



ENVIRONMENTAL IMPACT ASSESSMENT REPORT

For

**Proposed 44 MLD Sewage Treatment Plant for
Salem City Municipal Corporation**

at

**Vandipettai Village, Salem Taluk,
Salem District**

By

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CHAPTER 1- INTRODUCTION

1.1 Preamble

Generation of enormous volumes of sewage in Indian cities may be attributed to urban areas migration of people, exponential population growth in urbanization, and improved running water-supply. As per Central Pollution Control Board, which carries out regular inventory of water supply, wastewater generation and its disposal about 33,000 million litre of wastewater generated every day from Class-I cities and class –II towns.

It was also observed that most of the cities do not have adequate organized water supply, as well as wastewater collection and treatment facilities. The wastewater generated in these areas normally percolates in the soil or evaporates. The uncollected wastes accumulate in the urban areas cause unhygienic conditions and release significant amount of nutrients on their decomposition, which leaches to surface and groundwater and pollute them. There are evidence of gradual increase in nitrate concentration in groundwater in the urban areas. The problem is more severe in large urban areas.

The primary objective of sewage treatment is to □ariegate decomposable organic matter present in sewage so as to produce an effluent and sludge which can be disposed of in the environment without causing health hazards or nuisance. Salem City Municipal Corporation has proposed to set up a sewage treatment plant (STP) of 44 MLD with the aid of World Bank and TNUDF.

3.13 Project Background

The proposed STP project would cater to zone – II of Salem City Municipal Corporation which totally comprises of area of geographical extent of 91 sq.km and with a 2011 census population of 34,80,008. Accordingly, proposals were made for designing, providing, constructing, erection and commissioning, startup and performance trial run for 6 months followed by 5 years of O&M of 44 MLD capacity sewage treatment plant (STP) at Vandipettai with selected modern technologies in Salem City Municipal Corporation on DBOT Basis. The cost of the project is Rs.30.8 crores.

Time for completion has been decided as 90 months with 24 months duration for construction and commissioning; 6 months duration for performance trial run; and 60 months duration for subsequent Operation and Maintenance.

3.13 About the city

Salem city also called as 'Steel city' by virtue of the industries is located in the north central part of the state, about 340 kilometres southwest of the Tamil Nadu state capital, Chennai. Salem is the fifth biggest city in Tamil Nadu in terms of size. The city has a picturesque setting and is surrounded by hills on all sides namely Nagaramalai to the north, Jarugumalai to the south, Kanjamalai to the west, and Godumalai to the east. It is divided by the river Thirumanimuthar in the main division. Salem is noted for various remarkable sites among which is the Stanley Reservoir built across the Cauveri river is praised as an architectural marvel and engineering master-piece. Another significant landmark of Salem city is the Salem Steel Plant a public sector company engaged which provides employment to thousands and is engaged in rolling out cast steel blacks into sheets of required dimensions. Of the agricultural produces Mango fruits from Salem are enjoyed and much sought after even in international markets. Tapioca is also extensively cultivated by the farmers of Salem and the tubers are used primarily to produce starch.

The sewage treatment plant is proposed to be located near the state highway – SH 159 which is the Salem to Sankari road. The proposed site is a barren land and there is neither vegetation nor habitation. The map and satellite pictures showing the location of the site and the surrounding features are shown in the figures below as Fig 1.1 and 1.2.

1.4 Scope of the EIA study

The scope of the study is to document the proposed project of STP in relation to its setting, baseline data, foreseeable impacts on the environment especially in addressing the disposal / reuse of the treated sewage and arising there from identifying the remediations that may be needed and formulating an environmental management plan (EMP).

This Environmental Impact Assessment (EIA) Report for the proposed STP in Vandipettai Village of Salem Taluk has been prepared as per EIA Notification, 2006 by Ministry of Environment and Forests (MoEF), Government of India (GoI) and guidelines as specified by OP 4.01 of World Bank.

Environmental Impact Assessment of the project will include:

- Collection of baseline information on various components of the environment
- Identification of areas and aspects those are environmentally or socially significant

- Conducting community consultations on various environmental and social aspects of the project and documenting the same
- Determining the magnitude of environmental impacts and formulation of mitigation measures for consideration and incorporation during planning/design, construction and operational phases of the project implementation
- Preparation of environmental enhancement plans for improving the environmental quality of the project corridor; and
- Preparation of environmental management plans including a program for monitoring environmental impacts, implementation schedule and responsibilities. It also specifies requirements of Institutional strengthening, if any, supervision program and contracting procedures for execution of environmental mitigation works.

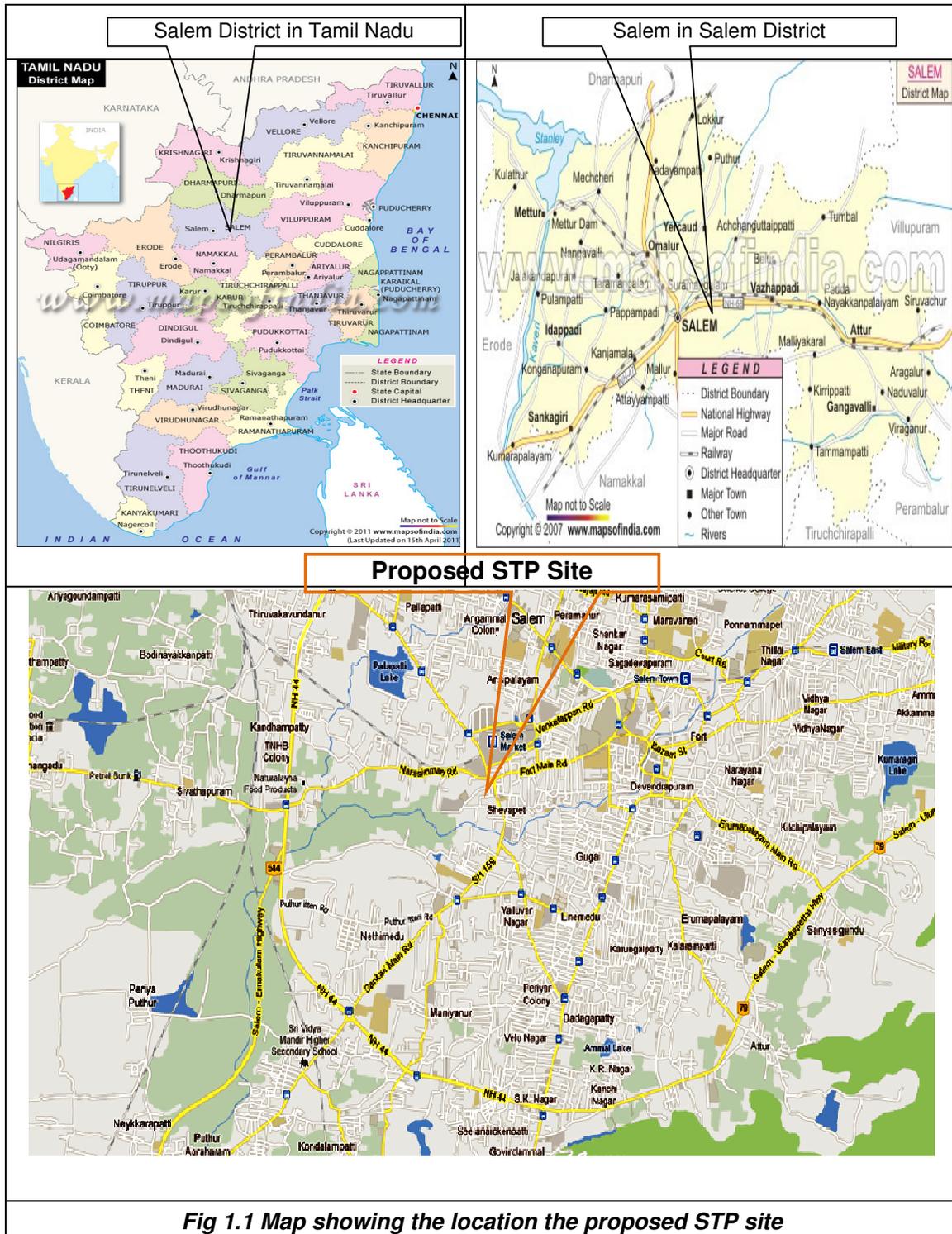


Fig 1.1 Map showing the location the proposed STP site

1.5.3 Coastal Regulation Zone Notification, 2011

All developmental activities proposed to be located in this zone are regulated under the Notification. It classifies the coastal stretch of the country into CRZ-I (ecologically sensitive areas), CRZ-II (built up municipal areas), CRZ-III (rural areas) and CRZ-IV (Islands of Lakshadweep and Andaman & Nicobar)

CRZ notification is not applicable to this project since the project site is not located near sea or any tidal influenced river.

1.5.4 Water (Prevention and Control of Pollution) Act, 1974

The act as amended in 1978 & 1988 vests regulatory authority on the State Pollution Control Boards and empowers them to establish and enforce effluent standards for industries and local authorities discharging effluents. Section 24 of the act prohibits use of stream or well or on land disposal for polluting substances that violate disposal standards laid down by the board.

The project activity of setting up of sewage treatment plant may attract various sections of the act.

1.5.5 Air (Prevention and Control of Pollution) Act, 1981

The act vests regulatory authority on the State Pollution Control Boards and empowers them to establish and enforce air quality standards to prevent air pollution in the country.

Consent for Establishment and consent to operate need to be obtained from TNPCB for various construction activities by the Contractor as per Water and Air Acts. The proposed construction activities would involve setting up of camp site, crushers, WMM and batching plants and hot mix plant by the contractor during the construction stage of the project.

1.5.6 Environmental and Social Framework (ESF)

The Tamil Nadu Urban Infrastructure Financial Services Limited (TNUIFSL) has been set up to manage a Trust fund ---- Tamil Nadu Urban Development Fund (TNUDF). The trust has been established to manage urban infrastructure projects in Tamil Nadu. Typical urban infrastructure projects eligible for funding would include water supply, sanitation, solid waste management, roads, transportation, sites and services, area development and other remunerative/non-remunerative urban infrastructure projects. Recognising the environmental and social issues that can arise in urban infrastructure projects, TNUIFSL has evolved an Environmental and Social Framework (ESF). The ESF provides an overall framework to TNUIFSL in identification, assessment and management of environmental and social concerns at the sub project level. The ESF outlines the policies, assessments and

procedures that will enable TNUIFSL to ensure that a subproject that it funds is developed in accordance with ESF and is adequately protected from associated risks. The ESF also aims to sensitise borrowers to assessment and management of environmental and social issues arising in urban infrastructure projects.

TNUDF has categorized the urban infrastructure projects depending on location and the nature of project activities in to different categories – E1, E2 and E3 linked to severity of impacts and regulatory requirements.

The proposed STP project comes under E1 category as per Table 1.3: Guidelines for Environmental Categorisation of Projects of Environmental and Social Framework developed by TNUIFSL. E-1 projects are those wherein TNUIFSL foresees major environmental impacts thus necessitating Environmental Assessment Reports (EAR).

1.5.7 Operational Policies / Directives of the World Bank

The following World Bank Operational Policies (OP) were found relevant with respect to the proposed project and are reviewed below:

- OP 4.01 – Environmental Assessment
- OP 4.04 – Natural Habitats
- Cultural Property – OPN 11.03 Requirements
- OP 4.36 – Forests

Operational Policy 4.01 (OP 4.01) is one of the ten safeguard policies of the World Bank, which provides the Environmental Assessment (EA) guidance for the lending operations. The OP 4.01 requires the borrower to screen projects upstream in the project cycle for potential impacts. Thereafter, an appropriate EA approach to assess, minimize / enhance and mitigate potentially adverse impacts is selected depending on nature and scale of project. The EA needs to be integrated in the project development process such that timely measures can be applied to address identified impacts. The policy requires consultation with affected groups and NGOs to mitigate community concerns and the need to address the same as part of EA.

TNUIFSL has adopted the principles of the above policy and has evolved a management framework to address the environmental issues in its lending operations.

Natural Habitats – OP/BP 4.04 – Operational Policy 4.04 sets out the World Bank’s policy on supporting and mitigate the precautionary approach to natural resource

management and ensuring opportunities for environmentally sustainable development. As per this policy, projects that involve significant conversion or degradation of critical natural habitats are not supported by the Bank.

Cultural Property – OPN 11.03 Requirements

The World Bank’s Operational Policy Note 11.03 aims at preserving and avoiding the elimination of structures having archaeological (prehistoric), paleontological, historical, religious and unique natural values. Projects that could significantly damage non-replicable cultural properties are declined for funding and the Bank will in turn assist protection and enhancement of cultural properties encountered in the project rather than leaving that protection to chance.

Forests – OP/BP 4.36

OP/BP 4.36 sets out specific policy on protection of forests through consideration of forest related impacts of all investment operations, ensuring restrictions for operations affecting critical forest conservation areas, and improving commercial forest practice through use of modern certification systems. The policy requires consultation with local people, the private sector and other stakeholders in forest area. In the context of TNUP operations, these issues are relevant for the projects that pass through or require diversion of forest land.

The EIA report has been prepared and presented as per requirements of the EIA Notification, 2006 of MoEF under the Environment (Protection) Act, 1986, and Operational Policy 4.01 of the World Bank

1.5.8 Permissions Required from Competent Authority

The permission pertaining to the project activities of the sewage treatment plant along with the status are discussed in this section.

S.No	Project Activity	Permission Required	Status
1.	Establishment of Sewage Treatment Plant	Consent for Establishment under Water (Prevention and Control of Pollution) Act, 1974.	Consent for Establishment has been obtained from TNPCB vide Consent Order No: DEE/ SLM/ Estt. 0094/ W/ 2011 dated 26.08.2011 for the proposed STP. The photocopy of the Consent for Establishment is enclosed as Annexure – 1.

S.No	Project Activity	Permission Required	Status
		Consent for Establishment under Air (Prevention and Control of Pollution) Act 1981	Consent for Establishment has been obtained from TNPCB vide Consent Order No: DEE/ SLM/ Estt. 0094/ A/ 2011 dated 26.08.2011 for the proposed STP. The photocopy of the Consent for Establishment is enclosed as Annexure – 1.
2.	Operation of Sewage Treatment Plant	Consent to Operate under Water (Prevention and Control of Pollution) Act, 1974.	Consent to Operate will be obtained from TNPCB before operation of the plant
		Consent to Operate under Air (Prevention and Control of Pollution) Act 1981	Consent to Operate will be obtained from TNPCB before operation of the plant

The responsibility of obtaining Consent for establishment and consent to operate for the proposed STP project vests with the project promoter. The project proponent, Salem City Municipal Corporation has obtained consent for establishment from TNPCB for the proposed STP project.

1.5.8 Consent Conditions & its Compliances

1.5.8.1 No Objection Certificate from TNPCB

As a prelude for getting consent for establishment, Tamil Nadu Pollution Control Board (TNPCB) has issued no objection certificate (NOC) for setting up STP at Vandipettai. The conditions stipulate and its compliance are discussed below.

S.No	Conditions as per NOC issued by TNPCB	Compliance Status
1.	The Corporation shall submit appropriate land use certificate from DTCP	The land use certificate will be submitted.
2.	The Corporation shall declare the land for a radius of 100 meters as no development activities in consultation with DTCP	It will be complied with.
3.	The Corporation shall develop green belt of 25 meters width all around the proposed STP	Green belt will be developed all around the proposed STP site
4.	The Corporation shall furnish full fledged sewage treatment plant proposal with design and drawing while applying for consent for establishment under the Water (P&CP) Act, 1974 as amended.	It will be complied with
5.	The Corporation shall provide STP	STP components of collection tank,

S.No	Conditions as per NOC issued by TNPCB	Compliance Status
	components of collection tank, aeration tank, clarifier & sludge drying beds along with any other components proposed by TWAD Board.	aeration tank, clarifier & sludge drying beds along with any other components proposed by TWAD Board will be provided.
6.	The Corporation shall obtain consent for establishment for the discharge of sewage effluent under section 25 of the Water (P&CP) Act, 1974 and for the installation of underground sewerage system along with the STP before establishment.	It will be complied with.
7.	No flooding of treated/ untreated effluent is permitted	It will be complied with.
8.	The Corporation shall commence the construction activity at the site only after obtaining consent for establishment from the Board under section 25 of the Water (P&CP) Act, 1974 as amended.	It will be complied with.
9.	The Corporation shall operate and maintain the sewage treatment plant to satisfy the standards prescribed by the Board before discharging to river Thirumanimutharu.	The sewage will be treated to satisfy the standards prescribed by the Board before discharging to river Thirumanimutharu.
10.	The Corporation shall construct compound wall around the periphery of the site at a height of 6 feet.	Compound wall will be constructed around the periphery of the site.

1.5.8.2 Consent for Establishment from TNPCB

Consent for Establishment for the proposed unit of 44 MLD STP at Salem Municipal Corporation has been obtained from TNPCB. The conditions stipulated by TNPCB and status of compliance are ariegate below.

Consent for Establishment – Water Act												
S.NO	SPECIAL CONDITIONS			COMPLIANCE STATEMENT								
1.	<p>The consent to establish is valid for the manufacture of products/ byproducts and the rate of production mentioned above. Any change in quality or quantity of the products has to be brought to the notice of the Board.</p> <table border="1"> <thead> <tr> <th>S.No</th> <th>Description</th> <th>Quantity/ Month</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Treatment of sewage</td> <td>44 MLD</td> </tr> </tbody> </table>			S.No	Description	Quantity/ Month	1.	Treatment of sewage	44 MLD	The STP will be designed for 44 MLD.		
S.No	Description	Quantity/ Month										
1.	Treatment of sewage	44 MLD										
2.	<p>This consent to establish is valid for establishing the facility with the below mentioned outlets for the discharge of sewage/trade effluent. Any change in the outlet has to be brought to the notice of the board and fresh consent has to be obtained if necessary.</p> <table border="1"> <thead> <tr> <th>Outlet no</th> <th>Description of outlet</th> <th>Max. daily discharge in KLD</th> <th>Point of disposal</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Sewage</td> <td>44000</td> <td>River Manimutharu</td> </tr> </tbody> </table>			Outlet no	Description of outlet	Max. daily discharge in KLD	Point of disposal	1.	Sewage	44000	River Manimutharu	The STP will be designed for 44 MLD and the treated effluent will be disposed to Thirumanimutharu river through pipes as per consent order.
Outlet no	Description of outlet	Max. daily discharge in KLD	Point of disposal									
1.	Sewage	44000	River Manimutharu									

3.	<p>The unit shall provide STP as indicated below. Nature of Effluent: sewage.</p> <table border="1" data-bbox="342 264 841 863"> <thead> <tr> <th>S. No</th> <th>Unit</th> <th>Quantity</th> <th>Size (m)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Septic tank</td> <td>1</td> <td>3x2x2</td> </tr> <tr> <td>2.</td> <td>Receiving Chamber</td> <td>1</td> <td>5.2 X 1.5 X 1.20</td> </tr> <tr> <td>3.</td> <td>Screen channel</td> <td>2+2</td> <td>6 X1.5 X 1.1</td> </tr> <tr> <td>4.</td> <td>Inlet Chamber</td> <td>1</td> <td>2.9 X 3.2 X 3.3</td> </tr> <tr> <td>5.</td> <td>Grit Chamber</td> <td>2</td> <td>10.2 dia X 0.7</td> </tr> <tr> <td>6.</td> <td>Fab Reactor</td> <td>4</td> <td>15 X 15 X 4.65</td> </tr> <tr> <td>7.</td> <td>Lamella clarifier</td> <td>8</td> <td>7.4 X 7.4 X 2.55 SWD</td> </tr> <tr> <td>8.</td> <td>Chlorine contact tank</td> <td>1</td> <td>26.2 X 10 X3.5</td> </tr> <tr> <td>9.</td> <td>Sludge sump</td> <td>1</td> <td>4.4 dia X3</td> </tr> <tr> <td>10.</td> <td>R.S Collection sump</td> <td>1</td> <td>14.80 dia X 2</td> </tr> </tbody> </table> <p>Trade effluent – Type of ETP – Not applicable</p>	S. No	Unit	Quantity	Size (m)	1.	Septic tank	1	3x2x2	2.	Receiving Chamber	1	5.2 X 1.5 X 1.20	3.	Screen channel	2+2	6 X1.5 X 1.1	4.	Inlet Chamber	1	2.9 X 3.2 X 3.3	5.	Grit Chamber	2	10.2 dia X 0.7	6.	Fab Reactor	4	15 X 15 X 4.65	7.	Lamella clarifier	8	7.4 X 7.4 X 2.55 SWD	8.	Chlorine contact tank	1	26.2 X 10 X3.5	9.	Sludge sump	1	4.4 dia X3	10.	R.S Collection sump	1	14.80 dia X 2	<p>The unit dimensions of STP submitted are from the approved final designs and implementation as per approval will be ensured.</p>
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4.	<u>Additional Conditions</u>																																													
1.	The Corporation shall provide septic tank for the sewage and shall connect the overflow to the receiving chamber of STP.	This will be carried out by the Corporation as indicated.																																												
2.	The Corporation shall install full fledged STP to satisfy the discharge standards prescribed by the Board before commissioning.	This will be complied with.																																												
3.	The Corporation shall have standby arrangement for all critical components like pumps, blowers, FAB reactor components etc to ensure continuous and smooth functioning of STP.	Standby arrangement for all critical components shall be provided.																																												
4.	The Corporation shall provide necessary safety measures like safety kit, chlorine gas leak detecting system with alarm, eye wash etc for handling chlorine gas cylinders.	Adequate safety measures like safety kit, chlorine gas leak detecting system with alarm, eye wash etc for handling chlorine gas cylinders will be provided.																																												
5.	25% of the land area acquired by the unit shall be utilized for green belt with trees planted at the rate of 400 trees /hect.	Green belt area will be allocated as per norms prescribed. Green belt will be developed area around the STP units and along the boundary of the site. The inter-spaces will be laid with shrubs																																												

6.	The Corporation shall provide Rain Water Harvesting Facilities wherever possible to increase the recharge of ground water.	Rain water harvesting system will be implemented as per approved plan.
7.	The STP operation shall not lead to any public complaint	This condition will be complied with.
8.	The unit shall install electro- magnetic flow meter with computerized recording system at inlet/outlet of STP.	This condition will be complied with.
9.	The operation of the STP shall not give rise to any objectionable odour.	The operation shall be carried out as per standard procedure and odour shall be avoided.
10.	Manual cleaning of effluent tanks must be avoided and mechanical means must be adopted. Accumulation of sludge in effluent tanks must be avoided.	Mechanical means must be adopted. Accumulation of sludge in effluent tanks must be avoided.
11.	The Corporation shall declare the radius of 100 m as no development activities in consultation with DTCP.	This condition will be complied with by the Corporation.
12.	The Corporation shall develop green belt of 25m width all around the proposed STP.	Green belt will be provided as per norms prescribed.
13.	No flooding of treated /untreated effluent is permitted in the STP.	It will be ensured that no flooding will take place as the O&M will be carried out effectively.
14.	The quality of treated sewage shall be got analysed regularly once in a month and report shall be furnished to TNPCB.	Periodical monitoring of treated sewage as prescribed parameters will be carried out.
15.	The Corporation shall provide necessary storm water drain in and around the STP site and ensure that there will not be any water logging.	This condition will be complied with by the Corporation.
16.	The Corporation shall provide uninterrupted power supply to the STP to operate continuously. The Corporation shall have standby power supply for operation of the STP.	This condition will be complied with by the Corporation.
17.	The sludge from the centrifuge is in undigested form. It should be properly handled and disposed off after stabilization. The STP sludge shall be used for green belt development.	The sludge will be utilized as manure for green area.

18.	The screening waste collected from fine screen and grit removal unit shall be properly collected and disposed.	It will be ensured that the collected waste will be disposed properly.
19.	The Corporation shall have baseline on ground water quality atleast in 6 locations around the STP site in consultation with the DEE, TNPCB, Salem and periodically monitor the ground water quality in the same locations once in six months. The complied data shall be furnished to the DEE once in a year.	Environmental monitoring will be carried out as per monitoring plan and at six locations for studying ground water quality.
20.	The Corporation shall provide compound wall on all sides of STP area.	This condition will be complied with by the Corporation.
21.	The Corporation shall comply with all conditions specified in the NOC.	This condition will be complied with by the Corporation.
GENERAL CONDITIONS		
1.	The above consent to establish cannot be construed as consent to operate and the unit shall not commence the operation without obtaining the consent to operate.	Operation will be commenced only after obtaining the consent to operate.
2.	The industry shall make a request for grant of consent to operate atleast thirty days before the commissioning of trial production.	This will be complied with.
3.	The unit shall construct compound wall around the boundary of the unit.	Compound wall will be constructed as per plan.
4.	Samples of water from the wells or any other nearby water sources have to be taken by the unit and get them analyzed by the Board Laboratory to develop baseline data to assess the existing water quality.	This will be complied with.
5.	The unit shall provide an alternate power source along with separate energy meter to ensure continuous operation of the STP	Continuous operation of STP will be ensured by provision of standby power supply.
6.	The consent does not authorize or approve the construction of any physical structures or facilities or the undertaking of any work in any natural watercourse.	This will be complied with.

