# TOR Compliance & Draft Environmental Impact Assessment Report

## For

**"DEVELOPMENT OF AN INDUSTRIAL PARK AT ALLIKULAM, KEELATHATTAPARAI, PERURANI, UMARIKOTTAI, MELATHATTAPARAI, RAMASAMYPURAM AND THERKUSILLUKKANPATTI VILLAGES, THOOTHUKUDI TALUK, THOOTHUKUDI DISTRICT, TAMIL NADU OVER AN EXTENT OF 796.240 HECTARES (1966.713 ACRES)"**

At

Villages : Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram & Therkusillukkanpatti Villages, Taluk & District :Thoothukudi Taluk, Thoothukudi District
State : Tamil Nadu.

**ToR File No: 10/19/2025-IA.III Dated on 21/09/2025**

**Plot Area:** 796.240 Ha

**Baseline Season**: March 2025– May 2025 (Summer Season)

**Laboratory Assigned:** M/s. Perfact Researchers Pvt Ltd., vide Certificate No. TC-6993, valid up to 03.04.2029

**Activity and Category As per EIA Notification, 2006:**

Schedule 7(c) – Industrial estates/Park/Areas falls under Category "A", Area exceeding 500 ha along with one pre-defined Schedule 5(d) Category 'B' Industry within the proposed Industrial Park

## Project Proponent

**M/s. STATE INDUSTRIES PROMOTION CORPORATION OF TAMILNADU LIMITED (SIPCOT)**

19-A, Rukmani Lakshmipathy Road Egmore, Chennai - 600008.

## Environmental Consultant

**M/s.Perfact EnviroSolutions Pvt. Ltd. (PESPL)**
(NABET Registered List of Accredited Consultant Organisations/NABET/EIA/ 22-28/ RA 0467 Valid Upto 26/11/2028)
**Registered Address:-** Perfact House, A 14, Shubham Enclave (Outer Ring Road), Paschim Vihar, New Delhi 110063
**Regional Office Address:-** 4th Floor, Kochar Bliss, Thiru. V. Ka. Industrial Estate, Guindy, Chennai 600032.

## Project Consultant

**M/s. ITCOT Limited.,**

**Address :** 50-A, Greams Road, Murugesa Naicker Complex, Chennai 600 006

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भारतीय गुणवत्ता परिषद्
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NABET

# National Accreditation Board for Education and Training

# Certificate of Accreditation

**Perfact EnviroSolutions Pvt. Ltd, Delhi**

A-14, Shubham Enclave (Outer Ring Road) Paschim Vihar, New Delhi 110063

Perfact EnviroSolutions Pvt. Ltd, Delhi *is Re-Accredited (RA5)* ***as Category-A organization*** *under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations (Version 3), for the preparation of EIA/EMP reports in the sectors listed below, as per the specified categories*

| S. No | Sector Description | Sector (as per) | | Cat. |
|---|---|---|---|---|
| | | NABET | MoEFCC | |
| 1. | Mining of minerals including opencast / underground mining | 1 | 1 (a) (i) | A |
| 2. | Offshore and onshore oil and gas exploration, development & production | 2 | 1 (b) | A |
| 3. | Thermal power plants | 4 | 1 (d) | A |
| 4. | Mineral beneficiation | 7 | 2 (b) | A |
| 5. | Metallurgical industries (ferrous & non-ferrous) | 8 | 3 (a) | A |
| 6. | Cement plants | 9 | 3 (b) | A |
| 7. | Coke oven plants | 11 | 4 (b) | A |
| 8. | Chlor-alkali industry | 13 | 4 (d) | A |
| 9. | Leather/skin/hide processing industry | 15 | 4 (f) | A |
| 10. | Pesticides industry and pesticide specific intermediates (excluding formulations) | 17 | 5 (b) | A |
| 11. | Manmade fibers manufacturing | 19 | 5 (d) | A |
| 12. | Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes) | 20 | 5 (e) | A |
| 13. | Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates) | 21 | 5 (f) | A |
| 14. | Distilleries | 22 | 5 (g) | A |
| 15. | Sugar Industry | 25 | 5 (j) | B |
| 16. | Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive areas including LNG terminal | 27 | 6 (a) | A |
| 17. | Air ports | 29 | 7 (a) | A |
| 18. | Industrial estates/ parks/ complexes/areas, export processing Zones(EPZs), Special Economic Zones(SEZs), Biotech Parks, Leather Complexes | 31 | 7 (c) | A |
| 19. | Common hazardous waste treatment, storage and disposal facilities (TSDFs) | 32 | 7 (d) | B |
| 20. | Bio-medical waste treatment facilities | 32A | 7(d a) | B |
| 21. | Aerial ropeways | 35 | 7 (g) | A |
| 22. | Common Effluent Treatment Plants (CETPs) | 36 | 7 (h) | B |
| 23. | Common Municipal Solid Waste Management Facility (CMSWMF) | 37 | 7 (i) | B |
| 24. | Building and construction projects | 38 | 8 (a) | B |
| 25. | Townships and Area development projects | 39 | 8 (b) | B |

***Note: Names of approved experts and sectors are mentioned in RAAC minutes dated November 27, 2025, posted on QCI-NABET website.***

*The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/25/3983 dated December 04, 2025. The accreditation needs to be renewed before the expiry date by Perfact EnviroSolutions Pvt. Ltd, Delhi following due process of assessment.*

**Valid up to**
**November 26, 2028**

**Issue Date**
**December 04, 2025**

**Certificate No.**
**NABET/EIA/25-28/RA 0467**

Varinder S Kanwar

**Prof (Dr) Varinder S Kanwar**
**(CEO – NABET)**

*For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.*

National Accreditation Board for Testing and Calibration Laboratories

NABL

# CERTIFICATE OF ACCREDITATION

## PERFACT RESEARCHERS PVT. LTD

has been assessed and accredited in accordance with the standard

## ISO/IEC 17025:2017

## "General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

506-507, 5TH FLOOR, NN MALL, MANGALAM PLACE, SEC 3, ROHINI, NEW DELHI, DELHI, INDIA

in the field of

## TESTING

**Certificate Number:** TC-6993

**Issue Date:** 04/04/2025 **Valid Until:** 03/04/2029

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of thislaboratory, you may also visit NABL website www.nabl-india.org)

**Name of Legal Entity:** PERFACT RESEARCHERS PVT. LTD

**Signed for and on behalf of NABL**

Anuja Anand
Director

N. Venkateswaran
Chief Executive Officer

Declaration by EIA Coordinator & Experts Contributing to the EIA "Development of an Industrial Park over an extent of 796.240 hectares (1966.713 acres) at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu" by M/s State Industries Promotion Corporation of Tamilnadu Limit

I hereby declare that I was involved in the following EIA Report submitted to MoEFCC, as EIA Coordinator. I further certify that the data given in this report is true and correct to the best of my knowledge.

**EIA Coordinator:**

| **Name** | **Mrs. Rachna Bhargava** | **Mr. Praveen Bhargava** | **Mr. Partho Mukherjee** | **Mr. Muthukumaran Ganpathi Narayanan** |
|---|---|---|---|---|
| | 7(c) Industrial Estates/ Parks/ Complexes/ Areas, Export Processing Zones (EPZS), Special Economic Zones (SEZS), Biotech Parks, Leather Complexes. | 5(d) Manmade Fibres Manufacturing | 1(d) Thermal Power Plants | 8(b) Townships and Area. Development projects |
| **Signature & Date** | 21/11/2025 | P. Bhargava 21/11/2025 | Partho Sarathi Mukherjee 21/11/2025 | 21/11/25 |
| | I had visited the site along with the FAEs to understand the project site and the study area. Coordinated with the experts and prepared the impact assessment methodology. Identification and Prediction of the impact assessment, Formulation of the Environment Management Plan, Technical Review. | I had visited the site along with the FAEs to understand the project site and the study area. Coordinated with the experts and prepared the impact assessment methodology. Identification and Prediction of the impact assessment, Formulation of the Environment | I had visited the site along with the FAEs to understand the project site and the study area. Coordinated with the experts and prepared the impact assessment methodology. Identification and Prediction of the impact assessment, Formulation of the Environment | I had visited the site along with the FAEs to understand the project site and the study area. Coordinated with the experts and prepared the impact assessment methodology. Identification and Prediction of the impact assessment, Formulation of the Environment |

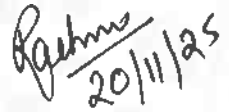
| | | | | |
|---|---|---|---|---|
| | Period of Involvement: March 2025 to November 2025 | Management Plan, Technical Review. Period of Involvement: March 2025 to November 2025 | Management Plan, Technical Review. Period of Involvement: March 2025 to November 2025 | Management Plan, Technical Review. Period of Involvement: March 2025 to November 2025 |
| **Office Address** | **Perfact Enviro Solutions Pvt. Ltd.** A 14, Shubham Enclave (Outer Ring Road), Paschim Vihar, New Delhi 110063 | **Perfact Enviro Solutions Pvt. Ltd.** A 14, Shubham Enclave (Outer Ring Road), Paschim Vihar, New Delhi 110063 | **Perfact Enviro Solutions Pvt. Ltd.** A 14, Shubham Enclave (Outer Ring Road), Paschim Vihar, New Delhi 110063 | **Perfact Enviro Solutions Pvt. Ltd.** A 14, Shubham Enclave (Outer Ring Road), Paschim Vihar, New Delhi 110063 |

| | |
|---|---|
| **Name of Assistants to EIA Coordinator** | Mrs. Sadaf Akhtar |
| **Signature & Date** | Sadaf 20.11.2025 |
| **Task & Period of Involvement** | I had understood the project site and the study area. Coordinated with the experts and prepared the impact assessment methodology. Identification and Prediction of the impact assessment, Formulation of the Environment Management Plan, Technical Review.<br>Period of Involvement: March 2025 to November 2025 |
| **Office Address** | **Perfact Enviro Solutions Pvt. Ltd.**<br>A 14, Shubham Enclave (Outer Ring Road),<br>Paschim Vihar, New Delhi 110063 |

**List of FAEs Involved (Cat A)**

| S. No. | Functional Areas | Name of Expert(s) | Involvement (Period & Task) | Signature & Date |
|---|---|---|---|---|
| 1 | AP | Dr. Nipun Bhargava | I had visited the site to assess the site conditions in the surrounding area. After assessing the Air pollution sources. Made Sampling plan & conducted monitoring; based on the results and the site specific details along with Project Specific Details obtained , I have prepared the Impact Mitigation measures<br>Period of Involvement: March 2025 to November 2025 |  |
| 2 | AQ | Dr. Nipun Bhargava | I had visited the site for the assessment of the sources and the emissions. After studying, I calculated the model input data related to the proposed emissions and micrometeorology interpretation of modeling results and development of EMP.<br>Period of Involvement: March 2025 to November 2025 |  |
| 3 | RH | Dr. Nipun Bhargava | I had visited the site to assess the site conditions in the surrounding area and identified hazards. After assessing the risk and hazard, I prepared the Impact Mitigation measures.<br>Period of Involvement: March 2025 to November 2025 |  |

| S. No. | Functional Areas | Name of Expert(s) | Involvement (Period & Task) | Signature & Date |
|---|---|---|---|---|
| 4 | WP | Mr. Muthukumaran Ganpathi Narayanan | I had visited the site to assess the water sources and its water quality in the study area. After studying the Water pollution sources have prepared Sampling plan & collected samples ; based on the results from the lab and the site specific details along with Project Specific Details obtained, I have prepared the Impact Mitigation measures.<br>Period of Involvement: March 2025 to November 2025 | |
| 5. | SE | Dr. Rahul Deshmukh | I had visited the site to collect the baseline status of socio-economic conditions and studied Villages in study areas using Topographical maps and extracted Secondary data from Census of India. Then was involved in preparing a socio economic study report using the primary survey and secondary data which includes impact and mitigation measures.<br>Period of Involvement: March 2025 to November 2025 | Rahul Deshmukh |
| 6. | NV | Mr. Muthukumaran Ganpathi Narayanan | I had visited the site to assess the site conditions in the surrounding area. After assessing the Noise pollution sources have prepared the Impact Mitigation measures.<br>Period of Involvement: March 2025 to November 2025 | |

| S. No. | Functional Areas | Name of Expert(s) | Involvement (Period & Task) | Signature & Date |
|---|---|---|---|---|
| 7. | SHW | Mr. Praveen Bhargava | I had visited the site to assess the Solid waste sources and status in the study area. After studying the sources have prepared the Impact report and suggested Mitigation measures and development of EMP. Period of Involvement: March 2025 to November 2025 |  |
| 8. | HG | Mr. Santosh Pant | The physical observation of the study area including Ground water sources and its water quality was made. After studying the Water pollution sources, the Impact report was prepared and Mitigation measures were suggested. Period of Involvement: March 2025 to November 2025 |  |
| 9. | GEO | Mr. Santosh Pant | I had visited the site to assess the geology of the study area. After studying I have prepared the Impact report and suggested mitigation measures Period of Involvement: March 2025 to November 2025 |  |
| 8 | SC | Mrs. Rachna Dogra | I had visited the site to assess the site conditions in the surrounding area. After assessing the type of soil and need of Soil Conservation, Prepared the Impact Mitigation measures accordingly. Period of Involvement: March 2025 to November 2025 |  |
| 11. | LU | Mr. Santosh Pant | I was involved in preparing a Land Use map using Satellite Imagery, Google maps after primary survey. Period of Involvement: March 2025 to November 2025 |  |

| S. No. | Functional Areas | Name of Expert(s) | Involvement (Period & Task) | Signature & Date |
|---|---|---|---|---|
| 12. | EB | Mrs. Tulika Rawat | I had visited the site to assess the various forest areas, Ecological and Biodiversity sources in the study area. After studying the various floral and faunal species, assisted FAE in preparing the Impact report and suggested Mitigation measures.<br>Period of Involvement: March 2025 to November 2025 |  |

**List of Category-B FAEs Involved**

| S.No. | Functional Areas | Name of Expert(s) | Involvement (Period & Task) | Signature & Date |
|---|---|---|---|---|
| 1 | AP | Mr. Muthukumaran Ganpathi Narayanan | I had visited the site to assess the site conditions in the surrounding area. After assessing the Air pollution sources. Made Sampling plan & conducted monitoring; based on the results and the site specific details along with Project Specific Details obtained, I have prepared the Impact Mitigation measures.<br>Period of Involvement: March 2025 to November 2025 |  |
| 2 | AQ | Mrs. Shweta Rajput | I had visited the site for the assessment of the sources and the emissions. After studying, I calculated the model input data related to the proposed emissions and micrometeorology interpretation of modeling results and development of EMP.<br>Period of Involvement:March 2025 to November 2025 |  |

| S.No. | Functional Areas | Name of Expert(s) | Involvement (Period & Task) | Signature & Date |
|---|---|---|---|---|
| 3 | WP | Mrs. Shweta Rajput | I had visited the site to assess the water sources and its water quality in the study area. After studying the Water pollution sources have prepared Sampling plan & collected samples ; based on the results from the lab and the site specific details along with Project Specific Details obtained, I have prepared the Impact Mitigation measures.<br>Period of Involvement: March 2025 to November 2025 | |
| 4 | RH | Mr. Muthukumaran Ganpathi Narayanan | I had visited the site to assess the site conditions in the surrounding area and identified hazards. After assessing the risk and hazard, I prepared the Impact Mitigation measures.<br>Period of Involvement: March 2025 to November 2025 | |
| 5 | NV | Mr. Partho Sarathi Mukherjee | I had visited the site to assess the site conditions in the surrounding area. After assessing the Noise pollution sources have prepared the Impact Mitigation measures.<br>Period of Involvement: March 2025 to November 2025 | Partho Sarathi Mukherjee |
| 6 | HG | Mrs. Saloni Sharma | I had visited the site to assess the physical observation of the study area. After studying the site, an Impact & mitigation report is prepared.<br>Period of Involvement: March 2025 to November 2025 | Saloni 24/11/2025 |

**List of FAA**

| S. No. | Functional Areas | Name of Expert(s) | Involvement (Period & Task) | Signature |
|---|---|---|---|---|
| 1. | AP | Mrs. Tanya Thakur | After assessing the Air pollution sources. Made Sampling plan & conducted monitoring; based on the results and the site specific details along with Project Specific Details obtained , I have prepared the Impact Mitigation measures. Period of Involvement: June 2025 to November 2025 | Tanya Thakur |
| 2. | AQ | Mrs. Tanya Thakur | After studying, I calculated the model input data related to the proposed emissions and micrometeorology interpretation of modeling results and development of EMP. Period of Involvement: June 2025 to November 2025 | Tanya Thakur |
| 3. | SHW | Ms. Navneet Kaur | I had visited the site to assess the Solid waste sources and status in the study area. After studying the sources have prepared the Impact report and suggested Mitigation measures and development of EMP. Period of Involvement: June 2025 to November 2025 | Navneet Kaur 21/11/25 |
| 4. | WP | Ms. Sakshi Tripathi | I had visited the site to assess the water sources and its water quality in the study area. After studying the Water pollution sources have prepared Sampling plan & collected samples ; based on the results from the lab and the site specific details along with Project Specific Details obtained, I have prepared the Impact Mitigation measures. Period of Involvement: June 2025 to November 2025 | Sakshi 20/11/25 |
| 5 | SE | Mr. Pramod Kumar | I had visited the site to collect the baseline status of socio-economic conditions and studied Villages in study areas using Topographical maps and extracted Secondary data from Census of India. Then was involved in preparing a socio economic report using the primary survey | Pramod Kumar 20/11/2025 |

| S. No. | Functional Areas | Name of Expert(s) | Involvement (Period & Task) | Signature |
|---|---|---|---|---|
| | | | and secondary data which includes impact and mitigation measures.<br>Period of Involvement: June 2025 to November 2025 | |

**List of Team Members**

| S. No. | Functional Areas | Name of Expert(s) | Involvement (Period & Task) | Signature |
|---|---|---|---|---|
| 1. | AP | Mrs. Sadaf Akhtar | I had visited the site to assess the site conditions in the surrounding area. After studying the various AP sources, assisted FAE in preparing the impact report and suggested mitigation measures.<br>Period of Involvement: June 2025 to November 2025 | Sadaf 20-11-2025 |
| 2. | WP | Mrs. Sadaf Akhtar | I had visited the site to assess the water sources and its water quality in the study area. After studying the various WP sources, assisted FAE in preparing the impact report and suggested mitigation measures.<br>Period of Involvement: June 2025 to November 2025 | Sadaf 20-11-2025 |
| 3. | LU | Mr. Deepak Kumar | I was involved in preparing a Land Use map using Satellite Imagery, Google maps after primary survey.<br>Period of Involvement: June 2025 to November 2025 | 20-11-2025 |
| 4. | EB | Mrs. Disha Patel | I had visited the site to assess the various forest areas, Ecological and Biodiversity sources in the study area. After studying the various floral and faunal species, assisted FAE in preparing the Impact report and suggested Mitigation measures.<br>Period of Involvement: March 2025 to November 2025 | |

| S. No. | Functional Areas | Name of Expert(s) | Involvement (Period & Task) | Signature |
|---|---|---|---|---|
| 5. | HG | Mr. Deepak Kumar | I have visited the site and assessed the hydrology of the area. After studying the hydrology and pollution sources the impact and mitigation have been identified.<br>Period of Involvement: June 2025 to November 2025 | 20.11.2025 |
| 6. | SE | Mr. Manoj Kumar Joshi | I had visited the site to collect the baseline status of socio-economic conditions and studied Villages in study areas using Topographical maps and extracted Secondary data from Census of India. Then was involved in preparing a socio economic study report using the primary survey and secondary data which includes impact and mitigation measures.<br>Period of Involvement: June 2025 to November 2025. | 20/11/2025 |

## Plagiarism/ QMS Certificate

| | |
|---|---|
| Title of EIA Report: | "Development of an Industrial Park over an extent of 796.240 hectares (1966.713 acres) at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu" by M/s State Industries Promotion Corporation of Tamilnadu Limited. |
| Name of Accredited Organization: | M/s Perfact Enviro Solutions Pvt Ltd |
| Unique Identification Number: | PE263328-E-04 |
| Name of EIA Coordinator (EC): | Mrs. Rachna Bhargava, Mr. Praveen Bhargava, Mr. Partho Mukherjee, Mr. Muthukumaran Ganpathi Narayanan |
| Name of the Software: | Plagiarism Checker X (5%) |
| Date of Check: | 10.11.2025 |
| Time of Check: | 5:00 pm |

I hereby certify that this EIA Report has been evaluated using online/In-house software Duplichecker. The report produced has been analyzed by the system and based on it, I certify that the EIA report produced in accordance with good scientific practice.

**Date and Signatures of EIA Coordinators:**

| Mrs. Rachna Bhargava | Mr. Praveen Bhargava | Mr. Partho Mukherjee | Mr. Muthukumaran Ganpat |
|---|---|---|---|
| 21/11/25 | P.Bhargava 21/11/25 | Partho Sarathi Mukherjee | |

**Date and Sign of Head of Accredited Organisation:**

**Rachna Bhargava**

Name of the EIA consultant organisation: M/s Perfact Enviro Solutions Pvt Ltd
NABET Certificate No. & Issue Date: NABET/EIA/2225/RA 0284 (Rev.01), issue date:- 20/10/2023 valid up to 26/11/2025

21/11

# Plagiarism Checker X - Report

## Originality Assessment

**5%**

**Overall Similarity**

**Date:** Nov 10, 2025 (04:57 PM)
**Matches:** 3349 / 67496 words
**Sources:** 103

**Remarks:** Low similarity detected, consider making necessary changes if needed.

**Verify Report:**
Scan this QR Code

SIPCOT

Date: 07.01.2026

**DECLARATION BY THE PROJECT PROPONENT**

I, Dr. K. Senthil Raj, I.A.S., Managing Director of State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT), give the declaration / undertaking that the contents (information and data) of EIA Report has been undertaken in the compliance with Terms of Reference (ToR) issued for the proposed "Development of Industrial Park at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu, over an extent of 796.240 hectares (1966.713 acres)" and the information and contents provided in the report are factually correct.

**Dr. K. SENTHIL RAJ, I.A.S.,**
**MANAGING DIRECTOR**

**State Industries Promotion Corporation of Tamil Nadu Limited**
(A Government of Tamil Nadu Undertaking)
CIN I U74999TN1971SGC005967
Regd. Office : 19-A, Rukmani Lakshmipathy Road, Post Box No. 7223, Egmore, Chennai - 600 008.
Phone : 4526 1777, Fax : 4526 1796 Website : www.sipcot.tn.gov.in

## Undertaking by Head of EIA Consultant

I, Rachna Bhargava, Director & CEO of M/s Perfact Enviro Solutions Pvt. Ltd., A 14, Shubham Enclave (Outer Ring Road), Paschim Vihar, New Delhi 110063 authorize **Mr. Praveen Bhargava Mr. Partho Mukherjee, Mr. Muthukumaran Ganpathi Narayanan** (EIA Coordinators) for the preparation and conducting the Environment Impact Assessment for project ""Development of an Industrial Park over an extent of 796.240 hectares (1966.713 acres) at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu" by M/s State Industries Promotion Corporation of Tamilnadu Limited.

**Rachna Bhargava, Director & CEO**

**M/s Perfact Enviro Solutions Pvt. Ltd.**

A 14, Shubham Enclave (Outer Ring Road),
Paschim Vihar, New Delhi 110063

## Undertaking By EIA Coordinator

**I, Rachna Bhargava, Praveen Bhargava, Partho Mukherjee, Muthukumaran Ganpathi Narayanan** EIA Coordinators from Environmental Consultant M/s Perfact Enviro Solutions Pvt. Ltd., A 14, Shubham Enclave (Outer Ring Road), Paschim Vihar, New Delhi 110063 for project "Development of an Industrial Park at Allikulam" by M/s. State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT), located at Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu Over an extent of 796.240 Hectares (1966.713 Acres). hereby undertake that the report is prepared in accordance with a robust quality management system adopted by EIA consulting organization for the EIA process and the prescribed ToR have been complied with and that the data submitted is factually correct.

**Date and Signatures of EIA Coordinators:**

| Mrs. Rachna Bhargava | Mr. Praveen Bhargava | Mr. Partho Mukherjee | Mr. Muthukumaran Ganj Narayanan |
|---|---|---|---|
| 21/11/25 | P. Bhargava | Partho Sarathi Mukherjee | |

**EIA Coordinators**

**M/s Perfact Enviro Solutions Pvt. Ltd.**

A 14, Shubham Enclave (Outer Ring Road),
Paschim Vihar, New Delhi 110063

# Section B (TOR Letter)

सत्यमेव जयते

**File No:** 10/19/2025-IA.III
**Government of India**
**Ministry of Environment, Forest and Climate Change**
**IA Division**
***

Dated **21/09/2025**

To,

Managing Director
STATE INDUSTRIES PROMOTION CORPORATION OF TAMILNADU LIMITED
19-A, Rukmani Lakshmipathy Road, Egmore, Chennai , Tamil Nadu-600008
md@sipcot.in

**Subject:** **The proposal is for Development of an Industrial Park over an extent of 796.240hectares(1966.713 acres) at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu by M/s State Industries Promotion Corporation of Tamilnadu Limited. -Terms of References regarding.**

**Sir/Madam,**

This is in reference to your application for Grant of Terms of Reference under the provision of the EIA Notification 2006-regarding in respect of project Development of an Industrial Park at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu an extent of 796.240 hectares (1966.713 acres) submitted to Ministry vide proposal number IA/TN/INFRA1/548303/2025 dated 16/08/2025.

2. The particulars of the proposal are as below :

| | |
|---|---|
| **(i) TOR Identification No.** | TO25A3102TN5260559N |
| **(ii) File No.** | 10/19/2025-IA.III |
| **(iii) Clearance Type** | TOR |
| **(iv) Category** | A |
| **(v) Project/Activity Included Schedule No.** | 7(c ) Industrial estates/ parks/ complexes/ areas, export processing Zones (EPZs), Special Economic Zones ,5(d) Manmade fibers manufacturing,1(d) Thermal Power Plants,8(b) Townships/ Area Development Projects / Rehabilitation Centres |
| **(vi) Sector** | INFRA-1 |
| **(vii) Name of Project** | Development of an Industrial Park at Allikulam, Keelathattaparai, Perurani, Umarikottai, |

| | |
|---|---|
| | Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu an extent of 796.240 hectares (1966.713 acres) |
| **(viii) Name of Company/Organization** | STATE INDUSTRIES PROMOTION CORPORATION OF TAMILNADU LIMITED |
| **(ix) Location of Project (District, State)** | TUTICORIN, TAMIL NADU |
| **(x) Issuing Authority** | MoEF&CC |
| **(xi) Applicability of General Conditions** | no |
| **(xii) Applicability of Specific Conditions** | yes |

3. The proposal is for the Development of an Industrial Park over an extent of 796.240 ha at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages, Thoothukudi Taluk, ThoothukudiDistrict, Tamil Nadu by M/s State Industries Promotion Corporation of Tamilnadu Limited.

