Draft Initial Environmental Examination

Project Number: 53067-004

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

July 2024

IND: Affordable Housing Project for Economically Weaker Sections by Ambur Properties Private Limited, Ambur, Tamil Nadu

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

CURRENCY EQUIVALENTS

(as of 24 May 2024)

Currency Unit	–	Indian Rupees (INR)
INR1.00	–	$0.012
$1.00	=	INR 83.13

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 Redress 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.

TABLE OF CONTENTS

LIST OF TABLE

LIST OF FIGURE

LIST OF APPENDICES

EXECUTIVE SUMMARY

1. **Project Background.** The 'Affordable Housing Project at Ambur' is a residential project, to be developed by Ambur Properties Private Limited (APPL) (Earlier known as Ambur Properties Limited Liability Partnership) in Ambur Municipality, Thirupattur District, Tamil Nadu. The project consists of a total of 305 units of 1RK (one room kitchen) and compact 1BHK (one bed, hall & kitchen). The total built-up area is 10,878 sq.m (1,17,090 sq.ft), including commercial spaces spread across 3 blocks (A, B and C) with a G+4 floor structure. The project will cater to the housing demand of the residents of Ambur, primarily the large number of women employees working in the leather factories in Ambur and the other nearby localities. The project is currently at a pre-construction stage. The construction will commence once the necessary approvals are obtained.

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[1]) based on the detailed design, accordingly this IEE report is 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 10,878 sq.m (construction of 2 towers of a G+4 floor structure with a designated community area and commercial space over a land area of 5.44 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.** Ambur Properties Private Limited (APPL) will be responsible for the management, coordination and execution of project activities funded by TNIFMC. A PMC will be on-board to assist APPL, in implementation of the environmental safeguard requirements incompliance with ADB SPS 2009, TNSF ESG and loan covenants. The Contractors will appoint the Environment, Health and Safety (EHS), Grievance Redressal Mechanism and Asbestos material management specialist/ staffs. The contractor will prepare the site specific EMP and Standard Operation and Maintenance Plans (SOMP) manuals, which shall be approved by the APPL/TNFIMC and the ADB, before the start of the construction works.

6. **Description of the Environment.** The subproject is located in Ambur Municipality, Thirupattur district, Tamil Nadu. Ambur is a Selection Grade Municipality, as per G.O. (Ms) No. 283 of MA. & WS. Department, dated 02.12.2008, which lies at a latitude of 12^0 78'N and longitude of 78^0 62'E. The Ambur town is located at an altitude of 316m above mean sea level along Chennai to Bangalore National Highways (NH 46). The mean maximum and minimum temperatures during summer and winter varies between 42°C and 13°C respectively. Highest temperature ever recorded is 43°C and lowest is 11 °C. The humidity ranges are 38% to 61%

[1] The EMP shared in this IEE has to be revised by the contractor at the time of construction, the prepared Construction EMP (C-EMP) has to be approved by the PMU/PIU before the start of the construction works

during summer and 65% to 84% during winter. The maximum rainfall occurs during Northeast monsoon (September to November). The area experiences rainfall during the Southwest monsoon as well. The average annual rainfall is 1000mm. The wind direction is predominately towards Southwest, during winter season it changes its direction from North to East, in summer from South to West. Topography of the town is mostly plain having moderate slope from South to North (towards Palar River).

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 (51.84%), shrub lands (24.91%), followed by cropland (11.60%) and built-up areas (10.67%). Permanent water bodies, grassland, and bare/sparse vegetation, together account for about 1% of the total area.

8. As per the Ambur 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 3 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) the components will involve straightforward construction and operation, so impacts will be mainly localized; (ii) there are no significant sensitive environmental features in the project sites and (iii) 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 and vibration impacts, with exemption to piling works, most of the construction activities (including pre-construction site cleaning works) shall be done involving minimal heavy equipment usage and hence noise and vibration impacts are not expected to be significant. However, for the piling operation, Piling Rig will be used, it will generate noise and vibration to the surrounding, since there are scattered habitations (the nearest settlement is located at a distance of 200m), the anticipated noise and vibration impacts shall be minimal.

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 purposes, the water shall be sourced from the Ambur municipality. During the operation phase of the project, water shall be sourced from the OHT (belongs to Ambur Municipality) located at a distance of 850m from the project site. The estimated water demand of 164 KLD will be sourced from the Ambur Municipality. The surface water body which is located adjacent to the project site shall not be disturbed at any stages of the project implementation.

15. Impact on the flora and fauna during the project construction and operation will be negligible. Tree cutting is not envisaged in the subproject area and there are no protected areas or environmentally sensitive areas surrounding the subproject sites. However, Ambur Reserve Forest (RF) boundary is located at a distance of 800m from the subproject site. As per the records the forest does not house big predators or endangered animals, it has reptiles and small mammals, which are mostly nocturnal in nature.

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 will be handled by the Ambur municipality (the collected waste will be segregated at the waste segregation yard and further it will be disposed in the landfill belonging to Ambur municipality). The generated wastewater will be collected in the nearby pumping / lift station, which is located at distance of 700m from the subproject area, the collected wastewater will be pumped to the STP (16.71MLD) located at Kaspa-A site for further treatment and discharge into Palar River.

19. The main project risk is the low institutional capacity of the contractors. These risks will be mitigated by: (i) hiring environmental specialists 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 and Standard Operation and Maintenance Plans (SOMPs), (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 in contracts, and bids for contractors.

20. For the identified impacts, mitigation measures have been developed to reduce all negative impacts to acceptable levels for the pre-construction, construction, post-construction, and project 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 249.10 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 that were collected to date were utilized in the design of the project, and environmental impact 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 Ambur Properties Private Limited (APPL) 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 to ADB.

24. **Monitoring and Reporting**. The key institutions involved in the IEE and EMP implementation will be the APPL and PMC. To ensure effective implementation of environmental safeguards procedures, the PMC will include designated and trained staff and focal point persons. The APPL 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 APPL 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 APPL/ 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 Quarterly Progress Reports (QPRs) and Semi-annual Environmental Monitoring Report (SEMR) for submission to the PMU for final submission to ADB till the project completion report (PCR). The environmental monitoring report for submission to ADB shall be on half yearly basis during construction and on an annual basis during operation 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 environmental monitoring reports will be publicly disclosed on the ADB public website.

26. The PMC will be responsible for safeguards monitoring and implementation, including an initial review of the contractor's SEMP before submission to the APPL for final approval. The APPL, 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 and update and finalize the IEE including EMP as required. During the project implementation, the PMC will conduct regular field visits for any identified noncompliance, and a suitable Action Taken Report (ATR) with a time-bound corrective action plan will be prepared. 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 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. 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. This IEE is based on a detailed design, and it may be updated during implementation of the project, if there is any change of location/design under the Project. Further, the updated IEE report shall be submitted to ADB for review and clearance.

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 culturally and 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 urbaninitiatives 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 APPL has selected the Ambur site (Geo-coordinates 12°47'41.57"N, 78°44'7.69"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 subproject is proposed to have 305 units. Block 1 will have G+4 structure with 128 units and Block 2 will have also have G+4 structure with 177 units. In Block 3, it is proposed to have 12 shops in G+1 structure.

Table 1: Proposed Project APLL

Sl.No	Housing blocks	Typology	No of units
1	Block 1	G+4	128
2	Block 2	G+4	177
	Total		**305**
3	Block 3 Shops	G+1	**12**

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 negative 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 Ambur Properties Private Limited (APPL). The IEE is based mainly on field reconnaissance surveys and secondary sources of information. Baseline environmental monitoring was conducted to prepare the IEE, and the environmental monitoring program developed as part of the Environmental Management Plan (EMP). The results of which will be reported in the IEE as part of the revision of the baseline environmental section and also as part of the environmental monitoring report.

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 fora 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 Redress Mechanism (GRM).** Establish a grievance redress 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 in local communities:

(i) Final or updated 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**[2] 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 3 towers of which 2 towers will have G+4 floor structure and one tower will have G+1 structure to accommodate shops/ commercial activities with designated community area and commercial spaces over a land area of 5.44 acres. The overall project shall comprise of 305 units of two major typology: 1 Bedroom, Hall, and Kitchen (BHK) and 1Room Kitchen (RK). The total built-up / saleable area

[2] 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.

is 10,878 sq.m (1,17,090 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 10,878 sq.m, (which is less than the stipulated built-up area), it does not require an Environmental Clearance (EC).

Table 2: 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 10,878 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 beenprepared.
Central Ground Water Authority Notification, 1997	It provides for the regulation and control of groundwater development and management	Permission for the extraction of Groundwater from Central Groundwater Board (CGWB)
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.	To obtain CtE and CtO prior to the start of construction for (i) hot mix plant /batching plant; (ii) construction (workers) camps and (iii) proposed 131 KLD STP Compliance to the

Law, Policy, Regulation	Description	Requirement
	All pollution potential activities will require consent to establish (CtE) from Tamil Nadu Pollution Control Board (TNPCB) before starting implementation and consent to operate. (CtO) before commissioning.	conditions and effluent disposal standards stipulated in CtE and CtO
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; and (iii) 131 KLD STP 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 t 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	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
	demolition / re-modellingor repairs	
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 APPL.** 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 APPL shall verify and support to ensure all necessary clearances/permission have been obtained prior to the start of construction. Any condition given as part of the clearance/ permission should be complied and accordingly the IEE including the EMP) should be updated.

Table 3: Clearances and Permissions required by the APPL 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 10,878 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	Ambur Municipality	Collection and transportation of Municipal Solid Waste generated from the site.	To be obtained
3.	Permission letter for discharge of treated sewage	Ambur Municipality	Proposed for zero liquid discharge (ZLD). However, in case of excess treated water, it shall be discharged to the nearest pumping/ lift station located at a distance of 700m.	To be obtained
4.	Ambur Municipality acceptance/ acknowledge for the supply of water and sewage connection to the site	Ambur Municipality	TWAD/Ambur Municipality has confirmed the supply of water and sewage connection to the site. The water will be sourced from the nearest OHT, which is located at a distance of 850m from the site.	To be obtained
5.	Confirmation for Collection and disposal of Sludge generated from STP	Ambur Municipality	Confirmation letter indicating that Ambur Municipality will undertake the collection and disposal of sludge generated from the STP.	To be obtained

53. **Other Environmental Clearance conditions requirements**. APPL will obtain the CTE and CTO from TNPCB for the 131 KLD STP. Further the STP design will be prepared by an independent expert/ consultant from a reputed academic institution (preferably Anna University/ IIT, Chennai). Based on the STP design and location, this IEE will be updated/

revised covering the anticipated environmental impacts and suggested mitigation measures. The construction works for the STP shall commence after the approval of the updated/revised IEE report by the ADB.

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 4: 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	APPL
2.	Waste water Discharges from Construction activities	TNPCB	Consent to establish and consent to operate under Water Act, 1974	Contractor	APPL
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	APPL
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. Contractor will require prior approval of PMC for obtaining material from a particular source. PMC to review and approve only existing licensed. mines	Contractor	APPL
5.	Groundwater extraction	Public Works Department	Tamil Nadu Groundwater Development and	Contractor	APPL

Sl.no	Construction Activity	Statutory Authority	Statute under which Clearance is Required	Implementation	Supervision
			Management Act 2000		
6.	Disposal of Construction and Demolition waste	TNPCB	Construction and Demolition (C&D) Waste Management Rules, 2016	Contractor	APPL
7.	Labour license	Labour dept.	The Contract Labour (Regulation and Abolition) Act, 1970; and Contract Labour (Regulation & Abolition) Central Rules, 1971	Contractor	APPL
8.	Workmen Insurance	Insurance company	Workmen Compensation Act, 1923	Contractor	APPL

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 APPL 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 APPL will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the APPL 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
- Good Practice Note: Asbestos: Occupational and Community Health Issues, May 2009
- Guidance Note on Workers Accommodation: Processes and Standards, August 2006[3]
- Guidelines on Occupational Health and Safety and Community Health and Safety (2007)

[3] IFC Guidance Note: Workers Accommodation

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.

Table 5: 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	Industrial	5 (Annual)	-	-	5 (Annual)

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]	
(C_6H_6) (µg/m^3)	Residential, Rural and Other Areas				
	Sensitive Area	5 (Annual)	-	-	5 (Annual)
Benzo(o) Pyrene (BaP) (ng/m^3)	Industrial	1 (Annual)	-	-	1 (Annual)
	Residential, Rural and Other Areas				
	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 6: 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 7: National Drinking Water Quality Standards and WHO Guidelines

Group	National Standards for Drinking Water [a, b] Parameter	Unit	Max. Concentration Limit	WHO Guidelines for Drinking Water Quality, 4th Edition, 2011[c]	Applicable Per ADB SPS [d, e]
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)

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		
	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)
	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 APPL 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 8: 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
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)

Sl. no	International Treaties/ Conventions/Declarations	Description
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. Ambur Properties Private Limited ("APPL" or "Company") is developing an affordable housing project in Ambur 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:

- The subproject is designed to have 10% OSR
- New site should provide comprehensive infrastructure and supporting services,

generate new optimally sited open spaces of adequate size, andcommunity spaces including space for training and community enterprise.

- The site is in conformation to the landuse , 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 supply of water by Ambur municipality and the quality of the water is as per the IS 10500 (drinking water standard). During the summer seasons, when 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 APPL.
- 131 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. The sludge generated in the STP shall be further digested to remove the pathogens and the dried sludge will be used for gardening and excess sludge disposed along with the organic waste in the Ambur Municipality MSW disposal facility

C. Proposed Subproject Interventions

63. The scope of this subproject includes the construction, operation and maintenance of 305 residential units and associated facilities at the site, which shall be achieved through the construction of 2 towers of G+4 floor structure with designated community area and commercial spaces over a land area of 5.44 acres. The total saleable area is 10,878 sq.m (1,17,090 sq. ft)

64. Proposed layout plan for the site is shown in Figure 2. The total area of the site is estimated to be 5.44 acre with the proposed land use land allocation is presented in Table 9.

Table 9 : Proposed Land use of the Area

Sl. no	Description	Area (%)	Area (m^2)
1.	Open Space Reserve Area	10.26	1569.42
2.	Space reserved for STP	5.0	331.00
Total Area		**15.26**	**1900.42**

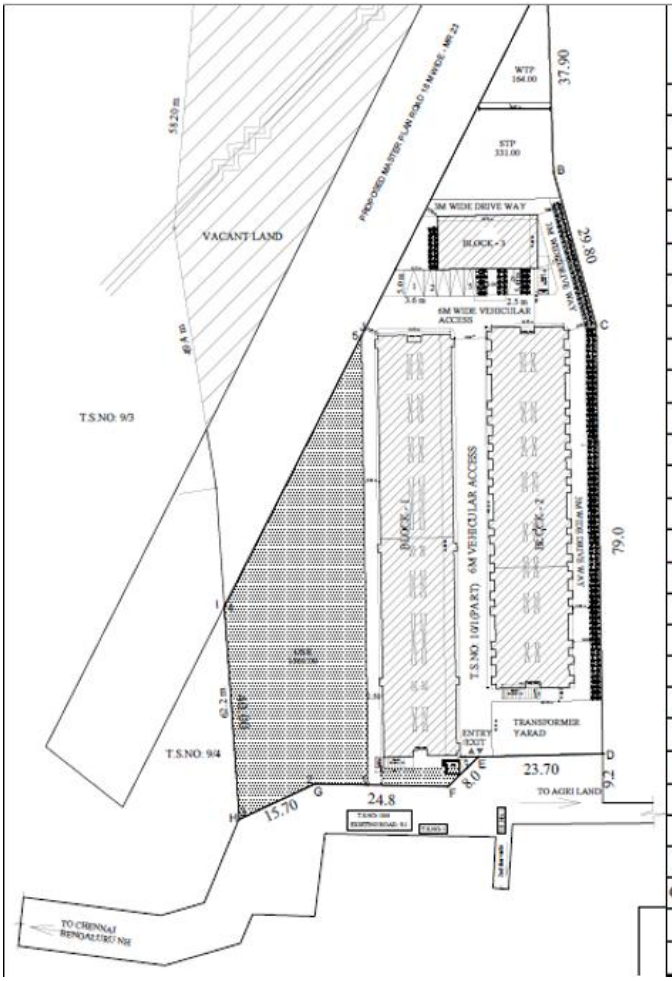
Source: APPL

65. Based on consultations, the design requirement for the communities have been identified and accordingly APPL 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 Table 10 has been proposed.

Table 10 : Subproject Interventions at the site

Sl.no	Subproject	Subproject Interventions
1	Construction of 305 residential units and supporting services	• Pedestrian Pathway • Connecting Pathways • Open Space Reserve (OSR) • Sewage Treatment Plant (131 KLD capacity) • Vehicle Parking area • Play park

Source: APPL



SL. NO.	DESCRIPTION	FSI AREA (SQ.M.)	NON FSI AREA (SQ.M.)	TOTAL AREA (SQ.M.)
	BLOCK - 1			
01	GROUND FLOOR	1081.57	-	1081.57
02	FIRST FLOOR	1011.07	70.50	1081.57
03	SECOND FLOOR	1011.07	70.50	1081.57
04	THIRD FLOOR	1011.07	70.50	1081.57
05	FOURTH FLOOR	1011.07	70.50	1081.57
06	TERRACE FLOOR	--	98.58	98.58
	TOTAL	5125.85	380.58	5506.43
	BLOCK - 2			
01	GROUND FLOOR	969.34	-	969.34
02	FIRST FLOOR	926.50	42.84	969.34
03	SECOND FLOOR	926.50	42.84	969.34
04	THIRD FLOOR	926.50	42.84	969.34
05	FOURTH FLOOR	926.50	42.84	969.34
06	TERRACE FLOOR	--	98.58	98.58
	TOTAL	4675.34	269.94	4945.28
	BLOCK - 3 - SHOPS CLUSTER			
01	GROUND FLOOR	187.00	-	187.00
02	FIRST FLOOR	187.00	-	187.00
03	TERRACE FLOOR	--		40.00
		374.00	40.00	414.00
	SECURITY ROOM			
01	GROUND FLOOR	-	-	12.40
G. TOTAL (A+B+C+SECURITY)		10175.19	690.52	10878.11
TOTAL BUA (in sq.fts)		117092		
TOTAL - 305 Dwelling Unit				

Figure 2: Layout Plan for 3 blocks

66. **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 1000 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 11 : Power Requirement at the Site

Sl. no	Particulars	Quantity	Unit
1	**Residential Use**		
	No. of residential units proposed	305	Nos.
	Power requirement per residential unit (Assuming 1 kWper 1 residential unit)	305	kW
2	**Pump Room**		
	No. of Pump Rooms	2	Nos.
	Power requirement for the Pump Room (Assuming 16 kWper Pump Room)	32	kW
3	**STP**		
	Power requirement for STP is in the range of 10 kW to 15kW	10	kW
4	**Streetlight**		
	No. of streetlights	10	Nos.
	Power required for the streetlights (Assuming 50 W perStreet Lamp)	0.5	kW
Total Power Requirement		**347.5**	**kW**

Source: APPL

67. 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 2 m fromthe height of the building (height of the building +2 m).