7.	Any change in the details furnished in the conditions has to be brought to the notice of the Board, before obtaining consent to operate under the said Act.	Any changes in the conditions
8.	The unit has to comply with provisions of Public Liability Insurance Act 1991 to provide immediate relief in the event of any hazard to human beings, other living creatures/plants	This will be complied with.
9.	Consent to operate will not be issued unless the unit complies with all the conditions of consent to establish	The conditions given in the consent to establish will be complied with.
10.	In case there is any change in the management, the unit shall inform the change with relevant documents immediately.	This will be complied with.

Consent to Establishment – Air Act

S.NO	GENERAL CONDITIONS	COMPLIANCE STATEMENT								
1.	<p>The consent to establish is valid for the manufacture of products/ byproducts and the rate of production mentioned above. Any change in quality or quantity of the products has to be brought to the notice of the Board.</p> <table border="1"> <thead> <tr> <th>S.No</th> <th>Description</th> <th>Quantity/ Month</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Treatment of sewage</td> <td>44 MLD</td> </tr> </tbody> </table>	S.No	Description	Quantity/ Month	1.	Treatment of sewage	44 MLD	The STP will be designed for 44 MLD.		
S.No	Description	Quantity/ Month								
1.	Treatment of sewage	44 MLD								
2.	<p>This consent to establish is valid for establishing 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 has to be obtained if necessary.</p> <table border="1"> <thead> <tr> <th>S.No.</th> <th>Source of Emission</th> <th>APC Measures to be provided</th> <th>Point of Discharge – Stack Height (Meters)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Gen Set 1000 KVA</td> <td>Stack with acoustic measures</td> <td>5</td> </tr> </tbody> </table>	S.No.	Source of Emission	APC Measures to be provided	Point of Discharge – Stack Height (Meters)	1.	Gen Set 1000 KVA	Stack with acoustic measures	5	The details of chimney/ stack as mentioned in the consent and their height will remain unchanged
S.No.	Source of Emission	APC Measures to be provided	Point of Discharge – Stack Height (Meters)							
1.	Gen Set 1000 KVA	Stack with acoustic measures	5							

3.	The Corporation shall provide APC measures as proposed to DG set so as to achieve AAQ/ Emission standards prescribed by the Board.	APC measures such as 5m stack with acoustic measures for DG set will be provided.
4.	The Corporation shall provide necessary safety measures like safety kit, chlorine gas leak detecting system with alarm, eye wash etc for handling chlorine gas cylinders.	Adequate safety measures like safety kit, chlorine gas leak detecting system with alarm, eye wash etc for handling chlorine gas cylinders will be provided.
5.	25% of the land area acquired by the unit shall be utilized for green belt with trees planted at the rate of 400 trees/ hect.	Green belt area will be allocated as per norms prescribed.
6.	The Corporation shall provide rain water harvesting facilities wherever possible to increase the recharge of ground water.	Rain water harvesting system will be implemented as per approved plan.
7.	The STP operation shall not lead to any public complaint.	This condition will be complied with.
8.	The operation of Sewage Treatment Plant shall not give rise to any objectionable odour.	The operation shall be carried out as per standard procedure and odour will be avoided. Green belt will be developed around STP to control odour. Odour removal scrubber will be retro-fitted to the system. Spraying of water will be done on the odour creating units Monitoring will be done on ambient air quality around STP.
9.	The Corporation shall ensure that 100 meters around the Sewage Treatment Plant shall be declared as no-development zone and green belt shall be developed in this zone. A minimum of 25 m width of green belt must be developed with tall trees all around Sewage Treatment Plant site to attenuate odour nuisance. A thick green belt shall also be developed all side so as to arrest noise and odour nuisance to the residents.	This will be complied with.
10.	The above consent to establish cannot be construed as consent to operate and	Operation will be commenced only after obtaining the consent to operate.

	the unit shall not commence the operation without obtaining the Consent to operate.	
11.	The applicant shall make a request for grant of consent to operate at least thirty days before the commissioning of trial production.	This will be complied with.
12.	Any change in the details furnished in the conditions has to be brought to the notice of the Board and got approved by the Board, before obtaining consent to operate under the said Act.	This will be complied with.
13.	The unit has to comply with the provisions of Public Liability Insurance Act, 1991 to provide immediate relief in the event of any hazard to human beings, other living creatures / plants and properties while handling and storage of hazardous substances (wherever applicable)	This will be complied with.
14.	Consent to operate will not be issued unless the unit complies with the conditions of consent to establish.	The conditions given in the consent to establish will be complied with.
15.	The unit shall provide adequate for the control of dust emission during the loading and unloading of construction materials so as to minimize dust emission.	Dust will be controlled with water sprinklers
16.	The unit shall provide water sprinklers along the temporary roads inside the premises to avoid fugitive dust emission during the vehicles movements.	Dust will be controlled with water sprinklers
17.	The unit shall develop green belt of adequate width around the premises.	Green belt will be provides as per norms prescribed.
18.	In case there is any change in the management, the unit shall inform the change with relevant documents immediately.	This will be complied with.

CHAPTER 2 – PROJECT DESCRIPTION

2.1 Introduction

The proposed STP project of Salem City Municipal Corporation is to set up 44 MLD capacity sewage treatment plant (STP) at Vandipettai to treat the sewage generated in the zone –II of city which comprises of area of geographical extent of 383 sq.km. The cost of the project is Rs.30.8 crores.

Accordingly, tenders were floated and based on the lowest quote of tender bids, M/s. Geo Miller and Co. Private Limited has been awarded the contract.

The contract involves designing, providing, constructing, erection and commissioning, startup and performance trial run for 6 months followed by 5 years of O&M of 44 MLD capacity sewage treatment plant (STP) at Vandipettai based on FAB technology in Salem City Municipal Corporation on DBOT Basis. Time for completion has been decided as 90 months with 24 months duration for construction and commissioning; 6 months duration for performance trial run; and 60 months duration for subsequent Operation and Maintenance.

2.2 Features of the Proposed Project Site

The site for the proposed 44 MLD STP is located at S.F. No 45, Shevvet village, Salem Taluk, Salem District. The proposed site belongs to Salem Municipal Corporation and the land use of the area is commercial. The nearby establishments around the STP site are Lorry Market, Corporation Shopping Complex, Middle School, Oil Mills, Indoor Stadium. The proposed site is a barren land and there is neither vegetation nor habitation. The salient features of the proposed project is shown in Table 2.1. The figure showing the features surrounding the site upto 500 m is shown in Fig 2.1.

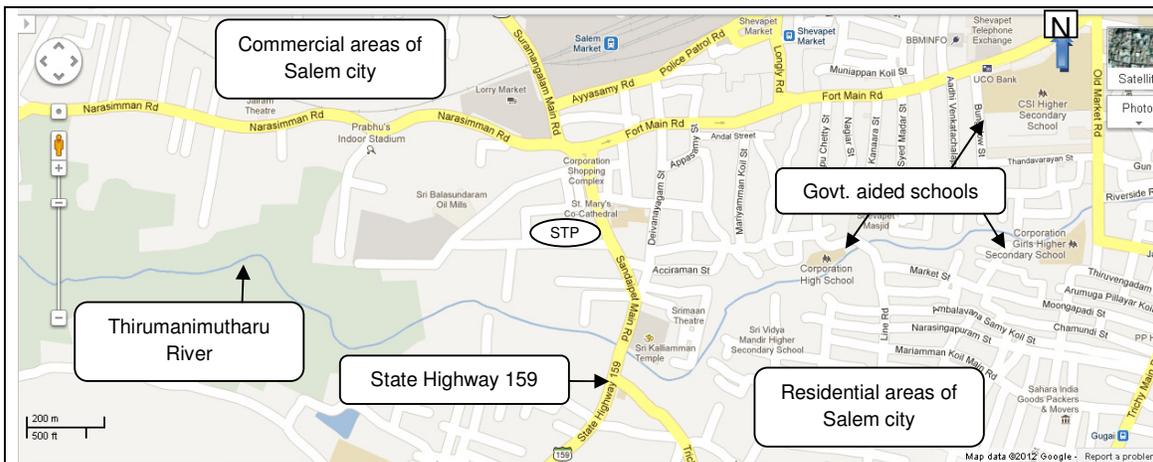
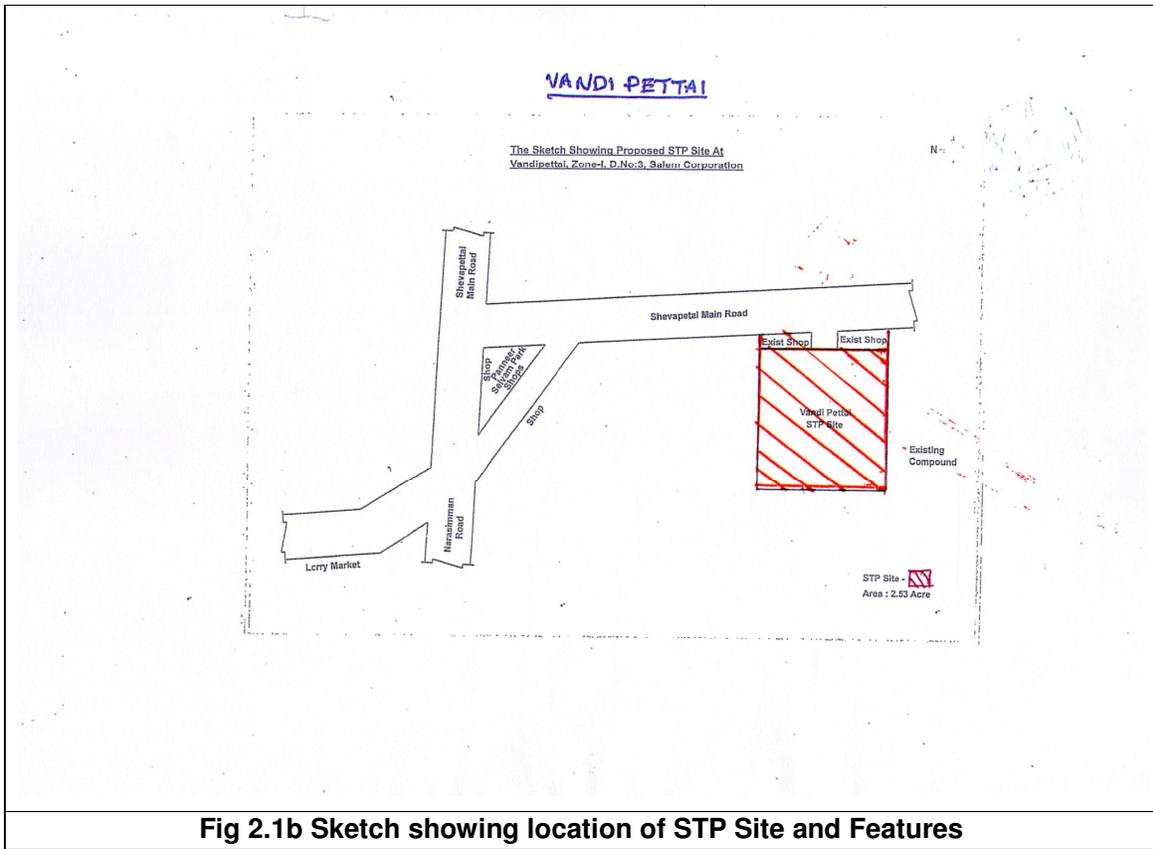


Fig 2.1a Location of STP Site and Features within 500m from the STP site



2.2.1 Land use

The site of the proposed STP falls under the land use category of commercial purpose in the existing and proposed condition. This is with reference to the Salem Corporation Master Plan, proposed land use 2011 issued by the Salem Local Planning authority under the Directorate of Town and Country Planning of Government of Tamil Nadu.

Table 2.1 Salient Features of the Project

S.No	Feature	Details
1	Name of the Project	Proposed 44 MLD based STP
2	Project location	Vandipettai Village, Salem Taluk in Salem District
3	Type of plant	Fluidized Aerobic Bioreactor based STP
4	Cost of the project	Rs.30.8 crores
5	Total Land area	7468 sq.m
6	Treated sewage disposal	The treated sewage will be discharged into Thirumanimuthar River.
7	Geographical co-ordinates	11°64'74"N 78°13'43"E
8	Nearest water body	Thirumanimuthar river runs at about 190 m west of site

2.3 Environmental Setting

The ecologically significant systems within the study area of the project site are listed and briefly discussed below:

3.□ Archaeological monuments

The location does not have significant archaeological monuments in nearby 10 km radius.

b) Biological resources

It was found that the location is devoid of any endangered flora and fauna within 10 km radius.

c) National Parks and Wildlife Sanctuary

There are no national parks or wildlife sanctuary in the study area.

d) Core Zone of Biosphere Reserve/ Habitat for Migratory Birds

There is no biosphere reserve/habitat for migratory birds in the study area.

e) Lakes / Reservoirs / Dams

In the study area there are no major lakes, reservoirs and dams.

f) Rivers / Streams

Thirumanimuthar River lies at a distance of 190 m from the site.

g) Sea / Estuary/ Mangroves

There is no sea/ estuary/ mangroves in the study area.

h) Cultural Monuments

This proposed unit does not have significant cultural monuments in nearby 10km radius.

3.□ Defence

There is no defence installation nearby the unit.

2.4 Need for the Proposed Project

As per Municipal Administration & Water Supply Department and Tamil Nadu Urban Development Project –III, the salient features of Salem Municipal Corporation relevant to the proposed project are discussed. The total area of Salem Corporation is 91.345 sq.km and the number of wards is 60. There are three number of sewerage zones in Salem Municipal Corporation. The proposed STPs are designed to meet the projected demands as given below.

S.no	Basis	Year	Total population
1	Census	2001	693236
2	Base year	2010	820000
3	Intermediate	2025	1052000
4	Ultimate	2040	1324000

As per proposal, the Length of sewers will be for 175 km in Zone –I; 68 km in Zone – II and 179 km in Zone – III. There would be three numbers Main pumping stations.

The proposed capacity and locations of STP will be 44 MLD at Vandipet; 35MLD at Manguttai; 13 MLD Vellakuttai Lake; and 6MLD at Anaimedu The sewerage collection and coverage areas proposed to be covered under the scheme under consideration are given below in Figure 2.2.

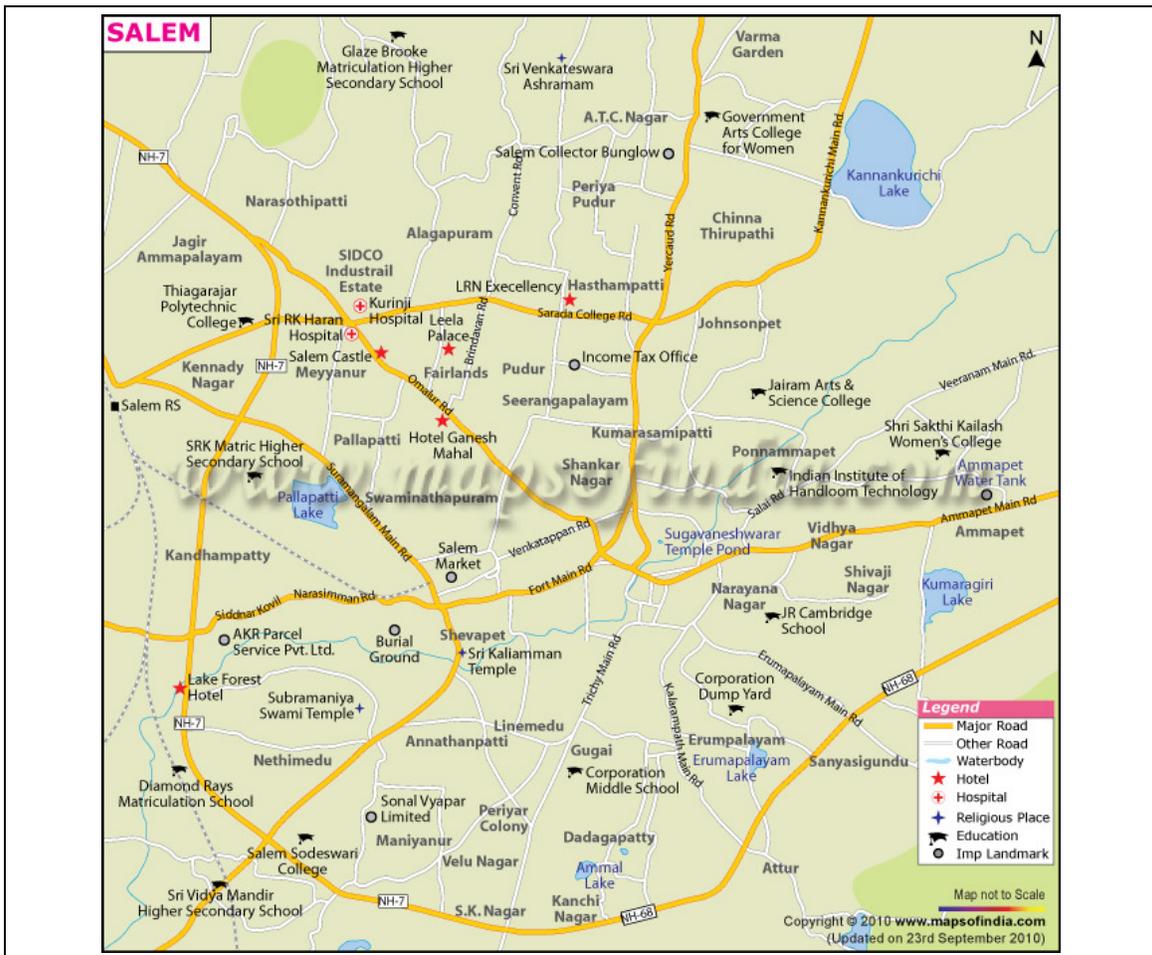


Fig 2.2 Showing Salem City Corporation Area

2.5 Site Selection for the Proposed Project

An assessment of the site of the proposed STP was conducted and the environmental features in the site and surrounding areas were noted. The site is a barren land and totally

devoid of plantation. Activities of site clearing such as tree cutting and removal of vegetation is not required. Since it lies alongside the state highway it presents an easily accessible approach.

There are two PAPs in the site as mentioned in Section 8.1, which may require resettlement or rehabilitation. As per the Chairman of the Grievance Redressal Committee of Salem Corporation, two PAPs were identified and identity cards and monetary compensation has been provided.

2.5.1 Site Layout

The layout for the proposed STP is shown in Fig 2.6. The layout has been in such a way that apart from the proposed 44 MLD STP units, there is sufficient space reserved considering future expansion activities.

2.5.2 Land Area

The breakup of the extent of land for the proposed project site is shown below.

Table 2.2 Details of land area

		Area (m ²)
1	Total area	8610
2	Built-up area	3300
3	Roads	1235
4	Utilities	6710
5	Green belt area	690
6	Vacant area (including future expansion)	1900

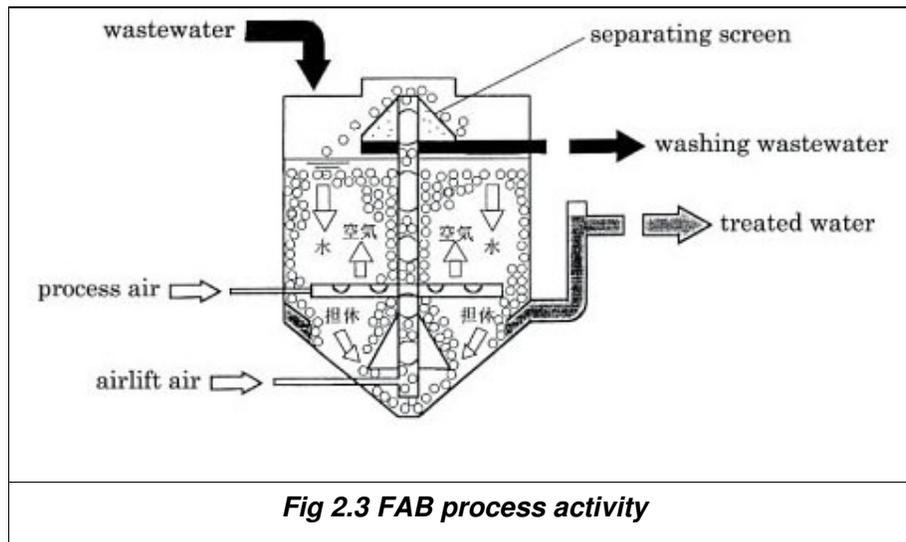
2.6 Sewage Treatment Method

Treatment technology based on FAB (Fluidized Aerobic Bioreactor) also known as MBBR (Moving Bed Bio Reactor) will be used for treatment of 44 MLD of sewage. Such sewage treatment plants of a medium or small scale require a simple equipment composition and easy maintenance. The FAB has largely simplified the washing mechanism by washing filtering media parallelly to the reactor processing. The wastewater is fed at the reactor top and flows downwards through the packed bed of filter media with a several-millimeter diameter. While passing through the packed bed, the sewage undergoes biological treatment by contacting the aeration air and Suspended Solids are removed.

Then the treated water is taken out from the side wall of the reactor. At the same time air is supplied to the bottom of the air lift pipe. By the air lifting through the

pipe, the filtering media together with the sludge is into the pipe and transported to the top area.

The filtering media with sludge is discharged by separating screen on the top are returned onto the packed bed, and the sludge is discharged as washing wastewater.



The advantages are that the facilities has simplified device requires only the air-compressor for the air-lift, and not the back-washing pump, blower, or tank that was needed for the fixed bed type reactor. Construction work is also simplified as the steel reactor is manufactured at the factory to facilitate the field work, and the construction term can be shortened.

2.7 Proposed Sewage Treatment Process

The treatment process is based FAB (Fluidized Aerobic Bioreactor) also known as MBBR (Moving Bed Bio Reactor).It has the following components. The flow chart indicating sewage treatment process is shown in Fig 2.5.

2.7.1 Sewage Pumping Station

The sewage is first received in the sewage pumping station through a 1400 dia RCC pipe at a level of 265.47. The sewage level in the pipe is considered to be 75% full at peak designed flow. The Sewage Pumping Station is provided with 2 nos of Coarse Screen, one mechanical working & one manual standby & each designed for 44 MLD avg flow. The detention time in the wet well is kept as 10 min for avg flow. The sewage is screened & received at the sump from where it is pumped through 2W + 1S Submersible pump to the

Inlet Chamber of the STP. The layout for the proposed construction of layout STP is given in Fig 2.6 and the hydraulic flow chart is given in Fig 2.7.

2.7.2 Inlet Chamber – STP

The Sewage is received at the Inlet chamber with detention time of 60 sec as per NIT. The detention time is enough to dampen the surge pumped flow & to attain an average approach velocity of 0.3 m/s before screen.

2.7.3 Screen Chamber

The sewage enters the screen chamber with 2 nos of Fine Screen, one mechanical working & one manual standby & each designed for 44 MLD avg flow. The design basis for screens is as follows

- Approach Velocity at avg flow - 0.3 m/s
- Velocity through screen at avg flow - 0.6 m/s
- Velocity through screen at peak flow - 1.2 m/s

2.7.4 Grit Chamber

The sewage after screening & being removed from all the coarse & fine suspended debris enters the grit chamber. The chamber removes the grit from the sewage based on Stokes law principal separating grit of Specific gravity > 2.65. The design overflow rate achieved is $960 \text{ m}^3/\text{m}^2/\text{d}$ with a detention time provided more than 60 seconds.

2.7.5 Biological Treatment

The sewage enters the biological unit named FAB or Fluidized Aerobic Bioreactor. Fluidized Bioreactor is defined as, a reactor having bed of small media freely suspended in upward flow of liquid combined with air flow. These are contributed by more complete removal of compounds, tolerance of harsh condition, resistance to upsets, reduce sludge production (lower sludge handling cost), reduced reactor size (lower capital cost).