4. The project/activity is covered under the category 'A' of item 7(c) i.e. Industries, of the schedule to the EIA Notification, 2006, and its subsequent amendments (As project). Total cost of the project is Rs.66111cr.

5. List of industries Proposed in the industrial estate.

| S.no | Activity | Sub Activity | Category as per the EIA notification, 2006 |
|---|---|---|---|
| 1. | Townships/Area Development Projects/ Rehabilitation Centers | Area Development | 8(b) |
| 2. | Thermal Power Plants | Biomass using auxiliary fuel such as coal/lignite/petroleum products more than 15% | 1(d) |
| 3. | Manmade fibers manufacturing | Other than Rayon | 5(d) |
| 4 | Light manufacturing | (electrical equipment, plastic components, packaging) | Not Applicable |
| 5 | Assembly operations | (consumer goods, electronics) | Not Applicable |
| 6 | Warehousing and distribution Center’s | - | Not Applicable |
| 7 | Ancillary units for larger industrial clusters | - | Not Applicable |
| 8 | IT-enabled services and technical support facilities | - | Not Applicable |

*The area proposed non-EC category industries where the built-up area for these industries may exceed 20,000 sq. meters. In such cases, the project would fall under Category 8(a)/8(b) of the EIA Notification, 2006, and hence would require a separate Environmental Clearance (EC). Therefore, a separate EC shall be obtained for such area development/construction projects.

6. Land Use/Land cover: Land Use/Land cover of proposed Industrial Park is as follows:

| Description | Area (Ha) | Percentage of Total Development area |
|---|---|---|
| Plotted Area* | 521.126 | 69.99% |
| Plots for Common Amenities | 14.891 | 2.00% |
| Plots for Commercial Activities | 22.336 | 3.00% |
| Area for Solid Waste Management | 2.024 | 0.27% |
| Road, Storm Water Drain area | 54.462 | 7.32% |
| Green Belt (20m Along Peripheral, 15m Along Water Body, 3m Along Nilaviyal Odai) | 129.715 | 17.42% |

| | | |
|---|---|---|
| Total Developmental Area | 744.554 | 100% |
| Non-Development Areas | | |
| Existing Nilaviyal Odai | 29.957 | - |
| RoW HT Line Buffer | 21.729 | - |
| Grand Total area of the Industrial Park | 796.240 | - |

7. Terrain and Topography: The proposed project site is currently classified as unclassified dry land. The site falls within the Thoothukudi District, with general elevation at 18-20m. Slopes are distinct with natural drainage flowing from North & Northwest to Southeast, finally confluencing with the Natural drainage Korampallam at the outskirts of Thoothukudi.

8. Details of water bodies, impact on drainage: Seasonal drains (Odai and Nilaviyal odai) passing through the plot will be maintained as such, leaving a 15 m buffer greenbelt area along the odai & minimum 3m buffer for Nilaviyal odai. There will be no obstructions by the proposed development. SIPCOT allocates a budget of INR1910 Lakhs under Capital cost for Desilting & revetment and Rainwater harvesting, and INR 155Lakhs per annum as recurring EMP budget. Hence there will be positive impact on the drains as well as to the surrounding environment.

9. Water Requirements of the Project: For SIPCOT Industrial Park, freshwater will be sourced from SIPCOT owned 60 MLD Desal plan.

| S.No. | Water Usage | Quantity (KLD) | Fresh Water* (KLD | Tertiary Treated Wastewater (KLD) |
|---|---|---|---|---|
| 1. | Domestic | 430 | 430 | 0 |
| 2. | Flushing | 344 | 344 | 0 |
| 3. | Greenbelt | 10745 0 | 10112 4 | 633 |
| 4. | Industrial Process** | 29000 | 0 | 29000 |
| 5. | Industrial Process & Utilities*** | 27980 | 0 | 27980 |
| 6. | Total | 68499 | 10886 | 57613 |

10. Diversion of forest land: There is no diversion of forest land and for wildlife conservation plan A total of 14 herepetofauna were recorded in the study area which include 11 reptile species and 3 mammal species Out of the 11 reptiles, 8 are under Least Concern category (LC), 1 is Not Evaluated (NE) and 2 species are in Near Threatened (NT) category as per IUCN Red list. As per Indian Wildlife Protection Act Amendment (2022), out of 11 herpetofauna recorded, 7 are Not Evaluated, 2 in Schedule IV, 1 in Schedule II and 1 in Schedule I. Indian Wildlife Protection Act (amendment 2022) classifies two mammals in Schedule II and one under Schedule I. All the five insect species recorded are either Not Evaluated or under Least Concern category.

11. Waste Management: The project will generate a total of 450 kg/day of solid waste, of which 270 kg/day is biodegradable and will be converted into manure for greenbelt development, while the remaining 180 kg/day of non-biodegradable waste handed over to TNPCB authorized Recyclers.

12. Critically Polluted Area: The proposed project is located within 5.1 km from the Critically Polluted Area/Severely Polluted Area notified by the CPCB.

13. Land acquisition and R&R issues involved: There is no R& R involved in the Project. The Government of Tamil Nadu has sanctioned vide under G.O. No. 100, dated 26.02.2021 for the acquisition of 904.40 hectares of land; of which, 796.240 hectares is being developed as an Industrial Park. This includes 788.742 hectares of patta land and 7.498 hectares of poramboke land.

14. Employment Opportunities: The proposed project is expected to generate direct employment and indirect employment of 17200 persons during construction and operational phase.

15. Benefits of the Project: The proposed SIPCOT Industrial Park at Allikulam in Thoothukudi District, Tamil Nadu, is expected to bring significant financial, social, and environmental benefits, especially to local and tribal communities. With a capital investment of 666.11 crores, the project will generate around 25 direct and 500 indirect jobs during construction, and approximately 1,270 direct and 15,930 indirect jobs during operation, thereby boosting employment and local

businesses through supply chain and logistics support. It will promote industrial growth in backward regions, enhance infrastructure such as roads, drainage, water supply, and waste management, and improve access to education, healthcare, and lifestyle amenities. Skill development programs in collaboration with government agencies will further empower the local workforce. In addition, community welfare initiatives within a 10 km radius will ensure inclusive development. By hosting industries such as Lyocell manufacturing, the park will strengthen domestic manufacturing, reduce import dependency, and contribute to balanced economic and industrial growth in Southern Tamil Nadu.

16. Details of Court Cases: There is no court cases involved in the Project.

17. The EAC based on the information submitted and clarifications provided by the project proponent and detailed discussions held on all the issues during 412th meeting of the Expert Appraisal Committee (Infra–1) held during 02nd September, 2025 recommended the project for grant of Terms of Reference (ToR) with stipulated specific conditions along with other Standard ToR Conditions.

18. The Ministry of Environment, Forest and Climate Change has considered the proposal based on the recommendations of the Expert Appraisal Committee (Infrastructure, CRZ and other Miscellaneous projects) and hereby decided to grant Terms of Reference for 'Development of an Industrial Park over an extent of 796.240 hectares (1966.713 acres) at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu by M/s State Industries Promotion Corporation of Tamilnadu Limited' and for preparation of EIA/EMP report with public consultations under the EIA Notification, 2006 as amended, subject to strict compliance of the following specific conditions, in addition to all standard ToR conditions applicable for such projects.

19. A detailed draft EIA/EMP report shall be prepared in terms of the above additional TOR and should be submitted to the State Pollution Control Board for Public Hearing. Public Hearing to be conducted for the project in accordance with the provisions of Environmental Impact Assessment Notification, 2006 and the issues raised by the public should be addressed in the Environmental Management Plan. The Public Hearing shall be conducted based on the TOR letter issued by the Ministry and not on the basis of Minutes of the Meeting available on the website.

20. The project proponent shall submit the detailed final EIA/EMP report prepared as per TOR including issues raised during Public Hearing to the Ministry for considering the proposal for environmental clearance before expiry of validity of ToR.

21. The consultants involved in preparation of EIA/EMP report after accreditation with Quality Council of India/National Accreditation Board of Education and Training (QCI/NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other Organization(s)/Laboratories including their status of approvals etc. vide notification of the MoEF dated 19th July, 2013.

22. The prescribed TOR would be valid for a period of four years for submission of the EIA/EMP Reports.

23. This issues with the approval of Competent Authority.

**Copy To**

1.The Deputy Director General of Forests (Central), Ministry of Environment, Forest and Climate Change (MoEF&CC), Integrated Regional Office Chennai, 1st Floor, Additional Office Block for GPOA, Shastri Bhawan, Haddows Road, Nungambakkam, Chennai–600 006, Tamil Nadu.
2. The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-600 032, Tamil Nadu.
3. Parivesh Portal.
4. Guard File/ Monitoring File/ Record File.

**Annexure 1**

**Specific Terms of Reference for (Townships/ Area Development Projects / Rehabilitation Centres)**

**1. Specific Conditions**

| S. No | Terms of Reference |
|---|---|
| **1.1** | The natural course of Odai and Nilaviyal odai shall not be modified, obstructed, or diverted under any circumstances. A buffer zone of 30 m to 50m width along both banks of Odai and 15m width along Nilaviyal odai shall be maintained and developed as a greenbelt. A multilayered greenbelt of at least 15 meters width along the project boundary shall be created. PP shall prepare a River Rejuvenation plan to rejuvenate the stretch of the river passing through the project area to maintain fragile ecosystem with the nationally reputed institute further, periodical assessment on the status of the water quality, soil characteristics, etc., should be done by engaging reputed agencies having expertise in the field and status report should be incorporated in six monthly compliance reports. |
| **1.2** | A green belt of 15m width shall be maintained by the PP all around the Lyocell Manufacturing Unit in addition to the green belt to be maintained by the industry. |
| **1.3** | The project proponent shall ensure the protection and conservation of nearby water bodies during the planning, construction, and operational phases of the project. No encroachment, filling, or discharge of untreated wastewater shall be permitted into these water bodies. Adequate buffer zones and greenbelt development shall be maintained around them. Preventive measures such as silt traps, oil–grease separators, and proper drainage systems shall be implemented to avoid contamination. Regular monitoring of water quality shall be conducted, and compliance reports shall be submitted to the regulatory authority. |
| **1.4** | The PP shall not discharge any affluent in to the river, further, PP shall prepare a River Rejuvenation plan to rejuvenate the stretch of the river passing through the project area to maintain fragile ecosystem with the nationally reputed institute further, periodical assessment on the status of the water quality, soil characteristics, etc., should be done by engaging reputed agencies having expertise in the field and status report should be incorporated in six monthly compliance reports. |
| **1.5** | The committee noted that windmills are already present at four locations within the proposed industrial area. To avoid obstruction of wind flow and potential operational hazards, plantation of tall trees in these zones should be restricted. Instead, the areas should be developed with low-height shrubs and ground cover species, which will provide ecological and aesthetic benefits without compromising windmill efficiency. Priority should be given to native, drought-resistant species to ensure sustainability and minimize maintenance requirements. |
| **1.6** | Provisions for plantation/afforestation in the plan shall invariably consider complete segregation of the Project area from non-project area around it through at least 30–50 meter green belt all along the boundary of the project and at least 50-meter green belt around the large water bodies with an intent of making them an undisturbed wilderness. Linear water bodies like river/ canals / nallah shall also be protected by the green belt of tree. Enough number green plantation patches shall be created especially in industrial area which shall act as green lungs to mitigate the impact of pollutants and effluents on the human health of the population within the industrial area as well as adjoining commercial and residential areas in the project. |
| **1.7** | For the purpose of maintaining the 33% green belt in the project green/ open spaces/parks shall not be accounted for Only multilayered plantation creating vegetative screens to obstruct the flow of pollutants shall be created. |
| **1.8** | List of existing and proposed industries and their layout shall be drawn and shall be submitted along with the EIA/EMP report. |

| S. No | Terms of Reference |
|---|---|
| **1.9** | Categorization of industries as per CPCB/SPCB norms and as per EIA notification, 2006 has to be mentioned. PP shall submit the estimation/assessment of the wastewater generation from the proposed Industries and the feasibility of the proposed Zero Liquid Discharge facility. |
| **1.10** | Provision for Reuse/Recycling of treated wastewater, wherever feasible. Explore possibilities for recycling and reusing treated water in the unit to reduce the freshwater demand and waste disposal. A detailed water harvesting plan needs to be submitted. Provision for Zero liquid discharge whenever techno-economically feasible. Provision for Continuous monitoring of effluent quality/quantity. |
| **1.11** | A detailed rainwater harvesting plan including the provisions for check dams across all major and minor drains/streams and water recharge wells along the banks of these drains/nallah/khad, shall be prepared and submitted as part of the EIA Report. |
| **1.12** | PP has to develop and plan greenbelt plantation strategy according to the soil parameters viz soil stabilization, comprehensive soil types, dividing area according to the pH values, and the budget for the greenbelt plantation to be allocated accordingly as the proposed Industrial Area is in nature of acidic soil. |
| **1.13** | The planning of Industrial Estate should be based on the criteria mentioned in this Ministry's Technical EIA Guidance Manual for Industrial Estate (2009) prepared by IL&FS as well as CPCB's Zoning Atlas Guidelines for siting industries. |
| **1.14** | PP also mentioned that the area proposed non-EC category industries where the built-up area for these industries may exceed 20,000 sq. meters. In such cases, the project would fall under Category 8(a)/8(b) of the EIA Notification, 2006, and hence would require a separate Environmental Clearance (EC). Therefore, a separate EC shall be obtained for such area development/construction projects. |
| **1.15** | A Detailed layout of the proposed Industrial area is to be submitted along with the EIA/EMP report. |
| **1.16** | The layout shall be planned in such a way that all red-category industries with higher pollution potential (highly polluting or hazardous) industries shall be kept away as far as possible from human habitations, and water bodies to minimize environmental and health risks to nearby communities. |
| **1.17** | A detailed plan for risk assessment and mitigation plan for the worst-case scenario providing an analysis of potential pollutant dispersion in case of accidents such as chemical spills, fires, or gas leaks. |
| **1.18** | A detailed hydro-geological study on the catchment area of the drainage system within the core zone and at least 5 km perimeter of the project area shall be conducted. |
| **1.19** | Groundwater Rejuvenation Plan, as well as water body rejuvenation plan, shall be submitted and drainage mapping shall be carried out and a plan for the rejuvenation of groundwater through the aquifers shall be submitted along with the EIA/EMP report with budgetary provisions as part of the Environmental Management Plan in consultation with gram panchayat for the restoration of structures, construction and maintenance of greenbelt buffer, garland drains for the Industrial Area. |
| **1.20** | The Water balancing chart and its resources for obtaining the groundwater shall be submitted. |

| S. No | Terms of Reference |
|---|---|
| **1.21** | PP shall submit a clarification regarding the purpose and requirement for setting up Petrol and diesel storage units in the proposed Industrial Estate. Further, details of the mode of receipt of petroleum products and distribution methodology, etc. Safety features and area required for the same etc. to be highlighted and submitted. |
| **1.22** | PP shall specify their commitment regarding the power generated through renewable sources like Solar etc. |
| **1.23** | PP shall calculate and submit the carbon footprint of the proposed Industrial Area in the detailed EIA/EMP Report. |
| **1.24** | Detailed air quality study for each point source to be conducted along with the Micro metallurgical data. |
| **1.25** | The industrial layout/zones shall be planned in such a way that no tree can be felled/transplanted unless exigencies demand. Where absolutely necessary, tree felling shall be with prior permission from the concerned Authority. Where the trees need to be cut/transplanted with prior permission from the concerned local Authority, a compensatory plantation in the ratio of 1:10 (i.e. planting of 10 trees for every 1 tree that is cut/non-survival of any transplanted tree) shall be done and maintained. Plantations to be ensured species (cut) to species (planted). All the plantation will be done by the State Forest Department as deposit work and not by private contractors. |
| **1.26** | The plan for afforestation should be such that it is free from pesticides with flowering plants of native species for attracting bees and insects, which in turn is beneficial to agriculture. Farmers around the project site shall be involved in developing such an afforestation Plan. |
| **1.27** | Details of Onsite and Offsite emergency plans as per provisions of the MSIHC Rules need to be submitted. |
| **1.28** | Obtain the most recent wind data relevant to the area of the proposed industrial park, ensuring that the data reflects prevailing wind directions and speeds over an extended period of at least one year, and create a Wind Rose Diagram that accurately represents the collected wind data. |
| **1.29** | Carry out a study with a reputed University/Social Institute like TISS on measuring the impact of the Project on the Health of Human beings and measures to monitor and mitigate the same. |
| **1.30** | Activity-wise, a time-bound action plan along with budgetary provision for occupational health & surveillance, environment management plan, and green belt development plan. Assessment of the carrying capacity of transportation load on roads inside the notified industrial premises shall be carried out and submitted. |
| **1.31** | In addition to the above, the EIA/EMP report shall also address issues such as i) Effective fugitive emission control measures for process, transportation, packing, etc. ii) use of cleaner fuels, and iii) best available technology for the plant. |

**Standard Terms of Reference for (Townships/ Area Development Projects / Rehabilitation Centres)**

**1. Project Details**

| S. No | Terms of Reference |
|---|---|
| **1.1** | Need and benefits of the project. |
| **1.2** | Submit data for built-up area for each building, the use and occupancy classification in line with NBC 2016 also to be indicated [for differential functional requirements]. |
| **1.3** | The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out. |

**2. Land Environment**

| S. No | Terms of Reference |
|---|---|
| **2.1** | Examine details of land use as per Master Plan and land use around 10 km radius of the project site. Analysis should be made based on latest satellite imagery for land use with raw images. Check on flood plain of any river. |

**3. Land Acquisition And R&r**

| S. No | Terms of Reference |
|---|---|
| **3.1** | Submit details of environmentally sensitive places, land acquisition status, rehabilitation of communities/villages and present status of such activities. |

**4. Environmental Monitoring And Management**

| S. No | Terms of Reference |
|---|---|
| **4.1** | Examine baseline environmental quality along with projected incremental load due to the project. |
| **4.2** | Environmental data to be considered in relation to the project development would be (a) land, (b) groundwater, (c) surface water, (d) air, (e) bio-diversity, (f) noise and vibrations, (g) socio economic and health. |
| **4.3** | Submit Roles and responsibility of the developer etc for compliance of environmental regulations under the provisions of EP Act. |
| **4.4** | Examine separately the details for construction and operation phases both for Environmental Management Plan and Environmental Monitoring Plan with cost and parameters. |
| **4.5** | Possible carbon footprint contribution from each activities and mitigation measures proposed shall be included as part of Environment Management Plan. |

**5. Drainage**

| S. No | Terms of Reference |
|---|---|
| **5.1** | Submit a copy of the contour plan with slopes, drainage pattern of the site and surrounding area. |

| S. No | Terms of Reference |
|---|---|
| | Any obstruction of the same by the project. |

**6. Forest**

| S. No | Terms of Reference |
|---|---|
| **6.1** | Submit the details of the trees to be felled for the project, if any . |
| **6.2** | Submit the present land use and permission required for any conversion such as forest, agriculture etc. |

**7. Water Environment**

| S. No | Terms of Reference |
|---|---|
| **7.1** | Ground water classification as per the Central Ground Water Authority. |

**8. Water Management**

| S. No | Terms of Reference |
|---|---|
| **8.1** | Examine the details of Source of water, water requirement, use of treated waste water and prepare a water balance chart. |
| **8.2** | Rain water harvesting proposals should be made with due safeguards for ground water quality. |
| **8.3** | Maximize recycling of water and utilization of rain water. Examine details. |
| **8.4** | Examine soil characteristics and depth of ground water table for rainwater harvesting |
| **8.5** | Permission from CGWA for abstraction of groundwater, if any, including dewatering during basement excavation. |

**9. Waste Management**

| S. No | Terms of Reference |
|---|---|
| **9.1** | Examine details of solid waste generation treatment and its disposal. |
| **9.2** | Construction & Demolition Waste Management Plan shall be prepared as part of EMP providing details of demolition activities involved along with quantification and disposal mechanism. |

**10. Energy Requirements**

| S. No | Terms of Reference |
|---|---|
| **10.1** | A certificate of adequacy of available power from the agency supplying power to the project along with the load allowed for the project. |
| **10.2** | Examine and submit details of use of solar energy and alternative source of energy to reduce the fossil energy consumption. Energy conservation and energy efficiency. |
| **10.3** | DG sets are likely to be used during construction and operational phase of the project. Emissions from DG sets must be taken into consideration while estimating the impacts on air environment. |

**11. Road And Traffic**

| S. No | Terms of Reference |
|---|---|
| **11.1** | Examine road/rail connectivity to the project site and impact on the traffic due to the proposed project. Present and future traffic and transport facilities for the region should be analysed with measures for preventing traffic congestion and providing faster trouble free system to reach different destinations in the city. |
| **11.2** | A detailed traffic and transportation study should be made for existing and projected passenger and cargo traffic. |
| **11.3** | Examine the details of transport of materials for construction which should include source and availability. |

**12. Disaster Management Plan**

| S. No | Terms of Reference |
|---|---|
| **12.1** | Submit details of a comprehensive Disaster Management Plan including emergency evacuation during natural and man-made disaster. This should cover details of vulnerabilities due to natural and manmade hazards (earthquake, flooding, cyclone, landslides, fire etc.) and details of disaster mitigation efforts for buildings and infrastructure through structural sufficiency and Fire and Life Safety compliance in line with National Building Code NBC, 2016. |

**13. Court Cases**

| S. No | Terms of Reference |
|---|---|
| **13.1** | Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given. |

**14. Miscellaneous**

| S. No | Terms of Reference |
|---|---|
| **14.1** | Any further clarification on carrying out the above studies including anticipated impacts due to the project and mitigative measure, project proponent can refer to the model ToR available on Ministry |

| S. No | Terms of Reference |
|---|---|
| | website http://moef.nic.in/Manual/Townships. |

**Additional Terms of Reference**

(i) The EIA document shall be printed on both sides, as for as possible.

(ii) All documents should be properly indexed, page numbered.

(iii) Period/date of data collection should be clearly indicated.

(iv) Authenticated English translation of all material provided in Regional languages.

(v) The letter/application for EC should quote the MoEF&CC File No. and also attach a copy of the letter prescribing the TOR.

(vi) The copy of the letter received from the Ministry on the TOR prescribed for the project should be attached as an annexure to the final EIA-EMP Report.

(vii) The final EIA-EMP report submitted to the Ministry must incorporate the issues in TOR and that raised in Public Hearing. The index of the final EIA-EMP report, must indicate the specific chapter and page no. of the EIA-EMP Report where the specific TOR prescribed by Ministry and the issue raised in the P.H. have been incorporated. Questionnaire related to the project (posted on MoEF&CC website) with all sections duly filled in shall also be submitted at the time of applying for EC.

(viii) Grant of TOR does not mean grant of EC.

(ix) Grant of TOR/EC to the present project does not mean grant of approvals in other regulations such as the Forest (Conservation) Act 1980 or the Wildlife (Protection) Act, 1972.

(x) Grant of EC is also subject to Circulars and Office Memorandum issued under the EIA Notification 2006 and subsequent amendments, which are available on the MoEF&CC website: www.envfor.nic.in.

(xi) The status of accreditation of the EIA consultant with NABET/QCI shall be specifically mentioned. The consultant shall certify that his accreditation is for the sector for which this EIA is prepared.

(xii) On the front page of EIA/EMP reports, the name of the consultant/consultancy firm along with their complete details including their accreditation, if any shall be indicated. The consultant while submitting the EIA/EMP report shall give an undertaking to the effect that the prescribed TOR (TOR proposed by the project proponent and additional TOR given by the MoEF) have been complied with and the data submitted is factually correct (Refer MoEF office memorandum dated 4 $^{th}$ August, 2009).

(xiii) While submitting the EIA/EMP reports, the name of the experts associated with/involved in the preparation of these reports and the laboratories through which the samples have been got analysed should be stated in the report. It shall clearly be indicated whether these laboratories are approved under the Environment (Protection) Act, 1986 and the rules made there under (Please refer MoEF office memorandum dated 4$^{th}$ August, 2009). The project Coordinator of the EIA study shall also be mentioned.

(xiv) All the TOR points as presented before EAC shall be covered.