68. **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 Ambur municipality. The water requirement during operation is estimated to be 164 KLD, which shall be supplied by the Ambur Municipality and relevant calculations can be found in Table 12.

69. During operation, the wastewater generation from the project is estimated to be about 131 KLD, which will be treated in a proposed Sewage Treatment Plant (STP) with a capacity of 131 KLD. Treated wastewater will be reused for flushing and gardening. The assumptions for estimating the water requirement are given in the following table.

Table 12: Water Requirement at the Site

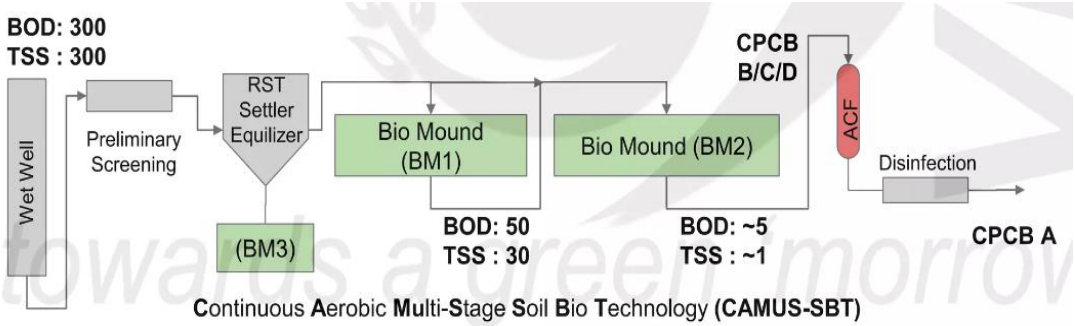
S No	Project Components	No of Units	Occupancy rate @	Total Occupancy No's
1	Residential	305	4 persons per unit	1220
	Total			**1220**
	As per the National Commission on Integrated Water Resources Development (NCIWRD) norms rural area shall be provided with 75 to150 Litre Per Capita Per Day (LPCD) have been recommended for theyear 2025 and 2050. For this subproject 135 lpcd has been proposed. Hence the estimated water requirement is 0.16 MLD.			1220 x 135 lcpd = 0.164 MLD
Green area Development/ landscaping				
	Actual water requirement for Gardening purpose = Area for Green belt development × 3.5 lts/Sqm			5.5 KLD

S No	Project Components	No of Units	Occupancy rate @	Total Occupancy No's
	= 1569x 3.5lts/Sqm= 5491.5 Lit (Rounded)			

Source: APPL

70. For the wastewater generated from the site a 131 KLD (0.13 MLD) capacity STP with Soil bio Technology (SBT) is proposed. The SBT will have two mounts for treating wastewater. The STP process flow chart and SBT structure is presented in Figure 3. Nearly 5.50 KLD (4%) of treated water will be used for green belt area/ landscaping purposes. From the remaining 49 KLD, nearly 38% of the treated water (after ultra-filtration and UV disinfection) will be recycled for flushing and gardening purposes with the remaining 76.5 KLD (58 %) to be disposed into the rainwater harvesting pits for groundwater recharge of the municipality or to any industries in the surrounding area based on requests water for their use.

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



71. **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 rain water 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.

72. **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, APPL have designed 9 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 842 mm

ii. The rainfall intensity has been estimated to be 2.47 mm /day

iii. The total built-up area is worked out to be 10878 m^2

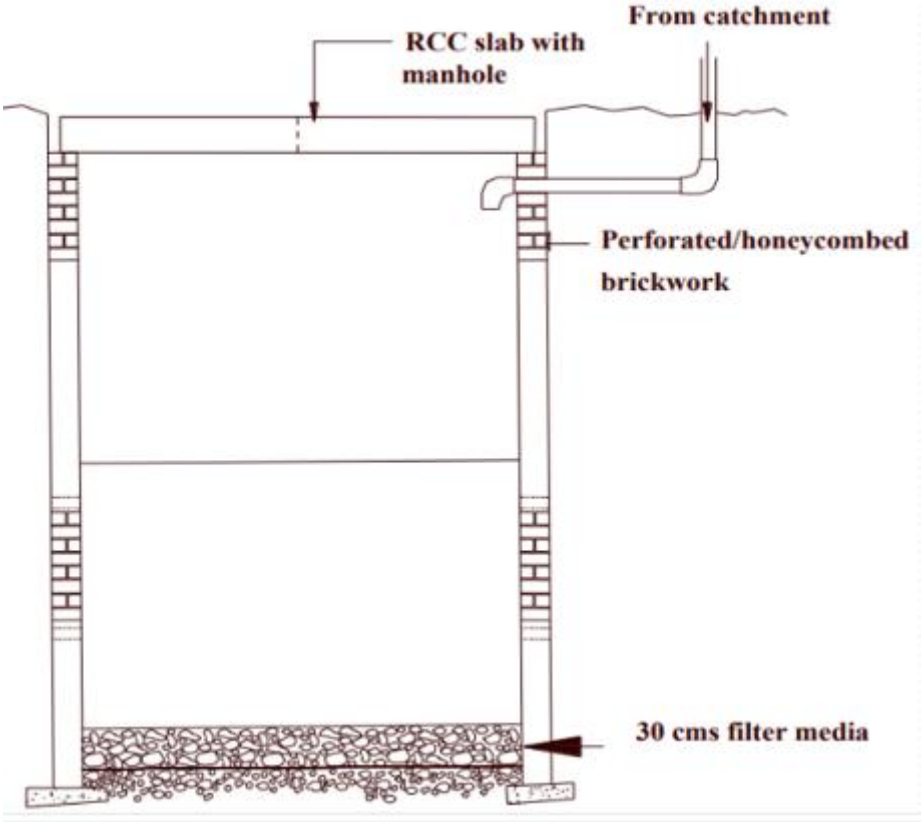
iv. Assuming the coefficient of runoff (c) to be 0.90 for concrete surface area,it is expected that Q=c.i.a= 0.90 x 2.47 x 10878= **24.18 m^3/day**

73. Based on the estimated rainwater volume, 9 RWH structures/pits and 985m of rainwater trenches are proposed. The design specifications for the RWH are as follows:

b. **Rainwater Harvesting Structure**[4]. It is proposed to construct 9 RWH structures/pits with a diameter of 1.2 m (clear) and a height of 2.40 m. Each residential block 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 2.71 m^3, hence 9 RWH structures/ pits will collect 24.39m^3 of rainwater. The structure of the RWH is shown in Figure 4.

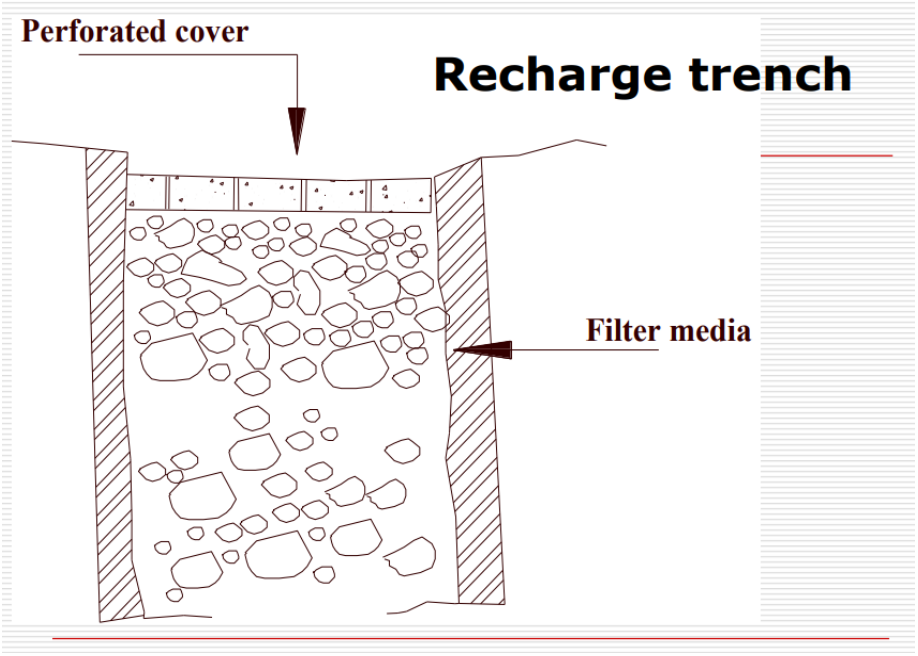
Figure 4 : Rainwater Harvesting Structure



c. **Rainwater Harvesting Trenches**. The site will be provided with 985m 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 1477.50m^3.

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

Figure 5 : Rainwater Harvesting Trenches



d. **Permeable paver block**. It is proposed to provide paver block for the walkway, parking area and surrounding the buildings above a filling of 45cm. The gaps between the paver block will not be sealed, which will allow the rainwaterto percolate further into the ground. The total area of the paver block is estimatedto be 4264 m^2. The volume of rainwater that can be collected by this system is estimated to be 1918.80m^3.

Figure 6 : Permeable paver block

Table 13 : Rainwater estimate

Sl.no	Infrastructure	Quantity	Volume of rainwater that can beCollected
1.	Rainwater Harvesting Structures/Pits	9 nos.	24.18 m^3
2.	Rainwater Harvesting Trenches	985 m	1477.50 m^3
3.	Paver block all-around the buildings	4264 m^2	1918.80 m^3
Total			3447.84 m^3 = **34.5 Lakh Liters**

Source: APPL

74. **Green area development/ landscaping**. It is proposed to have landscaping in an area of around 7139.59 m^2, which constitutes 15.93 % of the total area. It is estimated that 25 KLD of water is required for landscaping purposes which shall be met through the use of treated wastewater after ultra-filtration and UV disinfection. The master plan presented in Figure 5 shows the green areas proposed at the site.

75. **Solid Waste Management.** Wastes generated from the households will be segregated into bio-degradable waste and non-biodegradable waste at the source itself (by the occupants) in separate bins. The wastes from such bins will be collected separately on a daily basis and taken to a separate centralized collection facility by the APPL dealing with collection and disposal of garbage, the organic waste will be treated by vermi composting / Organic waste composter. Plastic waste will be sold to TNPCB authorized processing unit. It is also estimated to generate 50 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 following table illustrates the quantity of solid waste likely to be generated during the operation phase.

Table 14 : 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	1220	0.2	244	146	98
2	Sludge from STP			50	50	0
Total				**294**	**196**	**98**

Source: APPL

76. **Approach Road.** The approach road and internal roads have been designed for 3.5 m (single lane) width Bituminous Road (BT).

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. **Climate Resilience Measures.** A study on the Climate Change Risk and Vulnerability Assessment (CRVA) for the IRSHUPSP has been conducted for Climate Risks, Climate Adaptation and Climate Finance. The suggested adaptation measures or mitigation measures are as follows:

a. **Water Supply**.

- Level of consumption of water may be lowered further using more water efficient appliances, taps, and shower heads.
- Use drought-tolerant plants to reduce the need for watering the landscaping, increasing water efficiency;
- Community-based messaging/campaigns to promote water efficiency;
- To use swales and ponds on parts of the site for effective rainwater harvesting; and
- To incorporate natural drainage channels and lakes into storm water management plan.

b. Provision of green space, community farming, livestock

- Explore improved shading opportunities for community recreation areas, market and milk booth

c. Roads and pavement areas

- Reduce area of impermeable surfaces to minimize run-off.
- Use of pavement materials to ensure resilience to extreme temperatures.
- Use of permeable materials that provide additional cooling benefits.

80. **Project Implementation Schedule.** The construction period for the housing site is expected to take 24 months, which will be followed by 5-year maintenance period

IV. DESCRIPTION OF THE ENVIRONMENT

A. Area of Impact

81. The primary areas of impact are (i) subproject location (housing site) 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 (housing site) in terms of over-all environmental and socio-economic improvement.

B. Methodology used for Environment Baseline Study

82. **Data collection and stakeholder consultations.** Data for this study has been primarily collected through comprehensive literature survey, discussion with APPL, 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 APPL;

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.

83. **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

84. The subproject is located in Ambur Municipality, Thirupattur district, Tamil Nadu. Ambur is a Selection Grade Municipality, as per G.O. (Ms) No. 283 of MA. & WS. Department, dated 02.12.2008, which lies at a latitude of 12^0 78'N and longitude of 78^0 62'E. The Ambur town is located at an altitude of 316m above mean sea level along Chennai to Bangalore National Highways (NH 46). Ambur municipality is located at a distance of 200 km from Chennai, and 52 km from Vellore. The Ambur municipality is well connected by road and rail with the nearby urban centers.

2. Topography, Soils and Geology

85. Topography is moderately sloped undulating from west to east with an elevation difference of approximately 20m from the South to North near Palar River. The Town is located 316m above mean sea level. Ambur has Tropical wet and dry climate, reaching high temperature during summer and experiences wet winter. The area also experiences light rainfall during South East Monsoon. Black loam soil is found in parts of Ambur Municipality. The other type of soil is chiefly gravelly, stony and sandy of the red variety. There are no notable mineral resources.

86. Geologically, Ambur municipality is broadly classified into hard rock and sedimentary formations. The most common types of hard rock formations are the Gneisses and Charnockites. The Gneissic formations are found commonly in the project area, where as the Charnockite formations occur in the reserve forest areas. The sedimentary formations are the transported sediments by the river and streams stretch mainly along the Palar River course as thin isolated patches

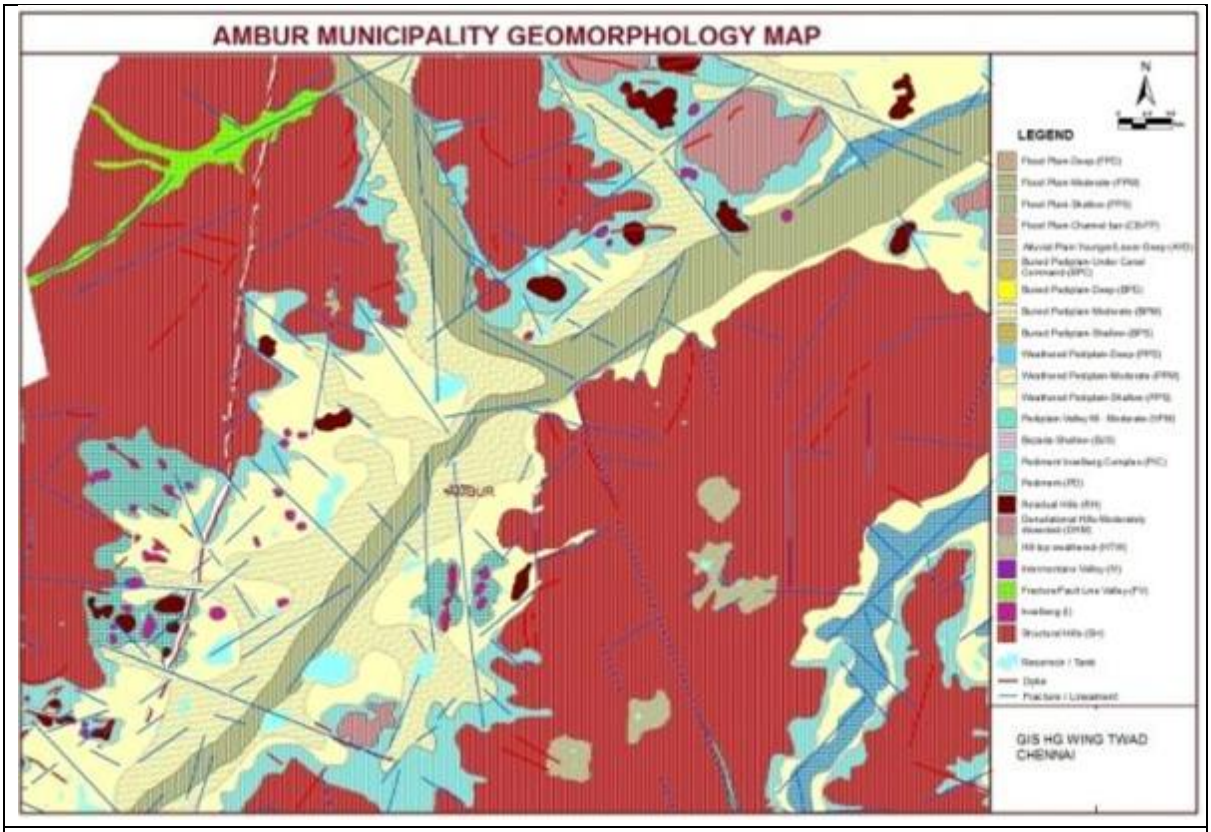


Figure 7: Geomorphology of Project Area

3. Seismology

87. As per the seismic zoning map of India, Ambur municipality falls under Zone III, which is the moderate earthquake risk zone in India.

4. Climatic Conditions

88. Ambur has tropical wet and dry climate, reaching high temperature during summer and experiences wet winter. The area also experiences light rainfall during South East monsoon. The mean maximum and minimum temperature during summer and winter varies between 42°C and 13°C respectively. Highest temperature ever recorded is 43°C and lowest is 11°C (refer Table 15). The humidity ranges are 38% to 61% during summer and 65% to 84% during winter. The maximum rainfall occurs during North East monsoon (September to November). Ambur experiences rainfall during the South West monsoon as well. The average annual rainfall is 1000 mm (Refer Figure 8). The wind direction is predominate towards South West, however, during winter it changes the direction from North to East and in summer from South to West.

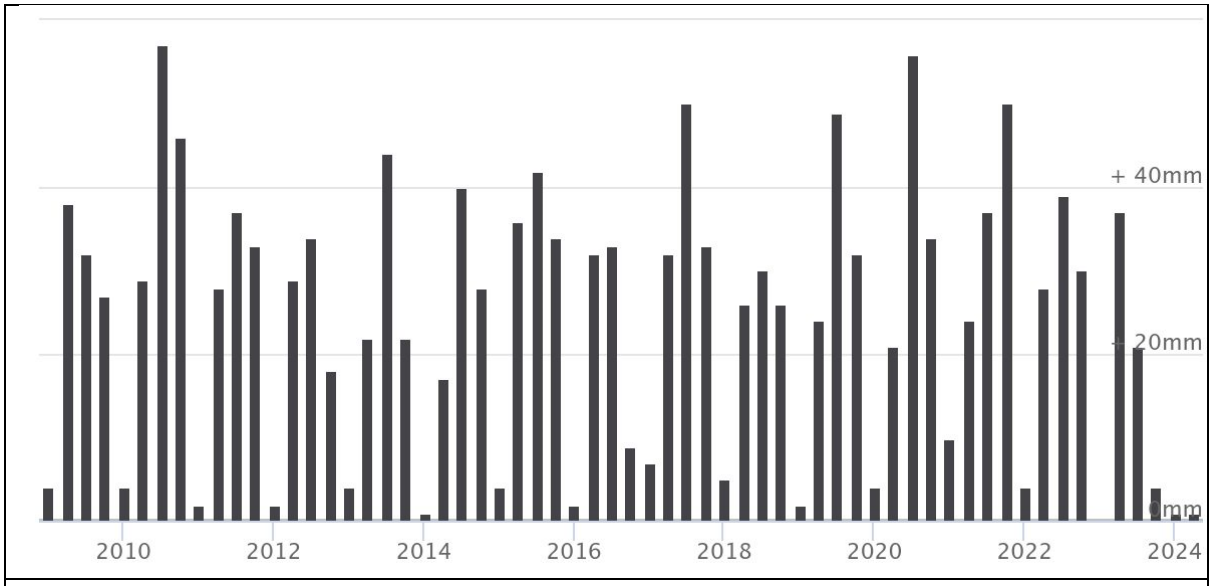


Figure 8: Annual Seasonal Rainfall in Project Area

Table 15: Monthly Max and Min Average Temperature

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg. Temp (°C)	23.5	25.4	28.0	30.5	31.5	30.0	28.7	28.5	28.0	26.8	24.6	23.1
Min. Temp (°C)	17.9	18.9	21.2	24.4	25.6	25.1	24.2	23.9	23.4	22.4	20.2	18.3
Max. Temp (°C)	29.1	31.9	34.9	36.6	37.4	35.0	33.2	33.1	32.7	31.2	29.1	28.0
Avg. Temp (°F)	74.3	77.7	82.4	86.9	88.7	86.0	83.7	83.3	82.4	80.2	76.3	73.6
Min. Temp (°F)	64.2	66.0	70.2	75.9	78.1	77.2	75.6	75.0	74.1	72.3	68.4	64.9
Max. Temp (°F)	84.4	89.4	94.8	97.9	99.3	95.0	91.8	91.6	90.9	88.2	84.4	82.4
Precipitation / Rainfall (mm)	9.0	2.0	7.0	24.0	74.0	52.0	98.0	103.0	125.0	163.0	97.0	31.0

5. Surface Water

89. The River Palar is a prominent and historical feature of Ambur Municipality. River seldom flows, and according to local information, it experienced flow in 2015 due to heavy floods after nearly two decades. Otherwise, the surface water flow lasts only for a few days in a year. But considerable groundwater potential exists in the Palar River bed.

