide information on establishment of grievance redressal mechanism and capacity of grievance redressal committee to address project-related issues/complaints. Include as an Appendix Notification of the GRM (package-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/concerns identified during the Reporting Period and Remedial Actions

- Provide corrective action plan which should include all issues/concerns, actions required to be implemented, responsible entities, and target dates.

Status of Corrective Actions from Previous Monitoring Report(S)

- Provide information on corrective actions to be implemented as reported in the previous Monitoring Report(s). Include status of implementation of feedbacks/comments/suggestions as provided by ADB, if any.

Corrective Action Plan Status

Issues/Concerns	Corrective Action	Status	Remarks

Appendices

- Photos
- Records of consultations
- Copies of environmental clearances and permits (if not provided in the previous Monitoring Report
- Environmental site inspection report (if not provided in the previous Monitoring Report
- Other