# TOR COMPLIANCE

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| **Specific Terms of Reference** | | | |
| **1.1** | The natural course of Odai and Nilaviyal odai shall not be modified, obstructed, or diverted under any circumstances. A buffer zone of 30 m to 50m width along both banks of Odai and 15m width along Nilaviyal odai shall be maintained and developed as a greenbelt. A multilayered greenbelt of at least 15 meters width along the project boundary shall be created. PP shall prepare a River Rejuvenation plan to rejuvenate the stretch of the river passing through the project area to maintain fragile ecosystem with the nationally reputed institute further, periodical assessment on the status of the water quality, soil characteristics, etc., should be done by engaging reputed agencies having expertise in the field and status report should be incorporated in six monthly compliance reports. | The existing Odai and Nilaviyal Odai streams within the 796.240 ha project area are retained in their natural alignment. A buffer of 30m on either side of Odai and 15 m along Nilaviyal Odai has been demarcated and will be developed as a greenbelt. These zones are shown in the layout plan. Ground water rejunervation plan taking in the consideration is prepared and given in Annexure - 11 | **Chapter 2 – Land Use Distribution (Table. 18) & Greenbelt Requirement (Table. 19)** |
| **1.2** | A greenbelt of 15m width shall be maintained by the PP all around the Lyocell Manufacturing Unit in addition to the greenbelt to be maintained by the industry. | A dedicated 15 m wide peripheral greenbelt has been planned around the Lyocell and Tissue Manufacturing Unit (139.46 ha plot). The greenbelt covers the entire unit boundary and will consist of native species with high dust-and noise-absorption capacity. | **Chapter 2 – Land Use and Layout (Table 8)** |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| **1.3** | The project proponent shall ensure the protection and conservation of nearby water bodies during the planning, construction, and operational phases of the project. No encroachment, filling, or discharge of untreated wastewater shall be permitted into these water bodies. Adequate buffer zones and greenbelt development shall be maintained around them. Preventive measures such as silt traps, oil–grease separators, and proper drainage systems shall be implemented to avoid contamination. Regular monitoring of water quality shall be conducted, and compliance reports shall be submitted to the regulatory authority. | All natural drainage channels, including the Odai and Nilaviyal Odai, are preserved in their existing alignment without filling or diversion. No wastewater or treated effluent from the Industrial Park or individual industries is discharged or let out into the Odai or Nilaviyal Odai. Individual industries within the Industrial Park follow Zero Liquid Discharge (ZLD) practices with complete reuse and recycling of treated wastewater within their premises. Silt traps, oil and grease separators, and lined stormwater drains are provided to prevent contamination of surface runoff. | **Chapter 2 – Drainage & Stormwater Management (Sec 2.12)** |
| **1.4** | The PP shall not discharge any effluent in to the river, further, PP shall prepare a River Rejuvenation plan to rejuvenate the stretch of the river passing through the project area to maintain fragile ecosystem with the nationally reputed institute further, periodical assessment on the status of the water quality, soil characteristics, etc., should be done by engaging reputed agencies having expertise in the field and status report should be incorporated in six monthly compliance reports. | The project follows a "Zero Liquid Discharge" policy. No common ETP or STP is proposed by SIPCOT; each industry will install its own ZLD system. Periodic water and soil quality assessment will be done and reported to TNPCB in six-monthly compliance reports. Rejuvenation of Odai is included under the EMP plan. Monitoring will be carried out through NABL-accredited reputed agencies. | **Chapter 2 – Wastewater Management (Sec 2.9.2)** |

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| **1.5** | The committee noted that windmills are already present at four locations within the proposed industrial area. To avoid obstruction of wind flow and potential operational hazards, plantation of tall trees in these zones should be restricted. Instead, the areas should be developed with low-height shrubs and ground cover species, which will provide ecological and aesthetic benefits without compromising windmill efficiency. Priority should be given to native, drought-resistant species to ensure sustainability and minimize maintenance requirements. | The windmill buffer areas within the project site are treated as designated no-development zones, wherein no buildings, infrastructure, or tall vegetation are permitted. These zones are maintained exclusively for windmill safety, wind-flow unobstruction, and operational clearance.There are Six existing windmills whose buffer area interfears with the proposed project boundary out of six, three falls within the Project area. SIPCOT has excluded high-canopy trees in these zones and will plant only low-height, drought-tolerant native shrubs and ground covers that do not interfere with wind flow or rotor safety. | **Chapter 2 – Project Components (Sec 2.7.3)** |
| **1.6** | Provisions for plantation/afforestation in the plan shall invariably consider complete segregation of the Project area from non-project area around it through at least 30–50 meter greenbelt all along the boundary of the project and at least 50-meter greenbelt around the large water bodies with an intent of making them an undisturbed wilderness. Linear water bodies like river/ canals / nallah shall also be protected by the greenbelt of tree. Enough number green plantation patches shall be created especially in industrial area which shall act as green lungs to mitigate the | A total greenbelt area of 186.714 ha (23.46% of the project area) is provided within the Industrial Park. This includes 108.503 ha developed by SIPCOT comprising a 10 m wide greenbelt along the project boundary, 30 m greenbelt along Odai, 15 m greenbelt along Nilaviyal Odai, and a 15 m wide greenbelt along the periphery of the Lyocell manufacturing unit. In addition, 78.211 ha of greenbelt is developed within individual industrial plots as per applicable norms. Odai and Nilaviyal odai are protected through dedicated greenbelt buffers, and multiple internal green plantation patches | **Table.8 – Greenbelt Requirement** |

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| | impact of pollutants and effluents on the human health of the population within the industrial area as well as adjoining commercial and residential areas in the project. | are provided within the industrial area to function as green lungs. | |
| **1.7** | For the purpose of maintaining the 33% greenbelt in the project green/ open spaces/parks shall not be accounted for Only multilayered plantation creating vegetative screens to obstruct the flow of pollutants shall be created. | As per the Office Memorandum dated 29.10.2025 on rationalization of greenbelt/green cover for Industrial Parks, only multilayered plantations forming vegetative screens are considered and green/open spaces and parks are excluded. Accordingly, a total greenbelt area of 186.714 ha (23.46% of the Total area) has been earmarked, with greenbelt requirements for Red, Orange, Green, and White category industries to be implemented as prescribed in the said OM, ensuring full compliance with the revised greenbelt norms. | **Table.8 – Greenbelt Requirement** |
| **1.8** | List of existing and proposed industries and their layout shall be drawn and shall be submitted along with the EIA/EMP report. | A comprehensive industrial zoning plan is prepared showing plots for Textile (Lyocell and other), Engineering and Non-EC industries, commercial zones, and amenities. The layout map is attached in Annexure- 4. | **Annexure – 4 Tentative Layout Map** |
| **1.9** | Categorization of industries as per CPCB/SPCB norms and as per EIA notification, 2006 has to be mentioned. PP shall submit the estimation/assessment of the wastewater generation from the proposed Industries and the feasibility of the proposed Zero | Industrial categories are classified per CPCB "Red, Orange, Green, White" standards. All industries will adopt ZLD and install separate effluent treatment systems. | **Chapter 2 – Wastewater Management (Sec 2.9.2)** |

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| | Liquid Discharge facility. | | |
| **1.10** | Provision for Reuse/Recycling of treated wastewater, wherever feasible. Explore possibilities for recycling and reusing treated water in the unit to reduce the freshwater demand and waste disposal. A detailed water harvesting plan needs to be submitted. Provision for Zero liquid discharge whenever techno-economically feasible. Provision for Continuous monitoring of effluent quality/quantity. | The project framework ensures maximum reuse and recycling of treated wastewater. For industrial process requirements, including the Lyocell manufacturing unit and other industrial units, water will be sourced from secondary treated sewage supplied by the Tuticorin Municipal Corporation, which will be further treated through tertiary treatment systems and utilized for process and utility operations. Industrial effluents generated from all units, including the Lyocell unit, will be treated through dedicated ETPs followed by Zero Liquid Discharge (ZLD) systems and 100% reused within industrial processes, thereby eliminating liquid discharge and reducing freshwater demand. Treated sewage from STPs will be reused for greenbelt development and landscape irrigation. Continuous online monitoring systems will be provided to monitor effluent quality and quantity, ensuring full regulatory compliance. | **Chapter 2 – Wastewater Management (Sec 2.9.2)** |
| **1.11** | A detailed rainwater harvesting plan including the provisions for check dams across all major and minor drains/streams and water recharge wells along the banks of these drains/nallah/khad, shall be prepared and submitted as part of the EIA Report. | The Industrial Park includes a comprehensive RWH plan with stormwater drains, percolation pits and recharge wells at strategic locations near Odai channels. Check dams are constructed to facilitate aquifer recharge and reduce run-off velocity. | **Chapter 2 – Rainwater Harvesting & Stormwater Management (Sec 2.12)** |
| **1.12** | PP has to develop and plan greenbelt plantation strategy according to the soil parameters viz soil stabilization, | Soil testing indicates slightly acidic conditions (suitable for native species like Neem, Pongamia and Cassia). Plantation species and | **Chapter 2 – Land Use and Soil Characteristic** |

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| | comprehensive soil types, dividing area according to the pH values, and the budget for the greenbelt plantation to be allocated accordingly as the proposed Industrial Area is in nature of acidic soil. | density planned; accordingly, budget included under EMP. | **s** |
| **1.13** | The planning of Industrial Estate should be based on the criteria mentioned in this Ministry's Technical EIA Guidance Manual for Industrial Estate (2009) prepared by IL&FS as well as CPCB's Zoning Atlas Guidelines for siting industries. | The EIA follows MoEFCC 2009 Guidance for Industrial Estates and CPCB Zoning Atlas criteria for site selection, distance from habitation, and buffer zones. | **Chapter 1 – Scope and Methodology (Sec 1.5)** |
| **1.14** | PP also mentioned that the area proposed non-EC category industries where the built-up area for these industries may exceed 20,000 sq. meters. In such cases, the project would fall under Category 8(a)/8(b) of the EIA Notification, 2006, and hence would require a separate Environmental Clearance (EC). Therefore, a separate EC shall be obtained for such area development/construction projects. | SIPCOT has noted that in the non-EC category industrial plots, if the built-up area of any individual unit exceeds 20,000 sq.m, such development shall attract the provisions of Schedule Activity 8(a)/8(b) of the EIA Notification, 2006 and its susequent amendments. In such cases, the concerned unit shall obtain a separate Environmental Clearance (EC) from the competent authority prior to construction, independent of the Industrial Park EC. | **Chapter 1 – ToR Compliance (Sec 1.7)** |
| **1.15** | A Detailed layout of the proposed Industrial area is to be submitted along with the EIA/EMP report. | A detailed layout plan of the proposed SIPCOT Industrial Park has been prepared and submitted with the EIA/EMP report, delineating all land uses, infrastructure, greenbelt, drainage features, and non-developable areas in compliance with the ToR. | **Annexure -3** |

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| **1.16** | The layout shall be planned in such a way that all red-category industries with higher pollution potential (highly polluting or hazardous) industries shall be kept away as far as possible from human habitations, and water bodies to minimize environmental and health risks to nearby communities. | The layout has been planned such that Technical Textile and other Textile industries are located to maintaining a minimum separation distance of more than 500 m from human habitations and water bodies. Other red-category industries that do not attract the provisions of the EIA Notification, 2006 are located within the Industrial Park and suitably buffered from settlements and water bodies. | **Chapter 2 – Project Zoning (Sec 2.7.2)** |
| **1.17** | A detailed plan for risk assessment and mitigation plan for the worst-case scenario providing an analysis of potential pollutant dispersion in case of accidents such as chemical spills, fires, or gas leaks. | Preliminary risk aspects identified for Proposed SIPCOT Industrial park, Lyocell unit and chemical storage; detailed RA and DMP is given in chapter 7. A detailed hydro-geological study report prepared by HG -Geo Expert team is attached in Annexure - 11 | **Chapter 1 – Scope / Cross-ref Ch. 7** |
| **1.18** | A detailed hydro-geological study on the catchment area of the drainage system within the core zone and at least 5 km perimeter of the project area shall be conducted. | A detailed hydro-geological study reprot has been prepared for 5km perimeter of project area and attached in Annexure -11 | **Annexure -11** |
| **1.19** | Groundwater Rejuvenation Plan, as well as water body rejuvenation plan, shall be submitted and drainage mapping shall be carried out and a plan for the rejuvenation of groundwater through the aquifers shall be submitted along with the EIA/EMP report with budgetary provisions as part of the Environmental Management Plan in consultation with gram panchayat for the restoration of structures, construction and | With the total rainwater harvestable from the proposed plot area considering peak rainfall scenario , Groundwater and water body rejuvenation plan is prepared and Given in Annexure - 11 | **Annexure - 11** |

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| | maintenance of greenbelt buffer, garland drains for the Industrial Area. | | |
| **1.2** | The Water balancing chart and its resources for obtaining the groundwater shall be submitted. | No groundwater extraction is proposed for the project. The entire water requirement of 66308 KLD will be met through SIPCOT's desalination supply (10437 KLD), domestic supply (430 KLD), and treated wastewater sources — including 20,000 KLD of tertiary-treated sewage from Tuticorin Municipal Corporation and 28,562 KLD of treated effluent reuse within industries. The detailed water balance chart and source distribution have been prepared and submitted, clearly demonstrating zero dependency on groundwater resources. | **Chapter 2 – Water Requirement (Sec 2.8.2)** |
| **1.21** | PP shall submit a clarification regarding the purpose and requirement for setting up Petrol and diesel storage units in the proposed Industrial Estate. Further, details of the mode of receipt of petroleum products and distribution methodology, etc. Safety features and area required for the same etc. to be highlighted and submitted. | No common petrol or diesel storage is proposed by SIPCOT. The Lyocell unit and other Individual industries will maintain its own PESO-approved fuel storage for captive power and DG backupFuel will be received through authorized oil tankers, with all safety measures as per statutory norms. | **Chapter 2 – Infrastructure Services (Sec 2.8.1)** |
| **1.22** | PP shall specify their commitment regarding the power generated through renewable sources like Solar etc. | SIPCOT and the Lyocell manufacturing unit are committed to promoting the use of renewable energy sources within the industrial park. The Lyocell unit will install 5–8 MW rooftop solar power systems and solar street lighting | **Chapter 2 – Power Requirement (Sec 2.8.1)** |

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| | | across the facility, while SIPCOT will implement solar-powered streetlights and common area lighting within the park infrastructure. | |
| **1.23** | PP shall calculate and submit the carbon footprint of the proposed Industrial Area in the detailed EIA/EMP Report. | Lifecycle analysis is carried out to assess the total carbon footprint on account of proposed development and given in Annexure - 8 | Annexure -8 |
| **1.24** | Detailed air quality study for each point source to be conducted along with the Micro metallurgical data. | Micrometeorological monitoring (Mar–May 2025) done on-site; wind rose and ambient AQ data used for dispersion analysis. In Operational phase Each individual Industries will will conduct Point source with the Micro metallurgical data. | **Chapter 3 – Air Environment (Sec 3.5)** |
| **1.25** | The industrial layout/zones shall be planned in such a way that no tree can be felled/transplanted unless exigencies demand. Where absolutely necessary, tree felling shall be with prior permission from the concerned Authority. Where the trees need to be cut/transplanted with prior permission from the concerned local Authority, a compensatory plantation in the ratio of 1:10 (i.e. planting of 10 trees for every 1 tree that is cut/non-survival of any transplanted tree) shall be done and maintained. Plantations to be ensured species (cut) to species (planted). All the plantation will be done by the State Forest Department as deposit work and not by private contractors. | The project layout has been planned to minimize tree felling. Of the 65 existing trees, 30 trees fall within road and amenity plots. 20 trees (18 Palm and 2 Neem) are proposed to be felled due to site exigencies, after obtaining prior permission from the DFO. Compensatory plantation shall be undertaken in a 1:10 ratio of the same species within the proposed greenbelt area (108.503 ha, 271258 Nos. of trees). Plantation will be carried out in consultation with the DFO. | **Chapter 2 – Project Zoning (Sec 2.7.2); Greenbelt Requirement (Table 8)** |

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| **1.26** | The plan for afforestation should be such that it is free from pesticides with flowering plants of native species for attracting bees and insects, which in turn is beneficial to agriculture. Farmers around the project site shall be involved in developing such an afforestation Plan. | Plantation will use native species like Neem, Pongamia, Cassia and Tabebuia; no chemical fertilizers or pesticides used; Local farmers will be engaged through community-based agreements for plantation, watering, and maintenance activities | **Chapter 2 – Greenbelt Development Plan (Sec 2.7.3)** |
| **1.27** | Details of Onsite and Offsite emergency plans as per provisions of the MSIHC Rules need to be submitted. | SIPCOT will not handle hazardous chemicals. Onsite and Offsite Emergency Plans under the MSIHC Rules shall be prepared and implemented by individual industries handling hazardous chemicals, in coordination with the District Authorities, as applicable. | **Chapter 1 – ToR Compliance / Cross-ref Ch. 7** |
| **1.28** | Obtain the most recent wind data relevant to the area of the proposed industrial park, ensuring that the data reflects prevailing wind directions and speeds over an extended period of at least one year, and create a Wind Rose Diagram that accurately represents the collected wind data. | Wind data recorded for March–May 2025; wind rose shows predominant SSW direction. | **Chapter 3 – Meteorology (Sec 3.4)** |
| **1.29** | Carry out a study with a reputed University/Social Institute like TISS on measuring the impact of the Project on the Health of Human beings and measures to monitor and mitigate the same. | The present proposal is for area development of Industrial ready plots with all common services like Road , Fresh Water supply, development, development of Greenbelt & Stormwater drain etc A detailed impact study has been conducted by NABET accredited Environmental consultant on the aspects of Social Impacts and welfare & mitigative measures . | **Annexure - 6** |

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| **1.3** | Activity-wise, a time-bound action plan along with budgetary provision for occupational health & surveillance, environment management plan, and greenbelt development plan. Assessment of the carrying capacity of transportation load on roads inside the notified industrial premises shall be carried out and submitted. | A detailed Environmental Management Plan (EMP) has been prepared with activity-wise, phase-wise implementation schedule with allocated budget INR 10636 lakhs for Proposed SIPCOT Industrial park and INR 24600.0 lakhs for the Lyocell unit; traffic load and road capacity studied for NH-138 connectivity. | **Chapter 2 – Project Cost (Sec 2.10) & Chapter 3 Traffic Survey (Sec 3.13)** |
| **1.31** | In addition to the above, the EIA/EMP report shall also address issues such as i) Effective fugitive emission control measures for process, transportation, packing, etc. ii) use of cleaner fuels, and iii) best available technology for the plant. | Air pollution control measures include dust suppression, paved roads, low-Sulphur fuel DG sets and use of green technologies for industrial units. | **Chapter 2 – Air Pollution Control Measures (Sec 2.9.1)** |
| **Standard Terms of Reference for (Townships/ Area Development Projects / Rehabilitation Centres)** | | | |
| **1.** | **Project Details** | | |
| **1.1** | Need and benefits of the project. | The project addresses the demand–supply gap for Technical Textiles and allied industries in southern Tamil Nadu. It promotes industrial decentralization, regional employment, and economic development. The park supports the "Make in India" initiative by providing ready industrial infrastructure for both export-oriented and non-EC category industries. | **Chapter 2 – Need for Project (Sec 2.2)** |
| **1.2** | Submit data for built-up area for each building, the use and occupancy classification in line with NBC 2016 also to be | Total built-up area of the Lyocell & Tissue Manufacturing Unit is **235,811 m²**, classified under "Industrial Occupancy" (as per | **Chapter 2 – Project Details (Sec 2.4 & Table** |

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| | indicated [for differential functional requirements]. | NBC 2016). Other plots are categorized for industrial sheds, warehouses, amenities, and administrative facilities as per SIPCOT's standard zoning practice. | **34 )** |
| **1.3** | The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out. | The total capital cost of the Industrial Park is ₹666.11 Crores. This includes cost of land development, infrastructure, internal roads, water supply network, stormwater drainage, street lighting, and greenbelt development. Environmental Management Plan Budget 10636.0 lakhs has been integrated into this allocation, covering plantation, monitoring, and mitigation measures | **Chapter 2 – Project Cost (Sec 2.10 & Table 33)** |
| **2.** | **Land Environment** | | |
| **2.1** | Examine details of land use as per Master Plan and land use around 10 km radius of the project site. Analysis should be made based on latest satellite imagery for land use with raw images. Check on flood plain of any river. | The site lies in Allikulam and adjoining villages under Thoothukudi District, GO issued by Govt. for development of Industrial park vide G.O.(Ms).No.100 dated 26.02.2021 . No part of the site falls within a floodplain or CRZ. The area slopes gently (average elevation 32–38 m AMSL) and natural drainage follows the Odai and Nilaviyal Odai system, which are retained and buffered. | **Chapter 2 – Land Use (Sec 2.4 & Table 6) Chapter 3 – Land Environment (Sec 3.9 & Table 71)** |
| **3** | **Land Acquisition and R&R** | | |
| **3.1** | Submit details of environmentally sensitive places, land acquisition status, rehabilitation of communities/villages and present | The total extent of 796.240 ha was approved under **G.O. (Ms) No. 100 dated 26.02.2021**. The land is government-owned land. Vallanadu | **Chapter 2 – Land Details (Sec 2.3 & Table 5)** |

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| | status of such activities. | Reserve Forest & Blackbuck Sanctuary are located 13.71 km SW, and the ESZ boundary is 13.27 km SW from the project site. | |
| **4** | **Environmental Monitoring And Management** | | |
| **4.1** | Examine baseline environmental quality along with projected incremental load due to the project. | Baseline Environmetal studies conducted and the details are given in chapter – 3. The predicted Impacts on air quality are done in Cumulative Impact analysis and given in Annexure – 10 Specific controls for Air control system, waste water control system, and Noise control on equipments all are prescribed in chapter -3. | **Chapter 3 – Description of Environment (Sec 3.1–3.12) Chapter 4 – Anticipated Impacts (Sec 4.1–4.4)** |
| **4.2** | Environmental data to be considered in relation to the project development would be (a) land, (b) groundwater, (c) surface water, (d) air, (e) bio-diversity, (f) noise and vibrations, (g) socio economic<br>and health. | **Land:** The project area mainly comprises barren/scrub and agricultural land with flat topography. Land use conforms to SIPCOT zoning norms, and 23.46% of the total area is will be developed with greenbelt. This complies with the recently published OM 29.10.2025.<br>**Groundwater:** Quality at all Ten monitoring locations meets IS 10500:2012 standards. The area is classified as "Safe" (16.06% development) by CGWB. No groundwater extraction is proposed; Water sourced from Desalination Plant and treated municipal water will be used.<br>**Surface Water:** Quality at Ten locations meets CPCB Class "C" criteria, suitable for drinking after conventional treatment. Zero Liquid Discharge (ZLD) will be | **Chapter 3 – Baseline Environment (Sec 3.4–3.12)** |

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| | | maintained through complete reuse of treated effluent and sewage. **Air:** Ambient air quality parameters ($PM_{10}$, $PM_{2.5}$, $SO_2$, $NO_2$) are within NAAQS limits, and AQI is rated "Good." Adequate stack height, APCS, and dust suppression systems will be provided by the Individual industries. **Biodiversity:** No forest or eco-sensitive zone lies within 10 km. Fifteen Schedule-I species recorded; a separate Wildlife Conservation Plan is attached in Annexure - 7. **Noise & Vibration:** Noise levels are within CPCB limits for industrial and residential areas. DG sets are acoustically enclosed, and PPEs will be provide to workers. **Socio-Economic & Health:** The area has good literacy, infrastructure, and healthcare access. The project will generate employment, improve local economy, and implement periodic occupational health surveillance. | |
| **4.3** | Submit Roles and responsibility of the developer etc for compliance of environmental regulations under the provisions of EP Act. | SIPCOT, as the Developer, shall ensure compliance with the Environment (Protection) Act, 1986 by:<br>1. Constituting a dedicated Environmental Managemnt Cell to oversee Environmental related activities.<br>2. Obtaining and maintaining statutory approvals, including | **Chapter 10 – EMP (Sec 10.2)** |

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| | | EC, CTE, CTO, and complying with all conditions of MoEF&CC/ SEIAA/TNPCB.<br>3. Implementing the approved EMP and ensuring proper operation of environmental infrastructure such as wastewater, stormwater, solid waste, and greenbelt systems.<br>4. SIPCOT shall instruct the individual industries to obtain all statutory clearance and comply with all regulatory norms.<br>5. Ensuring scientific management of all waste streams in accordance with applicable Rules under the EP Act.<br>6. Developing and maintaining the required greenbelt as per EC conditions and MoEF&CC guidelines.<br>7. Submitting half-yearly EC compliance reports and the annual Environmental Statement (Form-V) within prescribed timelines.<br>8. Ensuring that all industrial units and contractors within the Industrial Park comply with relevant environmental regulations.<br>9. Reporting any environmental incidents or deviations to the regulatory authorities as required. | |

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| **4.4** | Examine separately the details for construction and operation phases both for Environmental Management Plan and Environmental Monitoring Plan with cost and parameters. | The Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMoP) have been examined and detailed separately for construction and operational phases, including activity-wise mitigation measures, monitoring parameters, frequency, responsibilities, and associated capital and recurring costs. | **Chapter 10– EMP (Sec 10.5 & Tables 141–142) Chapter 6 (Sec 6.3)** |
| **4.5** | Possible carbon footprint contribution from each activities and mitigation measures proposed shall be included as part of Environment Management Plan. | Lifecycle assessment carried out by NABET accredited Environmental consultant is given in Annexure -8 | **Annexure - 8** |
| **5** | **Drainage** | | |
| **5.1** | Submit a copy of the contour plan with slopes, drainage pattern of the site and surrounding area. Any obstruction of the same by the project. | A topographical contour map and drainage layout are provided. The terrain has a gentle slope toward the southeast. Natural drainage via Odai and Nilaviyal Odai is retained with stormwater collection and recharge structures integrated along the flow path. | **Chapter 2 – Topography & Drainage (Sec 2.3.1 & 2.12)** |
| **6** | **Forest** | | |
| **6.1** | Submit the details of the trees to be felled for the project, if any . | The project site contains a total of 65 trees, comprising 41 Palm tree, 20 Vadali, 2 Neem, 1 Vagai, and 1 Manjanathi, along with scattered shrubs. The existing trees will be carefully replanted and preserved at suitable locations within the site. Along internal roads and greenbelt zones, as part of the landscape and greenbelt development plan. | **Chapter 2 – Project Description (Sec 2.7.3)** |
| **6.2** | Submit the present land use and permission required for any | Govt has issued GO for establishing the Industrial Park vide government | **Chapter 2 – Land Details** |

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| | conversion such as forest, agriculture etc. | order (G.O. 100/2021). No forest or agricultural land diversion is applicable. | **(Sec 2.3)** |
| **7** | **Water Environment** | | |
| **7.1** | Ground water classification as per the Central Ground Water Authority. | The site falls under the Thoothukudi block, which is classified as "Safe" by CGWA. Groundwater levels range from 12–18 m bgl. | **Chapter 3 – Water Environment (Sec 3.8 & Table 65)** |
| **8** | **Water Management** | | |
| **8.1** | Examine the details of Source of water, water requirement, use of treated waste water and prepare a water balance chart. | The total water requirement of 66308 KLD for the SIPCOT Industrial Park, including all individual industries, will be met from multiple sources. About 10,867 KLD will be supplied from SIPCOT's sources — comprising 10,437 KLD from the desalination plant and 430 KLD of fresh water for domestic use. In addition, 26266 KLD of secondary treated STP water from Thoothukudi Municipal Corporation will be supplied, of which 20,000 KLD is allocated to the Lyocell unit for tertiary treatment and process use, while the remaining 7,495.98 KLD will cater to other industries and greenbelt. Further, 28,562 KLD of treated effluent water from individual ETPs and common facilities will be reused within their premises, and 633 KLD of treated sewage from individual STPs will be used for greenbelt irrigation. No groundwater extraction is proposed. SIPCOT will function as the developer and water supplier, | **Chapter 2 – Water Requirement (Sec 2.8.2 & Table 25)** |

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| | | ensuring supply through its distribution system; it will not utilize the treated or tertiary water for its own consumption. The entire system will operate under a Zero Liquid Discharge (ZLD) arrangement. | |
| **8.2** | Rain water harvesting proposals should be made with due safeguards for ground water quality. | The park includes a detailed RWH system with check dams, recharge pits, and stormwater collection drains designed to maximize infiltration and minimize runoff. | **Chapter 2 – Rainwater Harvesting & Stormwater Management (Sec 2.12)** |
| **8.3** | Maximize recycling of water and utilization of rain water. Examine details. | Each industrial unit will install ZLD systems; treated effluent reused for cooling towers, utilities, and greenbelt irrigation. | **Chapter 2 – Wastewater Management (Sec 2.9.2)** |
| **8.4** | Examine soil characteristics and depth of ground water table for rainwater harvesting | Site soils are sandy clay loam with moderate permeability; water table 12–18 m bgl, suitable for recharge harvesting. | **Chapter 2 – Soil Conditions (Sec 2.4)** |
| **8.5** | Permission from CGWA for abstraction of groundwater, if any, including dewatering during basement excavation. | No groundwater extraction by SIPCOT or any member Industries. | **Chapter 2 – Water Management (Sec 2.8.2)** |
| **9** | **Waste Management** | | |
| **9.1** | Examine details of solid waste generation treatment and its disposal. | Solid waste during construction will be reused for backfilling and leveling. During operation, municipal solid waste from amenities and other individual industries will be collected and disposed through TNPCB-authorized vendors. | **Chapter 2 – Waste Management (Sec 2.9.4 & Table 28)** |
| **9.2** | Construction & Demolition Waste Management Plan shall be | Construction waste will be reused for road sub-base and leveling; | **Chapter 2 – Waste** |