6. Groundwater

90. 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.

91. Tirupathur district is underlain by geological formations ranging in age from Archaean to Recent. In the crystalline formations comprising charnockites, gneisses and granites. In the consolidated formations, primary depositional features such as grain size are the major controlling factors.

92. In Gondwana formations, groundwater abstraction is through dug wells and dug cum bore wells. These formations have considerably low yield potential compared to both 6 hard rock and alluvium. The depth of dug wells in Gondwana sediments varies from 6 – 15 m bgl with extension of bores at the bottom ranging in depth from 15 – 25 m. Dug wells are the most common structures in recent alluvial formations too. The depth of dug wells tapping Palar alluvium ranges from 4 – 18.70 m bgl. These formations have moderate to good yield potential in the district and can sustain pumping for 3-4 hrs even during peak summer months and have yield up to 4.6 lps. Filter points of 10 – 15 m bgl depth are also being used in these formations for tapping ground water for domestic purposes[5].

93. **Groundwater Quality**. The groundwater samples from the Ambur Municipality have been analyzed for its physico-chemical, parameters. The outcome of the analysis has been depicted in the Table 16. In comparison with the Indian Drinking water standard (IS 10500), it was observed that water quality in the Ambur town is highly deteriorated due to contamination of groundwater by the discharge of industrial effluents (mainly from tannery industries) and it is not suitable for drinking purpose. The Ambur Municipality depends on the Cauvery River source (CWSS to Vellore with a source of Cauvery River at Mettur dam) for drinking purpose.

Table 16: Groundwater Quality in Ambur

Sl.no	Parameter	Ambur Town Basha Nagar 5th Cross street	Requirement (Acceptable limit)	Permissible limit in the absence of alternate source as per IS 10500	Remarks
1.	pH	8.2	6.5 to 8.5	6.5 to 8.5	Within range
2.	Turbidity (NTU)	<0.5	1.0		
3.	Total Alkalinity (mg/l)	234	200	600	High
4.	Total Dissolved Solids (mg/l)	624	500	2000	High
5.	Chlorides (mg/l)	232	250	1000	High
6.	Total Hardness (mg/l)	209	200	600	High
7.	Sulphates (mg/l)	97	200	400	Within range

Source: Groundwater quality assessed as part of baseline monitoring for TNUIFIP 3

94. **Water quality monitoring.** Water samples has been collected from (i) municipal water supply source and (ii) well water from the site. The collected samples are tested for its quality as per IS 3025 (methods of sampling and test (physical and chemical) for water and wastewater). Nearly 42 parameters are tested (refer **Appendix 2**) which includes, both chemical (including pesticides) and biological parameters. For most of the parameters, the analysis outcome is below the limit of qualification (BLQ). The following table depicts the parameters with analysis results. From the analysis, it is observed that all key water quality parameters in the municipal water source including Total Hardness, Calcium, Chloride, Sulphate, Nitrate, Iron etc., are well within the stipulated acceptable limit (further treatment is not required). However, for the well water quality, some of the water quality parameters (Total Hardness, Calcium, Total alkalinity, Chloride, Magnesium, and TDS) are observed above the

[5] District Groundwater Brochure, Vellore District, Jan 2009 by CGWB

acceptable limit, but within the permissible limits, which indicates after water treatment it can be used for drinking purposes.

Table 17: Water Quality - Municipal water supply and well water (site)

Sl.no	Parameters	Municipal water source	Well water quality (site)	IS 10500: 2012	
				Acceptable limit	Permissible limit
1.	pH (at 25°C)	8.03	7.48	6.5 to 8.5	NR
2.	Turbidity (NTU)	0.4	1.3	1	5
3.	Total hardness as $CaCO_3$ (mg/l)	125.0	370.0	200	600
4.	Calcium as Ca (mg/l)	30.06	88.17	75	200
5.	Total Alkalinity as $CsCO_3$ (mg/l)	135.0	470.0	200	600
6.	Chloride as Cl (mg/l)	39.19	173.2	250	1000
7.	Magnesium (mg/l)	12.15	36.45	30	100
8.	Total Dissolved Solids (mg/l)	214.0	891.0	500	2000
9.	Total suspended solids (mg/l)	2.0	Not performed	-	-
10.	Sulphate as SO_4 (mg/l)	11.19	125.1	200	400
11.	Nitrate as NO_3 (mg/l)	2.6	2.45	45	NR
12.	Iron as Fe (mg/l)	0.027	0.069	1.0	NR
13.	Barium as Ba (mg/l)	0.059	BLQ	0.7	NR
14.	Total Plate Count (CFU/ml)	280	-	NA	NA
15.	Total Bacterial Count (CFU/ml)	-	24	NA	NA

Source: APPL, Note: NR- No Relaxation

7. Ambient Air Quality

95. Secondary information on the air quality from Tamil Nadu Pollution Control Board (TNPCB) is not available for Ambur. As a recent update, the TNPCB has fixed monitoring stations in Ambur and its surroundings (including Vellore) for periodic monitoring of air pollution. Based on the reconnaissance survey, the main source of air pollution in the city are attributed to vehicular traffic, road dust, construction and industrial activities.

96. Based on an international journal, the Ambient Air Quality (AAQ) recorded at a Tannery location in Ambur town is taken for discussing the AAQ of Ambur. The outcome of the monitoring results shows that none of the key air quality parameters exceeds the limitation prescribed by the CPCB.

Table 18: Ambient Air Quality at Traffic Junctions, Ambur, 2016

S. No	Location	Time	PM_{10}	$PM_{2.5}$	SO_2	NO_2	CO	NH_3
1	Tannery location at Ambur town	6.00AM-2.00PM	21.0	15.4	14.89	7.89	0.092	5
		2.00PM-10.00PM	20.5	15.1	18.94	10.12	0.083	8
		10.00PM-6.00AM	20.6	15.6	19.56	17.89	0.076	3
Average pollutant			20.7	15.36	17.79	11.96	0.083	5.33
CPCB Standard			100	60	80	80	02	100

Source: *International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE) ISSN: 0976-1353. Volume 23. (SPECIAL ISSUE) A. Kistan, A. PremKumar and A. Thaminum Ansari, Research& Development Centre, Bharathiar University, Coimbatore, India. Assistant Professor, Panimalar institute of technology, Chennai, India. Assistant professor, Muthurangam Government Arts and Science College, Vellore, India.*

97. **Ambient air quality monitoring**. Ambient air quality monitoring (24hrs sampling) has been conducted using high volume air sampler for the subproject area covering all directions namely (i) Southeast, (ii) Southwest, (iii) East, (iv) West, (v) Northeast and (vi) Northwest (Refer **Appendix 3**). The collected samples are tested for 12 key air quality parameters using various methods (IS 5182, CTL etc.). Based on the analysis, most of the AAQ parameters are observed to be Below Deduction limits (BDL), the parameters which has values are shown in the Table 19. In comparison with the NAAQS, the observed values are less than the stipulated limits.

Table 19: Ambient air quality monitoring

Sl.no	Parameters	Directions						NAAQS
		SE	SW	E	W	NE	NW	
1.	Particulate Matter ($PM_{2.5}$) µg/m^3	30.1	26.0	19.7	17.0	14.2	12.0	60
2.	Particulate Matter (PM_{10}) µg/m^3	66.7	58.6	46.2	40.8	36.3	34.1	100
3.	Sulphur Dioxide (SO_2) µg/m^3	9.5	7.6	4.1	3.4	BDL	BDL	80
4.	Oxides of Nitrogen (NO_2)	18.0	15.0	9.5	7.6	5.4	4.0	80
5.	Ozone (O_3)	20.5	16.2	12.0	10.2	BDL	BDL	180

Source: APPL, Note: Below Deduction limits (BDL), NAAQ – National Ambient Air Quality Standard

8. Ambient Noise Levels

98. The following table presents the noise level data across Ambur Municipality from a research study conducted in 2020. Study monitored noise levels along different types of roads at nine locations. The recorded noise levels at all locations and at all times (day and night) exceeded the ambient noise standards[6]. Further, due to heavy traffic volumes, noise levels along highways/expressways and arterial roads were much higher than the noise levels on local streets.

Table 20: Ambient Daytime Noise Levels in Ambur

Roadways	Area name	Measures of noise levels (dBA)	Morning peak 9:00-9:30	Morning off peak 11:30–12:00	Afternoon off peak 2:30-3:00	Evening peak 6:00-6:30	Night off-peak 9:30-10:00
TYPE I	Umar street	Lmax	72.13	73.65	75.29	78.32	75.33
		Lmin	63.24	62.58	78.71	68.61	61.78
		Leq	71.65	70.49	69.75	74.08	72.33
	Nethaji Road	Lmax	75.42	74.56	79.72	77.48	79.72
		Lmin	68.22	66.25	70.42	70.53	70.42
		Leq	71.23	71.68	73.89	74.58	73.89
	Peranampattu road	Lmax	75.69	76.55	82.7	82.7	78.73
		Lmin	69.24	71.66	70.16	70.16	65.37
		Leq	73.66	72.66	75.77	75.77	73.84

[6] *Day and night time noise standards for residential areas = 55 dBA and 45 dBA and for commercial areas = 65 dBA and 55dBA.*

Roadways	Area name	Measures of noise levels (dBA)	Morning peak 9:00-9:30	Morning off peak 11:30–12:00	Afternoon off peak 2:30-3:00	Evening peak 6:00-6:30	Night off-peak 9:30-10:00
TYPE II	Bethalegam	Lmax	69.58	68.22	74.81	76.05	74.81
		Lmin	61.25	59.65	64.35	64.94	64.35
		Leq	65.35	64.22	70.43	71.25	70.43
	Sanankuppam	Lmax	71.65	70.66	74.81	82.11	79.42
		Lmin	68.47	66.45	64.35	76.73	66.09
		Leq	69.98	68.22	70.43	79.12	75.29
	Somalapuram road	Lmax	68.95	66.75	69.68	82.35	78.71
		Lmin	61.32	61.55	66.98	71.86	69.75
		Leq	64.78	64.78	67.66	76.77	75.42

Source: SS Reddy, SK Hasan (2020), "Vehicular traffic noise in Vellore Municipality, Tamil Nadu, India – An Analysis", Amity journal of engineering and technology 1 (1), 48-52

99. **Ambient Noise level monitoring**. Ambient noise levels are monitored for the daytime in the subproject site and the monitoring locations are the locations where AAQ was conducted (Refer **Appendix 4**). The outcome of the analysis is shown in Table 21. It is evident from the analysis that the subproject site does not have noise pollution generating sources (including local traffic or commercial/industrial impacts).

Table 21: Ambient Noise Levels

Sl.no	Sampling Location	Day time noise levels (dB(A))	CPCB Limit
1.	Southeast	43.3	75
2.	Southwest	48.4	
3.	East	44.4	
4.	West	41.5	
5.	Northeast	46.2	
6.	Northwest	44.1	

Source: APPL

D. Biological Environment

100. There are no sensitive ecological areas, biospheres, national parks, or sanctuaries located in 10km radius from the subproject location. However, Ambur Reserve Forest (RF) is located within 800 to 1km distance from the subproject area. As per the forest records, it is an tropical thorn and scrub forest with canopy density <10%, the upper portion of the hillock is covered with Cymbo pogon grass, Small animals like wild boars, hares, civet cats and few reptile species are found in this RF. Considering the nature of the forest type and density, this RF type comes under the Eco-Class IV[7] and eco value as open forest category.

[7] Consisting of Tropical Thorn Forests and Tropical Dry Evergreen Forests

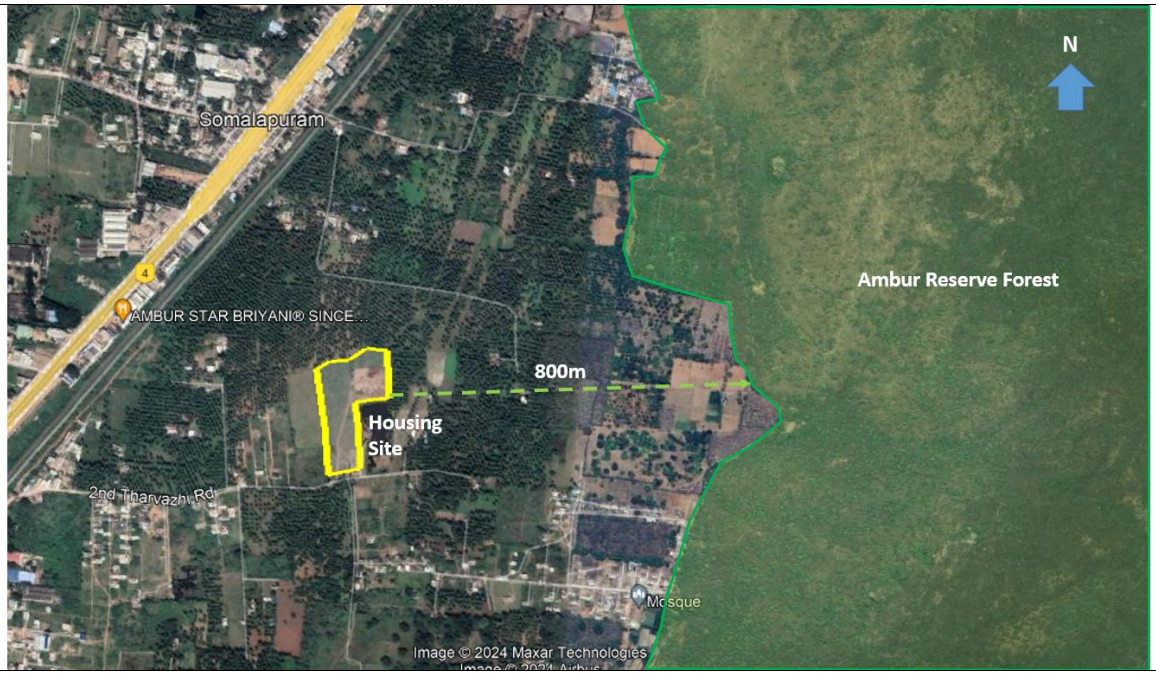


Figure 9: Location of the RF from the subproject site

E. Socio-Economic Features

9. Land use

101. The Regional Directorate of Town and Country Planning had conducted the land use survey for Ambur town. Based on the outcome of the survey, the town landuse is classified as.

- Residential.
- Commercial.
- Industrial
- Public and Semi Public
- Transportation and Communication.
- Recreational.
- Public utilities
- Vacant development.
- Non-Urban use.

Table 22: Land use Analysis for Ambur town.

Sl. No	Land use	Area in Hectares	Percentage over total developed area	Percentage over total area
(I)	**Developed Area**			
1	Residential	577.19	60.00	32.12
2	Commercial	56.74	5.46	3.15
3	Industrial	127.21	13.14	7.08
4	Public & Semi Public	135.16	13.95	7.52
5	Educational	72.15	7.45	4.03
	Total developed area	**968.45**	100.00	100.00
(II)	**Undeveloped Area**			
1	Agricultural Wet	93.13	11.24	5.18
2	Hillocks and Dry	579.25	69.91	32.23

Sl. No	Land use	Area in Hectares	Percentage over total developed area	Percentage over total area
3	Land under Water	156.17	18.85	8.69
	Total Undeveloped area	**828.55**	100.00	100.00
	Grand total	**1797.00 Hectares**		

10. Industry and Agriculture

102. Ambur Municipality is an industrially forward town and directly linked to Vellore by NH46. 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, so is the contribution to the Municipality economy.

11. Infrastructure

103. **Water Supply:** water supply sources to Ambur municipality are (i) Sarangal River (ii) Cauvery from Vellore CWSS and (iii) Local source.

- **Sarangal River**: An improvement scheme for this municipality has been provided during the year 2003, with sources from Sarangal River and from the unaffected upstream side of Malattar River near Mittapalli. An average of 0.50MLD of potable drinking water is being supplied daily from these sources.

- **Cauvery from Vellore CWSS**: Augmentation scheme under Vellore Mega CWSS in Vellore District with River Cauvery as source near Mettur Dam was commenced in 2016 and provides water supply of 9.82 MLD to Ambur Municipality. In addition to the above, 6.60 MLD of water is being supplied to this town through other local open well sources and bore wells sources at respective locations like Sarangal (3.40 MLD) 15 km from ULB, Aanaimaduku (1.20 MLD) 1 km from ULB, Sanikanavaimedu (0.80 MLD) 200 m from ULB, Nathisilapuram (0.60 MLD) 200 m from ULB and Vannandurai (0.60 MLD) 3 km from the ULB.

  Quantity from Vellore Mega CWSS - 9.82 MLD
  Quantity from local sources (0.50+6.60) - 7.10 MLD
  Total - 16.92 MLD

- Water supply from Vellore Mega CWSS will be increased to 15.85 MLD (from current supply level of 9.82 MLD) from 2018. After the increase of supply the total water supply from 2018 will be 22.95 MLD (7.10 +15.85) and a level of supply at intermediate stage will be more than 135 LPCD.

- **Local Sources (Over Head Tank)**: The potable water of 5.00L per day is daily supplied from the two open wells in Anaimadugu area.

104. **Existing Sewerage System:** Ambur is a fast-growing town, however, it was not having a dedicated underground sewerage system (UGSS). Under the TNUFIP 3 (funded by the ADB), the UGSS for Ambur municipality is now under construction. The civil component of the UGSS includes (i) sewage collection system (112.503-kilometre (km) length of sewers, 4024 manholes), (ii) One lift station, (iii) One Sub Pumping Station, (iv) One Main pump station, (v) Sewage Treatment Plant (STP) of 16.71million litres per day (MLD) capacity, and (vi) 18,387 house service connections. The treated water will be discharges into the River

Palar.