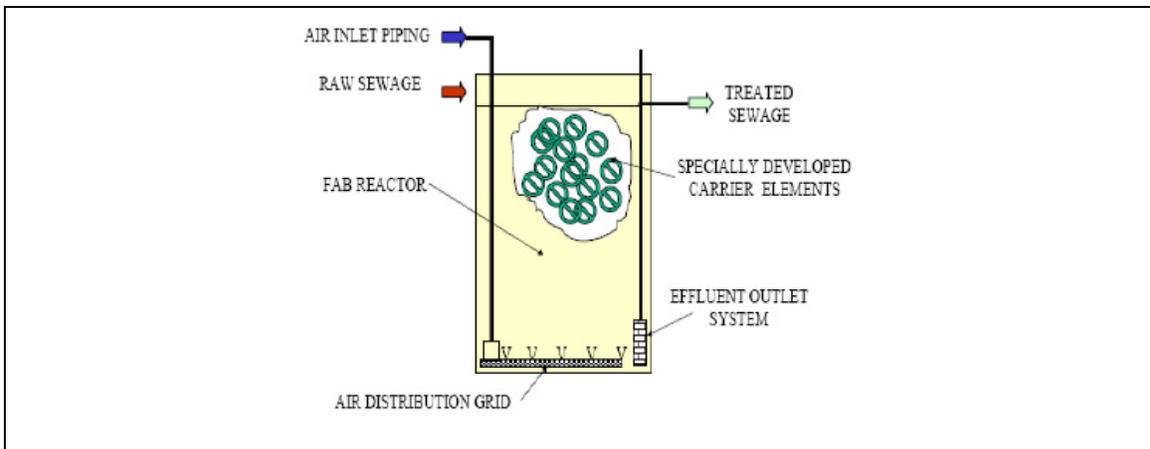


Fig 2.4 Schematic diagram of FAB process

The FAB works on the principles that media supports the biomass and media is in suspension of specific gravity lesser than water. The media fluidization is by virtue of hydraulic currents set by aeration and the media has high specific surface area, typically 300/400/500 m²/m³.

The unit achieves an overall BOD removal of more than 90% & brings down the discharge BOD level to <20 mg/l. The sewage generated from the city will be having the following characteristics

Table 2.2 Characteristics of Raw Sewage

S.No	Parameters	Unit	Design Value
1	pH	#	6.2
2	TSS	mg/l	220
3	BOD ₅ at 20° C	mg/l	236
4	COD	mg/l	452
5	Oil & Grease	mg/l	<1
6	Total Kjeldhal Nitrogen (TKN)	mg/l	61
7	Ammonia Nitrogen (as N)	mg/l	50
8	Total Phosphorus (as PO ₄)	mg/l	5
9	Sulphate	mg/l	54
10	Chlorides	mg/l	200

The treated sewage with the following characteristics is proposed to be let into the existing drain.

Table 2.3 Characteristics of Treated Sewage

S.No	Parameters	Unit	Design Value
1	pH	#	5.5 -9
2	TSS	mg/l	<30
3	BOD ₅ at 20° C	mg/l	<20
4	COD	mg/l	<250
5	Oil & Grease	mg/l	<=5
6	Ammonia Nitrogen (as N)	mg/l	<=50
7	Nitrate Nitrogen (as NO ₃)	mg/l	<=10
8	Total Phosphorus (as PO ₄)	mg/l	<=5

It may be seen that the projected treated sewage quality is easily attainable.

2.7.6 Lamella Clarifier

The flow from the FAB enters the settling tank with huge MLSS. The suspended solids require to be separated out from the system in order to achieve a clear supernatant. The

system proposed for the settling is a Lamella Clarifier, which requires a low foot print thus saving on the land & construction cost.

2.7.7 Chlorine Contact Tank

The clarified water coming out of the Lamella Clarifier is disinfected in this tank reducing the coliforms to acceptable standards prior to discharge into the channel. The chlorine is dosed through vacuum chlorination system and given 30 min detention time at average flow with baffling chambers for effective kill time of coliforms.

The chlorination will be carried out with chlorine gas to reduce coliforms. It will be dosed into chlorine contact tank with the help of a booster pump. Booster pump will take the suction of treated water from CCT & chlorine from discharge of chlorine tonner & inject the same.

2.7.8 Sludge Handling System

The sludge generated from the Lamella Clarifier is taken out to the sludge pump from where it is pumped to centrifuge through 2 nos. of screw pumps. The sludge generated from the system has the following characteristics:-

Table 2.4 Details of Sludge Generated

S.No	Particulars	Quantity
1	Solids generated in the system	3115.2 kg/d
2	Consistency	3.0%
3	Sludge quantity	103.84 m3/d

2.7.9 Grit and screen disposal

The disposal of grit from the grit chamber and bar screen removed by screw conveyor. Grits are collected and taken out in a trolley.

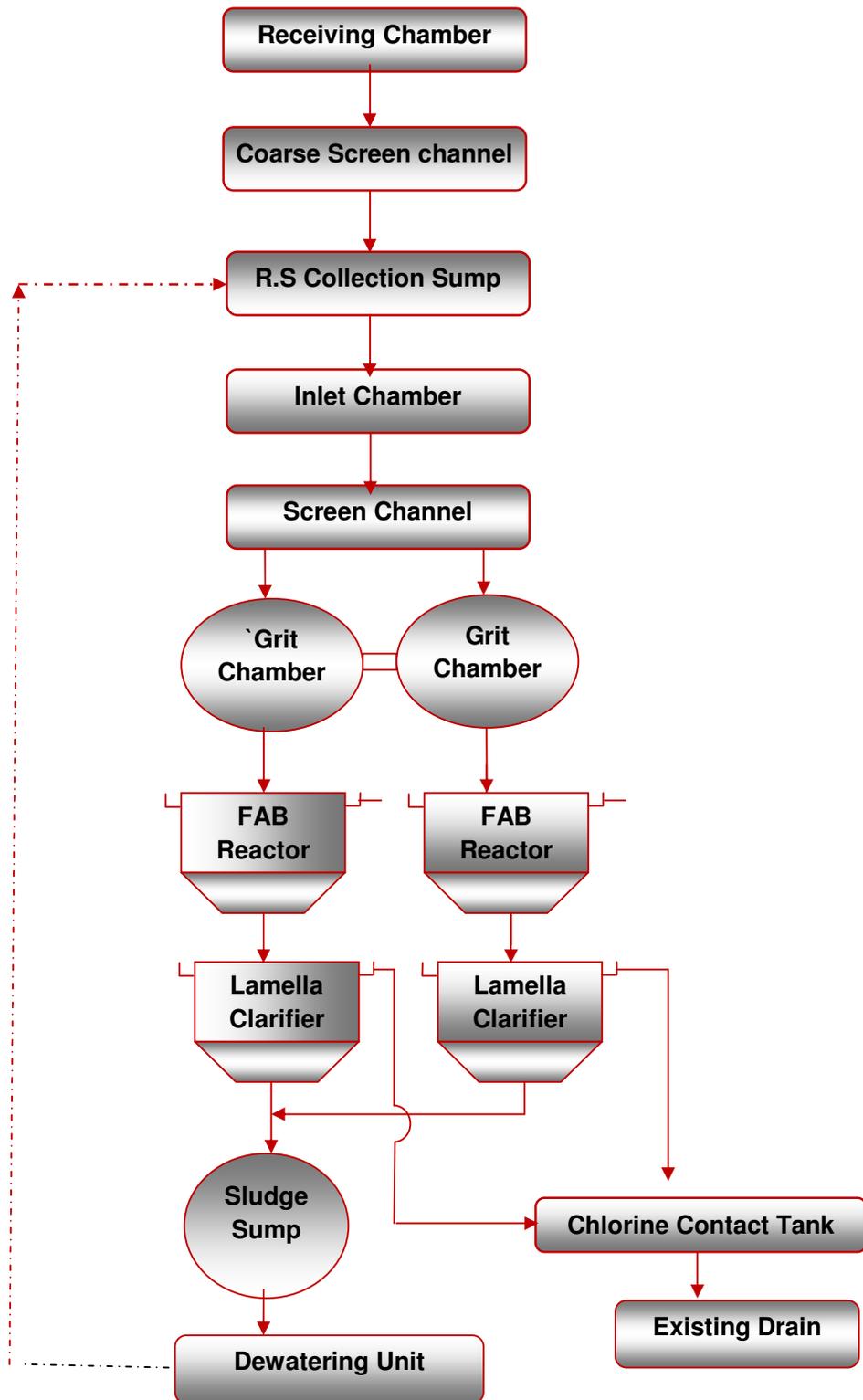


Fig 2.5 Flow Chart Indicating the STP Process

The size of the units in the proposed STP is shown in Table 2.5.

Table 2.5 Size of STP Units

S.No	Unit	Size (m)	Quantity
11.	R.S Receiving Chamber	5.2m X 1.5m X 1.20m	1
12.	Screen channel	6m X1.5m X 1.1m	2
13.	R.S Collection sump	14.80m dia X 2m	1
14.	MCC Room	-	1
15.	Inlet Chamber	2.9m X 3.2m X 3.3m	1
16.	Screen channel	6m X 1.5m X 1.1m	2
17.	Grit Chamber	10.2m dia X 0.7m	2
18.	Fab Reactor	15m X 15m X 4.65m	4
19.	Lamella clarifier	7.4m X 7.4m X 2.55 SWD	8
20.	Chlorine contact tank	26.2m X 10m X3.5m	1
21.	Sludge sump	4.4m dia X3m	1
22.	Blower room	20m X 7m X 4.5m	1
23.	Dewatering building (GF/FF)	10m X 7m (overall)	1
24.	Chlorinator room	6.75m X 8m X 4m total HT	1
25.	Chlorine tonner room	12.5m X 8m	1
26.	Space for transformer	5m X 4m	1
27.	Space for DG set	5m X 6m	1
28.	HT Panel/metering room	5m X 5m	1
29.	Main control panel room	12m X 5m	1
30.	Administrative building (GF/FF)	Carpet area=60m ²	1

2.8 Treated Sewage Disposal

The quality of the treated sewage will be within the limits as prescribed by CPCB. The treated sewage will be discharged into the Thirumanimutharu River as shown in Fig 2.8. The disposal of Clarified Water is taken through RCC pipe & the outfall point is kept above HFL. The sludge generated from the STP will be collected and will be utilized as manure. Consent for Establishment has been obtained from TNPCB vide Consent Order No: DEE/ SLM/ Estt. 0094/ W/ 2011 dated 26.08.2011 for the proposed STP. The compliance reporting for the conditions stipulated by TNPCB has been included. Since the effluent has to be discharged into Thirumanimuthar river after treatment, necessary permission is being sought for from the Public Works Department.

2.9 Safety Measures

Safety and emergency measures with regular maintenance activity for various units of STP will be carried out in accordance with the Safety Manual.

The Contractor shall take all required precautions to prevent danger from electrical equipment and ensure that

i) No material shall be stacked or placed as to cause danger or inconvenience to any person or the public.

ii) All necessary fencing and lights will be provided to protect the public in construction zones.

All machines to be used in the construction will conform to the relevant Indian Standards (IS) codes, will be free from patent defect, will be kept in good working order, will be regularly inspected and properly maintained as per IS provision and to the satisfaction of the Engineer.

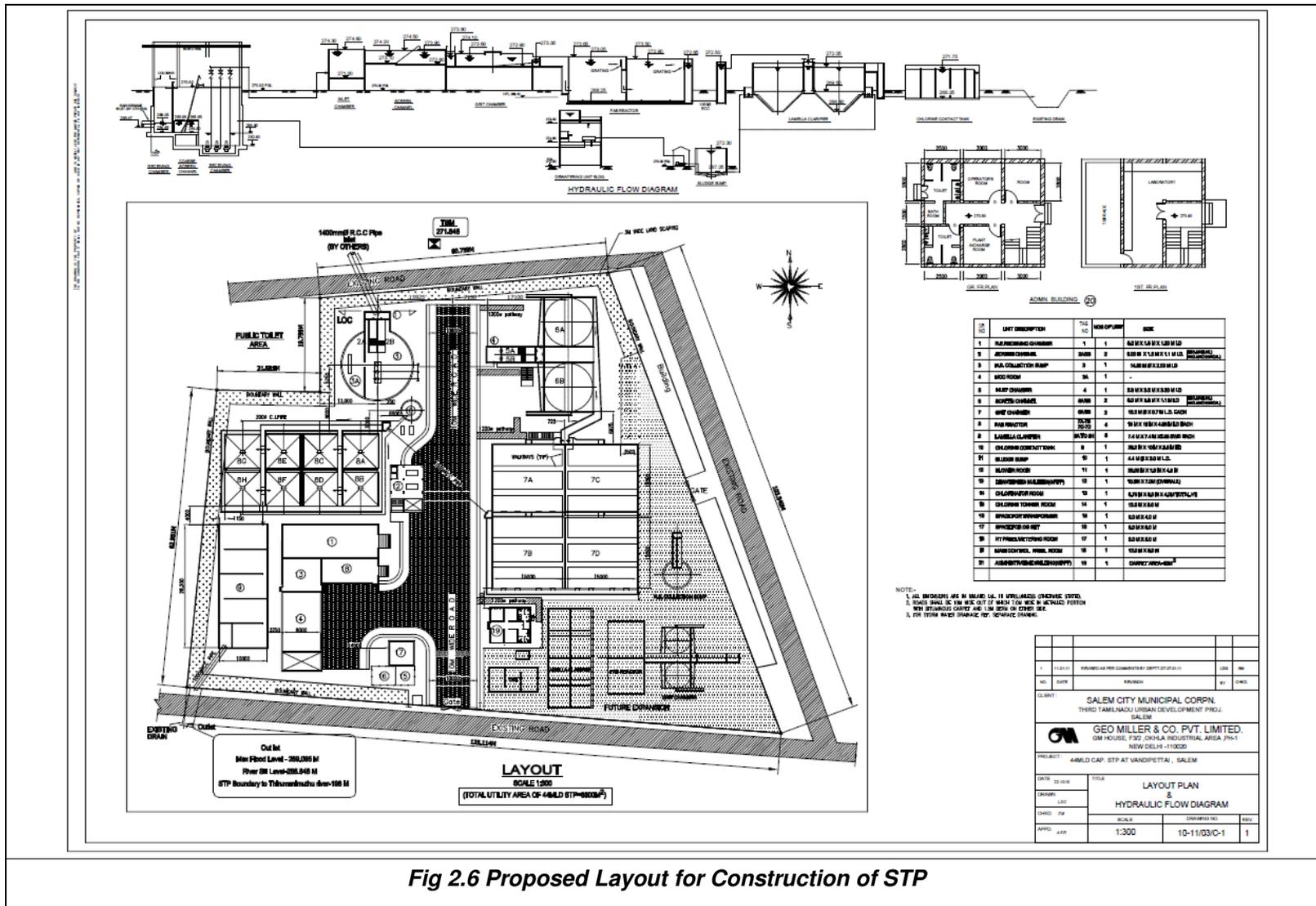


Fig 2.6 Proposed Layout for Construction of STP

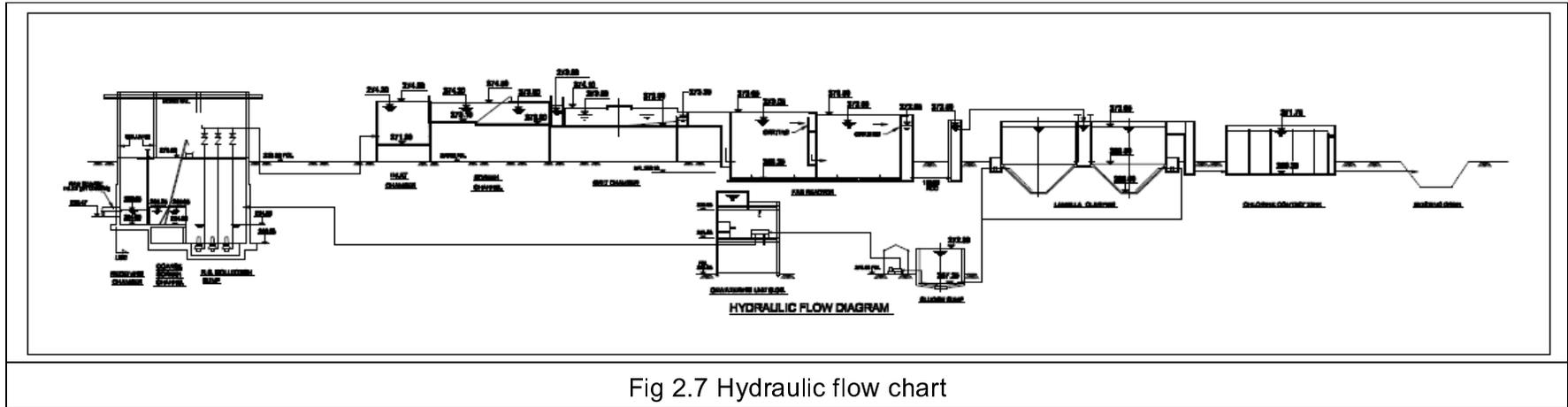


Fig 2.7 Hydraulic flow chart

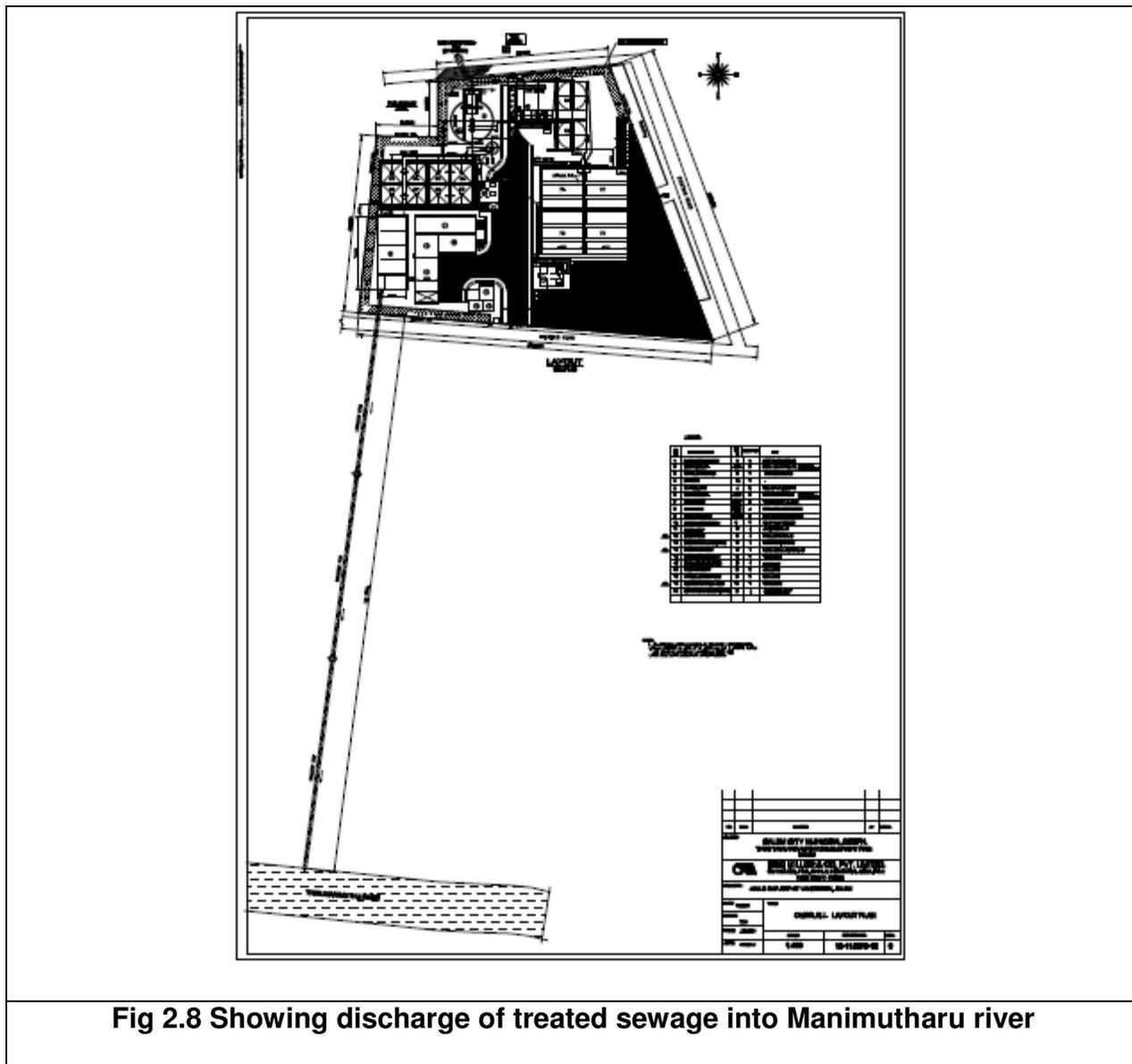


Fig 2.8 Showing discharge of treated sewage into Manimutharu river

CHAPTER 3 – ENVIRONMENT SETTING

3.1 Baseline Study

This chapter deals with the existing environmental settings in and around the project site. The baseline details recorded would form the basis for the potential impacts due to the proposed STP project. A description of the existing environmental condition of the proposed project with reference to prominent environmental attributes is discussed in this chapter.

The proposed STP project is studied with reference to the environmental sensitive components as defined in the Environmental and Social Framework of TNUDF.

3.2 Meteorology

Salem experiences a tropical wet and dry climate. The weather is hot and humid for most of the year. The hottest part of the year is May to June, with maximum temperatures around 36 –38 °C. The coolest part of the year is January, with minimum temperatures around 18 – 20 °C. The average annual rainfall is about 35 cm. The district receives the rain under the influence of both southwest and northeast monsoons. The northeast monsoon chiefly contributes to the rainfall in the district. The Rainfall data for Salem district for previous five years has been given below.

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
2006	4.3	0	37	30.3	86.2	46.5	30	102.1	192.7	191.5	142.3	13.6
2007	0.1	0.5	0	59.8	28.8	30.3	111.2	205.3	138.3	171.9	46.6	157.1
2008	4.6	10.4	99.4	35.5	132.2	53.1	95.8	262.6	72.5	163.2	197	13.2
2009	2.3	0	16.9	42.4	130.4	64.7	63.2	165.5	167.9	56.1	142.8	44.7
2010	0.6	0	2.8	21.9	129.2	124.5	111.9	202.8	106.6	165	328.7	7.5

3.3 Topography

Salem district forms part of the upland plateau region of Tamil Nadu with many hill ranges, hillocks and undulating terrain with a gentle slope towards east.

3.4 Geology

Major part of Salem district is covered by Red insitu and Red Colluvial soils. Block soils are mostly seen in Salem, Attur, Omallur and Sankari Taluks. Brown Soil occupies major portion of

Yercaud and parts of Salem and Omallur Taluks and the Alluvial Soil is seen along the river courses in Omallur and Sankari Taluks. Mixed soil is occurring only in Attur Taluk.

3.5 Seismic Zone

The Salem City Municipal Corporation lies in seismic zone III which covers the proposed project site too.

3.6 Air Environment

Ambient air quality of the project area was measured by setting up Ambient Air Quality Monitoring (AAQM) stations at seven locations. Pre calibrated Respirable Dust Samplers (RDS) were used for monitoring of Particulate Matter (PM 2.5 & PM 10) and gaseous pollutants like SO₂ and Nox. Seven locations for ambient air quality were identified so as to represent the ambient air quality in an area of 10 km radius as the impact due to air emission is not envisaged due to the proposed STP project. Moreover three locations for AAQ were identified within a radius of within 3 km. The locations for ambient air quality monitoring is shown in Fig 3.1.

