

COMMISSIONER, KARUR CITY MUNICIPAL CORPORATION,

KARUR – 639 001

NATIONAL COMPETITIVE BIDDING

BID DOCUMENT

FOR

**PROVIDING UNDERGROUND SEWERAGE SCHEME TO THE ELFTOUT AREAS AND
ADDED AREAS OF KARUR CORPORATION WITH OPERATION AND MAINTENANCE
FOR THE PERIOD OF 5 YEARS - PACKAGE II**

CONTRACT NO: 6052/2025/E5

BID DOCUMENT

VOLUME - V

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

Commissioner,

Karur City Municipal Corporation,

Azad Rd, Bunglaw Street, Karur-639 001

E-mail: commr.karur@tn.gov.in

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List of Abbreviations

ESS	Environmental and Social Safeguards
GLSR	Ground Level Service Reservoir
GOI	Government of India
GoTN	Government of Tamil Nadu
HDPE	High Density Polyethylene
HSC	Household Service Connection
IA	Implementing Agency
ICT	Information and Communication Technology
IEE	Initial Environmental Examination
LL	Lakh Liters
MLD	Million liters per day
MOEF&CC	Ministry of Environment, Forest and Climate Change
NOC	No Objection Certificate
OHT	Over Head Tank
PDGF	Project Development Grant Fund
PIU	Project Implementation Unit
PMU	Project Management Unit
PVC	Poly Vinyl Chloride
RoW	Right of Way
SAR	Environmental Assessment Report
SO	Safeguards Officer
SPS	Safeguard Policy Statement, 2009
TNUFIP	Tamil Nadu Urban Flagship Investment Program
TNUIFSL	Tamil Nadu Urban Infrastructure Financial Services Limited
WHO	World Health Organization
WDS	Water Distribution Station
STP	Sewage Treatment Plant
LS	Lifting Station
PS	Pumping Station

EXECUTIVE SUMMARY

The project mainly focus on upgrading urban infrastructure to meet growing demands. Karur aims to enhance UGSS, emphasize climate resilience and sustainable water management. They are supported by funding from KfW under SMIF-TN-III and SBM 2.0.

Karur city Municipal Corporation was expanded by adding Inamkarur, Thanthoni Municipalities and Sanapiratti Village Panchayat in the year 2011. The total area of the Karur city Municipal corporationat present is 53.26 Sq.km and comprises of 48 administrative wards. Karur is the administrative headquarters of Karur district. It is located on the banks of River Amaravathi. It is situated at about 395 km southwest of the state capital Chennai and 295 km away from Bangalore, the capital of Karnataka State. It is situated at 10° 57' 37" N & 78° 4' 36" E on the banks of River Amaravathi in Karur district of Tamil Nadu State at an average elevation of 115 meters above MSL. Amaravati River is a tributary of river Cauvery dissects Karur town into major divisions. Its confluence with river Cauvery is at about 12 km downstream to Karur.

The proposed UGSS project is environmentally beneficial, aiming to provide continuous, safe, and sustainable drinking water supply to Karur Municipal Corporation.

The project reduces dependence on groundwater sources and promotes surface water utilization, which aligns with sustainable water management principles.

Environmental screening and impact assessment indicate that no major irreversible environmental impacts are anticipated.

The project's interventions are largely confined to urban public roads and government lands, avoiding ecologically sensitive zones or forest areas.

Temporary construction-stage impacts such as dust, noise, vibration, and traffic congestion can be effectively mitigated with standard environmental management practices.

Air quality, water runoff, and construction waste must be monitored regularly, especially in dense residential and commercial zones.

Proper spoil disposal, debris reuse, and dust suppression should be ensured during excavation and road cutting works.

Water extraction from the designated source should be regulated, ensuring environmental flow in the river and compliance with CPCB norms.

The project should incorporate energy-efficient pumping systems and smart meters to reduce electricity consumption and operational footprint.

Appropriate noise barriers or work scheduling should be adopted near schools, hospitals, and sensitive receptors.

Proposed Project Particulars

Particulars	Details
Name of the Project	<i>Comprehensive Underground Sewerage Scheme (UGSS)</i>
Implementing Agency	<i>Karur City Municipal Corporation (KCMC)</i>
Project Location	<i>Karur, Tamil Nadu</i>
Total Municipal Area	<i>53.26 sq.km</i>
Total Wards Covered	<i>48 (Wards 1–32: Existing UGSS; Wards 33–48: Proposed UGSS)</i>
Design Period	<i>30 Years (2025–2055)</i>
Design Population (Ultimate Year)	<i>Approx. 3.76lakhs</i>
House Service Connections (HSC)	<i>Approximately 29,687 new connections to achieve 100% coverage</i>
Total Wastewater Generation (Ultimate Year)	<i>~41.37 MLD (Including both existing and proposed areas)</i>
Treatment Facility	<i>35.25 MLD STP with SBR technology (for Intermediate Year)</i>
Lift Stations	<i>16 Nos</i>
Main Pumping Station	<i>4 Nos</i>
Sewage Treatment Plant	<i>1 No</i>
Revamping of Existing Sewer Network	<i>14.53 Km & 497 No's</i>
Revamping of Existing pumping Main Length with Machine holes	<i>2.25 Km</i>
Total pumping Main Length	<i>26.3 km</i>

Particulars	Details
Integration Plan	<i>Proposed network to connect to existing STP via main pumping system</i>
	<i>Land & Clearances</i>
Sustainability Features	<i>Energy-efficient Pumps, Climate-Resilient Design</i>
<i>Light House components</i>	- <i>VFD pumps</i> - <i>Screw press</i> - <i>Solar sludge drying beds</i> <i>Other innovative technologies during construction and operation phase to reduce GHGs</i>
<i>Climate aspects</i>	<i>Reduction in GHGs</i>
Expected Outcomes	<i>100% Citywide Sanitation Coverage, Improved Public Health, Environmental Protection, and Urban Resilience</i>

1. INTRODUCTION AND BACKGROUND

As per the policy decision of the Government of Tamil Nadu, the implementation of the Under Ground Sewerage Schemes was taken up in 58 Urban Local Bodies (Corporations, District Head Quarters and other Towns having Tourism, Heritage, and Pilgrim Towns). Out of the 58 towns, 35 ULBs were completed and put into public use and execution of UGSS in the balance towns are in various stages of implementation. The implemented UGSS in most of the towns cover only core area or part of the town in the range of 35% to 70% of the total area. Originally at the time of project formulation/ DPR preparation, it was proposed to provide UGS Scheme to the core area/ developed areas/ densely populated areas and according to the availability of funds sanctioned by the Government. But it became necessary to implement UGSS for the above ULBs for additional uncovered areas to provide 100% coverage to the entire area of the ULBs.

1.1 Brief description of study area and existing infrastructure:

Karur, along the River Amaravathi, is the administrative headquarters of Karur District and has seen rapid urban growth, increasing pressure on sanitation infrastructure. Wards 1–32 are served by a 15 MLD STP and sewer network, but Wards 33–48 (Sanapiratti and Thanthoni) rely on decentralized systems, posing health and environmental risks. Under the KfW-assisted SMIF-TN-III Lighthouse Project, a comprehensive UGSS is proposed for the unserved areas to ensure 100% sanitation coverage, demonstrate climate-resilient, inclusive solutions, and provide a replicable model for sustainable urban sanitation in Tamil Nadu.

1.1.1 Project Objective:

The objective of the assignment is to review the DPRs for Karur UGSS, Karur UGSS and develop them as lighthouse projects with climate resilience, water security and water sustainability.

The main objective of the study is to identify and understand potential environmental & social impacts associated with the project and all its components and to prepare a plan including measures to mitigate and manage the identified adverse impacts. This includes also the identification of social issues and stakeholders and communities, including socially and economically disadvantaged communities.

In particular, the assessment of environmental and social impacts to be undertaken with following objectives:

- Identify and assess the potential positive and negative environmental and social risks and impacts stemming from the project components in the construction, operation and the decommissioning phases (direct, indirect and cumulative impacts).

- Design appropriate mitigation, management, and monitoring measures to implement an environmentally friendly and socially acceptable project, without compromising its technical and economic feasibility and help determine crucial elements that facilitate the decision-making process.
- Assessing the baseline environmental status (air, water, soil, noise, ecology and socio-economic conditions) of the study area.
- Identifying and evaluating potential environmental and social impacts associated with construction and operation phases.
- Identify the extent of lands, houses, settlements and other common properties likely to be affected and assess whether the proposed project involve land acquisition or not
- assess whether the proposed land acquisition for the project would serve public purpose;
- estimate the number of affected families, magnitude of land assets based on the actual holdings of the families and the number of families among them likely to be displaced physically or economically due to land acquisition.
- Suggest appropriate mitigation measures to effectively manage potential adverse impacts study the social impacts of the project by covering both direct land loser Family as well as the indirectly affected Family due to loss of common property resources (CPRs), socio-economic infrastructure etc.
- To develop an (Environmental and) Social Management Plan (ESMP) or additional plans (e.g. RAP, if needed to implement suggested mitigation measures to minimize adverse impacts through effective management systems including formulation of monitoring and reporting requirements at construction, commissioning, operation & maintenance phase.

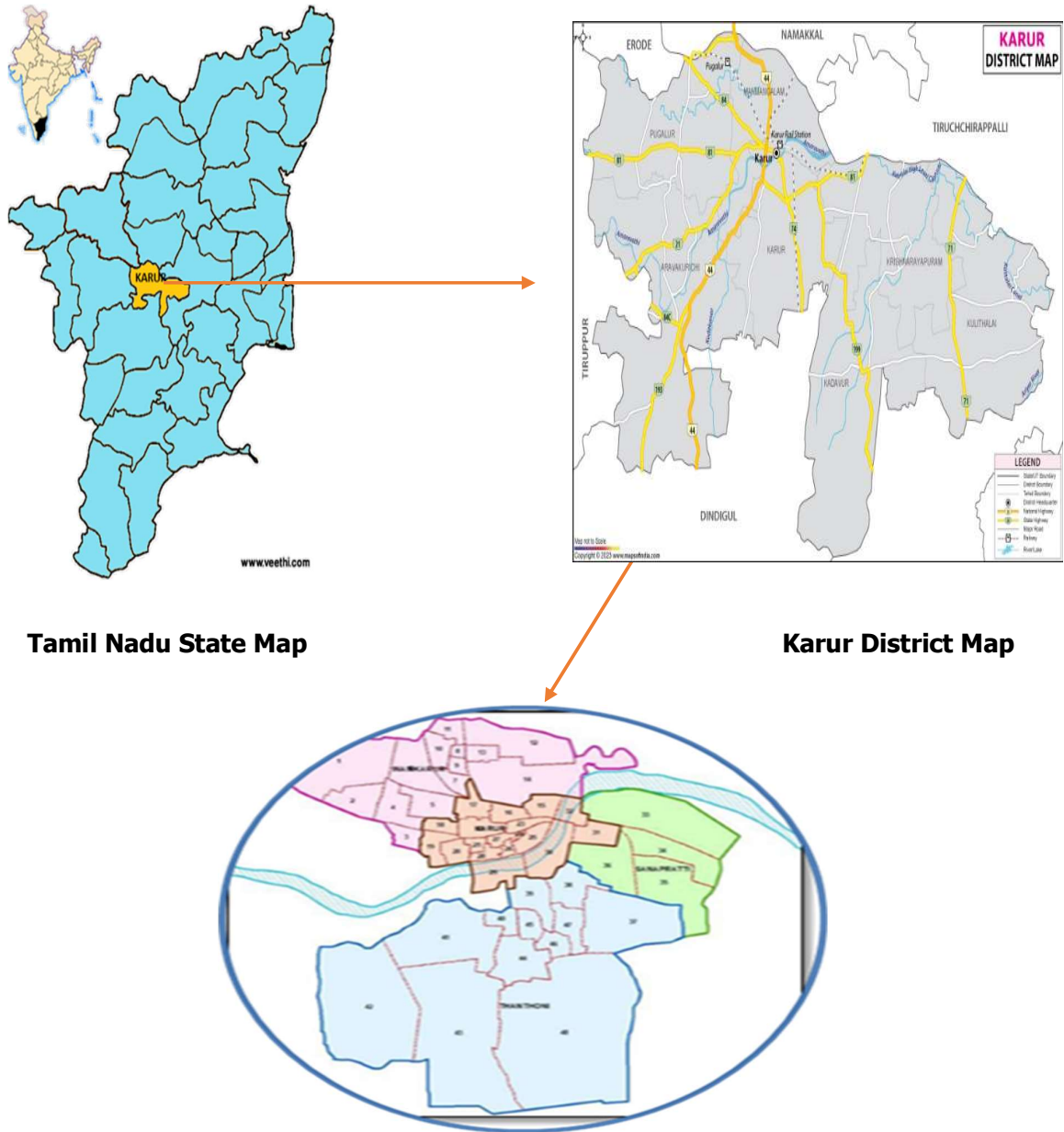


Figure 1: Karur City Index Map

1.1.2 The Purpose and Scope of the Study:

Prepare Environmental, Climate Change, and Social Impact Assessment report in line KfW sustainability guidelines

Create a detailed plan outlining next steps for E&S assessments, including tools like ESMP and RAP, with timelines and responsibilities

1.2 Existing Sewerage System in Karur Municipal Corporation

Karur Municipal Corporation, the administrative headquarters of Karur District, is situated along the banks of River Amaravathi and spans an area of 53.26 km², comprising 48 municipal wards. An underground sewerage system (UGSS) is presently functional in Wards 1 to 32, covering the core urban areas of Karur and Inam Karur. This sewerage system was implemented by the Tamil Nadu Water Supply and Drainage Board (TWAD) with administrative sanction accorded on 30th December 2000. The system was commissioned in the year 2007 and subsequently handed over to the Urban Local Body (ULB) for operation and maintenance, which is currently outsourced to M/s. PGR Constructions.

The existing sewerage system was designed based on a sewage generation rate of 90 litres per capita per day (lpcd), including infiltration. Although the original Detailed Project Report (DPR) is not available with the ULB, the project planning was carried out considering population projections for three design years: 1,32,000 in the base year 2003, 2,06,300 in the intermediate year 2018, and 2,72,000 in the ultimate year 2033. The corresponding sewage generation was estimated at 14.90 MLD for the intermediate year and 19.60 MLD for the ultimate year, calculated at 80% of the water supply rate.

The sewerage infrastructure in place includes approximately 96 km of sewer lines laid along 72 km of road length, with a total of 3,168 machine holes constructed for access and maintenance. The system incorporates two lift stations at Karur Road and Pasupathipalayam, which collect and convey sewage to a common machine hole. From this point, the flow continues by gravity to the main pumping station located at Balampalpuram. The sewage is then pumped to the 15 MLD Sewage Treatment Plant (STP) located at Vangal Road, Arasu Colony, for final treatment and disposal.

The system was originally planned to provide 15,000 household sewer connections (HSCs), with 9,000 connections in Karur and 6,000 in Inam Karur. To date, around 9,000 HSCs have been implemented, while the remaining are proposed to be executed using an interest-free loan of ₹460 lakhs sanctioned for this purpose. The existing UGSS has substantially improved sanitation coverage in Wards 1 to 32; however, Wards 33 to 48—covering Sanapiratti and Thanthoni—remain unserved by any sewerage infrastructure and continue to rely on on-site sanitation systems, which pose risks to public health and the environment. These uncovered areas are now proposed to be integrated into the citywide sewerage network under the Lighthouse UGSS initiative, aiming to ensure 100% sanitation coverage, environmental sustainability, and long-term public health resilience for Karur City Municipal Corporation.

1.3 Summary of Existing Service Levels and Identified Gaps

Utilisation of Existing UGSS Infrastructure: The proposed UGSS for left-out areas in Karur City Municipal Corporation aims to efficiently integrate with the existing wastewater infrastructure, including the 15 MLD STP land, main pumping station at Balampalpuram, and intermediate lift stations

Component	Existing Provision	Identified Gaps / Issues
Sewer Coverage	Wards 1 to 32 covered (Karur & Inam Karur)	Wards 33 to 48 (Sanapiratti & Thanthoni) not covered
Sewer Network	~96 km (SW & RCC pipes)	No network in uncovered wards; potential aging in older lines
Lift Stations	2 Nos (Karur Road & Pasupathipalayam)	Additional stations needed for new areas
Main Pumping Station	1 No. at Balampalpuram	Capacity adequate but may need rehabilitation due to age
Sewage Treatment Plant	15 MLD (Aerated Lagoon)	Underutilized (treating only ~4- 5 MLD); no treated water reuse system in place
HSCs Provided	Approx. 9,000 out of 15,000 proposed	Backlog of ~6,000 HSCs in existing system
Sanitation in Uncovered Areas	On-site sanitation systems (septic tanks, soak pits)	Inefficient, poorly maintained, prone to overflow and contamination
Treated Effluent Disposal	Discharge to irrigation canal leading to Amaravathi River	No reuse mechanism; risk of underutilizing treated water
Monitoring & Energy Use	Manual O&M, submersible pumps	No smart monitoring; scope for energy efficiency improvements

2. DESCRIPTION OF THE PROJECT

The proposed Underground Sewerage Scheme (UGSS) project area falls within the administrative jurisdiction of Karur City Municipal Corporation (KCMC), located in Karur District, Tamil Nadu. The city spans an area of approximately 53.26 sq.km and is divided into 48 municipal wards. Karur is strategically situated along the banks of the River Amaravathi and serves as an important hub for textile industries, commerce, and urban services in central Tamil Nadu.

The existing UGSS, commissioned in 2007, currently serves Wards 1 to 32, covering the core urban areas of Karur and Inam Karur. However, the remaining 16 wards (Wards 33 to 48), which include the expanding suburban localities of Sanapiratti and Thanthoni, lack access to underground drainage infrastructure. These areas rely on conventional onsite sanitation systems such as septic tanks, soak pits, and open drains, which are increasingly inadequate in the face of rapid urbanization, higher population density, and environmental concerns.

The project area under this DPR therefore comprises the left-out wards (33 to 48) that are currently outside the existing UGSS coverage. These wards represent approximately one-third of the city's geographical and demographic extent and are experiencing significant growth. The integration of these wards into a citywide UGSS network is essential to ensure holistic urban sanitation, environmental protection, and equitable access to services.

The selection of this project area under the Lighthouse initiative underscores its strategic importance and the need to demonstrate scalable, sustainable, and inclusive sewerage solutions that can serve as a model for other urban centres across Tamil Nadu.

2.1 Proposed Project

The proposed project aims to provide a comprehensive, climate-resilient, Underground Sewerage Scheme (UGSS) for the entire jurisdiction of Karur City Municipal Corporation (KCMC), including Karur, Inam Karur, Sanapiratti, and Thanthoni areas. The project is conceived under the KfW-assisted SMIF-TN-III Lighthouse initiative, addressing water security, sanitation, and environmental health through infrastructure development, integration of smart technologies, and reuse of treated wastewater.

2.1.1 Proposed Sewage Infrastructure Components

The project components are broadly categorized into core infrastructure works and Lighthouse components, as outlined below.

Table 1: Proposed components of project

SI.No	Components	Description
1	Sewer Network	1. Zone – (Karur & Inam Karur): 91 km of new sewer lines 2. Zone-2 (Sanapiratti & Thanthoni): 38 km of sewer lines. 3. Zone-3 (Sanapiratti & Thanthoni): 225 km of sewer lines 4. Total length of sewer network 354 Km
2	Revamping of Existing Sewer Network with machine holes	14.53 Km & 497 No's of machine holes
3	Total pumping Main Length	26.30 km
4	Revamping of Existing pumping Main Length	2.25 Km
5	Proposed lift station	16 Nos.
6	Pumping Station	1. Thirumanilaiyur 2. Vellalapatty 3. Pasupathipalayam 4. Periyakulathupalayam
7	STP	35.25 MLD at Arasu Colony
8	Railway Crossing	4 locations (Pumping main)
9	House Service Connections (HSCs):	29,687 Nos.
10	Disposal of treated effluent	Treated water is proposed to be discharged into agricultural channel and it reaches to Amaravati River.
11	Light house components	Solar sludge drying bed UV treatment at STP VFD pumps in all proposed Pumping/lift stations Screw press sludge dewatering machine at STP

2.1.2 Sewage Treatment Plant

The proposed 35.25 MLD Sewage Treatment Plant (STP) at Arasu Colony in Karur Municipal Corporation under the KfW assisted SMIF-TN-III project, an important component is the reuse of treated wastewater for agricultural purposes. Out of the total treated wastewater, has been earmarked for irrigation reuse, supporting the state's commitment to sustainable water management.

2.2 Lighthouse components

Karur Municipal Corporation is proposed to be developed as lighthouse project. The UGSS projects are proposed and components integrated with circular economy principles, treated water reuse, climate adaption, and urban livability enhancements are proposed as light house components.

2.2.1 Solar Sludge drying beds

Solar sludge drying beds are greenhouse-covered drying beds in STPs that use solar radiation and ventilation to evaporate moisture from dewatered sludge, reducing volume and weight for cheaper disposal or reuse

2.2.2 Sludge reuse

The proposed 35.25 MLD STP will generate sludge as reuse for the Agricultural/ Irrigation Purposes.

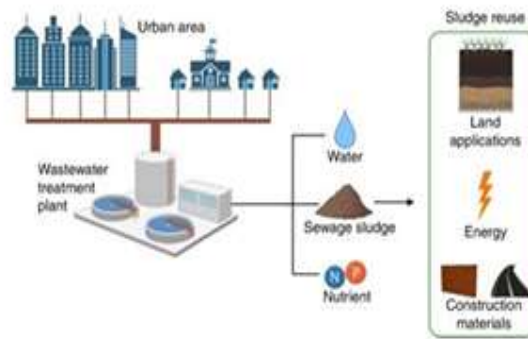


Figure 2: Typical Drawing show sludge reuse

2.2.3 VFD pumps

Variable Frequency Drive (VFD) pumps are proposed in all pumping station/lifting stations.

Table 2: Location, Size & FMB Of Land Required for Proposed Components

S. No	Location	Available land (Sq.m)	Extent Required of land (Sq. m)	Survey No. (TSR/OSR)	Land Classification	Ownership of land	Remarks/Current status
1	Thirumanilaiyur –PS 3	800	625	1758, 1759, 1760	Poramboke	ULB	No involuntary resettlement/ NOC obtained

S. No	Location	Available land (Sq.m)	Extent Required of land (Sq. m)	Survey No. (TSR/OSR)	Land Classification	Ownership of land	Remarks/Current status
2	S. Vellalapatty –PS 2	800	400	1256	Poramboke	ULB	No involuntary resettlement/ NOC obtained
3	Periyakulathupalayam - PS 1	700	400	335/2 part	Poramboke	ULB	No involuntary resettlement/ NOC obtained
4	Pasupathipalayam	650	625	2097/2	Poramboke	ULB	No involuntary resettlement/ NOC obtained
5	Arasu colony STP - Proposed land	36000	20000	1044, 1045, 1046, 1047, 1048, 1049	Poramboke	ULB	No involuntary resettlement/ NOC obtained

Note: Land for new 35.25 MLD is within the premises of existing STP where adequate space is available.

2.3 Zone-wise Details

The sewerage infrastructure for the proposed Underground Sewerage Scheme (UGSS) in Karur City Municipal Corporation (KCMC) has been designed by delineating the city into three distinct zones: Zone-1, Zone-2, and Zone-3. These zones cumulatively cover all wards, with the division based on geographic contiguity and population concentration to optimize sewage collection and conveyance systems.

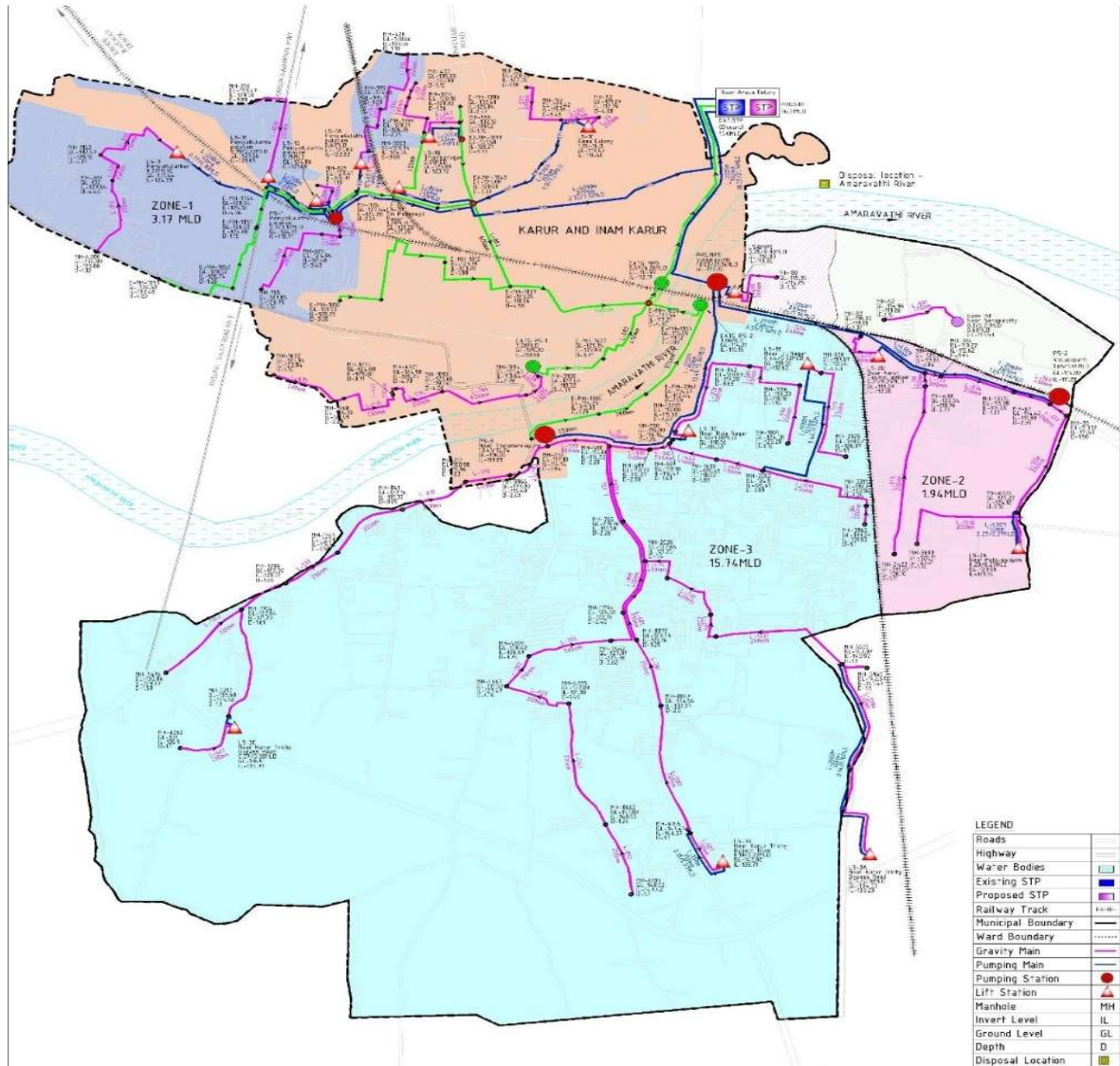


Figure 3: Proposed zone wise Pumping Stations in UGSS karur

2.4 Proposed new Sewerage system

The planning and design for the Underground Sewerage Scheme (UGSS), a comprehensive assessment was carried out to project the population growth and corresponding sewage generation over the design years of 2025, 2040, and 2055 across various coverage categories—namely fully covered, partially covered, and uncovered wards. The projections are vital to ensure that the proposed sewerage infrastructure is adequately sized and resilient to future demographic and environmental changes.

2.5 Key Components of Proposed Sewerage System

2.5.1 Sewer Networks

1. Zone-1 (Karur & Inam Karur): 91 km of new sewer lines and 14.53 Km of revamping of Existing sewer Networks and 2.25Km of existing Pumping main.
2. Zone-2 (Sanapiratti & Thanthoni): 38 km of sewer lines.
3. Zone-3 (Sanapiratti & Thanthoni): 225 km of sewer lines.
4. House Service Connections (HSCs): 29,687 Nos., with internal plumbing up to 6m per property.
5. Inspection Chambers (ICs): For 50% of HSCs with two ICs, and 50% with one IC.

2.5.2 Pumping System

❖ Pumping Main:

- 150mm & 700mm dia CI Class-LA pipes, 26.3 km length.

❖ Sewage Pumping Stations:

- Includes civil works, pumpsets, M&E components.
- Odour control units at all new/existing pumping stations.
- Online monitoring systems for pumping stations.

2.5.3 Sewage Treatment Plant (STP)

- ❖ Improvements in Existing STP for treating present sewage flow of 5 to 6MLD
- ❖ New STP at Arasu Colony: Design and construction of 35.25 MLD capacity.

❖ Effluent Management & Reuse:

- Screw-type Filter Press at STP.
- UV treatment for 35.25 MLD treated water.
- Treated water disposal to irrigation channel
- Pump sets is proposed for treated water.
- Solar Sludge Drying Beds: 35 cum/hr capacity.

❖ Digitalization:

- SCADA System for real-time monitoring and automation.

Pressure sensors, quality sensors, and control units across the system

Table 3: Population and Sewage Generation Projection

Wards	Population			Sewage generation in MLD		
	2,025	2,040	2,055	2,025	2,040	2,055
Fully Covered	146645	177469	208292	16.13	19.52	22.91
Partially Covered	21975	26593	31212	2.42	2.93	3.43
Uncovered	98905	119693	140482	10.88	13.17	15.45
Total	2,64,760	3,20,410	3,76,060	29.12	35.25	41.37

The following are the salient features of the proposed sewerage system

- Total proposed zones- 3 Zones
- Proposed lift stations – 16 Nos
- Proposed new Pumping stations - 4 No. s
- Total Pumping main lengths - 26.3km
- Max. depth of Machine Hole - 4.9m

2.5.4 Revamping of Existing Sewer Network/Machine Holes

Revamping of Existing Sewer Network consists of 14.53 Km sewer line & 497 No's Machine holes.

2.5.5 Revamping of Existing Pumping Main

Revamping of Existing Pumping Main is 2.25 Km.

Workplan

The work plan for the ESIA report is described below

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3. LEGAL AND REGULATORY FRAMEWORK

3.1 Regulatory Framework

In this regulatory framework section, the prevailing key of National, State level laws, rules, policies, Acts, notifications pertaining to environmental, climate change and social aspects have been reviewed for their applicability to the proposed sub projects are as follows. The policy objective is that all the environmental, social and climate change issues and impacts potential from the project are mitigated and effectively addressed in the project components and be in conformity to the applicable legislations and regulations.

3.2 Regulatory Framework Related to Environment, Social and Climate Change.

The environmental, climate change and social laws, rules, policies, Acts, notifications applicable to the lighthouse UGSS Projects are listed in the following Table 4.

National Legislations

Table 4: National and State Regulations on Environmental, Climate Change and Social Aspects

Sl. No.	Acts/ Rules/ Regulations	Description	Relevance to this Sub project
1	Water (Prevention and Control of Pollution) Act, 1974 and Tamil Nadu Water (Prevention and Control of Pollution) Rules, 1974	These laws seek to control pollution of water and enhance the quality of water. Under this law, it is mandatory to obtain consent for discharge of effluents and pay consent fees to Tamil Nadu State Pollution Control Board (TNPCCB) for any municipal projects causing water pollution.	Applicable.
2	The Water (Prevention and Control of Pollution) Cess Act, 1977	This Act provides for levy and collection of access by local authorities on water consumed by persons or industries to augment resources for Pollution Control Boards.	Applicable.
3	Forest (Conservation) Act, 1980	Forest (Conservation) Act, 1980 was enacted to halt rapid deforestation and governments cannot de-reserve forest land or direct that it be used for non-forest purposes.	Not Applicable.
4	Air (Prevention and Control of Pollution) Act 1981 and Tamil Nadu Air (Prevention of Control of Pollution) Rules 1983	These laws address the prevention and control of air pollution. Under section 21 of this Act, it is mandatory to obtain consent from Pollution Control Board to establish or operate any industrial operation.	Applicable.
5	Environment (Protection) Act, 1986	Popularly known as EP Act, it is an umbrella legislation that supplements existing environmental regulations. This law essentially links pollution and natural resource issues.	Applicable.
6	Prohibition of Employment as Manual Scavengers and their Rehabilitation Act 2013 (PEMSR)	This act prohibits construction of insanitary latrines and employment or engaging of manual scavenger for the purpose of manual scavenging. No person, local authority or any agency shall, from such date as notified by the State Government (which shall not be later than one year from the date of commencement of this Act), engage or employ, either directly or indirectly, any person for hazardous cleaning of a sewer or a septic tank.	Not Applicable
7	The Right to Fair Compensation and transparency in Land	The Act provides enhanced compensation and assistances measures and adopts a more consultative and participatory approach in dealing with Project Affected	Not Applicable

Sl. No.	Acts/ Rules/ Regulations	Description	Relevance to this Sub project
	Acquisition, Rehabilitation and Resettlement Act, 2013 (LARR). The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Rules, 2017, Government of Tamil Nadu. (Gazette Notification Sep 21, 2017)	Persons. This act came into effect on 1 January 2014 and the Land Acquisition Act, 1894 stands reled. The Act lays down procedures for estimating fair compensation of the affected families (and n o t j u s t the title holders) due to land acquisition, rehabilitation and resettlement. The Act is notified by the GoTN on 21 September 2017 (G.O. Ms. No. 298, Revenue & Disaster Management (LA-I(1), 20 th September 2017)	
8	The Child Labour (Prohibition and Regulation) Amendment Act, 2016. The Child Labour (Prohibition and Regulation) Act,1986	No child below 14 years of age will be employed or permitted to work in any of the occupations set forth in the Act's Part A of the Schedule or in any workshop wherein any of the processes set forth in Part B of the Schedule. Child can help his family or family enterprise, which is other than any hazardous occupations or processes set forth in the Schedule, after his school hours or during vacations.	Applicable.
9	National Policy on safety, health and environment at workplace	This code consolidates and amends the laws regulating the Occupational safety and health and working conditions of the persons employed in an establishment. The Act replaces 13 old central labour laws like The Factories Act, 1948, The Building and other Construction Workers Act, 1996, The Mines Act, 1952 etc.,	Applicable
10	The Occupational Safety, Health and Working Conditions Code, 2020	This code consolidates and amends the laws regulating the Occupational safety and health and working conditions of the persons employed in an establishment. The Act replaces 13 old central labour laws like The Factories Act, 1948, The Building and other Construction Workers Act, 1996, The Mines Act, 1952, The I n t e r -State Migrant Workmen Act, 1979, etc.,	Applicable.

Sl. No.	Acts/ Rules/ Regulations	Description	Relevance to this Sub project
11	Code on Wages, 2019	The Code on Wages seeks to regulate wages & bonus payments in all employments. The code subsumes four existing acts namely, The Equal Remuneration Act, 1976, The Minimum Wages Act, 1948, The Payment of Bonus Act, 1965, The Payment of Wages Act, 1936.	Applicable.
12	Workmen Compensation Act, 1923.	The Act provides for compensation by the employer to their workmen in case of injury by accident arising out of and during employment.	Applicable.

State Regulations

Sl. No.	Acts/ Rules/ Regulations	Description	Relevance to this sub- Project
1.	Chennai Metropolitan Area Ground water (Regulation) Amendment Act, 2002	This amendment to the original act was made to impose provision of rainwater harvesting in every building either private or government to augment ground water storage in such manner as may be prescribed. The act also mentions that water bodies, including ponds, lakes, tanks and the like, whether public or private should be used only for the purpose of storage of water and not for any other purposes. These provisions are also included in the Panchayats Act and the Municipal Act.	Not Applicable
2	District Green Committee	To consider the cutting of trees in public places and public offices. Ref G.O.(Ms). no.39 dated 02.07.2021 of the Environmental Climate Change and Forest (FR.13) Department, Government of Tamil Nadu	Applicable
3.	The Tamil Nadu Preservation of Private Forest Act, 1949	Guidelines for extraction of trees from non-forest area stipulates that permission for tree cutting shall be taken from State Forest department	Applicable.

Sl. No.	Acts/ Rules/ Regulations	Description	Relevance to this sub- Project
4.	The Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014 and Rules 2015 notified by GOTN.	Street vendors, defines the rights and duties of street vendors and requires definition of designated vending zones, issue of certificates of vending and identity cards to street vendors, and proposes vending fees and maintenance charges. Under the Act, each state government is required to define the public purpose for which a street vendor may be evicted and the manner of relocation, manner of giving notice, and provides for a dispute resolution mechanism. As per the Act, the planning and regulation of street vending is to be undertaken at town level by the Town Vending Committee. The Act also provides for social audit of the activities of the Town Vending Committee. This act that specifically aims to protect the rights of urban street vendors and to regulate street vending activities. It provides for Survey of street vendors and protection from eviction or relocation; issuance of certificate for vending; provides for rights and obligations of street vendors; development of street vending plans; organizing of capacity building programmes to enable the street vendors to exercise the rights contemplated under this Act; undertake research, education and training programs to advance knowledge and understanding of the role of the informal sector in the economy, in general and the street vendors, in particular and to raise awareness.	Applicable
5.	Occupational, Safety, Health and Working Conditions (Tamil Nadu) Rules 2022.	These draft rules notified on 11.04.2022	Applicable.

Sl. No.	Acts/ Rules/ Regulations	Description	Relevance to this sub- Project
6.	Code on Wages (Tamil Nadu) Rules, 2022	These draft rules notified on 11.04.2022	Applicable.