105. **Solid Waste Management**. Ambur Municipality is a Selection Grade Municipality that has 17.97 sq.km. consisting of 26,302 Households with the Population of 1,14,608 as per the 2011 census. Primary level collection, Secondary level collection, Re-cycle and Fertilizer Manufacturing processes are ongoing Under Solid Waste Management, through which 45 tons of Garbage is being collected daily. 80 Permanent Sanitary Workers and 120 Outsourced Sanitary Workers are engaged.

Primary Level Collection

- Push Carts : 54 No's
- Tricycles : 40 No's
- TATA Ace : 06 No's

Secondary Level Collection

- Tipper Lorry : 03 No's
- Dumper Blazer Lorry : 03 No's
- Dumper Blazer Bins : 42 No's

106. Bylaws have been made and enforced as per Solid Waste Management Rule 2016 by which 20 Bulk waste Generators have been identified and given notice for Self- Composting. Out of 20 BWGs, 6 BWGs have started their processes. Municipal Publics and Shop Keepers are instructed through issuance of notice and awareness programs done by 9 animators and 2 Supervisors to segregate wastes as Bio – Degradable and Non – Degradable waste being collected at their places. They are also instructed to provide municipal sanitation workers Non – degradable wastes on Wednesday and Bio – degradable on daily basis. As of now, source segregation is being done at 44% of wards and processed at 8.17 square kilometer area of municipal compost yard located at 1stTharvazli where fertilizers are manufacturing by Window Composting method. From the collected 45 tons of garbage, 25 tons of garbage is dumped and processed at Compost yards' existing windrow platforms by which 1500 kg (55.5%) of manure is produced so far. Now, additional Windrow platforms are being constructed by the estimated value of 339.72 lakhs. After completion of these works, all the 45 tons of garbage being collected will be processed into manures by using Windrow composting method. Recently, a proposal of MCC has been submitted for approval to execute in a place at TNHB, ward 11. Under AMRUT Scheme, construction of two parks has been completed in which onsite composting Shed work is going on.

107. **Transportation:** Ambur municipality lies on the Chennai- Bangalore National Highway. The town is at a distance of 200 km from Chennai, 180 km from Bengaluru and 50 km from Vellore. The town is well connected by road and rail with the nearby urban centres. The closest airport is in Chennai at a distance of 200 km, which serves both domestic and International passengers.

F. Socio Cultural Resources

12. Demography

108. According to 2011 census, Ambur has a population of 114,608 with a sex-ratio of 1,033 females for every 1,000 males, much above the national average of 929. A total of 13,235 were under the age of six, constituting 6,716 males and 6,519 females. Scheduled Castes and Scheduled Tribes accounted for 16.83% and 0.57% of the population respectively.

109. The average literacy of the city was 76.08%, compared to the national average of 72.99%. The city had a total of 26,302 households. There were a total of 40,654 workers, comprising 163 cultivators, 519 main agricultural labourers, 982 in household industries, 35,411 other workers, 3,579 marginal workers, 27 marginal cultivators, 174 marginal agricultural labourers, 306 marginal workers in household industries and 3,072 other marginal workers. Ambur has 35.0% Hindus, 60.9% Muslims, 3.8% Christians and 0.3% other religions.

Table 23: Percentage of working population - Ambur

Description	**Worker** (Among total population)	**Main Worker** (Among workers)	**Marginal Worker** (Among workers)	**Non-Worker** (Among total population)
Total	35.5%	32.3%	3.1%	64.5%
Male	55.4%	51.5%	3.8%	44.6%
Female	16.2%	13.8%	2.4%	83.8%

Source: https://indikosh.com/city/680479/ambur

13. History, Culture and Tourism

110. Ambur was in existence from the Pallava period during the 15th and 16th Century, North Arcot district was under control of Vijayanagar. In1687 onwards North Arcot district was brought under the control of the Nawab's of Carnatic. In1749 Nawab Anwaruddin was defeated and killed in Ambur by his rival Chandra Sahib. Haider Ali of Mysore, during his invasion of the Carnatic of 1767 laid seize to Ambur. The British army resumed the seize of Ambur. During the 18th Century Ambur was brought under the control of British. From the above past incidents, through it is known that Ambur was existence since 15th Century. There are no protected or notified movements at present to reveal the past history and perhaps they might have been ruined due to successive held during the past. There are no historical or ASI protected Monuments in the Ambur Municipality.

V. ANALYSIS OF ALTERNATIVES

111. This subproject (Affordable Housing Project for Economically Weaker Sections) is a Greenfield project, hence there are not much alternatives are 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.

112. The "with project scenario" has positive beneficial impacts for Economically Weaker Sections (EWS), the beneficiaries can avail housing loans from Banks, Housing Finance Companies and other such institutions and they are eligible for an interest subsidy at the rate of 6.5% for a tenure of 20 years or during tenure of loan whichever is lower. The Net Present Value (NPV) of the interest subsidy will be calculated at a discount rate of 9 %[8]. The subproject site is screened to avoid any natural disasters including flooding[9], erosion etc. Along with 305 residential units and supporting services, the subproject also proposed to have various infrastructures including (i) Pedestrian Pathway, (ii) Connecting Pathways, (iii) Open Space Reserve (OSR), (iv) Sewage Treatment Plant (131 KLD capacity), (v) Vehicle Parking area and (vi) Play Park. 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 sold 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

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

(i) The subproject is located 850 m off from Chennai Bangalore National Highway (NH 48) and strategically located between Bangalore & Chennai City at distance of about 180 & 200 km (The nearest urban centre is Vellore City 50km).

(ii) The primary access to the subproject site is 9 m. However, it's expected to be widened to 12 m by the Ambur Municipality. The site has secondary access road, which connects the subproject site in the north. Easy access of public transport system as the NH 48 is in close proximity. Also, the Bus Terminal and Ambur Railway station is located at distance of about 2.2km & 2.3km from the subproject site.

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

(iv) The nearest hospital/healthcare facilities and colleges & Schools (Vittal Hospital, Mazharul Uloom College & Mazharul Uloom Higher Secondary School) is located at a distance of about 2.5 km from subproject site.

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

(i) The envisaged development will be first of its kind in Ambur and will have first mover advantage in the region with significant positive impact on the Brand/ Developer profile.

[8] https://mohua.gov.in/upload/uploadfiles/files/5CLSS_EWS_LIG_English_Guidelines_wb.pdf
[9] The project is in the Low-risk Zone for floods according to the BMTPC Flood Hazard Map.

Also, a branded player/ developer with significant credentials along with good facilities & amenities can attract more home seekers.

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

(iii) Couple of land transaction along NH 48 by prominent and local developers for large scale plotted development project, indicating demand for plots for home seekers. The size of Subject Site explores possible options for a good sizable real estate development with high demand for sizable developable land parcel.

115. **Subproject benefits**. The proposed STP will treat the waste water generated from the housing units and has been designed to recycle the treated water for flushing and gardening purposes, which will reduce the actual water demand and have beneficial impacts on the environment (through recycling and reuse). Solar powered street lights 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.

116. As per the current situation, the EWS would not be able to buy a residential unit as per the real estate market price.

117. 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. With the presence of adequate sewerage system in their locality, they also end up suffering from several health complications caused by these unhygienic conditions.

118. 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

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

120. 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.

121. The proposal envisages construction, operation and maintenance of 305 residential units and essential amenities (Pedestrian Pathway, Connecting Pathways, Open Space Reserve (OSR), Sewage Treatment Plant (131 KLD capacity), Vehicle Parking area and Play Park) and hence this would result in some environmental impacts typical to construction activities.

122. 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 Ambur municipality or through private mobile water tankers.

123. **Land Acquisition and Resettlement.** As indicated earlier, the land proposed (5.44 acres) for construction of 305 residential units and associated services belongs to the APPL and hence land acquisition and resettlement issues are not envisaged.

124. **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
- A separate area has been designated (away from the residential blocks) in the layout plan for managing municipal solid waste
- 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.

125. 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

126. **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 Ambur Municipality interms of overall environmental and socioeconomic improvement.

127. 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

128. **Consents, permits, clearances, no objection certificate (NOC),** etc. Necessary consents/NOC as per Table 4 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 APPL and TNIFMC. Failure in obtaining the same will result in the delay of work and may lead to stoppage of works.

129. **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 updated EMP/ 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 (day time 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 environs (Air, Water and Noise).
- 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).

130. **Utilities**. Though the water supply and sewerage drain facilities are provided by the Ambur Municipality, 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

preventunnecessary 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 theproviders/line agencies to relocate the utility.

131. **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.

132. **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.

133. **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.

134. **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, slopeangles, 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.

135. **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

136. 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. However, the prepared EMP (refer to chapter VIII) should be updated as construction EMPs/ site specific EMP, based on the site conditions by the contractor under the supervision of the PMC.

137. **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.

138. 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.

139. **Erosion Hazards**. The subproject site is located in a gentle slope and hence the risk of erosion is moderate to high. However, the contractor will be required to:

- 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 wind-blown 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.
- 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 inspections (Refer **Appendix 6** - Site inspection form) to assess the effectiveness and the maintenance requirements for erosion and sediment control systems.

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

- The subproject site is in a water-scarce area where the use of groundwater is prohibited for construction purposes. Hence, the contractor should arrange for the water, it shall be purchased from the Ambur municipality. The agreement and/or MoU for the same has to be shared with the PMC. For any other arrangements for the source of water, the evidence of the same has to be furnished to the PMC.
- 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 27.
- Use a silt trap for the surface runoff to prevent sediments from entering into 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.

141. **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 27).

142. **Noise and Vibration Impacts**. The site is not located near any archaeological/ heritage buildings. With exemption to piling works, 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 and vibration 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 27.
- Ensure vehicles comply with the Government of India noise limits for vehicles. PUC should be available for every construction equipment and vehicle.

143. **Impacts on Flora and Fauna**. As per the detailed design, tree-cutting is not required. This will be reassessed during the pre-construction phase. Except the Ambur reserve forest, which is located at a distance of 800m to 1km, 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). The Ambur Reserve forest is categorised as Eco-Class IV[10], which has less importance (no major wildlife) among other forest categories. 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.

[10] Consisting of Tropical Thorn Forests and Tropical Dry Evergreen Forests

- 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.

144. **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 negative but short-term and reversible bymitigation 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.

145. **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.

146. **Impact on Associated Infrastructure Facilities**. The estimated water demand of 164KLD of water for 305 residential units shall be supplied by the Ambur municipality. The water will be supplied by connecting to the nearby OHT (located at a distance of 850m), which was constructed under the combined water supply scheme (CWSS) to Vellore with a source of Cauvery River at Mettur dam. During the summer season, when 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 APPL.

147. The sewer line will be provided by the Ambur municipality from the subproject site to the nearby lift/pumping station which is located at a distance of 700m. For both water supply pipeline laying activity and sewer line laying activity shall have direct air and noise impacts to the public.

148. Being an associated activity to this subproject, once detailed design information is available, the PMC environmental specialist shall prepare the EMP in accordance with ADB SPS requirements. Accordingly, this IEE and EMP will need to be revised and submitted to ADB for concurrence. The prepared EMP will need to 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 quarterly safeguard reports to ADB.

D. Post-Construction Impacts and Mitigation Measures

149. **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.

150. **Operation and maintenance activities**. The APPL 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.
    - APPL will carry out routine management of the RWH pits.
- Management of the STP
    - For an initial 5 years, the construction contractor shall maintain and operate the STP. Thereafter a separate Contractor shall be engaged for operation and maintenance of STP. During the operation, 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.
    - APPL 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.
    - APPL will 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 Ambur Municipality, 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 Ambur Municipality for maintenance and operation.

VII. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

A. Consultation and Participation

151. 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

152. 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

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

Table 24: 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	25-05-2023 Project site	Community Person	1		1	• Knowledge of project • Knowledge of Area and its recent development. • Water Availability • Traffic	No major concerns have been noted.
2	25-05-2023 Project site	Worker	1		1	• Current Role • Work Timings and Duration • Issues at work	No major concerns have been noted.

Informal Consultation with the shopkeeper, Mr. Ramesh

Site Team Interaction with Mr. Raj

b) Consultation during Construction

154. 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,). Attendee list and meeting outcomes will be recorded and included in the revised IEE to be submitted to ADB for concurrence.

155. A constant communication will be established with the affected communities to redress the environmental issues likely to surface during construction phase. The contractor will be required to provide public information (in Tamil and English) 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

156. Executive summary of the IEE will be translated in Tamil and 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 as a means 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.

157. 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 REDRESS MECHANISM

158. The APPL will establish the GRC and to ensure that GRM officers and focal points are established within the PMC and Contractor. The majority of complaints will be the responsibility of the APPL and addressed via procedures described in the ESGMS. Records of complaints (refer Appendix 5 – sample grievance form) received and how they are addressed will be maintained by the APPL 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.

159. **Field level**. The Contractor will designate an on-site Grievance Redress Officer (GRO)-1 in consultation with the PMC and APPL. The GRO-1 will receive and record the complaint at the subproject site. 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.

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

161. **Fund level**. If the grievance is not resolved, the grievance will be referred internally to APPL/TNFIMC for TNSF. The grievance at both subproject level and Fund level shall be resolved in 14 days of its receipt.

162. 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.

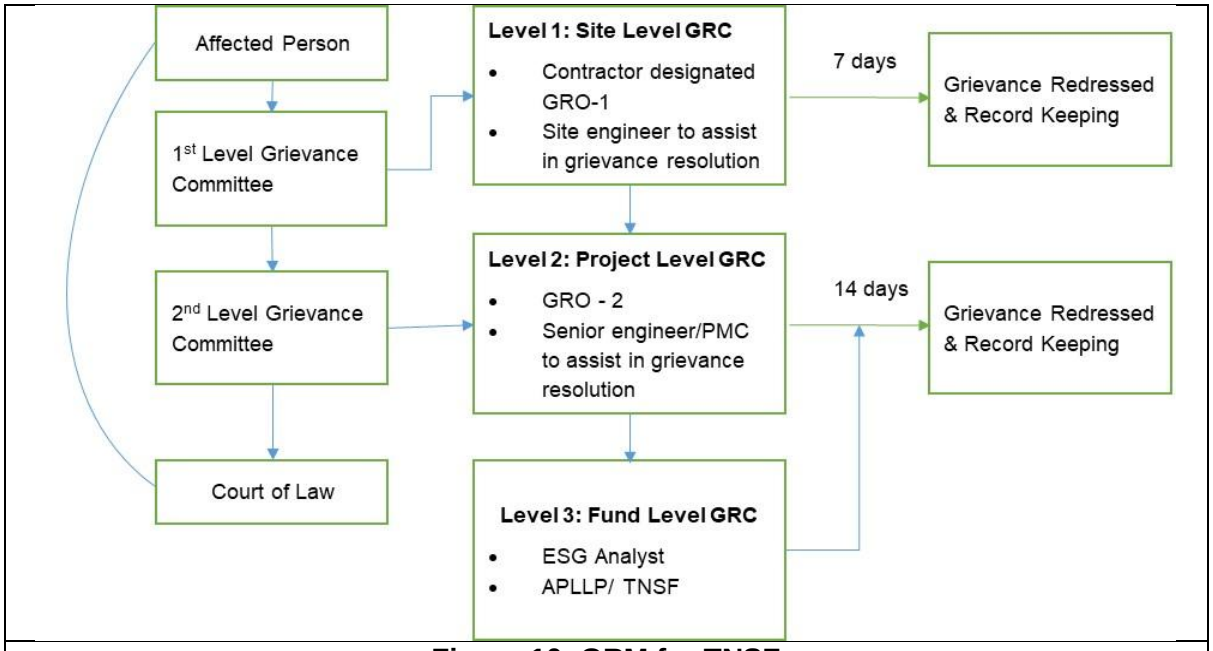


Figure 10: GRM for TNSF

163. **ADB's Accountability Mechanism**. In the event that 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.

164. **Periodic review and documentation of lessons learned**. The PMC and APPL 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.

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

IX. ENVIRONMENTAL MANAGEMENT PLAN

A. Environmental Management Plan

166. 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

167. The EMP will guide environmentally sound practices at the time of construction and operation of the subproject and ensure efficient lines of communication between APPL, 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 include 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.

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

169. As indicated in Chapter III (Description of the project), Water supply and sewer line shall be provided by the Ambur municipality, which shall be considered as an associated activity to this subproject and once enough information is available, the PMC environmental specialist shall prepare the EMP for this activity in accordance with ADB SPS requirements. Accordingly, this IEE and EMP will need to be revised and submitted to ADB for concurrence prior to appointment of the contractors by Ambur municipality. The prepared EMP will need to be adopted by the contractor, who undertakes the pipeline laying works (for both water supply and sewer line), and it shall be monitored and reported by PMC to APPL. The key observations should be reflected in the quarterly safeguard reports to ADB.

170. For civil works, the contractor will be required to (i) carry out all the mitigation and monitoring measures set forth in the approved 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 this IEE and SEMP. The contractor shall allocate budget for compliance with these SEMP measures, requirements and actions. The EMP for various stages of the subproject construction is given in the following table.