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| | prepared as part of EMP providing details of demolition activities involved along with quantification and disposal mechanism. | excess will be sent to authorized C&D waste recyclers. | **Management (Sec 2.9.4)** |
| **10** | **Energy Requirements** | | |
| **10.1** | A certificate of adequacy of available power from the agency supplying power to the project along with the load allowed for the project. | In TamilNadu , TANGEDCO is the nodal agency to provide power supply. Adequate generation and distribution capacity is available . 2 Nos. of Amenities Plot is earmarked for setting up TANGEDCO Sub station . | **Chapter 2 – Power Requirement (Sec 2.8.1)** |
| **10.2** | Examine and submit details of use of solar energy and alternative source of energy to reduce the fossil energy consumption. Energy conservation and energy efficiency. | SIPCOT proposes solar-powered streetlights and rooftop solar installations on administrative buildings; promotion of solar power for industrial users under net metering scheme.<br>Lyocell : In line with energy conservation measures, the project also proposes installation of 5–8 MW rooftop solar power systems and solar street lighting across the industrial complex to supplement captive power generation and promote renewable energy use within the site (Comply with Renewable Consumption Obligation (RCO) Notification, S.O.4421 (E) 27th September, 2025). | **Chapter 2 – Power Requirement (Sec 2.8.1)** |
| **10.3** | DG sets are likely to be used during construction and operational phase of the project. Emissions from DG sets must be taken into consideration while estimating the impacts on air environment. | SIPCOT has not proposed any DG sets. Individual industries will be instructed to follow applicable rules and regulations. DG sets, where used, will conform to CPCB-II norms and include acoustic enclosures and stack height as per | **Chapter 2 – Infrastructure Services (Sec 2.8.1)** |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| | | TNPCB standards. | |
| **11** | **Road and Traffic** | | |
| **11.1** | Examine road/rail connectivity to the project site and impact on the traffic due to the proposed project. Present and future traffic and transport facilities for the region should be analysed with measures for preventing traffic congestion and providing faster trouble free system to reach different destinations in the city. | The project site is well-connected to NH-7A (2.75 km SSE) and Thoothukudi Port (15 km). The internal road network follows a grid layout with 30–45 m ROWs to handle industrial traffic. | **Chapter 2 – Accessibility & Connectivity (Sec 2.3.2)** |
| **11.2** | A detailed traffic and transportation study should be made for existing and projected passenger and cargo traffic. | Baseline traffic survey conducted; additional industrial traffic assessed to remain within service capacity of NH-7A with planned widening and access control. | **Chapter 3 – Traffic Survey (Sec 3.13 & Tables 111–114)** |
| **11.3** | Examine the details of transport of materials for construction which should include source and availability. | Construction materials such as sand, aggregates, and cement will be sourced from licensed quarries and transported in covered trucks to prevent spillage and dust. | **Chapter 2 – Construction Plan (Sec 2.5)** |
| **12** | **Disaster Management Plan** | | |
| **12.1** | Submit details of a comprehensive Disaster Management Plan including emergency evacuation during natural and man-made disaster. This should cover details of vulnerabilities due to natural and manmade hazards (earthquake, flooding, cyclone, landslides, fire etc.) and details of disaster mitigation efforts for buildings and infrastructure through structural sufficiency and | A comprehensive Disaster Management Plan covering natural and man-made disasters, including emergency evacuation and mitigation measures in line with NBC, 2016. | **Chapter 7 – Disaster Management Plan (Sec 7.4)** |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| | Fire and Life Safety compliance in line with National Building Code NBC, 2016. | | |
| **13** | **Court Cases** | | |
| **13.1** | Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given. | No court cases or litigation filed against SIPCOT. | **Chapter 1 – Introduction** |
| **14** | **Miscellaneous** | | |
| **14.1** | Any further clarification on carrying out the above studies including anticipated impacts due to the project and mitigative measure, project proponent can refer to the model ToR available on Ministry website http://moef.nic.in/Manual/Townships. | The EIA is prepared in accordance with MoEF&CC's Model ToR and Guidance Manual (2009). | **Chapter 1 – Scope & Methodology (Sec 1.5)** |

# Section C (Executive Summary)

# DRAFT EXECUTIVE SUMMARY

**For**

## DEVELOPMENT OF AN INDUSTRIAL PARK AT ALLIKULAM, KEELATHATTAPARAI, PERURANI, UMARIKOTTAI, MELATHATTAPARAI, RAMASAMYPURAM AND THERKUSILLUKKANPATTI VILLAGES, THOOTHUKUDI TALUK, THOOTHUKUDI DISTRICT, TAMIL NADU OVER AN EXTENT OF 796.240 HECTARES (1966.713 ACRES)

**Activity and Category: Schedule 7(c) – Industrial estates/Park/Areas falls under Category "A", Area exceeding 500 ha along with one pre-defined Schedule 5(d) , 1(d) & 8(b) Category 'B' Industry within the proposed Industrial Park as per EIA Notification, 2006 as amended**

**ToR File No : 10/19/2025-IA.III Dated on 21/09/2025**

**Baseline Period : March 2025 – May 2025 (Summer Season)**
**(Laboratory Assigned: M/s. Perfact Researchers Pvt Ltd., vide Certificate No. TC-6993, valid up to 03.04.2029)**

**by**

## PROJECT PROPONENT

**M/s. STATE INDUSTRIES PROMOTION CORPORATION OF TAMILNADU LIMITED (SIPCOT)**

19-A, Rukmani Lakshmipathy Road Egmore, Chennai - 600008.

## ENVIRONMENTAL CONSULTANT

**M/s. PERFACT ENVIROSOLUTIONS PVT. LTD**

(NABET Registered List of Accredited Consultant Organisations/NABET/EIA/25 - 28/ RA 0467 Valid Upto 26/11/2028)

**Registered Address:-** Perfact House, A 14, Shubham Enclave (Outer Ring Road), Paschim Vihar, New Delhi 110063

**Regional Address :** 4th Floor, Kochar Bliss, Thiru. V. Ka. Industrial Estate, Guindy, Chennai 600032

## PROJECT CONSULTANT

**M/s. ITCOT LIMITED**

**Address :** 50-A, Greams Road ,Murugesa Naicker Complex, Chennai - 600 006

**DECEMBER 2025**

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# 1. INTRODUCTION

State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT as the apex body for industrial infrastructure development in Tamil Nadu has established more than 50 Industrial Parks including 8 Special Economic Zones (SEZs) across 24 districts, spanning over 48,926 acres., since its inception in 1971. These initiatives have attracted investments exceeding ₹1.99 lakh crores and generated nearly 8.79 lakh employment opportunities, solidifying Tamil Nadu's reputation as a premier industrial destination in India.

## 1.1 Project Description

State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT) proposes "Development of An Industrial Park at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram And Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu in an area of 796.240 hectare (1966.713 acres). The total project cost will be INR 666.11 Cr. The land is owned by State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT) vide G.O.(Ms).No.100 dated 26.02.2021.

The proposed Industrial Park features comprehensive zoning for Industrial Plots for Industries attracting EIA Notification (Technical Textile and other Textile units) and for those not attracting as well, plots for amenities, commercial and other activities such as SWM, Internal roads and Stormwater drains and Greenbelt development. Total plotted development will be carried out in 721.338 ha while Non-development area (Nilaviyal odai & RoW for HT Line Buffer) will be 48.951 ha, and no development buffer are left for the windmills falling distance is 25.951 ha.

Proposed Industrial Park will house one pre-defined Lyocell Manufacturing Unit (attracting Environmental Clearance - Category B, Schedule Activity 5(d) , CPP 1(d) and Buildings and Construction 8(b) of the EIA Notification, 2006 and its subsequent amendments.

Since Total plot area exceeds 500 hectares and proposed industrial park includes a predefined Category 'B' industry, Man-Made Fibre Manufacturing Unit Schedule 5(d), with 1(d) & 8(b) the entire project attracts the provisions of Category 'A' , Schedule 7(c) (Industrial Estates/Parks/Complexes/Areas) attracting specific conditions and applicability to public hearing.

Accordingly, application for ToR was uploaded in PARIVESH portal vide Proposal No IA/TN/INFRA1/548303/2025 dated 16.08.2025 & the project appraised in the EAC 414$^{th}$ Meeting dated 02.09.2025 and ToR was issued for the extent of 796.240 Ha (1966.713 acres) by MOEF&CC vide TOR Identification No: TO25A3102TN5260559N [File No. 10/19/2025-IA.III] dated 21.09.2025. EIA study has been carried out as per the above TOR granted and in compliance to the requirements of the EIA Notification, 2006 and its subsequent amendments to identify environmental impacts resulting from the proposed project and to prescribe mitigation measures. Now the report is

being submitted for Public hearing.

## 1.2 About the Project

*Table 1. Brief Description of Project*

| S.No. | Particulars | | Details | |
|---|---|---|---|---|
| **1.** | Location | | Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District. | |
| **2.** | Project Coordinates | | **Latitude :** 8°47'4.25"N<br>**Longitude :** 78° 1'1.48"E | |
| **3.** | Total Plot Area | | **ha** | 796.240 |
| | | | **acres** | 1966.713 |
| **4.** | Project Cost (INR) | | **Crores** | 666.11 |
| **5.** | Approach Road | | NH-7A (Thoothukudi–Tirunelveli National Highway), at an approximate distance of 2.75 km towards the south-southeast (SSE) direction | |
| **6.** | Scope of Development by SIPCOT | | Industrial Park development with zonation , layout , Common amenities, Commercial activities, Greenbelt, Stormwater drain, OSR, SWM, Project Management office and such other infrastructure facilities. | |
| **7.** | Details about the Pre-defined Activity | | Setting up of a Lyocell manufacturing unit in 139.46 ha (344.61 acres) with 300,000 TPA capacity, Tissue Manufacturing unit with 100,000 TPA capacity along with 135 MW Captive Power Generation using Coal & Biomass mixture and Industrial buildings & sheds of 2,35,000 sq.m under schedule Activity 5(d) , category B | |
| **8.** | Other Plotted development | | 1.Technical Textile Industries – 202.43 ha , 20 plots<br>2. Non EC Attracting industries – Red/Orange/Green /White Category 318.979 ha.<br>3. Amenities Plots<br>4. Commercial Plots<br>5. Solid Waste Management<br>6. Project Offices , Security and other Development | |
| **9.** | SIPCOT Industrial Park | EMP Capital Cost | INR 10636 lakhs | |
| | | EMP Recurring | INR 132 lakhs | |

| S.No. | Particulars | | Details |
|---|---|---|---|
| | | Cost | |
| **10.** | Lyocell Manufacturing Unit | Project Cost | INR 495300 lakhs |
| | | EMP Capital Cost | INR 24600.0 lakhs |
| | | EMP Recurring Cost | INR 450.0 lakhs |

*Table 2.Land Use Distribution Details of SIPCOT Industrial Park*

| S.No | Description | Unit | Area (Ha) | Area (Acres) | % of Total area |
|---|---|---|---|---|---|
| 1. | Industrial Plot Area* ( including 15% (193.182 acres) greenbelt as applicable to red category Industries ) | Hectare | 521.409 | 1287.880 | 65.48% |
| 2. | Plots for Common Amenities | Hectare | 14.425 | 35.630 | 1.81% |
| 3. | Plots for Commercial Activities | Hectare | 21.640 | 53.450 | 2.72% |
| 4. | Area for Solid Waste Management | Hectare | 2.024 | 5.000 | 0.25% |
| 5. | Road, Storm Water Drain area | Hectare | 53.337 | 131.740 | 6.70% |
| 6. | Greenbelt by SIPCOT (30 m on either side of Water body (Odai), 15 m on either side of Nilaviyal Odai & & 15m along the Periphery of Lyocell unit and 10m all along the boundary) | Hectare | 108.503 | 268.005 | 13.63% |
| **Total Developable area** | | **Hectare** | **721.338** | **1781.705** | **90.59%** |
| 7. | Area of wind mill falling distance (Radius 181m) | Hectare | 25.951 | 64.100 | 3.26% |
| 8. | Existing Nilaviyal Odai (Non-developable area) | Hectare | 27.994 | 69.145 | 3.52% |
| 9. | RoW HT Line Buffer(Non-developable area) | Hectare | 20.957 | 51.763 | 2.63% |
| **Total Non-developable area** | | **Hectare** | **74.902** | **185.008** | **9.41%** |
| **Grand Total area of the Industrial Park** | | **Hectare** | **796.240** | **1966.713** | **100%** |

(*Note: Includes greenbelt area to be provided by individual Units to meet MoEF&CC norms as per recent OM dated 29.10.2025.)

## 1.3 Location & Accessibility

The Industrial Park is proposed at:

- **Villages :** Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram And

Therkusillukkanpatti Villages,

- **Taluks & District :** Thoothukudi Taluk & District
- **State :** Tamil Nadu.
- **Elevation :** 32 - 38 m (MSL)

**Survey Numbers**: 1-/1, 1-/2, 1/3A, 1/3B, 1/3C, 1/3D, 1-/4, 1/5A, 1/5B, 1/5C, 1/6,8,10A, 1/7, 1-/9, 1/10B, 6-/1, 6-/2, 6-/3, 6/4A, 6/4B1, 6/4C, 6/4D, 6/4E, 6/4F, 6-/5, 6/6A, 6/6B, 7, 8/1,2,4A, 8/1,2,4B, 8-/10, 8/-11, 8-/3, 8-/5, 8/6,8, 8-/7, 8-/9, 10-/1, 10-/2, 10-/3, 10-/4,16, 10-/5, 10/6A, 10/6B, 10/6C, 10/7A, 10/7B, 10/7C, 10-/8, 10/9A, 10/9B, 10-/11,12, 10-/13, 10-/14, 11-/1A, 11/1B, 11-/2, 11-/3, 11-/4, 11-/5, 11-/6, 11-/7, 12/1A, 12/1B, 12/1C, 12/1D, 12/1E, 12/2A, 12/2B, 12-/3, 12-/4, 12-/5, 12-/6, 12-/7, 13/1A, 13/1B, 13/1C, 13/1D, 13/2A, 13/2B, 13-/3, 13-/4, 13-/5, 14-/1, 14-/10, 14-/11, 14-/12, 14-/13, 14-/14, 14-/15, 14-/16, 14-/17, 14-/2, 14-/3, 14-/4, 14-/5, 14-/6, 14-/7, 14-/8, 14-/9, 15/1A, 15/1B, 15-/2, 15/3A, 15/3B, 15/3C, 15/3D, 15-/4, 16-/1, 16/2A, 16/2B, 16/3,4,5, 16/6A, 16/6B, 17/1A, 17/1B, 17/1C, 17/1D, 17-/2, 17-/3, 18-/2, 18-/8, 18-/9, 18-/10, 18/11A, 18/11B, 18/11C, 18/12A, 18/12B, 18/12C, 18/13, 18/14, 18/15, 18/16, 18/17, 18/18A, 18/18B, 18/19, 18/1A, 18/1B, 18/1C, 18/1D, 18/1E, 18/1F, 18/1G, 18/1H, 18/1I, 18/1J, 18/1K, 18/3A, 18/3B, 18/3C, 18/3D, 18/3E, 18/3F, 18/3G, 18/4A1, 18/4A2, 18/4B, 18/4C, 18/5A, 18/5B, 18/5C, 18/6A, 18/6B, 18/6C, 18/7A, 18/7B, 18/7C, 19/1A, 19/1B, 19/1C, 19/1D, 19/1E, 19-/2, 19-/3, 19-/4, 19/5,8A, 19/5,8B, 19/5,8C, 19-/6, 19-/7, 19-/9, 20-/1, 20-/2, 20-/3, 20-/4, 20-/5, 20-/6, 20/7A, 20/7B, 20/8A, 20/8B, 20/8C, 20/8D, 20/9A, 20/9B, 20-/10, 20-/11, 20-/12, 20/13, 20/14, 20/15A, 20/15B, 20/15C, 20/16A, 20/16B, 20/17, 20/18, 20/20, 20/21, 20/22, 20/23, 20/24, 21, 22-/1, 22/2A, 22/2B, 22-/4, 23-/1, 23/2A1, 23/2B, 23/3A, 23/3B, 23/4A, 23/4B, 23/4C, 23/4D, 24, 25/1,3A, 25/1,3B, 25/1,3C, 25/1,3D, 25/1,3E, 25/1,3F, 25/1,3G, 25/1,3H, 25/1,3I, 25/1,3J, 25/2A, 25/2B, 25/2C, 25/2D, 25/4A, 25/4B, 25/4C, 25/4D, 25/4E, 25/4F, 25/4G, 25/4H, 25/4I, 25/5,7A, 25/5,7B, 25-/6, 25/8A,9A,10A, 25/8B,9B,10B1, 25/8B,9B,10B2, 25/8C,9C,10C1, 25/8C,9C,10C2, 25/8C,9C,10C3, 26/1A, 26/1B, 26/1C, 26/1D, 26/1E, 26/1F, 26/1G, 26-/2, 27, 28-/10, 28/1A, 28/1B, 28/1C, 28/2A, 28/2B, 28/2C, 28/2D, 28/3A, 28/3B, 28/3C, 28/4A, 28/4B, 28/4C, 28/4D, 28-/5, 28-/6, 28-/7, 28-/8, 28/9A, 28/9B, 29-/10, 29/1A, 29/1B, 29/1C, 29-/2, 29/3A, 29/3B, 29-/4, 29-/5, 29-/6, 29-/7, 29-/8, 29-/9, 30-/1, 30-/2, 30/3,4A, 30/3,4B, 30/3,4C, 30/5A, 30/5B, 30/6A, 30/6B, 30/6C, 30/7A, 31-/1, 31-/2, 31-/3, 31-/4, 31-/5, 31-/6, 32, 33-/1, 33/2A, 33/2B, 33/2C, 34-/1, 34-/2, 35, 36, 37-/1, 37-/2, 37-/3, 38-/1, 38-/2, 38-/3, 38-/4, 39/1A, 39/1B, 39/1C, 39-/2, 40/1A, 40/1B, 40/1C, 40/1D, 40/2, 40/3A, 40/3B, 40/3C, 40/4A, 40/4B, 40/4C, 40/4D, 40/5, 40/7, 41/1A, 41/1B, 41/2, 42/1A, 42/1B, 42/1C, 42/1D, 42/1E, 42/1F, 42/1G, 42/1H, 42/1I, 42/2, 42/3,4A1, 42/3,4A2, 42/3,4A3, 42/3,4A4, 42/4B, 42/4C, 42/5, 43, 45/1,2A, 45/1,2B, 47/1,2, 47/3A, 47/3B, 47/3C, 47/3D, 48/1, 48/2, 49, 50/1A, 50/1B, 50/1C, 50/2A, 50/2B, 51/10, 51/1A, 51/1B, 51/1C, 51/1D, 51/2A, 51/2B, 51/2C, 51/3, 51/4A, 51/4B, 51/5, 51/6, 51/7, 51/8, 51/9, 52/1, 52/2, 53/1, 53/2, 54/1, 54/2, 55/1, 55/2, 55/3, 55/4, 56/1, 56/2, 56/3 of Allikulam Village, 335, 337, 338, 340, 342, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 358, 360, 362, 364, 372, 373, 375, 376, 381, 382, 383, 385, 386, 387, 388, 391, 395, 400, 401, 402, 403, 406, 434, 435, 438, 444, 445, 446, 447, 448, 449, 450, 456, 459, 461, 462, 463, 464, 465, 466, 282/1, 282/2, 282/3, 282/4, 282/5, 283/1A, 283/1B, 283/1C, 283/1D, 283/1E, 283/2, 283/3, 283/4, 283/5, 333/1A, 333/1B, 333/2A1, 333/2A2, 333/2B, 336/1, 336/2, 339/1A, 339/1B, 339/2, 341/1A1B, 341/1A1C, 341/1A1D, 341/1A1E, 341/1A2, 341/1B, 341/2, 343/1, 343/2, 343/3, 357/1, 357/2, 359/1, 359/2, 359/3, 359/4, 361/1, 361/2A, 361/2B, 361/2C, 361/2D, 363/1, 363/2, 363/3, 363/4, 365/1, 365/2, 366/1, 366/2, 366/3, 366/4, 366/5, 367/1, 367/2, 367/3, 368/1, 368/2, 369/1, 369/2, 370/1, 370/2, 370/3, 370/4, 371/1, 371/2, 371/3, 371/4, 371/5, 371/6, 374/1, 374/2, 374/3, 374/4, 377/1, 377/2, 384/1, 384/2, 389/1, 390/1, 390/3, 392/1, 392/2, 393/1, 393/2,

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District, Tamil Nadu.

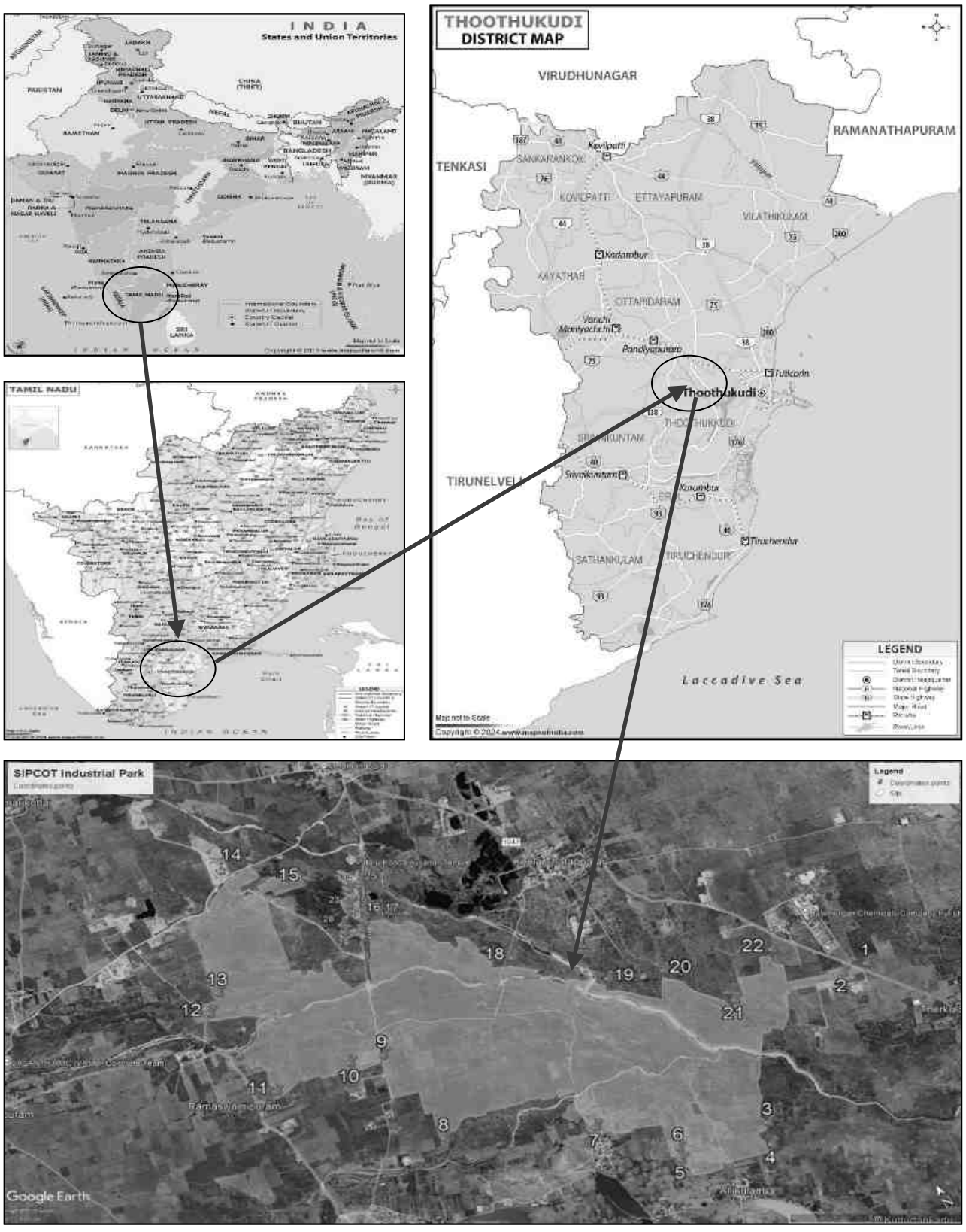


*Figure 1. Project Site showing Coordinates*

*Table 3. Coordinates of the project site*

| Point Nos. | Latitude (N) | Longitude (E) | Direction |
|---|---|---|---|
| 1 | 8°46'34.11"N | 78° 2'48.80"E | E |
| 2 | 8°46'34.49"N | 78° 2'41.02"E | E |
| 3 | 8°45'58.90"N | 78° 1'56.30"E | SE |
| 4 | 8°45'51.78"N | 78° 1'53.72"E | SE |
| 5 | 8°45'59.75"N | 78° 1'26.81"E | S |
| 6 | 8°46'3.64"N | 78° 1'28.24"E | S |
| 7 | 8°46'22.27"N | 78° 1'9.12"E | S |
| 8 | 8°46'39.43"N | 78° 0'27.06"E | S |
| 9 | 8°47'13.71"N | 78° 0'24.24"E | SW |
| 10 | 8°47'15.88"N | 78° 0'14.08"E | SW |
| 11 | 8°47'17.44"N | 77°59'49.74"E | SW |
| 12 | 8°47'50.77"N | 77°59'44.77"E | W |
| 13 | 8°47'55.88"N | 77°59'50.44"E | W |
| 14 | 8°48'32.96"N | 78° 0'21.28"E | NW |
| 15 | 8°48'18.80"N | 78° 0'33.19"E | NW |
| 16 | 8°47'56.84"N | 78° 0'49.48"E | N |
| 17 | 8°47'53.97"N | 78° 0'54.22"E | N |
| 18 | 8°47'25.31"N | 78° 1'14.77"E | N |
| 19 | 8°47'5.70"N | 78° 1'37.12"E | NE |
| 20 | 8°47'0.51"N | 78° 1'53.51"E | NE |
| 21 | 8°46'41.26"N | 78° 2'7.62"E | NE |
| 22 | 8°46'51.92"N | 78° 2'25.96"E | NE |
| 23 | 8°48'3.26"N | 78° 0'39.99"E | N |
| 24 | 8°48'8.34"N | 78° 0'43.34"E | N |
| 25 | 8°48'9.58"N | 78° 0'47.56"E | NW |
| 26 | 8°48'0.41"N | 78° 0'43.13"E | NW |
| 27 | 8°47'56.98"N | 78° 0'41.74"E | NW |
| 28 | 8°47'58.93"N | 78° 0'34.71"E | NW |
| 29 | 8°47'56.00"N | 78° 0'33.68"E | NW |
| 30 | 8°47'55.65"N | 78° 0'39.51"E | NW |

**Topo map of study area & Environment Sensitivity**

The site falls within the {Topo Map No. 58L01 & 58H13} of Thoothukudi District, with general elevation at 32-38 m. Slopes are distinct with natural drainage flowing from North & Northwest to Southeast , finally confluence with the Natural drainage Korampallam at the outskirts of Thoothukudi.