Climate Change

Sl. No.	Acts/ Rules/ Regulations	Description	Relevance to Karur Project
1.	NATIONAL ACTION PLAN ON CLIMATE CHANGE (30.06.2008) TNSAPCC, 31.03.2015	India is faced with the challenge of sustaining its rapid economic growth while dealing with the global threat of climate change. India, in 2008, has set up National Action plan on climate change (NAPCC) which outlined policies aimed at sustainable growth and dealing with climate change concerns effectively. NAPCC outlines eight national missions to address various adaptation and mitigation measures pertaining to Solar Energy, Enhanced Energy Efficiency, Sustainable Habitat, Water, Sustaining Himalayan Ecosystem, Green India, Sustaining Agriculture, and Strategic Knowledge on Climate Change.	Applicable

3.3 Regulatory Clearances required for this sub-project

The applicable regulatory clearances required for this sub-project is listed below.

Table 5 Clearances/permissions to be obtained by the Karur city municipal corporation for the project

SI No	Proposed activity	Statutory authority	Applicable legislation	Status
1	Construction and operation of STP	TNPCCB	Water (Prevention and Control of Pollution) Act, 1974	To be applied (CTE, CTO)
2	Tree Cutting	Department of Forest, Tamil Nadu and District Green Committee	Tamil Nadu Timber Transit Rules, 1968. G.O.(Ms). no.38 dated 02.07.2021 of the Environmental Climate Change and Forest (FR.13) Department, Government of Tamil Nadu	12 nos of tree affected in this sub-project. District Green Committee permission to be applied. Compensatory plantation at 10times (120 nos) has been proposed in this sub-project.
2	Highway crossings for laying of pipes.	NH, NHAI, SH	National Highways Rules 1957	To be applied
4	Railway Crossing	Southern Railway	Indian Railways G.O No: 2015/LML-1/19/2 dated 25-06-2015	To be applied
5	Electricity Connections and tariff.	TNPDCL	Tamil Nadu Electricity Supply Code (as amended up to 31-12-2009)	To be applied
4	Traffic diversion for laying of Sewer Networks, Machine holes, pumping mains etc.,	Traffic Police, Karur City	MoRTH 112 SP 55 of IRC codes	To be applied
5.	A. Disposal of treated water	Water Resources Department	G.O.(Ms). no.101 dated 30.09.2024	To be applied

Clearances to be obtained by the Contractor

Sl.no .	Constructio n Activity	Statutory Authority	Statute under which clearance is required	Responsibility	Supervision
1	Labour Licence and all other statutory work permits including Contract Labour & Interstate Migrant Worker License (if any)	Tamil Nadu Labour Department. Directorate of Industrial Safety and Health (DISH - https://dish.tn.gov.in/)	- The Contract Labour (Regulations & Abolition) Act, 1970 - The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996	Contractor	ULB /PMC
2	Workmen compensation Insurance / Accident Insurance, EPF and ESIC (as applicable)	Tamil Nadu Labour Department	Tamil Nadu Labour welfare Fund Act	Contractor	ULB /PMC
3	Crushers/Quarries and Batching plants/Ready Mix Concrete Plants	Tamil Nadu Pollution Control Board (TNPCB)	Consent to establish And consent to operate under Air Act, 1981	Contractor	ULB /PMC
4	Discharges from construction activities	Tamil Nadu Pollution Control Board (TNPCB)	Consent to establish and consent to operate under Water Act, 1974	Contractor	ULB /PMC

5	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 PIU for obtaining material from a particular source PIU to review and approve only existing licensed mines	Contractor	ULB /PMC
6	Ground water extraction	WRD	Tamil Nadu Groundwater Development and Management Act 2000	Contractor	ULB /PMC
7	Temporary traffic diversion measures	Traffic Police	MoRTH 112 SP 55 of IRC codes	Contractor	ULB /PMC
8	Controlled Blasting	District Collector	The Explosives Act 1884	Contractor	ULB /PMC
9	Use of Chlorine Gas Cylinders at STP (storage & use >5nos)	Chief Controller of Explosives, PESO	The Gas Cylinders Rules, 2016	Contractor	ULB /PMC

4. ENVIRONMENTAL AND SOCIAL BASELINE

This chapter presents the baseline data required to understand the environmental, ecological attributes and socio-economic characteristics of the study area, the pipeline route. The baseline includes climate, meteorology, topography, geology, hydrology, drainage, rainfall, land usage, water, air, noise, soil, flora, fauna and social profile of local population. The objective is to comprehend the current environmental conditions and socio-economic status of people which would help in comparing and assessing the impacts on E&S aspects caused by the project in pre-construction, construction and operation phases.

4.1 Environmental, Socio economic, demography, climate etc., setting of the project area is provided below.

The primary and secondary sources of documents, reports, On site survey etc.,. The secondary data were collected from relevant websites, online as well as offline for the sub-project area. Data thus collected from the secondary sources- published and unpublished literature, government documents, reports, etc were reviewed to establish the baseline.

The primary Environmental baseline air, soil, noise, ground water & surface water in sample locations representing the project area has been carried out. Social baseline survey has been carried out in all the project sites and alignment in order to identified permanent/temporary/economic/livelihood impacts.

Based on the secondary source's topography, Rainfall & Climate, Temperature and Humidity, Rainfall pattern, Geology and soils, Sedimentary formation, Major agricultural crops, Seismic details, Terrestrial ecology, Flora, Fauna, Socio-economic Environment, Economy, Physical Environmental Components of the Sub-project area is provided below.

4.1.1 Topography

KCMC covers around 2895.57 Sq. kms and almost plain except Rengamalai hills in extreme south of Karur Taluk. Tipasamymalai & Vellimalai hills in Kulithalai Taluk. Cauvery is the Major River flowing on northern and eastern boundaries. Amaravathi runs through Karur and Confluences with Cauvery at Nerur. There are Kudaganaru, Narganji Aru which flow during rainy days. Elevation ranges from 97 to 230 meters (MSL). Also, the average elevation of Karur district is 145 meters above mean sea level.

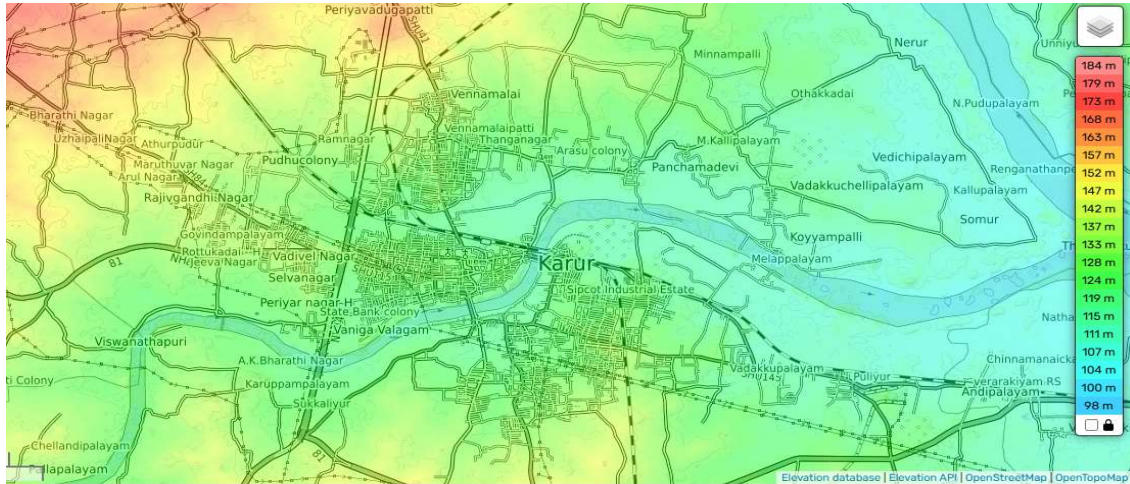


Figure 4: Topographic Map of Karur district

Image show that, range is 97 m to 230 m surface topographic of project area

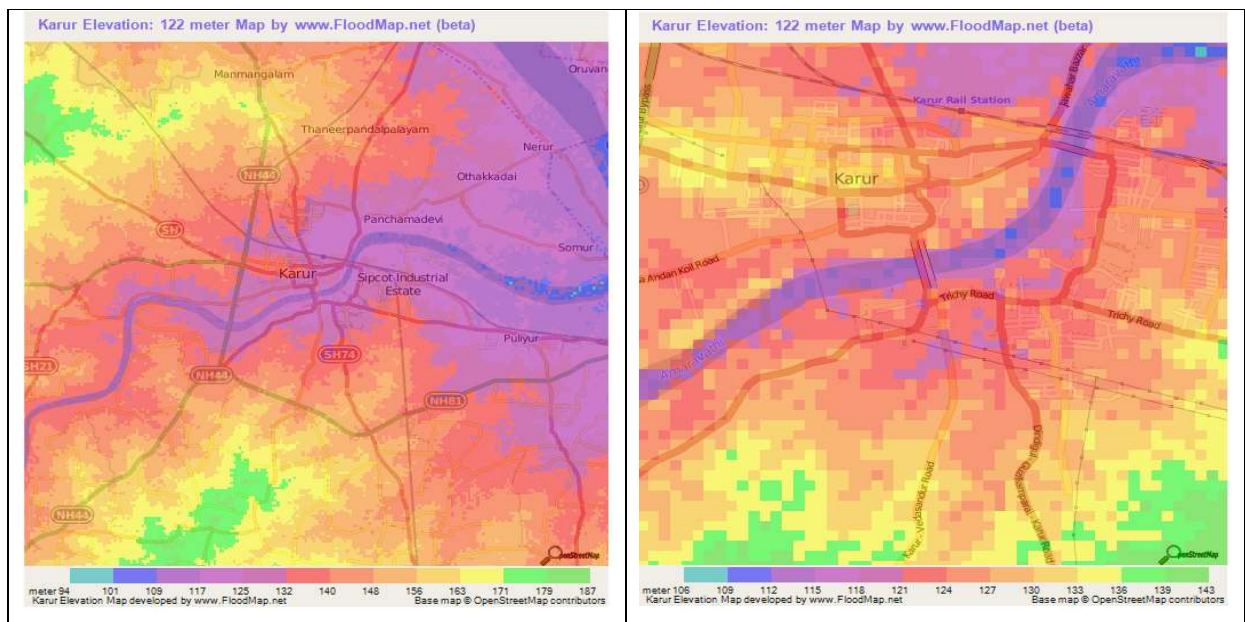


Figure 5: Karur Elevation Map by www.FloodMap.net (beta)

Image show that, range is 122 m elevation of project area

4.1.2 Rainfall & Climate

Karur district falls under the hot semi-arid climatic zone, influenced by both maritime and continental weather systems. The town experiences three distinct seasons: summer (March–May), monsoon (June–December), and winter (January–February). The prevailing climate is characterized by high

temperatures, moderate humidity, and significant seasonal rainfall variation, which has implications for infrastructure planning, water resources management, and urban flood resilience

4.1.3 Temperature and Humidity

The climate remains hot and humid for most of the year. The mean maximum temperature ranges from 30°C to 39°C in peak summer months (April–May), while the mean minimum temperature can drop to around 22°C during the cooler months (December–January). Relative humidity remains high, ranging from 50% to 75%, especially during the monsoon season, which affects human comfort levels and evaporative water loss.

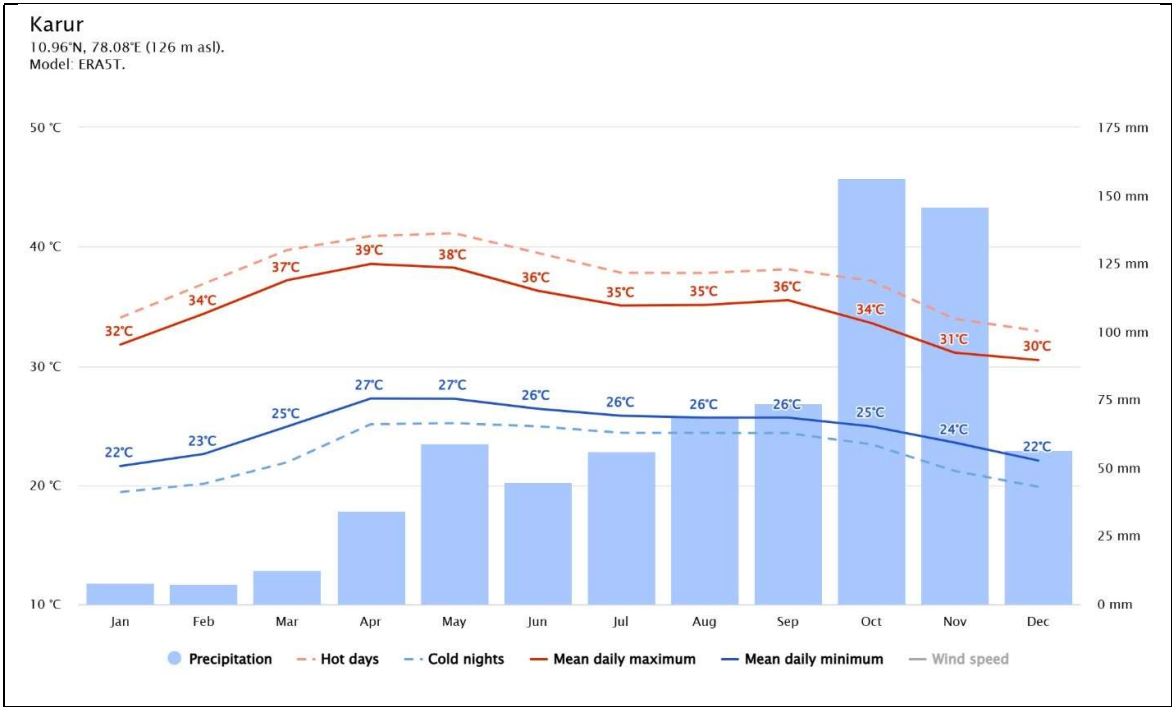


Figure 6: Mean daily maximum & minimum temperature of Karur district

4.1.4 Rainfall Pattern

The district receives the rain under the influence of both southwest and northeast monsoons. The rainfall an average annual rainfall of 635 mm(range 1994-2024), primarily contributed by the Northeast Monsoon (October to December).

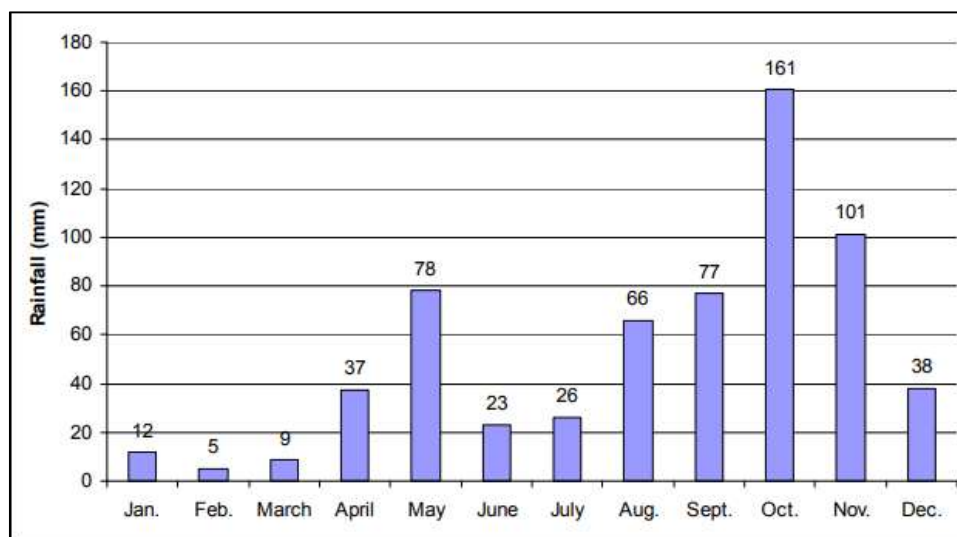


Figure 7: Mean Annual rainfall of Karur district

Rainfall)	Average (mm)	Normal Onset	Normal Cessation
SW monsoon (June-Sep):	192	1 st week of June	1 st week of October
NE Monsoon (Oct-Dec):	300	2 nd week of October	4 th week of December
Winter (Jan- March)	26	-	-
Summer (Apr-May)	115	-	-
Annual	635	-	-

Source: Agricultural contingency plan KARUR, CRIDA

4.2 Geology and Soils

Soil types of the area are more important, since soil deposition is important for agricultural production and also for the recharge of ground water. Different types of soil are derived from geological formations. On the basis soil map of Karur district based on the survey by the Tamil Nadu Agricultural Department indicates four different types of soils. Soil Map is given in Figure 10 and the type of soils found in Karur is given in Table below. The soils of Karur district can be broadly classified into 4 major soil types viz., Red Soil, Thin Red Soil, Red Loam and River Alluvium Soil. Red soil is the predominant one covering major part of the district followed by Thin Red soil and Red loam. The soil type in the project area is classified under red loam.

Table 6: Soils in Karur District

S. No	Type of Soil
1.	Yellowish Red, Fine Loamy Soils
2.	Reddish Brown, Fine Loamy Soils
3.	Reddish Brown, Coarse Loamy Soils
4.	Dark Brown, Clay Loamy Soils

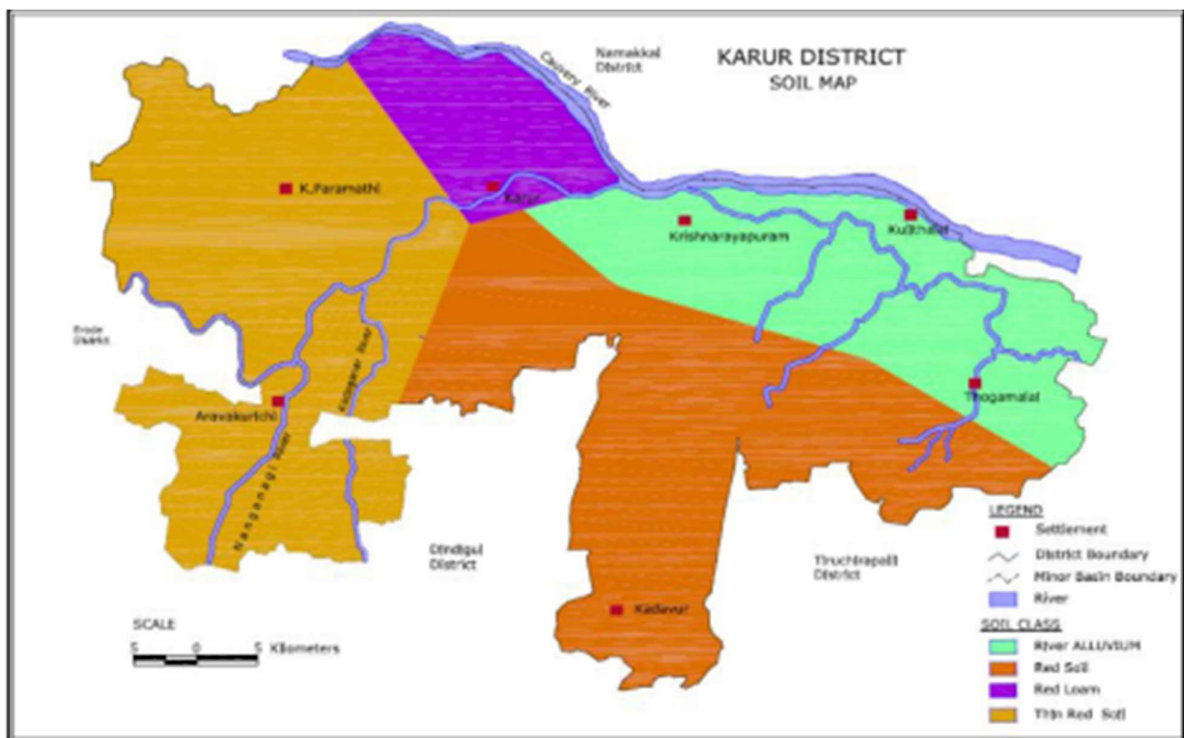


Figure 8: Soil map of Karur district

SOURCE: DISTRICT STATISTICAL HANDBOOK KARUR 2016 – 17

Geologically Karur district is underlain by the wide range of metamorphic rocks of peninsular gneissic complex. These rocks are extensively weathered and overlain by the recent valley fills and alluvium at places. The geological formations found in the district are Archaean rocks like Gneisses, Granites, Charnockites, basic granulites and calc-gneisses. The younger formations are quartz veins and pegmatite.

Hard Rock Formation: - More than 90 percent of the district is underlain by hard rock of Archaean age. The gneissic type of formation is the major formation among the various types of hard rocks. Charnockite occurs in this district as pockets in Karur taluk. Quartzites which are resistant to weathering are also seen as patches in Charnockite and gneissic varieties.

Sedimentary Formation: - Recent alluvial deposits such as sand, silt, clay, gravel etc. which are transported sediments by river are found on either side of Cauvery River in Karur, block. These formations are overlying the hardrock.

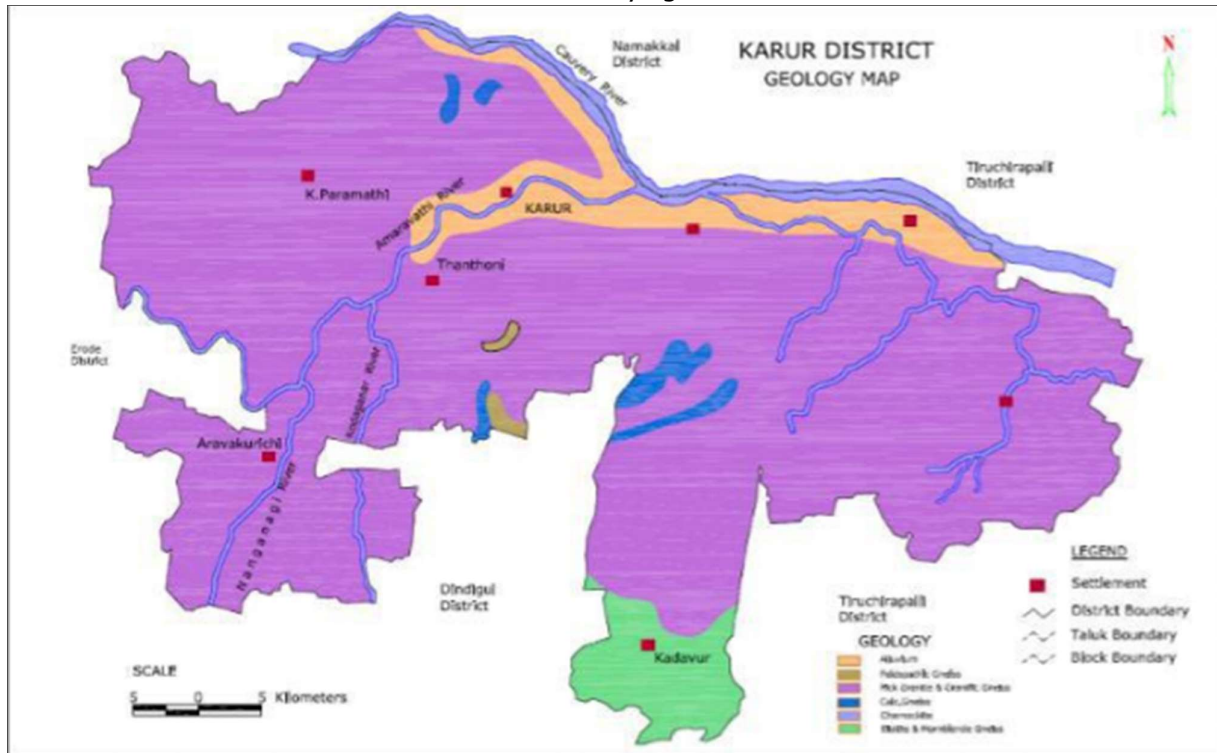


Figure 9: Geology map of Karur district

Source: Karur District sand mining report, GOTN

4.2.1 Major Agricultural crops:

Major Agricultural Crops cultivated in this district are crops Sorghum, Groundnut, Maize, Cowpea, Rice, Cotton. The most produced crop is Sorghum and the highest productivity is found in Maize.

Geomorphology: The entire area of the district is a pediplain. The Rangamalai hills and Kadavur hills occurring in the southern side of the district constitute the remnants of the much-denuded Eastern Ghats and rise to heights of over 1031m above mean sea level. From these hills the district slopes gently towards northeast and forms a vast stretch of plain country till the eastern boarder of the district. There are numerous small residual hills represented by Ayyarmalai, Thanthonimalai and Velayuthampalayam hills. The general elevation of the area is ranging between 100 m and 200m above

mean sea level. The prominent geomorphic units identified in the district are 1) Structural hill, 2) Pediments, 3) Shallow Pediments, 4) Buried Pediments and 5) Alluvial plain.

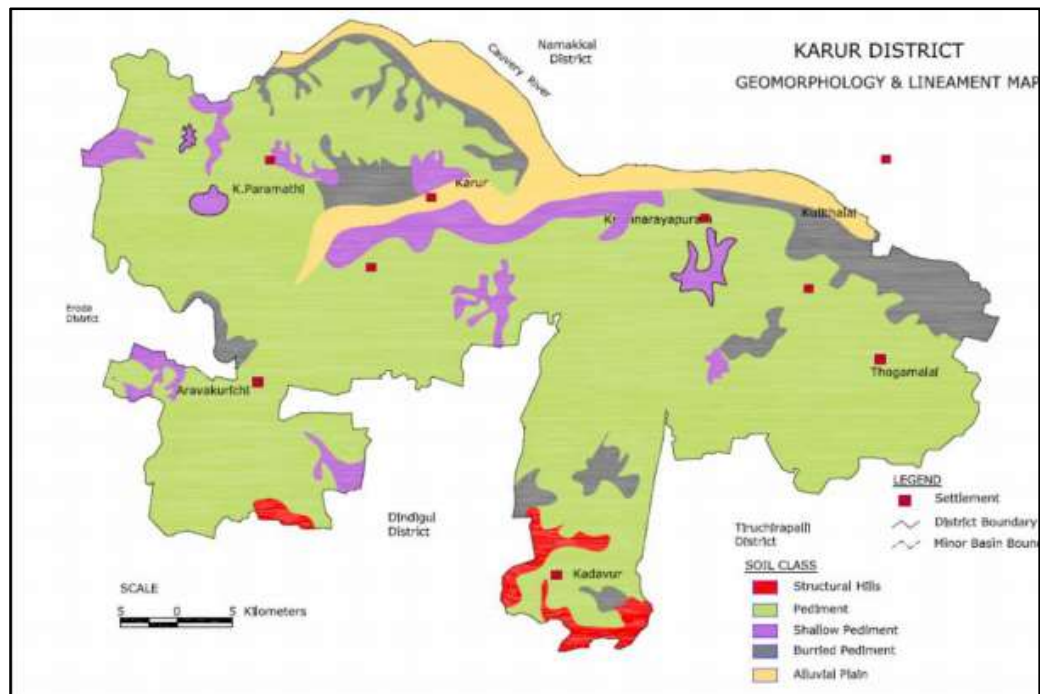
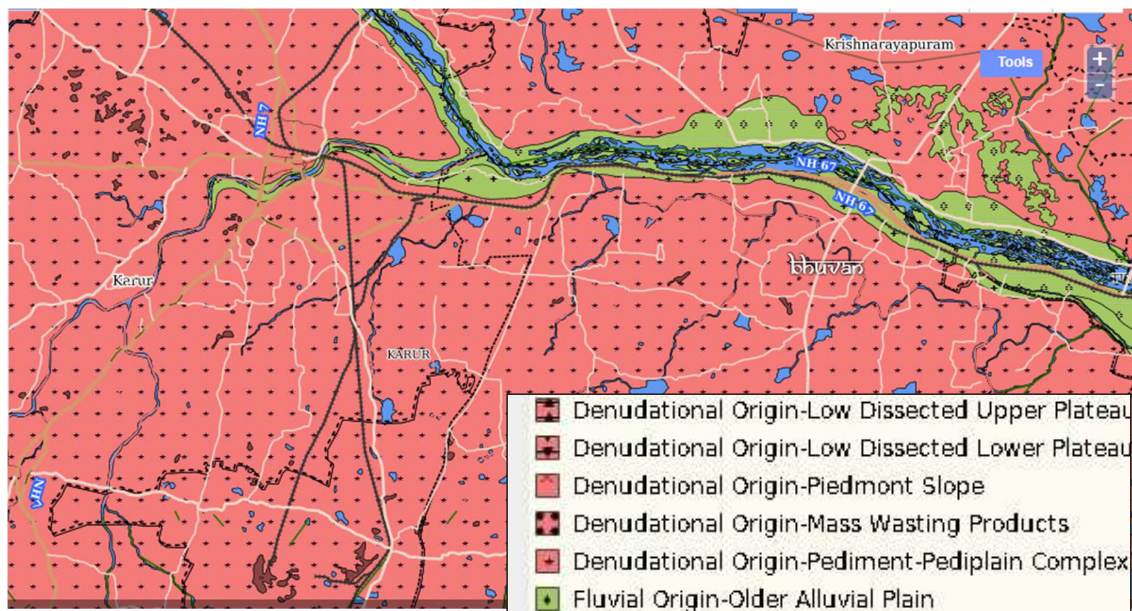


Figure 10: Hydrogeology & Lineament Map of Karur District



Source: Bhuvan LEGEND

4.2.2 Hydrogeology & Lineament map of project region

Lineaments may be indicative of fault or geological contact or shear or major joints. Lineaments are the proven secondary aquifers in hard rocks. Groundwater occurrence in the fractured aquifers is noted at relatively in deeper zones. After exploiting shallow aquifers for agricultural and domestic purposes, targeting of groundwater is concentrated towards the investigation of heterogenous deeper hydro fracture zones. Lineament map of Karur district indicates intersection of lineaments which is considered to be good potential zones of groundwater.

4.2.3 Seismic Details of the Area

The entire district falls under the category of Zone II with an intensity of Medvedev-Sponheuer-Karnik (MSK) VI or less as per the Seismic Zoning Map of India contained in IS 1893:2002 Fifth Revision. This zone is referred to as Moderate Risk Zone as per Building Material and Technology Promotion Council (BMPTC), which has no history of earthquakes above 5 magnitudes in its vicinity.

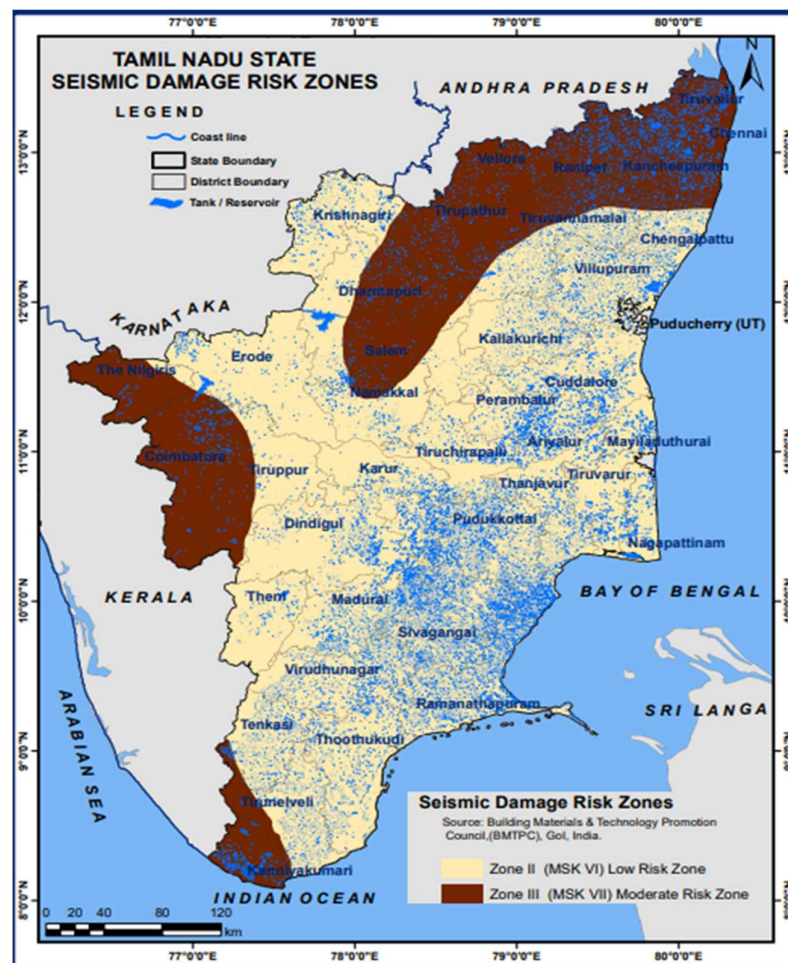


Figure 11: Seismic zone map Earthquake Vulnerability Mapping-Tamil Nadu

Source: Building Materials & Technology Promotion Council, (BMPTC), GoI, India.

4.2.4 Land use / Land cover:

The ever-growing population and limited availability of land necessitates proper utilization of available land through scientific land use planning. Data on land use/land cover patterns, their spatial distribution and changes are the prerequisites for making development plans. The geographical area of Karur is 2,89,901 ha. According to professional surveys and also village records, the land use pattern during 2011 is indicated in the following

Classification	Area in Hectares
Built up land	1000
Forest	6187
Barren and Uncultivable uses	2897
Land put to Non-Agricultural uses	35457
Cultivable Waste	67431
Permanent Pastures and Other Grazing Land	10779
Land Under Miscellaneous Tree Crops and Groves not included in Net Area Sown	1079
Current Fallows	10322
Other Fallow Land	57241
Net Area Sown	98508
Total Geographical Area	299901

(Source: Directorate of Town and Country Planning)

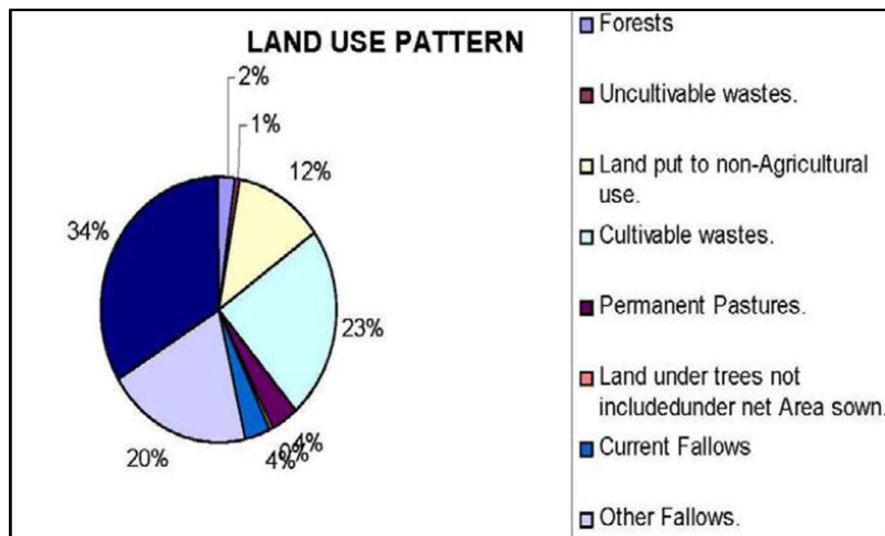


Figure 12: Land use classification of Karur district

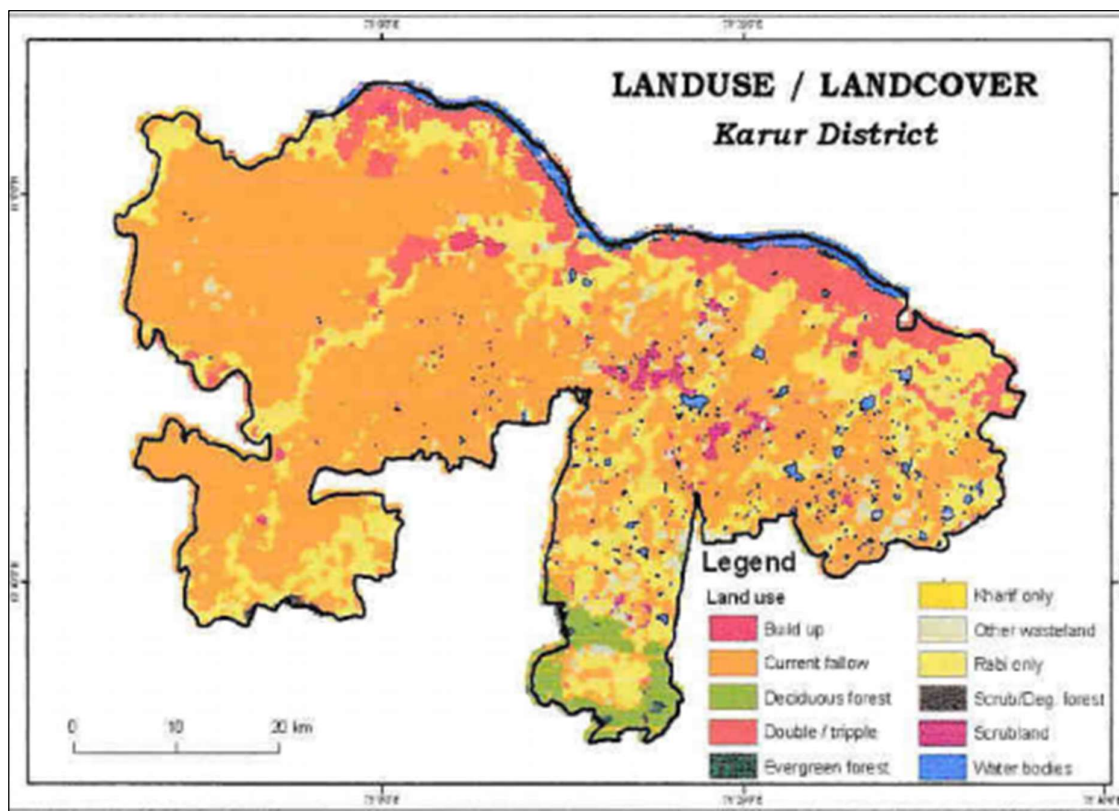


Figure 13: LU/LC Map of Karur district

4.3 Study Area Vulnerability

Flood Prone areas

According to the flood hazard/vulnerability map showing that, it is observed that very high vulnerability has been traced to the confluence points of Amaravathi and Cauvery River and the immediate four surrounding villages (Mayanur, Krishnarayanapuram North, Reganathapuram North, Balarajapuram), followed by high to low vulnerability along the riverine villages.