Table 25 : Environmental Management Plan 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 Ambur • 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 of Affordable Housing Project at Ambur belongs to Ambur Properties Private Limited (APPL). Hence there are not LA Issues anticipated. • The land is vacant and located in a plain area with a gentle slope towards eastern direction. Hence leveling operations have to be conducted for the construction purpose. By doing so it is anticipated to generate excavated excess earth/ soil (cut and filling), which has to be disposed in an authorized/ identified landfill or disposal area. If the site is a new disposal area, then it has to be approved by the PMC. • There are two trees identified in the project site, which have to be preserved through design considerations or it shall be transplanted to the designated landscaping area.	• List of tree species • Tree cutting permit / permission from the Revenue department • Identification of Disposal site for disposing debris and excavated soil	PMC	APPL
1.2	Lack of sufficient planning to assure long term sustainability of the developments	• In accordance with the provisions in the sub-project selection criteria, the sub- project design shall include adequate provisions for ensuring effective maintenance and protection of the assets created so as to ensure the long-term sustainability of the sites. • The designs will be worked out and implemented in accordance with the provisions. • No construction activity of any kind shall be	• DPR and designs approved from competent authority. • Work plan prepared and approved by PMC	PMC	APPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		taken up in the Open Space Reservation (OSR) area			
1.3	Clearing of trees/ Removal ofvegetation	• All reasonable measures shall be undertaken to ensure that no native fauna is harmed or placed at risk during the course of the clearing activities. • As per the proposed design, felling of trees is not envisaged at any stage of the project. However, under unavoidable conditions if any of the trees are required to be cut/ felled, then prior permission as per existing procedure from Forest / revenue department, ensuring appropriate compensation including compensatory plantation at 1:10 ratio as stipulated by the High Court of Madras (WP No 7811/2010 and MP No 1/2010 dated 25/06/2010).	• Tree count information and compensation ratio	PMC	APPL
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. • Construction activities (including excavation and trenching works) shall be restricted during the monsoon season. • The Contractor shall discuss with the PMC to carryout necessary construction activities in the monsoon season by providing appropriate safety measures to the satisfaction of the PMC.	• Site drainage planto be prepared and applied. • Construction of drains to prevent water logging at site during rains	PMC	APPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
2.2	Consents, permits, clearances, NOCs, etc.	• All the necessary approvals/ permissions/ clearances/ NoC's should be obtained by the APPL and contractor before start of the construction activities. This includes STP design approval from a third party. • Meaningful consultations with communities to keep them informed of anticipated activities and associated impacts	• Refer table 3 and table 4 • Consultation meeting outcomes and records	APPL	PMC
2.4	Selection of materials and construction technologies, if not carefully chosen, will adversely impact the visual appeal of the buildings	• Designs to be worked out in such a manner that exposed steel and concrete structures are avoided. • The design brief for all building components proposed will strictly conform to the APPL requirements. • Any new landscaping elements will only utilize native species to protect local biodiversity	• List of approved quarry sites and source of material • List of trees/ shrubs for landscaping • List of materials to be procured for construction works included in BOQ	PMC	APPL
2.5	Integration of energy efficiency and energy conservation programs indesign of building components	• The detailed designs for the building components shall ensure that environmental sustainability principles, including energy efficiency, resource recycling, waste minimization etc. are integrated, and designs accordingly worked out. • All the electrical and mechanical equipment used in the construction works shall be energy efficient and ISO certified as per BOQ provisions.	• DPR and designs approved from competent authority. • Use of energy efficient and ISO certified equipment in construction works. • PUC for all construction vehicles	PMC	APPL
2.6	Odour / smell from Sewage Treatment Plant, Solid waste collection area	• The detailed design/ layout should have designated STP and the MSW areas, which should be located away from the settlement to prevent the odour nuisance	• DPR and designs approved from competent authority.	PMC	APPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
			• MSW should be collected frequently. • STP should be maintained		
2.7	Noise pollution from the pumps used for lifting water to the OHTs	• Pump house should be located away from the residential blocks	• Regular maintenance is required. • Conducting frequent Noise monitoring	PMC	APPL
2.8	Sourcing of water for construction activities	• Contractors shall purchase water from Ambur municipality or water tankers for the construction activities. The agreement/ MoU has to be shared with the PMC. • Use of groundwater for construction purpose is prohibited. • Water demand during construction should be reduced by the use of premixed concrete, curing agents and other best practices prevalent. • For any other arrangements for the source of water, the evidence for the same has to be furnished to the PMC	• Regular monitoring is required. • Feedback from the local communities	Contractor and PMC	APPL
2.9	Installation of Diesel Generators	• As per the CPCB norms, place the Diesel Generators (DG's) in an acoustic enclosure or other sound insulation. • Place the DG's at least 100 m from the nearest new building for housing Low Sulphur Diesel shall be used for operating diesel generator. • Ensure DG sets comply with the noise standards prescribed by the CPCB	• Standards prescribed by the CPCB. • Conducting frequent noise monitoring	Contractor and PMC	APPL
3.	**Pre-Construction Activities by Contractor**				
3.1	Submission of	• Appoint Environment, Health and Safety	• Unsatisfactory	Contractor and	APPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
	updated EMP/ SEMP; EMP implementation and reporting	Supervisor to ensure EMP implementation. • Submission of updated EMP/ SEMP prior to starting of work, • Timely submission of monthly monitoring 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.	compliance with EMP • Contractor consultation records	PMC	
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 in the Table 3 and Table 4	APPL/Contractor/ PMC	APPL
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/ PMC	APPL

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. • 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	• Location of construction camp approved by PMC. Construction camp having all the basic amenities with proper sanitary conditions drainage and watery supply	Contractor and PMC	APPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		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 done by the concerned municipality for which the contractor should get approval from the Municipality with the assistance from the PMC. • 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 and PMC	APPL
3.6	Establishment of baseline environmental conditions prior to start of civil works	• Conduct documentation of location of components, areas for construction zone (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	Baseline environmental profile including ambient air, noise, water quality as perthe standards indicted in the monitoring plan (Table 27)	Contractor and PMC	APPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		Environmental Monitoring Plan (Table 27)			
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 and PMC	APPL
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 Ambur Municipality • Information on the disposal site should be included in the IEE (update/ revise it accordingly)	• Disposal site selected and approved by PMC. • Records of materials disposed at disposal site. • Logbook maintained for debris disposal	Contractor and PMC	APPL
3.9	Shifting of Utilities	• Identify and include locations and operators of these utilities in the detailed design documents 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	• List showing utilities to be shifted Contingency planfor services disruption	Contractor and PMC	APPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		utility and communicate the dates and duration in advance to affected communities / persons / businesses.			
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. • 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.	Chance find protocol	Contractor and PMC	APPL
3.11	Circulation plan during construction in	• Prior to mobilization and commencement of site activities, contractor has to prepare site	• Site work plan prepared by	Contractor and PMC	APPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
	the densely populated areas	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.	contractor and approved by PMC. • Traffic plan and records of road signage's		
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 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.	• Temporary Traffic management Plan	Contractor and PMC	APPL
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	• Health and safety (H&S) plan	Contractor and PMC	APPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		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 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 and PMC	APPL
3.14	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)	• Community Health and Safety Plan • Contractor consultation records	Contractor and PMC	APPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		during such periods. • Alert communities and residents if nighttime construction work shall occur nearby (no night time 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 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 and PMC	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	• Batching Plants should be kept/ stationed away from residential. • /settlements and at least 300m in the downwind direction from nearby sensitive receptors.	Contractor and PMC	PMC

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		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. • 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	Quarry, borrow areas operations	• If quarry, borrow areas are exclusively opened for the project, contractor shall ensure that they qualify all the legal conditions to operate such areas. • Consent to Operate (CtO) for quarry sites has to be taken from Tamil Nadu Pollution Control Board (TNPCB) and a copy of the same has to be kept in record and submitted in PMC. • The contractor has to comply all the conditions stipulated in the Consent to Operate document. • If contractor purchases the materials from other party, he has to ensure that quarry has obtained the necessary clearance from Tamil Nadu Pollution Control Board (TNPCB) and	• List of approved quarry sites and sources of materials • CtE and CtO certificates obtained by contractors for quarry sites, batching plant and DG sets and submitted to PMC	Contractor and PMC	PMC

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		should take a copy of it and submit in PMC.			
4.4	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 and PMC	PMC
4.5	Soil and water pollution due to storage of fuels, lubricants, construction vehicles and construction wastes	• 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 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	• Proper storage of fuel and lubricants • Impermeable membrane used in flooring of storage yard to prevent soil and water pollution. • Construction waste disposal records • Waste management plan	Contractor and PMC	PMC

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		operation. • Strictly prohibit open defecation by workers in nearby areas			
4.6	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 silt runoff. • Extraneous construction wastes will be transported to the pre-identified disposal site for safe disposal.	• Site fencing • Numbers of Silt traps constructed at site. • Proper drainage system provided at site. • Regular cleaning of drains during rain period	Contractor and PMC	PMC
4.7	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 and PMC	PMC
4.8	Erosion Hazards	• The site has a gentle slope and hence the risk of erosion is anticipated. Hence the Contractor	• Slope stability. • Frequent	Contractor and PMC	PMC

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		will require to: • 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. • 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 6 – site inspection form) to assess the effectiveness and the maintenance requirements for erosion and sediment control systems	monitoring during the piling operation • Monitoring noise and vibration		
4.9	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 and PMC	PMC
4.10	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	• Records of housekeeping • Records of water sprinkling at site • Vehicles carrying excavated soil covered. • AAQ parameters	Contractor and PMC	PMC

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		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 performed as per the Environmental Monitoring Program as indicated in the Table 24.	(Particulate matter (PM_{10} & $PM_{2.5}$), SO_x, NO_x, CO) to be monitored (Table 27)		
4.11	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 metre 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).	• 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 and as set out in Table 27.	Contractor and PMC	PMC

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		• Notwithstanding any other conditions of contract, noise level from any item of plant(s) will comply with the noise standards specified 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			
4.12	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 and PMC	PMC
4.13	Material Handling at	• All workers employed in mixing asphaltic	• Use of proper PPEs	Contractor and	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	PMC	
4.14	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 and PMC	PMC
4.15	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. • 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	• Use of PPEs • Records of PPEs procured and issued for use Compliance of all regulations regarding scaffolding, ladders and work at height	Contractor and PMC	PMC

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		watt flood lights)			
4.16	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 and PMC	PMC
4.17	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 and PMC	PMC
4.18	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 and PMC	PMC
4.19	Influx of migrant workers	• Local labourer's to be given preference for job opportunities and each contractor should be bound by this commitment. • The Contractor has to adopt a Code of Conduct for the migrant labour to resolve any issues with locals. • Ensure labour-related regulations are met.	• Health and safety risks • Chances of spread of sexually transmittable diseases like AIDS. • Water pollution	Contractor and PMC	PMC

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		• In case of hiring outside labour, 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 & Safety Risks due to Transmittable diseases (HIV/AID and COVID-19) / awareness plan		

Table 26 : Environmental Management Plan 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 APPL	APPL
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	APPL	APPL
1.3	Rainwater Harvesting	• Regular inspection and cleaning of catchment,	• Monitoring plan	APPL	APPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
	Pitmanagement	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	during project operation		
1.4	Management of the STP	• APPL will carry out regular maintenance of the STP to prevent any impacts, including pollution of ground water and nearby water courses. • APPL 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 APPL that the treated sewage water disposed (as per 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, which is proposed to be constructed by the Ambur municipality. • 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.	• Proper sanitation and solid waste management	STP service provider through AMC and APPL / Ambur municipality	APPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
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.	• APPL 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 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 the Ambur Municipality. 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. • The transfer of waste will also ensure that no spillage and all wastes will be transported to a designated solid waste treatment site.	Proper sanitation and solid waste management	Ambur Municipality	APPL
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	• Fire extinguisher expiry date. • Emergency preparedness plan • Training records	Contractor (during the DLP) and APPL	APPL

Sl.no	Environmental Issues	Mitigation Measures	Indicators and Targets	Responsibility for Implementation	Responsibility for Supervision
		emergency preparedness to create awareness among the residents			

Table 27: 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 Ambur	(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	Day time and nighttime noise	(i) Once before	Contractor under the

Monitoring Field	Monitoring Location	Monitoring Parameters	Frequency	Responsibility
	locations and sample size including methodology.	levels	start of construction (pre- construction) (ii) Quarterly monitoring (till the project completion).	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.
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.

Table 28 : 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

Monitoringfield	Monitoring location	Monitoring parameters	Frequency	Responsibility
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
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 Ambur Municipality.	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	Ambur municipality under the supervision of PMC (Cost for monitoring should be borne by the APPL)
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)

B. Implementation Arrangements

171. **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.

172. In this subproject APPL shall be supported by Project Monitoring Consultancy Services (PMC) hired by the APPL 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.

173. **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.

174. **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 effective implementation of environmental safeguards procedures, an environmental consultant will be assigned to the environmental team of the 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 updated 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 quarterly 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

175. **Contractor.** Contractor will appoint their own Environment, Health and Safety (EHS) staff for the construction works. The contractor will be required to prepare a site-specific EMP. The contractor will bear the costs of preparing these site- specific plans included in the EMP. 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

176. 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.

177. If the APPL 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 the APPL/PMC 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 to the legal agreements, including

initiating dialogue with the parties concerned to achieve compliance with legal agreements.

178. **Safeguards Training and Capacity Development.** The proposed transaction technical assistance (TRTA) attached to the sector loan will provide capacity building for project implementation. The ESG team and Project Monitoring Consultancy Services (PMC) will be supported through the TRTA for TNSF by the Senior Environment Expert and Senior Social Expert (independent hires).

C. ESGMS Monitoring, Reporting and Disclosure

179. 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 7) on ESGMS implementation and the agreed action plan will be submitted to ADB on a semi-annual basis during project implementation

D. EMP Implementation Cost

180. 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.

181. 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 and included within the bidding and contract documents as separate line items will ensure that the environmental impacts will not be significant or irreversible. An appropriate Environmental Management Budget has been estimated to carry out the monitoring requirements.

182. 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 costs of components for monitoring in operation stage and the capacity building costs are to be funded by the APPL. The EMP cost is given in the Table below.

Table 29: 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

Sl.no	Particulars	Stages	Unit	Total Nos.	Rate (₹)	Amount (₹)
13	Sewage Treatment Plant	131 KLD		1	LS	9500000
14	Water Treatment Plant	164 KLD		1	LS	2500000
15	Solar water heater	500 Lit		10	11000	1100000
16	Solar power system (Roof)	60KW	KW	60		2581175
17	Rainwater harvesting pit	110m @3m	No	36	5000	180000
18	OSR tree planation	1569 m^2		1569	500	784500
19	Solid waste management	244 Kg/day				2000000
20	Water savings nozzles		No	305	1000	305000
21	Permeable Concrete driveway	1113 m^2	m^2	1113	1814	2018982
22	Natural Daylight system		No	34	20000	680000
23	Solar Street Light	15W@10m c/c	No	31	13000	403000
24	Biogas plant food waste	20kg/day	No	2	78000	156000
25	Energy efficient BLDC fan	35w	No	305	3750	1143750
26	LED tube lights	20 w	No	610	500	305000
27	Roof cooling tiles		M^2	1800	600	1080000
					Total	**24919404**

X. CONCLUSION AND RECOMMENDATIONS

183. The proposed subproject is in line with the sub-project selection criteria for the program. The subproject conforms to all GoI and ADB regulations, policies, and standards including all necessary government permits and clearances.

184. During the project construction, possible negative environmental impacts are envisaged. As per the Initial Environmental Examination (IEE), the specific management measures laid down in the EMP 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 provide adequate opportunity towards course correction to address any residual impacts during construction or operation stages.

185. 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 redress in terms of environmental safeguards are known to exist at present.

186. The estimated water demand of 164KLD of water for 305 residential units shall be supplied by the Ambur municipality. The water will be supplied by connecting to the nearby OHT (located at a distance of 850m), which was constructed under the combined water supply scheme (CWSS) to Vellore with a source of Cauvery River at Mettur dam. Similarly, the sewer line shall be provided by the Ambur municipality from the subproject site to the nearby lift/pumping station which is located at a distance of 700m. For both water supply pipeline laying activity and sewer line laying activity shall have direct air and noise impacts to the public. Being an associated activity to this subproject, once detailed design information is available, the PMC environmental specialist shall prepare the EMP in accordance with ADB SPS requirements. Accordingly, this IEE and EMP will need to be revised and submitted to ADB for concurrence.

187. The positive benefit of this project is to provide affordable 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.

188. 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:	India/ Affordable Housing Project for Economically Weaker Sections by Ambur Properties Private Limited, Ambur, 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 Ambur Plantation RF Village, Ambur taluk, Vellore district, Tamil Nadu. The project area is at present uninhabited.
• Heavy with development activities?		**X**	The project location is in Ambur taluka and there is not a lot of development in the surrounding areas with all the buildings being constructed less than G+4 floors.
• Adjacent to or within any environmentally sensitive areas?			
○ Cultural heritage site		**X**	The nearest cultural heritage site is Jalakanteshwar Temple, Vellore that is located approximately 45 km from the project site.
○ Protected Area		**X**	There are no protected areas near the project site. Cauvery North wildlife 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 102 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**	Cauvery North wildlife 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 102 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 305 units of different typologies in a G+4 structure. The project will generate municipal solid waste during the construction phase. In order to reduce the impacts, 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 Masjid E Umar that is located approximately 0.36 km 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**	No 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 will be sourced from the municipality. Therefore, there will not be any adverse impact on the water availability in the project area.
• Air pollution due to urban	**X**		This is anticipated during construction

emissions?			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 will be utilized for the transportation of material and personnel during 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 total water requirement for the proposed housing facility will be sourced from the municipality. Therefore, there will not be any adverse impact on the water availability in the project area.
• Contamination of surface and ground waters due to improper waste disposal?		X	The pollution preventive and control measures as mentioned in CtO will be applied and will comply with prescribed statutory norms. The wastewater shall be discharged to the municipal sewer line. The developer shall submit an application to the Vellore Municipality for a sewer connection. There will be no contamination of surface and ground water due to waste disposal.
• Pollution of receiving waters resulting in amenity losses, fisheries and marine resource depletion, and health problems?		X	This is not anticipated. The project site is not near receiving bodies of water used for livelihood activities or drinking water 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 municipal/tankers. The wastewater shall be discharged to the municipal sewer line. The developer shall submit an application to the Vellore Municipality for a sewer connection.
• 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	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

community throughout project construction, operation and decommissioning?			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	India/ Tamil Nadu, APLLP's Affordable Housing Facility for Women (Site: Ambur Plantation R F Village District: Vellore)
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: Water Quality Monitoring (Municipal water source)

Hubert Enviro Care Systems (P) Ltd.
18, 92nd Street, Ashok Nagar,
Chennai - 600 083.
Ph: 42985555 Fax : 42985500
E-mail : labsales@hecs.in

Laboratory Services Division
(Chemical & Biological Testing)
Recognized by MoEF, BIS
FSSAI Notified Laboratory
ISO 9001, 14001 & OHSAS 18001 Certified.

TEST REPORT

Name of the Client : **M/s. Sree Shyam Sayi Corporation Pvt Ltd**
Address of the Client : **No.3, 2nd Street, Subba Rao Avenue, College Road, Chennai -600006**
Report No. : **HECSL/WT/001/130221**
Report Date : **20/02/2021**

Sample Description : **WATER**
Sample Mark : **Drinking Water**
Sample Drawn By : **Client**
Sampling/received Date : **12/02/2021 -12/02/2021**
Analysis Commenced On : **13/02/2021**
Completed On : **19/02/2021**

S.No.	Parameters	Units	Results	Test Method	IS:10500-2012	
					Acceptable Limits	Permissible Limits
1	pH (at 25 °C)	-	8.03	IS 3025 (Part - 11):1983	6.5 - 8.5	No relaxation
2	Colour	Hazen Unit	BLQ(LOQ:1.0)	IS 3025(Part - 4):1983	5	15
3	Turbidity	NTU	0.4	IS 3025(Part - 10):1984	1	5
4	Odour	-	Agreeable	IS 3025 (Part - 5):1983	Agreeable	Agreeable
5	Taste	-	Agreeable	IS 3025 (Part - 8):1984	Agreeable	Agreeable
6	Total Hardness as CaCO3	mg/l	125.0	IS 3025 (Part - 21):1983	200	600
7	Calcium as Ca	mg/l	30.06	IS 3025 (Part - 40):1991	75	200
8	Total Alkalinity as CaCO3	mg/l	135.0	IS 3025 (Part - 23):1986	200	600
9	Chloride as Cl	mg/l	39.19	4500 Cl -- B APHA 23rd Edn: 2017	250	1000
10	Residual free Chlorine	mg/l	BLQ(LOQ:0.1)	IS 3025 (Part - 26):1986	0.2	1
11	Magnesium as Mg	mg/l	12.15	IS 3025 (Part - 46) 1994	30	100
12	Total Dissolved Solids	mg/l	214.0	IS 3025(Part -16):1984	500	2000
13	Sulphate as SO4	mg/l	11.19	IS 3025(Part - 24):1986	200	400
14	Fluoride	mg/l	BLQ(LOQ:0.2)	IS 3025 (Part - 60):1986	1.0	1.5
15	Nitrate as NO3	mg/l	2.6	IS 3025 (Part 34): 1988	45	No Relaxation
16	Iron as Fe	mg/l	0.027	IS 3025 (Part - 53):2003	1.0	No Relaxation
17	Aluminium as Al	mg/l	BLQ(LOQ:0.03)	IS 3025 (Part - 55):2003	0.03	0.2
18	Boron as B	mg/l	BLQ(LOQ:0.1)	IS:3025 (Part - 57):2005	0.5	1.0
19	Phenolic compounds as C6H5OH	mg/l	BLQ(LOQ:0.001)	APHA 23rd edition (Method 5530C): 2017	0.001	0.002
20	Anionic Detergents as MBAS	mg/l	BLQ(LOQ:0.05)	Annex K of IS 13428-2005	0.2	1.0
21	Zinc as Zn	mg/l	BLQ(LOQ 0.1)	USEPA Method 200.8:1994	5	15

HUBERT ENVIRO CARE SYSTEMS (P) LTD. Chennai 600 083

Authorized Signatory

S. Ravi
Vice President (Labs)

1. The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization 2. Samples are not drawn by HECS unless or otherwise mentioned 3. Unless specifically requested by customer the test items will not be retained more than 15 days from the date of issue of test report. 4. Under no circumstances lab accepts any liability or loss / damage caused by use or misuse of test report after invoicing or issue of test report. 5. The test results relate only to the test items. 6. # not under scope of accreditation.