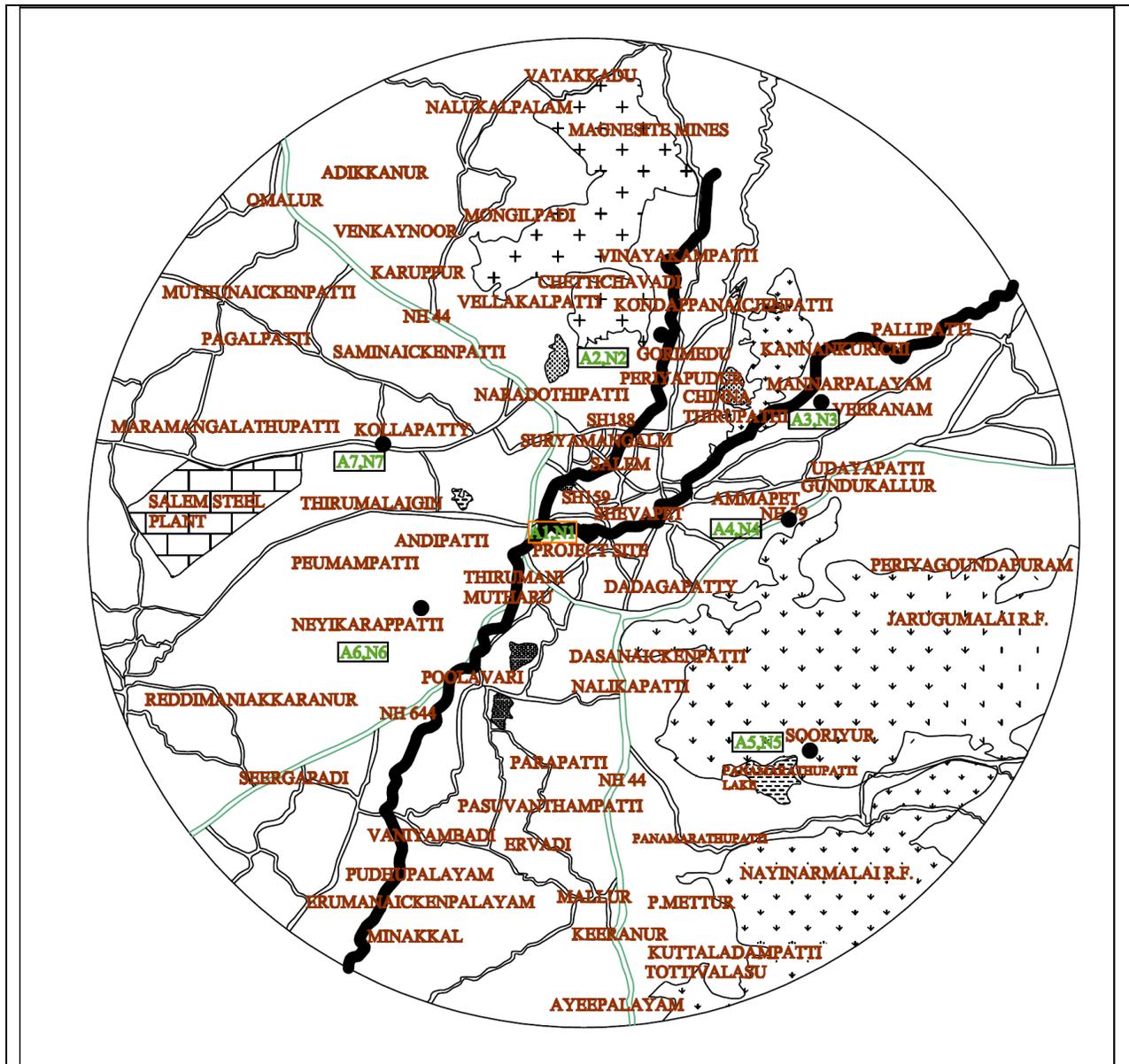


Fig 3.1 Showing Air and Noise Monitoring Locations

Table 3.1 Ambient Air Quality Monitoring Stations (Distance & Bearing Directions)

S.No	Location Name & Code	Distance in Km	Direction
1	Near Project Site (A1)	0.4	N
2	Gorimedu (A2)	2	NNE
3	Veeranam (A3)	3	ENE
4	Ammamet (A4)	4	E
5	Sooriyur (A5)	4.5	SE
6	Neyikkaranpatti (A6)	8	SW
7	Kollapatti (A7)	6	WNW

Table 3.2 Air Quality at Baseline Stations

Parameter	A1	A2	A3	A4	A5	A6	A7	CPCB LIMIT
PM 2.5 ($\mu\text{g}/\text{m}^3$)	49.8	51.5	48.5	48.9	50.1	47.6	48.1	60
PM 10 ($\mu\text{g}/\text{m}^3$)	90.5	92.3	88.4	89.3	89.0	86.2	87.5	100
SO ₂ ($\mu\text{g}/\text{m}^3$)	18.9	18.2	17.4	17.8	17.1	16.4	17.9	80
Nox ($\mu\text{g}/\text{m}^3$)	19.8	19.1	18.5	18.8	18.3	17.6	18.1	80
CO (mg/m^3)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	2

A1 – Near Project Site A2 – Gorimedu A3 – Veeranam A4 – Ammapet A5 – Sooriyur A6 – Neyikkaranpatti A7 – Kollapatti

The results of ambient air quality monitoring are presented in Table 3.2 along with the CPCB National Ambient Air Quality (NAAQ) Standards. The results show that all the ambient air quality parameters are well within the NAAQ Standards at all the locations. The project site lies in the residential area where such as Shevapet, Annathanapatti, etc are located. In spite of the location within residential belt, it is noted from the AAQ results, that the present air quality at all points of observation is well within the prescribed standards.

3.7 Noise Levels

Noise is considered to be one of the aspects of pollution, which also leads to the degradation of the social environment and also poses health and communication problems. The impact of noise sources on surrounding community depends on characteristics of noise the time of day at which noise occurs, the location of the noise source and the loudness and duration of exposure.

The assessment of noise is carried out by considering various factors like damage to hearing ability, physiological disturbance, annoyance and general community responses.

It is possible to describe important features of noise for noise levels measured over 24 hours using statistical methods. These features of noise are the parameters used for describing the noise levels at a particular location. Standards for permissible noise levels at various zones are set based on these parameters. The calculated noise levels for seven locations in the study area are presented in Table 3.3. The values are compared with the standards prescribed by CPCB for various zones.

Noise levels were monitored at seven locations within and outside the project premises. Noise readings were taken for day time as well as at night time. Portable sound level meter was used for recording noise levels.

The day time noise levels are in the range of 54.5 dB (A) to 57.2 dB (A) and night time noise levels are in the range of 50.5 dB (A) to 52.8 dB (A). The noise levels measured during the study period were found to be within the limits prescribed by CPCB.

Table 3.3 Noise Quality at Baseline Stations

Parameter	N1	N2	N3	N4	N5	N6	N7
Day time	54.9	56.5	55.8	55.1	54.5	56.2	57.2
Night time	50.5	51.6	51.1	51.4	51.9	52.3	52.8

N1 – Near Project Site N2 – Gorimedu N3 – Veeranam N4 – Ammapet N5 – Sooriyur N6 – Neyikkaranpatti N7 – Kollapatti

Table 3.3 Ambient Air Quality Standards in respect of Noise

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

3.8 Water Environment

The major surface water body in the study area is Thirumanimutharu River which is the tributary of Cauvery River and originates in the Shevroy hills. Presently, as there is no underground sewerage scheme in the town and the sewage let out from the households are let out in the open drains which lead to Thirumanimuthar channel, which flows across the town, and low lying areas in the extension areas of the town.

The baseline status of ground water quality in the project area has been established through the sampling and analysis of various water quality parameters as part of the environmental monitoring. Ground water samples were collected from seven locations in the project area. The samples were collected and analyzed as per the procedures specified in IS: 3025. The objective of the baseline ground water quality study was to establish the ground water quality of the study area. It is also used to evaluate the anticipated impact of the proposed project on the ground water quality and to suggest appropriate mitigation measures for implementation. This will also be useful for assessing the conformity to the standards of ground water quality during the construction and operation phase of the project.

A total of 7 ground water samples (W1 – W7) were collected and analyzed as per standard methods. The water quality monitoring stations are shown in Table 3.4. The locations for water quality monitoring is shown in Fig 3.2.

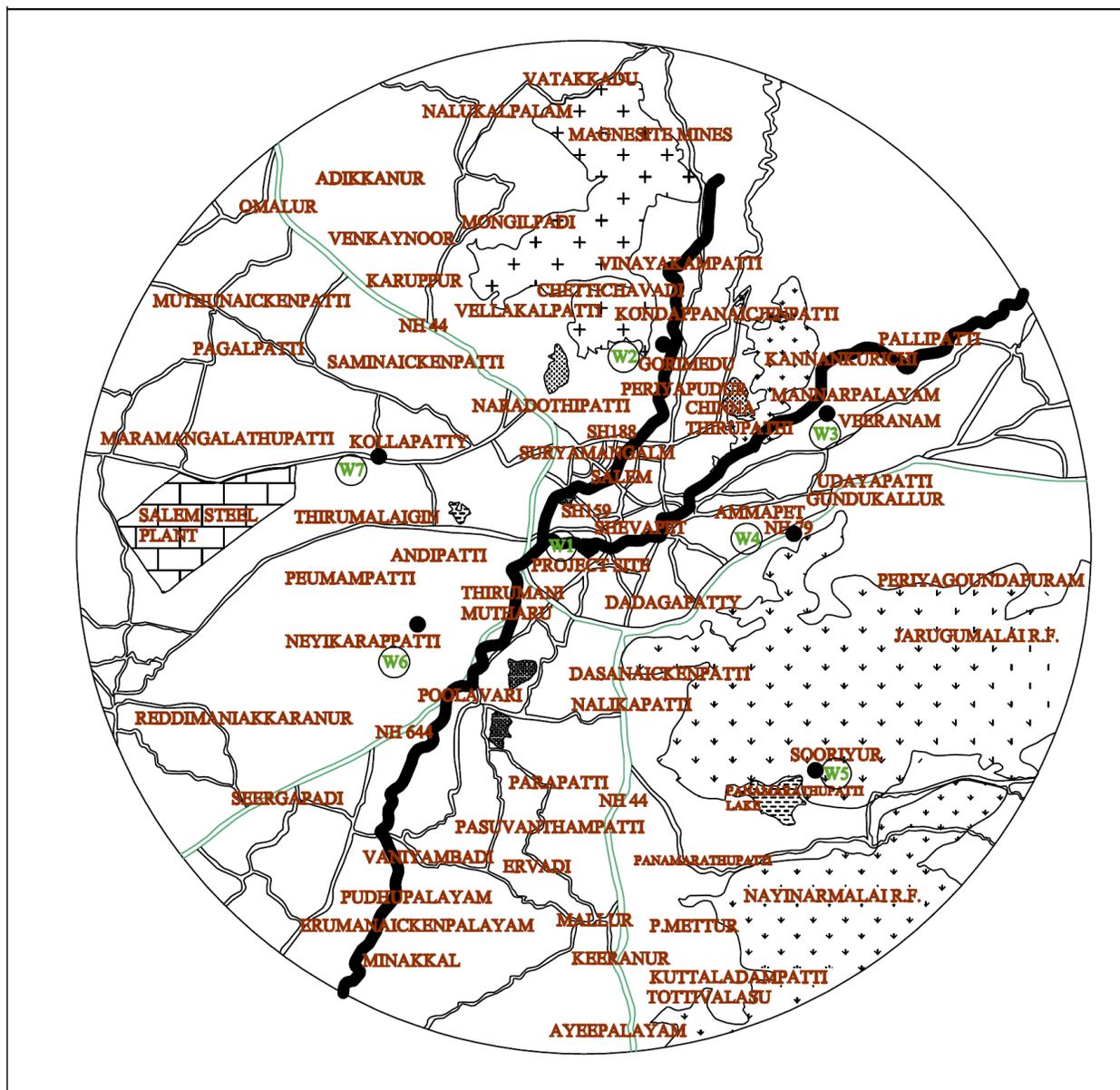


Fig 3.2 Showing Water Monitoring Locations

Table 3.4 Water Quality Monitoring Stations

S.No.	Location Name	Location Code
1	Borewell, Near Project site	W1
2	Borewell, Gorimedu	W2
3	Borewell, Veernam	W3
4	Openwell, Ammapet	W4
5	Borewell, Sooriyur	W5
6	Borewell, Neyikkaranpatti	W6
7	Borewell, Kollapatti	W7

Table 3.5 Ground Water Analysis Results

Parameter	W1	W2	W3	W4	W5	W6	W7
pH	7.6	7.7	7.6	7.4	7.6	7.4	7.5
Colour (Hazen)	5	10	10	10	10	5	5
Odour	Unobjectionable						
Turbidity (NTU)	1	0.5	0.6	0.5	1	0.6	0.5
Total Alkalinity (as CaCO ₃)	225	235	125	225	211	109	119
Total Hardness (as CaCO ₃)	320	315	134	275	285	112	98
Calcium as Ca	82.3	80.5	45	79.3	74.9	32	24
Magnesium as Mg	25	18	10	18	20	8	6
Total Iron (as Fe)	1.2	0.8	0.7	0.5	0.9	0.8	0.9
Chlorides (as Cl)	329	268	135	280	301	124	96
Sulphates (as SO ₄)	115	82	69	82	104	60	44
Fluorides (as F)	0.1	0.1	0.2	0.2	0.1	0.2	0.2
Nitrate as NO ₃	20	6	8	9	15	4.2	2.9
Total Dissolved Solids	985	767	510	798	874	428	348
Potassium as K	42	9	13	9	42	11	6

W1 – Near Project Site W2 – Gorimedu W3 – Veeranam W4 – Ammapet W5 – Sooriyur W6 – Neyikkaranpatti W7 – Kollapatti

At all locations, pH values were in the range of 7.4 to 7.7 with agreeable colour, taste and odour. Chloride and Sulphate values were in the range of 96 to 329 mg/l and 44 to 115 mg/l respectively. Hardness values were found to be in the range of 98 to 320 mg/l. Fluoride values were found upto 0.2 mg/l. Iron value was found to be a maximum of 1.2 mg/l. While comparing with IS: 10500 – 1991 norms, the water quality is found to be within the prescribed standards.

3.9 Soil Environment

In order to assess the baseline status of soil quality of the project site and neighborhood, seven sampling locations were selected. At each location, samples were collected using augers and analyzed for nutrient and engineering parameters. The locations for soil quality monitoring is shown in Fig 3.3. The soil quality status is given in Table No. 3.6.

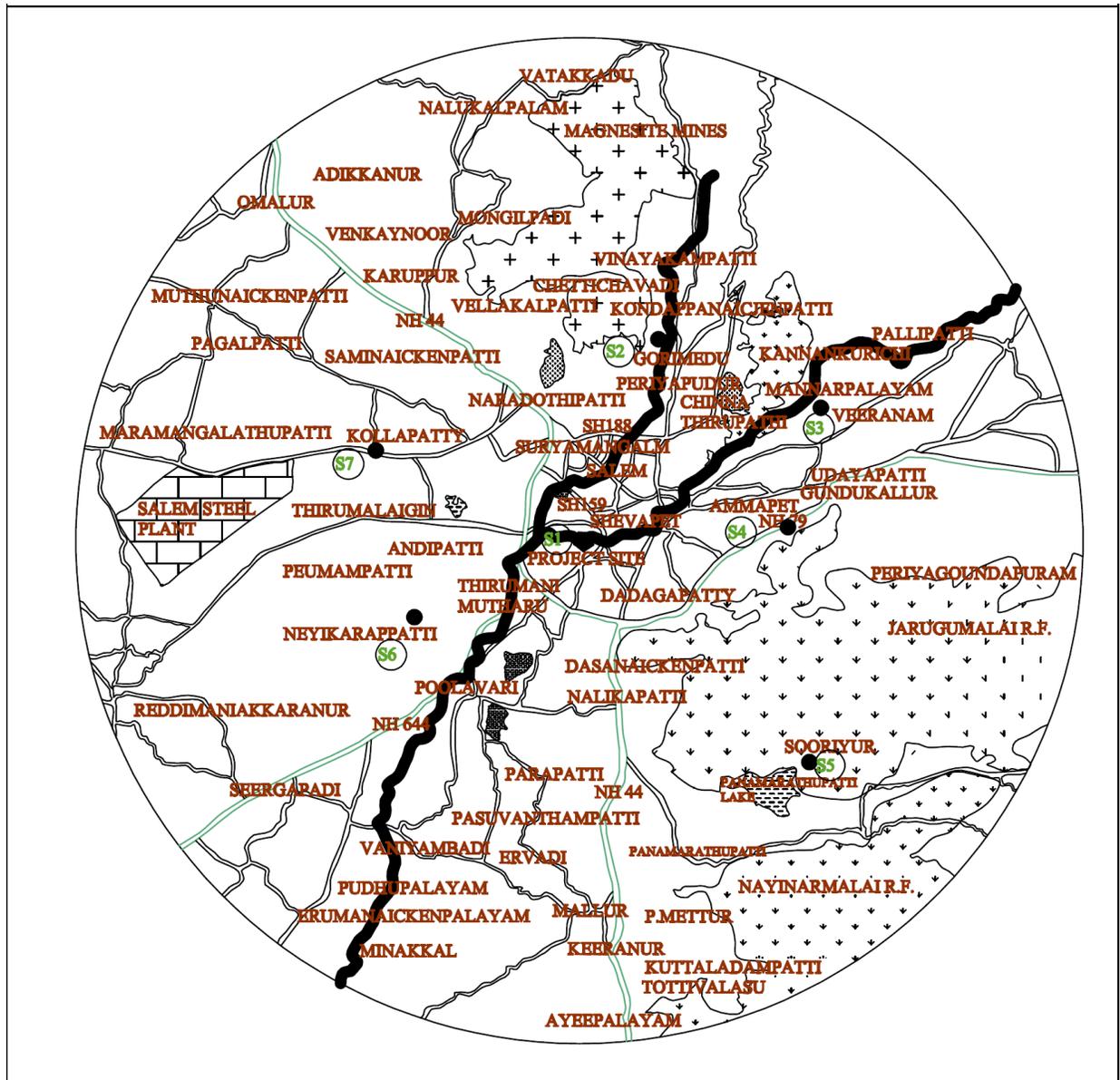


Fig 3.3 Showing Soil Monitoring Locations

Table 3.6 Soil Quality Status

Parameters	S1	S2	S3	S4	S5	S6	S7
Chemical Analysis							
pH	7.7	7.5	7.6	7.7	7.6	7.5	7.6
Electrical Conductivity (Micromhos/Cm)	95.1	64.2	102	88	90.5	75.5	97
Nitrogen (%)	0.029	0.028	0.031	0.036	0.032	0.035	0.030
Potassium (%)	0.0020	0.0025	0.0029	0.005	0.0024	0.0031	0.0033
Phosphorus (%)	0.004	0.0058	0.0043	0.0035	0.005	0.0031	0.0045
Natural moisture content (%)	1.6	1.2	0.9	0.5	1.9	1.2	13
Grain Size Distribution							
Gravel (%)	0.25	0.18	0.16	0.19	0.27	0.2	0.38
Coarse (%)	88.4	89.4	85.5	87	87.8	88.8	84.9
Medium (%)	0.03	0.04	1.6	1.16	0.15	0.08	1.5
Fine (%)	0.15	0.37	0.42	0.36	0.16	0.47	0.52
Silt (%)	0.2	0.28	0.86	0.72	0.32	0.72	0.92
Clay (%)	10.97	9.73	11.46	10.57	11.3	9.73	11.78
Textural class	Loamy Sand	Sandy	Loamy Sand	Loamy Sand	Loamy Sand	Sandy	Loamy Sand

S1 – Near Project Site S2 – Gorimedu S3 – Veeranam S4 – Ammapet S5 – Sooriyur S6 – Neyikkaranpatti S7 – Kollapatti

At all locations, pH ranges from 7.5 to 7.7. Nitrogen, Potassium and Phosphorus are found to be in the range of 0.028 to 0.036%, 0.002 to 0.005 % and 0.0031 to 0.0058 % respectively. Texture Class was found to be loamy sand to sandy.

3.10 Biological Environment

The flora and fauna identified in the study area are commonly found and not specific to the region due to the absence of forest in the study area. Moreover, there are no National Parks, Wild life sanctuaries, Bird sanctuaries within 10 Km. radius of the project site. There is no rare and endangered species in the area. The prominent tree species include coconut, mango, neem, tamarind, eucalyptus etc. The prominent species among the fauna include cats, cows, buffaloes etc.

Flora

<i>Acacia auriculiformis</i> – Golden shower (Pencil)	<i>Cocos nucifera</i> L. (Tennaiaram)
<i>Acanthus ilicifolius</i> L. (Kaludai Mulli.	<i>Cordial sebestena</i>
<i>Achras sapoa</i>	<i>Delonix regia</i> . (Gulmohar)
<i>Albizia lebbek</i> (Vakai)	<i>Emblica officinalis</i> (Indian gooseberry)
<i>Anacardium occidentala</i>	<i>Eucalyptus lanceolatus</i>
<i>Annona squamosa</i> (Seethapal)	<i>F. Religiosu</i> (Arasa Maram)
<i>Areca catechu</i> L (Pakkumaram)	<i>Ficus benghalensis</i> (Ala maram)
<i>Artocarpus integrifolia</i> (Jack)	<i>Ficus</i> □ <i>ariega</i> (Rubber tree)
<i>Azadirachta indica</i> (Veppa maram)	<i>Hibiscus</i> spp.,
<i>B. □ ariegate</i> (Manchori)	<i>Mangifera indica</i> (Mango)
<i>Banhinia purpurea</i> (Mandari)	<i>Jatropha</i> (Kattamanakku)
<i>Bougainvillea glabra</i> Choisy.	<i>Peltosporum</i> sp
<i>Butea monosperona</i> (Flame of the forest)	<i>Phoenix</i> sp (Palmyra)
<i>Callistemon lanceolatus</i> (Bottle brush)	<i>Pithecellobium dulce</i> (Kodukka puli)
<i>Calotropis gigantea</i> R.Br. (Erukku)	<i>Plumeria</i> sp
<i>Carica papaya</i>	<i>Polyathia longifolia</i> (Ashoka)
<i>Carica papaya</i> L. (Pappalimaram)	<i>Pongamia glabra</i> (Poonga)
<i>Cascabela thevitia</i> (Arali)	<i>Psidium guajava</i>
<i>Cassia fistula</i> L. (konrai)	<i>Punica granatum</i> (Pomegranate)
<i>Casuarina equisetifolia</i> Forst. (Cavukkumaram)	<i>Spathodea campanulata</i> (Tulip tree)
<i>Ceiba pentandra</i> (L.) Gaertn. (Ilavam)	<i>Tamarindus indica</i> (Puliya maram)
<i>Citrus limonia</i>	<i>Thespenia populnea</i> (Puvarasam)

Fauna

Mammals
<i>Civet cat</i>
<i>Fruit bat</i>
<i>Indian palm squirrel</i>

Mus cervicolour (fawn-coloured mouse)
Mus musculus (house mouse)
Mus platithrix (Indian brown spiny mouse)
Herpestes spp (mangoose)
Cows
Buffaloes

Reptiles

Hemidactylus brooki (house lizard)
Chameleon zeylanicus
Varanus bengalensis (monitor lizard)
Calotes versicolour
Bogia trigonata (cat snake)
Cerberus rhynchops (dog-faced snake)
Ptyas mucosus (rat snake)
Naja naja (cobra)
Hydrophis spiralis (yellow sea snake)
Bungarus caeruleus (krait)

Avifauna

Perdicula asiatica (bush quail)
Coturnix coromandelica (rain quail)
Coturnix coturnix (grey quail)
Psittacula eupatria (Indian parakeet)
Phoenicopterus roseus (flamingo)
Corvus splendens (House crow)
Corvus macrorhynchos (Jungle crow)

Common Prey Birds

Neophron percnopterus (white scavenger vulture)
Gyps bengalensis (white backed vultures)
Milvus migrans (pariah kite)

3.11 Socio Economic Study

3.11.1 Reconnaissance Survey

To assess the probable wide ranging effects on various aspects of environment it is vital to take in to consideration the existing socio-economic pattern and potential change. It is imperative to integrate the components of socio-economic environment in Impact Assessment Study related to environmental conservation, protection and management.

The social environment refers to demographic structure of the area incorporating population dynamics, infrastructure resource base and health status of the community, while economic environment refers to land utilization pattern, land values, employment generation, industrial development and sustainability of the project in financial term. The aesthetic environment refers to scenic value of the area, tourist attraction, forest, and wildlife, historic and cultural monuments.

3.11.2 Baseline Socio-Economic Environment Data

The site is located at Vandipettai, Salem Taluk, and Salem District Tamil Nadu. The study area falls in Salem Taluk and full of Salem Municipal Corporation. Description of demographic features is given in Table 3.7 and the literacy level is given in Table 3.8. The village wise data is given in Table 3.9.

3.11.3 Occupational Structure

The occupational structure of the study area is studied with reference to main workers, marginal workers and non-workers. The main workers include 10 categories of workers defined by the Census Department consisting of cultivators, agricultural laborers, those engaged in live-stock, forestry, fishing etc. mining and quarrying; manufacturing, processing and repairs in household industry; and other than household industry, construction, trade & commerce, transport & communication and other services. The marginal workers are those engaged in some work for a period of less than six months during the reference year prior to the census survey. The non-workers include those engaged in unpaid household duties, students, retired persons, dependents, etc.; institutional inmates or all other non-workers who do not fall under the above categories.