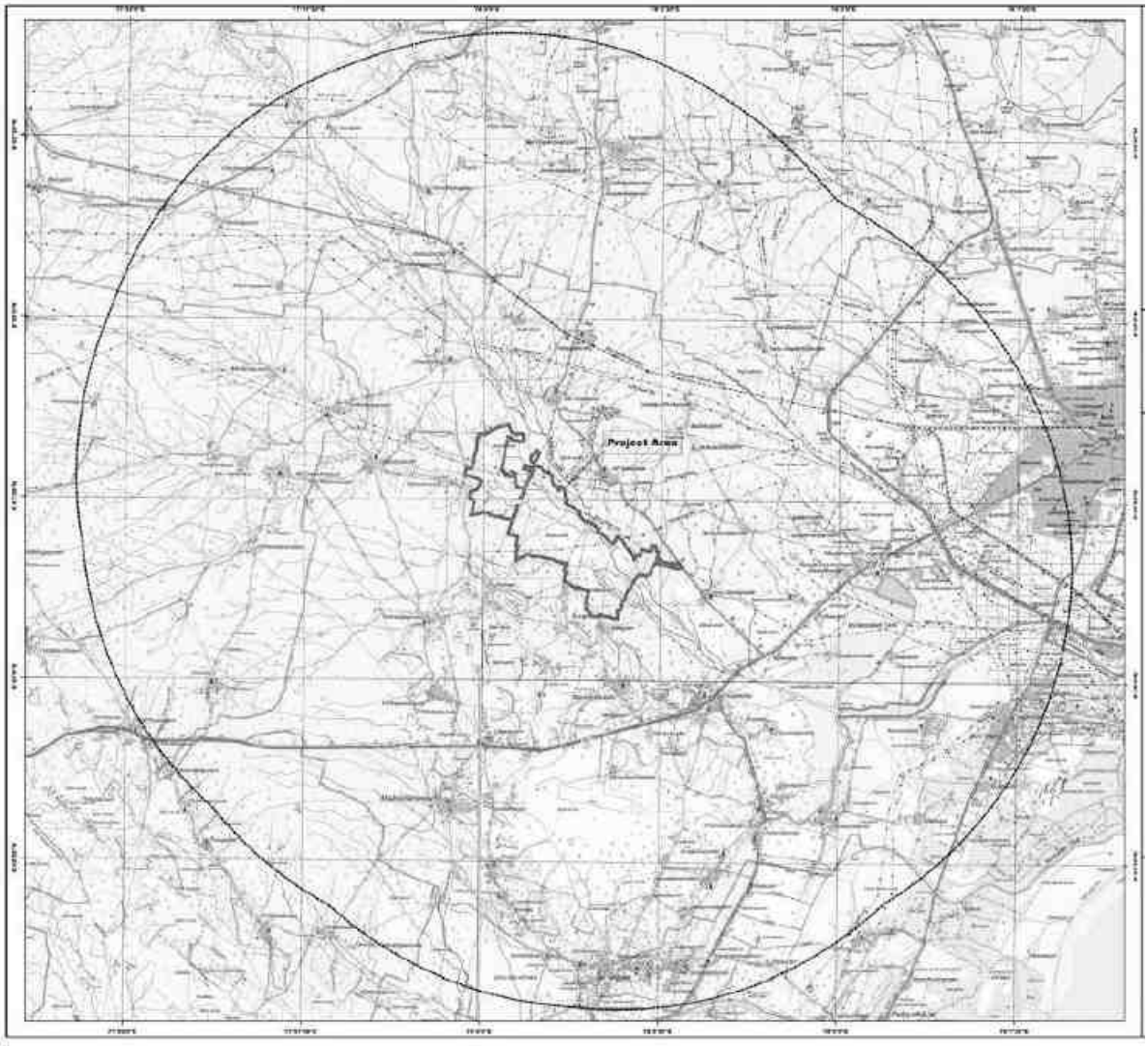



*Figure 2. Topo Map of Study area*

*Table 4. Project Site Specific Environmental Sensitivity Details*

| Environmental Feature / Sensitive Receptor | Approximate Distance (km) | Direction (from Project Site) |
|---|---|---|
| **Water Bodies** | | |
| Nilviyal odai Within Project Area | Odai Within Project Area | Passing through the site |
| Odai within Project Area | Odai Within Project Area | Passing through the site |
| Pond near Project Area | 0.21 | NE |
| Pond near Project Area | 0.31 | NW |

| Environmental Feature / Sensitive Receptor | Approximate Distance (km) | Direction (from Project Site) |
|---|---|---|
| Pond near Project Area | 0.39 | SSW |
| Allikulam Pond | 0.43 | S |
| Pond near Perurani | 0.80 | S |
| Pond near Allikulam | 0.80 | SSE |
| Swimming Pond near Perurani | 1.01 | S |
| Neeravi Pond Perurani | 1.13 | SW |
| Pond near Perurani | 1.25 | WSW |
| Perurani Pond | 1.28 | SW |
| Kadamba Kulam ( Fishing Pond ) | 1.53 | SSE |
| Pond near Perurani | 1.56 | SW |
| Pond near Mel Kuttudankadu | 1.90 | S |
| Pond Elim (Kanchan Kulam) | 2.07 | SSE |
| Vepan Pond | 2.11 | SW |
| Pond near Umari kkottai | 2.39 | NW |
| Pond near Putupatti | 3.04 | SSW |
| Koram Pallam Tank | 3.52 | SE |
| Pond near Varthagareddypatti | 3.52 | SW |
| Pond near Varthagareddypatti | 3.60 | SW |
| periya Kulam water body | 3.80 | SW |
| Pond Bethesda | 3.85 | SSE |
| Senkulam River (River Port) | 4.49 | ENE |
| Pond near Korampallam | 5.06 | E |
| Pond near Korampallam Check Dam | 5.38 | SE |
| North Channal | 6.31 | SSE |
| Pond near Jambulinga Puram | 6.84 | NNE |
| Canal near Tiruvai Puram | 7.18 | SSE |
| Pond near Melmatan | 7.68 | NNE |
| Pond near Sakkammal Puram | 7.73 | SSE |
| Canal near Peykulam | 7.75 | SSE |
| Canal near Brahmapuram | 8.10 | SSE |
| Canal near Manakkudu | 8.50 | SSE |
| Sivathaiya Puram Pond | 8.57 | SSE |
| **Nearby Area** | | |
| Allikulam Village | 0.16 | S |
| **Densely Populated Area** | | |
| Thoothukudi Corporation Area | 2.0 | SE |

| Environmental Feature / Sensitive Receptor | Approximate Distance (km) | Direction (from Project Site) |
|---|---|---|
| **Inland, Coastal, Marine Waters** | | |
| Gulf of Mannar | 14.63 | ENE |
| **State/National Boundaries** | | |
| International Boundary towards Bay of Bengal | 14.63 | ENE |
| **ASI Monuments** | | |
| Sirupadu (Iron age burial site) | 4.75 | E |
| The Panchalankurichi Fort | 14.06 | N |
| Sivagalai | 14.75 | S |
| Korkai | 14.80 | SEE |
| **Reserve Forest & Wildlife Sanctuary** | | |
| Vallanadu RF & Blackbuck Sanctuary | 13.71 | SW |
| **Eco-Sensitive Zone** | | |
| Vallanadu Blackbuck Sanctuary ESZ | 13.27 | SW |
| **Inter State Boundary** | | |
| No Inter State Boundary within 15 km Radius | | |
| **Protected Flora/Fauna Habitats (breeding, nesting, foraging, resting, overwintering, migration)** | | |
| Gulf of Mannar – 14.63 (ENE) | | |
| **Defence Installation** | | |
| No Defence Installation within 15 km Radius | | |
| **Areas Already Subjected to Pollution or Environmental Damage** | | |
| SIPCOT Industrial Complex, Thoothukudi | 5.07 | N |
| SIPCOT Furniture Park | 7.48 | NE |

*Table 5. Nearby Facilities, Institutions, and Infrastructure in the Vicinity of Proposes Industrial Park*

| Identified Sensitive Receptor (Name & Location) | Approx. Distance (km) | Direction (Relative to Project Boundary) |
|---|---|---|
| **Hospitals** | | |
| Jacob Hospital, Pudukottai | 3.03 | SE |
| Sree Aicort Maharaja Clinic, Sekkarakkudi | 4.43 | W |
| Primary Health Centre, Sekkarakkudi | 5.01 | W |
| Government Hospital, Sekkarakkudi | 5.02 | W |
| Rapha Hospital and Pharmacy, Ayyanadaippu | 5.34 | ENE |
| Nallathambi Hospital, Periyanayagapuram | 5.93 | ENE |
| Selvaa Hospital, Sawyerpuram | 8.93 | S |

| Identified Sensitive Receptor (Name & Location) | Approx. Distance (km) | Direction (Relative to Project Boundary) |
|---|---|---|
| **Post Offices** | | |
| Branch Post Office, Mela Thattaparai | 1.34 | NE |
| Post Office, Melakuttudakadu | 2.05 | S |
| Post Office, Pudukottai | 2.93 | SE |
| Senthil Postal Service Centre, Pudukottai | 2.96 | SE |
| Kumaragiri Panchayat Office (Post Office), Pudukottai | 3.36 | SE |
| Post Office, Sekkarakkudi | 4.93 | W |
| Post Office, Mudivaithanendal | 6.02 | SW |
| Post Office, Kulayankarisal | 7.57 | SE |
| Post Office, Sawyerpuram | 9.29 | S |
| **Places of Worship** | | |
| Sri Sappani Madan Temple, Allikulam | 0.21 | SSE |
| Sri Muthu Mariamman Temple, Allikulam | 0.31 | S |
| Sri Alagiya Thiruveattai Ayyanar Temple, Allikulam | 0.31 | SSW |
| Sri Perumal Temple, Allikulam | 0.33 | S |
| Sri Vinayagar Temple, Allikulam | 0.37 | S |
| Sri Parvathi Parameswari Amman Temple, Allikulam | 0.37 | S |
| Sri Muthumari Amman Temple, Allikulam | 0.41 | SW |
| Sri Thadikaraswami Temple, Thoothukudi | 0.42 | S |
| Mullai Marathu Sudalaimadan Swamy Temple, Thoothukudi | 0.50 | S |
| Kaliamman Temple, Melathattaparai | 0.90 | NE |
| Nallamadasamy Temple, Melathattaparai | 1.14 | NE |
| Shri Angala Parameshwari Temple, Melathattaparai | 1.15 | NE |
| Sri Uchinimakali Amman Temple, Melathattaparai | 1.23 | NE |
| Ellammal Temple, Melathattaparai | 1.25 | NE |
| Shri Nagamma Temple, Melathattaparai | 1.33 | NE |
| Sri Sappandimadasamy Temple, Melathattaparai | 1.42 | NE |
| Church of God, Melathattaparai | 2.31 | NE |
| **Schools** | | |
| Annai Subasri Vidhyalaya Nursery & Primary School, Melathattaparai | 0.95 | NNE |
| TDTA School, Melathattaparai | 1.25 | NE |
| Anganwadi Centre (Elementary School), Melathattaparai | 1.34 | NNE |

| Identified Sensitive Receptor (Name & Location) | Approx. Distance (km) | Direction (Relative to Project Boundary) |
|---|---|---|
| Govt School, Melathattaparai | 2.84 | NNE |
| Soosaipandiapuram Primary School, Kuttudankadu | 3.02 | SSE |
| TDTA PSP Hr Sec School, Pudukottai | 3.34 | SE |
| Aananthi Pappa Home, Pudukottai | 3.36 | SE |
| TNDTA St. Augustine Primary School, Pudukottai | 3.37 | SE |
| **Banks** | | |
| Indian Overseas Bank ATM, Pudukottai | 3.05 | SE |
| Tamilnad Mercantile Bank, Pudukottai | 3.12 | SE |
| Indian Overseas Bank ATM, Pudukottai | 3.18 | SE |
| ICICI Bank, Pudukottai | 3.19 | SE |
| Axis Bank ATM, Thattaparai | 7.48 | NNE |
| Indian Overseas Bank ATM, Pudiyamputhur | 7.61 | NNE |

*Table 6. Connectivity and Transportation Infrastructure proposed project site*

| Name / Description | Approximate Distance (km) | Direction (from Project Site) |
|---|---|---|
| **Road** | | |
| Kovilpatti–Ottapidaram–Pudukottai–Eral Village Road | Adjacent to Project Area | E |
| Santhanamari–Ammankovil Street | 0.85 | SSW |
| Amman Kovil Street | 1.12 | NE |
| Perurani Road | 1.25 | S |
| NH-138 | 2.75 | SSE |
| NH-38 | 5.10 | NE |
| Therku veerapandiapuram Road | 5.48 | NNE |
| **Railway Station** | | |
| Thattapparai Railway Station | 2.78 | NNE |
| Kailasa Puram Railway Station | 4.66 | NNW |
| Milavittan Railway Station | 5.94 | NE |
| Pandia Puram Railway Station | 9.01 | NW |
| **Airport** | | |
| Tuticorin Airport | 4.27 | S |
| **Port** | | |
| V.O. Chidambaranar Port (Thoothukudi Port) | 15.0 | SE |

## 1.4 Product Details

## Product Capacity - SIPCOT Industrial Park

*Table 7. Product Details - SIPCOT Industrial Park*

| S. No. | Product | Total area (in Hectare) |
|---|---|---|
| 1. | Total Development area | 721.338 |
| 2. | Total Non-development area (RoW HT Line Buffer is 20.957 ha & Existing Nilaviyal Odai is 27.994 ha) | 48.951 |
| 3. | Windmill Falling distance | 25.951 |
| **Total Plot area** | | **796.240** |

### 1.4.1 Break-up of Total Development area (Zonation)

The proposed SIPCOT Industrial Park at Allikulam, Thoothukudi District spans 796.240 ha (1967.44 acres) and is planned to host Technical Textile & other Textile Industries and Non EC Category Industries like Engineering, Automobile Components and Ancillary Units.

Of the total area, 521.409 ha (1287.880 acres) is earmarked for Industrial plots under both EC and Non-EC categories, supported by well-planned infrastructure, utilities, and green spaces to promote industrial diversification and employment generation.

*Table 8. Detils of Zonation in proposed SIPCOT Industrial Park*

| S.No | Description | Unit | Area (Ha) | Area (Acres) |
|---|---|---|---|---|
| 1. | Industrial Plot Area* ( including 15% (193.182 acres) greenbelt as applicable to red category Industries ) | Hectare | 521.409 | 1287.880 |
| 2. | Plots for Common Amenities | Hectare | 14.425 | 35.630 |
| 3. | Plots for Commercial Activities | Hectare | 21.640 | 53.450 |
| 4. | Area for Solid Waste Management | Hectare | 2.024 | 5.000 |
| 5. | Road, Storm Water Drain area | Hectare | 53.337 | 131.740 |
| 6. | Greenbelt by SIPCOT (30 m on either side of Water body (Odai), 15 m on either side of Nilaviyal Odai & & 15m along the Periphery of Lyocell unit and 10m all along the boundary) | Hectare | 108.503 | 268.005 |
| **Total Developable area** | | **Hectare** | **721.338** | **1781.705** |

### 1.4.1.1 Break-up area for Industrial Plots

*Table 9. Summary of Industrial Area Zoning*

| Category | Type of Industries / Activities | Extent (ha) | Environmental Classification | Regulatory Requirement |
|---|---|---|---|---|
| **EC Category** | Technical Textiles, Man-Made Fibre (Lyocell, Tissue and other Technical Textile) (Red Category) | 202.43 | Schedule 5(d) – EC Category | Prior Environmental Clearance |
| **Non-EC Category** | Aerospace/Defense insallations, Auto Components, Electrical, Engineering and Warehousing (Red/Orange/Green/White Category ) | 318.979 | Red/Orange/ Green/White | CTE & CTO from TNPCB |
| **Total Industrial Plot Area** | | **521.409** | | |

**EC Category Industries (Red) (Technical Textile & other Textile Industries)**

An extent of 202.43 hectares (500 acres) within the Industrial Park has been earmarked for Technical Textile and Man-Made Fibre (MMF) industries, which fall under Schedule 5(d) of the EIA Notification, 2006 and subsequent amendments. These industries are classified under the Environment Clearance (EC) category and will obtain prior clearance from the regulatory authority before commencement.

*Table 10. EC-Category Industrial Plot Area – Classification and Regulatory Requirement*

| Category | Type of Industries / Activities | Environmental Classification | Regulatory Requirement | Extent (ha) | % of Extent |
|---|---|---|---|---|---|
| **EC Category** | Pre-defined : Lyocell and Tissue Manufacturing Unit | Category - B | Prior Environmental Clearance | 139.46 | 17.51% |
| | Technical Textile and other Textile Industries | Category - A or B | | 62.97 | 7.91% |
| **Total EC-Category Industrial Plot Area** | | | | **202.43** | **25.42%** |

**Types of Industries and Products**

The EC category zone will accommodate industries engaged in:

- Production of Man-Made Fibres and Filaments such as Man-made fibre, Tissue and other

regenerated Technical textile Industries.

- Polymer preparation and fibre spinning units using closed-loop solvent recovery systems.
- Downstream value-added processing units such as fibre finishing, laminating, and surface modification.
- High-performance fabric and composite material production units catering to industrial, medical, and automotive applications.

All such industries will establish individual Effluent Treatment Plants (ETPs) and adopt Zero Liquid Discharge (ZLD) systems to recycle treated water. Air Pollution Control Systems (APCS) such as scrubbers and bag filters will be installed to maintain emission standards.

## Non-EC Category Industries (Red, Orange, Green and White Category Units)

The remaining 318.979 hectares (787.88 acres) of the industrial plot area are earmarked for Non-EC category industries, primarily falling under Red, Orange, Green, and White categories as per TNPCB classification. These industries are characterized by low pollution potential and will require only Consent to Establish (CTE) and Consent to Operate (CTO) from TNPCB under the Water and Air Acts. Non EC category industry also needs to adopt ZLD process. No wastewater is allowed discharge outside the industry.

*Table 11. Non EC-Category Industrial Plot Area – Classification and Regulatory Requirement*

| Category | Type of Industries / Activities | Environmental Classification | Regulatory Requirement | Extent (ha) | % of Extent |
|---|---|---|---|---|---|
| **Non-EC Category** | Aerospace/Defense Installations, Automobile Components, Electrical, Engineering and other light Engineering units | Red/Orange/ Green/White | CTE & CTO from TNPCB | 318.979 | 40.06% |
| **Total Non - EC-Category Industrial Plot Area** | | | | **318.979** | **40.06%** |

**Types of Industries Proposed**

Typical industries expected in this zone include:

- Aerospace/Defense Installation.
- Electrical and electronic component assembly and fabrication
- Engineering workshops and precision component machining units
- Small-scale equipment manufacturing and service units

- Warehousing, logistics, and maintenance facilities

These industries will generate minor quantities of wastewater, which will be treated and reused within premises. Each unit will develop its own domestic sewage and effluent treatment systems and comply with TNPCB's Red/Orange/Green/White standards.

## 1.4.2 Project Components

### 1.4.2.1 Industrial Plot area

The proposed Industrial Park includes 169 designated plots earmarked for various categories of industries, with a cumulative industrial area of 521.409 hectares.

### 1.4.2.2 Common Facilities

An extent of **14.425 ha (35.63 acres)** has been earmarked within the industrial park for amenities, distributed across designated plots AM-1 to AM-4. These areas are reserved to accommodate a range of essential common services and support facilities necessary for the effective functioning of the industrial park.

Common amenities will be development of water supply, Fire Station, Power supply through TANGEDCO.,etc. and SIPCOT project office with First aid centre.

### 1.4.2.3 Commercial area

The proposed industrial park includes a well-planned commercial area spanning 21.640 hectares (53.45 acres), distributed across nine plots (CP1 to CP9) as per the approved layout. These commercial plots are strategically allocated to accommodate commercial development that will complement and support the industrial activities within the park. Development within these zones will be undertaken in accordance with SIPCOT guidelines and local planning regulations, ensuring seamless integration with the overall infrastructure of the industrial park. The provision of dedicated commercial spaces will enhance the operational efficiency of the park by offering necessary services and amenities.

### 1.4.2.4 Greenbelt Development

The proposed project includes a comprehensive greenbelt development plan as part of its environmental management measures. A total greenbelt area of **186.714 hectares (461.187 acres)**, accounting for **23.46% of the total project area**, has been earmarked, which is higher than the minimum statutory requirement.

Out of this, 108.503 hectares (13.63%) will be developed by SIPCOT along water bodies, natural drains, internal buffers, and project boundaries. This includes greenbelt development along the main water body, Nilaviyal Odai, the periphery of the Lyocell unit, and the overall project boundary. About 271258 trees will be planted in these areas.

In addition, 78.211 hectares (9.83%) of greenbelt will be developed within individual industrial plots by respective industries, covering Red, Orange, Green, and White category units. This will involve planting approximately 195528 trees.

There are about 65 Nos. of existing trees within the Project site, comprising 41 Palm, 20 Vadali, 1 Vagai, 2 Neem and 1 Manjanathi, along with scattered shrubs. In total 30 Nos of grown-up trees (28 Palm trees and 2 Neem trees) are in the proposed road development and amenity plots. Though care will be exercised to transplant the trees within the project site. There will be a minimum of 20 trees 18 Palm tree and 2 Neem tree will be necessitated to cut. SIPCOT will compensate those number of trees by planting 10 trees for every 1 tree felldown (of the same species) within the proposed greenbelt development in an area of 108.503 ha, 271258 Nos. of trees .

The proposed greenbelt will help control air and noise pollution, improve local microclimate, support groundwater recharge, enhance site aesthetics, and promote ecological balance within the industrial park. It will also assist in meeting environmental clearance and regulatory requirements prescribed by CPCB and TNPCB.

*Table 12. Greenbelt Area Breakup*

| Description | | Unit | Area (Ha) | % of Total Area | No: of Trees @2500 |
|---|---|---|---|---|---|
| **Developed by SIPCOT** | Greenbelt by SIPCOT (30 m on either side of Water body (Odai) , 15 m on either side of Nilaviyal Odai & 15m along the Periphery of Lyocell unit and 10m all along the boundary) | Hectare | 108.503 | 13.63% | 271258 |
| **Developed by Individual Industries** | Greenbelt within Industrial Plot Area – Red/Orange/Green/White Category (@ 15%) | Hectare | 78.211 | 9.83% | 195528 |
| **Total Greenbelt within the Industrial Park** | | **Hectare** | **186.714** | **23.46** | **466786** |

**1.4.2.5 Roads Development**

An area of **53.337 ha (6.70%)** is allocated for internal roads and stormwater drains within the Industrial Park. The road network is planned to provide smooth movement and easy access to all industrial plots, commercial areas, and common facilities. Stormwater drains and street lighting will be provided along both sides of the roads. The total length of internal roads proposed is 21.917 km,

comprising 10.830 km of 30 m wide roads, 10.961 km of 20 m wide roads, and 0.126 km of 3 m wide roads.

## 1.5 Infrastructure requirement for the Project

### 1.5.1 Power Requirement

The total power requirement for the SIPCOT Industrial Park is estimated at 145 MVA during operation. Power will be supplied by TANGEDCO through a proposed 110/33 kV substation within the park, with internal distribution via 33 kV and 110 kV underground cables to all industrial, commercial, and common facility areas. SIPCOT will not provide a common backup; individual industries will arrange their own DG sets or alternate power systems.

### 1.5.2 Water requirement

**During Construction Phase:**

The total water requirement is 175 KLD, sourced from the SIPCOT Desalination Plant (75 KLD) and authorized private tankers (100 KLD). Water will be used for construction works, dust suppression, and domestic needs of around 625 workers during peak activity. No groundwater extraction is proposed.

**During Operational Phase :**

The total water requirement for the SIPCOT Industrial Park is estimated at 66308 KLD.Freshwater will be sourced from the SIPCOT-owned 60 MLD Desalination Plant at Thoothukudi, while secondary treated sewage from the Tuticorin Municipal Corporation will be used for non-potable purposes such as flushing and greenbelt irrigation.In addition, treated effluents and treated sewage from individual industries will be reused and recycled within their premises, minimizing freshwater dependency and achieving near zero discharge operation.

### 1.5.3 Manpower Requirement

During the Construction phase, the project will employ 25 permanent personnel and 600 temporary/contractual workers for a period of 2 years, resulting in a total employment generation of 385000 man-days.

During the Operation phase, the project will provide employment to 2025 permanent personnel and 18225 temporary/contractual personnel, activities related to Industrial operations, utilities, administration, and supporting services within the SIPCOT Industrial Park.

## 1.5.4 Solid and Hazardous Waste Management

### 1.5.4.1 Municipal Solid Waste Management

**Construction Phase (625 persons):**

- Approximately 168.75 kg/day of organic waste will be treated on-site using a mobile Organic Waste Converter (OWC), and the processed manure will be utilized for greenbelt and landscaping.
- About 112.50 kg/day of inorganic waste will be segregated and handed over to TNPCB-authorized recyclers.

**Operation Phase (20250 persons):**

- Around 6,210 kg/day of organic waste will be generated; segregation will be carried out by individual industries, and the organic waste will be composted and utilized as manure.
- Approximately 4,140 kg/day of inorganic waste will be segregated at source and handed over to TNPCB-authorized recyclers by individual industries.

### 1.5.4.2 Hazardous Waste Management

- Hazardous waste will primarily be generated from process industries, DG sets, and utility operations.
- Each industrial unit will obtain authorization under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.
- Used oil and waste oil from DG sets will be collected in leak-proof containers and handed over to TNPCB-authorized recyclers/reprocessors.
- Sludge from ETP/STP will be dewatered and disposed of through authorized TSDF facilities.
- A common hazardous waste storage area will be developed within the industrial park for temporary storage before disposal.
- All handling, transport, and disposal practices will comply with CPCB and TNPCB guidelines.