HECS/Q/FMT/50

Hubert Enviro Care Systems (P) Ltd.
18, 92nd Street, Ashok Nagar,
Chennai - 600 083.
Ph: 42985555 Fax : 42985500
E-mail : labsales@hecs.in

Laboratory Services Division
(Chemical & Biological Testing)
Recognized by MoEF, BIS
FSSAI Notified Laboratory
ISO 9001, 14001 & OHSAS 18001 Certified.

TEST REPORT

Name of the Client : **M/s. Sree Shyam Sayi Corporation Pvt Ltd** Report No. : **HECSL/WT/001/130221**
Address of the Client : **No.3, 2nd Street, Subba Rao Avenue, College Road, Chennai -600006** Report Date : **20/02/2021**

Sample Description : **WATER**
Sample Mark : **Drinking Water**
Sample Drawn By : **Client**
Sampling/received Date : **12/02/2021 -12/02/2021**
Analysis Commenced On : **13/02/2021** Completed On : **19/02/2021**

S.No.	Parameters	Units	Results	Test Method	IS:10500-2012	
					Acceptable Limits	Permissible Limits
22	Chromium as Cr	mg/l	BLQ(LOQ 0.01)	USEPA Method 200.8:1994	0.05	No Relaxation
23	Copper as Cu	mg/l	BLQ(LOQ 0.01)	USEPA Method 200.8:1994	0.05	1.5
24	Manganese as Mn	mg/l	BLQ(LOQ:0.05)	USEPA Method 200.8:1994	0.1	0.3
25	Cadmium as Cd	mg/l	BLQ(LOQ0.001)	USEPA Method 200.8:1994	0.003	No Relaxation
26	Lead as Pb	mg/l	BLQ(LOQ0.005)	USEPA Method 200.8:1994	0.01	No Relaxation
27	Selenium as Se	mg/l	BLQ(LOQ0.005)	USEPA Method 200.8:1994	0.01	No Relaxation
28	Arsenic as As	mg/l	BLQ(LOQ0.005)	USEPA Method 200.8:1994	0.01	0.05
29	Mercury as Hg	mg/l	BLQ(LOQ0.0005)	USEPA Method 200.8:1994	0.001	No Relaxation
30	Mineral Oil	mg/l	BLQ(LOQ 0.5)	IS 3025 (Part39):1991	0.5	No Relaxation
31	Sulphide as S2-	mg/l	BLQ(LOQ:0.04)	IS3025 (Part - 29):1986	0.05	No Relaxation
32	Nickel	mg/l	BLQ(LOQ 0.01)	USEPA Method 200.8:1994	0.02	No Relaxation
33	Ammonia as NH3	mg/l	BLQ(LOQ:0.02)	IS 3025 (Part - 34) 1982	0.5	No Relaxation
34	Barium as Ba	mg/l	0.059	USEPA Method 200.8:1994	0.7	No Relaxation
35	Silver as Ag	mg/l	BLQ(LOQ0.001)	USEPA Method 200.8:1994	0.1	No Relaxation
36	Chloramines	mg/l	BLQ(LOQ:0.1)	IS 3025 (Part - 26):1986	4.0	No Relaxation
37	Molybdenum	mg/l	BLQ(LOQ 0.01)	USEPA Method 200.8:1994	0.07	No Relaxation
38	Cyanide	mg/l	BLQ(LOQ:0.01)	IS 3025 (Part-27):1986	0.05	No Relaxation
39	Polychlorinated Biphenyls	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.5:1995	0.0005	No Relaxation
40	**Pesticides**					
	Alpha HCH	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.00001	No Relaxation
	Beta HCH	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.00004	No Relaxation
	Gama HCH (Lindane)	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.002	No Relaxation

HUBERT ENVIRO CARE SYSTEMS (P) LTD. Chennai 600 083

Authorized Signatory
S. Ravi
Vice President (Labs)

1. The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization 2. Samples are not drawn by HECS unless or otherwise mentioned 3. Unless specifically requested by customer the test items will not be retained more than 15 days from the date of issue of test report. 4. Under no circumstances lab accepts any liability or loss / damage caused by use or misuse of test report after invoicing or issue of test report. 5. The test results relate only to the test items. 6. # not under scope of accreditation.

Hubert Enviro Care Systems (P) Ltd.
18, 92nd Street, Ashok Nagar,
Chennai - 600 083.
Ph: 42985555 Fax : 42985500
E-mail : labsales@hecs.in

Laboratory Services Division
(Chemical & Biological Testing)
Recognized by MoEF, BIS
FSSAI Notified Laboratory
ISO 9001, 14001 & OHSAS 18001 Certified.

TEST REPORT

Name of the Client : **M/s. Sree Shyam Sayi Corporation Pvt Ltd**
Address of the Client : **No.3, 2nd Street, Subba Rao Avenue, College Road, Chennai -600006**

Report No. : **HECSL/WT/001/130221**
Report Date : **20/02/2021**

Sample Description : **WATER**
Sample Mark : **Drinking Water**
Sample Drawn By : **Client**
Sampling/received Date : **12/02/2021 -12/02/2021**
Analysis Commenced On : **13/02/2021**
Completed On : **19/02/2021**

S.No.	Parameters	Units	Results	Test Method	IS:10500-2012	
					Acceptable Limits	Permissible Limits
	Delta HCH	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.00004	No Relaxation
	Alpha Endosulfan	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.0004	No Relaxation
	Beta Endosulphan	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.0004	No Relaxation
	Endosulfansulphate	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.0004	No Relaxation
	Butachlor	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.125	No Relaxation
	Alachor	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.02	No Relaxation
	Atrazine	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.002	No Relaxation
	Aldrin	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.00003	No Relaxation
	Dieldrin	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.00003	No Relaxation
	Monocrotophos	mg/l	BLQ(LOQ0.00001)	USEPA Method 8321B:2007	0.001	No Relaxation
	Ethion	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.003	No Relaxation
	Phorate	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.002	No Relaxation
	2,4-D	mg/l	BLQ(LOQ0.00001)	USEPA Method 8321B:2007	0.03	No Relaxation
	Isoproturon	mg/l	BLQ(LOQ0.00001)	USEPA Method 8321B:2007	0.009	No Relaxation
	Methyl Parathion	mg/l	BLQ(LOQ0.00001)	USEPA Method 8321B:2007	0.0003	No Relaxation
	Malathion	mg/l	BLQ(LOQ0.00001)	USEPA Method 8321B:2007	0.190	No Relaxation
	Chlorpyriphos	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.03	No Relaxation
	Naphthlane	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Phenathrene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Benzo(a)Anthrazene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Indeo(123-ed),pyrene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA

HUBERT ENVIRO CARE SYSTEMS (P) LTD. Chennai 600 083

Authorized Signatory
S. Ravi
Vice President (Labs)

Hubert Enviro Care Systems (P) Ltd.
18, 92nd Street, Ashok Nagar,
Chennai - 600 083.
Ph: 42985555 Fax : 42985500
E-mail : labsales@hecs.in

Laboratory Services Division
(Chemical & Biological Testing)
Recognized by MoEF, BIS
FSSAI Notified Laboratory
ISO 9001, 14001 & OHSAS 18001 Certified.

TEST REPORT

Name of the Client : **M/s. Sree Shyam Sayi Corporation Pvt Ltd**
Address of the Client : **No.3, 2nd Street, Subba Rao Avenue, College Road, Chennai -600006**

Report No. : **HECSL/WT/001/130221**
Report Date : **20/02/2021**

Sample Description : **WATER**
Sample Mark : **Drinking Water**
Sample Drawn By : **Client**
Sampling/received Date : **12/02/2021 -12/02/2021**
Analysis Commenced On : **13/02/2021**
Completed On : **19/02/2021**

S.No.	Parameters	Units	Results	Test Method	IS:10500-2012	
					Acceptable Limits	Permissible Limits
	Benzo(ghi)pyrene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Benzo (B) Fluoranthene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Benzo (K) Fluoranthene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Chrysene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Fluoranthene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Fluorene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Acenaphthene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Acenaphthylene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Anthracene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Benzo(a) Pyrenees	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Dibenz[a,h]anthracene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Pyrene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	4,4' DDE	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	4,4' DDD	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Paraoxon Methyl	mg/l	BLQ(LOQ0.00001)	USEPA Method 8321B:2007	NA	NA
	Malaoxon	mg/l	BLQ(LOQ0.00001)	USEPA Method 8321B:2007	NA	NA
	Phorate Sulfone	mg/l	BLQ(LOQ0.00001)	USEPA Method 8321B:2007	NA	NA
	Phorate Sulfoxide	mg/l	BLQ(LOQ0.00001)	USEPA Method 8321B:2007	NA	NA
	2,4-DDD	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	2,4-DDE	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	2,4-DDT	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	4,4-DDT	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA

HUBERT ENVIRO CARE SYSTEMS (P) LTD. Chennai 600 083

Authorized Signatory
S. Ravi
Vice President (Labs)

X

Hubert Enviro Care Systems (P) Ltd.
18, 92nd Street, Ashok Nagar,
Chennai - 600 083.
Ph: 42985555 Fax : 42985500
E-mail : labsales@hecs.in

Laboratory Services Division
(Chemical & Biological Testing)
Recognized by MoEF, BIS
FSSAI Notified Laboratory
ISO 9001, 14001 & OHSAS 18001 Certified.

TEST REPORT

Name of the Client : **M/s. Sree Shyam Sayi Corporation Pvt Ltd** Report No. : **HECSL/WT/001/130221**
Address of the Client : **No.3, 2nd Street, Subba Rao Avenue, College Road, Chennai -600006** Report Date : **20/02/2021**

Sample Description : **WATER**
Sample Mark : **Drinking Water**
Sample Drawn By : **Client**
Sampling/received Date : **12/02/2021 -12/02/2021**
Analysis Commenced On : **13/02/2021** Completed On : **19/02/2021**

S.No.	Parameters	Units	Results	Test Method	IS:10500-2012	
					Acceptable Limits	Permissible Limits
41	**Trihalomethanes**					
	Dibromochloromethane	mg/l	BLQ(LOQ 0.05)	APHA 6232 23rd Edn: 2017	0.1	No Relaxation
	Bromodichloromethane	mg/l	BLQ(LOQ 0.05)	APHA 6232 23rd Edn: 2017	0.06	No Relaxation
	Chloroform	mg/l	BLQ(LOQ 0.05)	APHA 6232 23rd Edn: 2017	0.2	No Relaxation
	Bromoform	mg/l	BLQ(LOQ 0.05)	APHA 6232 23rd Edn: 2017	0.1	No Relaxation
42	Total Suspended Solids	mg/l	2.0	IS 3025(Part -17):1984	NA	NA

Note :- BLQ - Below the Limit of Quantification, LOQ- Limit of Quantification, NTU- Nephelometric Turbidity Unit, mg/l- Milligrams per litre, NA –Not Applicable.

End of Report

HUBERT ENVIRO CARE SYSTEMS (P) LTD. Chennai 600 083

Authorized Signatory

S. Ravi
Vice President (Labs)

Hubert Enviro Care Systems (P) Ltd.
18, 92nd Street, Ashok Nagar,
Chennai - 600 083.
Ph: 42985555 Fax : 42985500
E-mail : labsales@hecs.in

Laboratory Services Division
(Chemical & Biological Testing)
Recognized by MoEF, BIS
FSSAI Notified Laboratory
ISO 9001, 14001 & OHSAS 18001 Certified.

TEST REPORT

Name of the Client : **M/s. Sree Shyam Sayi Corporation Pvt Ltd** Report No. : **HECSL/WT/001/130221**
Address of the Client : **No.3, 2nd Street, Subba Rao Avenue, College Road, Chennai -600006** Report Date : **20/02/2021**

Sample Description : **WATER**
Sample Mark : **Drinking Water**
Sample Drawn By : **Client**
Sampling/received Date : **12/02/2021 -12/02/2021**
Analysis Commenced On : **13/02/2021** Completed On : **19/02/2021**

S.No.	Parameters	Units	Results	Test Method	IS:10500-2012	
					Acceptable Limits	Permissible Limits
41	**Trihalomethanes**					
	Dibromochloromethane	mg/l	BLQ(LOQ 0.05)	APHA 6232 23rd Edn: 2017	0.1	No Relaxation
	Bromodichloromethane	mg/l	BLQ(LOQ 0.05)	APHA 6232 23rd Edn: 2017	0.06	No Relaxation
	Chloroform	mg/l	BLQ(LOQ 0.05)	APHA 6232 23rd Edn: 2017	0.2	No Relaxation
	Bromoform	mg/l	BLQ(LOQ 0.05)	APHA 6232 23rd Edn: 2017	0.1	No Relaxation
42	Total Suspended Solids	mg/l	2.0	IS 3025(Part -17):1984	NA	NA

Note :- BLQ - Below the Limit of Quantification, LOQ- Limit of Quantification, NTU- Nephelometric Turbidity Unit, mg/l- Milligrams per litre, NA –Not Applicable.

End of Report

HUBERT ENVIRO CARE SYSTEMS (P) LTD. Chennai 600 083

Authorized Signatory
S. Ravi
Vice President (Labs)

Water Quality Monitoring (Well water subproject site)

Hubert Enviro Care Systems (P) Ltd.
18, 92nd Street, Ashok Nagar,
Chennai - 600 083.
Ph: 42985555 Fax : 42985500
E-mail : labsales@hecs.in

TC-5786

Laboratory Services Division
(Chemical & Biological Testing)
Recognized by MoEF, BIS
FSSAI Notified Laboratory
ISO 9001, 14001 & 45001 Certified.

TEST REPORT

Name of the Client : M/s. Ambur Properties LLP.,
Address of the Client : No. 52/2, Kottai Bunglow Street, Oomar Road, Ambur, Tirupattur - 635 802.

Report No. : HECSL/WT/005/080723
Report Date : 14/07/2023

Location of Site : TS No:10/1, 02nd Tharvazhi Road, Ambur
Sample Description : WATER
Sample Mark : Drinking Water
Sample Drawn By : Client
Sampling/received Date : 08/07/2023 -08/07/2023
Analysis Commenced On : 08/07/2023
Completed On : 12/07/2023
ULR No. : TC578623000003892F

S.No.	Parameters	Units	Results	Test Method	IS:10500-2012	
					Acceptable Limits(Max)	Permissible Limits(Max)
1	pH (at 25 °C)	-	7.48	IS 3025 (Part - 11):2022	6.5 - 8.5	No relaxation
2	Fluoride	mg/l	0.43	IS 3025 (Part - 60):2008	1.0	1.5
3	Colour	Hazen Unit	BLQ(LOQ:1.0)	IS 3025(Part - 4):2021	5	15
4	Turbidity	NTU	1.3	IS 3025(Part - 10):1984	1	5
5	Odour	-	Agreeable	IS 3025 (Part - 5):2018	Agreeable	Agreeable
6	Taste	-	Agreeable	IS 3025 (Part - 8):1984	Agreeable	Agreeable
7	Total Hardness as CaCO3	mg/l	370.0	IS 3025 (Part - 21):2009	200	600
8	Calcium as Ca	mg/l	88.17	IS 3025 (Part - 40):1991	75	200
9	Total Alkalinity as CaCO3	mg/l	470.0	IS 3025 (Part - 23):1986	200	600
10	Chloride as Cl	mg/l	173.2	4500 Cl --- B APHA 23rd Edn: 2017	250	1000
11	Residual free Chlorine	mg/l	BLQ(LOQ:0.1)	IS 3025 (Part - 26):1986	0.2	1
12	Magnesium as Mg	mg/l	36.45	IS 3025 (Part - 46) 1994	30	100
13	Total Dissolved Solids	mg/l	891.0	IS 3025(Part -16):1984	500	2000
14	Sulphate as SO4	mg/l	125.1	IS 3025(Part - 24)Sec 1:2022	200	400
15	Nitrate as NO3	mg/l	2.45	IS 3025 (Part 34) Sec 3: 2021	45	No Relaxation
16	Iron as Fe	mg/l	0.069	IS 3025 (Part - 53):2003	1.0	No Relaxation
17	Aluminium as Al	mg/l	BLQ(LOQ 0.03)	IS 3025 (Part - 55):2003	0.03	0.2
18	Phenolic compounds as C6H5OH	mg/l	BLQ(LOQ:0.001)	APHA 23rd edition (Method 5530C): 2017	0.001	0.002
19	Zinc as Zn	mg/l	BLQ(LOQ 0.1)	USEPA Method 200.8:1994	5	15
20	Chromium as Cr	mg/l	BLQ(LOQ 0.01)	USEPA Method 200.8:1994	0.05	No Relaxation
21	Copper as Cu	mg/l	BLQ(LOQ 0.01)	USEPA Method 200.8:1994	0.05	1.5
22	Manganese as Mn	mg/l	BLQ(LOQ:0.05)	USEPA Method 200.8:1994	0.1	0.3
23	Cadmium as Cd	mg/l	BLQ(LOQ0.001)	USEPA Method 200.8:1994	0.003	No Relaxation

HUBERT ENVIRO CARE SYSTEMS (P) LTD. Chennai 600 083

Authorized Signatory
J.MOHANA RANGAN
Section Head -Instrumentation

1. The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization 2. Samples are not drawn by HECS unless or otherwise mentioned 3. Unless specifically requested by customer the test items will not be retained more than 15 days from the date of issue of test report. 4. Under no circumstances lab accepts any liability or loss / damage caused by use or misuse of test report after invoicing or issue of test report. 5. The test results relate only to the test items. 6. HECS will not be responsible for the information shared by clients related to samples tested.