Table 3.7 Details of population

Particulars	Total
Total Population	873167
Total House Holds	205457
Male Population	445567
Female Population	427600
Average Household size	4.25
Sex Ratio	960

Table 3.8 Literacy rate

Total Population	873167
Total Literates	590654
Male Literates	328313
Female Literates	262341
Total Iliterates	282513
% of Literates	67.65
% of Iliterates	32.35

Table 3.9 Category of Workers

Total Population	873167
Total Workers	341556
Main Workers	325608
Main Cultivators	6034
Main Agricultural Labors	13721
Main House Hold Workers	48683
Main Other Workers	257170
Marginal Workers	15948
Non-Workers	531611

Source: Census of India 2001

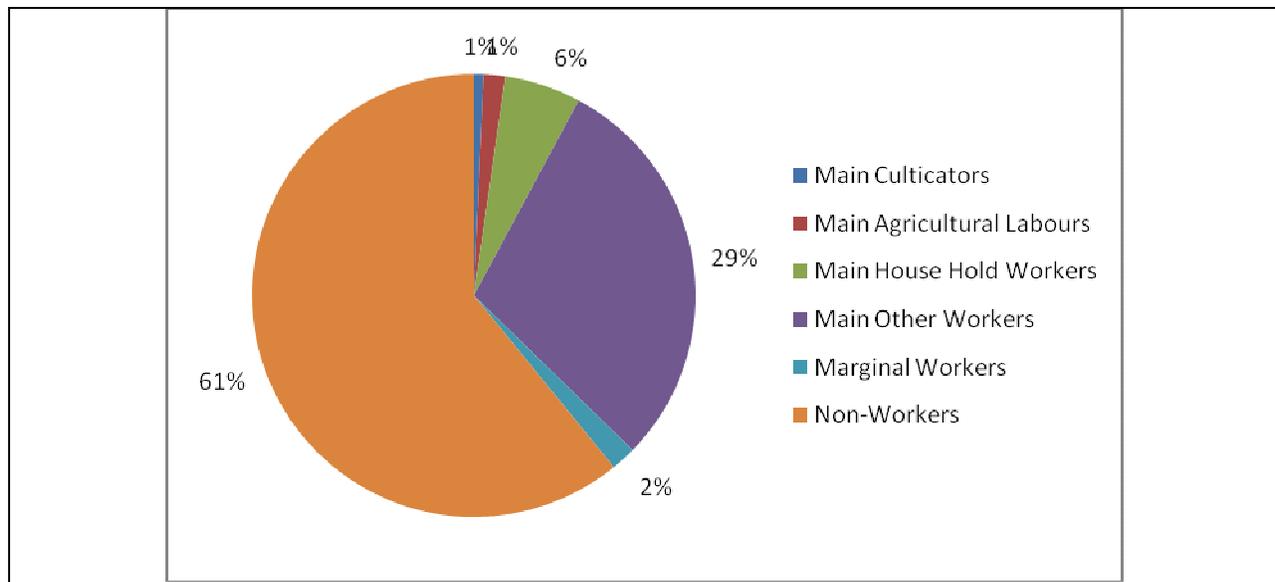


Fig 3.4 Pie Chart Depicting Worker Categories

The baseline study area of the proposed project study reveals that the area does not contain any ecological sensitive areas, the area is devoid of endangered/ threatened species of flora and fauna. The flora and fauna found in the region are not specific to the region

As per the baseline study most of the inhabitants of the region are employed in the nearby industries. As most of the study area is urban in nature the amenities available are generally good except infrastructure such as sewage treatment system. Educational facilities, Healthcare facilities, Water supply, Communication facilities, Banking facilities, Road and Transportation facilities, availability of news papers & magazines etc., are covered in these amenities.

As the proposed project site is owned by Salem municipality and the site and its surroundings is free from any habitations. Thus eliminating the need for any relocation of the population.

3.12 Baseline environmental status within 500 m of project site

The existing environmental settings in the near vicinity of the proposed STP project site was analysed with respect to air, noise and water to understand the impacts of the proposed project on these environmental parameters within 500 m of the site.

Environmental monitoring of ambient air quality, ambient noise level, ground water and soil quality were conducted and discussed below. The locations of environmental monitoring is shown in the Figure and table below.

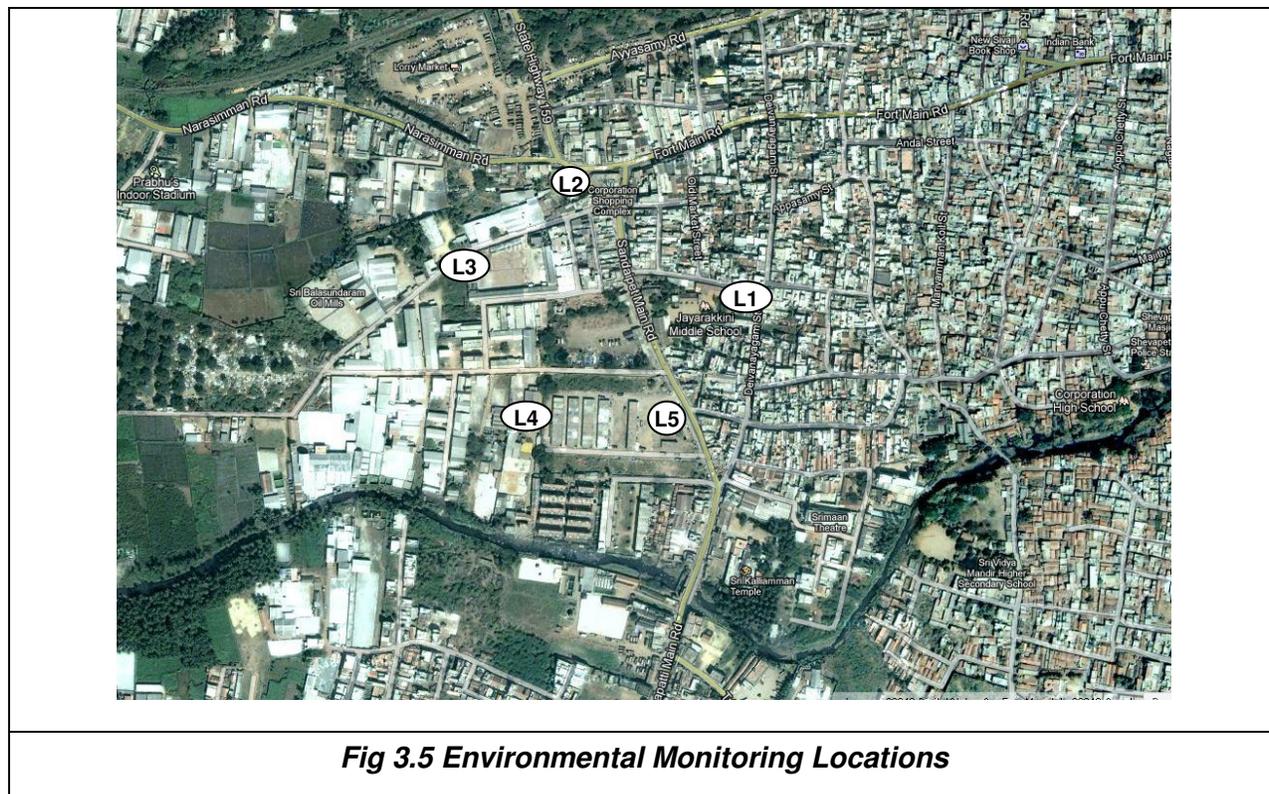


Fig 3.5 Environmental Monitoring Locations

3.12.1 Ambient Air Quality

The results of ambient air quality monitoring are presented in the Table below along with the CPCB National Ambient Air Quality (NAAQ) Standards.

Based on the project activities the parameters chosen for assessment of ambient air quality were Particulate Matter, Sulphur di-oxide (SO₂) and Oxides of Nitrogen (Nox) and carbon monoxide (CO).

Table 3.10 Ambient Air Quality Monitoring Stations (Distance & Bearing Directions)

S.No	Location Name & Code	Distance in m	Direction
1	Jeyarahini Middle school (L1)	150	E
2	Residence of Thiru. Muthukumar, Near Narasimman Road (L2)	350	N
3	Residence of Thiru. Balasubramanian, Near Kalliamman Koil (L3)	300	NW
4	Kuppuraj Mill, Burial ground road, Chevvpapet (L4)	250	SW
5	Mariamman Temple (L5)	150	S

Table 3.11 Ambient Air Quality Status

Parameter	L1	L2	L3	L4	L5	CPCB LIMIT
PM 2.5 ($\mu\text{g}/\text{m}^3$)	44	53	51	52	49	60
PM 10 ($\mu\text{g}/\text{m}^3$)	85	90	84	88	86	100
SO ₂ ($\mu\text{g}/\text{m}^3$)	11.9	16.6	15.5	14.8	13.9	80
Nox ($\mu\text{g}/\text{m}^3$)	18.2	20.6	19.4	18.2	19.1	80
CO (mg/m^3)	<0.1	<0.1	<0.1	<0.1	<0.1	2

The above table shows that the ambient air quality status of the area is well within the standards as prescribed by CPCB.

Table 3.12 Ambient Noise Quality Status

Parameter	L1	L2	L3	L4	L5
Day time	53.5	65.2	64.8	65.1	63.8
Night time	48.1	58.2	57.5	58.9	57.2

The day time noise level and the night time noise level exceeds the ambient noise quality standards as prescribed by CPCB as the project site and the study area falls in the urban residential area and near to market areas.

Table 3.13 Water Quality Status

S.No	Parameter	Units	L1	L2	L3	L4	Permissible Limit as per IS-10500 [#]
1	Colour	Hazen	6.5	8.5	9.5	8.8	25
2	Odour	-	odourless				---
3	Taste	-	Agreeable				---
4	pH @ 25°C	-	6.92	7.24	7.54	7.33	6.5 – 8.5
5	Elec.Con. @ 25°C	µS/cm	1876	1765	1658	1684	---
6	TSS		Nil	NIL	Nil	Nil	
7	TDS	mg/l	1163	1129	1061	1077.76	2000
8	Turbidity	NTU	<0.5	<0.5	<0.5	<0.5	10
9	Total Hardness as CaCO ₃	mg/l	528	436	454	424	600
10	Calcium as Ca	mg/l	160	127	132	123	200
11	Magnesium as Mg	mg/l	31	28.6	30	28	100
12	p-Alkalinity as CaCO ₃	mg/l	Nil	NIL	Nil	Nil	---
13	Total Alkalinity as CaCO ₃	mg/l	224	196	215	192	600
14	Chloride as Cl	mg/l	397	342	426	332	1000
15	Sulphate as SO ₄	mg/l	242	198	94	187	400
16	Nitrate as NO ₃	mg/l	18	8	7	9	45
17	Total Iron as Fe	mg/l	< 0.05	0.1	0.2	0.1	1

[#]in the absence of alternate source

The water quality is found to be within prescribed permissible limits.

Table 3.14 Surface Water Quality at Baseline Stations

S.No	PARAMETER	UNITS	Thirumanimuthar	REFERENCE METHOD
1	pH @ 25°C	-	7.53	IS 3025 Part 11 – 2006
2	Conductivity @ 25°C	µmhos/cm	2900	IS 3025 Part 14 – 2009
3	Copper as Cu	mg/l	BDL (DL : 0.03)	IS 3025 Part 42 – 2009
4	Iron as Fe	mg/l	0.62	IS 3025 Part 53 – 2009
5	Chloride as Cl	mg/l	710	IS 3025 Part 32 – 2009
6	Sulphate as SO ₄	mg/l	282	IS 3025 Part 24 – 2009
7	Nitrate as NO ₃	mg/l	64	IS 3025 Part 34 – 2009
8	Fluoride as F	mg/l	0.6	IS 3025 Part 60 : 2008
9	Total Dissolved Solids	mg/l	1856	IS 3025 Part 16 2006
10	Arsenic as As	mg/l	BDL (DL : 0.005)	IS 3025 Part 37 – 1988
11	Lead as Pb	mg/l	BDL (DL : 0.005)	IS 3025 Part 47-2009
12	Zinc as Zn	mg/l	BDL (DL : 0.005)	IS 3025 Part 49-2009
13	Dissolved Oxygen	mg/l	2.4	IS 3025 Part 38 – 2009
14	BOD 3 days @ 27°C	mg/l	78	IS 3025 Part 44 – 2009
15	Free ammonia as NH ₃	mg/l	24	IS 3025 Part 34 – 2009
16	Boron as B	mg/l	0.24	IS 3025 Part 57 : 2005
17	Sodium Absorption Ratio	√ meq/L	5.8	By calculation

Note: B DL1 is within first decimal; BDL2 is within second decimal; B DL3 is within third decimal.

Table 3.6 Soil Quality Status – locations within 500m

Parameters	S1	S2	S3	S4	S5
Chemical Analysis					
pH	7.1	7.2	7.5	7.1	7.4
Electrical Conductivity (Micromhos/Cm)	93.2	66.3	104	78	88.1
Nitrogen (%)	0.024	0.031	0.032	0.036	0.032
Potassium (%)	0.0030	0.0041	0.0026	0.015	0.0014
Phosphorus (%)	0.007	0.0042	0.0009	0.0023	0.0051
Natural moisture content (%)	1.7	0.9	1.2	1.1	0.8

Grain Size Distribution	S1	S2	S3	S4	S5
Gravel (%)	0.15	0.14	0.21	0.17	0.21
Coarse (%)	87.2	88.7	85.2	87.5	86.8
Medium (%)	0.27	0.16	0.84	0.87	0.14
Fine (%)	0.22	0.51	0.58	0.36	0.16
Silt (%)	0.19	0.76	0.66	0.42	0.79
Clay (%)	11.97	9.73	12.51	10.68	11.9
Textural class	Loamy Sand				

S1 – Near Jeyarahini middle school S2 – Near Narasimhan road S3 – Near Kalamman Koil S4 – Chevvetpet S5 – Near Mariamman temple

At all locations, pH ranges from 7.1 to 7.5. Texture Class was found to be loamy sand.

Inference:

The samples for air, noise, water and soil were collected and analysed and the parameters were found to be within the prescribed standards.

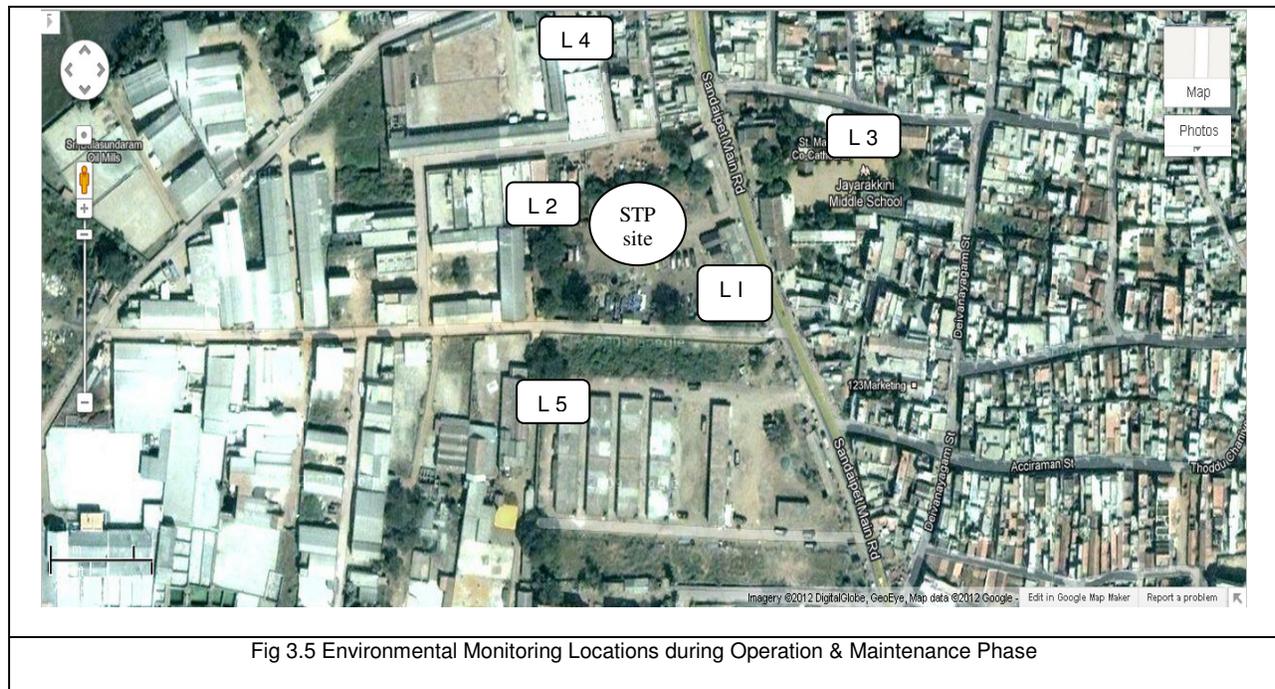


Fig 3.5 Environmental Monitoring Locations during Operation & Maintenance Phase

3.13 Development of green belt

Green belt will be developed along the periphery of the STP premises. The proposed species suitable for Salem region as per CPCB recommended are provided below in Table. The tree species act as dust barrier and also help in the absorption of pollutant gases.

Botanical Name	Common name	Local name
<i>Pongamia pinnata</i>	India Beech	Punga maram
<i>Pithecellobium dulce</i>	Manila tamarind	Kodukkapuli
<i>Polyalthia longifolia</i>	Indian mast tree	Nettilinkam
<i>Ficus bengalensis</i>	Indian fig	Aalamaram
<i>Ficus religiosa</i>	Sacred fig	Arasa maram
<i>Azadiracta indica</i>	Neem tree	Vembu
<i>Tabermontana divetar</i>	Crape jasmine	Nandiavattai
<i>Hibiscus rosasinensis</i>	Shoe flower	Sembararuthi
<i>Ixora cocoinea</i>	Pin jasmine	Nandhiavattai

From the above table, based on site condition and availability of land, trees like Neem, Pungam tree and tulsi plants will be grown in available areas of the plant.

CHAPTER 4 - ASSESSMENT OF ANTICIPATED IMPACTS

4.1 Introduction

This chapter focuses on the prediction and assessment of impacts on the various environmental components due to the project activities. Based on the magnitude and duration of the project activities and the environmental attributes of the receiving environment presented in earlier chapter on environmental setting, the nature, duration and extent of impact are assessed. Minor project impacts have also been identified and basis for their insignificance has been provided. Where relevant, the EMP also addresses the minor impacts and provides environmental mitigation or environmental enhancement measures.

4.2 Impact on Physical Resources

4.2.1 Impact on Topography

The proposed construction is planned on a flat unoccupied terrain. The project will not alter the topography of the site if planned and executed aesthetically will improve the visual appeal of the area.

4.2.2 Impact on Climate

The project area is part of an already developed area although the project site as such is devoid of any structures. At present the site has no trees or vegetation of any kind. The project therefore is unlikely to have any micro-climatic impacts.

4.2.3 Impact on Geology, Soils and Mineral Resources

As no new quarries are envisaged for the project the environmental impacts due to procurement of construction material for the project are insignificant.

4.3 Impact on Air Quality

The project entails movement of significant quantities of the construction material and operation of construction machinery at the site. The project therefore has potential for construction phase negative impacts on air quality. During the operation phase, however decrease movement of vehicular traffic to the site.

4.3.1 Construction Phase Impacts

During the construction phase, operation of construction machinery at the site and use of vehicles for transporting the construction material are the primary sources of air pollution. Combustion of diesel will be the principal cause of air pollution during the construction phase. To provide estimate of emission of air pollutants at the construction site, fuel consumption rates and approximate operation schedule for major construction machinery were estimated. During the period of maximum construction activity the fuel consumption at the project site is expected to be about 100 litres of diesel per hour.

4.4 Impact on Noise Levels

4.4.1 Construction Phase

During the construction phase, the major sources of noise pollution are movement of vehicles transporting the construction material to the project site and the noise generating activities at the site. Primary noise generating activities during the construction are concreting, mixing, casting and materials handling. The noise likely to be generated during excavation, loading and transportation of material.

The construction equipments that have high noise emissions levels can affect the personnel operating the machines. Use of proper personal protective equipment will mitigate any adverse impact of the noise generated by such equipment. Significant noise impacts due to movement of construction materials therefore are not expected.

4.4.2 Operational Phase

Noise generated during operation will not be significant. It is, however, required that adequate green cover to the site is provided.

4.5 Impact on Water Resources

4.5.1 Construction Phase

Water requirement during the construction phase of the project is estimated to be about 120 KLD. It has been proposed to procure water through tankers to meet the requirement during construction. During the construction phase care need to be taken to also provide adequate sanitary toilets equipped with septic tanks and soak-pits for the construction workers.

4.5.2 Operations phase

The water demand during the operation phase will be mainly to provide water to the employees involved in the administration, operation and maintenance of the STP. Rain water harvesting will be an important water conservation measure.

4.6 Impact on Water Quality

The project therefore will not have any adverse impact on local ground water and/or surface water resources. The treated sewage from the STP is proposed to be sent to existing drain.

Alternatively, taking precedent from the existing STPs of Chennai city, the treated sewage may be sold to private users based on rates fixed by the Authorities. Few of the options where treated sewage may be put to beneficial uses include:

- Sale to industries requiring huge quantity of water to meet the cooling water need. Tertiary treatment may be done to meet standards.
- To be made use by various government departments for the development of social farm forests thus achieving afforestation goals.
- Irrigation of traffic islands using treated sewage

Since the treated sewage is not let out to reach the soil and underground aquifer, there will not be negative impact on the water resources. On the contrary, due to structured collection of household sewage and treatment indiscriminate mixing of sewage in many water bodies are eliminated.

4.7 Impact on Land Environment

The land identified for the project development falls under Vandipettai Village, Salem Taluk in Salem District. Since, the entire land area for the project is part of government lands, acquisition of private lands is not entailed for the project.

Surrounding areas are already in commercial area. Hence, no disturbance to the local ecology is expected. There will not be any change in the topography of the region, as the land coverage area of STP units will be of small area.

4.8 Impact on Ecological Resources

It is observed that the project site is open barren land. As there are no endangered/ threatened species in the vicinity of the proposed project site, there will not be any concern for the loss of important species that needs conservation.

4.9 Impact on Socio-Economic Environment

Local people would also get job opportunities during construction and operation phases of the project. Thus the project is expected to contribute to the overall development of the area. There is no issue of resettlement or rehabilitation as the proposed site belongs to the municipality.

CHAPTER 5 - IMPACT MITIGATION MEASURES

5.1 Introduction

This chapter focuses on the mitigation measures suggested for the impacts identified on the various environmental components due to the project activities. A detailed environmental management plan is presented to mitigate all the identified environmental impacts that are found to be significant. It is observed that most of the project impacts are related to construction phase activities and are minor and transient in nature. All of these impacts can be mitigated following good construction practices. The management plans to mitigate the likely negative impacts due to the project activity is categorized into construction and operation phases for easy reference and are presented below.

5.2 Construction Phase

5.2.1 Impact on Air Quality

Impact on the air quality at the construction site and its adjoining areas during the construction phase would be mainly due to the operation of construction machinery at the site and use of vehicles for transporting the construction material. Since the project involves large-scale construction activity the negative impacts on the air quality would be significant during this phase. The impact on the air quality due to the operation of construction machineries in the site is found to be insignificant given the vast area of the site and the prevailing wind movement pattern. However, the negative impacts created as a result of movement of construction vehicles needs critical attention. For mitigation of these impacts following measures are suggested.

- Vehicles used for transportation of construction material, will be covered to avoid fugitive emission.
- Idling of delivery trucks or other equipment will not be done during loading and unloading of materials.

- All construction vehicles will be maintained in such a way so as to comply with air emission standards.
- Dust suppression measures such as sprinkling of water will be carried out regularly.
- Adequate improvement of access to withstand the movement of heavy construction vehicles.

5.2.2 Impact on Noise Levels

During the construction phase generation of noise would be mainly due to movement of vehicles transporting the construction material to the project site and due to the noise generating activities at the site itself. To mitigate these impacts during this phase the following measures are suggested.

- Restriction on the usage of noise generating activities and traffic movement in the residential areas to day light hours. Contracts should specify that the construction equipment should meet the noise and air emission levels as per EPA Rules, 1986.
- Generator sets should be provided with noise shields around them.
- Vehicles used for transportation of construction material should be well maintained.
- The workers operating high noise machinery or operating near it should be provided with ear plugs.

5.2.3 Impact on Micro Climate

The project area is part of an already developed area although the project site as such is devoid of any structures. Further, it is suggested that sufficient provision for on-site planting of shading trees should be made during the construction phase. Planting of large numbers of trees, of species like *Pongamia Glabra*, *Morinda Gtinctoria*, *Azadirachta indica*, *Thespesia Populnae*, *Enferolobum Samana* etc along the roads and on the designated open spaces is envisioned, to ensure the improvement of microclimatic condition of the project site.

5.2.4 Impact on Water Resources

Water required for the construction phase of the project will be about 150 -200 KLD and the requirement is only for a short duration. It has been proposed to procure water through bore wells to meet the requirement during construction. During the construction phase care need to be taken to also provide adequate sanitary toilets equipped with septic tanks and soak-pits for

the construction workers. Wastewater discharges from construction site should not be directly let into the local water resources.

The impact on water resources due to the operation of sewage treatment plant is insignificant due to the reason that, in the absence of the STP plant, at present the sewage generated in the Salem City Municipal Corporation area is discharged haphazardly without any treatment.

5.2.5 Storm Water Drainage

It is proposed to construct individual rainwater harvesting pits at regular intervals at the site level, along the roads, opens spaces for the disposal of storm water from the common areas of the development.