Table 7: List of flood vulnerable places in Sanapiratti of Karur Municipal Corporation

S.No	Name of the Taluk	Municipal Corporation / Town Panchayat	Ward Name & No	Status of Vulnerability
1.	Karur	Municipal Corporation	Kuditheru, Ahgraharam, Sanapiratti Karur city Municipal corporation Ward No.33	High Vulnerability

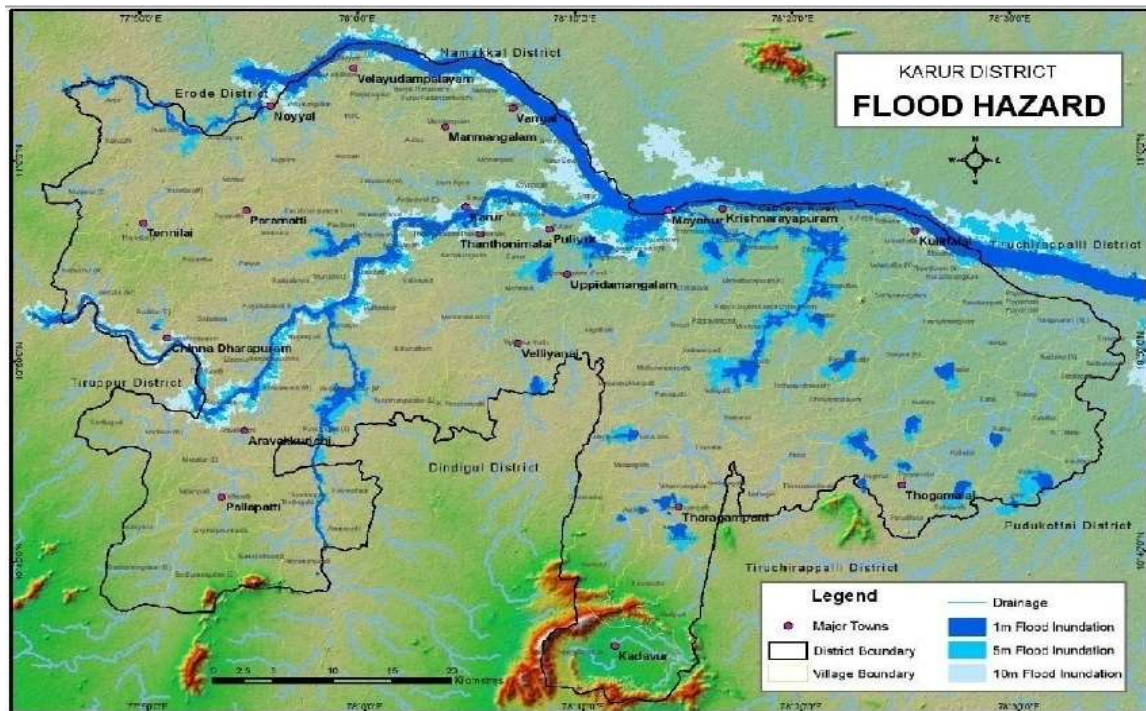
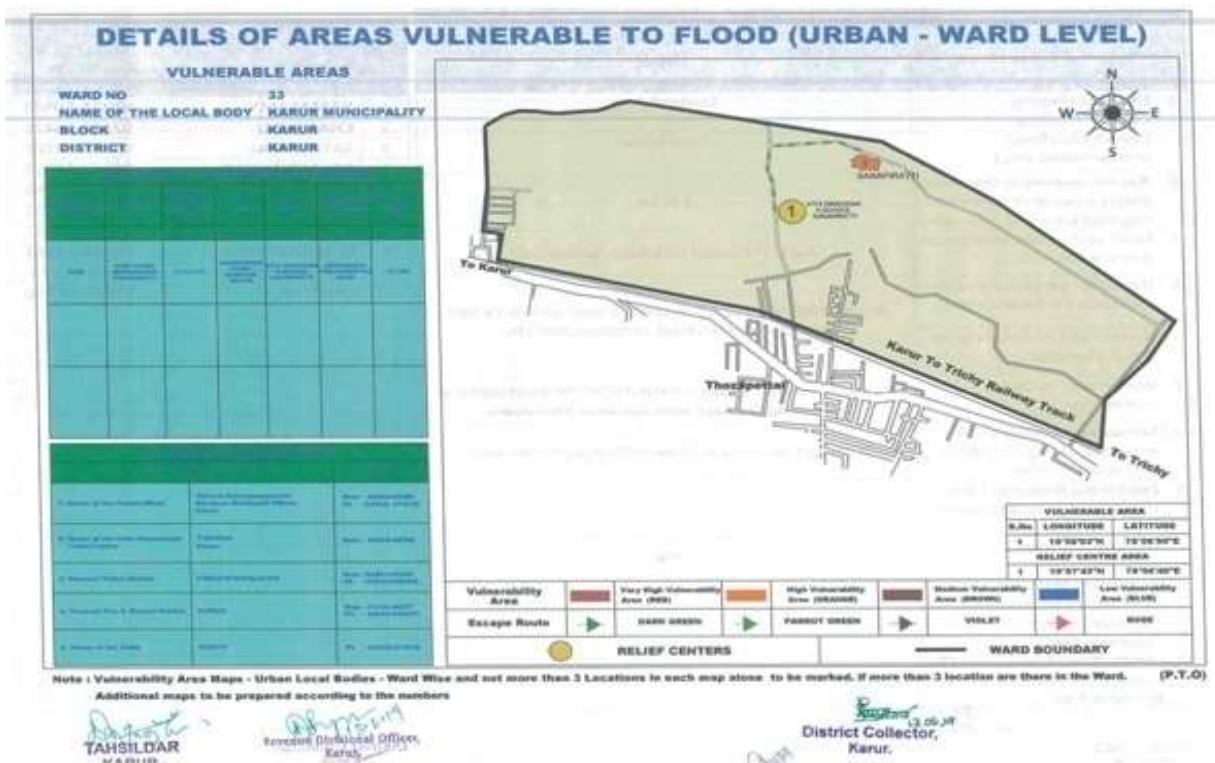
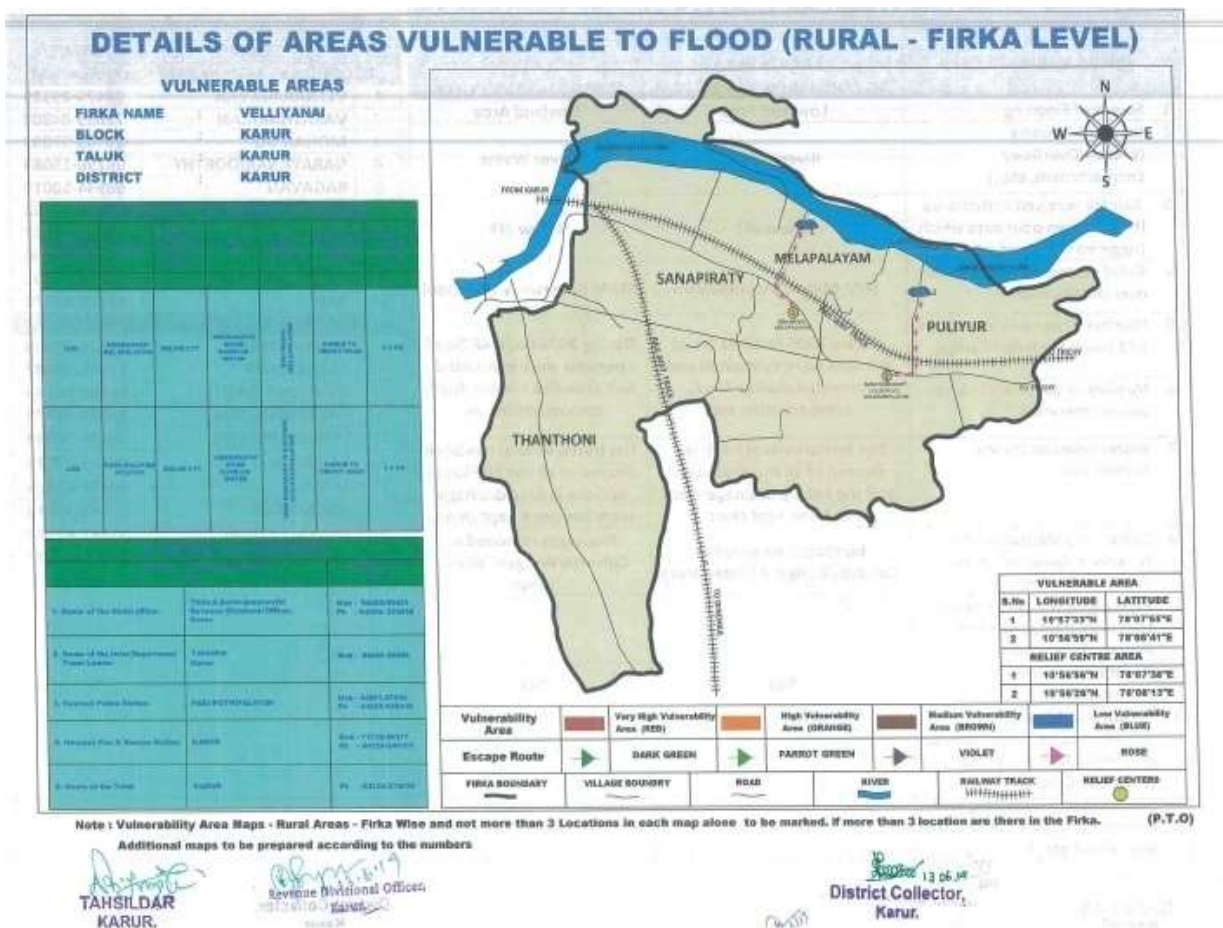


Figure 14: Flood Hazard /Vulnerability map
Source: Karur District Disaster Management Plan-2019





4.4 Terrestrial Ecology (Karur)

4.4.1 Flora

Common flora found in the project area are bananas, moringa, tapioca, cotton, rice, and sugarcane.

There no endangered plants are found in the Project area. Due to the proposals made in this project, no major impact on Flora is envisaged.

4.4.2 Fauna

Fauna found in the project area includes Indian Pond Heron and Little Egret, along with common reptiles like the Indian Chameleon and Asian Common Toad.

The proposals made in this project do not have any adverse impact on the Fauna.

Hereby, **No Forest land/Eco-Sensitive/Biodiversity** hot spots are present in the project area.

The secondary information collected from different sources include the Ministry of Environment, Forest and Climate Change (MOEF&CC), Census of India 2011, District Census Handbook, Geological Survey of India, Indian Meteorological Department, State Pollution Control Board (SPCB), Underground Water

department, PWD, tourism and other relevant departments of the state and Central governments. The data sources are indicated at Table below.

Table 8: Sources of E&S data

S.No.	Attribute	Parameter	Source of Data
1	Land use /cover	Land use patterns	Satellite Imagery
2	Geology	Rock formation and mineral profile	Geological Survey of India and project site study (geotechnical investigation)
3	Air, water, noise, soil	Measurement levels	Relevant departments. /Primary data
4	Meteorology	Temperature, cloud, wind, etc.	IMD Chennai office and other studies.
5	Ecology	Existing terrestrial flora and fauna	Various sources. /Flora fauna survey based on visual inspection and enquiry with locals
6	Socio-economic aspects	Socio-economic characteristics	Census of India, 2011; District Handbook, survey in project area
7	Social screening survey	To identify social impacts	Social baseline survey

4.5 Social Impact Assessment

Social experts developed a comprehensive methodology for the social screening process, aiming to incorporate feedback from a broad range of stakeholders—particularly vulnerable communities. Their approach focused on identifying key social concerns and recommending strategies to promote inclusion and mainstream these groups within the project framework. Stakeholder consultations were held to communicate the project's scope and objectives to the community, with a particular focus on families and individuals likely to be affected. These sessions also addressed the challenges faced by underserved areas, especially in relation to sanitation, wastewater management, and environmental health. Currently, the sewerage infrastructure continues to rely on on-site sanitation systems, which pose significant risks to both public health and the environment. Discussions emphasized the potential benefits of the Lighthouse UGSS projects. Throughout these sessions, stakeholders actively shared their insights and perspectives, while community members offered valuable suggestions that were further explored in focused group discussions.

4.5.1 Socio-economic Profile

Karur covers an area of 53.26 km² divided into 48 wards and had a population of 2, 14,412 as per 2011 census. It is administered by a City Municipal Corporation. The decadal census population for the entire Karur city Municipal corporation is given below.

Year	Total Population of Town
1991	1,55,852
2011	2,14,412
2017	2,24,378

As per 2011 Census Karur city Municipal corporation has a population density of the city is 4,026/sq.km. The town has a total of 67,051 households. In the subsequent years, Karur city Municipal corporation was expanded by adding adjacent 2 Municipal Corporation 's viz., Inam Karur and Thanthoni and village Panchayat viz., Sanapiratti. Map showing all the wards in the town is attached as **Annexure-6**.

Ward wise Population (2011)

Ward No	Population	Ward No	Population	Ward No	Population
1	5083	17	2066	33	3806
2	5629	18	4209	34	7093
3	4357	19	4517	35	4013
4	4471	20	4704	36	7535
5	6400	21	3274	37	7356
6	5644	22	4929	38	3942
7	3947	23	5843	39	5831
8	3804	24	3592	40	4369
9	3246	25	3205	41	6077
10	5585	26	3315	42	2670
11	5917	27	3181	43	1710
12	4725	28	4084	44	6177
13	4687	29	3436	45	2045
14	3636	30	5358	46	4726
15	2189	31	5652	47	5511
16	3599	32	3827	48	3440
				Total	2,14,412

Table 9: Religious census

Religion	Percent (%)
Hindu	91.41%
Muslim	5.62%
Christian	2.88%
Sikh	0.01%
Buddhist	0.01%
Other	0.07%
No religion	0.01%

4.5.2 Demographics of Karur District

The Karur district is one of the largest urban agglomerations in the state. It is located nearest to the geographic centre of the state of Tamil Nadu According to 2011 census; Karur district had a population of females, 64,493 with a sex-ratio of 1,015 females for every 1000 males, much above the National average of 929. A total of 102,731 were under the age of six, constituting 52,969 males and 49,762 females. Scheduled Castes and Scheduled Tribes accounted for 20.8 % and 0.05 % of the population respectively. The average literacy of the district was 68.3yo; compared to the national average of 72.99 %. The district had a total of 287,095 households. There was a total of 543,298 workers, comprising 83,800 cultivators, 182,639 main agricultural labourers, 10,162 in house hold industries, 231,906 other workers, 34,791 marginal workers, 2,072 marginal cultivators, 18,198 marginal agricultural labourers, 1,178 marginal workers in household industries and 13,343 other marginal workers.

4.5.3 Economy

The town has about 19% of its total area under agricultural land use. The major crops are rice, cotton, sugar cane and oil seeds, while the major horticultural crops are coconut, banana, betel and mango. The town is the commercial centre for trading of agricultural commodities from the nearby towns and villages. Karur, being the headquarters of the district, has registered growth in tertiary sectors, with a corresponding decrease in the primary sector. Approximately 80 per cent of the workforce is employed in tertiary sector, 17 percent in primary sector and 4% in secondary sector activities.

Karur is a major home textile centre and has five major product groups — bed linens, kitchen linens, toilet linens, table linens and wall hangings. The city generates around Rs 10000 crores. It earns more than 1.5 Billion US\$ in foreign exchange through direct and indirect exports. Major importers are Walmart, Sears in the US, IKEA in Sweden and other major retailers in the UK. Allied industries like ginning and spinning mills, dyeing factories and weaving employ around 300,000 people in and around Karur. Hand-loom Exports from Karur began on a modest scale with just 15 exporters in 1975. Karur is

also home to an integrated textile park, Rs190 crore, Karur Textile Park Limited (KTPL) a premier facility of its kind in the country for its technical and ancillary facilities.

Karur is a major hub for Bus Body [coach] building in South India, with a major market share of almost 70% of bus coaches being built here locally. The total business turnover from building bus coaches is estimated to be around Rs1000 crore per annum.

About 60% of mosquito nets in India are manufactured in Karur. About 2000 units are engaged in making High-density polyethylene (HDPE) mono filament yarn and associated products and employ about 50,000 people.

Bharat Petroleum Corporation formed a joint venture with Petronet CCK and has installed a pipeline facility from Cochin to Karur for transporting petroleum products. The petroleum products received at the BPCL-Karur terminal in Athur is supplied to more than 20 districts of Tamil Nadu through tanker trucks.

TNPL promoted by the Government of Tamil Nadu with loan assistance from the World Bank, located near Karur, is the largest producer of bagasse (sugarcane waste from Sugar mills) based paper in the world and the second-largest paper producer in Asia. The firm produces 230,000 tonnes of printing and writing paper and consumes 1 million tonnes of bagasse every year.

Chettinad group has established a wet process cement plant at Puliur near Karur with a capacity of 1.7 MTPA.

4.6 Physical Environmental Components

The environmental assessment of the Karur Municipality Under Ground Sewerage Scheme (UGSS) has been undertaken with careful consideration of the project footprint, its interaction with the physical environment, and prevailing environmental regulations. The key physical environmental attributes examined for the Environmental Assessment Report (EAR) include water quality, soil conditions, air quality, noise levels, topography, geology, hydrology, and climate profile. Each parameter was studied using both secondary data and field investigations in accordance with the Environmental Impact Assessment (EIA) Notification 2006 and relevant CPCB/IS codes.

Air

The nearest airport is at Trichy, about 70 km away from Karur

Rail

The nearest railway station is at Karur. Karur Junction an important hub to like the major cities like Chennai, Trichy, Madurai, Salem, and Coimbatore.

4.7 Environmental Monitoring study:

Air, Noise, Surface and Ground water samples were collected from near to the project influence area, particularly around the Amaravathi River stretch and tanks within the Karur Municipal Corporation boundary. The sampling locations for various parameters selected representing the sub-project area. The sample collected were tested and analysed in the NABL accredited Laboratory, the original test reports are annexed in the annexure 3.

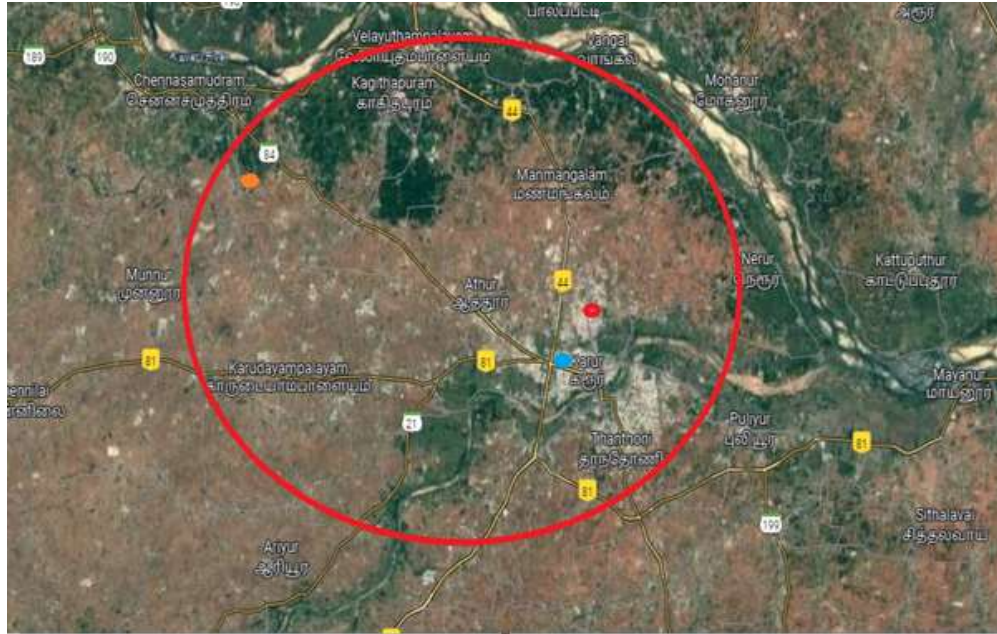


Figure 15: Environmental Baseline Sampling Location

Note **Colour code:** Air Quality Test Sampling & Noise Pollution sampling – Tansi – **Blue**; Ground water sample collection – Vangalpalayam – **Red**; Surface water sample collection- Kolathupalayam – **Orange**; Soil sample collection – Tansi – **Blue**

4.7.1 Air Quality:

Ambient air quality sample was collected near Arasu colony.

Methodology

Sampling was collected for 24 hours from 9am to 9 am particulate matter has been performed using High volume respirable dust sampler (RSD) attached with additional gaseous sampler.

S.No.	Test Parameters	Test Method	Results	Unit	CPCB Standards
Discipline :Chemical			Group :Atmospheric Pollution		
1	Particulate Matter (Particle Size less than 10µm) or PM ₁₀	IS 5182 Part 23 : 2006	60.3	µg/m ³	NMT 100
2	Particulate Matter (Particle Size less than 2.5 µm) or PM _{2.5}	IS 5182 Part 24 : 2019	27.8	µg/m ³	NMT 60
3	Sulphur dioxide (SO ₂)	IS 5182 Part 2/Sec 1 : 2023	6.5	µg/m ³	NMT 80
4	Nitrogen dioxide (NO ₂)	IS 5182 Part 6 : 2006	22.7	µg/m ³	NMT 80
5	Ammonia (NH ₃)	IS 5182 Part 25 : 2018	BDL(DL:20)	µg/m ³	NMT 400
6	Ozone (O ₃)	IS 5182 Part 9 : 1974	BDL(DL:20)	µg/m ³	NMT 180
7	Carbon Monoxide (CO)	IS 5182 Part 10 : 1999	BDL(DL:0.05)	mg/m ³	NMT 4
8	Benzene (C ₆ H ₆)	IS 5182 Part 11 : 2006	BDL(DL:1.0)	µg/m ³	NMT 5
9	Benzo (a) Pyrene (BaP) Particulate Phase only	IS 5182 Part 12 : 2004	BDL(DL:0.01)	ng/m ³	NMT 1
10	Lead (Pb)	USEPA Compendium Method IO - 3.4 : 1999	BDL(DL:0.1)	µg/m ³	NMT 1
11	Nickel (Ni)	USEPA Compendium Method IO - 3.4 : 1999	BDL(DL:1.0)	ng/m ³	NMT 20
12	Arsenic (As)	USEPA Compendium Method IO - 3.4 : 1999	BDL(DL:1.0)	ng/m ³	NMT 6
Instrument used for sampling: Respirable Dust Sampler Instrument ID & Calibration Due Date :CML/ENV/RDS/012 & 24.11.2025 Fine Dust Sampler Instrument ID & Calibration Due Date:CML/ENV/FDS/016 & 25.11.2025 Note: BDL:Below Detection Limit; DL:Detection Limit; NMT:Not More Than; Remarks: The values observed for the pollutants given above are within the CPCB Standard.					

- **Observation:** Ambient air quality result showing moderate to good condition. PM 2.5 range is 27.8 µg/m³, PM 10 range is 60.3 µg/m³, NO₂ range is 22.7 µg/m³ and SO₂ range is 6.5 µg/m³. All the parameters are within the permissible limits. Test report and photographs attached in **Annexure 03**.
- **Implication:** During the Pre-construction and post-construction phase required to monitor the air quality such as fine particulate matter both PM 2.5 & PM 10 in project area.
- **Mitigation:** The parameters monitored during the study at Arasu colony area were observed are within the permissible limits as per CPCB standards.

4.7.2 Noise Quality:

Methodology

For noise levels measured over a given period interval at pallavan nagar. Noise level monitoring was carried out continuously for 24-hours with one-hour interval starting at 0600 hrs to 0500 hrs next day. The noise levels were monitored on working days only. During each hour Leq were directly computed by the instrument based on the sound pressure levels.

S. No	Sampling location	Day Mean Leq dB(A)	Night Mean Leq dB(A)	CPCB Standards
1	Pallavan Nagar	62.6	47.2	55 dB(A) during day & 45 dB(A) during night

- **Observation:** Ambient noise quality noise showing daytime is 62.6 dB (A) Leq and Nighttime is 47.2 dB (A) Leq.
- **Implication:** Due to significant noise pollution from sources like traffic, construction, and urbanization.
- **Mitigation:** Create green belt and tree plantation to reduce the noise and regulate the industries to minimize the noise level at source reduction.

4.7.3 Ground Water:

Methodology

Ground water sample was collected in Gangai amman koil street, the test results are given below,

I	PHYSICAL EXAMINATION	BIS Limits	1	2
1	Appearance	Nil	Not Clear	Not Clear
2	Colour (Pt.Co - scale)	Nil	Slightly Black	Slightly Green
3	Odour	Nil	Bad Smell	Bad Smell
4	Turbidity NT units	Nil	18	12
5	Total dissolved solids, mg/L	2100 Mg/L	1371	1393
6	Total Solids	Nil	1467	1411
7	Total Suspended Solids	30 Mg/L	95	18
8	Electrical conductivity micro mho/cm	Nil	1958	1991
II	CHEMICAL EXAMINATION			
9	pH	5.5-9	7.69	7.88
10	Ph-Alkalinity as CaCO ₃ mg/L	Nil	0	0
11	Total Alkalinity CaCO ₃ mg/L	Nil	275	288
12	Total Hardness as CaCO ₃ mg/L	Nil	530	560
17	Iron as Fe mg/L	3.0Mg/L	1.26	1.29
18	Manganese as Mn mg/L	2.0Mg/L	0	0
19	Free Ammonia as NH ₃ mg/L	5Mg/L	49.65	46.2
20	Nitrite as NO ₂ mg/L	Nil	1.88	1.90
21	Nitrate as NO ₃ mg/L	Nil	0.00	0
22	Chloride as Cl mg/L	Nil	460	470
23	Fluoride as F mg/L	2.0MG/L	0	0
24	Sulphate as SO ₄ mg/L	Nil	88	90
25	Phosphate as PO ₄ mg/L	5Mg/L	57.38	58.61
26	Tidy's Test 4hrs as O ₂ mg/L	Nil	0.28	0.2
27	COD	250Mg/L	171	54
28	BOD as O ₂ mg/L	30Mg/L	57	18
III	BACTERIOLOGICAL EXAMINATION			
1	Fecal coliform (colonies per 100 ml)		8.4×10^5	680

- **Observation:** Surface water bodies, especially Amaravathi River, exhibit **moderate to poor water quality**, with high levels of BOD and coliforms, indicating pollution from untreated sewage and solid waste disposal.
- **Implication:** The project avoids direct abstraction from surface water sources and proposes Groundwater-based collector wells. Adequate care shall be taken to avoid any pollution run-off during construction.
- **Mitigation:** Implement efficient waste disposal systems, recycle, and avoid dumping waste in or near water bodies. Securely manage industrial and domestic waste. Properly dispose of chemicals and fuels, test for underground leaks, maintain septic systems, and minimize chemical use.

4.7.4 Soil Quality

Methodology

Soil sample was collected in Arasu colony STP, the testing parameter results are given below.

S. No	Test Parameters	Protocols	Results
Discipline: Chemical		Group: Pollution & Environment	
01	pH @ 25°C	IS 2720 Part 26 - 1987 (electrometric method)	6.94
02	Conductivity @ 25°C	IS 14767 - 2000	124 µmhos/cm
03	Iron as Fe	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	9486 mg/kg
04	Copper as Cu		9.28 mg/kg
05	Lead as Pb		BDL(DL:1.0 mg/kg)
06	Arsenic as As		BDL(DL:0.1 mg/kg)
07	Zinc as Zn		7.64 mg/kg
08	Nickel as Ni		3.12 mg/kg
09	Cadmium as Cd		BDL (DL : 1.0 mg/kg)
10	Total Chromium as Cr		5.46 mg/kg
11	Manganese as Mn		198 mg/kg
12	Mercury as Hg		BDL(DL:1.0 mg/kg)
Note : BDL : Below Detection Limit. DL : Detection Limit.			

- **Observation:** Soil is generally **moderately contaminated**, with Iron ranging from **9486 mg/kg**, and zinc levels around **7.64 mg/kg**, marginally exceeding the acceptable limit. Test report and photographs attached in **Annexure 03**.
- **Implication:** Quality of soil will be moderately contaminated in the location due to STP. The source of sustainability must also be monitored regularly.
- **Mitigation:** Improve wastewater treatment, manage mining waste, and plan land use to minimize pollution. Enforce strict regulations on industrial waste disposal and emissions and promote eco-friendly industrial practices.

Table 10: Location of Air, Noise and Surface water sampling

Sl.No	Location	Lat/Long
1.	AAQ- STP Arasu Colony	10°58'46.49"N / 78° 5'44.38"E
2.	ANQ- STP Arasu Colony	10°58'46.49"N / 78° 5'44.38"E
3.	GW- STP Arasu Colony	10°58'46.49"N / 78° 5'44.38"E
4.	Soil - STP Arasu Colony	10°58'46.49"N / 78° 5'44.38"E

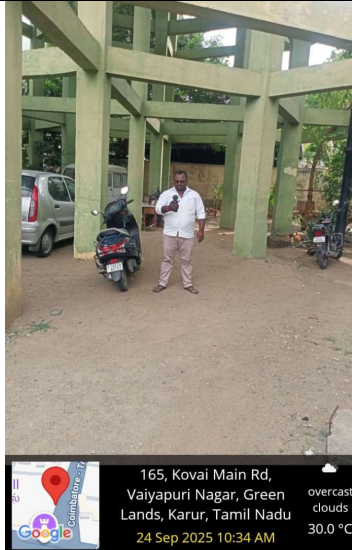
	
AAQ- STP Arasu Colony	ANQ- STP Arasu Colony
	
GW- Vangalpalayam Sump Area	

Figure 16: Air, Noise, Surface water & Ground water sampling in Project site

Drainage: Major part of Karur district is drained by Cauvery River. Amaravathi, Kodavanar and Pungar are the important rivers draining the western part of the district and the river Pungar drains in eastern part of the district. The drainage pattern, in general, is dendritic. All the rivers are seasonal and carry substantial flows during monsoon period. The river Cauvery flows on the northern and eastern boundaries of District. The river Amaravathi flows through Thanthoni and Sanapirati and joins with Cauvery at Nerur.

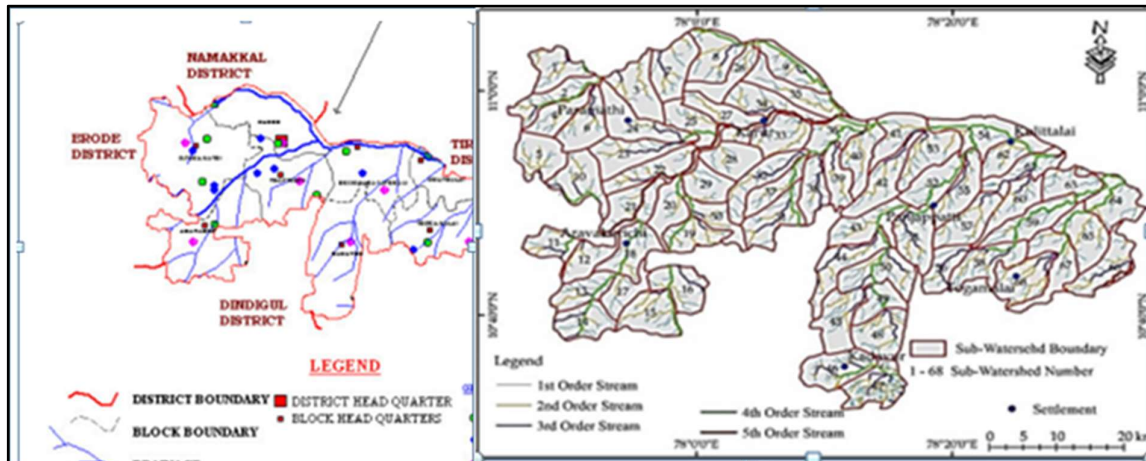


Figure 17: Drainage map of Karur district with stream orders

Source: Drainage Morphometric Analysis in Karur District, Tamil Nadu, India through Remote Sensing and GIS Techniques by Muralitharan1, & K.Palanivel, Journal of Remote Sensing & GIS, Volume 10, Issue 2&CGWA

4.8 Social Impact Assessment

The environmental baseline and analysis were completed. The Social Impact Assessment (SIA) process is carried out with an objective to identify, analyse, and assessment the impact of the project on the lives of people.

Analyse the impact of the project on the vulnerable communities associated to the project, ensure inclusion by identifying their concerns related to social aspect and recommend measures for inclusion and mainstreaming them into the project.

To assess the land details of the project area from the social safeguard point of view of social safeguards. Formulating the methodology for the social screening process is social screening, Focus Group Discussion and stakeholder consultation.

4.8.1 Social screening Methodology

Initially a DPR preparation stage social screening process including a reconnaissance survey and a resource mapping around the area were conducted to identify vulnerable groups within the project area, including women, children, elderly, and disabled persons and the impact of the project on them. It's a step by step process after the screening the focus group discussion was conducted with the residents and other stakeholders around the streets. Next step stakeholder consultation were conducted to screening the pipe line alimnt and proposed site.

4.8.2 Social Screening Survey

The social screening was carried out on 24-05-2025 to identify the potential temporary economic impacts in the project area. As per the entitlement matrix, the potential temporary economic impacts

are compensated for 7 days with notified minimum wage of Rs. 643 per day if there is any impact identified during the implementation

All the proposed pumping station sites are carefully selected in government owned vacant lands /existing pumping station and therefore there is no requirement for land acquisition or any resettlement. The alignment of pipeline within the road carriage way, and also the measures suggested for ensuring accessibility during works, notable but temporary impact is envisaged. Some shops and other premises along the roads may lose income if the access will be impeded by excavation, the presence of heavy vehicles and machinery, etc Inform all businesses and residents about the nature and duration of any work well in advance so that they can make necessary preparations.

Table 11: Site specific Environmental and Social features

SL NO	INFRASTRUCTURE	DETAILS	LOCATION & ENVIRONMENTAL FEATURE
1	Proposed Pumping Station (PS 01)	Inam Karur	The proposed pumping station site is vacant land. The site belongs to ULB. The site is located outside of town surrounded by industries and residential building. vacant lands on one side and another side main road. Hence improvement to aesthetics of site, the odour control mechanism, tree plantation are proposed. No impact identified during the assessment.
2	Proposed (PS 02)	Sanapiratti	The proposed site is vacant land. The proposed site is located at Commercial buildings at one side, vacant land at another side with the road access from main road. The odour control mechanism, compound wall on all the four sides, planting creepers and tree plantation provisions are proposed. No impact identified during the assessment.
3	Proposed (PS 03)	Thanthoni. Near Amaravati Bridge	The proposed site is vacant land. The site belongs to ULB. The proposed site is located by Residential buildings at one side; another side is main road. The odour control mechanism, compound wall on all three sides, planting creepers and tree plantation provisions

			are proposed. No impact identified during the assessment.
4	Pasupathipalayam	Pasupathipalayam	The proposed site is vacant land. The site belongs to ULB. Both the sites are Surrounded by vacant land. No impact identified during the assessment.
5	STP - Proposed land	Arasu colony	The proposed site is within existing STP premises only. The site belongs to ULB. No residential building nearby, vacant land at one side with the road access from main road. The odour control mechanism, Compound wall already existing on all the four sides, planting creepers and tree plantation provisions are proposed. No impact identified during the assessment.

The 16 no's Lifting stations are proposed in adjacent side of the road; all the roads are clear and accessible for the construction.

Revamping of Existing Sewer Network & Pumping Main line:

During the preparation phase, the screening was conducted on 24.05.2025 to identify any potential temporary impacts related to the proposed revamping of the pipeline from of 14.53 km. No negative impacts were identified during the screening.

Since the pipeline is laid along the middle of the road, street vendors, hawkers, and shop owners will not experience any livelihood impacts.

4.8.3 Focus Group Discussion

A focus group discussion is included for the study to bring together the residents in a common spot to understand, know and collect information about propose of lighthouse project in the locality. FGD were conducted on 23.5.2025 and 11.6.2025. Social expert will lead the FGD by sharing the details of the proposed project, putting forward the specific questions and the participants share their views, opinions and ideas. Verbal consent will be sought prior to document the discussions. In the FGD, the Social Expert will facilitate the discussion by asking enquiring questions to the participants which are included in the findings.

4.8.4 Stakeholders Meeting:

The stakeholder meeting is a formal meeting conducted with the Municipal Engineer, Executive Engineer and Assistant Engineer from Urban Local Bodies on 23.05.2025. The objective of the meeting is to have an interaction and gather information about the existing Sewage line, household connection etc. In this meeting discussions were carried out about the project purpose, scope and goal with the leader. Information about the area is gathered, the plan for development is shared and their suggestions of development of are with advanced water treatment and sewage supply system also availed and documented.

5. POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

This section identifies and assesses the potential changes in the environment and social aspects that could be expected from the proposed project. The proposed project activities would create impact on the environment in two distinct phases i.e., construction and operation phases. Impacts are identified, predicted and evaluated based on the analysis of the information collected from following:

- Project information (as discussed in Chapter-2) and
- Baseline information and site visits of the study area (as discussed in Chapter-4)

This section also describes mitigation measures, which have been suggested for the adverse impacts likely to be caused due to activities of both construction and operation phases of the project. The details of the activities and their impacts have been worked out in the following sections. Mitigation measures to minimize / mitigate negative impacts, if any, are recommended along with the agency responsible for implementation. Monitoring actions to be conducted during the implementation phase is also recommended to reduce the impact.

SI.No	Components	Description	Area of Influence
1	Sewer Network	1. Zone – (Karur & Inam Karur): 91 km of new sewer lines 2. Zone-2 (Sanapiratti & Thanthoni): 38 km of sewer lines. 3. Zone-3 (Sanapiratti & Thanthoni): 225 km of sewer lines 4. Total length of sewer network 354 Km	15 m
2	Revamping of Existing Sewer line	14.53 Km of sewer network & 497 No's of machine holes	15 m
3	Total pumping Main Length	26.30 km	15 m
4	Revamping of Existing pumping Main Length	2.25 Km	15 m
5	Proposed lift station	16 Nos.	15 m
6	Pumping Station	1. Thirumanilaiyur 2. Vellalapatty	25 m

		3. Pasupathipalayam 4. Periyakulathupalaym	
7	STP	35.25 MLD at Arasu Colony	50 m
8	Railway Crossing	4 locations (Pumping main)	15m
9	House Service Connections (HSCs):	29,687 Nos.	-
10	Disposal of treated effluent	Treated water is proposed to be discharged into agricultural channel and it reaches to Amaravati River.	-
11	Light house components	Solar sludge drying bed UV treatment at STP VFD pumps in all proposed Pumping/lift stations Screw press sludge dewatering machine at STP	-

Within this area of influence of each component, there is no sensitive environmental component identified.

5.1 Identification of likely impacts

Screening of potential environmental and social impacts are categorized into four categories Considering subproject phases: location impacts and design impacts (pre-construction phase), construction phase impacts and operations and maintenance phase impacts.

(i) Location impacts include impacts associated with site selection and include loss of on-site biophysical array and encroachment either directly or indirectly on adjacent environments. It also includes impacts on people who will lose their livelihood or any other structures by the development of that site.

(ii) Design impacts include impacts arising from Investment Program design, including technology used, scale of operation/throughput, waste production, discharge specifications, pollution sources and ancillary services.

(iii) Construction impacts include impacts caused by site clearing, earthworks, machinery, vehicles, workers, occupational health and safety. Construction site impacts include erosion, dust, noise, traffic congestion and waste production.

(iv) O&M impacts include impacts arising from the operation and maintenance activities of the infrastructure facility. These include routine management of operational waste streams, and

occupational health and safety issues.

This section of the ESIA reviews possible project-related impacts, in order to identify Issues requiring further attention and screen out issues of no relevance. The Environmental and Social Screening format are provided in the Annexure 1

In the case of this project most of the individual elements involve simple construction and operation, so impacts will be mainly localized and not greatly significant negative impacts. Most of the predicted impacts are associated with the construction process, and are produced because that process is invasive, involving excavation and earth movements; and being mostly located in an urban area, will not cause direct impact on biodiversity values. The project will be in properties held by the local government and access to the project location is through public rights-of-way and existing roads hence, land acquisition and encroachment on private property will not occur.

5.2 Design & Location impacts

Design of the Proposed Components. The Central Public Health and Environment Engineering Organization (CPHEEO) manual suggests a design period of 15/30 years. The UGSS components were designed following the recommendations of the CPHEEO manual for water supply and treatment.

- Impacts arise from the design of the project including the technology used, scale of operation, waste production, discharge specification, pollution sources and ancillary services.
- Impacts associated with the planning mainly depend on the site selection. Location impacts include on-site biophysical array and encroachment / impact either directly or indirectly on adjacent environments. It also includes the impacts on the people who might lose their properties or livelihoods due to the development of the proposed site.

Sources of Materials. For the construction work, the required materials like coarse aggregate and fine aggregate will be obtained from the permitted / licensed quarries by the Department of Geology & Mining, Government of Tamil Nadu. Contractors should not create/use any new borrow pits / quarries. The contractor should also make a concerted effort to re-use as much excavated material from this project as possible.

The construction contractor will be required to:

- (i) Obtain construction materials only from government-approved quarries with prior approval from Karur City Municipal Corporation;
- (ii) Karur City Municipal Corporation to review, and ensure that proposed quarry sources have all necessary clearances/ permissions in place prior to approval;
- (iii) Contractor to submit to Karur City Municipal Corporation on a monthly basis documentation on material obtained from each source (quarry/ borrow pit) and
- (iv) Avoid 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 prior to approval by Karur City Municipal Corporation.

5.3 Site Selection of Construction Work Camps, Stockpile Areas, Storage Areas, and Disposal Areas

Priority is to locate these near the project location, but it shall be at least 100m away from residential areas, groundwater wells and surface water bodies. 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, dust, noise etc. It is also intended to prevent any social conflicts, shortages of amenities, and crime). Extreme care will be taken to avoid disposals near forest areas, water bodies, or its nearby areas. The contractor will prepare a Construction ESMP (CESMP), including Labour Camp Plan and Waste Management Plan prior to construction and submit it to KCMC.

5.4 Noise from pumping operations

Operation of pumps and motors and diesel generators is a major source of noise. As the pumping station are located in the residential areas, with few located very close to the houses, noise generated from lifting / pump stations can have continuous negative impacts on the surrounding population. High inside noise levels can affect the health of operators and staff at the facilities, and therefore, noise levels need to be maintained within and outside the plant at acceptable levels. Procure good quality latest technology high pressure pumps that guarantee controlled noise at a level of around 80 dB(A) at a distance of 1 m.

Use appropriate building materials and construction techniques for pump houses which can absorb sound rather than reflect noise, use acoustic enclosures – manufacturer specified, for all pumps, motors. Procure only Central Pollution Control Board (CPCB) approved generators to meet air emission and noise level requirements. Provide sound mufflers for ventilators in the plant rooms; and sound proof doors. Provide ear plugs designated for noise reduction to workers.

5.5 Energy Efficiency

The entire quantity of water proposed to be drawn from Cauvery River in Vangal village is collection well 1 & 2 near the source. From the standpost the water reaches gravity. The sewer line is transmitted for a distance of 19.5 km by gravity. From the STP, again the water is pumped to the existing and proposed, and water will be distributed by gravity to the beneficiaries. Hence this project is predominantly based on gravity and is energy efficient.

To optimize power consumption, the hydraulic design shall follow optimal approach, and the following is also considered in design and selection of pumping systems. According to Manual for the Development of Municipal Energy Efficiency Projects in India (jointly developed by Bureau of Energy Efficiency (BEE) and International Finance Corporation in 2008), energy savings, at minimum, of 25% to 40% is possible with appropriate measures. The following measures have been considered and incorporated into the subproject designs wherever possible:

- Using low-noise and energy efficient pumping systems
- Energy Efficient Motors and Pumps
- Installation of Variable Frequency Drives (VFDs) and energy efficient than conventional starters, this will ultimately reduce the energy cost. This VFD will take care of fluctuations in pumping of water at source locations in terms of extreme variations.

5.6 Utilities

Telephone lines, electric poles and wires, water lines, drains, if exists within the proposed project locations may require to be shifted. The proposed sites are in government lands. Existing structures do not involve any hazardous material (chemical) and should be managed in compliance with C&D waste management rules.

Provision is made in BOQ for dismantling these structures. All the sites belong to ULB. Sewer lines are proposed mid of ways wherever road width is more than 18m and Rider mains are proposed on other sides. In such cases, the work may require shifting of utilities on the shoulder. To mitigate the adverse impacts due to relocation of the utilities, the contractor, in collaboration with the Municipal Corporation will

- Identify the locations and operators of these utilities to prevent unnecessary disruption of services during construction phase; and
- Instruct construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services

5.6.1 Site Selection of Construction Work Camps, Stockpile Areas, Storage Areas, and Disposal Areas

Priority is to locate these near the project location, but it shall be at least 100m away from residential areas, groundwater wells and surface water bodies. 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, dust, noise etc. It is also intended to prevent any social conflicts, shortages of amenities, and crime). Extreme care will be taken to avoid disposals near forest areas, water bodies, or its near by areas. The contractor will prepare (PA-ESMP) prior to construction and submit to PIU/ PMC.

5.6.2 Site Selection for Sourcing of Materials

Significant quantities of coarse aggregate and fine aggregate will be required for construction works. Contractor should procure these materials only from the licensed quarries with valid permits. Contractor should, to the maximum extent possible, procure material from existing quarries. It will be the main contractor's responsibility to verify the suitability and legal status of all material sources and to obtain the approval of Department of Geology and Mining and local revenue administration, as required. The record should be maintained and made available for verification as and when required.

5.6.3 Social and Cultural Resources – Chance Finds

Any work involving ground disturbance can uncover and damage archaeological and historical remains. For this project, excavation will occur in project sites for foundations, laying pipelines, and for construction of underground structures at pumping/lifting stations. In the project site there are no archeologically or historically recognized sites or places close to project sites or within the project area. However, in case of such finds are recognized during excavation, all necessary measures are to be taken to ensure they are protected and conserved.

Construction contractors to follow these measures in conducting any excavation work.

- Create awareness among the workers, supervisors and engineers about the chance finds during excavation work.
- Stop working immediately to allow further investigation if any finds are suspected.
- Inform State Archaeological Department if a find is suspected and taking any action, they require to ensure its removal or protection in situ.

5.7 Construction impacts

Main civil works in the subproject include laying sewer lines and construction of pumping stations at the identified sites. water pumping stations works will be confined to sites, and construction will include general activities like site clearance, excavation for foundations, and creation of concrete structures will be one of the major construction activities for this project, as many of the subproject components will be fixed to concrete plinths and most will be housed in buildings with at least some concrete structural elements. Most such structures will be constructed from reinforced concrete (RC), where steel reinforcing rods and bars are placed and attached by hand to create an interior skeleton

for the foundations, walls, columns, plinths, etc, and heavy-duty metal and timber/plywood formwork is bolted around the outside to build a mould into which pre-mixed concrete is poured.

Earth work excavation will be undertaken by machine (backhoe excavator) and include danger lighting and using sight rails and barricades. The work will also be supplemented manually where there is no proper working area (e.g. very narrow streets) for the backhoe excavators. As trenches are deep (up to 2.5 m), there is no risk of collapse of trenches and/or damage to surrounding buildings, safety risk to pedestrians and traffic.

Although sewer laying work involves quite simple techniques of civil work, the invasive nature of excavation in the urban area where there are a variety of human activities, will result in impacts to the environment and sensitive receptors such as residents, businesses, and the community in general. These anticipated impacts are temporary and for short duration, however, needs to be mitigated.

The proposed under this area is well developed urban pockets and are busy and packed, hence contract company needs to take all site safety, Environmental safeguard measures strictly also PPE (Personnel protective equipment) to all who are at site shall be provided.

Anticipated impacts during the construction phase are discussed below along with appropriate mitigation measures to avoid, minimize or mitigate those impacts to acceptable levels.

For construction of new STP, the existing Sludge drying beds and maturation pond area shall be utilized. Hence, be due care will be taken by the contractor on DBOT basis in treating the present flow with improvements in existing STP as per the TNPCB Standards and in parallel the construction of new STP of 35.25 MLD of SBR technology. CFE will be obtained before constructing the New STP. The impacts are localized, which can be minimized with measures.

5.8 Sources of Materials

Significant amount of sand and coarse aggregate will be required for this project, which will be sourced from quarries. Quarries inevitably cause extensive physical changes; as construction materials are excavated from the ground, leaving large cavities, or levelling hillsides, etc. The physical damage caused by quarries is controlled by allowing them to operate within specific limited areas only, so the damage is restricted in extent and not allowed to spread indiscriminately. Contractor should, to the maximum extent possible, procure material from existing quarries. It will be the main contractor's responsibility to verify the suitability and legal status of all material sources and to obtain the approval of Department of Geology and Mining and local revenue administration, as required. The record should be maintained and made available for verification as and when required.

The construction contractor will be required to:

- Obtain construction materials only from government approved quarries with prior approval of PIU.

- PIU to review and ensure that proposed quarry sources have all necessary clearances/ permissions in place prior to approval.
- Contractor to submit to PIU on a monthly basis documentation on material obtained from each source (quarry/ borrow pit).
- No new areas, quarries etc., shall be developed for the project. If required contractor need to get clearance from concern department.

5.9 Air Quality

Construction work, especially from earthwork activities, coupled with dry and windy working conditions, material and debris transport, and works along the public roads carrying significant traffic and has high potential to generate dust in the air.

Significant quantities of earthwork will be conducted in the subproject, spread all over the project area. Also, emissions from construction vehicles, equipment, and machinery used for excavation and construction will induce impacts on the air quality. Anticipated impacts include dust and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulphur oxides, particulate matter, nitrous oxides, and hydrocarbons. Dust generation from construction work in individual and confined work sites lifting and pumping stations etc., will be mainly during the initial construction phase of earth work, as the site is confined, dust can be effectively controlled with common measures. Dust generation will be significant during sewer laying along the roads. Increase in dust/ particulate matter in ambient air is detrimental and may have adverse impacts on people and environment. To mitigate the impacts, construction contractors will be required to ensure followings for all construction works:

Provide a dust screen (6 m high) around the construction sites of pumping stations, provide 2 m high barricades for the sewer line laying works. Damp down the soil and any stockpiled material on site by water sprinkling. (water sprinkled 3-4 times a day - before the start of work, 1-2 times in between, and at the end of the day). when working in the roads there should permanently be one person responsible for directing when water sprinkling needs to take place to stop the dust moving. Reduce the need to sprinkle water by stabilizing surface soils where loaders, support equipment and vehicles will operate by using water and maintain surface soils in a stabilized condition.

Apply water prior to levelling or any other earth moving activity to keep the soil moist throughout the process.

Cover the soil stocked at the sites with tarpaulins and surround by dust screens. Control access to work area, prevent unnecessary movement of vehicle, public trespassing into work areas; limiting soil disturbance will minimize dust generation. Use tarpaulins to cover the loose material (soil, sand, aggregate etc.,) when transported by open trucks. Control dust generation while unloading the loose material (particularly aggregate, sand, soil) at the site by sprinkling water and unloading inside the

barricaded area; minimize the drop height when moving the excavated soil. Clean wheels and undercarriage of haul trucks prior to leaving construction site

Ensure that all the construction equipment, machinery is fitted with pollution control devices, which are operating correctly, and have a valid pollution under control (PUC) certificate.

No vehicles or plant to be left idling at site. Diesel generators to be at placed maximum distance from properties.

5.10 For Pipeline laying works

Barricade is the construction area using hard barricades (of 2 m height) on both sides. Initiate site clearance and excavation work only after barricading of the site is done. Confine all the material, excavated soil, debris, equipment, machinery (excavators, cranes etc.,) to the barricaded area. Limit the stocking of excavated material at the site; remove the excess soil from the site immediately to the designated disposal area. Undertake the work section wise: a 500 m section should be demarcated and barricaded; open up several such sections at a time, but care shall be taken to locate such sections in different zones.

Conduct work sequentially - excavation, water pipe laying, backfilling; testing section-wise (for a minimum length as possible) so that backfilling, stabilization of soil can be done. Remove the excavated soil of first section to the disposal site as the work progresses sequentially, by the time second section is excavated, the first section will be ready for back filling, use the freshly excavated soil for back filling, this will avoid stocking of material, and minimize the dust. Backfilled trench at any completed section after removal of barricading will be the main source of dust pollution. The traffic, pedestrian movement and wind will generate dust from backfilled sections. Road restoration shall be undertaken immediately after successful testing of the section.

Immediate Road restoration after refilling the trench

Excavation and refilling activities disturb the top soil, and under the influence of wind, traffic, pedestrians, and other activities etc., produces dust. There is large potential to generate significant quantities of dust after refilling the trench, and prior to road relaying. It is a common practice not to restore the road immediately after refilling the trench so as to allow sufficient time for the refilled material to stabilize naturally. Given the dry and windy conditions, and heavy traffic and other activities along the roads, the refilled trenches with loose top soil along the roads will generate maximum dust and create very unhealthy conditions. Moreover, as the barricades/dust screens will be removed after the trench is refilled, there will be absolutely nothing to control the dust generation.

Dust control activities like wetting of topsoil will not be effective given the site conditions. It is therefore necessary to restore/relay the road surface immediately or take suitable steps to arrest the

dust. Soil consolidation techniques shall be used so that road can be restored immediately. Immediately consolidate the backfilled soil and restore the road surface, if immediate road restoration is not possible, provide a layer of plain cement concrete (PCC) of suitable mix on the backfilled trench so that dust generation, erosion is arrested, and it will also provide a smooth riding surface for the traffic until the road is properly restored. Backfilled trench without any road restoration is a major source of dust.

Surface Water Quality

Run-off from stockpiled materials and chemicals from fuels and lubricants during construction works can contaminate water quality of the receiving water bodies and streams/rivers. Project area receives rainfall in southwest and northeast monsoon seasons, between June/July to November/December. Hence It is important that runoff from the construction areas, which may contain silt, and chemical traces do not enter these water bodies. Though impact will be temporary but needs to be mitigated and hence Construction contractor to ensure to implement necessary mitigation measures.

All earthworks be conducted during the dry season to prevent the problem of soil/silt run-off during rains.

- Avoid stockpiling of earth fill especially during the monsoon season; unless covered by tarpaulins or plastic sheet, do not stock earth/material close to water bodies (at least 100 m)
- Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, only designated disposal areas shall be used.
- Install temporary silt traps, oil traps or sedimentation basins along the drainage leading to the water bodies.
- Place storage areas (with impermeable surface) for fuels and lubricants away from any drainage leading to water bodies, these should be at least 100 m away from water bodies and groundwater wells.
- Store fuel, construction chemicals etc., on an impervious floor, also avoid spillage by careful handling; provide spill collection sets for effective spill management.
- Dispose any waste generated by construction activities in designated sites and conduct surface quality inspection according to the Environmental & Social Management Plan (ESMP).
- Select a construction method which is less disruptive (e.g., precast/ Cast in-situ type).
- Use spill traps / metal basins to avoid accidental spillage of construction chemicals, fuels, lubricants in the water body.
- Clean up the site immediately after construction is complete; construction debris, materials, etc., shall be cleared and pre project condition restored or improved.

5.11 Surface and Groundwater Quality

Another physical impact that is often associated with excavation is the effect on drainage and the local water table if groundwater and surface water collect in the voids. In the project area, necessary care should be taken to prevent pollution of ground water during execution. In this direction contractor needs to take following measures:

- As far as possible control the entry of runoff from upper areas into the excavated pits, and work area by creation of temporary drains or bunds around the periphery of work area.
- Pump out the water collected in the pits / excavations to a temporary sedimentation pond dispose of only clarified water into drainage channels/streams after sedimentation in the temporary ponds.
- Avoid oil spillages, keep mechanical equipment and automobiles in good condition
- Consider safety aspects related to pit collapse due to accumulation of water.

5.11.1 Generation of Construction Wastes

Solid waste generated from construction activities are excess excavated earth (spoils), discarded construction materials, cement bags, wood, steel, oils, fuels, empty containers and other similar items. Domestic solid waste may also be generated from the workers' camp. Improper waste management could cause odour and vermin problems; pollution and flow obstruction of nearby watercourses could negatively impact the landscape. The following mitigation measures to minimize impacts from waste generation shall be implemented by the contractor:

Prepare and implement a Construction Waste (Spoils) Management Plan. As far as possible utilize the debris and excess soil in construction purpose, for example for raising the ground level or construction of access roads etc. Avoid stockpiling any excess spoils at the site for long time. Excess excavated soils should be disposed of approved designated areas immediately.

If disposal is required, the site shall be selected preferably from barren, infertile lands, sites should be located away from residential areas, forests, water bodies and any other sensitive land uses. Domestic solid wastes should be properly segregated in biodegradable and non-biodegradable for collection and disposal to designated solid waste disposal site; create a compost pit (with impermeable bottom and sides) at workers camp sites for disposal of biodegradable waste; non-biodegradable / recyclable material shall be collected separately and sold in the local recycling material market.

Residual and hazardous waste such as oils, fuels, and lubricants shall be disposed off via licensed (by TNPCB) third parties.

Prohibit burning of construction and/or domestic waste. Ensure that wastes are not haphazardly thrown in and around the project site, provide proper collection bins, and create awareness to use the dust bins, recycle waste material where possible. Conduct site clearance and restoration to original

condition after the completion of construction work. PIU to ensure that site is properly restored prior to issuing of construction completion certificate.

The revamping of a sewer network generates significant volumes of Construction and Demolition (C&D) waste, predominantly consisting of excavated materials like soil, aggregates, and sand, along with old piping and related construction debris.

5.12 Noise Levels

All these sites are located within habitations, where there are houses, schools and hospitals, religious places and businesses. The sensitive receptors are the general population in these areas. Increase in noise level may be caused by excavation, particularly breaking of cement concrete or bitumen roads for laying of sewer, operation of construction equipment, and the transportation of equipment, materials and people. Vibration generated from construction activity, for instance from the use of pneumatic drills, will have impact on nearby buildings. Trenches deeper than 2-3 m require removal of rocks (soft to hard), will generate heavy noise and vibration. This impact is negative in the short-term, and reversible by mitigation measures, hence the construction contractor needs to ensure following.

- Plan activities in consultation with PIU so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance, especially near schools and other sensitive receptors.
- Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and use portable acoustic street barriers to minimize sound impact to surrounding sensitive receptors.
- Maintain maximum sound levels not exceeding 70 decibels (dBA) when measured at a distance of 10 m or more from the vehicle/s.
- Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity; if any building at risk, structural survey be completed prior to work, to provide baseline in case any issues from vibration, and if building is structurally unsound that measures taken to avoid any further damage.
- Horns should not be used unless it is necessary to warn other road users or animals.
- Consult local communities in advance of work to identify and address key issues, and avoid working at sensitive times, such as nights, religious and cultural festivals.

5.13 Accessibility and Traffic Disruptions.

Excavation along and across the roads for laying of sewers pipeline, hauling of construction materials and operation of equipment on-site will cause traffic problems. Sewers are proposed along all the main roads of karur city corporation, As the sewer pipelines are proposed to be laid within the road carriage way, it will disrupt the traffic in one-traffic lane. In the narrower roads, sewers pipelines

will be laid in the center of the road, and therefore during the work traffic movement will be mostly disrupted. Works related to all the remaining components will be confined to the selected sites, therefore there is no direct interference of these works with the traffic and accessibility.

The impacts due to vehicular movement and construction machinery can be minimized by using the designated routes for movement of heavy vehicles and machinery to avoid the soil compaction in areas other than the site. The transportation of construction material will be generally supplied at night when the traffic is minimum. Indicative traffic management plan given below will be updated prior to the diversion of traffic where required for the construction activities.

Hauling of construction materials, equipment, construction waste, etc., to and from the work site may increase the road traffic on local roads. This will further inconvenience the local community and road users. Potential impact is negative but short term and reversible by mitigation measures

5.14 Surface and Groundwater Quality.

Another physical impact that is often associated with excavation is the effect on drainage and the local water table if groundwater and surface water collect in the voids. To ensure that water will not pond in pits and voids near subproject location, the construction contractor will be required to conduct excavation works on non-monsoon season.

5.15 Control dust generation

Immediately consolidate the backfilled soil and restore the road surface, this will also avoid any business loss due to dust and access inconvenience of construction work. Employee best construction practices, speed up construction work with better equipment, increase workforce, etc., in the areas with predominantly commercial, and with sensitive features like hospitals, and schools. Consult businesses and institutions regarding operating hours and factoring this in work schedules. Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.

5.16 Occupational Health and Safety

Workers need to be mindful of the occupational hazards which can arise from working in confined areas such as trenches, working at heights, near the heavy equipment operating areas etc. Potential impacts are negative and long-term but reversible by mitigation measures. The construction contractor will be required to provide all at site with personnel protective equipment such as boots, Spectacles, Hand gloves Helmets and to follow all national, state and local labour laws. Develop and implement site-specific occupational health and safety (OHS) Plan, informed by OHS risk assessment seeking to avoid, minimize and mitigate risk, which shall include measures such as:

Safe and documented construction procedures to be followed for all site activities. Ensuring all workers are provided with and use personal protective equipment. OHS Training for all site personnel. Exclude public from the work sites.

Documentation of work-related accidents. Follow International Standards such as the World Bank Group's Environmental, Health and Safety Guidelines. Ensure that qualified first aid is always provided. Equipped first-aid stations shall be easily accessible throughout the sites.

Secure all installations from unauthorized intrusion and accident risks. Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers. Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted. Ensure the visibility of workers through their use of high visibility vests and other PPE 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 for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate. Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.

Provide supplies of potable drinking water. Provide clean eating areas where workers are not exposed to hazardous or noxious substances.

5.17 Community Health and Safety

Pipe Laying works and deep excavations along the roads and narrow streets, hauling of equipment and vehicles have potential to create safety risks to the community. Deep excavations without any proper protection may endanger the close by buildings. Hazards posed to the public, specifically in high-pedestrian areas may include traffic accidents and vehicle collision with pedestrians. Potential impact is negative but short-term and reversible by mitigation measures. The construction contractor needs to ensure following during execution.

Confine work areas, prevent public access to all areas where construction works are on-going through the use of barricading and security personnel. Attach warning signs, blinkers to the barricading to caution the public about the hazards associated with the works, and presence of deep excavation. Minimize the duration of time when the water distribution trench is left open through careful planning; plan the work properly from excavation to refilling and road relaying.

Control dust pollution in distribution trench control measures as suggested under air quality section. Ensure appropriate and safe passage for pedestrians along the work sites. Provide road signs and flag persons to warn of on-going trenching activities.

Restrict construction vehicle movements to defined access roads and demarcated working areas (unless in the event of an emergency). Enforce strict speed limit (10 - 20 kmph) for plying on unpaved roads, construction tracks. Provide temporary traffic control (e.g. flagmen) and signs where necessary to improve safety and smooth traffic flow. Where traffic is diverted around crossings, traffic control or careful selection of the exit from the working areas will be provided with the aim of ensuring that vehicles join the road in a safe manner.

At sensitive locations particularly where there are schools and markets close to the road; awareness of safety issues will be raised through neighbourhood awareness meetings. All drivers and equipment operators will undergo safety training. Maintain regularly the construction equipment and vehicles; use manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure.

5.18 Labour Camps

Contractor may require setting up construction camps – for temporary storage of construction material (Pipes, cement, steel, fixtures, fuel, lubricants etc.,) and stocking of surplus soil, and may also include separate living areas for migrant workers if any are engaged. The contractor will however be encouraged to engage local workers as much as possible. In case of operation of work camps can cause temporary air, noise and water pollution, and may become a source of conflicts, and unhealthy environment if not operated properly. Potential impacts are negative but short-term and reversible by mitigation measures.

The construction contractor will be required to ensure:

Consult PIU before locating project offices, sheds, and construction plants. Select a camp site away from residential areas (at least 100m buffer shall be maintained) or locate the camp site within the existing facilities of ULB.

Avoid tree cutting for setting up camp facilities. Provide a proper fencing/compound wall for camp sites. Camp site shall not be located near (100 m) water bodies, flood plains, flood prone/low lying areas, or any ecologically, socially, archeologically sensitive areas.

Separate the workers living areas and material storage areas clearly with a fencing and separate entry and exit. Ensure conditions of livability at work camps are maintained at the highest standards possible at all times, living quarters and construction camps shall be provided with standard materials (as far as possible to use portable ready to fit-in reusable cabins with proper ventilation), thatched huts, and facilities constructed with materials like GI sheets, tarpaulins, etc., shall not be used as accommodation for workers.

Camp shall be provided with proper drainage; there shall not be any water accumulation. Provide drinking water, water for other uses, and sanitation facilities for employees, drinking water should be regularly tested to confirm that drinking water standards are met. Prohibit employees from cutting of trees for firewood, contractor should provide cooking fuel (cooking gas) fire wood not allowed.

Train employees in the storage and handling of materials which can potentially cause soil contamination. Wastewater from the camps shall be disposed properly either into sewer system, if sewer system is not available, provide on-site sanitation with septic tank and soak pit arrangements (100 m away from surface water body or groundwater well). Recover used oil and lubricants and reuse or remove from the site.

Manage solid waste according to the following preference hierarchy reuse, recycling and disposal to designated areas, provide a compost pit for bio degradable waste, and non-biodegradable / recyclable waste shall be collected and sold in local market. Remove all wreckage, rubbish, or temporary structures which are no longer required. At the completion of work, camp area shall be cleaned and restored to pre-project conditions, and submit report to PIU, PIU to review and approve camp clearance and closure of work site.

5.19 Operation and Maintenance Impacts

The main O&M activities of the proposed infrastructure will be detection and repair of leaks and pipe bursts. These are, however, likely to be minimal as proper design and selection of good quality pipe material should mean that leaks are minimal. Leak repair work will be similar to the pipe laying work as earlier explained. Trenches will be dug to reveal the leaking area and the faulty connection will be re-fitted, or the pipe will be removed and replaced if necessary.

1. Recurrence of blockage and leakage problems. Although impact is likely to be minimal due to new and well-designed efficient system; it should be ensured that leak detection and restoration time is minimized to the extent possible.

2. To ensure that water delivered to consumers at all times meets the drinking water standards, the following measures are suggested:

- (i) Preparation and implementation of a water quality surveillance as part of the project to ensure that supplied water meets the drinking water standards; and Surveillance program will be organized to ensure the water quality of the consumer water.

SCADA systems and DMAs are proposed in the project. The parameters like pressure reduction, leakage, pollution etc will be captured in the system. This system will help to zero in on the issues and speedy redressed.

5.20 Social Impact Assessment

As per the Environment and Social Framework (ESF), this sub project falls under the social category of B. However, during implementation of pumping main, business of some of the vendors would be affected, and they will continue the business in the adjusting area and no livelihood loss for the vendors.

Table 12: Project Components and Social Impact Matrix

Area	Pumping Station	STP	Sewer network	Lifting Station	Revamping
Karur	4	1	354 Km	16	14.53km
Description	Pumping station of 4 different locations is proposed 1. Thirumanilaiyur 2. Vellalapatty 3. Pasupathipalayam 4. Periyakulathupalaym	Improvements in Existing 15 MLD of STP in arasu colony will be made to treat present flow and proposed STP of same location with the increasing capacity of 35.25 MLD is to be constructed.	The proposed laying of sewer pipe line in the 3 different zones 1. Zone – (Karur & Inam Karur): 91 km of new sewer lines 2. Zone-2 (Sanapiratti & Thanthoni): 38 km of sewer lines. 3. Zone-3 (Sanapiratti & Thanthoni): 225 km of sewer lines	16 No's of lifting station is proposed in the project to enhance the sewer collection and treatment facility.	Revamping Existing Sewerage Scheme is follows, 1. Existing Sewer Network length of 14.53km, 2. 497 No's of Machine holes, 3. Existing pumping main 2.25km.
Social Impacts	The above sites is free from encumbrance and no permanent / temporary social impacts.	The land use of the proposed project is in the existing STP, there is no permanent / temporary social impacts.	Based on the survey carried out on date 11-06-2025. The sewer is laid in mid of the road, so the street vendors are not affected. There is no livelihood impact in the project, as per	The above sites is free from encumbrance and no permanent / temporary social impacts.	Based on the survey carried out on date 11-06-2025. The sewer is laid in mid of the road, so the street vendors are not affected. There is no livelihood impact in the project, as per survey. There is no permanent / temporary impact identified.

			survey. There is no permanent / temporary impact identified.		
Risk Assessment	Low Risk	Low Risk	Low Risk	Low Risk	Low Risk

Table 13: Activity Impact Identification Matrix during construction phase

Construction Phase		Potential Impacts														
Main Activities	Sub Activities	Land use	Landscape	Land/Soil	Surface	Ground water	Water Quality	Solid waste	Air Quality	Ambient Noise level	Traffic & Transport	Resource use	Ecology	Socio	Culture/ Heritage	Agriculture
Site Preparation	Site Clearing & Cleaning Ground levelling Waste handling and its transportation Soil Compaction		✓					✓	✓	✓			✓			
Labour deployment camp siting	Construction of Labour sheds to accommodate labour Supply of		✓	✓	✓	✓	✓	✓				✓		✓		

Construction Phase		Potential Impacts														
Main Activities	Sub Activities	Land use	Landscape	Land/Soil	Surface	Ground water	Water Quality	Solid waste	Air Quality	Ambient Noise level	Traffic & Transport	Resource use	Ecology	Socio	Culture/ Heritage	Agriculture
	water Supply of fuel/ Energy Waste handling & its disposal Sewage disposal															
Excavation	Moving of Heavy Machinery Soil Extraction and Slacking Soil Loading and Transportation for Disposal Various Tools Like Crow Bar Foundations for heavy		✓						✓	✓	✓	✓	✓			✓

Construction Phase		Potential Impacts														
Main Activities	Sub Activities	Land use	Landscape	Land/Soil	Surface	Ground water	Water Quality	Solid waste	Air Quality	Ambient Noise level	Traffic & Transport	Resource use	Ecology	Socio	Culture/ Heritage	Agriculture
	machinery installation Construction Power through onsite Diesel Generators															
Material handling & Storage	Erection of sheds -welding/cutting onsite Installation. of heavy machinery, pumps Mechanical installation and Electrical installation Drilling and			✓		✓	✓			✓	✓	✓				

Construction Phase		Potential Impacts														
Main Activities	Sub Activities	Land use	Landscape	Land/Soil	Surface	Ground water	Water Quality	Solid waste	Air Quality	Ambient Noise level	Traffic & Transport	Resource use	Ecology	Socio	Culture/ Heritage	Agriculture
	Operation of construction machinery (like cranes, Concrete Mix Plant, Floor Developer, Forklift etc,) Handling and disposal of construction wastes, Diesel Generator Operation															
Erection of sheds, installation of Machinery	Erection of sheds -welding/ cutting onsite Installation. of								✓	✓	✓	✓				✓

[illegible]

Construction Phase		Potential Impacts														
Main Activities	Sub Activities	Land use	Landscape	Land/Soil	Surface	Ground water	Water Quality	Solid waste	Air Quality	Ambient Noise level	Traffic & Transport	Resource use	Ecology	Socio	Culture/ Heritage	Agriculture
Demobilization of construction equipment	Dismantling of temporary support construction structures/ equipment Removal of construction machinery Transportation of Construction/ Dismantled waste Site cleaning/ washings		✓	✓					✓	✓	✓					
Laying Pumping Main	Excavation and alignment of pipelines along	✓	✓						✓	✓	✓		✓			

[illegible]

Awareness about the project

The stakeholders are well aware about the project, its purpose is to provide sewage line connection, impacts, compensation, etc. There no Potential Temporary Economic Impacts were identified in this study area of the proposed project.

5.21 Narration of the Proposed Project

Pumping Station (PS 01)- Periyakolathupalayam Inam Karur - The proposed pumping station site is vacant land. The site belongs to ULB. The site is located outside of town surrounded by industries and residential building. vacant lands on one side and another side main road. Hence improvement to aesthetics of site, the odour control mechanism, tree plantation are proposed. No impact identified during the assessment.

Pumping Station (PS 02) – S. vellalapatty - The proposed site is vacant land. The proposed site is located at Commercial buildings at one side, vacant land at another side with the road access from main road. The odour control mechanism, compound wall on all the four sides, planting creepers and tree plantation provisions are proposed. No impact identified during the assessment.

Pumping Station (PS 03) – Thirumanlaiyure. Near Amaravati Bridge - The proposed site is vacant land. The site belongs to ULB. The proposed site is located by Residential buildings at one side; another side is main road. The odour control mechanism, compound wall on all three sides, planting creepers and tree plantation provisions are proposed. No impact identified during the assessment.

Pumping Station (PS 04) Pasupathipalayam- The proposed site is vacant land. The site belongs to ULB. Both the sites are Surrounded by vacant land. No impact identified during the assessment. The overhead tank proposed in the site requires demolition.

STP - Arasu colony- The proposed site is within existing STP premises The site belongs to ULB. No residential buildings nearby. Vacant land at one side with the road access from main road. The odour control mechanism, compound wall on all the four sides, planting creepers and tree plantation provisions are proposed. No impact identified during the assessment.

6. ANALYSIS OF ALTERNATIVES

The proposed Lighthouse UGSS project aims to bridge this infrastructure gap by introducing an inclusive, climate-resilient, and technologically advanced sewerage system in the left-out areas. This initiative will serve as a model for integrated urban sanitation planning, leveraging digital monitoring systems, energy-efficient technologies, and decentralized wastewater treatment wherever necessary. The project will enhance the quality of urban life, reduce public health risks, and contribute to sustainable urban management in Karur. The following previous decadal population of all ULBs in ULB area has been collected from census website for the purpose of population projections in design years. The total population in ULB as per 2011 is 2,14,412.

1971	69,335
1981	99,509
1991	1,40,470
2001	1,68,448
2011	2,14,412

The projected population for year 2025, 2040 and 2055 is 264760, 320410 and 376060 respectively.

6.1 Technology Alternatives

In this Chapter, detailed designs of the proposed components in sewage System are described. All the designs are prepared as per the norms in CPHEEO manual on Sewage and norms which are in practice in TamilNadu. Hydraulic designs and structural designs of proposed project components are given in Volume -2 (Hydraulic Designs and Structural Designs) of the Revised Final DPR.

To ensure equitable and efficient Sewage collection across Karur City Municipal Corporation, the city has been divided into 48 Wards based on existing and proposed infrastructure, projected demand, and administrative boundaries. This zoning strategy allows for optimized planning of storage reservoirs, transmission mains, and sewer networks tailored to localized demand conditions.