HECS/Q/FMT/50

Hubert Enviro Care Systems (P) Ltd.
18, 92nd Street, Ashok Nagar,
Chennai - 600 083.
Ph: 42985555 Fax : 42985500
E-mail : labsales@hecs.in

TC-5786

Laboratory Services Division
(Chemical & Biological Testing)
Recognized by MoEF, BIS
FSSAI Notified Laboratory
ISO 9001, 14001 & 45001 Certified.

TEST REPORT

Name of the Client : **M/s. Ambur Properties LLP.,**
Address of the Client : **No. 52/2, Kottai Bunglow Street, Oomar Road, Ambur, Tirupattur - 635 802.**

Report No. : **HECSL/WT/005/080723**
Report Date : **14/07/2023**

Location of Site : **TS No:10/1, 02nd Tharvazhi Road, Ambur**
Sample Description : **WATER**
Sample Mark : **Drinking Water**
Sample Drawn By : **Client**
Sampling/received Date : **08/07/2023 -08/07/2023**
Analysis Commenced On : **08/07/2023**
Completed On : **12/07/2023**

ULR No. : TC578623000003892F

S.No.	Parameters	Units	Results	Test Method	IS:10500-2012	
					Acceptable Limits(Max)	Permissible Limits(Max)
24	Lead as Pb	mg/l	BLQ(LOQ0.005)	USEPA Method 200.8:1994	0.01	No Relaxation
25	Selenium as Se	mg/l	BLQ(LOQ0.005)	USEPA Method 200.8:1994	0.01	No Relaxation
26	Arsenic as As	mg/l	BLQ(LOQ0.005)	USEPA Method 200.8:1994	0.01	No Relaxation
27	Mercury as Hg	mg/l	BLQ(LOQ0.0005)	USEPA Method 200.8:1994	0.001	No Relaxation
28	Mineral Oil	mg/l	BLQ(LOQ 0.5)	IS 3025 (Part39):1991	0.5	No Relaxation
29	Sulphide as S2-	mg/l	BLQ(LOQ:0.04)	IS3025 (Part - 29):1986	0.05	No Relaxation
30	Boran	mg/l	BLQ(LOQ:0.1)	IS:3025 (Part - 57):2021	0.5	2.4
31	Nickel	mg/l	BLQ(LOQ 0.01)	USEPA Method 200.8:1994	0.02	No Relaxation
32	Ammonia as NH3	mg/l	BLQ(LOQ:0.02)	IS 3025(Part - 34)Sec 2:2021	0.5	No Relaxation
33	Silver as Ag	mg/l	BLQ(LOQ	USEPA Method 200.8:1994	0.1	No Relaxation
34	Chloramines	mg/l	BLQ(LOQ:0.1)	IS 3025 (Part - 26):1986	4.0	No Relaxation
35	Molybdenum	mg/l	BLQ(LOQ 0.01)	USEPA Method 200.8:1994	0.07	No Relaxation
36	Polychlorinated Biphenyls	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.5:1995	0.0005	No Relaxation
37	Barium as Ba	mg/l	BLQ(LOQ:0.01)	USEPA Method 200.8:1994	0.7	No Relaxation
38	Cyanide	mg/l	BLQ(LOQ:0.01)	IS 3025(Part - 27)Sec 1:2021	0.05	No Relaxation
39	Anionic Detergents as MBAS	mg/l	BLQ(LOQ:0.05)	APHA 23rd edition (Method 5540C):2017	0.2	1.0
40	**Pesticides**					
	Alpha HCH	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.00001	No Relaxation
	Beta HCH	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.00004	No Relaxation
	Gama HCH (Lindane)	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.002	No Relaxation
	Delta HCH	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.00004	No Relaxation
	Alpha Endosulfan	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.0004	No Relaxation

HUBERT ENVIRO CARE SYSTEMS (P) LTD. Chennai 600 083

Authorized Signatory
J.MOHANA RANGAN
Section Head -Instrumen

Hubert Enviro Care Systems (P) Ltd.
18, 92nd Street, Ashok Nagar,
Chennai - 600 083.
Ph: 42985555 Fax : 42985500
E-mail : labsales@hecs.in

TC-5786

Laboratory Services Division
(Chemical & Biological Testing)
Recognized by MoEF, BIS
FSSAI Notified Laboratory
ISO 9001, 14001 & 45001 Certified.

TEST REPORT

Name of the Client : **M/s. Ambur Properties LLP.,**
Address of the Client : **No. 52/2, Kottai Bunglow Street, Oomar Road, Ambur, Tirupattur - 635 802.**

Report No. : **HECSL/WT/005/080723**
Report Date : **14/07/2023**

Location of Site : **TS No:10/1, 02nd Tharvazhi Road, Ambur**
Sample Description : **WATER**
Sample Mark : **Drinking Water**
Sample Drawn By : **Client**
Sampling/received Date : **08/07/2023 -08/07/2023**
Analysis Commenced On : **08/07/2023**
Completed On : **12/07/2023**
ULR No. : TC578623000003892F

S.No.	Parameters	Units	Results	Test Method	IS:10500-2012	
					Acceptable Limits(Max)	Permissible Limits(Max)
	Beta Endosulphan	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.0004	No Relaxation
	Endosulfansulphate	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.0004	No Relaxation
	Butachlor	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.125	No Relaxation
	Alachor	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.02	No Relaxation
	Atrazine	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.002	No Relaxation
	Aldrin	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.00003	No Relaxation
	Dieldrin	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.00003	No Relaxation
	Monocrotophos	mg/l	BLQ(LOQ0.00001)	USEPA Method 8321B:2007	0.001	No Relaxation
	Ethion	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.003	No Relaxation
	Phorate	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.002	No Relaxation
	2,4-D	mg/l	BLQ(LOQ0.00001)	USEPA Method 8321B:2007	0.03	No Relaxation
	Isoproturon	mg/l	BLQ(LOQ0.00001)	USEPA Method 8321B:2007	0.009	No Relaxation
	Methyl Parathion	mg/l	BLQ(LOQ0.00001)	USEPA Method 8321B:2007	0.0003	No Relaxation
	Malathion	mg/l	BLQ(LOQ0.00001)	USEPA Method 8321B:2007	0.190	No Relaxation
	Chlorpyriphos	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.03	No Relaxation
	4,4' DDE	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.001	No Relaxation
	4,4' DDD	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.001	No Relaxation
	Paraoxon Methyl	mg/l	BLQ(LOQ0.00001)	USEPA Method 8321B:2007	NA	NA
	Malaoxon	mg/l	BLQ(LOQ0.00001)	USEPA Method 8321B:2007	NA	NA
	Phorate Sulfone	mg/l	BLQ(LOQ0.00001)	USEPA Method 8321B:2007	NA	NA
	Phorate Sulfoxide	mg/l	BLQ(LOQ0.00001)	USEPA Method 8321B:2007	NA	NA

HUBERT ENVIRO CARE SYSTEMS (P) LTD. Chennai 600 083

Authorized Signatory

J.MOHANA RANGA
Section Head -Instrumen

Hubert Enviro Care Systems (P) Ltd.
18, 92nd Street, Ashok Nagar,
Chennai - 600 083.
Ph: 42985555 Fax : 42985500
E-mail : labsales@hecs.in

TC-5786

Laboratory Services Division
(Chemical & Biological Testing)
Recognized by MoEF, BIS
FSSAI Notified Laboratory
ISO 9001, 14001 & 45001 Certified.

TEST REPORT

Name of the Client : **M/s. Ambur Properties LLP.,**
Address of the Client : **No. 52/2, Kottai Bunglow Street, Oomar Road, Ambur, Tirupattur - 635 802.**

Report No. : **HECSL/WT/005/080723**
Report Date : **14/07/2023**

Location of Site : **TS No:10/1, 02nd Tharvazhi Road, Ambur**
Sample Description : **WATER**
Sample Mark : **Drinking Water**
Sample Drawn By : **Client**
Sampling/received Date : **08/07/2023 -08/07/2023**
Analysis Commenced On : **08/07/2023**

Completed On : **12/07/2023**

ULR No. : **TC578623000003892F**

S.No.	Parameters	Units	Results	Test Method	IS:10500-2012	
					Acceptable Limits(Max)	Permissible Limits(Max)
	2,4-DDD	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.001	No Relaxation
	2,4-DDE	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.001	No Relaxation
	2,4-DDT	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.001	No Relaxation
	4,4-DDT	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	0.001	No Relaxation
41	**PAH**					
	Benzo(ghi)pyrene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Benzo (B) Fluoranthene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Benzo (K) Fluoranthene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Chrysene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Fluoranthene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Fluorene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Acenaphthene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Acenaphthylene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Anthracene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Benzo(a) Pyrenees	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Dibenz[a,h]anthracene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Pyrene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Naphthlane	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Phenathrene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Benzo(a)Anthrazene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Indeo(123-ed),pyrene	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2:1995	NA	NA
	Polyneuclear Aromatic Hydrocarbons	mg/l	BLQ(LOQ0.00001)	USEPA Method 525.2 : 1995	0.0001	No Relaxation

HUBERT ENVIRO CARE SYSTEMS (P) LTD. Chennai 600 083

Authorized Signatory

J.MOHANA RANGA
Section Head -Instrumen

Hubert Enviro Care Systems (P) Ltd.
18, 92nd Street, Ashok Nagar,
Chennai - 600 083.
Ph: 42985555 Fax : 42985500
E-mail : labsales@hecs.in

TC-5786

Laboratory Services Division
(Chemical & Biological Testing)
Recognized by MoEF, BIS
FSSAI Notified Laboratory
ISO 9001, 14001 & 45001 Certified.

TEST REPORT

Name of the Client : **M/s. Ambur Properties LLP.,**
Address of the Client : **No. 52/2, Kottai Bunglow Street, Oomar Road, Ambur, Tirupattur - 635 802.**

Report No. : **HECSL/WT/005/080723**
Report Date : **14/07/2023**

Location of Site : **TS No:10/1, 02nd Tharvazhi Road, Ambur**
Sample Description : **WATER**
Sample Mark : **Drinking Water**
Sample Drawn By : **Client**

Sampling/received Date : **08/07/2023 -08/07/2023**
Analysis Commenced On : **08/07/2023**

Completed On : **12/07/2023**

ULR No. : TC578623000003892F

S.No.	Parameters	Units	Results	Test Method	IS:10500-2012	
					Acceptable Limits(Max)	Permissible Limits(Max)
41	**Trihalomethanes**					
	Chloroform	mg/l	BLQ(LOQ 0.05)	APHA 6232 23rd Edn: 2017	0.2	No Relaxation
	Bromoform	mg/l	BLQ(LOQ 0.05)	APHA 6232 23rd Edn: 2017	0.1	No Relaxation
	Bromodichloromethane	mg/l	BLQ(LOQ 0.05)	APHA 6232 23rd Edn: 2017	0.06	No Relaxation
	Dibromochloromethane	mg/l	BLQ(LOQ 0.05)	APHA 6232 23rd Edn: 2017	0.1	No Relaxation

Note :- BLQ - Below the Limit of Quantification, LOQ- Limit of Quantification, NTU- Nephelometric Turbidity Unit, mg/l- Milligrams per litre, NA –Not Applicable.

Remarks: The Tested Parameters as above are within the Permissible Limits of Drinking Water Standards IS:10500:2012.

End of Report

HUBERT ENVIRO CARE SYSTEMS (P) LTD. Chennai 600 083

Authorized Signatory

J.MOHANA RANGA
Section Head -Instrumen

Hubert Enviro Care Systems (P) Ltd.
18, 92nd Street, Ashok Nagar,
Chennai - 600 083.
Ph: 42985555 Fax : 42985500
E-mail : labsales@hecs.in

TC-5786

Laboratory Services Division
(Chemical & Biological Testing)
Recognized by MoEF, BIS
FSSAI Notified Laboratory
ISO 9001, 14001 & 45001 Certified.

TEST REPORT

Name of the Client : **M/s. Ambur Properties LLP.,**
Address of the Client : **No. 52/2, Kottai Bunglow Street, Oomar Road, Ambur, Tirupattur - 635 802.**

Report No. : **HECSL/MB/004/080723**
Report Date : **14/07/2023**

Location of Site : **TS No:10/1, 02nd Tharvazhi Road, Ambur**
Sample Description : **WATER**
Sample Mark : **Water**
Sample Drawn By : **Client**

Sampling/received Date : **08/07/2023 -08/07/2023**
Analysis Commenced On : **08/07/2023**
Completed On : **10/07/2023**

ULR No. : **TC578623000003893**

S.No.	Parameters	Units	Results	Test Method	IS:10500-2012	
					Acceptable Limits (Max)	Permissible Limits (Max)
1	Total Coliforms	Per 100ml	Absent	IS 1622	Absent/100ml	NA
2	Escherichia coli	Per 100ml	Absent	IS 1622	Absent/100ml	NA
3	Total Bacterial Count	Cfu/ml	24	IS 5402	NA	NA
4	Faecal coliform	Per 100ml	Absent	IS 1622	NA	NA
5	Feacal streptococci	per 100ml	Absent	IS 1622	NA	NA

Note:- CFU-Colony Forming Unit.
Remarks: The Tested Parameters as above are within the Limits of Drinking Water Standards IS: 10500:2012.

End of Report

HUBERT ENVIRO CARE SYSTEMS (P) LTD. Chennai 600 083

Authorized Signatory

A. SATHISH KUMAR
Section Head - Microbiology

Appendix 3: Ambient Air Quality Monitoring Results

CHENNAI TESTING LABORATORY PRIVATE LIMITED
Testing redefined

www.ctllabs.in

CIN: U93000TN2000PTC043869

TEST REPORT

Test Report No & Date	**CTL/CH/N-25543/2023-24 & 24.07.2023**
Sample Number	**N-25543/23-24**
Name of the Customer	**M/s. AMBUR PROPERTIES LLP,**
Address	TS NO:- 10/1, 2nd Tharvazhi Road, Ambur, Tirupattur (Dt) - 635 802.
Sample Drawn by	Laboratory
Sample Name	Ambient Air
Sample Description	**Ambient Air Quality**
Sampling Location	**South East Corner**
Sample Drawn on	17.07.2023 & 10.30 to 18.30
Sample Received on	18.07.2023
Sampling Plan & Procedure	CTL/QSP/F-89 & IS 5182 (Part V) and (Part XIV)
Sample Quantity	1 No
Equipment used for Sampling	Respirable Dust Sampler - 2611 DTI 2019
Analysis Started on	18.07.2023
Analysis Completed on	24.07.2023
Environmental Condition	
Relative Humidity	55%
Ambient Temperature	36°C
Wind Direction	W
Weather Condition	Clear Sky

Test Results:

The above sample tested as received, and results are as follows:

SL.NO	PARAMETERS	METHOD	UNITS	RESULTS	NAAQS*
1	PARTICULATE MATTER ($PM_{2.5}$)	IS 5182 Part 24 - 2019	$\mu g/m^3$	30.1	60
2	PARTICULATE MATTER (PM_{10})	IS 5182 Part 23 - 2006 (R.2017)	$\mu g/m^3$	66.7	100
3	SULPHUR DIOXIDE (SO_2)	IS 5182 Part 2 - 2001 (R.2017)	$\mu g/m^3$	9.5	80
4	OXIDES OF NITROGEN (NO_2)	IS 5182 Part 6 - 2006 (R.2017)	$\mu g/m^3$	18.0	80
5	OZONE (O_3)	CTL/SOP/AIR/08 - 2016	$\mu g/m^3$	20.5	180
6	LEAD (Pb)	IS 5182 PART 22 - 2004 (R.2019)	$\mu g/m^3$	BDL(DL:0.1)	1
7	CARBON MONOXIDE (CO)	CTL/SOP/AIR/23 – 2016	mg/m^3	BDL(DL:1.15)	4
8	AMMONIA (NH_3)	IS 5182 Part 25 - 2018	$\mu g/m^3$	11.5	400
9	ARSENIC (As)	CTL/SOP/AIR/06 – 2016	ng/m^3	BDL(DL:1.0)	6
10	NICKEL (Ni)	IS 5182 Part 26 - 2020	ng/m^3	BDL(DL:5.0)	20
11	BENZENE (C_6H_6)	IS 5182 PART 11 - 2006 (R.2017)	$\mu g/m^3$	BDL(DL:1.0)	5
12	BENZO(a)PYRENE	IS 5182 PART 12 - 2004 (R.2019)	ng/m^3	BDL(DL:0.5)	1

*National Ambient Air Quality Standards - CPCB

BDL - Below Detection Limit(D.L - Detection Limit)

END OF REPORT

For Chennai Testing Laboratory Pvt Ltd

Verified by

Authorised Signatory

G. MANIKANDAN
Head - Environment Division
(CHEMICAL)

Page 1 of 1

A - Super 19 | T.V.K. Industrial Estate | Guindy | E-mail : chennaitestinglab@gmail.com
Chennai - 600 032 | Tamil Nadu | India | Telefax : +91-44-2250 1757

CHENNAI
Testing redefined
TESTING LABORATORY PRIVATE LIMITED

www.ctllabs.in

CIN: U93000TN2000PTC043869

TEST REPORT

Test Report No & Date	**CTL/CH/N-25544/2023-24 & 24.07.2023**
Sample Number	**N-25544/23-24**
Name of the Customer	**M/s. AMBUR PROPERTIES LLP,**
Address	TS NO:- 10/1, 2nd Tharvazhi Road, Ambur, Tirupattur (Dt) - 635 802.
Sample Drawn by	Laboratory
Sample Name	Ambient Air
Sample Description	**Ambient Air Quality**
Sampling Location	**South West Corner**
Sample Drawn on	17.07.2023 & 10.35 to 18.35
Sample Received on	18.07.2023
Sampling Plan & Procedure	CTL/QSP/F-89 & IS 5182 (Part V) and (Part XIV)
Sample Quantity	1 No
Equipment used for Sampling	Respirable Dust Sampler - 2610 DTI 2019
Analysis Started on	18.07.2023
Analysis Completed on	24.07.2023
Environmental Condition	
Relative Humidity	55%
Ambient Temperature	36°C
Wind Direction	W
Weather Condition	Clear Sky

Test Results:

The above sample tested as received, and results are as follows:

SL.NO	PARAMETERS	METHOD	UNITS	RESULTS	NAAQS*
1	PARTICULATE MATTER ($PM_{2.5}$)	IS 5182 Part 24 - 2019	$\mu g/m^3$	26.0	60
2	PARTICULATE MATTER (PM_{10})	IS 5182 Part 23 - 2006 (R.2017)	$\mu g/m^3$	58.6	100
3	SULPHUR DIOXIDE (SO_2)	IS 5182 Part 2 - 2001 (R.2017)	$\mu g/m^3$	7.6	80
4	OXIDES OF NITROGEN (NO_2)	IS 5182 Part 6 - 2006 (R.2017)	$\mu g/m^3$	15.0	80
5	OZONE (O_3)	CTL/SOP/AIR/08 - 2016	$\mu g/m^3$	16.2	180
6	LEAD (Pb)	IS 5182 PART 22 - 2004 (R.2019)	$\mu g/m^3$	BDL(DL:0.1)	1
7	CARBON MONOXIDE (CO)	CTL/SOP/AIR/23 – 2016	mg/m^3	BDL(DL:1.15)	4
8	AMMONIA (NH_3)	IS 5182 Part 25 - 2018	$\mu g/m^3$	9.4	400
9	ARSENIC (As)	CTL/SOP/AIR/06 – 2016	ng/m^3	BDL(DL:1.0)	6
10	NICKEL (Ni)	IS 5182 Part 26 - 2020	ng/m^3	BDL(DL:5.0)	20
11	BENZENE (C_6H_6)	IS 5182 PART 11 - 2006 (R.2017)	$\mu g/m^3$	BDL(DL:1.0)	5
12	BENZO(a)PYRENE	IS 5182 PART 12 - 2004 (R.2019)	ng/m^3	BDL(DL:0.5)	1