## 1.5.5 Rainwater Harvesting & Storm Water Management For Sipcot Industrial Park

The SIPCOT Industrial Park will have a stormwater drain network designed to prevent waterlogging and to safely convey surplus runoff through check dams, percolation pits, Parshall flumes, and dug recharge pits, ensuring regulated discharge into the Nilaviyal Odai.

While SIPCOT will not provide a common rainwater harvesting system, each industry must install rooftop RWH and ground recharge pits as per TNPCB and BIS standards, supporting groundwater recharge and reducing surface runoff.

Rooftop rainwater harvesting potential of the proposed Industrial Park will be 34394 m³ (26930 m³ from industrial plots other than the Lyocell unit, 1596.5 m³ from commercial plots, 529 m³ from amenity plots) on an average per day. Individual units will harvest not less than 50% of roof water potential. 14518 m³ will be surplus rooftop rainwater, which will drain into the stormwater drain.

Rooftop rainwater harvesting potential for the proposed Lyocell unit alone is 5358 m³ on an average per day. The plant capacity for two ponds envisaged within the Lyocell unit is for an average 3 days holding of rooftop rainwater capacity.

Total stormwater for the proposed Industrial Park will be 48720 m³ on an average rainy day. Excess rooftop rainwater from other industrial units, commercial and amenities is 14518 m³. Total stormwater will be 63238 m³. The size of the stormwater drain will be 1.5 m wide and 1.2 m deep, 28650 m long all along the boundary. Percolation pits will be made of 1 m dia and 3.5 m deep (holding capacity 2.75 m³ volume) at every 50 m to maximize online percolation.

A suitable groundwater rejuvenation plan is planned to be implemented in discussion with WRD and local administration.

## 1.6 Lyocell AND TISSUE MANUFACTURING UNIT :

### 1.6.1 Brief Description

The proposed Lyocell and Tissue Manufacturing Unit will be developed by **M/s APRIL Fiber Resource Pvt. Ltd.** under an MoU with SIPCOT. A total of 139.46 ha (344.61 acres) within the Industrial Park is allocated for this facility, which will include an integrated captive co-generation power plant to ensure reliable, self-sustained energy supply. The unit will be established in full compliance with applicable regulatory and environmental standards.

#### 1.6.2 Product Capacity

The facility is planned to be executed in two phases with the following production details:

*Table 13. Product Details (Lyocell Manufacturing Unit)*

| Particulars | Unit | Quantity Proposed | Remarks |
|---|---|---|---|
| **Major Activity (5(d))** | | | |
| Lyocell | TPA | 300000 | Phase 1: 150,000<br>Phase 2 : 150,000 |
| Tissue | TPA | 100000 | Phase 1 : 50,000<br>Phase 2 : 50,000 |
| **Minor Activity (1(d))** | | | |
| Captive Power Generation | MW | 135 | Phase-1 : 90 MW<br>Phase-2 : 45 MW |
| **Minor Activity (8(b))** | | | |
| Industrial Sheds & other | Sq.m | 235811 | - |

| Particulars | Unit | Quantity Proposed | Remarks |
|---|---|---|---|
| building | | | |

### 1.6.2 Description and Details of the Process

A dedicated Lyocell and Tissue Manufacturing Unit will be developed within the park as an integrated facility supporting the Technical textile and other Textile Industries.

**Lyocell Manufacturing Process**

- Handling and storage of polymers, pulp, and chemical inputs
- Fibre production through pulp dissolution, filtration, regeneration, washing, and drying
- Product finishing, quality control, and packaging for domestic and export markets
- In-house power generation to ensure uninterrupted operations

The facility will use modern, energy-efficient technology with strong systems for emission control, resource optimization, and water conservation. It will enhance domestic Lyocell and Tissue production capacity and reduce import dependence.

**Tissue Manufacturing Process**

- Dissolving pulp sheets in water to form a slurry
- Feeding slurry into a tissue machine to form continuous sheets
- Drying through heated cylinders
- Converting dried sheets into rolls using winders in various sizes
- Packaging and storage in a dedicated warehouse.

State-of-the-art equipment, water recycling systems, and stringent quality controls will ensure efficient operations and consistent product quality.

## 1.6.2 Raw Material Details for Lyocell and Tissue Manufacturing unit

*Table 14. Product-wise Raw Materials and Transportation Details of Lyocell and Tissue Manufacturing Unit*

| S. No. | Raw Material | CAS No. | Planned Capacity | Means of Storage | Transportation Mode | No. of Tankers / Trailers per Day (or Shipment Details) |
|---|---|---|---|---|---|---|
| 1 | Solvent | 7529-22-8 | 540 $m^3$ (610 T) | Tank within dyke wall | Local – Tanker | 5 tankers of 20 $m^3$ capacity per week |

| S. No. | Raw Material | CAS No. | Planned Capacity | Means of Storage | Transportation Mode | No. of Tankers / Trailers per Day (or Shipment Details) |
|---|---|---|---|---|---|---|
| 2 | Sodium Hydroxide (NaOH) | 1310-73-2 | 400 m³ (600 T) | Tank within dyke wall | Local – Tanker | 2 tankers of 20 m³ capacity per day |
| 3 | Hydrochloric Acid (HCl) | 7647-01-0 | 200 m³ (450 T) | Tank within dyke wall | Local – Tanker | 4 tankers of 20 m³ capacity per week |
| 4 | Ferric Chloride ($FeCl_3$) | 7705-08-0 | 10 T | HDPE bags | Local – Truck | 1 truck per month |
| 5 | Propyl Gallate | 121-79-9 | 4 T | 200 kg drums in chemical warehouse | Local – Truck | 1 truck per month |
| 6 | Sodium Hypochlorite (NaOCl) | 7681-52-9 | 50 m³ | Tank within dyke wall | Local – Tanker | 3 tankers of 10 m³ capacity per month |
| 7 | Soft Finish | – | 250 T | Drums in chemical warehouse | Import (Tuticorin Port) – Sea / Truck | 60 T per shipment (3 containers per shipment) |
| 8 | Hydroxylamine (HA) | 7803-49-8 | 40 T | Drums in chemical warehouse | Local – Truck | 2 trucks per month |
| 9 | Pulp (for Product A & B) | 65996-61-4 | 35,000 T | Bales in pulp warehouse | Import (Tuticorin Port) – Sea / Truck | 10,000 T per shipment; 50 trucks per day for 6 days |
| 10 | Coal | 125612-26-2 | 50,000 T | Loose in covered shed | Import (Tuticorin Port) – Sea / Truck | 30,000–40,000 T per shipment; 100–150 trips of 25 T each per day for 12 days |
| 11 | Biomass | – | 15,000 T | Loose in covered shed | Local – Truck | 24 trips per day |
| 12 | Pulp (additional) | 65996-61-4 | 10,000 T | Bales | Import (Tuticorin Port) – Sea / Truck | 5,000 T per shipment; 50 trips per day for 3 days |

| S. No. | Raw Material | CAS No. | Planned Capacity | Means of Storage | Transportation Mode | No. of Tankers / Trailers per Day (or Shipment Details) |
|---|---|---|---|---|---|---|
| 13 | Lime | – | 45 T | Loose in covered shed | Local – Truck | 3 trucks per day |
| 14 | Sand | – | 45 T | Loose in covered shed | Local – Truck | 4 trucks per day |
| 15 | Diesel | – | 250 $m^3$ | Tank within dyke wall | Local – Tanker | As per requirement (occasional) |

## 1.6.3 List of Major Machinery and Equipment

The Lyocell and Tissue unit will include a Captive Power Plant to ensure reliable power and steam supply. The CPP will use efficient combustion and energy-recovery systems to minimize emissions. Key equipment includes CFBC boilers, steam turbine generators, and coal/biomass handling systems.

*Table 15. List of Major Machinery and Equipment*

| Major Equipment Description | Proposed No. & Capacity – Phase I | Proposed No. & Capacity – Phase II | Remarks |
|---|---|---|---|
| Power Boiler – CFBC (70:30 Coal to Biomass) | 2 × 280 TPH | 1 × 280 TPH | Coal / Biomass fired |
| Steam Turbine Generator | 2 × 45 MW | 1 × 45 MW | – |
| Coal Handling Plant | 150 TPH | – | Covered system with mechanical loaders |

### 1.6.4 Manufacturing Process and Technology

The Lyocell and Tissue Manufacturing Unit will use state-of-the-art production processes, supported by an integrated captive co-gen power plant to ensure stable and continuous operations.

*Table 16. Manufacturing Process of Lyocell Manufacturing unit*

| Manufacturing Process | |
|---|---|
| **Lyocell Manufacturing Process** | |
| **Dissolution** | Dissolution of the pulp fibers (Lyocell) and mixing with the solvent. |
| **Filtration** | The above solution is filterd to remove undissolved Lyocell & impurities. |
| **Regeneration** | The filtered solution is extruded through a orifice spinneret and sent through the spinning machine , where it is cut to the required staple length & sent for washing |
| **Washing** | Resulting fibers are washed & residual solvent is recovered and recycled |
| **Drying** | Washed Fibres are opened up and send to the dryer where the moisture is removed. |
| **Packing** | The dryed Fibre is sent to the baling press where it is packed as bales and sent to ware house for dispatch |
| **Tissue Manufacturing Process** | |
| **Pulping** | Pulp sheets are dissolved in water |
| **Tissue Machine** | Slurry is passed through dryer cylinder and form tissue paper. |
| **Winder** | Tissue paper is passed through winders to make Multiple sheet rolls and cut in various width and diameter rolls as per the market requirements |
| **Warehouse** | Customer rolls from winders are stored in warehouse before dispatch. |

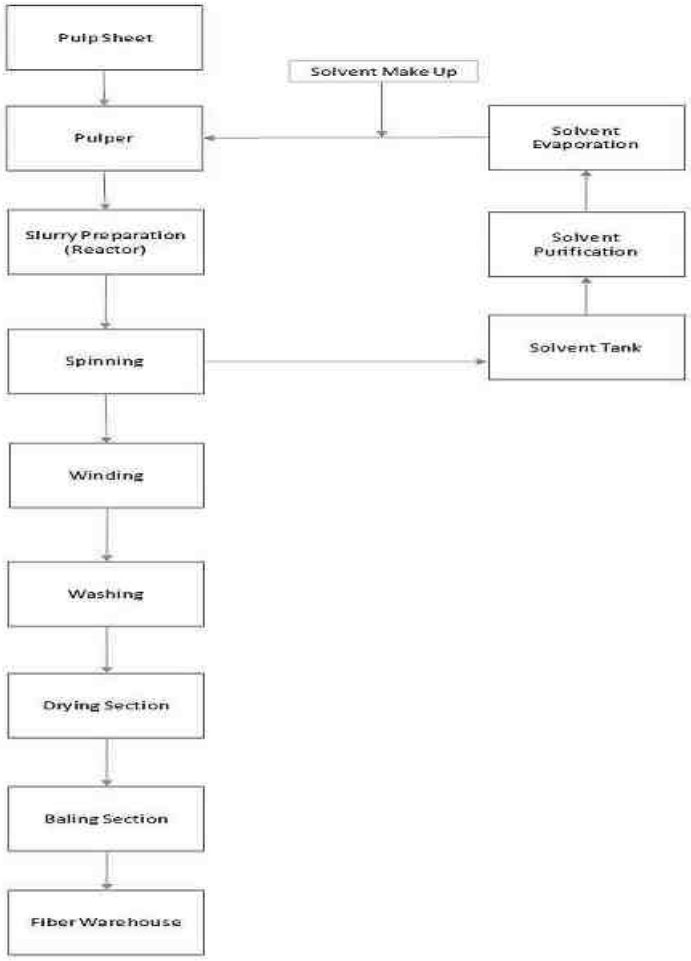



*Figure 3. Process Flow of Lyocell*

## 1.6.4 Details of Products and Storage

*Table 17. Details of Products and their Storage*

| Product Name | Physical State | Planned Capacity (Tons) | | Means of Storage |
|---|---|---|---|---|
| | | Phase I | Phase II | |
| **Lyocell (i.e., Man Made Fibre)** | Solid | 9,000 | 6,750 | Bales |
| **Tissue** | Solid | 3,000 | 2,250 | Rolls & Cartons |

## 1.6.5 Water Requirement and Source

The water requirement for the proposed Lyocell manufacturing facility will be sourced through supply from Tuticorin Municipal Corporation on a long-term contractual arrangement. Tertiary Treated STP

water from Common Sewerage Treatment plant will be utilized to meet the plant's operational needs, with provisions for water recycling to reduce freshwater dependency. Domestic freshwater demand will be met from SIPCOT fresh water supply.

*Table 18. Water Requirement Table for Lyocell and Tissue Manufacturing Unit*

| Sl. No | Water Requirement | Unit | Proposed | Particulars |
|---|---|---|---|---|
| 1 | Source of Water Supply | KLD | 39296 | Tuticorin Municipal Corporation- Tertiary Treatment Plant through pipeline |
| 1A | Proposed Treatment at Lyocell unit | Tertiary treatment comprising of multimedia filtration, Ultra filtration & RO systems for incoming raw water | | |
| 2 | Tertiary Treated STP water | KLD | 20000 | (**Phase 1:** 10,000) **(Phase 2 :** 10,000) |
| 3 | Recycled Tertiary Treated in-house Effluent | KLD | 19296 | (**Phase 1:** 9,648) **(Phase 2 :** 9,648) |

**Wastewater Treatment :**

- Trade effluent generation is estimated at 22000 KLD (11000 KLD during Phase-I and 11000 KLD during Phase-II)
- 22000 KLD effluent will undergo pre-treatment involving degradation of organic matter through Fe-C treatment.
- Further treatment will be carried out in an ETP of capacity 24000 KLD (12000 KLD in phase 1 augmented with another 12000 KLD in phase -2) . Effluent Treatment will be carried out using an EGSB reactor followed by sedimentation with ozone .
- 19296 KLD Treated effluent will be further sent through UF & 3 stage RO for polishing to meet the reusable quality requirement (9648 KLD capacity in each phase).
- The reject from RO system will be sent to an evaporator, crystallizer, and dryer to achieve Zero Liquid Discharge (ZLD).

## 1.6.6 Employment Generation (Direct and Indirect) from the Project:

The project will generate about 315 jobs during the construction phase, including skilled, semi-skilled, unskilled, and supervisory staff. During operation, it is expected to create around 1,000 jobs, comprising 100 direct positions within the units and 900 indirect opportunities through ancillary services, supply chains, logistics, and support activities.

### 1.6.7 Energy / Power Requirement

- It is proposed to install a Steam Turbine Generator (STG) with a total planned capacity of 135 MW

(3 × 45 MW).

- The power generation facility is proposed to be implemented in phases:
  - **Phase-I:** Two units of 45 MW each.
  - **Phase-II:** One unit of **45 MW.**
- Provision is proposed for DG sets with a total standby capacity of up to 10,000 kVA.
- The DG sets are proposed to operate on High Speed Diesel (HSD).
- The backup system will comprise two DG sets of 5,000 kVA each, intended for emergency and standby power requirements only.

### 1.6.8 Fuel Requirement and Source

*Table 19. Fuel Requirement and Source (Lyocell Manufacturing Unit)*

| S. No | Fuel | Quantity | Imported / Domestic | Sources / Location | Mode of Transportation |
|---|---|---|---|---|---|
| **Coal** | | | | | |
| 1 | Coal | 30,000 MT/M | Imported | Indonesia, South Africa, Australia, Russia | By Dump trucks from Thoothukudi Port to site |
| 2 | Coal | 30,000 MT/M | Domestic | Talcher Coalfields (Odisha); Tilapia II & III (Odisha); IB Valley (Chhattisgarh, MCL); Raniganj Coalfields (West Bengal); Nagpur | By Dump trucks from domestic source to site |
| **Biofuel** | | | | | |
| 3 | Biomass Briquettes | 27,500 MT/M | Local / Imported | Local sources / Authorized suppliers | By Dump trucks from biomass source to site |
| 4 | Rice Husk / Saw Dust / Other Biomass | 27,500 MT/M | Local / Imported | Local sources / Authorized suppliers | |
| **High-Speed Diesel (HSD)** | | | | | |
| 5 | High-Speed Diesel | 500 $m^3$ / annum | Domestic | Indian Oil Corporation Ltd. (IOCL) | By tanker trucks from respective supply units to site |
| | | | | Hindustan Petroleum Corporation Ltd. (HPCL) | |
| | | | | Bharat Petroleum Corporation Ltd. (BPCL) | |
| | | | | Nayara Energy (formerly Essar Oil) | |
| | | | | Reliance Industries Ltd. (RIL) | |

## 1.7 Air Emissions Details

*Table 20. Stack details (Lyocell Manufacturing Unit )*

| Stack Attached | Nos. of Stacks | Pollutants Emitted | Pollution control measures | APCs | Remark |
|---|---|---|---|---|---|
| **Power boiler** | **One** | Particulate Matter | < 3 (Dry 6% O2 ) mg/Nm3. | Electrostatic precipitators will be installed | CSMS for control Single stack for 3 boilers ESP installed for each boiler |
| | | SOX | < 100 (Dry 6% O2 ) mg/Nm3. | Dry limestone injection system used for $SO_2$ reduction. | |
| | | NOX | < 100 (Dry 6% O2 ) mg/Nm3. | Advanced NOx reduction technologies will be employed, including combustion optimization and selective catalytic/non-catalytic reduction. | |
| | | Mercury (Hg) | < 0,03 (Dry 6% O2 ) mg/Nm3 | Mercury control measures include activated carbon injection and process adjustments to minimize emissions. | |
| **Lyocell** | **4-6 points** | VOC | <50 mg/Nm3 | Scrubbed before venting | - |

## 1.8 Solid Waste Management

For the proposed Lyocell and Tissue Manufacturing Unit, the total solid waste generation is estimated at 600 kg/day, comprising 360 kg/day of biodegradable waste and 240 kg/day of non-biodegradable waste. The biodegradable waste will be treated within the premises, and the resulting manure will be utilized for greenbelt development. The non-biodegradable waste will be handed over to TNPCB-authorized recyclers for appropriate recycling and disposal, in accordance with CPHEEO (2016) guidelines.

# 2. BASELINE ENVIRONMENTAL STUDIES

The baseline environmental study was undertaken for the period from March 2025 - May 2025, covering the summer season. The assessment encompassed a 10 km radius from the project site and included a detailed evaluation of air, noise, water, soil, ecological, and socio-economic components.

## 2.1 Meteorology

The climatic conditions of the area were assessed based on temperature, humidity, wind speed and direction, and rainfall. The maximum temperature recorded was 40.6°C and the minimum was 15.3°C, while relative humidity ranged from 64% to 85%. The annual mean rainfall was 682.4 mm, with the highest number of rainy days observed in November.

## 2.2 Ambient Air Quality

**Core zone:** The mean value of $PM_{2.5}$ ranges from (17.07-20.28 µg/m$^3$) & $PM_{10}$ at core zone locations ranges from (26.83-31.88 µg/m$^3$) $NO_2$ ranges from (18.81-22.34 µg/m$^3$), $SO_2$ ranges from (7.14-8.48 µg/m$^3$), $CO_2$ (0.56-0.67 mg/m$^3$) which are within the limits of National Ambient Air Quality Standards (NAAQS).

As per the Air Quality Index by CPCB, the air quality of the core zone is found Good during the sampling period from March 2025 to May 2025.

**Buffer zone:** The mean value of PM2.5 ranges from (13.83–24.17 µg/m3) & PM10 at core zone locations ranges from (21.73–37.99 µg/m3) NO2 ranges from (15.23–26.63 µg/m3), SO2 ranges from (5.78–10.11 µg/m3), CO (0.46–0.80 mg/m3) which are within the limits of National Ambient Air Quality Standards (NAAQS).As per the Air Quality Index by CPCB, the air quality of the buffer zone is found to be Good during the sampling period from March 2025 to May 2025.

**Conclusions:** As per the Air Quality Index by CPCB & NAAQS, the air quality of the Core & buffer zone within the standard during the sampling period from March 2025 to May 2025.

## 2.3 Ambient Noise Quality

**Core Zone :**

The ambient noise level during day time at the proposed project site varies from 40.6 dB (A) to 48.4 dB (A) which are within the day time standard limit of Industrial area ~75 dB (A). During night the noise level at the project site ranges from 36.4 dB (A) to 43.2 dB (A) which are within the night time standard limit of Industrial area 70.0 dB (A).

**Buffer Zone:**

**Residential Area:**

N5: The ambient noise level at Thiruvanthapuram is 54.3 dB (A) which is within the daytime noise standard limit of the Residential area of ~ 55.0 dB (A). During the night the noise level was recorded at 41.9 dB (A) which is within the night-time noise standard limit of ~ 45.0 dB (A).

N6: The ambient noise level at Therku Silukkanpatti is 53.7 dB (A) which is within the daytime noise standard limit of Residential area ~ 55.0 dB (A). During the night the noise level was recorded at 42.6 dB (A) which is within the night-time noise standard limit of ~ 45.0 dB (A).

N7: The noise level at Keela Thatapparai is 52.6 dB (A) which is within the daytime noise within the standard limit of Residential area ~ 55.0 dB (A). During the night the noise level was recorded at 41.8 dB (A) which is within the night-time noise standard limit of ~ 45.0 dB (A).

N8: The noise level at Kuttudankadu is 52.2 dB (A) which is above the standard limit of Residential area ~ 55.0 dB (A). During the night the noise level was recorded at 44.6 dB (A) which is within the night-time noise standard limit of ~ 45.0 dB (A).

N9: The noise level at Korampallam is 47.1 dB (A) which is within the daytime noise within the standard limit of Residential area ~ 55.0 dB (A). During the night the noise level was recorded at 43.7 dB (A) which is within the night-time noise standard limit of ~ 45.0 dB (A).

N10: The noise level at Therkku Veerapandiyapuram is 49.2 dB (A) which is within the daytime noise within the standard limit of Residential area ~ 55.0 dB (A). During the night the noise level was recorded at 43.6 dB (A) which is within the night-time noise standard limit of ~ 45.0 dB (A).

## 2.4 Groundwater Quality

1. The Total Dissolved Solids (TDS) of the sampling locations ranges from 140.8 mg/l to 1901.5 mg/l. The TDS of sampling locations are within the acceptable limit of 500 mg/l & permissible limit i.e. 2000 mg/l respectively.
2. The Total Hardness of the sampling locations ranges from 88 mg/l to 1484 mg/l. The Total Hardness of sampling locations are within the acceptable limit of 200 mg/l & permissible limit of 600 mg/l respectively.
3. The Alkalinity of the sampling locations ranges from 92 mg/l to 300 mg/l. The alkalinity of sampling locations are within the acceptable limit of 200 mg/l & permissible limit i.e. 600 mg/l respectively.
4. The Chloride Concentration of the sampling locations ranges from 34 mg/l to 519 mg/l. The Chloride concentration of sampling locations are within the acceptable limit of 250 mg/l & permissible limit i.e. 1000 mg/l respectively.

**Conclusion :**

The groundwater quality parameters (buffer zone) are within the IS 10500:2012 (Drinking water standard).

## 2.5 Surface Water Quality

Surface water samples were collected from 8 locations namely Nilaviyal Odai Upstream, Drain onsite, Odai onsite, Thiruvanthapuram Pond, Pond near Keelathatapparai, Allikulam Pond, Perurani Pond, and Elim Pond.

As per the samples collected and analyzed from locations SW1, SW2, SW3, SW4, SW5, SW6, SW7 & SW8, surface water quality is meeting the criteria defined by class "C" as per the CPCB criteria. It is suitable for drinking water after conventional treatment and disinfection.

1. The surface water quality of the **Nilaviyal Odai Upstream** shows that the values of the parameters including TDS, total hardness chloride, fluoride, calcium, magnesium, iron, sulphate, nitrate nitrogen and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Nilaviyal Odai Upstream can be placed in Class "B" i.e. Outdoor bathing (Organised).
2. The **Surface water quality of the Drain onsite** shows that the parameters including Turbidity, TSS, Nitrate nitrogen, BOD, COD & iron content are within the EPA discharge standards. BOD & DO value indicating that the surface water quality of Drain onsite can be placed in Class "C" i.e., Drinking Water Source without conventional treatment but after disinfection per CPCB surface water quality - Designated Best Use Water Quality Criteria.
3. The **surface water quality of the Odai onsite** shows that the values of the parameters including TDS, total hardness, calcium, magnesium, and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Odai onsite can be placed in Class "E". i.e., Irrigation, Industrial Cooling, Controlled Waste disposal.
4. The **surface water quality of the Thiruvanthapuram Pond** shows that the values of the parameters including TDS, total hardness chloride, fluoride, calcium, magnesium, iron, sulphate, nitrate nitrogen and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Thiruvanthapuram Pond can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality - Designated Best Use Water Quality Criteria.
5. The **surface water quality of the Pond near Keela Thatapparai** shows that the values of the parameters including nitrate nitrogen, chloride, fluoride, calcium, magnesium, iron and alkalinity are within the IS drinking water quality standards. BOD & DO value indicating that the surface water quality of the Pond near Keela Thatapparai can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality - Designated Best Use Water Quality Criteria.
6. The **surface water quality of the Allikulam Pond** shows that the values of the parameters including TDS, total hardness, calcium, magnesium, and alkalinity are within the IS drinking

water quality standards. BOD and DO value indicating that the surface water quality of Allikulam Pond can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality- Designated Best Use Water Quality Criteria.

7. The **surface water quality of the Perurani Pond** shows that the values of the parameters including TDS, total hardness, calcium, magnesium, and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Perurani Pond can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality- Designated Best Use Water Quality Criteria.
8. The **surface water quality of the Elim Pond** shows that the values of the parameters including TDS, total hardness, calcium, magnesium, and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Elim Pond can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality- Designated Best Use Water Quality Criteria.

**9.** The surface water quality of the Bethesda Pond shows that the values of the parameters including TDS, total hardness, calcium, magnesium, and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Bethesda Pond can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality- Designated Best Use Water Quality Criteria.

10. The surface water quality of the Pond near Korampallam shows that the values of the parameters including TDS, total hardness, calcium, magnesium, and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Pond near Korampallam can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality- Designated Best Use Water Quality Criteria.

## 2.6 Land Use and Land Cover

**Agriculture Land:**Based on analyzed imagery and ground truth, Crop land area extents have been extracted. The Agricultural Land area is about 20287.0 hectares which is 41.95 percent of the total 10 km radius study area.

**Built up Land:**Based on analysis of imagery, using GIS and ground truth the total built up area is about 7891.7 hectares which is 16.32 percent of the total study area.

**Waste/Barren Land:** Barren Land area occupies around 17937 ha which is 37.09 percent of the study area.

**Wet Land-Water Bodies:**Based on satellite data and ground truth, the total area covered by the inland wetland, river and water bodies is 2244.4 hectares which is 4.64 percent of the total study area.