5.2.6 Health, Safety and Sanitation at Workers Camp

Adequate measures will be taken to maintain the sanitation and health standards of the construction workers

- Vehicles transporting construction materials and sand prone to fugitive dust emissions should be covered.
- Idling of delivery trucks or other equipment should not be permitted during loading and unloading.
- All construction vehicles should comply with air emission standards and be maintained properly.
- Development of alternative access routes to the site bypassing the residential areas to avoid air pollution.

5.2.7 Safety and Health related Measures

- During the construction and operational phase, safety precautions will be practiced in order to prevent any possible occurrence of accident. For this, it will be ensured that all machines used shall conform to the relevant Indian standards Code and undergo regular inspection.
- During construction phase, Personal Protective Equipments (PPE) such as Protective footwear and protective goggles, Welder's protective eye-shields shall be provided to workers who are engaged in welding works, earplugs shall be provided to workers

exposed to loud noise, and workers working in crushing, compaction, or concrete mixing operation.

- The workers will also be provided all necessary safety appliances such as helmets, safety belts, earplugs, mask etc.
- A well maintained first aid kit including an adequate supply of sterilized dressing materials and appliances will be made available.
- Only the working staff and authorised personnel will only be allowed inside the STP premises..
- Drinking water facility will be made available. Also, Adequate ablutions and change facilities to promote appropriate occupational health and safety (OHS) will be provided.

Storage and Use of Hazardous Materials like chlorine etc

- Hazardous substances, if any will be stored in accordance with safety standards and regulations in force and accompanied by material safety data sheets
- Storing of chlorine and chlorination arrangements will be provided with proper leak detecting arrangements
- The quantity of material stored on-site will be kept to a minimum and chemicals will be preferentially ordered on a needs basis.
- Operators will be trained in the safe handling and storage of hazardous goods

Plant Operations and Maintenance

- The manuals grading Operations and maintenance procedures will be developed and maintained to ensure optimum environmental management of the activity will be produced.
- The workers involved in O& M will be adequately trained to operate the plant and also trained in environmental management requirements of the plant.

CHAPTER 6 - ENVIRONMENTAL MONITORING PLAN

Environmental Monitoring is carried out to record the environmental parameters likely to be affected by the project at pre-defined intervals. The purpose of these observations is to ensure that the mitigation measures are adequate and the residual negative impacts remain within acceptable limits. Where necessary, these observations also help in timely up gradation of mitigation measure. In the context of this project, the negative environmental impacts, although minor, will be experienced during the construction period. The environmental monitoring therefore focuses on construction phase and aims to give an indication of level of compliance with the recommended mitigation measures. In addition to direct observations of environmental parameters, periodic inspection to ensure compliance with good construction practices and adherence to distance norms for locating the construction yards and workers camp is also recommended. During the operation phase, the recommended monitoring is limited to visual observations on the site to see that the infrastructure facilities are working appropriately and ground water quality observations in the wells and sump provided for auxiliary water supply.

6.1 Environmental Monitoring at Site

The environmental quality of the project area with respect to air, noise water and soil will be monitored as in Table 6.1 for compliance with the applicable regulatory requirements. The monitoring should be implemented through the environmental monitoring laboratories.

Table 6.1 Environmental Monitoring Plan

Ambient Air Quality Monitoring	
Project stage	Pre Construction , Construction & operation phase
Parameter	SPM, RPM, SO ₂ , NO _x , CO
Sampling Method	Use method specified by CPCB for analysis
Standards	Air (Prevention and Control of Pollution) Rules, CPCB 1994
Frequency	Once before start of work & once every season of the year during construction period and operation Period.
Duration	Continuous 24 hours / or as per standards
Location	Sensitive locations of the project site.
Measures	Whenever air pollution parameters increase above specified standards, additional measures as decided by the engineer are to be

	adopted
Stack Monitoring of the Diesel Generators	
Project stage	Construction & operation phase
Parameter	SPM, SO ₂ , NO _x , CO
Sampling Method	Use method specified by CPCB for analysis
Standards	Air (Prevention and Control of Pollution) Rules, CPCB, 1994
Frequency	Once every season of the year during construction period and operation Period/or as specified by PCB
Duration	Continuous 24 hours / or as per standards
Location	Stacks of the Diesel Generator Sets
Measures	Wherever air emission parameters increase above specified standards, additional measures as decided by the engineer shall be adopted
Water quality Monitoring	
Project stage	Construction & operation phase
Parameter	pH, TSS, BOD, COD, DO, TDS, Pb, nutrients and microbes for Surface water to which the drainage disposal takes place.
Sampling Method	Grab sample collected from source and analysis as per Standard Methods for Examination of water and Waste water (APHA, 2005)
Standards	Indian standards for Inland Surface Water (IS; 2296, 1982) and for Drinking water (IS; 10500,1991)
Frequency	Twice a year (pre monsoon and post monsoon seasons) during the construction period and monthly during O&M.
Measures	All inflow channels shall be checked for pollution loads and channel delivering higher pollution load shall be terminated from disposal into the water source and monitored by local wells.
Sewage Analysis	
Project stage	Operation phase
Parameter	pH, TSS, BOD, COD, TDS, TKN
Sampling Method	Grab sample collected from source and analysis as per Standard Methods for Examination of water and Waste water (APHA, 2005)
Standards	As per CPCB standards
Frequency	Weekly
Measures	Inflow and outflow channels shall be checked for pollution loads and

	channel delivering higher pollution load
Noise Level Monitoring	
Project stage	Pre Construction , Construction & operation phase
Parameter	Noise level on dB (A) scale
Special guidance	Free field at 1 m from the equipments whose noise level are being determined. Equivalent noise levels using an integrated noise level meter kept at a distance of 15m from edge of pavement
Standards	MoEF Noise Rules, 2000
Frequency	Once every season (except monsoon)
Duration	Reading to be taken at 15 seconds interval for 15 minutes every hour and then averaged
Measures	In case of noise levels causing disturbance to the sensitive receptors, management measures as suggested in the EMP shall be carried out.

6.2 Environmental Monitoring during O & M Stage

The monitoring activities will be carried out as mentioned in the Table 6.1. and also during O & M stage. The location for monitoring are given below.

Table 6.2 Proposed Environmental Monitoring Stations During O & M Stage

S.No	Location Name & Code	Distance in m	Direction
1	Near Main Gate of STP Site (L5)	At site	-
2	Near Admin Building	At site	-
3	Jeyarahini Middle school (L1)	150	E
4	Near Narasimman Road (L2)	350	N
5	Near Kaliamma Koil (L3)	300	NW
6	Kuppuraj Mill, Burial ground road, Chevvetpet (L4)	250	SW

6.2 Ground water and surface water monitoring:

The ground water quality will be monitored once in six months in six locations around the site and the locations will be selected in the direction of water flow. Surface water quality will be monitored twice a year and samples will be taken from downstream of outlet.

CHAPTER 7 ENVIRONMENT MANAGEMENT PLAN

Environmental Management Plans have the purpose of protecting the environment, and are based around the objectives of the Act. The Environment Protection Act 1997 to ensure sustainable development in the area of the project site. The identification of impacts due to the proposed STP project have been presented in Chapter 4.

7.1 Management Plan

The environmental attributes in the region include air quality, water quality, ecology and public health. The Environmental Management Plan aims at controlling pollution at the source level to the possible extent with the available and affordable technology followed by treatment measures. The proposed EMP measures are discussed below.

Table 7.1 Environmental Management Plan during Pre-Construction Phase

S.No	Potential Impact	Mitigation measures	Steps taken	Time frame	Responsible Agencies
PRE-CONSTRUCTION PHASE					
1	Clearance	All clearance required for Environmental aspects during construction shall be ensured and made available before start of work.	As a prelude for getting consent for establishment, TNPCB has issued no objection certificate (NOC) for setting up STP at Vandipettai. Consent to establish STP has been obtained from TNPCB on 26.08.2011.	Before Construction	Salem City Municipal Corporation (SMC)/ concerned departments & agency / contractor
2	Tree Cutting	<p>i) Try to save the trees by adjusting the plant layout or the alignment of sewage intake structures, sewer mains, pumping stations, etc.</p> <p>ii) Provide adequate protection to the trees to be retained with tree guards (eg. Masonry tree guards, low level RCC tree guards, circular iron tree guard with Bars) as required.</p> <p>iii) Identify the number of trees that will be affected with girth size & species type along the sewer mains, pumping / lifting station sites and sewerage treatment plant site. The details to be indicated on map to scale and / or a strip map as may be appropriate. Prepare tree cutting schedule to facilitate clearance requirements.</p> <p>iv) Trees identified for cutting shall be removed from the construction sites before commencement of construction with prior permission from the concerned</p>	The proposed site is a vacant land without any kind of vegetation, hence tree cutting not done.	Pre-construction & construction phase	Contractor / SMC

S.No	Potential Impact	Mitigation measures	Steps taken	Time frame	Responsible Agencies
		<p>department.</p> <p>v) Undertake tree plantation (not less than three rows inside and along the boundary of STP, and compensatory plantation as per the tree cutting clearances)</p> <p>vi) Compensatory plantation by way of Re-plantation of at least twice the number of trees cut should be carried out in the project area.</p>			
3	Utility Relocation	<p>i) Identify the common utilities to be affected such as: telephone cables. Electric cables, electric poles, water pipelines, public tabs, etc.</p> <p>ii) Affected utilities shall be relocated with prior approval of the concerned agencies before construction starts.</p> <p>iii) Provide advance notice (not less than 10 working days) to affected parties. The advance notice shall be in the form of written notice and a grievance redressal cell shall be established for timely addressing of grievances.</p>	There are no utilities in the proposed site, hence relocation not required.	Pre-construction & construction phase	SMC / Concerned departments.
4	Baseline parameters	Adequate measures shall be taken and checked to control the baseline parameters of Air, Water and Noise pollution. Baseline parameters shall be recorded and ensured conformance till the completion of the project. The monitoring requirements, at minimum shall comply with consent conditions by the pollution control Board.	Existing environmental parameters were measured and the baseline environment was found to be within prescribed standards.	Pre-construction, construction and post construction phase	Prospective contractor / SMC
5	Planning temporary traffic	i) Temporary diversion will be provided with the approval of the engineer. Detailed traffic control plans will be	Traffic diversion is not required.	Pre-construction, construction	Prospective contractor / SMC

S.No	Potential Impact	Mitigation measures	Steps taken	Time frame	Responsible Agencies
	arrangements	<p>prepared and submitted to the engineers for approval, at least two weeks prior to commencement of works.</p> <p>ii) The traffic control and plans shall contain details of temporary diversion, details of traffic arrangements after cessation of work each day, SIGNAGES, safety measures for transport of hazardous materials and arrangements of flagmen.</p> <p>iii) Any accidents and/or risk of inconveniences caused to the community shall be borne by the contractor.</p>		and post construction phase	
6	Disposal of treated waste water	<p>i) The construction activities at STP shall be initiated only after consent to establish certificate is secured from the TNPCB.</p> <p>ii) STP operations shall take place only after Consent to Operate certificate is accorded by the TNPCB and treated water quality shall comply with the consent conditions stipulated by TNPCB or at minimum shall meet the discharge standards depending on the type of receiving water body (stream/nullah/open land/irrigation purpose, etc)</p> <p>iii) Performance standards shall always be maintained, ensuring efficient working condition of treatment plant.</p>	<p>i) Consent for establishment for the STP has been obtained.</p> <p>ii) Operation of STP will be carried out only after obtaining consent to operate from TNPCB.</p> <p>iii) Standards will be maintained.</p>	Pre-construction, construction and post construction phase	Prospective contractor / SMC
7	Storage of materials	The contractor shall identify the site for temporary use of land for construction sites / storage of construction materials, etc. These sites shall be operated only after prior approval of the engineer.	Storage of construction materials will be done in a place identified within the premises	Pre-construction, construction and post construction	Prospective contractor / SMC

S.No	Potential Impact	Mitigation measures	Steps taken	Time frame	Responsible Agencies
8	Construction of labour camps	<p>Contractor shall follow all relevant provisions of the Factories Act, 1948 and the Building and the other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 for construction and maintenance of labour camp.</p> <p>The location, layout and basic facility provision of each labour camp will be submitted to Engineer prior to their construction.</p> <p>The construction will commence only upon the written approval of the Engineer.</p> <p>The contractor shall maintain necessary living accommodation and ancillary facilities in functional and hygienic manner and as approved by the engineer.</p> <p>All temporary accommodation must be constructed and maintained in such a fashion that uncontaminated water is available for drinking, cooking and washing.</p> <p>The sewage system for the camp must be planned. Adequate health care is to be provided for the work force. The layout of the construction camp and details of the facilities provided should be prepared shall be approved by the engineer. The construction camp shall not be located within 1000 m from the nearest water stream, residential areas and / or any sensitive land uses like schools, hospitals, etc.</p>	Labour required for construction will be sourced locally, hence labour camps are not proposed	phase During the construction	Prospective contractor.

Table 7.2 Environmental Management Plan during Construction and Operation Phase

S.No	Potential Impact	Mitigation measures	Steps taken	Time frame	Responsible Agencies
1	Compensatory plantation of trees	Compensatory plantation of atleast twice the number of trees felled should be done in line with competent authority guidelines.	The site is a open and barren land and no trees are present.	Pre-construction, construction and post construction phase	Prospective contractor / SMC
2	Protection of soil & Environmental enhancing	The top soil to be protected and compacted after completion of work. Top soil from the STP area should be stored in stock piles and that can be used for gardening purposes at STP site which will be an environmental enhancing measure.	Top soil will be stored separately and it will be used for gardening.	During construction	Prospective contractor/ SMC
3	Disposal of construction debris and excavated materials	A suitable site should be identified for safe disposal, in relatively low lying areas, away from the water bodies, residential and agricultural fields, etc., and got approved by the engineer. Care should be taken that dumped material does not affect natural drainage system.	The construction debris will be used for leveling of land.	During construction	Prospective contractor/ SMC
4	Pollution from fuel and lubricants	i) The contractor shall ensure that all constructions vehicle parking location, fuel / lubricants storage sites, vehicle machinery and equipments Maintenance and refueling sites will be located at least 500m from rivers and irrigation canal/ponds.	vi) Servicing of vehicles will be carried out at the existing service centres owned by 3rd parties. Hence no water pollution is expected and there is no issue of generation of oily wastes.	Construction and operation	Prospective contractor/ SMC

S.No	Potential Impact	Mitigation measures	Steps taken	Time frame	Responsible Agencies
		ii) All location and layout plans of such sites submitted by the contractor prior to their establishment and will be approved by the engineer. iii) Contractor shall ensure that all vehicle/machinery and equipment operation, Maintenance and refueling will be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the ground. iv) Contractor will arrange for collection, storing and disposal of oily wastes to the pre-identified disposal sites (list to be submitted to Engineer) and approved by the engineer. All spills and collected petroleum products will be disposed off in accordance with MoEF and state PCB guidelines. v) Engineer will certify that all arrangements comply with the guidelines of PCB/MoEF or any other relevant laws.			
5	Decline of ground water quality	i) Ground water quality may get contaminated due to leaching of waste water. So, the treated water quality shall comply with the standards laid down by the pcb for disposal	The treated sewage will be suitably reused.	Construction and operation	Prospective contractor/ SMC

S.No	Potential Impact	Mitigation measures	Steps taken	Time frame	Responsible Agencies
		<p>onto land, water body or for irrigation use.</p> <p>ii) Regular monitoring is required for the treated sewage quality and also the ground water quality in the nearby areas and ensures compliance with PCB standards.</p>			
6	Water pollution from construction phase	The contractor shall take all precautionary measures to prevent the waste water generated during construction from entering into streams, water bodies or the irrigation system. All waste arising from the project is to be disposed off in the manner that is acceptable by the Engineer.	Care will be taken so that runoff of waste concrete does not enter water bodies. Construction waste generated from the site will be collected and disposed at the identified sites by the Engineer.	Construction and operation	Prospective contractor/ SMC
7	Impact of surrounding areas	To avoid the problems of foul smell polluted air, insects, noise pollution and other problems buffer zones to be provided in the form of green belt around the STP site, this has to be strictly ensured.	Adequate greenery will be maintained to foul smell polluted air, insects, noise pollution and other problems.	During construction	Prospective contractor/ SMC
8	Information signs and hoardings	The contractor shall provide, erect and maintain inforatory /safety signs, hoardings written in English and local languages, whatever required or as suggested by the Engineer.	The condition will be complied with.	During construction	Prospective contractor/ SMC
9	Risk from Electrical Equipments	The contractor shall take all required precautions to prevent danger from electrical	The condition will be complied with.	During construction	Prospective contractor/ SMC

S.No	Potential Impact	Mitigation measures	Steps taken	Time frame	Responsible Agencies
		<p>equipment and ensure that-</p> <p>i) No material shall be stacked or placed as to cause danger or inconvenience to any person or the public.</p> <p>ii) All necessary fencing and lights will be provided to protect the public in construction zones. All machines to be used in the construction will conform to the relevant Indian Standards (IS) codes, will be free from patent defect, will be kept in good working order, will be regularly inspected and properly maintained as per IS provision and to satisfaction of the Engineer.</p>			
10	Disposal of treated waste water	<p>i) The treated water quality shall comply with the standards of TNPCB before let out into the stream/nullah/open land/irrigation purposes, and necessary permission to be obtained from the concerned department.</p> <p>ii) Ensure efficient working condition or treatment plant.</p> <p>iii) Prevent the pollution of stream water and other water bodies receiving STP discharge.</p>	The treated sewage will be analysed in order to meet prescribed standards.	Pre construction/construction and operation stage	SMC /Prospected contractor
11	Disposal of	A suitable site should identify	Sludge will be disposed	Pre-construction-	Prospective

S.No	Potential Impact	Mitigation measures	Steps taken	Time frame	Responsible Agencies
	sludge	for the safe the safe disposal of sludge generated at the STP site and got approved by the Engineer. Prepare a sludge disposal plan and adheres to the same.	suitably in compliance to standard.	construction and operation	contractor/ SMC
12	Labour camp & facilities	Settling up of labour camps needs to be done as per the procedures. Adequate potable water facilities, sanitation and drainage etc., in conformity with the Indian labour laws shall be ensured. The contractor shall also guarantee the following: i) The location, layout and basic facility provision of each labour camp will be submitted to Engineer prior to their construction. ii) The construction will commence only upon the written approval of the Engineer. iii) The contractor shall construct and maintain all labour accommodation in such a fashion that uncontaminated water is available for drinking, cooking and washing. iv) Supply of sufficient quantity of potable water (as per IS) in every workplace/labour camp site at suitable and easily accessible places and regular	Labour from neighbouring areas will be employed and hence labour camps are not required.	During pre-construction and construction	Perspective contractor/ SMC

S.No	Potential Impact	Mitigation measures	Steps taken	Time frame	Responsible Agencies
		maintenance of such facilities. v) The sewage system for the camp are designed, built and operated in such fashion that no health hazards occurs and no pollution to the air, ground water or adjacent water courses take place. Ensure adequate water supply is to be provided in all toilets and urinals.			
13	Safety aspects	i) Adequate precautions shall be taken to prevent the accidents and from the machineries. All machines used shall conform to the relevant Indian standards code and shall be regularly inspected by the PIA. ii) Where loose soil is met with, shoring and strutting shall be provided to avoid collapse of soil. iii) Protective footwear and protective goggles to all workers employed on mixing of materials like cement, concrete etc. iv) Welder's protective eye-shields shall be provided to workers who are engaged in welding works. v) Earplugs shall be provided to workers exposed to	Requisite safety precautions will be taken and PPEs will be provided.	During construction	Prospective contractor.

S.No	Potential Impact	Mitigation measures	Steps taken	Time frame	Responsible Agencies
		<p>loud noise, and workers working in crushing, compaction, or concrete mixing operation.</p> <p>vi) The contractor shall supply all necessary safety appliances such as safety goggles, helmets, safety belts, ear plugs, mask etc to workers and staffs.</p> <p>The contractor will comply with all the precautions as required for ensuring the safety of the workmen as per the international labour organization (ILO) convention No. 62 as far as those are applicable to this contract.</p> <p>The contractor will make sure that during the construction work all relevant provisions of the factories act, 1948 and Building and other Conditions of Services) Act, 1996 are adhered to.</p> <p>The contractor will not employ any person below the age 14 years for any work and no woman will be employed on the work of painting with products containing lead in any form.</p>			
14	First Aid	<p>The contractor shall arrange for:</p> <p>i) A readily available first aid unit including an adequate supply of sterilized dressing</p>	<p>First aid kit will be made available and in case of incidents affected persons will be transported</p>	During construction	Prospective contractor.

S.No	Potential Impact	Mitigation measures	Steps taken	Time frame	Responsible Agencies
		<p>materials and appliances as per the factories rules I every work zone.</p> <p>ii) Availability of suitable transport at all times to take injured or sick persons to the nearest hospital.</p>	immediately to nearby hospital		
15	Odour control	<p>Adequate green belt will be developed around STP to control odour.</p> <p>Spraying of water will be done on the odour creating units</p> <p>Monitoring will be done on ambient air quality around STP.</p>	The sludge from the Lamella Clarifier may produce odor when becomes anaerobic wherein an Aeration system is being provided there to keep the sludge in aerobic conditions. The Aerobic sludge so produced will be disposed as per the guidelines of State Pollution Control Board. The odour control measures are given in section 7.2		
16	Noise pollution due to operation of pumps & machineries.	<p>DG sets will be provided with acoustic enclosures</p> <p>Green belt will be developed which will attenuate noise</p>		During construction & operation phases	Prospective contractor.
17	Protective Equipments	<p>For Chlorination System the following mitigation measures will be in place to arrest/ identify any leakage of chlorine</p> <ol style="list-style-type: none"> 1) Neutralization System. 2) Leak Detection System. 3) Ventilation System. 			Perspective contractor/ SMC

S.No	Potential Impact	Mitigation measures	Steps taken	Time frame	Responsible Agencies
		<p>The personnel will be provided with personnel protective equipments (PPEs)</p>			
18	Safety measures	<p>1) All plant personnel will be provided safety clothing and Personal Protective Equipments (PPE) and also trained to implement Occupational Health and Safety (OHS)</p> <p>2) During storage and Use of Hazardous Materials like chlorine etc it will be ensured that chemicals and fuel handling and storage is safe and materials do not causing any damage</p> <p>3) Chlorine will be stored in accordance with safety standards and regulations in force</p> <p>4) Operating staff will be provided induction training on safe handling, storage and precautions in use of hazardous materials. Also directions will be given regarding chlorine emergency repair kits, and other emergency procedures.</p> <p>5) Leak detecting arrangements will be properly provided in the plant</p>		Operation phase	Perspective contractor/ SMC

S.No	Potential Impact	Mitigation measures	Steps taken	Time frame	Responsible Agencies
		6) Storage of large quantity of chlorine will be avoided and only procured based on need and accurate inventory will be maintained. 7) Only approved instruments should be used for lifting and opening cylinders			

Table 7.3 Environmental Management Plan - Environmental Enhancement and Special Issues

S.No	Environmental enhancement and special issues		Steps	Implementing agency	location
1	Flora and chance found fauna	The contractor will take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora (plant/vegetation) and fauna (animal) including fishing in any water body and haunting of any animal. If any wild animal is found near the construction site at any point of time, the contractor will immediately upon discovery thereof acquaint the Engineer and carry out the Engineers instructions for dealing with the same. The Engineer will report to the nearby forest office (range office or divisional office) and will take appropriate steps/measures, if required in consultation with the forest officials.	The site is open and barren land and there is no trees present	Prospective contractor	Project area
2	Chance found archaeological property	All fossils, coins, articles of value of antiquity, structures and other remains or things of geological or archaeological interest discovered on the site shall be property of the government	The condition will be complied with	Prospective contractor	Project area

S.No	Environmental enhancement and special issues		Steps	Implementing agency	location
		and shall be dealt with as per provisions of the relevant legislation. The contractor will take reasonable precautions to prevent his workmen or any other persons from removing and damaging any such article or thing. He will, immediately upon discovery and carry out the SC's instructions for dealing with the same, waiting which all work shall be stopped. The Engineer will seek direction from the Archaeological Survey of India (ASI) before instructing the Contractor to recommence of the work in the site.			
3	Monitoring of environment parameters	The contractor shall undertake seasonal monitoring of air, water, and noise and soil quality through an approved monitoring agency. The parameter to be monitored, frequency and duration of monitoring plan shall be prepared.	Environmental Monitoring Plan will be prepared and executed.	Prospective contractor	Project area
4	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 and during operation phase.	Sensitive areas like school and residential areas are not located nearby the proposed STP.	Prospective contractor	Project area
5	Clearing of construction of campus and restoration	Contractor to prepare site restoration plans for approval by the engineer. The plan is to be implemented by the contractor prior to demobilization. On completion of the works, all temporary structures will be cleared away, all rubbish cleared, excreta or other disposal pits or trenches filled in and effectively sealed off and the site left clean and tidy, at the contractors expenses, to the entire satisfaction of the engineer.	This will be complied with	Prospective Contractor	Corridor of Impact

S.No	Environmental enhancement and special issues		Steps	Implementing agency	location
6	Tree protection, tree planting	<ul style="list-style-type: none"> • Giving due protection to the trees that fall in the shoulders/corridor of impact shall be the prime focus during Construction/post construction. • Masonry tree guards, low level RCC tree guards, Circular Iron Tree Guard with Bars, use of plate compactors near trees may also be consider where necessary. • Re-plantation of a least twice the number of trees cut should be carried out along the project road. Since the major portion of the project road may pass through open lands, planting of trees along the entire stretch of the road is recommended as an enhancement measure. • Growth and survival of trees planted shall be ensured and monitoring done at least for a period of 3 years. Survival status shall be reported on monthly basis by Engineer incharge. • Green Belt will be developed as per the instructions contained in page 124 of NIT Vol-II Section-5 of NIT & Compensatory Afforestation shall be carried out as per the provisions contained in Page no 128 of Vol-II Section-5 Tech Spcs of NIT. 	There will be no cutting of trees as there is no trees or plantation in the site./ The planted saplings will be given due care.	Prospective Contractor	Corridor of impact

Table 7.4 Causes and Remedy of STP units

S.No	Units	problems	Remedies
1	Inlet Chamber	Foam development may arise during inflow	Sprinkling of water will be done through hose
		Leakages in bottom of sluice gates	Periodical greasing and proper lubrication for proper functioning
2	Screen Chamber	Damage to screens by breakage	Periodical inspection and rectification of damaged parts will be carried out.
3	Grit Chamber	Washing away of grit particles along with the sewage	velocity of flow will be controlled properly
4	Fluidized Aerobic Bioreactor	Media may be washed away	Screens will be installed at the outlet of FAB reactors
2	Sludge handling pump sets	Choking of Pump due to heavy inflow.	Maintenance activity will be taken for uninterrupted operation.