6.1.1 Population and Demand Projections

The sewage generation for the entire project area as described in earlier chapter is as follows:

- **2025:** ~29.12 MLD
- **2040:** ~35.25 MLD
- **2055:** ~41.37 MLD

6.2 Zone-wise Design Basis

The sewerage infrastructure for the proposed Underground Sewerage Scheme (UGSS) in Karur City Municipal Corporation (KCMC) has been designed by delineating the city into three distinct zones: Zone-

1, Zone-2, and Zone-3. These zones cumulatively cover all wards, with the division based on geographic contiguity and population concentration to optimize sewage collection and conveyance systems.

6.3 Population and Sewage Generation Projection

As part of the planning and design for the Underground Sewerage Scheme (UGSS), a comprehensive assessment was carried out to project the population growth and corresponding sewage generation over the design years of 2025, 2040, and 2055 across various coverage categories-namely fully covered, partially covered, and uncovered wards. The projections are vital to ensure that the proposed sewerage infrastructure is adequately sized and resilient to future demographic and environmental changes. **Population and Sewage Generation Projection**

Wards	Population			Sewage generation in MLD		
	2,025	2,040	2,055	2,025	2,040	2,055
Fully Covered	146645	177469	208292	16.13	19.52	22.91
Partially Covered	21975	26593	31212	2.42	2.93	3.43
Uncovered	98905	119693	140482	10.88	13.17	15.45
Total	2,64,760	3,20,410	3,76,060	29.12	35.25	41.37

6.4 Hydraulic Design and Sewer GEMS Modelling Summary

The hydraulic design of the proposed underground sewerage system was carried out using Bentley **Sewer GEMS software**, enabling detailed simulation of flow characteristics across various Machine holes, pump stations, and outfall links within the network. The model incorporates inputs such as projected **2055 population, ground level (GL), invert level (IL), ultimate average flow**, and calculated **peak flows** for each node and sub-catchment.

7. ENVIRONMENTAL AND SOCIAL STANDARDS AND RISK CLASSIFICATION

7.1 Applicable Environmental and Social Standards

This chapter outlines the Environmental and Social Standards (ESS) applicable to the Karur sewer pipeline Scheme, drawing upon the KfW Sustainability Guidelines (February 2022) on the Assessment and Management of Environmental, Social, and Climate Aspects: Principles and Procedures. These guidelines provide a unified and binding framework for integrating environmental, social and climate considerations across the planning, appraisal, implementation, and monitoring stages of Financial Cooperation (FC) measures. This emphasize transparency, predictability, and accountability in environmental and social due diligence (ESDD) and climate mainstreaming.

In line with these guidelines, the Project has adopted the World Bank Environmental and Social Framework (ESF), which sets out ten Environmental and Social Standards (ESS1–10) as the benchmark for international best practices in sustainability, resilience, and community well-being. For this Project, ESS7 (Indigenous Peoples) and ESS8 (Cultural Heritage) are not applicable and have therefore been excluded from the analysis. The applicable standards, together with relevant national laws and legal requirements, provide the framework for assessing potential impacts and ensuring effective risk management.

Specifically, this chapter describes:

- The World Bank ESS applicable to the Karur sewer pipeline Scheme,
- The corresponding potential impacts and mitigation measures (aligned with the Environmental and Social Impact Assessment – ESIA),
- The environmental, social, and overall risk classification of the Project, and
- The organization of responsibilities, documentation and Environmental, Social, Health & Safety (ESHS) topic areas.

This integrated approach ensures consistency between the ESIA and the Environmental and Social Management Plan (ESMP), thereby confirming that all identified impacts are addressed, mitigation measures are aligned and ESHS issues are systematically structured under the ESS framework.

Table 14: Application of the World Bank's Environmental and Social Standards to Karur

Environmental and Social Standards	Relevance to this project & actions
ESS1 Assessment and Management of Environmental and Social Risks and Impacts	This project involves construction of pumping station, lifting station, sewer lines and Revamping of existing sewer Network involves project utility sites. There are no sensitive or protected environmental features within the project area. ESS1 is relevant for this sub-project. As per National regulations the project needs ESIA. Hence ESIA and ESMP are prepared.
ESS2 Labor and Working Conditions	Labours including migrant labour, local labours according to the skill sets will be expected to be engaged. ESS2 is relevant for this project. As per ESS2, LMP is to be prepared by the contractor. The LMP will describe the findings of the ESIA, national labour policies and practices, the types of project workers that are likely to be involved, worker influx, the procedures to apply ESS2, and a grievance mechanism. ESS2 is relevant for this sub-project.
ESS3 Resource Efficiency and Pollution Prevention and Management	There will be Air, Noise, Water pollution during the implementation and which will be managed through the ESMP. ESS3 is relevant for this sub-project.
ESS4 Community Health and Safety	Risk to community health and safety is considered as minor and manageable through ESMP. During implementation pedestrian, vehicles, labour working in the trench excavation works and laying of sewer lines and appropriate safety measures included in the ESMP. ESS4 is relevant for this sub-project.
ESS5 Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	There is no land acquisition, restrictions on land use and involuntary resettlement requirements. Sewer line will be laid on the middle of the available ROW and PS & LS will be constructed on identified government owned vacant lands. Temporary restrictions in movement may be there due to laying of sewer mains. There may be potential temporary economic impacts to hawkers, vendors, while laying of sewer lines

Environmental and Social Standards	Relevance to this project & actions
	GRM to be in place prior to starting of the works as per updated ECSMF. Based on the above, ESS5 is not triggered for this sub-project.
ESS6 Biodiversity Conservation and Sustainable Management of Living Natural Resources	ESS6 is not relevant to this sub-project.
ESS7 Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	ESS7 During the social screening process, no indigenous people and Historical Traditional people are identified
ESS8 Cultural Heritage	The project area does not have any protected site or monuments of cultural importance. However, chance find procedures have been included as part of the ESMP for compliance during project implementation. Hence ESS8 is not relevant to this sub-project.
ESS9 Financial Intermediaries	ESS9 is not relevant to this sub-project.
ESS10 Stakeholder Engagement and Information Disclosure	This ESS10 is applicable to the sub-project. Accordingly, Stakeholder Engagement Plan is prepared and included in the ESIA.

7.2 Risk Assessment Classification and Categorisation

- The environmental and social risk screening process reveals that the project is B+ (substantial risk category) as there is no involuntary resettlement, loss of assets, livelihoods, common property resources or any significant impact.

7.3 Project Risk Classification and Categorisation

As per ECSMF, risk assessment is divided into has two levels:

- Level 1 – Risk Classification:** Projects are rated separately for environmental and social risks as High, Substantial, Moderate, or Low, based on baseline conditions.
- Level 2 – Risk Categorisation:** The overall project category (A, B+, B, or C) is determined from the Level 1 classifications.

Table 15: Karur UGSS risk classification and Categorisation is as below

Dimension	Justification	Risk Classification
Environmental Risk	The project involves construction of pumping station, lifting station, sewer lines and Revamping of existing sewer Network involve project utility sites.	Substantial

Dimension	Justification	Risk Classification
	Potential impacts: alteration of water body flow regimes, risk of pollution during construction, sludge disposal from STP, dust, noise, and emissions during construction. Impacts are mostly site-specific and reversible but can be significant without mitigation. Climate risks include stress on raw water sources, water quality fluctuations due to rainfall variability, and energy consumption in pumping/treatment.	
Social Risk	Works are mostly within ULB. Risks are temporary: traffic disruption, access restrictions, livelihood disturbance (roadside vendors), and health/safety risks. No large-scale land acquisition expected, but isolated cases may arise for siting STP, lifting or pumping stations. Vulnerable groups may face disproportionate temporary disruptions to water access. Risks are manageable through proper planning, stakeholder engagement, and mitigation.	Low
Dimension	Justification	Risk Category
Risk Category	There is no negative impact in the project, the site-specific, reversible, mitigation feasible; no major irreversible. All the E&S risks & impacts are Temporary & reversible in nature. Based on this, Mitigation measures are included in ESMP.	B+

8. Environmental and Social Management Plan (ESMP)

An Environmental and Social Management Plan (ESMP) is a structured management tool designed to ensure that any undue or reasonably avoidable adverse environmental and social impacts associated with the construction, operation, and decommissioning phases of a project are effectively prevented, mitigated, or minimized. At the same time, it seeks to maximize and enhance the positive benefits that the project can deliver to both the environment and society.

The ESMP serves as a critical framework for translating the findings and recommendations of the Environmental and Social Impact Assessment (ESIA) into practical and actionable management measures. By clearly defining responsibilities, monitoring requirements, and mitigation strategies, the ESMP ensures that environmental and social considerations are consistently integrated throughout the entire project life cycle.

In addition, the ESMP supports organizations in tracking progress and demonstrating continual improvement in their environmental and social performance. This ongoing process not only strengthens compliance with regulatory requirements but also builds stakeholder confidence and contributes to sustainable project outcomes.

The detailed Environmental and Social Management Plans for the construction phase and operation phase are presented in the table below.

Table 16: Environmental and Social Management Plan

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
I. Pre-construction phase							
1.1	Engineering design and alternative analysis	Ensure that the investigation and analysis of alternative engineering design and technologies, and the route location of the proposed sewer line network (the project) cause minimum environmental and social risk and impact during the project cycle; Ensure the activities like trenching, excavation, pipes joint welding result into minimum or no loss to terrestrial ecosystem; and Alternatives in terms of cost effectiveness, low maintenance, minimum and area for pipeline route selected along the existing roads for	PIU/ PMC/ Contractor.	Design/Pre-construction	Review the performance of design and technology and route decided for the project; and Consult the experts and learn from the experiences gained from such projects elsewhere	Minimum E&S risk and impact; Minimum or no impact on local ecology, water bodies and forest; Minimum impact on land and livelihood of local communities; and cost effective and	On regular basis

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		the project will cause minimum E&S impact.				O&M efficient.	
1.2	Utility relocation	Identify the common utilities to be affected such as telephone cables, electric cables, electric poles, water pipelines, public water taps, etc; and Seek prior approval and inform the concerned agencies for utilities shifting before construction starts.	PIU /PMC, Contractor/ Authority of concerned utilities	Pre construction phase	Review detailed layout plan and site inspection	Utilities shifted in time where necessary	Continuous
1.3	Permits and approvals	Obtain all permits and approvals required for E&S aspects during pre-construction, construction, operation and decommissioning phases. These shall be made available from the NHAI, State highways, WRD, Traffic Police, Telecom, Electricity and other departments and regulators of the State and Central governments as applicable.	PIU /PMC, Contractor Contractor	Before construction commences	Keep record of all permit, approvals and authorizations	Permits and approvals are available	One time/ Continuous

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		Ensure that all necessary approvals for construction to be obtained by contractor like labour licence / labour insurance are obtained before start of construction.					
1.4	Source of Materials	Obtain construction materials only from government approved quarries with prior approval of PIU. The contractor has to obtain approvals for all construction materials. PIU to review, and ensure that proposed quarry sources have all necessary clearances/ permissions in place prior to approval. Contractor to submit to PIU on a monthly basis documentation on material obtained from each sources (quarry/ borrow pit)	PIU /PMC, Contractor	Pre-Construction and Construction Phase	Records, approvals	Approvals documents	Periodically

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		No new borrow areas, quarries etc., shall be developed for the project;					
1.5	Material storage and portable office cabin	Storing the pipeline fittings and associated materials supplied at the stock yard. Necessary stacking procedures to be followed. Safety precautions including Fire & safety. Establish a suitable portable cabin for site staffs.	Contractor/ULB / PMC	Pre-construction	Site inspection	Location and its access; and Basic facilities and civic amenities.	Semi-annually
1.6	Labour accommodation and facilities	Identify the suitable building in terms of location, sufficient area, access, security, basic amenities, etc. Follow all relevant provisions of the Contract Labour (Regulation and Abolition) Act, 1970, IFC guidelines, the building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996, ILO convention 62-Safety provisions	Contractor	During Pre-construction	Visual inspection; Consultations with labour, and local communities nearby; Site inspection; Facilities made available;	All the facilities available as per law and standards; Assess the satisfaction level of labourers;	Everyday

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		(Building) Convention and applicable laws for rented labour accommodation; The location, layout and basic facility provision for labour accommodation will be reviewed by the Convenor and suggestions to be communicated to the contractor prior to the construction; Maintain necessary living accommodation and ancillary facilities in functional and hygienic conditions; Provide adequate number of toilets, bathing area, kitchen, safe fuel/ LPG for cooking and uncontaminated water for drinking, cooking and washing; Prohibit employees from cutting of trees for firewood; fire wood not allowed;			Type of illness and its causes; and Discussions about the level of health awareness and safety precautions taken by the workers while working on the work site.	Cordial relation between labour and local communities; Easy access of first-aid box with required medicine and accessories at each working site, labour accommodation, labour and office to workers all the time; and	

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		Labour accommodation and temporary shade near work sites shall provide protection from heat, rain, flooding, insects, snakes and mosquitoes. It should have adequate provisions for emergency such as fire safety, security, etc; Adequate healthcare is to be provided for the workforce; Ensure adequate water supply in all toilets and urinals; Provide separate toilets/ bathrooms for women laborers and shall be screened from those for men (marked in vernacular language. Provide first aid medical kit at labour accommodation, temporary labour shed and working site; train the labour for usage of items in injury, emergency, coordinate with nearest government and private medical centers for the medical services, display the contact number of medical doctor(s) and keep a vehicle				Arrangement made with the Doctors at then nearest government health and medical center/ private clinic.	

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		for emergency travel all the time; As per provisions of WHO and MOHFW guidelines of Covid-19, sanitizer, soap, mask, etc. should be made available in sufficient quantity and its use by the workers mandatorily and maintain social distancing all the time; The contractor will provide garbage bins in the camps and ensure that these are regularly emptied and disposed off in co-ordination with the ULB. Ensure medical tests and treatment of Covid-19 positive cases immediately; and any emergency medical Maintain the required data and documents at site and regularly submit the compliance report to the PIU.					

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
1.7	Public disclosure & Stakeholders Consultation	Ensure timely and fully project information dissemination through distribution of prior notice, pamphlet in local language, oral communication, meetings, websites, etc. Under take detailed mapping and analysis of key stakeholders. Based on the stakeholder analysis, stakeholder engagement plan is prepared that will be updated as required; Ensure that stakeholder including impacted persons are consulted and made aware about the project's purpose, risks/ impacts, mitigation measures and time- frame; and Maintain the records and documentation of the procedure followed and the output of stakeholder engagement.	PIU/PMC, Contractor	Pre-construction phase	Issue of Project information Pamphlets to the Public. Advance notice about Roadcut to the residents. Awareness about the project to the Beneficiaries. (FGD's with RWA, Awareness meeting with school students.etc.,) Consultations with local	Methods used for public disclosure; and Project awareness. (Number of Participants with Male, Female details.) Awareness level of stake holders, particularly the local communities, beneficiaries of the proposed sewage line.	Continuous

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
					communities, beneficiaries, temporary economic impacts and other stakeholders.		
1.8	Grievances redressal system	Establish the efficient grievance redressal mechanism and accordingly constitute the grievance redressal committee (GRC) as outlined in the ESIA project level with representatives of all the stakeholders as members, including women and vulnerable groups of local communities; Ensure the wider publicity of procedure, functioning and availability of GRC since the inception of the project; All the grievances received shall be acknowledged and proper recording and tracking should be carried out;	ULB/PMC, Contractor	Project life cycle	Review the proceedings and minutes of meetings; and Consultations with the members of GRC. Disclosure of GRM in the all the work sites.	GRC established. Number of Grievances received and number of grievances resolved. Number of GRC meetings held.	Monthly or as required

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		GRC will adjudicate the complaints in 6-8 weeks depending upon the severity of case; Convenor will be the coordinator for organizing GRC meetings as required, writing the proceedings, minutes of meeting, informing the aggrieved party about the decision of GRC, etc;				Decision taken with in a timeframe. Time taken for resolving the grievances.	
1.9	Sensitive Areas	The sensitive areas like Schools, hospitals to be provided with suitable noise barriers and safety measures, prior to the start of work in order to minimize the dust and noise impacts due to vehicle movement during construction and their effectiveness to be checked.	PIU /PMC, Contractor	Pre-construction phase	Site inspection	Location and its access; and Basic facilities and civic amenities.	Periodically
1.10	Construction material storage	Ready mix concrete (RMC) will be outsourced and contractor shall identify designated covered area for storage of construction material such as pipeline fittings, etc. with proper marking and measures to avoid dust emissions;	Contractor, PIU/PMC	Construction phase	Site inspection; and Review the material record maintained.	Clean and organized storage site; and	Periodically

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		Construction material stored in open shall be covered in order to avoid wind-blown dust emissions; Ensure and maintain record of proper stacking, loading and unloading of material and provide sufficient space for the movement of heavy vehicles inside the yard; Ensure handling the construction material safely by the labour;				Incidence of injury in loading, unloading and handling the material.	
2. Construction and operation phases							
2.1.	Labour mobilization	Contractor to submit labor management plan (LMP). LMP includes Camp layouts, facilities (Water & Sanitation, Storm water drains, septic tank, SWM, lighting, Health Clinic, etc.,) First Aid kit, Fire Safety, Emergency response Plan, Security Arrangements, etc., Disclosure of nearest hospitals, Bus stations, Police stations, etc., with Location and contact details. Contractor to prepare a Labour	Contractor, PMC/PIU	Construction phase	Review site management and labour plan; and Site inspection	Number and date of labour mobilization; and Date of starting works.	Periodically

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		Management Plan including the above & approval from the project Engineer in charge of PIU and approved.					
	Appointment and Mobilization of Environment & Safety Officer	The contractor to appoint Environment, Safety, social Experts as per the ESHS in the contract documents. The experts will be mobilized prior to start work. ESO will dedicatedly work and ensure implementation of Environmental Management Plan including Occupational, Health and Safety measures during the project implementation.	Contractor / PMC	Pre-Construction Phase	Review reports and records	No compliance at site	Mobilized and to be available throughout the contract period.
2.2.	Site clearance and tree cutting	Site to be cleared prior to initiating works. If necessary the top soil to be carved out and stored in a separate place. Avoid tree cutting and loss of vegetation, shrubs, grasses, etc. to the maximum extent possible; There are 12 trees to be affected in this project. Prior permission from the District Green Committee approval to be obtained.	Contractor, PIU/PMC/	Construction phase	Review site management and labour plan; and Site Inspection.	No tree cutting Minimum vegetation loss; Number and species of trees cut and	Monthly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		Compensatory plantation for every tree cut by way of re-plantation at ten times the trees cut; Growth and survival of trees planted shall be ensured and monitoring should be conducted at least for construction period. Survival rate of plants shall be reported to the ULB on monthly basis; Greenbelt will be developed around the 16 lifting station sites. Contractor shall develop plantation program for the site;				replanted; and Survival of number and species of trees planted.	
2.3.	Site preparation	- Disturbance to land surface contours to be kept to minimum; - Maintaining the natural drainage pattern existing onsite; - Adequate drains and slopes to be laid across the proposed project site prior to start of excavation work to	Contractor, PIU/PMC	Beginning of construction	Site inspection	Natural drainage maintained; and Minimum excavation for drainage and levelling	One time and periodically

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		ensure adequate cross drainage; and • Ensure that the earmarked operational area for laying of pipeline and pumping house is barricaded with specific access (entry and exit) points. • Barricading of the earmarked sites, besides the safety, will limit the disturbances or construction impacts to the adjacent areas within the premises. • Necessary precautions such as bracing / shoring in the trench will be provided for trenches of more than 1.2 m deep or as required based on site conditions.					
2.4.	Site Camp	Locate the suitable place for site camp at the start of civil works for the labours constructing sewer line/ approved by the PIU;	Contractor, PIU/PMC	Prior to start of construction	Review approved site camp and site	Approved site plan layout; and Area outside the	Once

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		Provide water and other facilities at the site camp; Establish a suitable site office in portable cabin at the start of the civil work. Designate the area beyond the boundary of the site as No-Go areas for all personnel on site. No vehicles, machinery, materials and people shall be permitted in the No-Go area at any time without the permission.			office layout; and Site inspection	site camp and site office designated as No-go area.	
2.5.	Barricading working site	Ensure that the construction site should be barricaded at all time with adequate marking, flags, reflectors etc. to isolate it from other operating areas; and Barricade the pipeline route and in all the construction sites at prior to construction activities.	Contractor	Prior to start of construction	Site inspection	Proper barricading in place; and Accident or casualty reported	One time
2.6	Sewer lines	Adequate precautions should be taken while laying the sewer line to avoid the possibility of damage of	Contractor	During construction	Site inspection, No of	Leakage of water,	Regularly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		existing water supply lines; and Avoid any damage to storm water drains & other public utilities.			Grievances received relating to utility severance.	grievance regarding utility severance.	
2.7	Traffic management	Contractor will prepare the traffic management plan. Route for use by construction traffic with in site to be planned with proper signage, flagman, barriers and safety to minimize encountering of workers with vehicles as per National Road Safety Policy 2010. Route for movement of heavy machinery shall be designated to avoid the soil compaction in other areas; All vehicles deployed at site shall be certified for pollution under control (PUC), undertake regular maintenance of vehicles; Transportation of construction material will be generally scheduled in night when the traffic is minimum;	Contractor,P IU/ PMC	Construction phases	Review traffic management plan; and Site inspection	Implementati on of traffic management plan adequately; Number of complaints received; and Incidence of accidents	

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		Holding area shall be provided within the site for vehicles waiting to deliver loads at site to avoid queuing outside the site; Ensure that the vehicles follow speed norms of the traffic department; and Investigate and respond to complaints about traffic.					
2.8	Construction machinery	Modern machineries such as JCBs, proclaim, road roller, etc. shall be used to increase work efficiency and minimize the construction period; Ensure that material transported is properly covered with Tarpaulin, etc. Schedule material deliveries after daylight hours; and Identify and repair minor leaks and prevent machineries/equipment failures. All the vehicle will have pollution control certificate	Contractor, PIU/ PMC	Construction phase	Review the vehicle details TPI	Noise level and working of heavy machinery in order	Continues, as required

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
2.9.	Construction works (concrete, Cement, etc.)	Use ready-mix concrete outsourced for the works on pumping station and lift station site and construction of machine holes and chambers to the maximum extent possible; and If required, ensure that cement is mixed on mortar boards and not directly on the ground unless unavoidable.	Contractor	Construction phase	Site inspection	Incidence of mixing concrete on working site; Visible concrete on site; and Contamination of water and soil.	Regularly
2.10	Top soil protection	Topsoil removed prior to commencement of construction activities shall be stored (stockpile no higher than 2 meter) separately and reused for backfilling and landscape development within the project area; Keep topsoil stockpiles in an area protected from the wind and water; Land disturbance shall be restricted	Contractor, PIU/PMC	Construction phase	Site inspection; and Assessment of disturbed (project components construction area) and	Incidence of erosion; Storage and uses of topsoil; and Topsoil erosion on	Regularly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		to the footprint of the project components and remaining area will be kept undisturbed to the extent possible; Ensure suitable control of run-off during the construction phase to prevent erosion of topsoil on adjacent land and undeveloped portions of the site; and All excavations should be closed at the earliest before the start of rainy season.			undisturbed area.	adjacent land.	
2.11	Noise from vehicles and machineries	Servicing of all vehicles, machinery, power generating equipment shall be done regularly as per the manufacturer's guidelines and during routine servicing operations, the effectiveness of exhaust silencers will be checked and if found defective will be replaced; All machines to be used shall conform to the relevant Indian Standards (IS), will be free from patent defect, kept in good working order, properly maintained and	Contractor, PIU/PMC	Construction phases	Review of monitoring records Random Noise measurements	Level of noise generated; and Number of registered complaints	Regularly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		inspected regularly; Acoustic enclosure measures will be provided during operation to reduce noise level of machinery and DG set; Construction activities shall be carried out in a planned manner restricting high noise generating construction activities only during daytime; Contractor will maintain the proper record for all the construction vehicles which shall have the valid fitness certificate, NOC, insurance, etc. Ensure noise level in the residential and industrial areas with in the permissible limit; Regular monitoring of noise shall be conducted at site during the operations of machines and equipment; and Technicians/mechanics working on noise generating machineries will use PPEs such as ear plug, muffler, etc.					

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
2.12	Dust emissions	Avoid clearing of vegetation until absolutely necessary; Trucks carrying construction material shall be adequately covered with tarpaulin sheet to avoid the dust pollution and the material spillage; DG set shall have adequate stack height as per TNPCB requirement; Dust levels will be controlled, through spraying of water from water tankers fitted with pressurized fine spray; Maintain all generators, vehicles, vessels and other equipment in good working order to minimise exhaust fumes; and Locate soil stockpiles in sheltered areas where they are not exposed to the erosive effects of wind.	Contractor	Construction phase	Site inspection; Incidence of dust plumes; and Review of dust emission control measures.	Emission from construction site; Incidence of dust plumes observed; Dust mitigation measures followed; and Number of complaints received.	Regularly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
2.13	Air quality	Maintain all vehicles, DG sets/generator and other equipment in good working condition to minimize GHG emission, exhaust fumes, etc.; Wherever possible to use energy efficiency equipments. Avoid excavation, handling and transport of materials which may generate dust under high wind conditions or when a visible dust plume is present; Water sprinkling, cover dumping and stockpiles of loose material with plastic sheets or nets, particularly in windy conditions should be used to reduce airborne dust at construction sites; and Prevent burning, fire, use of wood for cooking in the project sites to avoid air contamination.	Contractor	Construction phases	Site inspection; Incidence of air pollution; and Review of fuel emission control measures.	Fuel emission from vehicles; Air pollution mitigation measures followed; and Number of complaints received.	Regularly
2.14	Ground water	Contractor shall ensure that all vehicle / machinery and equipment operation, maintenance and refueling will be carried out in such a	Contractor	Construction & operation phases	Site inspection; and Review of spillage control	Fuel or lubricant spillage; and	Regularly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		manner that spillage of fuels and lubricants will not contaminate the ground water. Workforce will be trained in the environmental pollution aspect and activities should stop immediately and resume only when problem is resolved; and Faulty equipment, vehicles and other source of possible oil and lubricant contamination should be repaired on priority and must be kept in good condition all the time.			measures.	Underground water pollution mitigation measures followed.	
2.15	Protection of lakes/ water bodies/ Surface water	Contractor shall ensure that all vehicle / machinery and equipment operation, maintenance and refueling will be carried out in such a manner that spillage of fuels and lubricants will not contaminate the water bodies and construction of pipe carrying bridges across Buckingham canal; Water bodies need to be cordoned off by using protective barriers such as green cloth and subsequently	Contractor	Construction phases	Site inspection; and Review of spillage control measures.	Fuel or lubricant spillage; and water pollution mitigation measures followed.	Regularly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		plantation; and In case of water logging, water will be pumped out during the construction PS and LS.					
2.16	Protection of archaeological and heritage Monuments.	Conduct training to impart knowledge and create awareness among the workers about the significance of archaeological, paleontological and geological aspects and the applicable Indian Treasure Trove Act, 1878; The fossils, coins, articles of value of antiquity, human skeletal and other remains or things might be exposed during construction activities. In such situation, stop the work, do not remove and damage any article; Inform the Convenor and concerned authority(Archaeological Survey of India) immediately to take-action per referred Act and recommence the work after receiving written permission; and also, prevent any type of impact on	Contractor, PIU /PMC	Construction phases	Site inspection; and Actions taken by the workers, PIU.	Discovery of archaeological I/ paleontological material; Level of awareness among workers; and Protection and reporting of identified material when discovered.	When occurrence of chance finding

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		the cultural heritage, monument, etc.					
2.17	Safety of workforce	Adequate precautions shall be taken to prevent the accidents from the machineries. All machines shall confirm to the relevant Indian Standards Code and shall be regularly inspected for its working condition; Where loose soil is met with, shoring and strutting shall be provided to avoid collapse of soil. Provide job specific safety induction training, including environmental awareness and ensure daily toolbox talk to workers at the working area; Ensure availability and mandatory use of PPEs at the site; Use of protective footwear and protective goggles by the workers involved in mixing of materials like cement, concrete etc. at pumping station; Use of earplugs by the workers	Contractor, PIU/PMC	Construction phases	Site inspection; and Observation of workers with PPE and safety measures while working on work site.	Quantity and timely supply of PPEs; Awareness level about the use of PPEs; and Incidence of injury, accident, infirmity.	Everyday

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		exposed to loud noise, and those engaged in crushing, compaction, concrete mixing operations; Ensure sufficient quantity of all PPEs, necessary safety appliances such as safety goggles, helmets, boots, safety belts, ear plugs, mask, etc. to workers and staffs; Adequate measures and care to be taken while approaching any open water bodies for construction for the pipe carrying bridges. Ensure railing around such sites are intact and in good condition; and The contractor will comply with all the precautions as required for ensuring the safety of the workmen as per the International Labor Organization (ILO)and applicable laws of India and Tamil Nadu state as applicable.					

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
2.18	Work-zone safety Management	Temporary barricades shall be provided to delineate construction zone as well material stacking areas. The construction site and the labour facility shall be appropriately barricaded to prevent entry and accidental trespassing of workers, staff and others into the construction sites. All operational areas shall be access controlled. Watch and ward facilities at all times shall be provided by the contractor. Proper retro reflective warning signage will be installed on the access road next to the construction site about movement of construction machinery and vehicles. In excavations for longitudinal surface road drains, culverts etc., a high visibility warning and retro reflective signage shall be displayed in vernacular language and English. Entry of unauthorized persons	Contractor, PIU/PMC	Construction phase	Site inspection	Availability of safety measures Absence of safety Incidents	Everyday

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		should be prevented. Excavations will be adequately barricaded and well lit – with signages /info boards. There shall be adequate lighting arrangement at night and adequate barricading to prevent mishaps after construction activity ceases for the day. A readily available first aid unit with necessary supplies, drinking water, resting shed, sanitation etc shall be made available in every work zone.					
2.19	Exposure to electrical equipment	The Contractor shall take all required precautions to prevent danger from electrical equipment at pumping room, etc. and ensure that: No material will be so stacked or placed as to cause danger or inconvenience to any person or the public; All necessary fencing and lights will be provided in construction area;	Contractor, PIU/PMC	Construction phase	Site inspection; Observation of power supply system; and Electricity safety precaution taken by	Incidence of current shock, injury, electrocution	Daily

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		Deactivation and proper grounding of live power equipment and sewer lines to be ensured before initiating work; All energized electrical devices to be marked with warning signs. Use the symbol of danger as warning of high electricity voltage or current flow on cable boxes or where required to avoid any incidence of current shock or electrocution; and Provision of specialized electrical safety training to those workers working with or around exposed components of electric circuits.			workers while working on work site.		
2.20	Fire Safety	Ensure that no fires are permitted on or adjacent to site; Ensure that no smoking is permitted on the working site; Ensure that sufficient and certified fire fighting equipment are placed and maintained on the site;	Contractor	Project life cycle	Inspect Attendance register for fire fighting training conducted; and	Number of Fire incidents; Certified extinguishers in appropriate locations; and	When required

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		Equip all fuel stores and waste storage areas with fire extinguishers; Ensure that all workforce and staff on site are aware of the location of fire fighting equipment on the site; and Conduct training program on use of extinguishers, sand, etc for fire-fighting and ensure that they are trained in its operations.			Observation of fire extinguishers and certificate at the sites.	Workers knowledge to operate the fire extinguisher	
2.21	Emergency response to manage cyclone and other disaster conditions	Contractor shall ensure efficient communication system in place which will be required during occurrence of any natural hazard; Evacuation plan shall be in place for the site; Evacuation plan or route is displayed clearly through signs or picture at prominent places within the sites; Ensure effective coordination within the workforce and concerned departments and display contact	Contractor, PIU/ PMC	Project life cycle	Inspect attendance register for training program; and Inspect fire extinguishers and certificate	DMP in place; Communication system in existence; Display of evacuation route;	When required

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		number of concerned persons at prominent places; and Conduct training program and mock drills to workers to deal with the disaster situations due to occurrence of cyclones and tsunami.				Capacity of workers to manage; and Disaster and emergency situations	
2.22	Demolition of existing structures from proposed PS site(if required)	Prior to carrying out any building demolition, detailed building appraisal by means of surveys and appropriate assessments shall be carried out. In case of asbestos present in the buildings, specific measures for removal and disposal have to be taken and included in the site specific ESMPs Hoarding and covered walkway is to be provided for protection of the public during the demolition of buildings since hoarding isolates the demolition site from the public, thus	Contractor, PIU/PMC	Construction phases	Site Inspection; Review of waste management plan; disposal registers	Air quality, noise level;	When required

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		preventing unauthorized access and trespassing. Metal scaffolds shall be used for top down demolition. Both bamboo scaffolds and metal scaffolds are considered acceptable provided that they are erected according to the Construction Sites (Safety) Regulations and the codes of practices on scaffolding safety. Concrete breaking, handling of debris and hauling process are main sources of dust from building demolition. Dust mitigation measures complying with the Air Pollution Control (Construction Dust) Regulations shall be adopted to minimize dust emissions. Silent type power mechanical equipment shall be used to reduce noise impact as much as practicable or possibilities of engaging man power with light dismantling tools with PPE are studied and engaged.					

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		Debris waste and other materials shall not be thrown, tipped or shot down from a height where they are liable to cause injury to any person on or near the site. Disposal of debris has to be controlled and to be reused in filling of low ground with due permissions from local authority. Wasted reinforcement will be handled as per the departmental procedure.					
2.23	Submission of updated environmental & social management plan (ESMP) / site environmental plan (SEP); ESMP implementation and reporting	Supervisor to ensure ESMP implementation. Submission of updated ESMP/ SEP Timely submission of monthly monitoring reports including documentary evidence on ESMP implementation such as photographs.	Contacting/PMC	Project cycle	Review of reports and records	Compliance at the site	One-time / As and when need arises

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
2.24	Scaffolding	Mild steel scaffolding with adequate harness with double hook hanging safety belt will be provided in the working of construction of STP in the project area	Contractor	Construction Phase	Site inspection	Availability of safety measures Absence of safety Incidents	Regular inspection of safety equipment and awareness through tool box talk (TBT)
2.25	Mechanical Lifts	Adequate use of chain blocks and cranes which are used in the lifting of equipment with the safe handling of materials in the pumping station and lifting station. Fallen materials should be avoided during construction by using appropriate mechanical equipment.	Contractor	Construction phase	Site inspection; and Observation of workers with PPE and safety measures while working on work site.	Quantity and timely supply of PPEs; Awareness level about the use of PPEs; and Incidence of injury, accident, infirmity.	Everyday
Social aspect							

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
2.26	Compensation and Assistancess to potential temporary economic impacts	Provide compensation and assistance to potential temporary economic impacts; Employ people of local communities for project works with a priority to potential temporary economic impacts based on their skills; Employ the potential temporary economic impacts, particularly willing women on priority in project related unskilled, semi-skilled and skilled works as applicable;	Contractor, PIU/PMC	Construction Phase	Verify the disbursement of compensation and assistance; and Conduct consultation with local communities	Potential temporary economic impacts were compensated at replacement cost against the income loss	One time
2.27	Loss of access	The contractor shall ensure that access to connecting roads; market, residence and other places should not be blocked. In case, it is unavoidable, then alternate route should be provided to people. The community should be made aware about the diversion plan along with expected deadline for the completion of work. After completion of the work, the access should be restored as per original condition.	Contractor	Construction	Visual inspection	Crossing/ access closed	Regularly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		The contractor is required to provide notice to the shop owners of the need to shift kiosk/wares displayed on ROW as soon as the work plan is ready with minimum 7 working days. No works can be commenced unless 100% shifted in sections ready for implementation.					
3.Decommissioning phase							
3.1	Site clearance and rehabilitation/ Post-construction clean-up	Remove all construction equipment, vehicles, surplus materials, site office facilities, temporary fencing, structures and other items from the project site including pumping stations and lifting stations; Clean up and remove any spills and contaminated soil in the appropriate manner; Do not bury discarded materials on site or on any other land not designated for this purpose;	Contractor	After completion of construction phase and operation phase	Site inspection; and Review of record of activities upon completion of construction phase and	Restoration of construction sites in original condition; and Sites are fully rehabilitated prior to commissioning of project	Weekly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these shall be cleaned up. Level the disturbed area and restore to a condition resembling its natural profile; and Ensure site is fully clean and tidy before the exit and prior to its handover to the officer of ULB and other authorized persons.			commissioning phase		
4. Operation and Maintenance phase							
4.1	Odour nuisance during operation of Sewage lifting and pumping stations	Strictly follow standard operating procedures / operational manual for operation and maintenance Ensure that pumping cycles are properly followed; and there is no build-up of sewage beyond design volume in the wells Conduct monitoring (periodically at all operational pumping stations and lifting stations	ULB	Operation and Maintenance phase	Odour control measures; monitoring of H2S and ammonia; site inspection	No odour is experienced around the pumping station	Periodical

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
4.2	Workers exposure to toxic gases in sewers and hazardous material during sewer maintenance work	During cleaning/ maintenance operation, the sewer line will be adequately vented to ensure that no toxic or hazardous gases are present in the line. Ensure availability of PPE for maintenance workers. Follow safety and Emergency preparedness plan	ULB	Operation and Maintenance phase	Site inspection	Nil grievances/ incidents	Regularly

8.1 Implementation of the Proposed Project, Institutional Arrangements at ULB and Monitoring

The proposed project involves a new UGSS scheme including source augmentation at Karur Municipal Corporation for providing sewage line improvements to wards, under PDGF managed by TNUIFSL. This project will be implemented by ULB under the scheme of Tamil Nadu sustainable urban development project (TNSUDP). At Present this project is being looked after ULB Engineers at Karur and comprises of 1 Assistant Executive Engineer and 1 Assistant Engineer under the control of Executive Engineer, Urban Division, and Karur. This project is proposed to be implemented as a single Package.