## 2.7 Soil Environment

**Core Zone :** After analyzing the samples collected from the site, it shows that the soil texture is 4/3 Brown, pH is 7.49-7.83 Amount of primary nutrients like Organic matter is 0.41-1.02 %, the available nitrogen 54.4-98.8 mg/kg is low to medium and available Potassium 32.90-56.10 mg/kg is medium to high & the available Phosphorus 6.40-9.75 mg/kg is medium to high range.

The overall fertility of this soil would be considered moderate to low. While the phosphorus levels are adequate, the low levels of organic matter, nitrogen, and potassium suggest that the soil may need amendments, particularly organic matter and fertilizers, to improve fertility.

**Buffer Zone:** 6/3 Dull Brown, 4/3 Brown, 5/6 Bright Brown, pH ranges from 7.12 to 7.95 Amount of primary nutrients like Organic matter 0.41 to 1.16%, the Available Nitrogen 62.6 to 108.60 mg/kg is low to high range, the Available Phosphorus 2.29 mg/kg to 15.03 mg/kg is low to high range, Available Potassium 28.70 mg/kg to 52.80 mg/kg is low to high range.

The overall fertility of this soil would be considered moderate. The soil has good potential due to its clay loam texture and relatively neutral pH, but the fertility is limited by low to medium levels of organic matter, nitrogen, and potassium.

## 2.8 Biological Environment

The baseline ecological study indicates that the core and buffer zones primarily comprise dry deciduous vegetation interspersed with agricultural lands, open scrub, and human habitation. The flora mainly includes *Prosopis juliflora, Azadirachta indica, Albizia amara, Calotropis gigantea, and Cenchrus ciliaris,* while faunal species such as *house crow, Indian myna, cattle egret, common toad, and garden lizard* are commonly observed.

Based on both our primary and secondary surveys, as well as the compiled table above, we have identified a total of 15 species listed under Schedule I of the Wildlife Protection Act, indicating their endangered status and necessitating conservation efforts.

Hence, it is inferred that the project will not cause any major ecological disturbance, provided that the proposed greenbelt and landscaping development measures are effectively implemented to enhance local biodiversity and habitat quality.

## 2.9 Socio-Economic Environment

The socio-economic study covering the 10 km radius around the project site indicates that the region consists of rural and peri-urban settlements with agriculture as the dominant occupation, followed by small-scale trade, transport, and service activities. The area shows a balanced gender ratio**,** moderate to high literacy levels**,** and stable demographic growth**.**

Infrastructure facilities such as schools, healthcare centers, roads, and electricity are available in most villages. The population exhibits a satisfactory quality of life, with no significant displacement or rehabilitation issues anticipated.

The establishment of the SIPCOT Industrial Park is expected to create direct and indirect employment opportunities**,** promote industrial growth**,** and strengthen socio-economic conditions of nearby communities through improvement in infrastructure, skill development, and allied business activities.

# 3. ANTICIPATED ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

## 3.1 Air environment

Impacts on ambient air would be mainly due to the emission of Volatile Organic Compounds (VOC's), SO2, CO2, PM, SO2, NO2 generation, dust generation which could lead to an increase in ground concentration level (GLC), respiratory problems, damage to flora and fauna and aesthetic properties in the environment and increase the level of toxic chemicals to other aspect of environment indirectly. APCS like Wet Scrubber, adequate stack heights are being installed. Plantation of native tree species, installation of water sprinkling systems and dust compression systems in the nearby areas, provision of proper nose masks to laborers, Vehicles with valid PUC certificates will be used for transportation etc. shall be done. Vehicles with valid PUC certificates will be used for transportation of construction material, raw material, waste and finished products.

## 3.2 Water Environment

The total water requirement for the project is **66308 KLD**, including 10867 KLD of freshwater from the SIPCOT 60 MLD desalination plant, 26246 KLD of treated wastewater from Thoothukudi Municipal Corporation, and 39296 KLD of tertiary-treated sewage for the Lyocell unit.

SIPCOT will provide water supply and drainage infrastructure, while individual industries, including the Lyocell unit, will manage their own wastewater through Zero Liquid Discharge (ZLD) systems. SIPCOT will maintain stormwater drains and rainwater harvesting pits to prevent contamination and support groundwater recharge, with no groundwater extraction proposed.

## 3.3 Land Use

Land use change is limited to converting acquired land (G.O. No. 100, 26.02.2021) into planned industrial, commercial, and green zones, with no impact on agricultural or forest land. Excavated earth and debris will be reused for site leveling and roads, while construction and solid wastes will be collected, segregated, and managed to prevent open dumping. Individual industries will handle their own industrial waste per TNPCB norms. Impacts from construction and hazardous wastes will be minimized through proper separate collection and disposal.

## 3.4 Soil quality

Soil quality impacts may arise from industrial activities such as raw material handling, boiler and process operations, chemical storage, and transportation, potentially causing erosion, spills, or waste deposition. To mitigate these, industries will implement proper waste treatment and disposal, impervious flooring, chemical containment, regular equipment inspection, ISO-certified storage, and spill kits, along with greenbelt development for dust control and soil stabilization. With these

measures, no significant adverse impact on soil quality, including from the Lyocell Manufacturing Unit, is expected.

## 3.5 Noise Levels

Major environmental impacts may arise from machinery operation and transportation, causing increased noise, vibrations, and potential effects on workers, nearby residents, and local biodiversity. Mitigation measures include restricting activities to project areas, proper equipment maintenance, noise barriers, protective devices (earmuffs, silencers), greenbelt development, No-Honking Zones, and regulated traffic management.

## 3.6 Ecology & Biodiversity

Activities such as site preparation, excavation, manufacturing, machinery operation, transportation, and material handling may impact ecology and biodiversity through dust, emissions, noise, soil erosion, water contamination, and waste generation, leading to habitat loss, reduced plant/tree cover, disturbance to wildlife, and decreased local fauna populations. Mitigation measures include air pollution control equipment, scrubbers, greenbelt development, dust suppression and water sprinkling systems, noise barriers, regulated vehicular movement, proper waste treatment, daytime transport with minimal honking, and greenery along project periphery and roads.

## 3.7 Solid and Hazardous Waste

Solid and hazardous waste management is the responsibility of individual industries, as SIPCOT will not handle such wastes. Generated solid waste will be reused, recycled, or disposed of through authorized vendors in compliance with the Solid Waste Management Rules, 2016, ensuring no dumping within or outside the park.

Hazardous wastes will be stored, handled, and disposed of per the Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016, with TNPCB authorization. Wastes will be collected in labeled drums, stored in covered sheds with impervious flooring, and disposed of through authorized recyclers.

## 3.8 Hydrology and Geology

Activities like excavation, manufacturing, machinery operation, daily labor and staff activities, and transportation may impact hydrology and geology through solid, e - waste, and biomedical waste generation, wastewater discharge, and chemical spills, potentially affecting surface and groundwater quality. Mitigation measures include proper wastewater channelization and treatment, regular inspection of pipelines and storage vessels, leak detection, using dry adsorbents for chemical spills, and safe disposal of all wastes.

## 3.9 Socio-Economic

The proposed SIPCOT Industrial Park will drive socio-economic development in the region. While SIPCOT provides infrastructure, the direct benefits will come from individual industries, including the Lyocell and Tissue manufacturing unit, through employment generation during construction and operation, increasing household incomes and reducing rural-urban migration. The project will also stimulate supporting sectors such as transport, warehousing, small-scale manufacturing, and services, enhancing the local economy. Improved roads, lighting, and drainage will boost connectivity and quality of life. As land was legally acquired with no displacement, no resettlement is needed. Overall, the project will contribute positively to regional growth, livelihoods, and social well-being in Thoothukudi District.

# 4. ALTERNATIVE ANALYSIS

During the site selection stage, SIPCOT carried out a comparative analysis of three alternative locations within Thoothukudi District, considering environmental sensitivity, land availability, infrastructure connectivity, and socio-economic factors. The three sites examined were:

1. Mettupacheri
2. Allikulam and nearby villages (including Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram, and Therkusillukkanpatti)
3. Subramaniyapuram

Each site was assessed based on parameters such as land use pattern, soil characteristics, ecological sensitivity, proximity to human settlements, accessibility to road/rail/air/sea networks, availability of water and power, and the need for rehabilitation and resettlement (R & R).

A site-matrix approach following the MoEF&CC Technical Guidance was applied, assigning weighted scores to each environmental and infrastructural criterion. The analysis concluded that the Allikulam and adjacent villages site achieved the highest environmental compatibility and feasibility score, with minimal displacement and optimal infrastructure connectivity.

## 4.1 Site Matrix – Environmental Analysis of Alternative Sites

Three locations were inspected on site and reviewed using available land records, revenue details, and the availability of contiguous land. The comparison was carried out following the MoEF&CC Technical Guidance Document. The environmental suitability of the sites was assessed based on area, access, soil conditions, ecological sensitivity, and rehabilitation and resettlement (R&R) requirements.

Among the three locations, Allikulam and nearby villages were found to be more suitable due to the availability of large contiguous land, fewer nearby habitations, minimal tree presence, better road connectivity, availability of nearby water bodies, and no requirement for R&R. The other two sites have nearby settlements, fragmented land parcels, higher tree presence, and would require R&R.

## 4.2 Site Matrix – Selection Criteria

Based on land availability, connectivity, soil condition, ecological sensitivity, land-use conversion, water sourcing options, R&R requirements, project timeline, and overall project economics, the **Allikulam and adjacent villages** site was found to be the most suitable. The site has more than **900 hectares of contiguous land**, good connectivity by road, rail, air, and seaport, approved Government Orders for industrial land use, no ecological sensitivity issues, and access to desalinated water and secondary treated sewage. The project can also be developed within the planned timeline at comparatively lower cost.

## 4.3 Site Matrix – Score and Final Site Selection

A weighted scoring method was adopted to compare the three sites. The **Allikulam and adjacent villages** site scored **1250 out of 1500**, which is the highest among all evaluated locations. Mettupacheri and Subramaniyapuram scored **600** and **650**, respectively.

Based on the overall environmental suitability, land availability, infrastructure connectivity, absence of displacement, water sourcing options, project feasibility, and economic considerations, the site covering Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram, and Therkusillukkanpatti villages has been selected as the most suitable location for the proposed SIPCOT Industrial Park.

# 5. ENVIRONMENTAL MONITORING PROGRAMME

Monitoring will be carried out to assess the quality of the environment during the construction phase and after commissioning of the project.

*Table 21.Monitoring Plan - Construction Phase*

| S. No. | Type of Monitoring | Frequency of Monitoring | Parameter | Location | Number Per Year | Responsibility |
|---|---|---|---|---|---|---|
| 1 | Ambient Air Quality | Six Monthly | Particulate Matter ($PM_{2.5}$)<br>Particulate Matter ($PM_{10}$)<br>Sulphur Dioxide ($SO_2$)<br>Nitrogen Oxides ($NO_x$)<br>Volatile Organic Compound (VOCs)<br>Carbon monoxide (CO) | 2 in Core Zone & 2 in Buffer Zone | 8 | -EMC (Air Incharge) & Contractor |
| 2 | Water Quality for drinking water | Six Monthly | All parameters mentioned in IS:10500 | One drinking water sample | 2 | -EMC (Water Incharge) & Contractor |
| 3 | Water Quality for Construction purpose | Six Monthly | All parameters mentioned in IS:456 | One construction water sample | 2 | -EMC (Water Incharge) & Contractor |
| 4 | Ambient Noise Level | Six Monthly | Day and Night noise level | 2 in Core Zone & 2 in Buffer Zone | 8 | -EMC (Noise Incharge) & Contractor |
| 5 | Soil Quality | Six Monthly | All parameters to check soil Fertility | 2 in Core Zone & 2 in Buffer Zone | 8 | -EMC (Soil Incharge) & Contractor |

***Note :***

- *Each individual industry within the park will have its own stack, process, and DG monitoring program, to be conducted separately under TNPCB consent conditions.*
- *SIPCOT's role is limited to ambient and infrastructure-level monitoring to evaluate the effectiveness of mitigation measures and ensure overall environmental compliance.*

*Table 22.Monitoring Plan - Operational Phase*

| S. No | Area of Monitoring | Number of Sampling Stations | Frequency of Sampling | Parameters to be Analyzed | Number per Year | Responsibility |
|---|---|---|---|---|---|---|
| 1 | **Ambient Air Quality** | 3 stations – one upwind, one downwind, and one within project site | Half Yearly | $PM_{10}$, $PM_{2.5}$, $SO_2$, $NO_x$, CO, VOCs and other parameters as per NAAQS (2009) | 6 | EMC (Air In-charge) / NABL-Accredited Laboratory |
| 2 | **Noise** | 3 locations within the study area | Half Yearly | Equivalent Continuous Noise Levels (Leq – Day and Night) | 6 | EMC (Noise In-charge) / External Monitoring Agency |
| 3 | **Water (Surface & Ground Water)** | 2 sampling points (1 surface water & 1 groundwater near the site) | Half Yearly | As per IS:10500:2012 (drinking) and IS:2296:1992 (surface water) | 4 | EMC (Water In-charge) / NABL-Accredited Laboratory |
| 4 | **Solid Waste Management Area** | 1 location – designated solid waste storage / transfer area | Half Yearly | Quantity generated, segregation efficiency, and disposal records | 2 | EMC (Solid Waste In-charge) / Authorized Disposal Agency |
| 5 | **Soil** | 3 locations within the study area (1 on-site & 2 in buffer area) | Half Yearly | Physico-chemical properties, nutrients (N, P, K) and heavy metals | 6 | EMC (Soil In-charge) / NABL-Accredited Laboratory |
| 6 | **Greenbelt / Plantation Monitoring** | Entire greenbelt area (~186.714 ha) | Yearly | Survival rate, canopy cover, species composition | 1 | EMC (Horticulture In-charge) |

***Note :***

- *Each individual industry within the park will have its own stack, process, and DG monitoring program, to be conducted separately under TNPCB consent conditions.*
- *SIPCOT's role is limited to ambient and infrastructure-level monitoring to evaluate the effectiveness of mitigation measures and ensure overall environmental compliance.*

# 6.ADDITIONAL STUDIES

## 6.1 Introduction

### 6.1.1 Hazard Identification and Risk Assessment

- The project is exposed to both natural and man-made hazards.
- Natural hazards include earthquakes and floods.
- Man-made hazards may include fires, explosions, electrical accidents, chemical spills, and accidental release of toxic chemicals.
- Such hazards may arise due to equipment failure, human error, or extreme weather conditions.

### 6.1.2 Disaster Management Plan

- The Disaster Management Plan (DMP) is prepared to identify and assess potential hazards and associated risks.
- It addresses hazards arising from natural events as well as those related to the proposed industrial activities.
- The plan outlines preparedness measures and response actions to control and manage emergency situations.
- The objective is to ensure effective coordination and timely response during any hazard or emergency occurrence.

### 6.1.3 General Safety and Occupational safety

It is of utmost importance to take into account the safety of the plant personnel irrespective of the plant size. Proper safety measures should be followed in this regard.

- These include the use of Personal Protective Equipment (hand gloves, dust masks, face shield,goggles,apron, etc.) during working.
- Avoid contact with the raw materials without the use of Personal protective equipment.
- A schedule should be prepared for regular maintenance of each unit and the same should be followed regularly.
- Allthevalves, which are prone to open and spill inflammable/toxic material due to accident impact,mustbe placed with a suitable guard.

- The unit's management should ensure that all rotating machines and moving parts are provided with appropriate guards and the guards are put back in the position after check-up and maintenance.
- All the control systems are being periodically checked for their reliability and accuracy.
- Proper ventilation to be provided in areas where there are chances of a build-up of hazardous gases, chemicals and causing fire hazards

## 6.2 PUBLIC CONSULTATION

Details will be incorporated after the Public Hearing is conducted.

# 7. PROJECT BENEFITS

The proposed SIPCOT Industrial Park at Allikulam, Thoothukudi, spread over 796.240 ha, will drive industrial, economic, and social development in southern Tamil Nadu. It will host Man-Made Fibre (Lyocell/Technical Textile and other Technical Textile Industries) and other non-EC industries, promoting industrial diversification and modernization in the region.

The Lyocell unit will produce environment-friendly regenerated Lyocell, a key raw material for the technical textile and apparel sector, serving domestic and export markets. Its integration within the industrial park strengthens the overall industrial value chain.

## 7.1 Environmental Benefits

- The Lyocell manufacturing process follows a closed-loop system, recovering over 99% of NMMO solvent, thereby minimizing chemical discharge.
- A greenbelt of 186.714 ha (23.46% of Total area), including 78.211 ha within industrial plots, is proposed to act as a buffer for air quality improvement, noise attenuation, and microclimate stabilization.
- Stormwater management measures, including drains, recharge pits, and rainwater harvesting structures, are proposed to enhance groundwater recharge.
- Solid waste management for common facilities will be provided by SIPCOT, while individual industries will adopt ZLD practices to safeguard water quality.
- Measures such as dust suppression, solar lighting, energy-efficient infrastructure, and low-emission transport are proposed to reduce the overall carbon footprint.
- The environmental layout of the industrial park supports resource efficiency and ecological conservation.

## 7.2 Economic Benefits

- The project is expected to attract domestic and foreign investments in the Lyocell and allied textile sectors.
- Employment generation is estimated at 25 direct and 600 indirect jobs during the construction phase and 2025 direct and 18,225 indirect jobs during the operation phase.
- The industrial park will support logistics, warehousing, MSMEs, and ancillary industries.
- The project is expected to contribute to State GDP, Tax revenues, and Industrial competitiveness.
- Improved infrastructure and proximity to Thoothukudi Port will facilitate export-oriented

industrial activities.

## 7.3 Social Benefits

- The project will generate direct and indirect employment opportunities for residents of nearby villages.
- Engagement of local workforce, wherever feasible, will help improve income levels and reduce migration.
- Development of supporting infrastructure and civic amenities such as housing, healthcare, and education is expected in the surrounding areas.
- Community engagement and grievance redressal mechanisms will be implemented to address social concerns and enhance social wellbeing.
- The following welfare measures are envisaged as part of the project development:
    - Provision of safe drinking water through RO units, storage facilities, and distribution pipelines.
    - Support to healthcare facilities through medical camps and basic equipment.
    - Improvement of government schools with classroom and digital learning support.
    - Establishment of skill development and training centres aligned with industrial employment needs.
    - Development of sanitation facilities and community-level waste management systems.
    - Greenbelt development and community plantation activities.
    - Improvement of basic community infrastructure such as street lighting and small civic works.

# 8. ENVIRONMENT MANAGEMENT PLAN

The Environmental Management System (EMS) will ensure continuous monitoring of environmental components. An EMP has been prepared with a capital cost of INR 10636 lakhs and a recurring cost of INR 132 lakhs. Work zone monitoring for gaseous pollutants and dust will be conducted monthly, with records maintained per Factories Rules. During operation, sampling and monitoring will be carried out through NABL approved agencies.

Proposed Cost for the Industrial Park is **INR 66611 Lakhs.** The detailed cost bifurcation is given below:

## 8.1 SIPCOT Industrial Park – Cost & Environmental Provisions

### 8.1.1 Project Cost

*Table 23. Project cost for Proposed Industrial Park*

| S.No. | Project Components | Amount (Rs. in lakhs) |
|---|---|---|
| 1. | Land Cost | 16061 |
| 2. | Land development cost | 200 |
| 3. | Roads and drains | 28419 |
| 4. | Desilting and revetment of odai | 1860 |
| 5. | Street Light | 1193 |
| 6. | Water supply system | 5765 |
| 7. | Amenity Infrastructure | 575 |
| 8. | Greenbelt development | 100 |
| 9. | Rain water harvesting | 50 |
| 10. | Solid waste handling facility | 100 |
| 11. | Preliminary and Preoperative expenses | 12288 |
| **Total** | | **66611** |

### 8.1.2 EMP Capital Cost

*Table 24. Environment Management Plan Capital cost*

| S. No. | Particulars | Unit | Amount (Rs.) |
|---|---|---|---|
| 1 | Storm water drains & Groundwater rejuvenation Plan | INR Lakhs | 8526 |
| 2 | Desilting and Revetment of odai and Rainwater Harvesting | INR Lakhs | 1910 |
| 3 | Greenbelt development | INR Lakhs | 100 |
| 4 | Solid waste handling facility | INR Lakhs | 100 |
| **Total (in Lakhs)** | | | **10636** |

### 8.1.3 Recurring Cost

*Table 25. Environment Management Plan Recurring cost*

| S. No. | Particulars | Unit | Recurring Expenses (Lakhs) |
|---|---|---|---|
| 1 | Environmental Monitoring during construction and Operational Phase | INR | 2 |
| 2 | Desilting and Revetment of odai, Storm Water Drain and Rainwater Harvesting | INR | 50 |
| 3 | Greenbelt development | INR | 50 |
| 4 | Solid waste handling facility | INR | 30 |
| **Total (in Lakhs)** | | | **132** |

## 8.2 Lyocell & Tissue Manufacturing Unit – Cost & Environmental Provisions

### 8.2.1 Project Cost

The tentative total project cost for the Lyocell & Tissue Manufacturing unit is **₹4,593.00 crore**, of which ₹4,398.28 crore is allocated towards plant and machinery.

### 8.2.2 EMP Capital Cost

The total capital cost earmarked for the implementation of the Environmental Management Plan (EMP) for the proposed project is **₹24,600 lakhs**, covering provisions for pollution control measures,

environmental monitoring systems, greenbelt development, waste management facilities, occupational health and safety infrastructure, and other statutory environmental safeguards.

### 8.2.3 Recurring Cost

The recurring cost earmarked for the implementation of the Environmental Management Plan (EMP) for the proposed project is **₹450 lakhs per annum**, which includes expenses towards environmental monitoring, operation and maintenance of pollution control systems, greenbelt maintenance, waste management, occupational health and safety measures, and other ongoing environmental safeguards.

### 8.2.4 Occupational Health and Safety Measures & Budget Allocation

| S. No. | Description | Amount (INR Lakhs) |
|---|---|---|
| **1** | Workers will be subjected to primary health check-up before they are employed to ascertain their health conditions. Thereafter, Regular Medical check-up & First Aid facility will be organized for workers to evaluate the adverse impact if any on these persons due to the proposed activity. Occupational health surveillance programmes shall be done yearly. A Medical Officer and full-fledged medical staff are recruited. | 60 |
| **2** | Infrastructure facilities such as sanitation, fuel, restroom, canteen etc. shall be provided to the labour force during construction as well as to the casual workers including truck drivers during the operation phase. | 40 |
| **Total** | | **100** |

# 9. CONCLUSION

The development of the proposed SIPCOT Industrial Park in Thoothukudi District, is part of Tamil Nadu's ongoing efforts to expand organized industrial infrastructure and promote regionally balanced economic development. The project is aligned with the State's objectives to facilitate large-scale industrial investment, generate employment opportunities, and strengthen export potential. Thoothukudi District, with its strategic proximity to Thoothukudi Port and established transport networks, has been identified as a suitable location for industrial project particularly for industries requiring direct access to port infrastructure. The Industrial Park will create the necessary infrastructure framework to attract manufacturing industries, facilitate industrial operations, and support ancillary services, contributing to the State's and the country's economic growth.

# Section D (Environmental Impact Assessment Report)

# DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

**For**

**DEVELOPMENT OF AN INDUSTRIAL PARK AT ALLIKULAM, KEELATHATTAPARAI, PERURANI, UMARIKOTTAI, MELATHATTAPARAI, RAMASAMYPURAM AND THERKUSILLUKKANPATTI VILLAGES, THOOTHUKUDI TALUK, THOOTHUKUDI DISTRICT, TAMIL NADU OVER AN EXTENT OF 796.240 HECTARES (1966.713 ACRES)**

**Activity and Category: Schedule 7(c) – Industrial estates/Park/Areas falls under Category "A", Area exceeding 500 ha along with one pre-defined Schedule 5(d) Category 'B' Industry within the proposed Industrial Park as per EIA Notification, 2006 as amended**

**ToR File No: 10/19/2025-IA.III Dated on 21/09/2025**

**Baseline Period: March 2025– May 2025 (Summer Season)**
**(Laboratory Assigned: M/s. Perfact Researchers Pvt Ltd., vide Certificate No. TC-6993, valid up to 03.04.2029)**

**by**

## PROJECT PROPONENT

**M/s. STATE INDUSTRIES PROMOTION CORPORATION OF TAMILNADU LIMITED (SIPCOT)**
19-A, Rukmani Lakshmipathy Road Egmore, Chennai - 600008.

## ENVIRONMENTAL CONSULTANT

## M/s. PERFACT ENVIROSOLUTIONS PVT. LTD

(NABET Registered List of Accredited Consultant Organisations/NABET/EIA/25 - 28/ RA 0467 Valid Upto 26/11/2028)
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## M/s. ITCOT LIMITED

**Address :** 50-A, Greams Road ,Murugesa Naicker Complex, Chennai - 600 006

**DECEMBER 2025**

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# 1. EXECUTIVE SUMMARY

**State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT),** established in 1971, stands as the apex body for industrial infrastructure development in Tamil Nadu. Over the past five decades, SIPCOT has been instrumental in establishing more than 50 Industrial Parks including 8 Special Economic Zones (SEZs) across 24 districts, spanning over 48,926 acres. These initiatives have attracted investments exceeding ₹1.99 lakh crores and generated nearly 8.79 lakh employment opportunities, solidifying Tamil Nadu's reputation as a premier industrial destination in India.

Embracing the era of Industry 4.0 and the imperatives of smart manufacturing in line with the "Make in India" program , SIPCOT is committed to developing integrated industrial ecosystems. These ecosystems are designed with state-of-the-art utilities, sustainable infrastructure, robust environmental safeguards, and investor-centric frameworks.

Strategically positioned with seamless connectivity to major transport corridors, Thoothukudi Port, and regional infrastructure, the proposed SIPCOT Industrial Park is set to emerge as a next-generation industrial growth Centre. It will foster the development of Technical Textile and other Textile industries, other Engineering and manufacturing Industries that does not attract EIA Notification 2006 Provisions, Commercial and Amenities for the proposed Industrial Park; Development will generate significant employment opportunities, strengthen logistics networks, and promote balanced regional development. The park is expected to attract investments and facilitate the growth of value-added industries, driving sustainable economic progress in southern Tamil Nadu.

In line with this vision and spearheading industrial transformation in Southern Tamil Nadu, SIPCOT proposes the development of a world-class Industrial Park in Allikulam, Tamil Nadu, covering an extent of **796.240 hectares (1966.713 acres).** Government of Tamil Nadu has issued Administrative sanction for acquisition/alienation of 796.240 Ha. land vide G.O (Ms).No: 100 dated: 26.02.2021 which is attached as ***Annexure 1.*** The proposed Industrial Park establishment will house a large-scale Lyocell and Tissue manufacturing unit within a single plot and includes an earmarked area of about 500 acres (202.430 ha) designated for Technical Textile and other textile industries within the Industrial Park This strategic project is designed to significantly enhance Tamil Nadu's global stature in man- made fibre manufacturing Sectors.