Table 7.5 Table Budget Allocation For Environmental Protection

S. No	Component	Capital Cost (Rs in Lakhs)	Operational Cost per annum (Rs in Lakhs)
1	Development of green area and maintenance	10.0	1.0
2	Environmental monitoring for quarterly study of air, noise, water and soil	-	4.0
3	Protective equipments for personal and fire safety	5.0	1.0
Total		15	6.0

7.2 Odour control measures

The treatment chain consists of Raw sewage pumping, screening, grit removal, Fluidised Aerobic Bed (FAB) reactor, Lamella clarifier and chlorination. The secondary biological treatment technology proposed in the treatment system which is the FAB system has specifically been proposed in view of its advantage vis a-vis the requirement of land, low odour, high effluent quality and ease of operation. Therefore, apart from the preliminary treatment consisting of screening and grit removal, the treatment system is purely aerobic thus resulting in minimal offensive odour. The need therefore is to minimize any offensive odour in and near the preliminary treatment structures. This is proposed by taking the following measures:

1. The odour produced in inlet region shall be regular and proper house keeping and maintenance, inlet sump and pump house, screens, approach channels and grit chambers would be maintained clean by suitably disposing off all generated waste on daily basis.
2. All screenings and grit would be properly collected through chutes into trolleys and disposed off as per laid down procedures.
3. A three meter wide green belt as shown in the plant layout drawing with suitable tree plantation would be provided in area between existing road and treatment units to control and reduce odour in nearby localities.
4. The possibility of having an additional green belt between existing road and the residential colony would have to be examined by the concerned authorities to further improve the situation in the area.

7.3 Water tight structures in the plant

To assess the water tight nature of the structure, a hydrotest will be conducted for liquid storage concrete structure in the treatment plant. On construction of structures in the plant they are physically verified for possible honey comb surface. If any such surface is found the same is properly grouted with grouting materials using grouting pump. After sealing of the open outlets, water will be filled up to a level of 6" to observe the weaker parts, if any. If any weaker part is observed, it will be grouted properly. Again to verify absorption of water, if any, and on finding satisfactory results, again fill it for lost water, if any up to the level of 6". On observation, if the water level does not recede, it can be considered that there is no leakage from the floor area. Now, water is to be filled to full capacity of the structure to verify any seepage, weepage or leakage, and if any is found it will be grouted with proper grouting pumps and special chemicals. After verification and finding the structure, fully ready in all aspects, it will be tested as per IS 4370 Part I. If the structure is found to be 100% leak proof after testing, sewage can be received in the structure.

7.4 Safety measures

In case of any emergency certain precautionary measures have been planned in the plant in the process stages.

The activated sludge from the underflow of the final settling tanks will be returned to the inlet of the aeration tanks at a rate sufficient to maintain the MLSS concentration at at plant designed value. Solids are generated by microorganism growth and reproduction. The influent BOD Supplies the food for the growth and reproduction. As microorganisms'

populations multiply, excess solids must be removed. If excess solids are not removed, the mixed liquor suspended solids (MLSS) and sludge age will increase and process efficiency will be lowered. Sludge settling rates are affected. Eventually, if excess solids do not get wasted, they can overflow the clarifier weirs and into the receiving water. These operating parameters are widely used and the details of the operating procedure will vary accordingly.

Other precautions will also be carried out:

1. There will be sufficient aeration to maintain a dissolved oxygen concentration of at least two mg/L at all times throughout the aeration tanks.
2. Dissolved oxygen will be present at all times in the treated wastewater in the final settling tanks.
3. Activated sludge will be returned continuously from the final settling tanks to the aeration tanks.
4. Optimum rate of returning activated sludge will vary with each installation and with different load factors.
5. The optimum mixed liquor suspended solids concentration in the aeration tanks will be in the range of 600 to 3000 mg/L.
6. A sludge volume index of about 100 and a sludge age of three days to fifteen days will be maintained.
7. The suspended solids content in the aeration tanks may partially be controlled by the amount of sludge returned to them. All sludge in excess of that needed in the aeration tanks will be removed from the system. It will be removed in small amounts continuously or at frequent intervals rather than in large amounts at any one time. Sludge held too long in the final settling tank will be avoided.

The quality of the treated water will be continuously monitored as this is the basic indicator of the normal plant operation.

CHAPTER 8 - PROJECT BENEFITS

8.1 Effective technology

The project uses Fluidised Aerobic Bio-Reactor (FAB), which is a space and power saving technology and is a better alternative to conventional wastewater treatment plants that are large-sized, power intensive and require a lot of monitoring.

FAB offers an effective option to the conventional systems made unviable due to scarcity of open space, geographical network of piping, high power and land cost. It has Odourless operations, with a self-regulating system, reduced power consumption, simple to operate, low maintenance requirements and removes pathogenic coli forms.

8.2 Improvement of Environmental Status

The project will contribute to the substantial decrease of pollution caused by the discharge of untreated sewage into the environment. This in turn would improve the quality of water resources such as ground as well as surface water. The contamination of the region's soil is also prevented by the proper collection and disposal of waste water.

8.3 Health Benefits

The proposed project which would ensure the efficient disposal of the waste generation will ultimately bring about social, economic, health and benefits to the community. The allied benefits include reduction in health-care costs related with waterborne and water-related diseases.

8.4 Generation of Employment

The construction phase will have positive effects on employment. During the construction phase, services of local subcontractors will be used which will generate job opportunities for skilled and unskilled workers in addition to professional services of engineers and others

8.5 Socio-economic Benefits

The Project will promote sustainability of water and wastewater infrastructure to be supported by the Project through high standards of O&M and environmental mitigation and management. The project will enhance the infrastructure of the area with respect to waste

water collection and disposal thus enriching the aesthetic appearance of the overall region. The project will promote domestic wastewater management, as a result of discharge their wastewater into the proposed sewer systems.

8.6 Reuse of Treated Effluent

The project will promote water conservation measures such as water reuse that will reduce future increases in water demand. The proposed STP project will ensure beneficial reuse of treated sewage for various uses of industry and agricultural activities in and around the project site. The treated sewage sludge which is rich in organic content would serve as low cost organic manure.

CHAPTER 9 - PUBLIC CONSULTATION

9.1 Public hearing conducted

Public consultation with Public and various stakeholders was conducted on 30.12.2009 at the Central Hall of Salem Municipal Corporation. The details about the proposed STP in Vandipettai were explained to the participants of the meeting. The details of public consultation activities are reported in this chapter.

There are two PAPs as per the minutes of meeting of Grievance Redressal Committee held on 30.12.2009, which may require resettlement or rehabilitation. As per the Chairman of the Grievance Redressal Committee of Salem Corporation, two PAPs were identified and identity cards and monetary compensation has been provided.

The details of public consultation and the notices issued, venue details and list of participants and minutes of meeting is enclosed as Annexure 2.

Annexure – 1
Consnt For Establishment

A. Water Act

By Registered Post with Acknowledgement Due
(This document contains 6 Pages)



TAMILNADU POLLUTION CONTROL BOARD

CONSENT ORDER NO. : DEE/SLM/Estt.0094/W/2011 DATED :26.08.2011

Proceedings No. : F.SLM0451/OL/DEE/TNPCB/SLM/W/2011 dated:26.08.2011.

Sub : Tamil Nadu Pollution Control Board - Consent for Establishment -M/s.
**VANDIPETTAI SEWAGE TREATMENT PLANT, S.F.No.45,Ward F, Block -1,
Shevapet, Village, SALEM Taluk, Salem District-** For the establishment or take
steps to establish the industry under Section 25 of the Water (Prevention and
Control of Pollution) Act, 1974 as amended in 1988 (Central Act 53 of 1988) - Reg.

Ref : 1. Your Application No. --- dated: 13.7.2011
2. DEE I.R. No. : F.SLM0451/OL/DEE /SLM /2011 dated: 16.7.2011
3. Minutes of the XVIIth ZLCCC meeting held on 20.08.2011

Consent to establish or take steps to establish is hereby granted under Section 25 of the Water
(Prevention and Control of Pollution) Act, 1974, as amended in 1988 (Central Act 53 of 1988)
(hereinafter referred to as 'The Act') and the Rules and Orders made there under to

**The Commissioner,
Salem Corporation
M/s VANDIPETTAI SEWAGE TREATMENT PLANT**

(hereinafter referred to as 'The Applicant') authorizing him to establish or take steps to establish
the industry in the site mentioned below:

**S.F.No. 45,Ward, F Block -1,
Shevapet Village
SALEM Taluk
Salem District**

This Consent to establish is valid for **two years** or till the industry obtains consent to operate
under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974, as amended in
1988 whichever is earlier subject to special and general conditions enclosed.

**District Environmental Engineer
Tamil Nadu Pollution Control Board
Salem**

POLLUTION PREVENTION PAYS

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TAMILNADU POLLUTION CONTROL BOARD

(2)

To

The Commissioner,
Salem Corporation,
Fort,
Salem-636 001.

Copy to

1. The Commissioner,
SALEM Corporation
SALEM Taluk
Salem District
2. Copy submitted to the Member Secretary, Tamil Nadu Pollution Control Board, Chennai for
favour of kind information.
3. Spare.

POLLUTION PREVENTION PAYS

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TAMILNADU POLLUTION CONTROL BOARD

(3)
SPECIAL CONDITIONS

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

Sl. No.	Description	Quantity
a Main Products manufactured:		
1.	Treatment of Sewage	44MLD

2. This consent to establish is valid for establishing the facility with the below mentioned outlets for the discharge of sewage/trade effluent. Any change in the outlets has to be brought to the notice of the Board and fresh consent has to be obtained if necessary.

Outlet No.	Description of Outlet	Maximum daily discharge in KLD	Point of disposal
1	Sewage	44000	River Thirumanimutharu

3. The unit shall provide Sewage Treatment Plant and /or Effluent Treatment Plant as indicated below.

Nature of Effluent (1)	Sl. No. (2)	Components of ETP (2)	Nos. (3)	Dimensions (In metres) (4)
Sewage	1	Septic tank	1	3x2.0x2.0
	2	Receiving Chamber	1	5.20x1.50x1.2
	3	Screen Channel	2+2	6.0x1.50x1.10
	4	Inlet Chamber	1	2.9x3.20x3.30
	5	Grit Chamber	2	10.20M dia ,Depth 0.7M
	6	Fab Reactor	4	15x15x4.65
	7	Lamella Clarifier	8	7.4x7.4x2.55
	8	Chlorine Contact Tank	1	26.20x10x3.5
	9	Sludge Sump	1	4.4M dia , 3M depth
	10	RS Collection Sump	1	14.80M dia, 2M Ht.
Trade Effluent - Type of ETP : Not Applicable				

4. Additional Conditions

1. The Corporation shall provide septic tank for the sewage and shall connect the overflow to the Receiving Chamber of STP.
2. The Corporation shall install full fledged Sewage Treatment plant as proposed so as to satisfy the discharge standards prescribed by the Board before commissioning.

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TAMILNADU POLLUTION CONTROL BOARD

(4)

3. The Corporation shall have standby arrangement for all critical components like pumps, blowers, Fab reactor Components etc to ensure continuous and smooth functioning of STP.
4. The Corporation shall provide necessary safety measures like safety kit, chlorine gas leak detecting system with alarm, Eye wash etc for handling chlorine gas cylinders.
5. 25% of the land area acquired by the unit shall be utilized for green belt with trees planted at the rate of 400trees/Hect.
6. The Corporation shall provide rain water harvesting facilities wherever possible to increase the recharge of ground water.
7. The STP operation shall not lead to any public complaint.
8. The unit shall install Electro Magnetic flow meter with computerized recording system at Inlet/ Outlet of STP.
9. The operation of Sewage Treatment Plant shall not give rise to any objectionable odour.
10. Manual cleaning of effluent tanks must be avoided and mechanical means must be adopted. Accumulation of sludge in effluent tanks must be avoided.
11. The Corporation shall be declared the land for a radius 100 metres as no development activities in consultation with DTCP.
12. The Corporation shall develop green belt of 25 metres width all around the proposed Sewage Treatment Plant.
13. No flooding of treated/untreated effluent is permitted in the Sewage Treatment Plant.
14. The quality of treated sewage shall be got analysed regularly once in a month and report shall be furnished to Tamilnadu Pollution Control Board.
15. The Corporation shall provide necessary storm water drain in and around the Sewage Treatment Plant site and ensure that there will not be any water logging.
16. The Corporation shall provide uninterrupted power supply to the Sewage Treatment Plant to operate continuously. The Corporation shall have stand by power supply for operation of Sewage Treatment Plant.
17. The sludge from the centrifuge is in un-digested form. It should be properly handled and disposed off after stabilization. The STP sludge shall be used for green belt development.
18. The screening waste collected from the fine screen and grit removal unit shall properly collected and disposed.

POLLUTION PREVENTION PAYS

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TAMILNADU POLLUTION CONTROL BOARD

(5)

19. The corporation shall have base line on ground quality atleast in 6 location around the Sewage Treatment Plant site in consultation with District Environmental Engineer, Tamilnadu Pollution Control Board, Salem and periodically monitor the ground water quality in the same locations once in six months. The complied data shall be furnished to the District Environmental Engineer once in a year.
20. The Corporation shall provide compound wall on all sides of Sewage Treatment Plant area.
21. The Corporation shall comply with all conditions specified in the NOC.

[Handwritten Signature]
District Environmental Engineer
Tamil Nadu Pollution Control Board
Salem

POLLUTION PREVENTION PAYS

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B. Air Act

By Registered Post with Acknowledgement Due
(This document contains 5 Pages)



TAMILNADU POLLUTION CONTROL BOARD

CONSENT ORDER NO. : DEE/SLM/Estt.0094 /A/2011, DATED : 26.08.2011

Proceedings No. : F. SLM0451/OL/DEE/TNPCB/SLM/A/2011 dated: 26.08.2011

Sub : Tamil Nadu Pollution Control Board - Consent for Establishment -M/s.

VANDIPETTAI SEWAGE TREATMENT PLANT, S.F.No. 45 Ward F, Block -1, Shevapet Village, SALEM Taluk, Salem District, - For the establishment or take steps to establish the Industry under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981, as amended in 1987 (Central Act, 14 of 1981)- Reg.

- Ref:** 1. Your Application No. -- dated: 13.7.2011
2. DEE I.R. No. : F.SLM0451/ OL/DEE/ SLM/2011 dated: 16.7.2011
3. Minutes of the XVth ZLCCC meeting held on 20.08.2011

Consent to establish or take steps to establish is hereby granted under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981, as amended in 1987 and the Rules and Orders made there under to

**The Commissioner,
Salem Corporation,
M/s VANDIPETTAI SEWAGE TREATMENT PLANT**

(hereinafter referred to as 'The Applicant') authorizing him/her/them to establish or take steps to establish the industry in the site mentioned below:

**S.F.No. 45, Ward F, Block -1
Shevapet Village
SALEM Taluk
Salem District**

This Consent to establish is valid for **two years** or till the industry obtains consent to operate under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981, as amended in 1987 whichever is earlier subject to special and general conditions enclosed.

**District Environmental Engineer
Tamil Nadu Pollution Control Board
Salem**

POLLUTION PREVENTION PAYS

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TAMILNADU POLLUTION CONTROL BOARD

(2)

To

The Commissioner,
Salem Corporation,
Fort,
Salem-636 001.

Copy to

1. The Commissioner,
SALEM Corporation
SALEM Taluk
Salem District
2. Copy submitted to the Member Secretary, Tamil Nadu Pollution Control Board, Chennai for
favour of kind Information.
3. Spare.

POLLUTION PREVENTION PAYS

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TAMILNADU POLLUTION CONTROL BOARD

(3)

SPECIAL CONDITIONS

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

Sl. No.	Description	Quantity
a	Main Products manufactured:	
1.	Treatment of Sewage	44MLD

2. This consent to establish is valid for establishing 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 has to be obtained if necessary.

Sl. No.	Source of Emission	APC measures to be provided	Point of Discharge- Stack height (In metres)	Additional facilities to be provided	Maximum discharge in cubic metre/hr.
1.	Get Set 1000 KVA	Stack with Acoustic measures	5		

3. Additional conditions.

1. The Corporation shall provide APC measures as proposed to DG set so as to achieve AAQ/Emission standards prescribed by the Board.
2. The Corporation shall provide necessary safety measures like safety kit, chlorine gas leak detecting system with alarm, Eye wash etc for handling chlorine gas cylinders.
3. 25% of the land area acquired by the unit shall be utilized for green belt with trees planted at the rate of 400trees/Hect.
4. The Corporation shall provide rain water harvesting facilities wherever possible to increase the recharge of ground water.
5. The STP operation shall not lead to any public complaint.
6. The operation of Sewage Treatment Plant shall not give rise to any objectionable odour.

POLLUTION PREVENTION PAYS

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TAMILNADU POLLUTION CONTROL BOARD

(4)

7. The Corporation shall ensure that 100 metres around the Sewage Treatment Plant site shall be declared as no-development zone and green belt shall be developed in this zone. A minimum of 25 m width of green belt must be developed with tall trees all around Sewage Treatment Plant site to attenuate odour nuisance. A tick green belt shall also be developed all side so as to arrest noise and odour nuisance to the residents.
8. The Corporation shall comply with all the conditions specified in the NOC.

[Signature]
District Environmental Engineer
Tamil Nadu Pollution Control Board
Salem

POLLUTION PREVENTION PAYS

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(5)

GENERAL CONDITIONS

1. The above consent to establish cannot be construed as consent to operate and the unit shall not commence the operation without obtaining the Consent to operate.
2. The applicant shall make a request for grant of consent to operate at least thirty days, before the commissioning of trial production.
3. Any Change in the details furnished in the conditions has to be brought to the notice of the Board and got approved by the Board, before obtaining consent to operate under the said Act.
4. The unit has to comply with the provisions of Public Liability Insurance Act, 1991 to provide immediate relief in the event of any hazard to human beings, other living creatures/plants and properties while handling and storage of hazardous substances (wherever applicable).
5. Consent to operate will not be issued unless the unit complies with the conditions of consent to establish,
6. The unit shall provide adequate water sprinklers for the control of dust emission during the loading and unloading of construction material so as to minimize the dust emission.
7. The unit shall provide water sprinklers along the temporary roads inside the premises to avoid fugitive dust emission during the vehicle movements.
8. The unit shall develop green belt of adequate width around the premises
9. In case there is any change in the management, the unit shall inform the change with relevant documents immediately.

**District Environmental Engineer
Tamil Nadu Pollution Control Board
Salem**

POLLUTION PREVENTION PAYS

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சேலம் மாநகராட்சி

அனுப்புநர்

பெறுநர்

திரு. மு.ஜெயராமன், எம்.லாம்.,எம்.பி.ஏ.,
ஆணையாளர்,
சேலம் மாநகராட்சி,
சேலம்.

நகராட்சி நிர்வாக ஆணையர்,
எழிலகம்,
சென்னை.

ந.க.எண்.இ2/2304/2000

நாள்: 0201.2008

அய்யா,

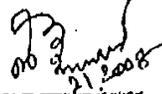
பொருள்: சேலம் மாநகராட்சி - பாதாளச்சாக்கடை திட்டம் - நவீன கத்திகரிப்பு நிலையம் அமைத்தல் - பொது மக்கள் கருத்து - கூட்டம் - தொடர்பாக.

பார்வை: 15.12.2007 - அன்று மாநகராட்சி அலுவலகத்தில் நடைபெற்ற கருத்துரு கூட்டம்.

சேலம் மாநகரில், பாதாளச் சாக்கடைத் திட்டத்திற்கென நவீன கத்திகரிப்பு நிலையங்கள் கொள்ளக் கூடாது, மாண்கூட்டை, அணைமேடு, வண்டிப்பேட்டை ஆகிய நான்கு இடங்களில் அமைப்பதற்காக பொதுமக்களின் கருத்தை அறிய பார்வையின்படி கருத்துருக் கூட்டம் நடைபெற 14.11.2007-ல் தினத்தந்தி நாளிதழில் அறிவிப்பு செய்யப்பட்டு, மேற்கண்ட நாளில் கருத்துரு கூட்டம் நடைபெற்றது. மேற்கண்ட இக்கூட்டத்தில் நகரில் பலப்பகுதிகளில் இருந்து பொதுமக்களும், மாமன்ற உறுப்பினர்களும், பத்திரிக்கையாளர்களும், தொலைக்காட்சியாளரும் கலந்து கொண்டனர். இக்கூட்டத்தில் பொதுமக்களுக்கு பாதாள சாக்கடைத் திட்டம் அமைவது குறித்த அவசியத்தினையும் அதன் விபரங்களையும் தெளிவாக எடுத்துரைக்கப்பட்டது. பொது மக்களும் மேற்படி திட்டத்திற்கு பெரும் ஆதரவு தெரிவித்தும், மேற்படி கூட்டத்தின் செயல்முறைகள், மற்றும் பத்திரிக்கை செய்திகள், ஆகியவற்றினை இத்துடன் இணைத்து தகவலுக்காக பணிநிறுப்புகிறது.

(ஓம்) மு. ஜெயராமன்,
ஆணையாளர்,
சேலம் மாநகராட்சி.

// உண்மை நகல் :


21.12.2007
ஆணையருக்காக,
சேலம் மாநகராட்சி.

- இணைப்பு: 1. 14.11.07-ம் தேதிய தினத்தந்தி நாளிதழ் நகல்.
2. 16.12.07-ம் தேதிய தினசாரன் மற்றும் காலக்கதிர், நகல்கள்
சென்னை, 9212 சாட், 9212 சாட், 9212 சாட், 9212 சாட்
3) ரிபத்தின் கலந்து கலந்து கலந்து கலந்து கலந்து
நகல்: தலைமை செயல் அலுவலர்,
தமிழ்நாடு நகர்ப்புற உள்கூட்டமைப்பு நிதிச்சேவை நிறுவனம்,
சென்னை, தகவலுக்காக.

14.11.2007

செவ்வாய்

2011-ல் மப்போம் தாஸ் பேட்டி



ராமதாஸ்

நிழ்பது பாட்டாளி மக்கள் கட்சி தான் இந்த ஆட்சியில் நாங்கள் பொறுப்புள்ள, தோழமை உணர்வுள்ள எதிர்க்கட்சியாக செயல்பட்டு வருகிறோம். ஆனால் எதிரி கட்சியாக அல்ல.

காவிரி பிரச்சினை தீர்ந்து

கடிகழ்ச்சிக்கு ஒரு கொட்டு

தண்ணீர் கட்டுகொடுக்கக் கூடாது என்பதில் கர்நாடகத்தில் உள்ள அரசியல் கட்சிகள் ஒருமித்த கருத்து கொண்டுள்ளன. எனவே கர்நாடகாவில் புதிதாக பதவி ஏற்க உள்ள முதல்-மந்திரியினால் காவிரி நீர் பிரச்சினைக்கு எப்போதும் தீர்வு ஏற்பட போவதில்லை.