Monitoring The management measures identified for contractor will be included in the bid document for ensuring implementation of the environmental safeguards. Implementation of the management measures by the contractor shall be ensured by ULB and report on ESMF compliance shall be submitted to TNUIFSL periodically. The management measures identified for operation phase will be taken up by the ULB Board & contractor upon completion of construction activities for the Contractor's Maintenance period of one year and by the Karur Municipal Corporation for Subsequent period. Any social impacts identified during the implementation of the project the Contractor to intimate the same to ULB shall communicate the same to ULB, TNUIFSL for mitigation.

8.2 Environmental Monitoring Program

The Environmental Monitoring Programme is an essential part of managing any development project. Its purpose is to identify possible environmental problems at an early stage, so that timely corrective measures can be taken. This ensures that the project is carried out in an environmentally safe and sustainable manner.

The main objectives of the programme are:

- To check and understand any changes in environmental conditions caused by the project.
- To monitor whether the suggested mitigation (control) measures are being implemented properly.
- To track changes in environmental quality and take preventive actions where required.

Details of the monitoring programme, including parameters, frequency and locations, are provided in Tables below. The programme will also be updated periodically as per the rules and guidelines of the Ministry of Environment, Forest and Climate Change (MoEFCC) and the State Pollution Control Board. To ensure smooth implementation, the Environmental and Safety team will carry out regular inspections. Any compliance or non-compliance with the programme will be documented, and a quarterly report will be submitted to the Client.

8.3 Environmental and Social Monitoring Action Plan (Esmop)

An Environmental and Social Monitoring Action Plan (ESMOP) has to be formulated for construction and operation phases to monitor the major environmental and social parameters along with the frequency of monitoring, methods of monitoring, parameters to be measured and responsibility of monitoring.

8.3.1 Reporting System of Environmental and Social Monitoring

The reporting system of environmental and social monitoring will be based on a feedback mechanism from project sites to the project proponent level in the implementation framework of the project. The Contractor will prepare report on environmental and social safeguards implementation, making it a part of the monthly progress report. Quarterly. The E&S Safeguard Expert at the PIU level and PMC level will review the reports and prepare the action taken report on monthly basis and appraise to the ULB. The ULB, based on the review of the environment and social safeguard measures taken at the project level, should discuss with the PIU and PMC on critical issues for decision making. The experts of PMC will prepare environmental and social monitoring reports on semi-annual basis for onwards submission to ULB. After review of the report, ULB may seek further clarifications from PIU on critical aspects, whichever is felt appropriate. The E&S Safeguard Experts at the PIU / PMC will compile the quarterly reports and submit half-yearly progress reports.

The Mechanism of the Implementation of the Proposed Mitigation Measures

- **Implementation Mechanism for Proposed Mitigation Measures**

To ensure effective execution of the mitigation strategies identified during the social impact assessment, the following implementation mechanism is proposed for UGSS projects:

8.3.2 Institutional Responsibility

- **Project Implementation Unit (PIU):** Overall coordination and monitoring of mitigation activities.
- **Social Safeguard Officer (SFO):** Responsible for executing social mitigation measures, including stakeholder engagement and grievance redress.
- **Contractors:** Required to comply with social safeguard provisions during construction, including minimizing disruption and ensuring safety.
- **Local Government Bodies:** Support in community mobilization, relocation assistance, and monitoring of vulnerable groups.

8.3.3 Mitigation Measures Execution

- **Pre-construction Phase:**
 - Dissemination of project information to affected communities.
 - Coordination with local authorities for land and asset verification.
- **Construction Phase:**
 - Implementation of safety protocols and traffic management plans.
 - Provision of temporary access routes and sanitation facilities.
 - Monitoring of labor practices and prevention of child labor.
- **Post-construction Phase:**
 - Restoration of public spaces and utilities.
 - Continued support to relocated households.
 - Final social audit and feedback collection.

8.4 Resource Requirements

- **Budget Allocation:** Dedicated funds for compensation, relocation, community engagement, and grievance redress.
- **Human Resources:** Deployment of trained social specialists, community mobilizers, and monitoring staff.
- **Monitoring Tools:** Use of MIS systems, field reports, and third-party audits to track progress and compliance.

8.4.1 Budget for Environmental and Social Management Plan

Table below gives a detailed outline of the budgetary provisions for the implementation of environmental management plan. These costs are to be considered as estimated and tentative, since the detailed cost estimates depend on site condition and construction/operation practices.

Table 17: Summary of Budget for ESMP

ESIA Table A Cost as per the DPR

Construction Phase	Total Cost (Lakhs)	
Barricading for sewer System (Included in sewer Network Costing)	Contractor has to quote in BoQ Schedule	Included in BOQ
Barricading for Pumping Main (Included in Pumping main costing)		Included in BOQ
Construction of compound wall around station at a distance of 10m.; (Thickness 230mm; Height of 1.5m)		Included in BOQ
Total		

Table – B As per ESIA items (Non SOR items)

Construction Phase	Quantity	Rate per unit	Total Cost Rs
Ambient Air Quality Monitoring (Nos.)	60	Contractor has to quote in BoQ Schedule	
Ambient Noise Monitoring (Nos.)	60		
Surface Water Quality Monitoring (Nos.)	60		
Soil Quality (Nos.)	60		
Water Sprinkling for Dust Management (cu.m)	213		
Transport of Excavated Earth for levelling at specific disposal sites in the ULB such as Karur Municipal Corporation (cu.m)	177		
Environmental Enhancement measures			
Tree plantation towards Compensatory afforestation@1:10 ratio (Nos.)	60	Contractor has to quote in BoQ Schedule	
M S Tree Guards for plantation (Nos.)	60		
Operation Phase			
Ambient Noise Monitoring (Nos.)	60	Contractor has to quote in BoQ Schedule	
Surface Water Quality Monitoring (Nos.)	60		
Odour Monitoring (Nos.)	60		

Social Monitoring		
Revalidation survey, update the ESIA and documentation		Contractor has to quote in BoQ Schedule
Stakeholder meeting with line department (yearly twice for three years)	6	
Awareness Training for community member for maintains (yearly twice for three years)	6	
Provision of pamphlet /Leaflets distribution to created awareness about scheme and information about the road cutting and Printing cost for Leaflet/ pamphlet	36030	
Total		
ESMP Total Cost		
Table A		
Table B		
Overall Cost Table (A+B)		

Budget Breakdown for Social Impact Assessment Activities

The budget was prepared solely based on the social impact assessment activities conducted during the implementation phase. Since the project is not expected to cause any negative impacts, entitlements were not included in the budget.

8.5 Stakeholder Engagement

Stakeholders can be representatives of the communities, government agencies, political parties, religious, caste-based groups and other civil society groups with 'special' or 'specific' interests. Stakeholders could be classified as internal or external stakeholders or primary or secondary stakeholders. Stakeholder engagement will be continuous process with regular check-ins during project planning, implementation, and monitoring phases. This ensures that stakeholders are kept informed of progress and have ongoing opportunities to influence decision-making, resolve GRM issue, and provide input achieve the target. Every six month once the stakeholder meeting will be conduct by ULB and contractors to ensure the status of work.

Table 18: Schedule of activities

S.No.	Schedule of activities	Responsibility	Time line
1	Obtain required permits and licenses	PIU/Contractor	Prior to Pre-construction
2	Designate the Convenor	PIU	Pre- construction

3	Constitute the GRC& disclose in all the project work sites.	PIU	Pre- construction
4	Mobilization of EHS officer	Contractor	Prior to construction
5	Mobilization of one environment expert	PMC	During construction
6	Mobilization of one social expert	PMC	During construction
7	Social – Revalidation Survey	PMC	Before start the start of work.

Awareness Meeting

Awareness Meeting to the community to informed about the proposed project and understanding of the project scope. The awareness meeting will be tool to maintain the proposed project and ensure the proposed project will be maintain by community in the future. After the implementation every six month once the awareness meeting will be conducted. Ensure that the project leaflets contain clear instruction and the language is clear and easy to understand and translate in the local language. Guidelines for Stakeholder meeting and Awareness meeting was annexure 07.

Table 19: TimeLine for Stakeholder meeting and Awareness Campaign

S.No	Activity	Stakeholder	Timeline
1	Stakeholder Meeting	lines Department	Yearly two stakeholder meeting for three years. To monitor the work process
2	Awareness Meeting	Community-Based Organizations (CBOs), RWAs, SHGs Beneficiary	Yearly twice for three years. To monitor the work process and maintain the proposed sites

The Environmental Monitoring Programme outlines a systematic approach to track and manage potential impacts of the project on air, water, noise, soil, and related environmental parameters during construction and operation. It defines clear monitoring protocols, responsibilities, and standards to ensure compliance with regulatory requirements and safeguard community health and ecosystems. With defined budgets, regular reporting, and provisions for corrective actions, the programme serves as a practical tool to promote accountability, minimize risks, and support the long-term sustainability of the project.

9. STAKEHOLDER ENGAGEMENT AND GRIEVANCE REDRESSAL MECHANISM

The stakeholder engagement during the preparing stage were conducted across 2 locations in Karur. These consultations involved leader of resident welfare association, members of association and other community members. A stakeholder consultation was held on 11.06.2025 and the proposed components of the project was explained to the public. All the public welcomed the proposed light house project.

9.1 Focus Group Discussion – During the Preparing stage

Table 20: Details of focus group discussion

S.NO	DATE	NAME OF THE STREET	NUMBER OF RESPONDENTS
1	11.06.2025	Amma Nagar	Total- 15 Female-8 Male- 7
2	11.06.2025	North Gandhigramam	Total- 10 Female-4 Male-6

The Social team introduced themselves and briefed participants on the objectives, components, and intended impact of the Lighthouse project. The leader of the Resident Welfare Association (RWA), Ward counsellor along with a community member, participated in the focus group discussion.

9.1.1 Ward-16 – North Gandhigarmam

Key Findings:

- Construct the Proper underground sewage system (UGSS) as the resident faces severe hygiene and sanitation issue to due to overflow of septic tank.
- Residents recommended the creation of a walking path or public park to promote relaxation and improve community health.
- They also urged proper measures to manage the growing population of street dogs, which have been causing disturbances and raising safety concerns in the neighborhood for several weeks.
- Additionally, residents expressed serious concerns about biomedical waste from the nearby medical college, citing its impact on public health and overall cleanliness.

9.1.2 Ward-46 – Amma Nagar

Key Findings :

- Residents currently receive water once every eight days for only 2–3 hours. The initial 30–40 minutes delivers resulting in significant wastage.
- Most households do not have borewell facilities and rely on storing water in sumps for future use.
- Introduce a comprehensive underground sewerage system to ensure proper waste management and improve public hygiene.
- Develop a public park or playground to provide recreational space for children and support community engagement.
- Establish a library to nurture educational growth and encourage reading habits, especially among students.
- Set up a community fitness centre to promote health and wellness among residents.
- Enhance the accessibility and reliability of public transportation. Many residents, including students and working professionals, struggle with inadequate transit services.
- Upgrade the local school, which currently offers education only up to the 10th grade. Expanding facilities to include higher secondary education would reduce the need for students to travel long distances.

Community response of the project

Residents expressed strong support and enthusiasm for the proposed Lighthouse UGSS project. They believe its implementation would address longstanding sanitation challenges and significantly improve the quality of life in the community. Stakeholders engagement is an integral part of developing an understanding about the project and the associated risks and impacts as perceived by the public. It helps in planning and setting up priorities for project management.

9.2 During the Implementation phase

Table 21: Stakeholder Engagement During Implementation phase

S.No	Information	Mode	Responsibility	Duration
1	PID	Phamplets	PIU/PMC/ Contractor	Continuous
2	Road Cut Intimation	Hand bills / Notice / Phamplet	PIU/PMC/ Contractor	Continuous
3	Awareness Campaigns (water use etc)	Out reach to the school student in the project area, SHG , RWA etc	PMC / Contractor and E&S Experts	Continuous
4	HSC Campaigns	Street Theater / Hand bills / Notice / Phamplet	PIU/PMC/ Contractor	While effecting HSC
5	Stakeholder Meeting	Focus Group Discussion in the project area, SHG , RWA etc	PMC / Contractor and E&S Experts	Continuous

9.2.1 Public disclosure

Public disclosure is aimed at making information accessible to interested and affected persons during the implementation. Communicating such information in a manner that is understandable to stakeholders is an important first step in the process of stakeholder engagement. All activities in the process from consultation and informed participation to negotiation and resolution of grievances will be more constructive if stakeholders have accurate and timely information about the project.

Information disclosure demonstrates the fact that transparency and accountability are being upheld in the planning and development of a proposed project and general public is aware of it. This would create awareness among the local people and in still participation and public involvement in the project management.

The awareness for judicious purpose of source of water, collection, treatment and distribution of sewerage system to public will be created by the PIU and contractor among the beneficiaries, PAP's and other stakeholders in the project area. Also, the details related to project impacts and assistance and safety measures during construction shall be made available to the affected population through meetings and distribution of pamphlets in local language.

9.2.2 Public consultation

Public consultation is a continuous process throughout the project planning, preparation, implementation, and monitoring stages. The sustainability of any infrastructure development project depends on the participatory planning in which public consultation plays a major role. Experiences indicate that environmental and social impacts, particularly the involuntary resettlement generally causes numerous problems for the affected population. Such problems may be reduced to a great extent if people are properly informed and consulted about the project, its impacts, mitigation measures and PAP's are allowed to make meaningful choices or preferences. This helps to reduce the sense of insecurity and opposition of PAP's to the project which otherwise are likely to occur during project implementation. The overall objective of the consultation process and SEP is to minimize, mitigate or offset negative impact of the project and make people aware about the rational and positive impacts of the impact.

The practical measures will be taken through consultative process to make the stakeholders as partners in project planning, implementation and monitoring stages. One way to help satisfy stakeholder concerns and promote transparency is to involve project affected stakeholders in monitoring the implementation of mitigation measures or other environmental and social impact related activities. The stakeholders will be informed about relevant policies, laws, types and severity of impacts, entitlements for compensation and mitigation measures through the proper communication channel, verbally or distribution of pamphlets in local language with required details. Once consultations have taken place, stakeholders will want to know which of their suggestions have been taken on board, what risk or impact mitigation measures will be put in place to address their concerns. Such information will be disseminated in time and regularly. The consultations shall be arranged with the beneficiaries, PAP's and other stakeholders to understand and solicit their views about risk and impact due to the project at the pre-construction stage.

Stake holder/Public consultation has been conducted during the DPR preparation stage and participation list attached in Annexure **07**



Figure 18: Focus Group Discussion Photographs

9.3 Grievance Redress Mechanism

A common GRM will be in place to redress social, environmental or any other project related grievances. Two tier GRM shall be constituted. The Municipal Engineer at project level, the Convenor for the project, who will coordinate with all the members, convene meetings and perform other activities required to ensure the efficient grievance redressal system. Such meetings will be held as per requirements.

GRIEVANCE REDRESS COMMITTEE (GRC)

1st level grievance redress: Comprises of

1. PIU/ULB supervision personnel
2. PMC supervision personnel
3. Contractors site engineer & ESO. To resolve issues on-site in consultation with each other.

2nd Level grievance redress: The Project level GRC shall be constituted with three persons with (preferably one of them as woman).

1. Commissioner of the ULB
2. Executive Engineer of the Implementing Agency
3. Representatives from PMC (TL, E&S Safeguards specialists)
4. Others may be nominated, as required.

The GRC would assist in amicable settlement of issues/complaints raised by the aggrieved person/ Potential Temporary Impacts without any interruption to the project implementation. As referred, the Municipal Engineer of PIU, Team Leader and Safeguard Specialists of PMC, Project Manager and the EHS officer will also act as the community liaison officers (CLOs). They will inform the Potential Temporary Impacts, workers and other stakeholders / public about the set-up of GRC, its constitution, functioning and procedure to address their project related E&S concerns and complaints. They will conduct consultations with the stakeholders regularly to keep them informed about the project progress and future activities, as required.

Step 1 -The Project Manager supported by the EHS Officer stationed at the project site. Project manager will be the first contact person for the local residents, who will settle the concerns of residents immediately or within the 3 working days.

Step 2 - If the concerns will not be solved in 3 days. The Project Manager will report to the EE/PIU and PMC, who will support, and initiate actions required to resolve the complaints in 7 days. The complaints will receive orally or in written.

Step 3- The cases complaints not resolved within two weeks the PAP will be contacted the GRC for taking decision to solve the complaints within the four weeks or stipulated time as deemed appropriate.

The phone numbers of these personnel and addresses will be disclosed on the boardings fixed at prominent public places and will be shared with the GRC members. Potential temporary economic impacts and other stakeholders usually communicate grievances orally and those submitted in writing will be logged in the register maintained at the CLO office. The grievances form in Tamil and English including the details of Complaint Receiving Officer (Convenor) will be made accessible at public places.

The GRC shall

- Convene meetings of the committee as necessary at such place or places in the PIA as he/she considers appropriate; and

- Conduct the proceedings in an informal manner as he/she considers appropriate with the object to bring an amicable settlement between the parties.

Step by step approach will be followed for redressing grievances. First, the aggrieved person to approach the GRC in the first stage and the grievance committee will look into the grievances and resolve the issues. The proceedings of GRC will be documented.

In addition to the project level GRC, redressal of grievances relating to Land Acquisition will be as per the RTFCTLARR Act, 2013.

Recordkeeping. Records of all grievances received, including contact details of complainant, date the complaint was received, nature of grievance, agreed corrective actions and the date these were affected, and final outcome will be kept by PIU (with the support of Project Management Consultants) and submitted to PMU.

- Information dissemination methods of the GRM. The PIU, assisted by experts will be responsible for information dissemination to affected persons and general public in the project area on GRM. Public awareness campaign will be conducted to ensure that awareness on the project and its grievance redress procedures is generated. The campaign will ensure that the poor, vulnerable and others are made aware of grievance redress procedures and entitlements per this resettlement framework including contact details of officials/members of GRC, whom to contact, and when, where/ how to register grievance, various stages of grievance redress process, time likely to be taken for redress of minor and major grievances, etc. Grievances received and responses provided will be documented and reported back to the affected persons. The number of grievances recorded and resolved, and the outcomes will be reported in the Annual environmental and social performance report (AESPR) to KFW.
- Periodic review and documentation of lessons earned. TNUIFSL will periodically review the functioning of the GRM and record information on the effectiveness of the mechanism, especially on the PIU's ability to prevent and address grievances.
- Costs. All costs involved in resolving the complaints (meetings, consultations, communication and reporting/information dissemination) will be borne by the respective ULB/PIU.

10. INSTITUTIONAL AND IMPLEMENTATION MECHANISM

10.1 Structure for Implementation

PMU

TNUIFSL is the PMU of this project will have dedicated team of Environmental and Social experts to ensuring adoption and compliance of the ECSMF and prepare and submit monthly/quarterly/semi-annual/annual compliance report.

10.1.1 ULB

The Implementing Agencies ULB shall have designated Environmental & Social experts for ECSMF implementation and submit the compliance reports on environmental and social safeguards along with physical progress reports, as required.

10.1.2 PIU

This sub-project will be implemented by the Municipality. The PIU will be established in the Municipal Corporation for implementation of this project. PIU will have adequate staff including designated officials as E&S officers to monitor ESMP implementation. PIU will supervise activities of Environmental and social safeguards, ESHS for ensuring adoption and compliance of ESSA and report to TNUIFSL.

10.1.3 PMC

A PMC will be appointed and will assist the PIU in the implementation of the project. The PMC will have dedicated Environmental, Social, Gender and ESHS specialists and will supervise implementation of the ESMP, sensitize contractors on ESHS, Safeguards Capacity Building. PMC will prepare periodical progress reports, flag critical issues to PMU/PIU.

10.1.4 CONTRACTOR

The contractor will also prepare Contract specific ESMP. Contractor will appoint ESHS personnel who along with the Project Manager be responsible for implementation of Environmental and Social management plan and mitigation measures and submit the compliance report to PIU.

Annexure 1: Environmental, Climate Change and Social Screening Format**Environmental Climate Change and Social Screening Format****Date:** _____**Contact :****Person:****Name of ULB: Karur Municipal Corporation****Background and Objective: Suggest to add a few brief sentences on the objective of this Screening and how it will be used.**

Project Details																					
Sl.no	Components	Details																			
1	Project Objective and components	The objective of this project is to provide wastewater sewer network systems in ULB. The components are • Maintain the hygienic and healthy environment • Efficient usage of treated water to industrial use • Upgradation of sewage sewer network • 100% of House Service Connections • Upgradation of Energy efficient technology • Public Awareness and Demand Management																			
2	Details of Alignment / Components (main components including construction activities)	• The current system covers only Wards 1 to 32 (Karur and Inam Karur), while Wards 33 to 48 (Sanapiratti and Thanthoni) remain unserved. This limits citywide sanitation coverage and equity in service delivery. • The 15 MLD STP is currently treating only around 4-5 MLD of sewage, indicating substantial underutilization. A significant portion of designed capacity remains idle due to incomplete network connectivity and low house service connections (HSCs). • In unserved wards, residents rely on septic tanks and soak pits. These systems are often outdated, poorly maintained, and cause groundwater contamination, health hazards, and foul odour due to direct discharge into open drains.																			
3	Location of the Project Sites (all sites including alignment of networks, other structures like pumping stations; offices, locations where treated waste water, sludge & C&D wastes will be disposed/reused directly, any other) Current Land use (Provide information for all sites involved in the project), any	Location of the project site: <table border="1"><thead><tr><th>Sl. No</th><th>Pumping Station</th><th>Area</th></tr></thead><tbody><tr><td>1</td><td>Thirumanilaiyur</td><td>Thanthoni. Near Amaravathi bridge</td></tr><tr><td>2</td><td>S. Vellalapatty</td><td>Sanapiratti</td></tr><tr><td>3</td><td>Periyakulathupalaym</td><td>Inam karur/karur</td></tr><tr><td>4</td><td>Pasupathipalayam</td><td>Pasupathipalayam</td></tr><tr><td>5</td><td>STP - Proposed land</td><td>Arasu colony</td></tr></tbody></table>		Sl. No	Pumping Station	Area	1	Thirumanilaiyur	Thanthoni. Near Amaravathi bridge	2	S. Vellalapatty	Sanapiratti	3	Periyakulathupalaym	Inam karur/karur	4	Pasupathipalayam	Pasupathipalayam	5	STP - Proposed land	Arasu colony
Sl. No	Pumping Station	Area																			
1	Thirumanilaiyur	Thanthoni. Near Amaravathi bridge																			
2	S. Vellalapatty	Sanapiratti																			
3	Periyakulathupalaym	Inam karur/karur																			
4	Pasupathipalayam	Pasupathipalayam																			
5	STP - Proposed land	Arasu colony																			

	historic land use (related to heritage, or contamination) Site Survey No:/s (with ownership), Geographical coordinates of the site	
--	--	--

Proposed Resource Use

Resource Use				
Sl.no	Proposed Resources	Area/Quantity	Unit	Details
(i).	Land Area proposed to be used: Location wise (in sq km / sq m)	30780	Sq.m	
(ii).	Estimated energy consumption for the project activities – Source wise	1623343	KWH	
(iii).	Estimated usage of water quantity for the project: Ground Water and Surface water?	21.58	ML	

Baseline Environmental Conditions

Sl.no	Environmental Aspects	Yes	No	Details (mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated based on location/activities as per National / State regulations& need permits/follow guidance)
1	Is the project site located on or adjacent to any of the following (Provide information for all sites and alignment of the project components/subcomponents, associated activities; mention distance to these features in meters/kilometres)			
i)	Critically Vulnerable Coastal Areas, Ecosensitive Areas		√	There is no critically vulnerable areas near the project site.

ii)	Cultural Heritage site, Protected monuments		√	There is no declared cultural heritage or protected monuments near the project site.
iii)	Natural Forests / Protected Areas Is the project in an eco- sensitive or adjoining an eco-sensitive area or its demarcated buffers? If Yes, provide details.		√	None in the project area.
iv)	Any other Wetlands/ Mangrove/ Estuarine Region?		√	
v)	Any Natural Habitat areas, areas with natural features such as the Coasts, Lakes/ other water bodies?	√		Amaravathi River Kaveri River
vi)	Any other Sensitive Environmental Components?		√	
vii)	Any Residences, schools, hospitals, sensitive receptors?		√	
viii)	Any culturally – socially important paths, areas/religious occupancies, sacred groves, burial grounds, tourist or pilgrim congregation areas, borders, etc?		√	
ix)	Any Drinking water source, upstream and downstream uses of rivers, etc which may be impacted by proposed discharge of treated sewage / sludge from water supply or sewage treatment plant?		√	
x)	Any Low-lying areas prone to flooding/areas of Tidal Influence used as part of the Project or near the project components?		√	
xi)	Details of Surface water quality at intake point or Disposal point of treated sewage		√	

xii)	Any areas affected by other disasters?		√	
2	Groundwater: Is the site in Critical / Over Exploited condition?		√	
3	Is the area disaster-prone? If yes; list all disaster zone categories applicable		√	
4	Describe the soil and vegetation on site			Red and Black Soil
5	Is the site area and condition suitable for proposed development?	√		
6	Describe existing pollution/contamination or degradation in the site(s)		√	
7	Near Dams, Barrages		√	
8	Any other remark on baseline condition?		√	

Anticipated Environmental Impacts: Impacts on Land, Geology and Soils

Sl.no	Impacts	Yes/ May create	No	Details(mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated based on location/activities as per National / State regulations & need permits/follow guidance)
8.	Will the proposed project cause the following on Land / Soil?			
i)	Impact on Surrounding Environmental Conditions including Occupation on Low lying lands/flood plains		√	
ii)	Substantial removal of Top Soil (mention area in sqm)		√	

iii)	Any degradation of land / eco-systems expected due to the project?		√	
iv)	Loss or impacts on Cultural/heritage properties/precincts, features		√	
v)	Does the project activity involve cutting and filling/ blasting etc?	√		During pipe laying, soil cutting and filling activities will be carried out.
vi)	Will the project cause physical changes in the project area (e.g., changes to the topography) due to earth filling, excavation, earthwork or any other activity?		√	No change in topography anticipated. During pipe laying, excavation, refilling of soil, road restoration will be carried out
vii)	Will the project involve any quarrying/ mining etc?		√	
viii)	Will the project / any of its component contaminate or pollute the Land? (for example sludge, disposal of untreated sewage/bypass)		√	
ix)	Pre-existing contamination on site/s		√	

Impacts on Water Environment

Sl.no	Impacts	Yes/ May Create	No	Details (mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated based on location/activities as per National / State

				regulations & need permits/follow guidance)
9	Will the subproject or its components cause any of the following impact on Water sources (Quantity or Quality):			
i)	Will the activities proposed at the site(s) impact water quality (surface or underground) and water resource availability and use? Will this sub-project involve the dredging of water bodies, sea, canals, etc.		√	
ii)	Impacts on Water Resources		√	
iii)	Pollution of Water bodies/ground water nearby or downstream		√	
iv)	Will the project affect the River /cannel flow pattern, stream pattern or any other irrigation canal?		√	
v)	Will the project result in stagnation of water flow or pondage or weed growth due to increased pollution/siltation		√	

Impacts on Biodiversity and Host Communities

Sl.no	Environmental Impacts	Yes/ May Create	No	Details(mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated based on location/activities as per National / State regulations & need permits/follow guidance)
10	Will the subproject or its components cause any of the following impacts on Biodiversity or the neighborhood			
i)	Will the project necessitate cutting of? Trees / Loss of Vegetation		√	
ii)	Will the project result in Health & Safety Risks in the neighborhood including the release of toxic gases, accident risks		√	
iii)	Potential risk of habitat fragmentation due to the clearing activities? (e.g. Hindrance to the local biodiversity like disturbing the migratory path of animals/ birds etc.)		√	
iv)	Potential Noise and Light Pollution or disturbance to surrounding habitats/communities		√	

Sl.no	Environmental Impacts	Yes/ May Create	No	Details(mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated based on location/activities as per National / State regulations & need permits/follow guidance)
v)	Potential disruption to common property, accessibility, traffic disruptions, conflicts or disruption to the local community within the subproject area?	√		Only during during construction phase for which suitable measures are given ESMP. These impacts are temporary in nature.

Impacts due to Storage and Wastes: Pollution and Hazards

Sl.no	Type	Yes	No	Details(mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated based on location/activities as per National / State regulations & need permits/follow guidance)
11	Will the subproject or its components cause any impact due to storage of materials, wastes or pollution due to releases during various project activities			
i)	Will the project use or store dangerous substances (e.g., large quantities of hazardous chemicals/ materials like Chlorine, Diesel, Petroleum products; any other?		√	
ii)	Will the project produce solid or liquid wastes; including construction/demolition wastes (including dredging, de-weeding wastes, muck/silt, dust, sludge, C&D wastes, hazardous wastes (such as asbestos from existing network), e-wastes (from equipment)); polluted liquids?		√	
iii)	Will the project cause or increase air pollution or odour nuisance?		√	During construction increase in particulate matter may be observed /generated due to excavation activities and construction. Proper dust control measures will be

Sl.no	Type	Yes	No	Details(mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated based on location/activities as per National / State regulations & need permits/follow guidance)
				provided e.g. water sprinkling.
iv)	Will the project generate or increase noise levels which will impact surrounding biodiversity or communities?		√	
v)	Will the project generate or increase visual blight or light pollution?		√	
vi)	Will the project cause water pollution?(of waterbodies/ groundwater)?		√	
vii)	Will the project involve dangerous construction activities which may be a safety concern to workers/ host communities		√	
viii	Is there a potential for release of toxic gases or accident risks (e.g. potential fire outbreaks)		√	
12	Describe any other features of the project that could influence the ambient environment		√	

Sl.no	Type	Yes	No	Details(mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated based on location/activities as per National / State regulations & need permits/follow guidance)
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Baseline Climate Data

13. Project Area Baseline

Note: Please provide details for ULB and also site. Please provide quantitative information where relevant.

i)	Agro climatic zone	Western Zone
ii)	No of Water Bodies in the ULB area	No major water bodies except lakes
iii)	Name of the River(s) in the ULB	Cauvery River Amaravathi River
iv)	Proximity to River (kms)	Amaravathi River flowing in between the Karur
v)	Proximity to Sea (kms)	--
vi)	Proximity to hilly terrains (kms)	--
vii)	High Flood Level of the River	High Vulnerability
viii)	Flooding Events (Years) (Based on historic data of extreme flood events and future projections based on available analysis)	2019
ix)	Flooding hotspots in the ULB	--
x)	Available Water sources (Surface / ground)	Ground water

Sl.no	Type	Yes	No	Details(mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated based on location/activities as per National / State regulations & need permits/follow guidance)
xii)	Groundwater Level and potential zone	--		
xiii)	Normal Temperature & long term average; trends in changes in temperature	--		
xiv)	Rainfall trends & long term average	--		
xv)	Land Use	---		
xvi)	% of Green Cover in the ULB area	---		
xvii)	% of Water Bodies/Rivers	----		
xviii)	Seismic Zone	Zone II (Low Risk Zone)		
xix)	Coverage rainwater harvesting structures (in %)	---		
	a) Residential			
	b) Commercial & Institutional			
	c) Government/ULB			
xx)	RWH in buildings – Mandating byelaws			

Sl.no	Type		Yes	No	Details(mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated based on location/activities as per National / State regulations & need permits/follow guidance)
xxi)	Frequency of drought in study area. Does the area face water scarcity? Please provide details.		No		
xxii)	Frequency and intensity of cyclones in study area.		No		
14	Climate Change Impacts in project area				
(i)	Climate signal Please select the relevant signals	Climate hazard Please select the relevant hazards	Yes	No	Details
	☐ Sea level rise	☐ Saltwater intrusion		√	
	☐ Frequency of tropical storms	☐ Flooding of the coast		√	
	☐ Intensity of tropical storms	☐ River flood		√	
	☐ Higher precipitation amounts	☐ Bank erosion (sea/river)		√	
	☐ Shifting seasons	☐ Flash flood (heavy rain)		√	
	☐ Higher temperatures	☐ Landslides		√	

Sl.no	Type	Yes	No	Details(mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated based on location/activities as per National / State regulations & need permits/follow guidance)
	☐ Less precipitation	☐ Forest/Bush fires	✓	
	☐ Lower temperatures	☐ Water shortage/drought	✓	
	☐ Others	☐ Effects of heat	✓	
		☐ Effects of cold	✓	
		☐ Effects of winds	✓	
		☐ Effects of air quality	✓	
		☐ Effects of storm surge	✓	
		☐ Soil quality/land degradation	✓	
		☐ Others	✓	
ii)	Energy consumption for the project? Will the project result in GHG emission?		✓	
iii)	Will the project affect any other water or other user? (downstream intake points of Water Supply projects,		✓	

Sl.no	Type	Yes	No	Details(mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated based on location/activities as per National / State regulations & need permits/follow guidance)
	downstream water use by people, animals; irrigation)			
iv)	Is the project located in exploited ground water block?		√	
v)	Is the project area vulnerable to temperature fluctuations and drought?		√	
vi)	Is the site vulnerable to hazards such as Earthquakes, Landslides, Flooding, Storm surge, Severe wind damage, Fire, Explosion, Other (specify)		√	
vii)	Will the project result in generation of wastes / by-product?		√	
viii)	Will the project impact the water resource availability (surface/ ground water) and use (effluent/sewage disposal, bypasses from STPs/PS, leachate, runoff, wastes deposition, erosion)		√	
ix)	Will the project cause flooding of adjoining low lying areas		√	

Sl.no	Type	Yes	No	Details(mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated based on location/activities as per National / State regulations & need permits/follow guidance)
(x)	Will the project impact water quality or quantity in natural/constructed Lakes, or ponds		√	

Project Environmental Enhancement Measures

Sl.No	Enhancement Measures	Yes	No	Details
15	Has the subproject design considered environmental enhancement measures?			
i)	Energy conservation measures/ energy recovery options incorporated in subproject design? Quantify the reduction in CO ₂ emission from the sub-project.	√		Details given in ESIA report
ii)	Has the project considered alternate /renewable energy?		√	
iii)	Has the project considered waste minimization (waste reuse/recycle options/circular economy)		√	
iv)	Rainwater harvesting, water recycling and other water resource enhancement measures proposed in the project?		√	

v)	Does the project include measures for prevention of wastage of water resource?		√	
vi)	What waterbody conservation/ drinking water source improvements/drought management options are being proposed?		√	
vii)	Design Considerations for protection of project components from extreme events - flood, drought, other natural disasters	√		
viii)	Greenbelt development proposed for the project?	√		Greenbelt proposed Near Pumping Station & STP Area
ix)	Is the sub-project including design elements to strengthen infrastructure resilience? If so what?		√	
x)	Has the project considered nature-based solutions and if so what?		√	
xi)	Is the sub-project combining infrastructure and nature-based solutions? If so how?		√	
xii)	What design considerations is the project including to mitigate heat island effect?		√	
xiii)	What design considerations is the project including to preserve and expand green cover?		√	

Land Use, Resettlement, and/or Land Acquisition

Sl.no	Components	Yes	No	Details
1	Does the project involve acquisition of private land?		√	
2	Alienation of any type of Government land including that owned by Urban Local Body?	√		Government land
3	Clearance of encroachment from Government/ Local body Land?		√	

4	Clearance of squatters/hawkers from Government/ Local Body Land?		√	
5	Number of structures, both authorized and/or unauthorized to be acquired/ cleared/		√	
6	Number of households to be displaced?		√	
7	Village common properties to be alienated Pasture Land (acres) Acquisition / burial ground and others specify?		√	
8	Existing land uses on and around the project area (e.g., community facilities, agriculture, tourism, private property) will be affected?		√	
9	Will the project result in construction workers or other people moving into or having access to the area (for a long-time period and in large numbers compared to permanent residents)?		√	
10	Are financial compensation measures expected to be needed?		√	

Loss of Crops, Fruit Trees, Household Infrastructure and livelihood				
Sl.no	Components	Yes	No	Details
11	Will the project result in the permanent or temporary loss of the following?		√	
11.1	Crops?		√	
11.2	Fruit trees? Specify with numbers		√	
11.3	Petty Shops		√	
11.4	Vegetable/Fish/Meat vending		√	
11.5	Cycle repair shop		√	
11.6	Garage		√	
11.7	Tea stalls		√	
11.8	Grazing		√	
11.9	Loss of access to forest produce		√	

11.10	Any others - specify		√	
Welfare, Employment, and Gender				
12	Is the project likely to provide local employment opportunities, including employment opportunities for women?	√		
13	Is the project being planned with sufficient attention to local poverty alleviation objectives?	√		
14	Is the project being designed with sufficient local participation (including the participation of women) in the planning, design, and implementation process?	√		
Historical, Archaeological, or Cultural Heritage Sites				
15	Historical heritage site(s) require excavation near the same?		√	
16	Archaeological heritage site(s) require excavation near the same?		√	
17	Cultural heritage site(s) require excavation near the same?		√	
18	Graves or sacred locations require excavations near the same?		√	
Tribal Population/Indigenous People				
19	Does this project involve acquisition / alienation of any land belonging to Tribal people?		√	
20	Will the project lead to displacement / other adverse impacts on tribal / indigenous peoples ?		√	
Beneficiaries				

Sl.no	Components	Yes	No	Details
21	Population proposed to be benefitted by the proposed project	Approx. no.:		Ultimate population 2055 – 3,76,060 Intermediate Population 2040 – 3,20,410
22	No. of Females proposed to be benefitted by the proposed project	Approx. no.:		Ultimate population 2055 – 1,90,963 Intermediate Population 2040 – 1,62,704
23	Vulnerable households /population to be benefitted	Approx. no.:		Ultimate population 2055 –45,127 Intermediate Population 2040 – 38,449
24	No. of Families to be benefitted	Approx. no.:		Ultimate 2055 –75,212 Intermediate 2040 – 64,082

Date: _____

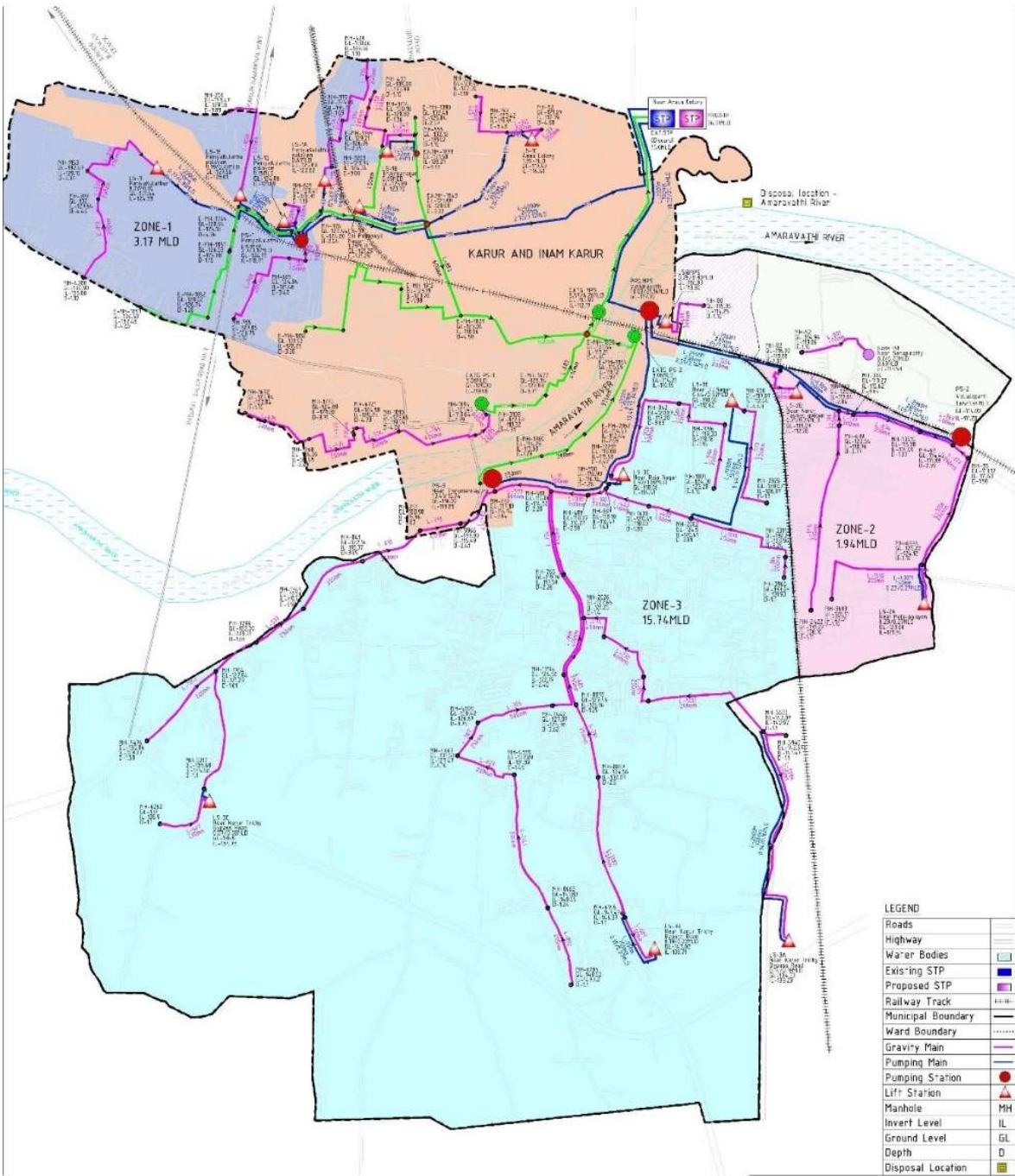
Signature and name of the Borrower
Authorized Signatory

Note: This Screening sheet must be completed for each of the proposed sub-project along with the DPR and ESIA Report.