*National Ambient Air Quality Standards - CPCB

BDL - Below Detection Limit(D.L - Detection Limit)

END OF REPORT

For Chennai Testing Laboratory Pvt Ltd

Verified by

Authorised Signatory

G. MANIKANDAN
Head - Environment Division
(CHEMICAL)

A - Super 19 | T.V.K. Industrial Estate | Guindy | E-mail : chennaitestinglab@gmail.com
Chennai - 600 032 | Tamil Nadu | India | Telefax : +91-44-2250 1757

CHENNAI
Testing redefined
TESTING LABORATORY PRIVATE LIMITED

www.ctllabs.in

CIN: U93000TN2000PTC043869

TEST REPORT

Test Report No & Date	**CTL/CH/N-25545/2023-24 & 24.07.2023**
Sample Number	**N-25545/23-24**
Name of the Customer	**M/s. AMBUR PROPERTIES LLP,**
Address	TS NO:- 10/1, 2nd Tharvazhi Road, Ambur, Tirupattur (Dt) - 635 802.
Sample Drawn by	Laboratory
Sample Name	Ambient Air
Sample Description	**Ambient Air Quality**
Sampling Location	**East Corner**
Sample Drawn on	17.07.2023 & 10.40 to 18.40
Sample Received on	18.07.2023
Sampling Plan & Procedure	CTL/QSP/F-89 & IS 5182 (Part V) and (Part XIV)
Sample Quantity	1 No
Equipment used for Sampling	Respirable Dust Sampler - 2613 DTI 2019
Analysis Started on	18.07.2023
Analysis Completed on	24.07.2023
Environmental Condition	
Relative Humidity	55%
Ambient Temperature	36°C
Wind Direction	W
Weather Condition	Clear Sky

Test Results:

The above sample tested as received, and results are as follows:

SL.NO	PARAMETERS	METHOD	UNITS	RESULTS	NAAQS*
1	PARTICULATE MATTER ($PM_{2.5}$)	IS 5182 Part 24 - 2019	$\mu g/m^3$	19.7	60
2	PARTICULATE MATTER (PM_{10})	IS 5182 Part 23 - 2006 (R.2017)	$\mu g/m^3$	46.2	100
3	SULPHUR DIOXIDE (SO_2)	IS 5182 Part 2 - 2001 (R.2017)	$\mu g/m^3$	4.1	80
4	OXIDES OF NITROGEN (NO_2)	IS 5182 Part 6 - 2006 (R.2017)	$\mu g/m^3$	9.5	80
5	OZONE (O_3)	CTL/SOP/AIR/08 - 2016	$\mu g/m^3$	12.0	180
6	LEAD (Pb)	IS 5182 PART 22 - 2004 (R.2019)	$\mu g/m^3$	BDL(DL:0.1)	1
7	CARBON MONOXIDE (CO)	CTL/SOP/AIR/23 – 2016	mg/m^3	BDL(DL:1.15)	4
8	AMMONIA (NH_3)	IS 5182 Part 25 - 2018	$\mu g/m^3$	BDL(DL:5.0)	400
9	ARSENIC (As)	CTL/SOP/AIR/06 – 2016	ng/m^3	BDL(DL:1.0)	6
10	NICKEL (Ni)	IS 5182 Part 26 - 2020	ng/m^3	BDL(DL:5.0)	20
11	BENZENE (C_6H_6)	IS 5182 PART 11 - 2006 (R.2017)	$\mu g/m^3$	BDL(DL:1.0)	5
12	BENZO(a)PYRENE	IS 5182 PART 12 - 2004 (R.2019)	ng/m^3	BDL(DL:0.5)	1

*National Ambient Air Quality Standards - CPCB

BDL - Below Detection Limit(D.L - Detection Limit)

END OF REPORT

For Chennai Testing Laboratory Pvt Ltd

Verified by

Authorised Signatory

G. MANIKANDAN
Head - Environment Division
(CHEMICAL)

A - Super 19 | T.V.K. Industrial Estate | Guindy | E-mail : chennaitestinglab@gmail.com
Chennai - 600 032 | Tamil Nadu | India | Telefax : +91-44-2250 1757

CHENNAI
Testing redefined
TESTING LABORATORY PRIVATE LIMITED

www.ctllabs.in

CIN: U93000TN2000PTC043869

TEST REPORT

Test Report No & Date	**CTL/CH/N-25546/2023-24 & 24.07.2023**
Sample Number	**N-25546/23-24**
Name of the Customer	**M/s. AMBUR PROPERTIES LLP,**
Address	TS NO:- 10/1, 2nd Tharvazhi Road, Ambur, Tirupattur (Dt) - 635 802.
Sample Drawn by	Laboratory
Sample Name	Ambient Air
Sample Description	**Ambient Air Quality**
Sampling Location	**West Corner**
Sample Drawn on	17.07.2023 & 10.40 to 18.40
Sample Received on	18.07.2023
Sampling Plan & Procedure	CTL/QSP/F-89 & IS 5182 (Part V) and (Part XIV)
Sample Quantity	1 No
Equipment used for Sampling	Respirable Dust Sampler - 2025 DTD 2016
Analysis Started on	18.07.2023
Analysis Completed on	24.07.2023
Environmental Condition	
Relative Humidity	55%
Ambient Temperature	36°C
Wind Direction	W
Weather Condition	Clear Sky

Test Results:

The above sample tested as received, and results are as follows:

SL.NO	PARAMETERS	METHOD	UNITS	RESULTS	NAAQS*
1	PARTICULATE MATTER ($PM_{2.5}$)	IS 5182 Part 24 - 2019	$\mu g/m^3$	17.0	60
2	PARTICULATE MATTER (PM_{10})	IS 5182 Part 23 - 2006 (R.2017)	$\mu g/m^3$	40.8	100
3	SULPHUR DIOXIDE (SO_2)	IS 5182 Part 2 - 2001 (R.2017)	$\mu g/m^3$	3.4	80
4	OXIDES OF NITROGEN (NO_2)	IS 5182 Part 6 - 2006 (R.2017)	$\mu g/m^3$	7.6	80
5	OZONE (O_3)	CTL/SOP/AIR/08 - 2016	$\mu g/m^3$	10.2	180
6	LEAD (Pb)	IS 5182 PART 22 - 2004 (R.2019)	$\mu g/m^3$	BDL(DL:0.1)	1
7	CARBON MONOXIDE (CO)	CTL/SOP/AIR/23 – 2016	mg/m^3	BDL(DL:1.15)	4
8	AMMONIA (NH_3)	IS 5182 Part 25 - 2018	$\mu g/m^3$	BDL(DL:5.0)	400
9	ARSENIC (As)	CTL/SOP/AIR/06 – 2016	ng/m^3	BDL(DL:1.0)	6
10	NICKEL (Ni)	IS 5182 Part 26 - 2020	ng/m^3	BDL(DL:5.0)	20
11	BENZENE (C_6H_6)	IS 5182 PART 11 - 2006 (R.2017)	$\mu g/m^3$	BDL(DL:1.0)	5
12	BENZO(a)PYRENE	IS 5182 PART 12 - 2004 (R.2019)	ng/m^3	BDL(DL:0.5)	1

*National Ambient Air Quality Standards - CPCB

BDL - Below Detection Limit(D.L - Detection Limit)

END OF REPORT

For Chennai Testing Laboratory Pvt Ltd

Verified by

Authorised Signatory

G. MANIKANDAN
Head - Environment Division
(CHEMICAL)

A - Super 19 | T.V.K. Industrial Estate | Guindy | E-mail : chennaitestinglab@gmail.com
Chennai - 600 032 | Tamil Nadu | India | Telefax : +91-44-2250 1757

CHENNAI
Testing redefined
TESTING LABORATORY PRIVATE LIMITED

www.ctllabs.in

CIN: U93000TN2000PTC043869

TEST REPORT

Test Report No & Date	**CTL/CH/N-25547/2023-24 & 24.07.2023**
Sample Number	**N-25547/23-24**
Name of the Customer	**M/s. AMBUR PROPERTIES LLP,**
Address	TS NO:- 10/1, 2nd Tharvazhi Road, Ambur, Tirupattur (Dt) - 635 802.
Sample Drawn by	Laboratory
Sample Name	Ambient Air
Sample Description	**Ambient Air Quality**
Sampling Location	**North East Corner**
Sample Drawn on	17.07.2023 & 11.15 to 19.15
Sample Received on	18.07.2023
Sampling Plan & Procedure	CTL/QSP/F-89 & IS 5182 (Part V) and (Part XIV)
Sample Quantity	1 No
Equipment used for Sampling	Respirable Dust Sampler - 2023 DTD 2016
Analysis Started on	18.07.2023
Analysis Completed on	24.07.2023
Environmental Condition	
Relative Humidity	55%
Ambient Temperature	36°C
Wind Direction	W
Weather Condition	Clear Sky

Test Results:

The above sample tested as received, and results are as follows:

SL.NO	PARAMETERS	METHOD	UNITS	RESULTS	NAAQS*
1	PARTICULATE MATTER ($PM_{2.5}$)	IS 5182 Part 24 - 2019	$\mu g/m^3$	14.2	60
2	PARTICULATE MATTER (PM_{10})	IS 5182 Part 23 - 2006 (R.2017)	$\mu g/m^3$	36.3	100
3	SULPHUR DIOXIDE (SO_2)	IS 5182 Part 2 - 2001 (R.2017)	$\mu g/m^3$	BDL(DL:3.0)	80
4	OXIDES OF NITROGEN (NO_2)	IS 5182 Part 6 - 2006 (R.2017)	$\mu g/m^3$	5.4	80
5	OZONE (O_3)	CTL/SOP/AIR/08 - 2016	$\mu g/m^3$	BDL(DL:5.0)	180
6	LEAD (Pb)	IS 5182 PART 22 - 2004 (R.2019)	$\mu g/m^3$	BDL(DL:0.1)	1
7	CARBON MONOXIDE (CO)	CTL/SOP/AIR/23 – 2016	mg/m^3	BDL(DL:1.15)	4
8	AMMONIA (NH_3)	IS 5182 Part 25 - 2018	$\mu g/m^3$	BDL(DL:5.0)	400
9	ARSENIC (As)	CTL/SOP/AIR/06 – 2016	ng/m^3	BDL(DL:1.0)	6
10	NICKEL (Ni)	IS 5182 Part 26 - 2020	ng/m^3	BDL(DL:5.0)	20
11	BENZENE (C_6H_6)	IS 5182 PART 11 - 2006 (R.2017)	$\mu g/m^3$	BDL(DL:1.0)	5
12	BENZO(a)PYRENE	IS 5182 PART 12 - 2004 (R.2019)	ng/m^3	BDL(DL:0.5)	1

*National Ambient Air Quality Standards - CPCB

BDL - Below Detection Limit(D.L - Detection Limit)

END OF REPORT

For Chennai Testing Laboratory Pvt Ltd

Verified by

Authorised Signatory

G. MANIKANDAN
Head - Environment Division
(CHEMICAL)

A - Super 19 | T.V.K. Industrial Estate | Guindy | E-mail : chennaitestinglab@gmail.com
Chennai - 600 032 | Tamil Nadu | India | Telefax : +91-44-2250 1757

CHENNAI
Testing redefined
TESTING LABORATORY PRIVATE LIMITED

www.ctllabs.in

CIN: U93000TN2000PTC043869

TEST REPORT

Test Report No & Date	**CTL/CH/N-25548/2023-24 & 24.07.2023**
Sample Number	**N-25548/23-24**
Name of the Customer	**M/s. AMBUR PROPERTIES LLP,**
Address	TS NO:- 10/1, 2nd Tharvazhi Road, Ambur, Tirupattur (Dt) - 635 802.
Sample Drawn by	Laboratory
Sample Name	Ambient Air
Sample Description	**Ambient Air Quality**
Sampling Location	**North West Corner**
Sample Drawn on	17.07.2023 & 11.15 to 19.15
Sample Received on	18.07.2023
Sampling Plan & Procedure	CTL/QSP/F-89 & IS 5182 (Part V) and (Part XIV)
Sample Quantity	1 No
Equipment used for Sampling	Respirable Dust Sampler - 2021 DTD 2016
Analysis Started on	18.07.2023
Analysis Completed on	24.07.2023
Environmental Condition	
Relative Humidity	55%
Ambient Temperature	36°C
Wind Direction	W
Weather Condition	Clear Sky

Test Results:

The above sample tested as received, and results are as follows:

SL.NO	PARAMETERS	METHOD	UNITS	RESULTS	NAAQS*
1	PARTICULATE MATTER ($PM_{2.5}$)	IS 5182 Part 24 - 2019	$\mu g/m^3$	12.0	60
2	PARTICULATE MATTER (PM_{10})	IS 5182 Part 23 - 2006 (R.2017)	$\mu g/m^3$	34.1	100
3	SULPHUR DIOXIDE (SO_2)	IS 5182 Part 2 - 2001 (R.2017)	$\mu g/m^3$	BDL(DL:3.0)	80
4	OXIDES OF NITROGEN (NO_2)	IS 5182 Part 6 - 2006 (R.2017)	$\mu g/m^3$	4.0	80
5	OZONE (O_3)	CTL/SOP/AIR/08 - 2016	$\mu g/m^3$	BDL(DL:5.0)	180
6	LEAD (Pb)	IS 5182 PART 22 - 2004 (R.2019)	$\mu g/m^3$	BDL(DL:0.1)	1
7	CARBON MONOXIDE (CO)	CTL/SOP/AIR/23 – 2016	mg/m^3	BDL(DL:1.15)	4
8	AMMONIA (NH_3)	IS 5182 Part 25 - 2018	$\mu g/m^3$	BDL(DL:5.0)	400
9	ARSENIC (As)	CTL/SOP/AIR/06 – 2016	ng/m^3	BDL(DL:1.0)	6
10	NICKEL (Ni)	IS 5182 Part 26 - 2020	ng/m^3	BDL(DL:5.0)	20
11	BENZENE (C_6H_6)	IS 5182 PART 11 - 2006 (R.2017)	$\mu g/m^3$	BDL(DL:1.0)	5
12	BENZO(a)PYRENE	IS 5182 PART 12 - 2004 (R.2019)	ng/m^3	BDL(DL:0.5)	1

*National Ambient Air Quality Standards - CPCB

BDL - Below Detection Limit(D.L - Detection Limit)

END OF REPORT

For Chennai Testing Laboratory Pvt Ltd

Verified by

Authorised Signatory

G. MANIKANDAN
Head - Environment Division
(CHEMICAL)

A - Super 19 | T.V.K. Industrial Estate | Guindy | E-mail : chennaitestinglab@gmail.com
Chennai - 600 032 | Tamil Nadu | India | Telefax : +91-44-2250 1757

Appendix 4: Ambient Noise Level Monitoring Results

CHENNAI TESTING LABORATORY PRIVATE LIMITED
Testing redefined

www.ctllabs.in

CIN: U93000TN2000PTC043869

TEST REPORT

Test Report No & Date	**CTL/CH/N-25549/2023-24 & 24.07.2023**
Sample Number	**N-25549/23-24**
Name of the Customer	**M/s. AMBUR PROPERTIES LLP,**
Address	TS NO:- 10/1, 2nd Tharvazhi Road, Ambur, Tirupattur (Dt) - 635 802.
Sample Drawn by	Laboratory
Sample Name	Noise
Sample Description	**AMBIENT NOISE**
Sample Drawn on	17.07.2023
Sampling Plan & Procedure	CTL/QSP/F-89 & IS 9989
Equipment used for Sampling	Sound Level Meter Make -S.NO:Q641689

Test Results:

The above sample tested as received, and results are as follows:

SL.NO	LOCATION	NOISE LEVEL dB (A)Leq	LIMITS*
		Day Noise	
1	South East Corner	43.3	75.0
2	South West Corner	48.4	
3	East Corner	44.4	
4	West Corner	41.5	
5	North East Corner	46.2	
6	North West Corner	44.1	

* CPCB Limits (Day Time)

END OF REPORT

For Chennai Testing Laboratory Pvt Ltd

Verified by

Authorised Signatory
G. MANIKANDAN
Head - Environment Division
(CHEMICAL)

A - Super 19 | T.V.K. Industrial Estate | Guindy | E-mail : chennaitestinglab@gmail.com
Chennai - 600 032 | Tamil Nadu | India | Telefax : +91-44-2250 1757

Appendix 5: 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 6: 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 7: 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				
Salem PID 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)[11]	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.

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

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

Status of IEE per Subproject/Package

- Provide status of updated/final IEE[12] 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?[13] (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[14]

Package Number	Statutory Environmental Requirements[15]	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[16]

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, occupational EHS, community health and safety)	Covenant	Status of Compliance	Action Required

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.

[12] IEE prepared based on preliminary design and cleared by ADB with condition that updated/Final IEE based on detailed design will be submitted.
[13] Works will not be allowed until C-EMP is approved by the PMU and/or Concerned division.
[14] 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.
[15] Specify statutory requirements: environmental clearance? Permit/consent to establish? Forest clearance? Workers/Labor permit, etc.
[16] Example: Environmental Clearance requires ambient air quality monitoring, Forest Clearance/Tree-cutting Permit requires 10 trees for every tree, etc.

- 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 C-EMP when applicable).

Summary of Environmental Monitoring Activities (for the Reporting Period)[17]

Impacts (List from C-EMP)	Mitigation Measures (List from C-EMP)	Parameters Monitored (As identified in the C-EMP)	Method of Monitoring (Visual, Actual Sampling, etc.)	Location of Monitoring (Provide GPS Coordinates)[18]	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

- Provide information on monitoring activities conducted during reporting period. If not conducted, provide justification. Compare results with baseline and internationally recognized standards.[19]

Air Quality Monitoring Results

Site No.	Date of Testing	Site Location (Provide GPS Coordinates)[20]	Parameters (as required by statutory clearances or as mentioned in the IEE)	Remarks

[17] Attach Laboratory Results and Sampling Map/Locations

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

[19] 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.

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

			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/Salem PID Division/contractors provide project-related information to stakeholders, communities and/or affected people before and during construction works.[21]
- Provide information on consultations conducted during reporting period such dates, topics discussed, type of consultation, issues/concerns raised, safeguards team 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 Redress Mechanism

- **Grievance Redress Mechanism.** Provide information on establishment of grievance redress mechanism and capacity of grievance redress committee to address project-related issues/complaints. Include as 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.

[21] 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.

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