தமிழகத்தில் வருகிற 2011-ம் ஆண்டு வரை தி.மு.க. ஆட்சி தொடரும். அதாவரை எங்கள் ஆதரவு உண்டு. இலங்கை பிரச்சினைக்கு உடனே தீர்வு காண வேண்டும். இலங்கை பிரச்சினை தீர் மத்திய அரசுக்கு கலைஞர் அழுத்தம் கொடுக்க வேண்டும். இது தொடர்பாக அவருக்கு நான் ஒரு கடிதம் எழுதியுள்ளேன். கலைஞர் தயவில் மத்திய அரசு உள்ளது. இதனால் கலைஞர் முயற்சி எடுத்து மத்திய அரசுக்கு அழுத்தம் கொடுத்தால் இந்த பிரச்சினைக்கு தீர்வு காணலாம்.

வவகோ கைது பற்றி நான் கருத்து சொல்ல விரும்பவில்லை. விவசாயிகள் விளைவிக்கப்படும் பொருட்களுக்கு அவர்களே விலை நிர்ணயம் செய்யும் வரை விவசாயி வாழ முடியாது. விவசாயிகள் தற்கொலை செய்து கொள்வது தற்போது அதிகரித்துக் கொண்டு உள்ளது. தமிழகத்தில் விவசாயிகள் தற்கொலை செய்து கொள்வது பற்றி புகார்

செய்யப்படுவதில்லை. இவ்வாறு டாக்டர் ராமதாஸ் கூறினார். பேட்டியின் போது

பாட்டாளி மக்கள் கட்சி மாநில தலைவர் ஜி.கே.மணி மற்றும் பலர் உடன் இருந்தனர்.

சேலம் மாநகராட்சி பாதாள சாக்கடை திட்டம்

சேலம் மாநகராட்சியின் பகுதிகளில் நிறைவேற்றப்பட்ட உள்ள பாதாள சாக்கடை திட்டத்தின் கீழ் புதிய தொழில் நுட்பத்துடன் கூடிய நவீன கழிவுநீர் சுத்திகரிப்பு நிலையங்கள் மாநகரின் வெள்ளக்குட்டை, வண்டிப்பேட்டை, மாங்குட்டை மற்றும் அணைமேடு ஆகிய நான்கு இடங்களில் அமைக்க உத்தேசிக்கப்பட்டுள்ளது. மேற்படி பகுதிகளில் புதிய தொழில்நுட்பத்துடன் கூடிய நவீன கழிவுநீர் சுத்திகரிப்பு நிலையங்கள் அமைத்தல் தொடர்பாக பொதுமக்களது கருத்தினை அறிய 15.12.2007 அன்று காலை 11.00 மணி அளவில் மாநகராட்சி மைய அலுவலகத்தில் உள்ள கூட்ட அரங்கத்தில் பொதுமக்களுடன் ஒரு கலந்துரையோசனை கூட்டம் நடத்தப்பட உள்ளது. எனவே மேற்படி கூட்டத்தில் சம்மந்தப்பட்ட பகுதி பொதுமக்கள் கலந்து கொண்டு தங்களது கருத்துக்களை தெரிவிக்குமாறு கேட்டுக்கொள்ளப்படுகிறது.

ஆணையருக்காக,
சேலம் மாநகராட்சி.

எட்டுயர்வே நட்டுயர்வு! நட்டுயர்வே நட்டுயர்வு!
உஞ்சனை: 234410

S.1300, உஞ்சனை மேட்டுப்பாளையம்
வநாடக்க வேளாண்மை கூட்டுறவு வங்கி லிட.,
மேட்டுப்பாளையம், குமாரமங்கலம் அஞ்சல் - 637 205,
திருச்செங்கோடு வட்டம், நாமக்கல் மாவட்டம்.

பேரவைக்கூட்ட அறிவிப்பு
S.1300 உஞ்சனை மேட்டுப்பாளையம் தொடக்க வேளாண்மை கூட்டுறவு வங்கியின் பேரவைக்கூட்டம் வங்கி கூட்டத்தில் 2007-ம் ஆண்டு நவம்பர் மாதம் 24-ந்தேதி சனிக்கிழமை காலை 10.00 மணிக்கு கீழ்க்காணும் பொருட்களைப்பற்றி ஆலோசிக்கப்படும். அடியாவும் 'A' வகுப்பு உறுப்பினர்கள் அனைவரும் தயாராக கலந்து கொள்ள கேட்டுக்கொள்ளப்படுகிறார்கள்.

- பொருட்கள்:**
- 1) 2004-05, 2005-06-ம் ஆண்டு தனித்தனி அறிக்கையினை வாசித்து பதிவு செய்தல்.
 - 2) 2004-05, 2005-06, 2006-07-ம் ஆண்டு ஆண்டறிக்கை வரவு செலவு வாசித்து அங்கீகரித்தல்.
 - 3) நல்லு வங்கி 2004-05-ம் ஆண்டு அடைந்த திகர வாய்ப்பு ரூ.380258.88ஐ கூட்டுறவு சங்கங்களின் சட்டம் விதிகளின்படி இலாப பிரிவினை செய்தல்.
 - 4) நல்லு வங்கி 2005-06-ம் ஆண்டு அடைந்த திகர இலாபம் ரூ.423990-22ஐ கூட்டுறவு சங்கங்களின் சட்டம் விதிகளின்படி இலாப பிரிவினை செய்தல்.
 - 5) 2005-06-ம் ஆண்டு மீ. தொழில் காட்டுகளை செலவுவிவரங்களை விட

தெற்கு ரயில்வே அறிக்கை

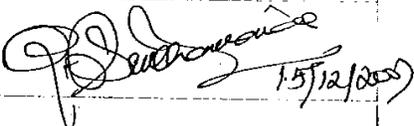
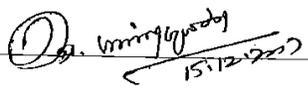
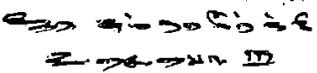
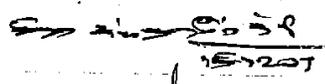
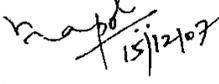
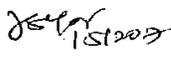
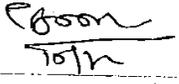
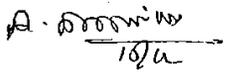
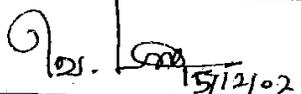
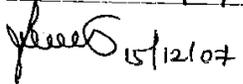
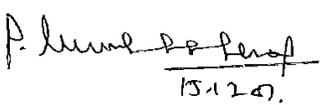
பொருள் : தொழிற்சங்கங்களை அங்கீகரிப்பதற்கான இரகசிய வாக்கெடுப்பு - தபால் மூலமான வாக்கெடுப்பு வசதி
ரயில்வே வாரியத்தின் கடிதம் எண். 2007/SBC/Rev5 தேதி 24-7-2007 என்பதற்கிணங்க பதிவு பெற்ற ரயில்வே தொழிற்சங்கங்களுக்கு அங்கீகாரம் அளிப்பதற்கான இரகசிய வாக்கெடுப்பானது 26-11-2007, 27-11-2007 மற்றும் 28-11-2007 ஆகிய தேதிகளில் நடைபெற உள்ளது. 01-07-2007 அன்றுள்ளபடி ரயில்வே நிர்வாகத்தின் பணியிலுள்ள திரத்தர குழு 'C' மற்றும் குழு 'D' பணியாளர்களின் வாக்காளர் பட்டியல் ஒன்று தயாரிக்கப்பட்டு <http://10.5.2.32> ("Voters list") என்ற தோரம் (பேஜி) என்ற இணைய தள முகவரியின் கீழ் ரயில்தெட்டில் அப்போது செய்யப்பட்டுள்ளது.

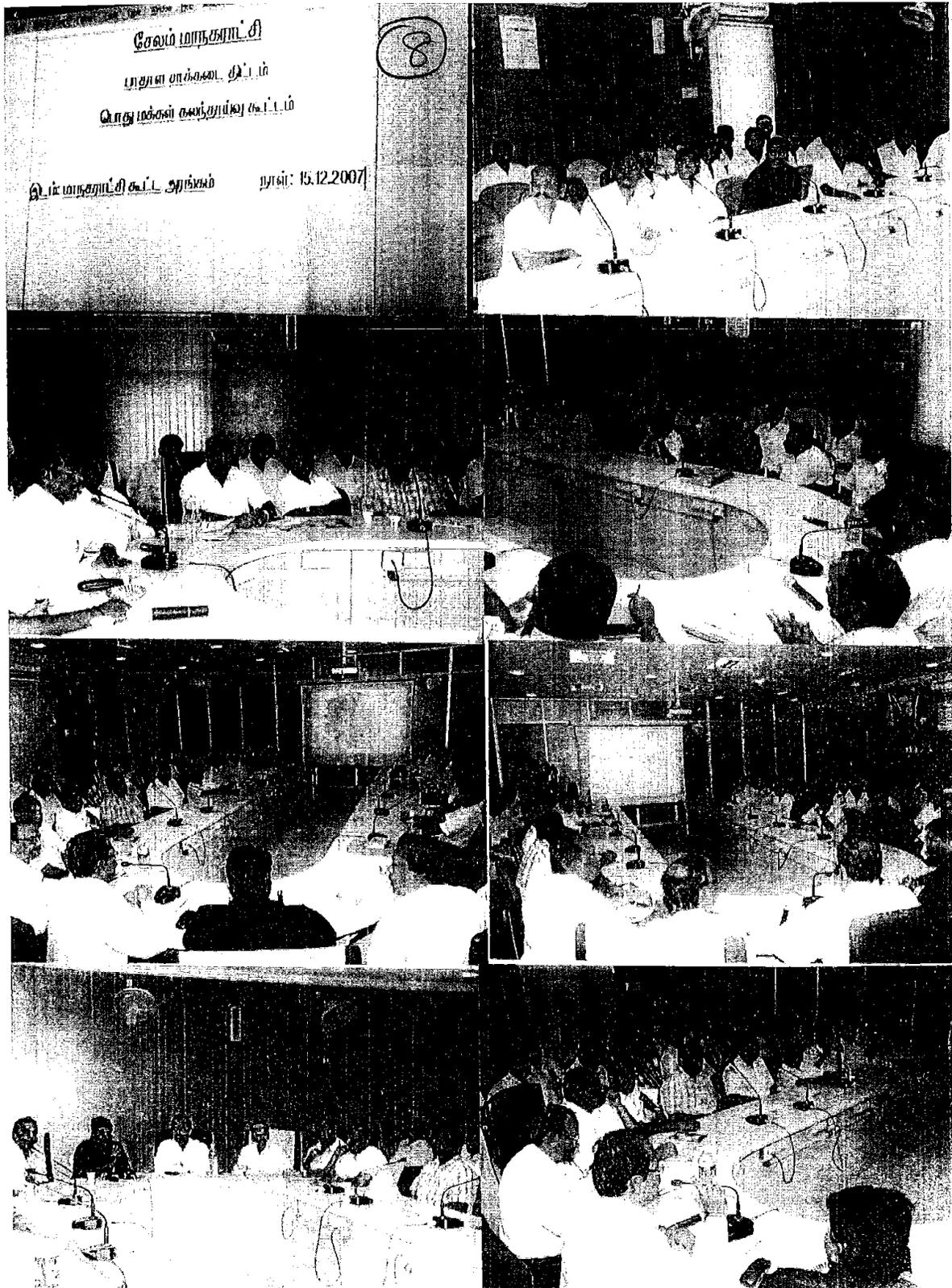
- மேற்கண்ட தேர்தலை முன்னிட்டு கீழ்க்கண்ட பணியாளர் பிரிவுகளுக்கு தபால் மூலமான வாக்கெடுப்பு வசதியும் உண்டு
- 1) வேறு பணியில் (Deputation) உள்ள பணியாளர்கள்.
 - 2) எந்த பயிற்சி மையங்களிலும் பல்வேறு பயிற்சி அமர்வுகளை மேற்கொள்ளும் பணியாளர்கள்.
 - 3) தேர்தல் நடைபெறும் இந்த மூன்று நாட்களிலும் தியூக்கப்பட்ட தலைமையகத்திலிருந்து வெளியே வெகு தொலைவு செல்லும் ரயில்களில் பணிபுரியும்/பாதுகாப்பு பணி மேற்கொள்ளும்/பல்வேறு வசதிகளை வழங்கும் பணியாளர்கள்.
 - 4) ரயில்வே மருத்துவமனையில் சேர்க்கப்பட்டு சிகிச்சையை பெறும் பணியாளர்கள்.
- தபால் மூலம் வாக்களிக்கும் வசதியைப் பெறும் தகுதியுள்ள பணியாளர்கள் அங்கீகரிக்காத கோரிக்கையை தக்க பணி விபரங்களுடன் 15-11-2007 அன்றோ அல்லது அதற்கு முன்னரே சம்பந்தப்பட்ட தலைமை திணைகளை அறிவிப்பில் உட்படுத்தலாம். இந்த கோரிக்கையை சம்பந்தப்பட்ட

சேலம் மாநகராட்சியின் பகுதிகளில் நிறைவேற்றப்பட உள் பாதாள வடிகால் திட்டத்தின் கீழ் புதிய தொழில் நுட்பத்துடன் கூடிய நவீன கழிவு நீர் சுத்திகரிப்புநிலையங்கள் மாநகரின் வெள்ளக்குட்டை, வண்டிடிப்பேட்டை, மான் குட்டை மற்றும் அணைமேடு பகுதியில் அமைக்க உத்தேசிக்கப்பட்டுள்ளது. புதிய தொழில் நுட்பத்துடன் அமைக்கப்படவுள்ள நவீன கழிவு நீர் சுத்திகரிப்பு நிலையம் அமைத்தல் தொடர்பான பொதுமக்கள் கருத்தினை அறிய 15.12.2007ம் தேதி காலை 11 மணி அளவில் மாநகராட்சி மைய அலுவலகத்தில் நடைபெற்ற கலந்துரையாடல் கூட்டத்தில் கலந்து கொண்டவர்கள்

வ.எண்	பெயர் மற்றும் விலாசம்	கையேப்பம்
1	தி.நா. மனோரயன் 352 மாலாதிருவர் 23வது கோட்டம்	தி.நா. மனோரயன்
2	அ. கோபாலன் 271. அம்லாதிருவர் 23வது கோட்டம்	A. Anpalan
3	அ. க. குமாரசண்மணி காமநாதகாவலன் 23வது கோட்டம்	A.K.Punith
4	சி. மாரணசாமி 233. கண்ணகிவாடி 23வது கோட்டம்	C. Maran
5	சி. சண்முகம் 4வது வது 23வது கோட்டம்	C. Shanmugam
6	தி. அண்ணாசாமி தி. தி. அண்ணாசாமி கோட்டம் - 5	T. Annasami
7	P. சாமி தி. அண்ணாசாமி 23வது கோட்டம்	P. Sathi
8	M. சத்திரவேல் காமநாதகாவலன் 23வது கோட்டம்	M. Sathiravel
9	அ. சண்முகம், Mr. S. S. S. காமநாதகாவலன், கோட்டம்	A. Shanmugam
10	P. சண்முகம் Shanmugam Narasimman chetty road Salem - 2	P. Shanmugam
11	S. Shanmuga Sundaram 3164 moolapillaiyan kovils, Salem - 636002	S. Shanmuga Sundaram
12	P. Shanmuga Sundaram Narasimman chetty road Salem - 2	P. Shanmuga Sundaram
13	Venkabash shevapet salem - 2	Venkabash

தொழில்நுட்ப அலுவலர்கள்

SL. NO.	தலைப்பு மற்றும் பதவி	கையெழுத்து
1.	M. சிவசுந்தரம் தலைவர்	
2.	R. சிவசுந்தரம் தலைவர் (அ) II	 15/12/2007
3.	A. Ramesh Kumar தலைவர் II	A. Ramesh Kumar 15/12/07
4.	D. சிவசுந்தரம் B. சிவசுந்தரம் (அ) II	 15/12/2007
5.	S. சிவசுந்தரம் தலைவர் I	
6.	 தலைவர் II	 15/12/07
7.	V. Rajendran தலைவர் (அ) II தலைவர்	 15/12/07
8.	N. சிவசுந்தரம் தலைவர்	 15/12/07
9.	G. Ramadoss Asst. Exe. Engineer	 15/12/07
10.	K. Ravichandran Sanitary Inspector	 15/12/07
11.	V. Balu Sanitary Inspector	 15/12/07
12.	I. Subramani Assistant Engineer	 15/12/07
13.	P. Voss Asst. Engineer	 15/12/07
14.	P. Mohideen Abdul Kader Asst. Engineer	 15/12/07



SALEM CORPORATION

Annexure I

Details of Public Hearing/Stakeholder Consultation
(Duly Co-ordinated by the ULBs)

Date : 09.10.10
 Venue : At Mankuttai area
 Advertisement published in Newspapers :-
 National :-
 Vernacular :-
 Date of Advertisement :-
 Composition of the Stakeholder consultation Panel :
 Number of Stakeholders / Participants : 26
 Discussion during the public hearing : Construction of STP at Mankuttai

S.No	Issues raised	Response of the borrower/ULB to the issues	Comments
	Enclosed	Enclosed	Enclosed

S.No	Issues raised	Response of the borrower/ULB to the issues	Comments
1)	ஏற்கனவே இந்த பகுதியில் சாக்கடை சுத்திகரிப்பு நிலையம் கட்டுவதாக கூறி இப்படிப்பட்ட கூட்டம் நடைபெற்றது, ஏன் மறுபடியும் இங்கு நடைபெறுகிறது	ஆணையாளர் சேலம் மாநகராட்சி	ஏற்கனவே தேர்வு செய்யப்பட்ட இடத்திற்கு பதில் அதனை ஒட்டி அதன் அருகில் உள்ள இடத்தில் சுத்திகரிப்பு நிலையம் கட்ட உள்ளதால் உங்களது கருத்தினை அறிய இந்த கூட்டம் கூட்டப்பட்டுள்ளது.
2)	இந்த கழிவு நீர் சுத்திகரிப்பு நிலையம் கட்டப்பட்டால் மொத்த கழிவு நீர் இங்கு தேங்கி சுத்திகரிக்கப்படுவதாக தெரிகிறது இதனால் கொக பிரச்சனை வருமா. இதர விபாதிகள் வருமா?	ஆணையாளர் சேலம் மாநகராட்சி	இப்பகுதியில் தற்போது தேங்கியுள்ள கழிவு நீரால் இப்பகுதியில் தாங்கள் கூறுவது போல சுகாதாரமற்றதாக இருப்பதை இங்கு கட்டப்படும் நவீன சுத்திகரிப்பு நிலையத்தால் வரக்கூடிய கழிவு நீர் தேக்கி வைக்காமல் உடனடியாக சுத்திகரிக்கப்பட்டு வெளியேற்றப்படவுள்ளது. இதன்காரணமாக இவ்விடம் சுத்தமாக இருக்கும் விபாதிகள் ஏதும் வராது
3)	கழிவு நீர் சுத்திகரிக்கும் போது நாற்றம் வருமா?	ஆணையாளர் சேலம் மாநகராட்சி	நவீன முறையில் சுத்திகரிக்கப்படுவதால் துர்நாற்றம் வராது.

S.No	Issues raised	Response of the borrower/ULB to the issues	Comments
4)	அருகில் உள்ள குடியிருப்பு பகுதியில் உள்ளவர் சுத்திகரிப்பு நிலையத்தை கடந்து போவதால் ஏதேனும் பிரச்சனை உள்ளதா?	ஆணையாளர் சேலம் மாநகராட்சி	அருகில் உள்ள குடியிருப்புகளுக்கோ அப்பகுதியில் வசிப்பவர்களுக்கோ சுத்திகரிப்பு நிலையத்தினால் எந்த பிரச்சனையும் இல்லை
5)	விஞ்ஞான முறையில் சுத்திகரிப்பு செய்வதால் என்ன பயன்?	ஆணையாளர் சேலம் மாநகராட்சி	விஞ்ஞான முறையில் சுத்திகரிப்பதால் சுற்றுபுறம் /சுகாதாரம் /காற்று /நிலம் மாகபடாமல் இருக்கும்
6)	கழிவு நீர் தேக்கி வைத்தால் இங்கு மண்ணின் தன்மை பாதிக்காதா?	ஆணையாளர் சேலம் மாநகராட்சி	கழிவு நீர் மண்ணில் தேக்கிவைக்கப்படுவதில்லை வரக்கூடிய கழிவு நீர் உடனடியாக நவீன முறையில் சுத்திகரிக்கப்படும் எனவே மண்ணின் தன்மை பாதிக்காது.
7)	எப்போது இங்கு கட்டிடம் கட்டி சுத்தம் செய்யப்படும்	ஆணையாளர் சேலம் மாநகராட்சி	கட்டிடம் உடனடியாக கட்டப்பட உள்ளது. இரண்டு வருடங்களில் கட்டி முடிக்க உத்தேசிக்கப்பட்டுள்ளது.
8)	ஊரில் உள்ள அனைத்து பகுதி சாக்கடை நீர் இங்கு கொண்டு வருவார்களா? எதற்கு இந்த பகுதி ஏன் தேர்ந்தெடுத்தார்கள்,	ஆணையாளர் சேலம் மாநகராட்சி	சேலம் மாநகரத்தில் அனைத்து பகுதி சாக்கடை நீரும் இங்கு வராது. மேலும் நான்கு இடங்களில் சுத்திகரிப்பு நிலையம் கட்டப்படவுள்ளது. இவற்றில் ஒரு சுத்திகரிப்பு நிலையம் இங்கு அமைக்கப்படவுள்ளது. நில அமைப்புக்கு ஏற்ப கழிவு நீர் குழாய்களில் சேகரம் செய்யப்படும் கழிவு இயற்கையாகவே தாழ்வான இப்பகுதிக்கு ஏற்ப உள்ளதால் இப்பகுதி தேர்வு செய்யப்பட்டுள்ளது
9)	எங்களுடைய போர் வெல் பாதிக்குமா.	ஆணையாளர் சேலம் மாநகராட்சி	சுத்திகரிப்பு நிலையம் அமைப்பதால் நிலத்தடி நீர் பாதிக்காது.
10)	கழிவு நீர் எப்படி பிரித்து அனுப்புவீர்கள்.	ஆணையாளர் சேலம் மாநகராட்சி	இதற்கான நவீன இயந்திரங்கள் மூலம் சுத்திகரிக்கப்பட்டு சுத்திகரிக்கப்பட்ட நீர் தனியாக வெளியேற்றப்படும் கழிவுகளில் பொருட்கள் தனியாக பிரித்து எடுக்கப்படும்.
11)	பாதாள சாக்கடை திட்டம் என்றால் என்ன?	ஆணையாளர் சேலம் மாநகராட்சி	கழிவு நீர் நிலத்திற்கு அடியில் குழாய்கள் மூலம் கொண்டு சென்று சுத்திகரிக்கப்படுவதற்கு பாதாள சாக்கடை திட்டம் எனப்படும். இதனால் சுற்றுபுறம் மாகபடாமல் சுகாதாரமாக இருக்கும்.
12)	சுத்திகரிப்பு நிலையம் அமைத்தால் இப்பகுதி சுத்தமடையுமா?	ஆணையாளர் சேலம் மாநகராட்சி	தற்போது குப்பையும் கூளமுமாக உள்ள இந்த இடம் சுத்திகரிப்பு நிலையம் அமைவதால் இடம் சுத்தமாவதுடன் இதனை ஒட்டியுள்ள இதர பகுதிகளும் சுத்தமாக இருக்கும்.
13)	கழிவு நீர் சுத்தப்படுத்தி எங்கே விடுவீர்கள்?	ஆணையாளர் சேலம் மாநகராட்சி	கழிவு நீர் சுத்தப்படுத்தி குழாய் மூலம் வெளியேற்றி இங்கு அருகில் உள்ள ஓடையின் மூலம் திருமணி முத்தாற்றில் கொண்டு சென்று விடப்படும்.
14)	இத்திட்டம் செயல்படுத்தினால் இப்பகுதி சுற்றுபுறம் சுகாதாரமாக இருக்கும் என்பதால் எங்களுக்கு ஆட்சேபனை இல்லை.	ஆணையாளர் சேலம் மாநகராட்சி	இத்திட்டத்தினை செயல்படுத்திட நீங்கள் முழு ஒத்துழைப்பு கொடுப்பதினால் விரைவில் இவ்விடத்தில் பொதுமக்களுக்கு பயன்படும் சுத்திகரிப்பு நிலையம் கட்டி இடத்தினையும் சுற்றுப்புறத்தினையும் சுகாதாரமாக ஆக்குவோம் என தெரிவிக்கப்பட்டது.