Indicative Enclosures:

1. Provide maps with the geographical location of the project; Google maps with project sites and project alignment
2. An appropriately scaled map clearly showing the project area and project sites with land use, existing buildings, infrastructure, vegetation, adjacent land use, utility lines, access roads and any planned construction, and
3. Any other information to describe the project, locations and possible impact as required.
4. Provide relevant maps on flooding hotspots, LULC, etc
5. Land details for the project sites with (i) extent available and required, (ii) location, (iii) survey numbers, (iv) FMB extract, (v) current land use, landuse classification (vi)land ownership, alienation/acquisition status, (vii) certificate giving availability of sites required for the project by the borrower, (viii) location photographs with Geo-co-ordinates of all project sites and alignment (start, end point).

Annexure-2: Sewer lines for wards of Karur Municipal Corporation -Zone Map



Annexure-3: Environmental Monitoring Reports

Soil Test Report



CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 | CIN : U74999TN2008PTC069459
Email : test@mettexlab.com | Web : www.mettexlab.com



TC-5589

TEST REPORT

Page No. 1 of 2

ISSUED TO : M/s Vitya Consultants Pvt. Ltd,
L-78, L18th Street, Anna Nagar East,
Chennai - 600 102,
Tamilnadu, India.

T.C Date 29/09/2025

T.C No : CML/25-26/T066631

Date Of Receipt : 25/09/2025

Cust. Ref : SRF Date: Email Date: 24/09/2025

Analysis Commenced On : 25/09/2025

Lab No : 2631067/001

Analysis Completed On : 29/09/2025

Sample Description : Soil - Location Name : Sewage Water Treatment Plant - Arasu Colony Karur.
(as stated by customer)

S. No	Test Parameters	Protocols	Results
Discipline: Chemical		Group: Pollution & Environment	
01	pH @ 25°C	IS 2720 Part 26 - 1987 (electrometric method)	6.94
02	Conductivity @ 25°C	IS 14767 - 2000	124 µmhos/cm
03	Iron as Fe	USEPA 3050 B - 1996 & USEPA 6010 C - 2000	9486 mg/kg
04	Copper as Cu		9.28 mg/kg
05	Lead as Pb		BDL(DL:1.0 mg/kg)
06	Arsenic as As		BDL(DL:0.1 mg/kg)
07	Zinc as Zn		7.64 mg/kg
08	Nickel as Ni		3.12 mg/kg
09	Cadmium as Cd		BDL (DL : 1.0 mg/kg)
10	Total Chromium as Cr		5.46 mg/kg
11	Manganese as Mn		198 mg/kg
12	Mercury as Hg		BDL(DL:1.0 mg/kg)
Note : BDL : Below Detection Limit. DL : Detection Limit.			

----- End of Report -----

For Chennai Mettex Lab Private Limited



[Signature]
Reviewed & Authorised by
P. KAVITHA
Technical Manager
Authorised Signatory



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CML/LAB/F/7.8/1



CHENNAI METTEX LAB PRIVATE LIMITED[®]

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 | CIN : U74999TN2008PTC069459
Email : test@mettexlab.com | Web : www.mettexlab.com

TEST REPORT

Page No. 1 of 1

ISSUED TO : M/s Vitya Consultants Pvt. Ltd,
L-78, L18th Street, Anna Nagar East,
Chennai - 600 102,
Tamilnadu, India.

T.C Date 29/09/2025

T.C No : CML/25-26/T066631-A

Date Of Receipt : 25/09/2025

Cust. Ref : SRF Date: Email Date: 24/09/2025

Analysis Commenced On : 25/09/2025

Analysis Completed On : 29/09/2025

Lab No : 2631067/001

Sample Description : Soil - Location Name : Sewage Water Treatment Plant - Arasu Colony Karur.
(as stated by customer)

S. No	Test Parameters	Protocols	Results
Texture ;			
01	Clay	Gravimetric Method	10.74 %
	Sand		88.72 %
	Silt		0.54 %
02	Sodium Adsorption Ratio	IS:11624 -1986 (Reaff:2015)	2.54 $\sqrt{\text{m.mole/l}}$
03	Oil & Grease	USEPA 9071 B - 1998	BDL(DL:0.1 %)

End of Report

For Chennai Mettex Lab Private Limited



P. Kavitha
Reviewed & Authorised by
P. KAVITHA
Technical Manager
Authorised Signatory



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AAQ – Test Report



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TEST REPORT

ISSUED TO : **M/s. Vitya Consultants Pvt.Ltd.**
L-78, L 18th Street,
Anna Nagar East,
Chennai-600 102,
Tamil Nadu, India.

Page: 1 of 1

Customer Reference : SRF Dated :25/09/2025
Laboratory No : 2631060/001
Sampling Plan & Procedure : CML/LAB/ENV/SOP/AAQ
Date of Sampling : 24/09/2025
Date of Receipt : 25/09/2025
Sample Description : Ambient Air Quality Monitoring
Test Certificate No : CML/25-26/T065807
Test Certificate Date : 26/09/2025
Analysis Commenced On : 25/09/2025
Analysis Completed On : 26/09/2025

Location of Sampling (as stated by customer) : Sewage Water Treatment Plant Arusu Colony-Karur
Ambient Temperature : Min 26°C & Max 33°C

Relative Humidity : Min 49 % & Max 81 %

S.No.	Test Parameters	Test Method	Results	Unit	CPCB Standards
Discipline :Chemical		Group :Atmospheric Pollution			
1	Particulate Matter (Particle Size less than 10µm) or PM ₁₀	IS 5182 Part 23 : 2006	60.3	µg/m ³	NMT 100
2	Particulate Matter (Particle Size less than 2.5 µm) or PM _{2.5}	IS 5182 Part 24 : 2019	27.8	µg/m ³	NMT 60
3	Sulphur dioxide (SO ₂)	IS 5182 Part 2/Sec 1 : 2023	6.5	µg/m ³	NMT 80
4	Nitrogen dioxide (NO ₂)	IS 5182 Part 6 : 2006	22.7	µg/m ³	NMT 80
5	Ammonia (NH ₃)	IS 5182 Part 25 : 2018	BDL(DL:20)	µg/m ³	NMT 400
6	Ozone (O ₃)	IS 5182 Part 9 : 1974	BDL(DL:20)	µg/m ³	NMT 180
7	Carbon Monoxide (CO)	IS 5182 Part 10 : 1999	BDL(DL:0.05)	mg/m ³	NMT 4
8	Benzene (C ₆ H ₆)	IS 5182 Part 11 : 2006	BDL(DL:1.0)	µg/m ³	NMT 5
9	Benzo (a) Pyrene (BaP) Particulate Phase only	IS 5182 Part 12 : 2004	BDL(DL:0.01)	ng/m ³	NMT 1
10	Lead (Pb)	USEPA Compendium Method IO - 3.4 : 1999	BDL(DL:0.1)	µg/m ³	NMT 1
11	Nickel (Ni)	USEPA Compendium Method IO - 3.4 : 1999	BDL(DL:1.0)	ng/m ³	NMT 20
12	Arsenic (As)	USEPA Compendium Method IO - 3.4 : 1999	BDL(DL:1.0)	ng/m ³	NMT 6

Instrument used for sampling:

Respirable Dust Sampler Instrument ID & Calibration Due Date :CML/ENV/RDS/012 & 24.11.2025
Fine Dust Sampler Instrument ID & Calibration Due Date:CML/ENV/FDS/016 & 25.11.2025

Note: BDL:Below Detection Limit; DL:Detection Limit; NMT:Not More Than;

Remarks: The values observed for the pollutants given above are within the CPCB Standard.

.....End of Report.....

For Chennai Mettex Lab Private Limited



v. *[Signature]*

Reviewed & Authorized by
V. SELVAKUMAR
Technical Manager
Authorized Signatory

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CML/LAB/F/7 S/1

ANQ- Test Report



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Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
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Anna Nagar East,
Chennai-600 102,
Tamil Nadu, India.

Page:1 of 1

Customer Reference : SRF Dated :25/09/2025
Laboratory No : 2631060/003,006
Sampling Plan & Procedure : CML/LAB/ENV/SOP/N&L
Date of Sampling : 24/09/2025
Test Method : IS 9989:1981
Sample Description : Noise Level Monitoring - Ambient

Test Certificate No : CML/25-26/T065809
Test Certificate Date : 26/09/2025
Date of Completion : 26/09/2025

S.No.	Location of Sampling (as stated by customer)	Day Time Results dB(A) Leq
Discipline :Chemical		Group :Atmospheric pollution
1	Sewage Water Treatment Plant Arasu Colony- Karur	62.6
2	TANSI OHT Tank Area-Karur	64.1
CPCB Standards for Industrial Area (Maximum) : Day Time 75 dB(A) Leq & Night Time 70 dB(A) CPCB Standards for Commercial Area (Maximum) : Day Time 65 dB(A) Leq & Night Time 55 dB(A) CPCB Standards for Residential Area (Maximum) : Day Time 55 dB(A) Leq & Night Time 45 dB(A)		
Instrument used for sampling: Sound Level Meter Instrument ID & Calibration Due Date:CML/ENV/SLM/008 & 31.01.2026 Note: LEQ: Equivalent Continuous Sound Pressure Level Remarks: The values observed for the pollutants given above are within the CPCB Standard.		

.....End of Report.....

For Chennai Mettex Lab Private Limited



[Signature]

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

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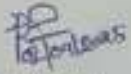
CML/LAB/F/7.8/1

Ground Water Test Report

From M. Kameswari Chemist Ground Water Testing Lab Thiruvananthapuram Kerala		To The Commissioner Kerala Sahasrabala Kerala	
The results of analysis for the water sample with serial reference is Subsequent Serial			
Date Source Location of Sampling Inspection Prescription Notes		25.08.2025 STP INLET STP OUTLET STP Wastewater Wastewater Microscopic Examination Filter	
1	PHYSICAL EXAMINATION	SPP INLET	2
1	Appearance	Not Clear	Not Clear
2	Colour (Pt-Co - units)	Slightly Black	Slightly Green
3	Odour	Bad Smell	Bad Smell
4	Transparency NT units	14	11
5	Total dissolved solids, mg/L	1205	1015
6	Total Solids	1565	1075
7	Total Suspended Solids	72	20
8	Electrical conductivity micro mhos/cm	1025	1007
9	CHEMICAL EXAMINATION		
10	pH	7.58	7.68
11	Free Alkalinity as CaCO ₃ , mg/L	0	0
12	Total Alkalinity CaCO ₃ , mg/L	273	254
13	Total Hardness as CaCO ₃ , mg/L	920	634
14	Iron as Fe, mg/L	1.21	0.73
15	Manganese as Mn, mg/L	0	0
16	Free Ammonia as NH ₃ , mg/L	48.24	43.31
17	Nitrite as NO ₂ , mg/L	1.84	1.00
18	Nitrate as NO ₃ , mg/L	0.00	0
19	Chloride as Cl, mg/L	420	456
20	Fluoride as F, mg/L	0	0
21	Sulfate as SO ₄ , mg/L	75	47
22	Phosphate as PO ₄ , mg/L	34.2	36.77
23	Dissolved Oxygen as O ₂ , mg/L	0.28	0.3
24	DO	120	45
25	DO as O ₂ , mg/L	42	15
26	BACTERIOLOGICAL EXAMINATION		
1	Fecal coliform (colours per 100 ml)	7.4x10 ³	528

10/08/25
 M. Kameswari
 DWT L - Kerala

From		To	
M.Kalaswari		The Commissioner	
Chemist		Karur Municipality	
District Water Testing Lab		Karur	
Thanthirimalai			
Karur			
The results of analysis for the water sample sent under reference is furnished below			
Date		02.09.2025	
Source		STP INLET	STP OUTLET
Location of Sampling		STP Arasutolony	
Habitation		Arasutolony	
Panchayat		Minnampalli Panjamadevi	
Union		Karur	
I	PHYSICAL EXAMINATION	BIS Limits	
1	Appearance	Nil	Not Clear
2	Colour (Pt Co - scale)	Nil	Slightly Black
3	Odour	Nil	Bad Smell
4	Turbidity NT units	Nil	18
5	Total dissolved solids, mg/L	2100 Mg/L	1371
6	Total Solids	Nil	1467
7	Total Suspended Solids	20 Mg/L	96
8	Electrical conductivity micro mho/cm	Nil	1958
II	CHEMICAL EXAMINATION		
9	pH	5.5-8	7.55
10	Ph-Alkalinity as CaCO ₃ mg/L	Nil	0
11	Total Alkalinity CaCO ₃ mg/L	Nil	276
12	Total Hardness as CaCO ₃ mg/L	Nil	530
17	Iron as Fe mg/L	1.0Mg/L	1.26
18	Manganese as Mn mg/L	2.0Mg/L	0
19	Free Ammonia as NH ₃ mg/L	5Mg/L	49.65
20	Nitrite as NO ₂ mg/L	Nil	1.88
21	Nitrate as NO ₃ mg/L	Nil	0.00
22	Chloride as Cl mg/L	Nil	460
23	Fluoride as F mg/L	2.0MG/L	0
24	Sulphate as SO ₄ mg/L	Nil	88
25	Phosphate as PO ₄ mg/L	5Mg/L	57.38
26	Tidy's Test 4hrs as O ₂ mg/L	Nil	0.28
27	COD	250Mg/L	171
28	BOD as O ₂ mg/L	30Mg/L	57
III	BACTERIOLOGICAL EXAMINATION		
1	Fecal coliform (colonies per 100 ml)	8.4*10 ³	580


 M. Kalaswari
 Chemist
 DWTL - Karur



**Karnataka Water Supply and Drainage Board
District Water Testing Laboratory - Karur**

Central Water Testing Laboratory - Karur		
From: M/s. At. Sankaradasaiah & Co Junior Water Analysts/CS TWAD Board, DWT Lab, Karur	To: The Commissioner Karur City Municipal Corporation Karur	
Sr No : 144 /SE /DWTL KAR /2023 - 24, dt 04.07.2023		
Sub: Examination of waste water sample report -Furnished : msg		
1. Invoice No 5730 /Dated 30.06.23 for Rs. 2360/-		
2.DD.No.258594 Dated 30.06.23, SBI Thanthond, Rs. 2800/-		
The results of Analysis for the sample sent under reference is furnished below:		
Source: STP -Outlet	Location: Anasolary	
Panchayat: Minamangudi Palpamedu	Union: Karur	
	BS Limits	Dist Ltd
1. Appearance	NH	Not Clear
2. Colour (pLoCo scale)	NH	Slightly Pinkish
3. Odour	NH	Bad Smell
4. Turbidity NT Units	NH	1.2
5. Total suspended Solids	100mg/l	34
6. Total Solids	Not Given	1300
7. Total dissolved Solids mg/L	2100mg/l	1387
8. Electrical Conductivity Micro mho/cm	NH	194.1
II. CHEMICAL EXAMINATION: BS No 10500/2012		
9. pH	5.5 to 9	7.49
10. Total Alkalinity as CaCO_3 mg/l	NH	224
11. Total Hardness as CaCO_3 mg/l	NH	570
12 Iron as Fe mg/L	3.0mg/l	0.98
13 Free Ammonia as NH_3 mg/l	5mg/l	4.42
14 Nitrite as NO_2 mg/l	NH	1.63
15 Nitrate as NO_3 mg/l	NH	10
16 Chloride as Cl mg/L	NH	495
17 Sulphate as SO_4 mg/l	NH	122
18 Phosphate as PO_4 mg/l	5mg/l	4.8
19 Toly's Test 4hrs as O_2 mg/L	NH	0.36
20 Fluoride as F mg/L	1.0Mg/L	
21. C.O.D	250mg/L	65
22. B.O.D as O_2 mg/l	50 mg/l	21
III. BACTERIOLOGICAL EXAMINATION		
23 Fecal coliform (colonies per 100 ml)		410

M. B. Sankaradasaiah
 Junior Water Analyst
 TWAD Board,
 District Water Testing Laboratory,
 Karur.

Annexure 4: Land Confirmation Letter and FMB sketches

மாநகராட்சி திட்டமிடல்
நகராட்சி நிர்வாகம் மற்றும் குடிநீர் வழங்கு துறை

அனுப்பவர்:
திருவாழி கோமுகதாசு, பிரைட்.சி.எம்.பி.எம்.,
ஆலையாளர்,
மாநகராட்சி அலுவலகம்,
கரூர்- 639 001



பெறுவர்:
Vitya Consultants Pvt Ltd JV
With Active Learning Solutions
Pvt Ltd
Vila No 21, Villa Orchids,
Kowkoor Village, Yaparli,
Secunderabad - 500010

த.க.வண்.இத/6052/2020
அப்ப.பா.

நாள். 09.2025

பொருள் : கரூர் மாநகராட்சிக்குட்பட்ட பகுதிகளில் கனல்வரை வரைக்க திட்டமாக குடிநீர் அபிவிருத்தி திட்டம் செயல்படுத்துவதற்காக திறந்தும் நினைவகங்கள் மற்றும் மேந்தினை தீர்ந்தெக்க தொட்டி அமைக்க இடம் ஒப்படைத்தல் - தொடர்பாக.

பார்வை : 1) அலுவலர் எண்.93 நகராட்சி நிர்வாகம் மற்றும் குடிநீர் வழங்கல் (நப.த) துறை, நாள்.12.07.2023
2) நகர திட்டமிடல் கரூர் மாநகராட்சி அலுவலர் குறிப்பு நாள். 30.09.2025

பார்வை 1ல் அலுவலர் எண்.93 இம்மாநகராட்சிக்குட்பட்ட பகுதிகளில் கனல்வரை வரைக்க திட்டமாக குடிநீர் அபிவிருத்தி திட்டம் மேற்கொள்ள அனுமதி அளிக்கப்பட்ட பேரில் விவரமான திட்ட அறிக்கை தயார் செய்து சமர்ப்பிக்க தெரிவிக்கப்பட்டுள்ளது.

கரூர் மாநகராட்சிக்குட்பட்ட பகுதியில் குடிநீர் அபிவிருத்தி திட்டம் செயல்படுத்துவதற்காக திறந்தும் நினைவகங்கள் மற்றும் மேந்தினை தீர்ந்தெக்க தொட்டி அமைக்கவதற்கு கீழ்க்கண்ட இடங்கள் தேர்வு செய்யப்பட்டுள்ளது.

வ. எண்.	அமைவிடம்	சர்வே எண்.
1)	Thirumanilaiyur - PS 3	திருமாளிநல்லூர் கிராமம் சர்வே எண்.1758/2
2)	S.Vellalappatty - PS 2	சண்பிரட்டி கிராமம் சர்வே எண்.1256
3)	Periyakulathupalaya, - PS 1	இளம் கரூர் கிராமம் சர்வே எண்.335/2 Part
4)	Pasupathipalayam	கரூர் நகரம், நகரவாடி வார்டு-2, பிரைட் -34, நகர புரம் எண்.2097/2
5)	STP - Proposed Land	பஞ்சமாநேலி கிராமம் சர்வே எண். 1044,1045,1046,1047,1048,1049

Scanned with OKEN Scz

மேற்கண்ட பட்டியலில் உள்ள சர்வே எண்.களில் திறந்தும் நினைவகங்கள் மற்றும் மேந்தினை தீர்ந்தெக்க தொட்டி அமைப்பதற்கான இடங்களில் திட்டத்தினை செயல்படுத்துவதற்கு பார்வை 2ல் கண்டெடுத்த நகர திட்டமிடல் அலுவலர் குறிப்பின்படி கொடுத்த இட வாரிசை உள்ளதால் மேற்கண்ட இடங்களுக்கு தடைவிண்ணம் காண்பது வழங்கப்படுகிறது.

இணைப்பு :
FMB வரைபடங்கள் மற்றும் A Register


 அலுவலர்,
 கரூர் மாநகராட்சி.

பணித்தொடர்ப்படுகிறது.

பொருள் கரூர் மாநகராட்சி - இம்மாநகராட்சிக்குட்பட்ட மண்டலம்-1 முதல் 4 வரை உள்ள 48 வார்டுகளில் புதிய பாதாள சாக்கடை திட்டமான கலங்கரை திட்டத்தின் ஏலம் புதிய கழிவு நீர் நீருக்கு நிலையங்கள் மற்றும் கழிவுநீர் ஆய்வு குழிகள் அமைத்திட இடம் போதிய அளவில் உள்ளதா என்பதை குறிப்பாக வழங்க வேண்டியது - விபரம் சமர்ப்பீத்தல் - தொடர்பாக.

பார்வை ஆணையர், கரூர் மாநகராட்சி அவர்களின் குறிப்பு நக.எண்.இ2/6052/2025, நாள்.16.09.2025

பார்வையில் கண்டுள்ள ஆணையர், அவர்களின் குறிப்பில் கரூர் மாநகராட்சிக்குட்பட்ட மண்டலம்-1 முதல் 4 வரை உள்ள 48 வார்டுகளில் புதிய பாதாள சாக்கடை திட்டமான கலங்கரை திட்டத்தின் ஏலம் புதிய கழிவு நீர் நீருக்கு நிலையங்கள் மற்றும் கழிவுநீர் ஆய்வு குழிகள் அமைத்திட இடம் போதிய அளவில் உள்ளதா என்பது தொடர்பான அறிக்கை சமர்ப்பிக்க கோரப்பட்டுள்ளது.

மேற்படி குறிப்பிட இணைக்கப்பட்ட பட்டியலில் கண்டுள்ள இடங்கள் நேராய்வு செய்யப்பட்டு போதுமான இட வசதிகள் உள்ளது. அதன் விபரம் கீழ்க்கண்டவாறு அறிக்கையாக சமர்ப்பிக்கப்படுகிறது. (FMB மற்றும் அ - பதிவேடு நகல் இணைப்பப்பட்டுள்ளது.

வ. எண்.	அமைவிடம்	சர்வே எண்.
1)	Thirumanilaiyur - PS 3	திருமனிலையூர் கிராமம் சர்வே எண்.1758/2
2)	S.Vellalapatty - PS 2	சண்பிரட்டி கிராமம் சர்வே எண்.1256
3)	Periyakulathupalaya, - PS 1	இணாம் கரூர் கிராமம் சர்வே எண்.335/2 Part
4)	Pasupathipalayam	கரூர் நகரம், நகராட்சி வார்டு-2, பிளாக் -34, நகர புல எண்.2097/2

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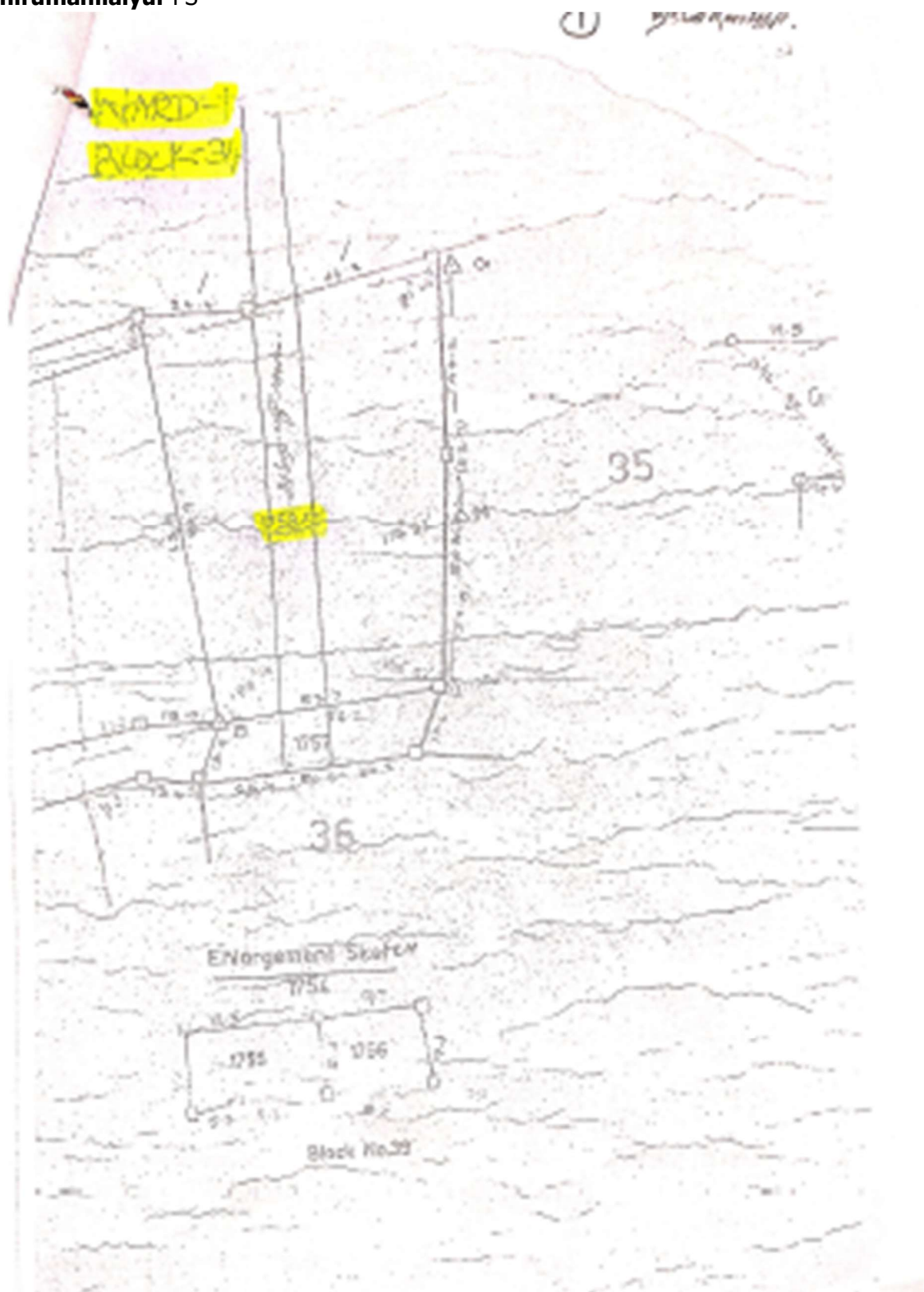
வ. எண்.	அமைவிடம்	சர்வே எண்.
5)	STP - Proposed Land	பஞ்சமாநேனி கிராமம் சர்வே எண்.1044, 1045, 1046, 1047, 1048, 1049

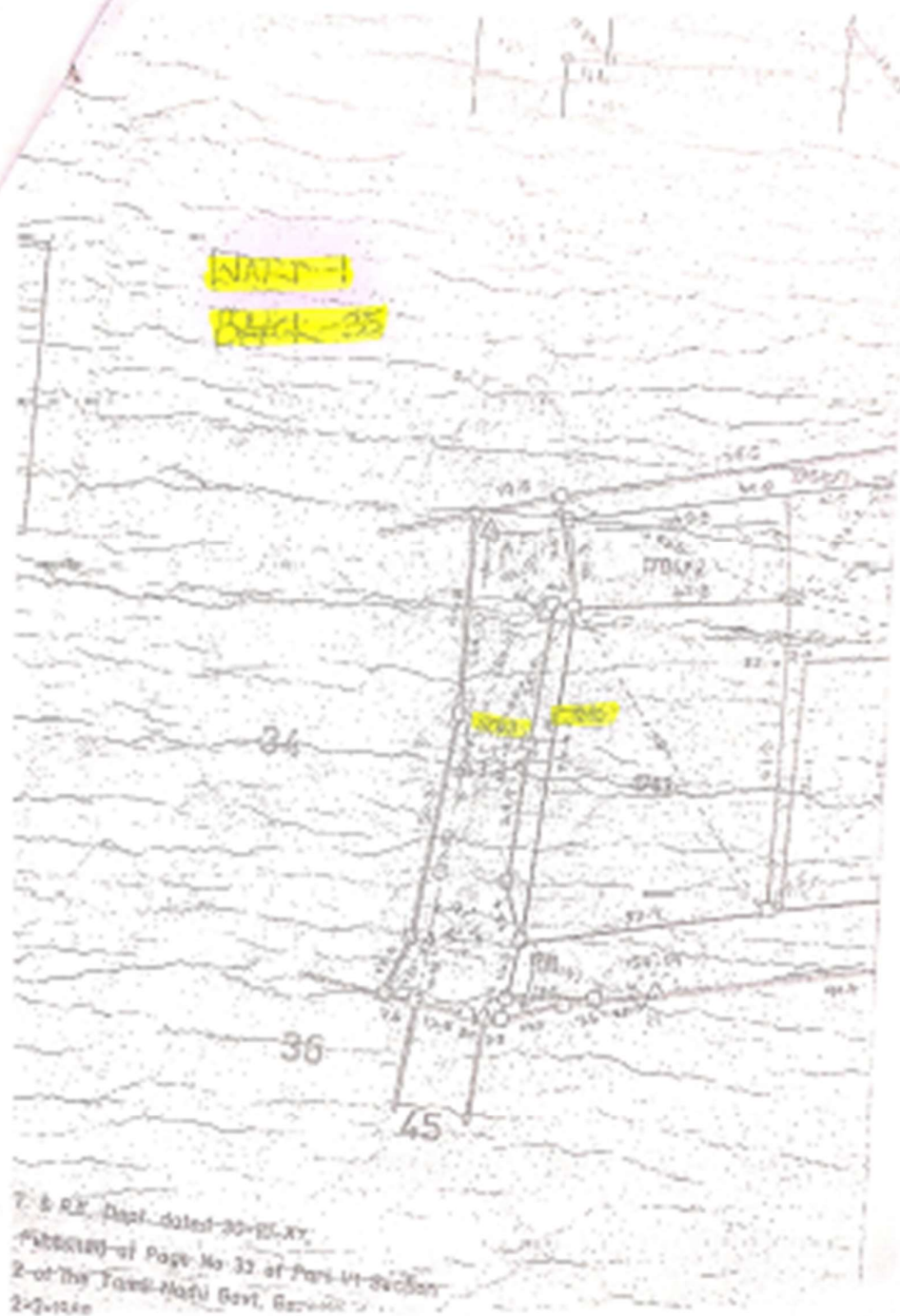
P. R. 30.09.25
நகர திட்டமிடுநர்,
கரூர் மாநகராட்சி

30.09.25

S. No	Pumping station	Classification	Landmark	Area Sq.m	Survey Number
1	Thirumanilaiyur – PS 3	Puramboke	Thanthoni. Near Amaravathi bridge	25*25	1758/2
2	S. Vellalapatty – PS 2	Puramboke	Sanapiratti	20*20	1256
3	Periyakulathupalaym - PS 1	Puramboke	Inam karur/karur	20*20	335/2 part
4	Pasupathipalayam	Puramboke	Pasupathipalayam	25*25	2097/2
5	STP - Proposed land	Puramboke	Arasu colony	2 acres	1044, 1045, 1046, 1047, 1048, 1049

Thirumanilaiyur PS





② இலாபத்தின் பற்றி

பக்கம் 2

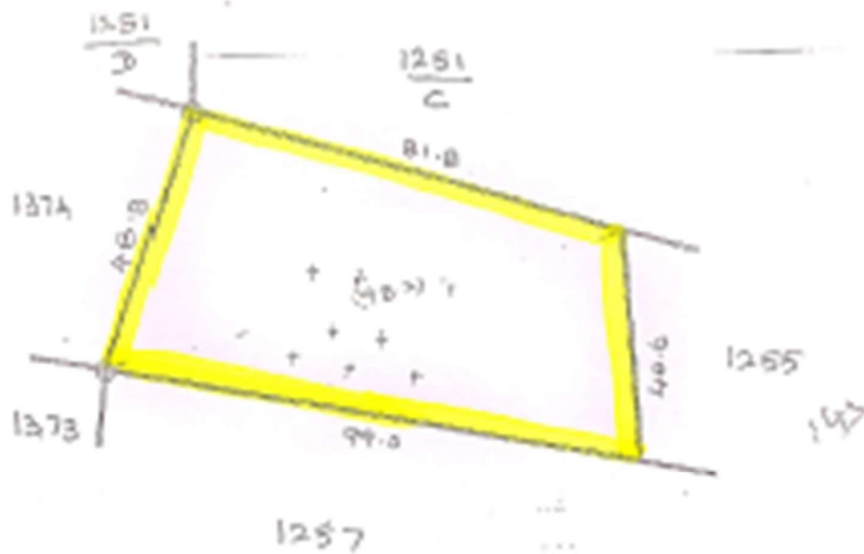
புதிய இலாபத்தின் பற்றி

புதிய பக்கம்

புதிய பக்கம், 1256

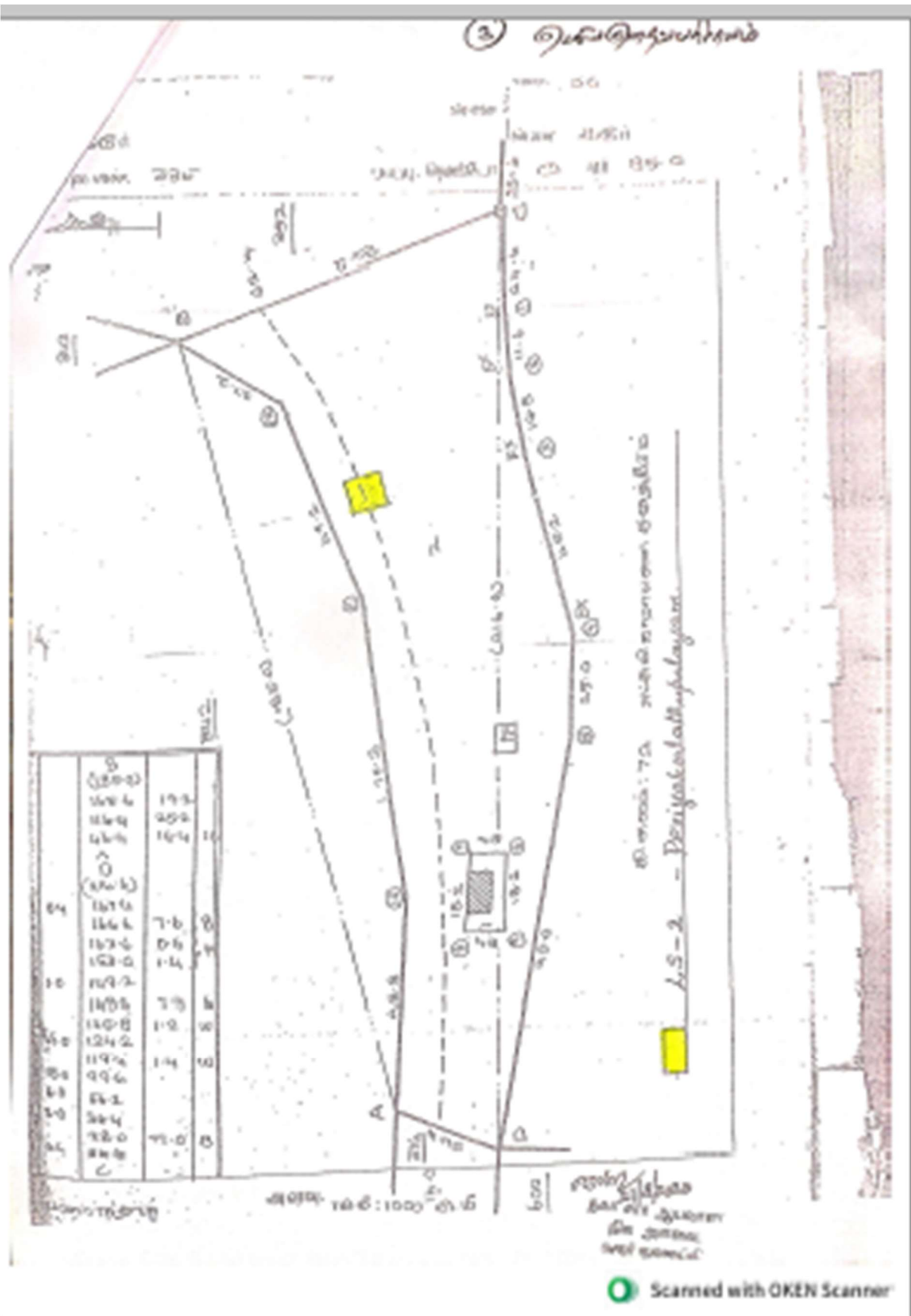
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புதிய பக்கம்

புதிய பக்கம்

Periyakulathupalayam PS

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Pasupathipalayam PS

4) உரிமையாளர்.

District : Karur
Taluk : Karur
Tanna : Karur
Vard : Ward No 2



Block : 31
Area : Host 00 Acres 16 Saps 78
T.S. No : 2097/2
Scale : 1 : 500 mm

TSLR Sketch



Annexure- 5: Consent to Operate status of existing STP of 15MLD (Valid till March 2026)

RENEWAL OF CONSENT ORDER NO:2509269727355
DATE:18/09/2025



PROCEEDINGS NO.F.0437KAR/RS/DEE/TNPCB/KAR/A/2025 DATED: 18/09/2025

Sub :	Tamil Nadu Pollution Control Board – AUTO RENEWAL OF CONSENT –M/s. KARUR MUNICIPALITY SEWAGE TREATMENT PLANT , S.F. No. 1044, 1045, 1046, 1047, 1049, PANCHAMADEVI village, Manmangalam Taluk and Karur District- Renewal of Consent for operation of the plant and discharge of emissions under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987 (Central Act 14 of 1981) – Issued – Reg. (Industry User ID- R16KAR5619439)
Ref :	1. CTO- Direct Proc.No. DEE/TNPCB/KAR/F.0462/OM/A/2011 dated 30.05.2011 2. Unit's Auto renewal application through OCMMS on 04.09.2025.

Renewal of Consent is hereby granted under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987 (Central Act 14 of 1981) (hereinafter referred to as "The Act") and the rules and orders made there under to

COMMISSIONER,
M/s . KARUR MUNICIPALITY SEWAGE TREATMENT PLANT
S.F No. 1044, 1045, 1046, 1047, 1049,
PANCHAMADEVI Village,
Manmangalam Taluk,
Karur District.

Authorizing the occupier to operate the industrial plant in the Air Pollution Control Area as notified by the Government and to make discharge of emission from the stacks/chimneys.

This is subject to the provisions of the Act, the rules and the orders made there under and the terms and conditions incorporated under the Special and General conditions stipulated in the Consent Order issued earlier and subject to the special conditions annexed.

This RENEWAL OF CONSENT is valid for the period ending - March 31, 2026

SPECIAL CONDITIONS

1. This renewal of consent is valid for operating the facility for the manufacture of products (Col. 2) at the rate (Col. 3) mentioned below. Any change in the products and its quantity has to be brought to the notice of the Board and fresh consent has to be obtained.

Sl.No.	Description	Quantity	Unit
Product Details :-			
1.	TREATMENT OF SEWAGE THROUGH SEWAGE TREATMENT PLANT FOR KARUR MUNICIPALITY AND INAM KARUR MUNICIPALITY	15.00	MLD

By-Product Details :-

Intermediate Product Details :-

2. This renewal of consent is valid for operating the facility with the below mentioned emission/noise sources along with the control measures and/or stack. Any change in the emission source/control measures/change in stack height has to be brought to the notice of the Board and fresh consent/Amendment has to be obtained

I				
Point source emission with stack :				
Stack No	Point Emission sources	Air pollution Control measures provided	Stack height from Ground Level in m	Gaseous Discharge in Nm ³ /hr
1	D G Set- 500 KVA	Stack	4.00	
II				
Fugitive/Noise emission :				
Sl.No.	Fugitive or Noise Emission sources	Type of Emission	Control measures provided	Quantity
1.	D G Set- 500 KVA	Noise	Acoustic Enclosures	

Special Additional Conditions-

The unit shall obtain No Objection Certificate (NOC) from the Tamil Nadu Bio Diversity Board /National Bio Diversity Authority if the unit is using any Biological resources or knowledge associated thereto as per the provisions of Biological Diversity Act 2002.

The industries shall take all efforts to use and popularize "Mission LiFE" logo and mascot which is available in TNPCB & MoEFCC website. They shall also request their employees to adopt "Mission LiFE" action points and document the same and furnish half yearly report to Board.

Additional Conditions-

1. The unit shall operate the APC measures efficiently and continuously so as to adhere to AAQ/Emission standards prescribed by the Board.
2. The unit shall adhere to the Ambient noise level standards prescribed by the Board.
3. The unit shall develop green belt adequate depth within the premises.
4. The unit shall comply with the directions issued by Hon'ble NGT in O.A.No 257/2020 from time to time.

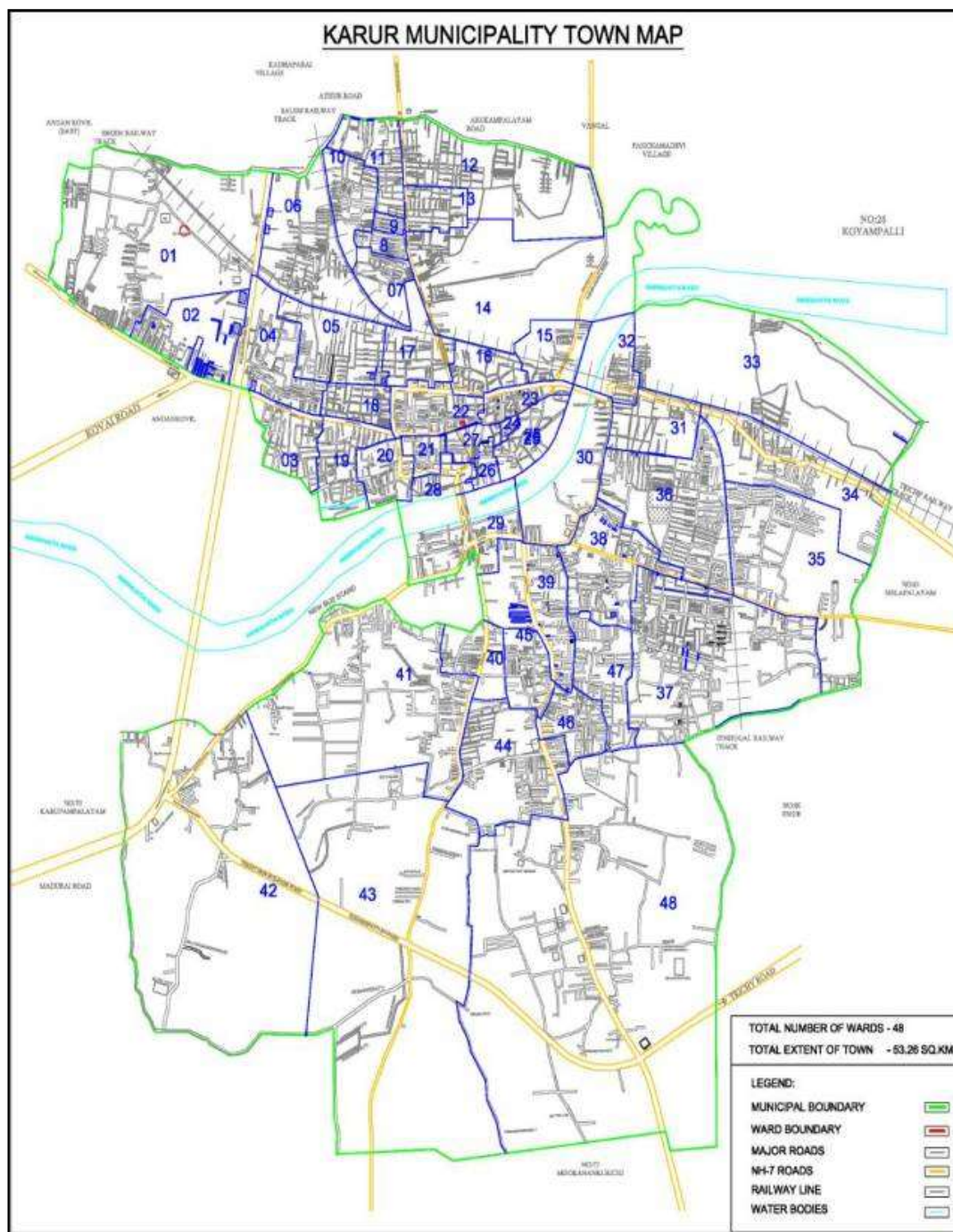
To
COMMISSIONER,
M/s.KARUR MUNICIPALITY SEWAGE TREATMENT PLANT,
THE COMMISSIONER,
KARUR MUNICIPALITY,
9A, AZAD ROAD, KARUR
Pin: 639001

Copy to:

- 1.The Commissioner, KARUR-Panchayat Union, Manmangalam Taluk, Karur District .

2. Copy submitted to the Member Secretary, Tamil Nadu Pollution Control Board, Chennai for favour of kind information.
3. Copy submitted to the JCEE-Monitoring, Tamil Nadu Pollution Control Board, Tiruchirappalli for favour of kind information.
4. File

Annexure -6 Wards Map of Karur Municipal Corporation



Annexure-7 Stakeholders Engagement Plan

Pre-Construction

An overall consultation with the general public and other stakeholders has been planned by PIU prior to start of project construction for the Proposed Project.

During Construction

The engagement with the project stakeholders will be continued as required during the project implementation and the strategy is provided as below.

Stakeholder Engagement and Information Disclosure Strategy					
Project:					
S.No	Target stakeholders	Information to be disclosed	Proposed engagement & disclosure method	Timing of Engagement	Responsible Parties
1	Project Affected Persons- During construction of any project affected person, identified (If required)	• Project design details, alignments and their impacts • Provisions for compensating economic and physical displacement, timelines for completing rehabilitation - Communication on final rehabilitation/ compensation approved by govt. • Grievance mechanism in place	• FGDs and small group consultations • Print-Newspaper, Newsletter/leaflets/Pamphlet • Radio information capsules	• At least twice-before & after compensating • During alignment works	PIU/Contractor

2	Households / people residing along alignment of sewer sites	• Project design details, planned alignments and their impacts • Design and site alternatives explored for impact minimization • Accidents and road safety/ traffic management issues and measures planned to be in place; • Information on likely disruptions to services and arrangement during construction including its duration and likely timings • Management of air and noise pollution; Disruption to services and arrangement during construction • Community and Occupational Safety measures planned for; • Excavation works-sludge/ earth disposal plans • Labour management plans/proposed camp sites • Grievance mechanism process	• Newsletters/ Pamphlets/ Hand bills • Focus group Discussions • Digital based Information dissemination • Helpline/ Toll-free numbers displayed at project locations and prominently accessed areas • Suggestion boxes at site offices	• Continuous, as required in construction stage • One week prior to start of construction in the respective stretches	PIU/Contractor / PMC
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3	Other Interested Parties: • Resident Welfare Associations (RWAs) • Elected Reps of Municipal Corporation Civil Society Organizations • Print and Tele Media • Staff of Line departments • Service providers and duty bearers • Staff of Municipal Corporations • Community /Religious leaders • Regulatory agencies	• Project design details, planned alignments and their impacts • Design and site alternatives explored for impact minimization • Accidents and road safety/ traffic management issues and measures planned to be in place; • Information on likely disruptions to services and arrangement during construction including its duration and likely timings • Community and Occupational Safety measures planned for WTP/OHSR constructions and transmissions;	• One-on-one Meetings • Formal Small group meetings • Open forums and Town-hall meetings for RWAs and ERs • Formal presentations to closed groups like regulators, service providers and duty bearers	• Continuous, as and when required during construction	PIU/Contractor/PMC
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		• Excavation works-sludge/ earth disposal plans • Labour management plans/ proposed camp sites • Grievance mechanism process			
4	Civil Works Contractor, staff & subcontractors	Project design details, alternatives, planned alignments and their impacts • Baseline information on environmental and social aspects • Project's induced environmental and social risk • Accidents & road safety/ traffic management measures planned	Provisions in Bid/ contract documents • One-on-One and formal small group meetings/ discussions • Formal presentations/ training to contractor's project management team	• Once, at the time of contract signing and orientation during preconstruction phase • Periodic briefings and orientation at site • Feedback as and when required on site	

		• Orientation on EHS provisions • Sexual harassment provisions and requirements • Labor Management Procedures • Orientation on RAP implementation and requirements • ESIA requirements and measures proposed • Grievance mechanism proposed under the project, requirements • Feedback on consultant/ contractor implementation and supervision ports		and monitoring reports	
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S.No	Aspect	Mitigation measures	Responsibility	Implementation stage	Monitoring method	Performance Indicator	Frequency
1	Public disclosure	placement of hoarding at public and prominent places indicating in English and Tamil language project details, name and contact number of Convenor and the Contractor.	Convenor/ Contractor	Pre-construction phase	No. of hoardings and locations chosen	Effectiveness of message communicated	Once
	Conduct Consultations with the beneficiaries, local communities and other stakeholders	Understand the perception of stakeholders, the positive and negative impact of the project; Analyse the concerns and issues of potential temporary economic impacts, local communities and other stakeholders; Address the concerns raised as per ESMP provisions; and	PMC E&S experts, Contractor EHS - officer/ Project Manager and Convenor of PIU	Project life cycle beginning from the early stage of preconstruction	Review of available documents; Support or opposition of stakeholders in project activities; Project progress level; And Consultations conducted with	Procedure followed for conducting consultation; No. of meetings/ consultations held; No. of participants in each meeting; Profile of participants	Conduct consultations with the beneficiaries, local communities and other stakeholders

		Implementation of project with a Gender responsive Approach.			stakeholders	such as male and female; Type and severity of issues raised; Response and action taken; Awareness level about the project; Temporary loss of Potential temporary Economic impacts compensated Favourable Social atmosphere Towards project and support to	
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						participation in project activities; and Increased engagement in terms of number and level of stakeholders and women in the project compensated activities	
3	Effective functioning of GRC	Resolve the E&S related complaints and disputes in a time bound manner amicably without any cost.	GRC members headed by the authority	Project life cycle beginning from the early stage of preconstruction.	Site inspections; Consultations held with potential temporary economic impacts, and other stakeholders;	Adequacy of information & dissemination about the GRC and its objectives among the stakeholders; No. of GRC meetings held	Whenever required

					Project related E&S complaints received in writing or verbally.	and timeframe; GRC members present in each meeting; No. of complaints/ grievances received and resolved; Time taken;	
	Organize meetings with line departments to seek project support as required	Coordination and meetings with the line departments, namely District Administration, PWD, Traffic Police/ ULBs/ and line agencies; Understand the role of line department and support envisaged for project implementation and operation; and Obtain an update related to	PIU/Contractor	Project Planning stage onwards	Review the feedback of participants of the meeting; Date, time, and venue fixed as per suitability of other departments; Communicated information in advance (letter	No. of officials participated in the meetings and signed the attendance sheet; Relevant information shared; Comments/sug Gestions offered, Effectiveness	Semi annually

		potential temporary economic impacts, beneficiaries and other stakeholders.			signed by the CE/SE of the CMWSSB); Presentation about the project (PPT),including objectives of the meeting expectations from the participants; and Q&A details.	of meeting in project implementation and operation; Improved communication ,coordination helpful in project activities; Increased understanding about the project related tasks; and Other Facilitation roles.	
	Public awareness about the project	Organize public events and engage all stakeholders like related government	PIU, PMC, Contractors	Pre-construction stage and onwards	Review the public awareness activities undertaken;	People understand importance of project and need for	Semi annually

		departments, local communities, beneficiaries of the project, women's group, NGOs in project areas.			Feedback of target groups to assess the effectiveness of such activities.	environmental and social sustainability;	
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Guidelines for Stakeholder Engagement & Awareness Meeting

I. Introduction

Ensure the community meeting is well-organized and accessible to all residents. If needed, provide translators or facilitators for different language groups.

- **Project Presentation:** Present the project in a clear, accessible manner. Highlight key details such as project timelines, expected benefits, and potential disruptions.
- **Interactive Session:** Allow time for Q&A, addressing community concerns, and clarifying any doubts.
- **Feedback Collection:** Collect feedback from participants about their concerns, ideas, and suggestions. This can be done through surveys, suggestion boxes, or open discussions.

II. Community Briefing:

- Conduct a **community-level briefing** to inform Project Affected Families (PAFs) about the social assessment process. Explain the purpose of the survey, how the data will be used, and emphasize confidentiality and data protection.
- Use accessible language and formats (e.g., posters, fliers) to ensure broad understanding, especially in areas with diverse language speakers.

Engage Local Leaders:

- Meet with local leaders, community representatives, and Sangams (if applicable) to get their buy-in and assistance in mobilizing participants. This helps ensure that the survey process is transparent and accepted by the community.
- Inform local leaders about the **Grievance Redressal Mechanism** (GRM) in case any issues arise during the survey process.

Prepare Participants:

- Provide information on the **Social Assessment** to PAFs at the household level, explaining the role of the survey, what will be asked, and how they can contribute.
- Encourage participants to be open and transparent in their responses, reassuring them of the confidentiality of the process.

Checklist for Meeting

Venue Preparation

- Ensure the venue is accessible and comfortable for all participants.
- Arrange for seating, audio-visual equipment, and refreshments.

Welcome and Introduction

- Introduce the team and explain the purpose of the consultation.
- Reassure participants about confidentiality and the voluntary nature of participation.

Present Project Details

- Explain the project, including its benefits, challenges, and impacts.
- Highlight how public feedback will influence decision-making.

Facilitated Discussion

- Assign a skilled facilitator to guide the discussion.
- Use open-ended questions to encourage dialogue, such as:
 - What are your concerns about the project?
 - What improvements would you suggest?
 - How do you foresee this project impacting your community?

Documentation

- Record participant feedback through notes or audio (with consent).
- Use tools such as comment cards or suggestion boxes for additional inputs.
- Take pictures during the meeting.

Encourage Participation

- Create opportunities for everyone to speak, including quieter participants.
- Use breakout groups for smaller, focused discussions if needed.

Post-Consultation Activities

Compile Feedback

- Summarize key insights, concerns, and recommendations from the consultation.
- Group feedback into themes for easier analysis.

Share Outcomes

- Prepare a summary report and share it with participants.

- Explain how their input will influence the project.

Monitor Follow-Up

- Develop an action plan to address community feedback.
- Schedule subsequent consultations if required.

Expected Outcomes:

- The community is well-informed about the survey process.
- Local leaders and community representatives are engaged and supportive.
- PAFs are prepared and understand the value of participating

Stakeholder Engagement Meeting

Name of the tool	Stakeholders Meeting
Purpose	• To share project goals, timelines, and implementation strategies. • To gather inputs, address concerns, and co-create solutions. • To align roles and responsibilities among stakeholders. • To build trust and ensure community participation.
Stages to use the tool	• During planning and pre-implementation phases. • At key decision-making milestones (e.g., design finalization, relocation schedule). • For conflict resolution or when facing delays/resistance. • Periodically during project execution for monitoring and feedback by means of site consultation meeting.
Stakeholders	• Line Departments • Urban Local Body (ULB) • Elected Representatives • Community-Based Organizations (CBOs), RWAs, SHGs • Civil Society Groups & NGOs • Project Implementation Agency (PIA)
Steps	A. Preparation: ○ Identify relevant stakeholders and project area.

	○ Prepare an agenda with clear objectives and expected outcomes. ○ Arrange meeting venue, date and time. B. Invitations & Outreach: ○ Send formal invitations to government and elected officials. ○ Use local networks (e.g., SHGs, RWAs) to mobilize community participation. C. Meeting Structure: ○ Welcome and Introductions. ○ Presentation of project details. ○ Open floor for stakeholder inputs/questions. ○ Document key concerns, suggestions, and action items. ○ Assign follow-ups and timelines. ○ Registration form and preparation of minutes. D. Follow-Up: ○ Circulate minutes of the previous meeting. ○ Track action items and provide updates in subsequent meetings. ○ Institutionalize regular stakeholder meetings (monthly/quarterly).
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Annexure-8 Projected population and UGSS Assessment

Accordingly, the projected population for year 2025, 2040 and 2055 is 2,64,760, 3,20,410 and 3,76,060 respectively.

Wastewater Generation Assessment: Wastewater demand for the proposed UGSS in Karur has been assessed based on a water supply norm of 135 lpcd. Sewage generation is taken as 80% of the total water demand, in line with CPHEEO guidelines. Accordingly, the projected wastewater generation is estimated as 29.12MLD, 35.25MLD and 41.37MLD for year 2025, 2040 and 2055 respectively and *STP capacity is proposed for 35.25 MLD (For intermediate year).*

Estimation of Wastewater Generation

Provision of 29,627 house service connections (HSCs), new sewer lines and machine holes (91 km Zone-1, 38 km Zone-2, 225 km Zone-3), pumping mains, sewage pumping stations, odour control, trenchless crossings, pipe bridges, online monitoring, STP works new 35.25 MLD) and provisions for present sewage flow of 6MLD coming to STP for treatment, road restoration, ESMP, and replacement of 14.53 km old sewer network and replacement of 2.25 km of pumping main.

Improvements in existing STP and proposed new 35.25MLD STP

Presently a total 5-6 MLD is receiving at STP for treatment of sewage. The existing STP is of Aerated Lagoon operational since 2007. The treated sewage further goes to maturation ponds thereby further discharge into irrigation channels for agriculture propose. Since, the existing STP is more than 15 years old and is of old technology as compared to present treatment technology available, hence as discussed with ULB, it has been proposed to construct a total new STP capacity of 35.25 MLD with new SBR technology, within STP area. No additional land is required for this purpose.

The existing STP drawing is as submitted below:

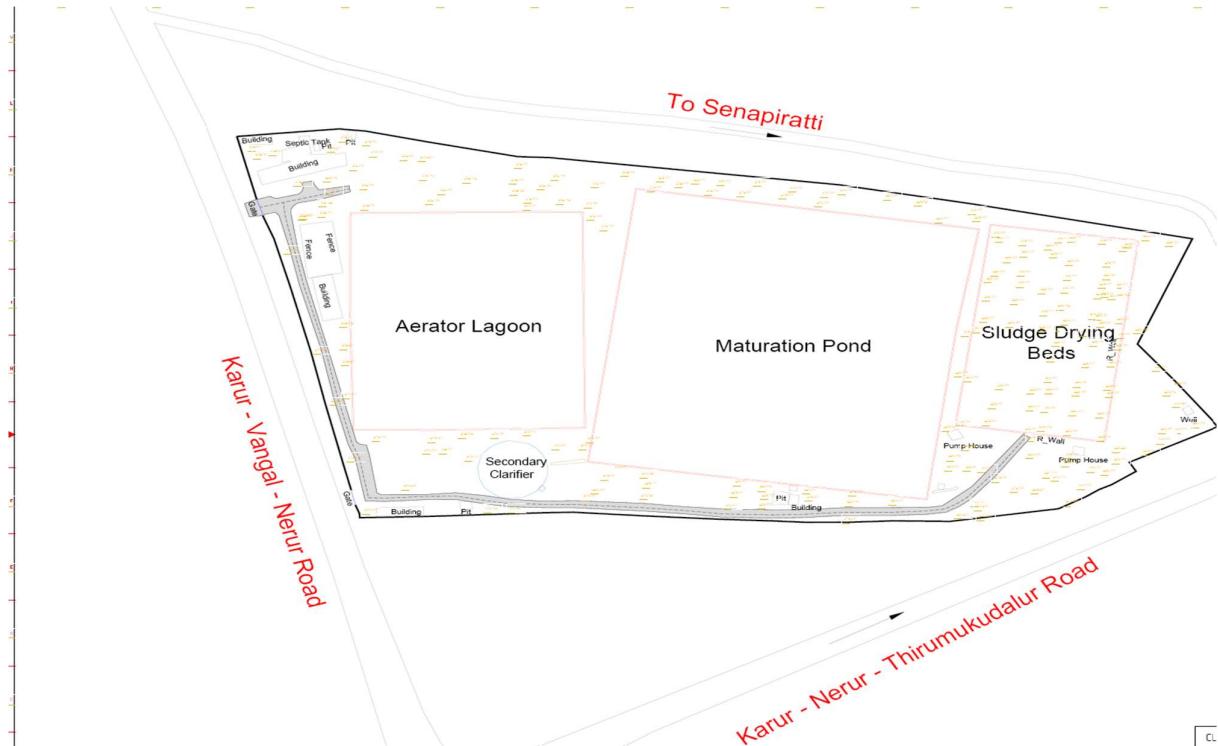


Figure 19: Figure Existing STP Layout

Till the new SBR technology in Maturation Pond area is in operation, the present flow will be treated at existing STP only, with following improvements.

- ✓ Screen System Replacement
- ✓ Aerator Repair and increasing the aerators capacity
- ✓ Secondary Clarifier Rehabilitation
- ✓ Improvements in Chlorination Unit
- ✓ Sludge Handling Unit Rehabilitation
- ✓ Additional testing facilities in Laboratory Unit
- ✓ Monitoring Unit - (SCADA/OCMS) Integrated with TNPCB
- ✓ Safety Equipment
- ✓ Inlet Flow Meters - Replacement
- ✓ Outlet Flow Meters - Replacement
- ✓ Electrical Systems Repair

The proposed treatment system is as follows:

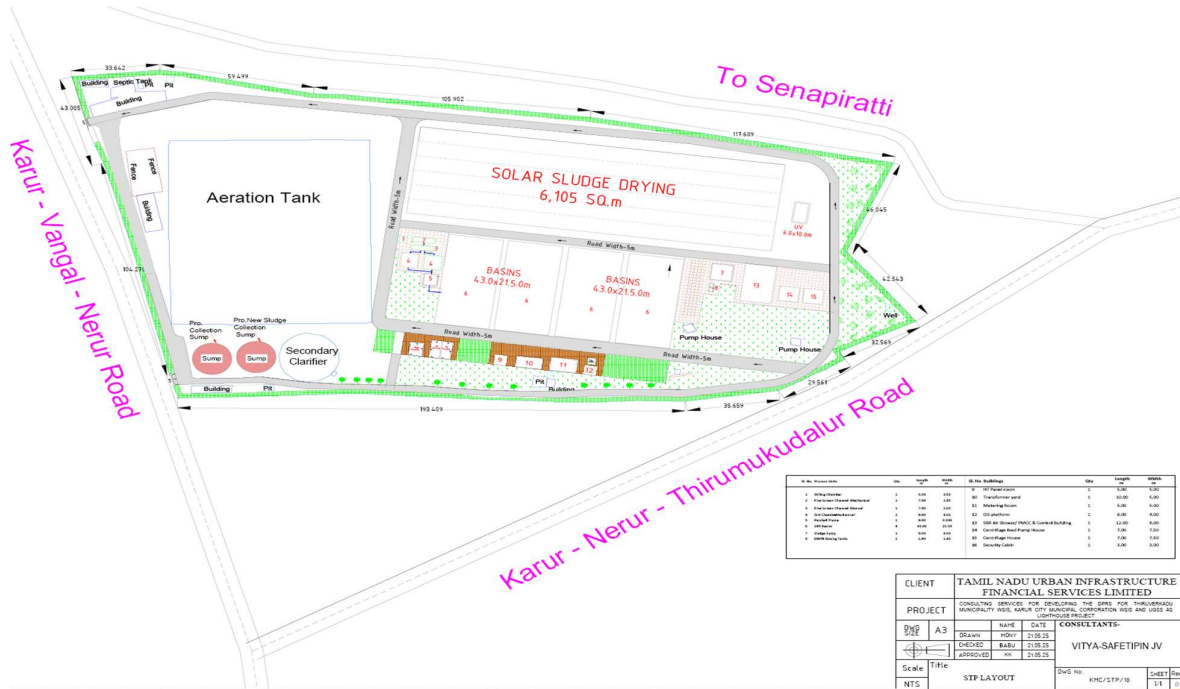


Figure 20: Proposed STP Layout

For construction of new STP, the existing Sludge drying beds and maturation pond area shall be utilized. Hence, be due care will be taken by the contractor on DBOT basis in treating the present flow with improvements in existing STP as per the TNPCB Standards and in parallel the construction of new STP of 35.25 MLD of SBR technology. CFE will be obtained before constructing the New STP.

The Consent to operate (CTO) for existing 15MLD is valid till **March 2026** and the copy of the CTO is enclosed in Annexure 5.

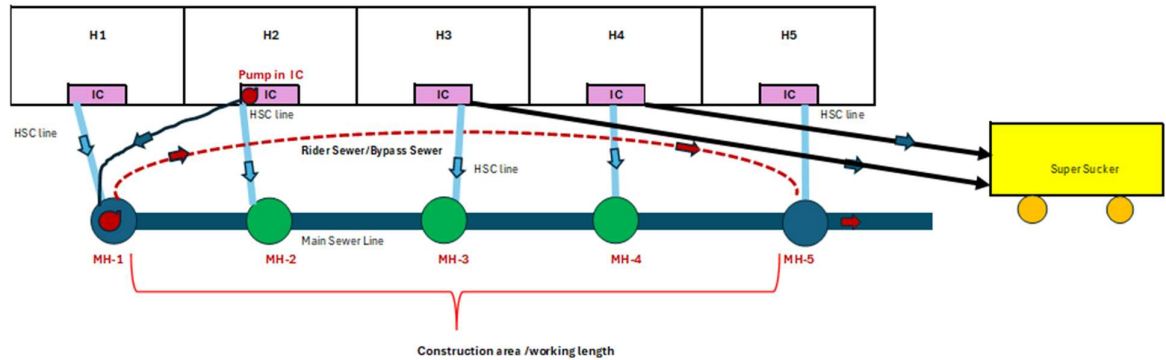
Annexure 9: Siting Criteria for Sewage Treatment Plants

S.No	Location	Site clearance from STP
1	Lake or pond	250 meters
2	River	250 meters
3	Notified habitat area	500 meters
4	Public utility such as park, temple, educational institution etc.,	500 meters

- The site of STP should be selected on dry lands and the treated sewage shall be utilized on land for irrigation.
- The local body shall also ensure that the land availability and consent from the land owners for the disposal of treated sewage, which should be mentioned at the time of application for NOC itself.
- In case of disposal of treated sewage into marine water bodies, the local body shall obtain CRZ clearance and this should be submitted along with NOC application.
- The local body shall obtain appropriate land use certificate from DTCP for STP site.
- The local body shall consider the treatment technology while selecting the site in respect of extent of land. Advanced treatment technology will require less footprint area in order to meet the inland surface water standards
- prescribed of the TNPCCB.
- A preliminary assessment of public / nearby residents opinion neighbouring the location of STP site is essential.

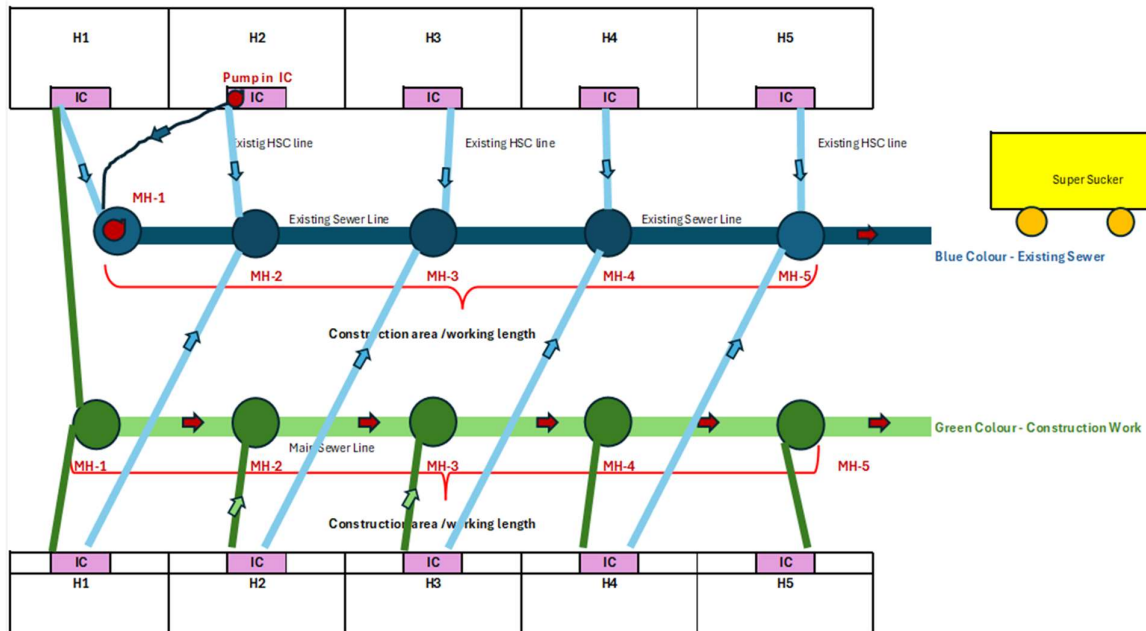
Annexure 10 Methodology for sewer constructions and SPS works

Case 1 – when the sewer is to be laid in the same alignment with existing machinehole improvement



Step 1	Prior intimation to residents regarding the construction works is to be provided.
Step 2	Contractors should ensure all bypass arrangements (temporary pumps and associated bypass rider sewer) at MH1, and ICs are placed and operational, as explained in step 3, 4 and 5
Step 3	Place a pump in MH 1, connected with bypass rider sewer discharging into MH-5, to make available intermediate sewer and machine holes (MH-2, MH-3 and MH-4 for works / replacement works)
Step 4	A Super sucker machine shall be kept at site, as an alternative arrangement, for suction of generated sewage during the construction duration from ICs/ MHs Contractors must plan the work on same alignment in discussion with CMWSSB and ensure availability of super suckers (in MH and in ICs) to collect the generated sewage during construction works. Based on site conditions, Contractor decides whether to put pump in IC at Household level or use super sucker machine to collect the generated sewage during construction.
Step 5	Once bypass arrangements are operational, place gunny bag / Sand Pag /Sewer Plug at MH 1 - to stop flows downstream sewers.
Step 6	Dismantling the existing sewer and MH from outlet of MH 1 to inlet of MH 5.
Step 7	Start laying sewer line to the design details.
Step 8	Once the work of sewer network is completed, tested, trench refilled and temporarily closed, the entire assembly will be shifted downwards or upward (based on the site situations). Say downward direction, then pump will be placed in MH 5 to further work downstream.
Step 9	While working, existing house connections will close from IC end and MH end.

Case 2 – when the sewer is to be laid with new parallel network



Step 1	Alignment for new sewer should be marked on ground parallel to existing Sewer line, with minimum disruption to existing utilities.
Step 2	Construct new sewer line and machine holes to be completed including the laying of sewer line, construction of manholes, testing and backfill.
Step 3	Once the parallel sewers line is ready, existing sewer house connection shall be transferred from existing line to the newly laid sewer line.
Step 4	To transfer HSCs to newly constructed line, contractors should ensure that ICs are equipped with temporary pump and bypass sewer to pump out sewage generated during construction works and discharge to the newly constructed sewer line. Alternatively, a super sucker machine can also be used.
	Note: contractor to ensure bypass arrangements as explained in the case I.