While the PM MITRA Mega Textile Park is under development in Virudhunagar District, the proposed Lyocell Manufacturing Unit at the SIPCOT Industrial Park at Allikulam, approximately 100 km away, is envisioned at a scale and objective that will surpass this benchmark The proposed Technical and other Textile industries will contribute to strengthening Tamil Nadu's capacity in Technical textile manufacturing by providing dedicated industrial infrastructure and facilitating sector-specific investments.

## 1.1 About the Project

SIPCOT Proposes development of an Industrial Park mainly for promoting Technical Textile and other Textile Industries in Thoothukudi District, Tamil Nadu with total plot area 796.240 hectares

(1966.713 acres) & Total Project Cost INR 666.11 Cr. The proposed Industrial Park establishment will house a large-scale Lyocell and Tissue manufacturing unit within a single plot. It is also envisaged to include Industries which don't attract EIA Notification 2006 such as Engineering and other manufacturing industries, allied commercial, and administrative buildings, integrated with green development, and advanced utilities creating a sustainable and investor-friendly environment.

The proposed Industrial Park features comprehensive zoning for industrial Development mainly as Technical Textile and other Textile Industries, amenities commercial and other activities such as SWM, Project office , Security and Services with total plot area 796.240 hectares (1966.713 acres) & Total Project Cost INR 666.11 Cr. The proposed plotted development will be carried out over an extent of 721.338 hectares (1781.705 acres). The non-developable area within the project site comprises 27.994 hectares (69.145 acres) of the existing Nilaviyal Odai and 20.957 hectares (51.763 acres) earmarked as Right-of-Way buffer for the HT transmission line, together aggregating to 48.951 hectares (120.908 acres). In addition, an extent of 25.951 hectares (64.100 acres) will be retained as a No-development buffer for existing windmills.

Employment generation is anticipated during both the construction and operational phases of the proposed Industrial Development. Approximately 625 personnel will be engaged during the construction phase (including 315 persons for the Lyocell Unit). During the operational phase, about 20,250 employment opportunities will be employed (including 1,000 positions within the pre-defined Industry that will manufacture Lyocell), to be provided by individual industries and other units planned within the Industrial Park. The Layout plan has been prepared taking into consideration of the TOR specific recommendations and also the recent OM issued by MOEFCC (F. No. IA3-22/14/2025-IA.III (E-275538)) on 29.10.2025 on development of greenbelt development for Industrial Estates/Parks.

Industries which don't attract EIA Notification 2006 such as Aerospace/Defense Installation, Engineering and other manufacturing industries, integrated with green development, and advanced utilities creating a sustainable and investor-friendly environment. SIPCOT allocates land to TANGEDCO to set up a substation to provide power supply to member industries and commercial units within the park. No common Sewage Treatment plant or common Effluent Treatment plant is envisaged by SIPCOT

Designed to attract a wide range of industries, the park offers essential infrastructure and connectivity, including proximity to Thoothukudi Port, national highways, and rail links. The project aims to promote industrial development, attract investment, create employment, and contribute to the economic growth of the region.

SIPCOT will develop Industrial Plots in 521.409 ha (including 15% greenbelt as applicable to red category Industries), Commercial plots in 21.640 ha , Plots for Amenities in 14.425 ha, Solid waste handling area 2.024 ha, Internal roads and Stormwater drain network will be 53.337 ha . Within the Industrial plot area, 202.43 ha (500 acres) will be dedicated to Technical Textile and other Textile Industries that will attract Schedule Activity 5(d) , Category A or B and in balance 318.979 ha , plots will be allotted for units that will not attract the provisions of EIA Notification will be established. Within the Technical Textile & other Textile Industrial plots, a single plot S-1 with 139.45 ha (344.61

acres) is identified for the proposed Lyocell manufacturing unit and in remaining plots, other Technical Textile Industrial units that may fall under Schedule Activity 5(d), Category A or B . Accordingly, application for ToR was uploaded in PARIVESH portal vide Proposal No IA/TN/INFRA1/548303/2025 dated 16.08.2025 and the project was taken in the EAC 414th Meeting dated 02.09.2025. Subsequently, ToR was issued for the extent of 796.240 Ha (1966.713 acres) by MOEF&CC vide TOR Identification No: TO25A3102TN5260559N [File no. 10/19/2025-IA.III] dated 21.09.2025. The copy of Terms of Reference is enclosed.

**Demand – Supply Gap for setting up a new Industrial park**

Currently, an industrial park developed by SIPCOT, recognized as India's first large-scale Furniture Manufacturing Park, catering to both domestic and export-oriented industries is in operation in Thoothukudi District. In addition to the furniture sector, the Furniture Manufacturing park also accommodates enterprises in products for marine and renewable energy, chemicals, agro-processing, and engineering**,** contributing to the region's diversified industrial base.

This strategic development is expected to enhance regional industrial growth, attract investments, and create employment opportunities, while addressing the existing gap in dedicated infrastructure for the technical textile and other sector in Southern Tamil Nadu.

**Demand – Supply Gap for setting up a new Lyocell manufacturing industry**

**Lyocell**

India stands proudly as the second-largest textile market globally. While the global demand for fiber is Steady , Man Mmade Fibre in India has shown growth about 1.4 million MT within very short period, the rapid expansion in demand is to meet increased demands for technical textiles, hygiene, medical, and performance apparel. Due limited large-scale production capacity and dependence on imported technologies, there is in the domestic market which can be well serviced by a state-of-the-art domestic manufacturing capacity The added benefit of sharp reduction in lead times and reduction in logistics costs will significantly enhance the downstream industry's competitiveness. This stability provides a solid foundation for domestic industry expansion.

The future of India's textile growth is in premium, eco-friendly alternatives. Viscose and Lyocell consumption has been a primary growth driver, accelerating at an impressive rate. MMCF demand has grown at an approximate 10% CAGR from 2019 to 2024 (from 0.5 million MT to 0.8 million MT), replacing cotton usage. The market shift indicates a major commitment to sustainable alternatives. Total demand for Viscose and Lyocell is expected to increase from 1.3 to 1.4 million MT by 2030. This increase in demand is fueled by increasing consumer preference for biodegradable and eco-friendly fabrics, aligning with the government's push for a sustainable and circular economy. India has also witnessed a rapid expansion in demand for technical textiles, hygiene, medical, and performance apparel. Due limited large-scale production capacity and dependence on imported technologies, there is a substantial supply-demand gap in the domestic market, which can be well serviced by a state-of-the-art domestic manufacturing capacity. The added benefit of sharp reduction in lead times and reduction in logistics costs will significantly enhance the downstream industry's competitiveness.

Based on the date in public domain, India's total MMCF capacity is about 9,00,000 MT (of which Lyocell is 50,000 MT). With the demand projected to touch 1.34 million MT by 2030, there will be a critical supply gap of 4,00,000 MT. The proposed project is expected to fill this gap with production of Lyocell – a fiber celebrated for its closed-loop production, biodegradability, and superior performance. This project will meaningfully contribute as India positions itself as a global hub for high-value, sustainable textile products.

**Total Fibre Demand:**

The annual domestic demand is estimated at approximately 6.5 million MT (Cotton + Viscose + Lyocell). The bulk of this consumption caters to:

- Technical textiles and other fabrics
- Apparel (performance, fashion, and everyday wear)
- Home furnishings (bed linen, towels, curtains)
- Automotive interiors and filtration
- Hygiene and medical applications

*Table 1. Lyocell Market Overview (2024–2030).*

| Parameter | 2024–25 Estimate | 2030 Projected | CAGR |
|---|---|---|---|
| Domestic Demand | 6,441 K Tons | 6,890 K Tons | 1% |
| Cotton | 5,550 K Tons | 5,550 K Tons | 0% |
| MMCF (Viscose+Lyocell) | 900 K Tons | 1340 K Tons | 8% |
| MMCF Domestic Capacity | 845 K Tons | 975 K Tons (based on public announcements) | - |
| Estimated Gap | 55 K Tons | 365 K Tons (to be serviced by the proposed Lyocell Project) | - |

**Government and Policy Push**

The PLI Scheme and National Technical Textile Mission**,** along with state-level incentives (e.g., Tamil Nadu's infrastructure support), are encouraging new investments and fast-track clearances for integrated fibre manufacturing.

**Strategic Relevance of SIPCOT Industrial Park at Allikulam:**

The propo**s**ed Lyocell and Tissue Manufacturing Unit at SIPCOT Industrial Park at Allikulam will:

- Add new domestic capacity in high-performance Lyocell grades**.**
- Ensure energy reliability via a Captive Co-gen Power Plant.
- Reduce import dependence and strengthen India's "Make in India" initiative.

**References:**


- IMARC Group: *India Lyocell Fiber Market Size, Share and Report, 2033*
- Mordor Intelligence: *Lyocell Fiber Market Size, Share & Growth Trends*

- Expert Market Research: *Lyocell Fibre Market Size, Share, Price, Analysis | 2034*

**DEMAND AND SUPPLY GAP FOR TISSUE**

India's tissue-paper sector—including toilet tissue, facial tissues, napkins, and kitchen rolls—continues to expand rapidly, driven by rising hygiene awareness, urbanisation, and the growing hospitality and institutional sectors. According to market data, consumption increased from ~ 169,000 tonnes in 2018 to an estimated 550,000 tonnes by 2032 (Paper Mart). The market value was about **USD 7.0 billion in 2024** and is projected to reach **USD 10.5 billion by 2033** (IMARC Group).

**Estimated Domestic Scenario:**

- Current domestic demand (2024): ~ 0.30 – 0.35 million MT (≈ 300 000 – 350 000 tonnes)
- Current domestic production: ~ 0.22 – 0.25 million MT (≈ 220 000 – 250 000 tonnes)
- Current gap : ~ 0.05 – 0.13 million MT (≈ 50 000 – 130 000 tonnes)

**Projection by 2030:**

- Demand : ~ 0.55 – 0.60 million MT
- Production : ~ 0.40 million MT
- Estimated gap : ~ 0.15 – 0.20 million MT

**Key Drivers of the Gap:**

- India's per-capita consumption (~ 0.18 kg) is far below global levels (5 – 10 kg). (Paper Mart)
- Growth in hospitality, commercial, and institutional hygiene markets.
- Lag in integrated virgin-pulp and high-grade tissue manufacturing.
- Continued reliance on imported parent rolls and pulp.

**Project Relevance:**

The proposed integrated tissue manufacturing facility at Allikulam will fill the current domestic gap by producing premium tissue grades, improving supply reliability, and reducing imports. The facility's integration with captive utilities will ensure operational efficiency and competitiveness.

**References:**


- India's Tissue Market: A Pulp and Paper Industry-Centric Analysis – Paper Mart
- India Tissue Paper Market Size, Share, Growth | Report 2033 – IMARC Group
- India Tissue Paper Market Outlook – 6Wresearch


**Demand -Supply Gap for Non-EC applicable Category Industries**

Non-EC applicable industries, while often classified as low-pollution or low-impact, play a crucial role in the broader industrial ecosystem by:

- Supporting supply chains for large industries
- Facilitating warehousing, logistics, and assembly operations

- Generating significant employment, especially for semi-skilled and unskilled workers
- Driving decentralized, small and medium-scale industrial growth including:
  - Light manufacturing (electrical equipment, plastic components, packaging)
  - Assembly operations (consumer goods, electronics)
  - Warehousing and distribution centres.
  - Ancillary units for larger industrial clusters
  - IT-enabled services and technical support facilities

Current demand for non-EC category industrial spaces is increasing due to:

- Growth of e-commerce and the need for last-mile warehousing and logistics for upcoming Aero-space activities
- Rising demand for domestic production of intermediate goods and spare parts
- The requirement for decentralized employment opportunities in non-metropolitan regions

However, the availability of organized, infrastructure-equipped land for non-EC industries remains limited, particularly in southern Tamil Nadu. Existing industrial areas are either saturated or lack the necessary facilities to attract smaller, non-EC compliant units.

The SIPCOT Industrial Park addresses this gap by:

- Providing designated plots with reliable utilities, road connectivity, and shared infrastructure.
- Ensuring rapid establishment timelines with minimal regulatory hurdles for non-EC industries.
- Facilitating the growth of support industries, creating employment, and boosting regional economic activity.

The presence of non-EC industries within a larger, diversified industrial Park supports:

- Supply chain efficiency for core industries like Lyocell and Tissue Manufacturing, engineering, and other industries.
- Creation of jobs across different skill levels.
- Enhanced utilization of infrastructure, contributing to economic resilience in the region

**Imports vs. Indigenous Production**

- As SIPCOT functions as an industrial infrastructure developer, it does not directly engage in manufacturing or production activities. However, by creating developed industrial plots with integrated utilities and infrastructure, SIPCOT facilitates the establishment of both import-substitution and export-oriented industries. The park is expected to promote indigenous production across various sectors by providing world-class facilities that attract domestic industries and reduce dependency on imported finished goods, while simultaneously encouraging industries with export potential
- The SIPCOT Industrial Park is located approximately **15 km** from V.O. Chidambaranar Port (Thoothukudi Port), a major deep-water, all-weather port on India's east coast. The port handles over **36 million tonnes of cargo annually** (including bulk, breakbulk, liquid and containerized cargo) and offers container, bulk, breakbulk, and liquid cargo services. With **14 berths** and a dedicated container terminal, it provides industries within the park access to

efficient, cost-effective logistics for both imports and exports. Regular shipping services connect to Southeast Asia, Europe, Africa, and the Middle East, making the park highly attractive to export-driven industries. The proximity reduces lead times, lowers transportation costs, and improves global market connectivity, positioning the industrial park as a hub for regional and international trade.

- The proposed Lyocell and Tissue Manufacturing unit is designed to strengthen domestic production capacity in the Lyocell segment, which is currently reliant on imports to meet market demand. By establishing advanced indigenous manufacturing capabilities, the project aims to provide affordable raw material to the domestic textile industry, improve self-reliance, and enhance India's position in the global Technical textile and other industries value chain. Additionally, the project is expected to create opportunities for import substitution while supporting exports of high-quality, value-added products.
- The proposed Lyocell and Tissue Manufacturing Complex is advantageously situated just **15 km** from Thoothukudi Port, providing critical logistics for the import of pulp and the export of Lyocell and tissue products. The port's capacity to handle over **1 million TEUs (Twenty-Foot Equivalent Units) annually (container traffic)** ensures smooth container handling and quick turnaround for export consignments. It is equipped with **dedicated road and rail links** to major industrial zones, further enhancing supply chain efficiency. The port's access to over **50 international shipping destinations** improves the project's competitiveness, enabling entry into global textile markets and supporting foreign exchange earnings. This proximity positions the project to achieve both operational efficiency and global market integration.
- The Lyocell and Tissue Manufacturing Complex is geared toward addressing supply gaps in India's domestic market while positioning itself as a competitive exporter. Within India, demand for Lyocell -based products is rising across textiles, hygiene, and specialty applications, providing robust local market opportunities. On the global front, the complex is expected to supply high-quality Fibre to Technical textile and nonwoven markets in Asia-Pacific, the Middle East, and Europe. Its dedicated manufacturing capacity, combined with port access just 15 km away, allows it to scale export operations efficiently, meet international quality standards, and contribute to India's Technical textile and other industries export portfolio. The Tissue manufacturing plant will meet the fast-growing demand for tissues in India.

## 1.2 IDENTIFICATION OF THE PROJECT AND THE PROJECT PROPONENT :

### SIPCOT Industrial Park

*Table 2.Identification of the Project – SIPCOT Industrial Park*

| Name of Project | Activity & Category | Remark |
|---|---|---|
| Development of Industrial Park at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram, | Activity: 7(c) – Industrial Estates / Parks / Complexes / Areas, Export | The proposed Industrial Park covers 796.240 ha and includes one pre-defined 5(d) Category 'B' Lyocell Manufacturing Unit. |

| Name of Project | Activity & Category | Remark |
|---|---|---|
| and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu over an extent of 796.240 ha (1966.713 acres) | Processing Zones, (Infrastructure for Industrial Development) **Category 'A'** | As per EIA Notification, 2006 and its amendments, projects covering an area of more than **500 ha** or those including a **pre-defined Category 'B' activity** fall under **Schedule 7(c), Category 'A'** and the Industrial Park is also expected to have other textile manufacturing units that may fall under 'Category A' or 'B' industries **within the balance of EC plots,** It is also envisaged to include proposed Industries which don't attract EIA Notification 2006 such as Engineering and other manufacturing industries, allied commercial, and administrative buildings, integrated with green development, and advanced utilities and are appraised at the **Central Level** by the Expert Appraisal Committee (EAC–Infra 1), MoEF&CC. |

**Identification of the Project Proponent:**

*Table 3. Identification of Project proponent (SIPCOT)*

| Particulars | Details |
|---|---|
| **Name of the Proponent** | State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT) |
| **Name of the Applicant** | The Managing Director |
| **Registered Office Address** | 19-A, Rukmani Lakshmipathy Road, Egmore, Chennai – 600 008, Tamil Nadu, India |
| **Nature of the Organisation** | Government Undertaking (Tamil Nadu State Government) |
| **Core Activity** | Development of Industrial Parks, Estates, and Infrastructure Facilities across Tamil Nadu |
| **Email** | md@sipcot.in |

**Identifiation project and the Proponent of Pre-defined Industry** within the proposed Industrial Park is as given below:

**Lyocell and Tissue Manufacturing Unit :**

*Table 4. Identification of the Project – Lyocell & Tissue Manufacturing Unit*

| Name of Project | Activity & Category | Remark |
|---|---|---|
| Proposed Lyocell (Man-Made Fibre) and Tissue Manufacturing Unit with Captive Co-gen Power Plant (135 MW) within SIPCOT Industrial Park at Allikulam, Thoothukudi District | Activity: 5(d) – Man-Made Fibre Manufacturing Category 'B' (with specific conditions as per EIA Notification 2006)<br><br>**Interlinked Activities:**<br>• 1(d) – Captive Co-gen Power Plant (135 MW)<br>• 8(b) – Industrial Sheds & Buildings (235,811 sq.m built-up area) | The proposed Lyocell & Tissue Manufacturing Unit is a **pre-defined industry** within SIPCOT Industrial Park. As it involves **Man-Made Fibre manufacturing (5d)** and **Captive Co-gen Power generation (1d)**, the project attracts EIA provisions and is appraised under **Schedule 7(c), Category 'A'** along with the Industrial Park. The plant includes industrial sheds exceeding **20,000 sq.m**, falling under **Schedule 8(b), Category 'B'**. |

**Identification of Proponent**

The proposed Lyocell Manufacturing Unit will be set up by **M/s. APRIL Fiber Resource Pvt.Ltd.,** through an MOU between Government of Tamil Nadu & the Company for the specific purpose.

## 1.3 BRIEF DESCRIPTION OF THE PROJECT

*Table 5. Brief Description of Site*

| S.No. | Particulars | Details | |
|---|---|---|---|
| **1.** | Location | Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District. | |
| **2.** | Project Coordinates | **Latitude :** 8°47'4.25"N<br>**Longitude :** 78° 1'1.48"E | |
| **3.** | Total Plot Area | **ha** | 796.240 |
| | | **acres** | 1966.713 |
| **4.** | Project Cost (INR) | **Crores** | 666.11 |
| **5.** | Approach Road | NH-7A (Thoothukudi–Tirunelveli National Highway), at an approximate distance of 2.75 km towards the south-southeast (SSE) direction | |
| **6.** | Scope of Development by SIPCOT | Industrial Park development with zonation , layout , common amenities, Commercial activities, Greenbelt, Stormwater drain, OSR, SWM, Project | |

| S.No. | Particulars | | Details |
|---|---|---|---|
| | | | Management office and such other infrastructure facilities. |
| **7.** | Details about the Pre-defined Activity | | Setting up of a Lyocell manufacturing unit in 139.46 ha (344.61 acres) with 300,000 TPA capacity, Tissue Manufacturing unit with 100,000 TPA capacity along with 135 MW Captive Power Generation using Coal & Biomass mixture and Industrial buildings & sheds of 2,35,000 sq.m under schedule Activity 5(d) , category B |
| **8.** | Other Plotted development | | 1.Technical Textile Industries – 202.43 ha , 20 plots<br>2. Non EC Attracting industries – Red/Orange/Green /White Category 318.979 ha.<br>3. Amenities Plots<br>4. Commercial Plots<br>5. Solid Waste Management<br>6. Project Offices , Security and other Development |
| **9.** | SIPCOT Industrial Park | EMP Capital Cost | INR 10636 lakhs |
| | | EMP Recurring Cost | INR 132 lakhs |
| **10.** | Lyocell Manufacturing Unit | Project Cost | INR 495300 lakhs |
| | | EMP Capital Cost | INR 24600.0 lakhs |
| | | EMP Recurring Cost | INR 450.0 lakhs |

## 1.4 LAND BREAK-UP AND INFRASTRUCTURE REQUIREMENT

### Development of an Industrial Park – Land Use

*Table 6. Proposed Land Use Distribution Details of SIPCOT Industrial Park*

| S.No | Description | Unit | Area (Ha) | Area (Acres) | % of Total area |
|---|---|---|---|---|---|
| 1. | Industrial Plot Area* (including 15% (193.182 acres) greenbelt as applicable to red category Industries ) | Hectare | 521.409 | 1287.880 | 65.48% |
| 2. | Plots for Common Amenities | Hectare | 14.425 | 35.630 | 1.81% |
| 3. | Plots for Commercial Activities | Hectare | 21.640 | 53.450 | 2.72% |
| 4. | Area for Solid Waste Management | Hectare | 2.024 | 5.000 | 0.25% |
| 5. | Road, Storm Water Drain area | Hectare | 53.337 | 131.740 | 6.70% |
| 6. | Greenbelt by SIPCOT (30 m on either side of Water body (Odai), 15 m on either side of Nilaviyal Odai & & 15m along the Periphery | Hectare | 108.503 | 268.005 | 13.63% |

| S.No | Description | Unit | Area (Ha) | Area (Acres) | % of Total area |
|---|---|---|---|---|---|
| | of Lyocell unit and 10m all along the boundary) | | | | |
| **Total Developable area** | | **Hectare** | **721.338** | **1781.705** | **90.59%** |
| 7. | Area of wind mill falling distance (Radius 181m) | Hectare | 25.951 | 64.100 | 3.26% |
| 8. | Existing Nilaviyal Odai (Non-developable area) | Hectare | 27.994 | 69.145 | 3.52% |
| 9. | RoW HT Line Buffer(Non-developable area) | Hectare | 20.957 | 51.763 | 2.63% |
| **Total Non-developable area** | | **Hectare** | **74.902** | **185.008** | **9.41%** |
| **Grand Total area of the Industrial Park** | | **Hectare** | **796.240** | **1966.713** | **100%** |

*Table 7. Comparison of Land Use Distribution details*

*(During EAC 414th Meeting and Revised for EIA as per TOR and Recent OM for Greenbelt)*

| S.No | Description | Unit | During EAC 414th Meeting | | Revised for EIA as per ToR and Recent OM | |
|---|---|---|---|---|---|---|
| | | | Extent (Ha) | % of Total area | Revised Extent (Ha) | % of Total area |
| 1 | Industrial Plot Area* (inclusive of greenbelt) | Hectare | 521.126 | 65.45 | 521.409 | 65.48 |
| 2 | Plots for Common Amenities | Hectare | 14.891 | 1.87 | 14.425 | 1.81 |
| 3 | Plots for Commercial Activities | Hectare | 22.336 | 2.80 | 21.640 | 2.72 |
| 4 | Area for Solid Waste Management | Hectare | 2.024 | 0.25 | 2.024 | 0.25 |
| 5 | Roads & Storm Water Drain Area | Hectare | 54.462 | 6.84 | 53.337 | 6.70 |
| 6 | Greenbelt by SIPCOT | Hectare | 129.715 | 16.29 | 108.503 | 13.63 |
| **Total Developable Area** | | **Hectare** | **744.554** | **93.50** | **93.50 %** | **90.59** |
| 7 | Windmill Falling Distance (181 m radius) | Hectare | — | — | 25.951 | 3.26 |
| 8 | Existing Nilaviyal Odai (Non-developable) | Hectare | 29.957 | 3.76 | 27.994 | 3.52 |
| 9 | RoW HT Line Buffer (Non-developable) | Hectare | 21.729 | 2.73 | 20.957 | 2.63 |
| **Total Non-Developable Area** | | **Hectare** | **51.686** | **6.50** | **74.902** | **9.41** |
| **Grand Total Area of Industrial Park** | | **Hectare** | **796.240** | **100.00** | **796.240** | **100.00** |

(*Note: Includes greenbelt area to be provided by individual Units to meet MoEF&CC norms as per recent OM dated 29.10.2025)

**Distribution of Industrial plot area :**

*Table 8. Distribution of industrial pot area*

| Description | Unit | Area (Ha) | Area (Acres) | % of Total Area |
|---|---|---|---|---|
| Technical Textile Industries | Hectare | 202.430 | 500.00 | 25.42% |
| Plots for other Industries that does not attract the provisions of EIA notification 2006 and subsequent amendments | Hectare | 318.979 | 787.88 | 40.06% |
| **Total Industrial Plot area** | **Hectare** | **521.409** | **1287.88** | **65.48%** |

A statement on the area to be developed as greenbelt within the proposed Industrial Park

*Table 9. Compliance to Greenbelt Requirement*

| Description | | Unit | Area (Ha) | % of Total Area | No: of Trees @2500 |
|---|---|---|---|---|---|
| **Developed by SIPCOT** | Greenbelt by SIPCOT 30m on either side of water body, 15m on either side of Nilaviyal Odai & 15m along the Periphery of Lyocell unit and 10m all along the boundary) | Hectare | 108.503 | 13.63% | 271258 |
| **Developed by Individual Industries** | Greenbelt within Industrial Plot Area – Red/Orange/Green/White Category (@ 15%) | Hectare | 78.211 | 9.83% | 195528 |
| **Total Greenbelt within the Industrial Park** | | **Hectare** | **186.714** | **23.46** | **466786** |

* Note: Includes greenbelt area to be provided by individual Units to meet MoEF&CC norms as per recent OM dated 29.10.2025

**B. Lyocell & Tissue Manufacturing Unit :**

**Details of Land use bifurcation :**

*Table 10. Proposed Land Use and Area Distribution*

| Description | Area (acres) | Area (ha) | % of Total plot Area of Lyocell unit |
|---|---|---|---|
| **Ground Coverage** | 181.66 | 73.55 | 52.74% |
| **Internal Roads** | 28.30 | 11.46 | 8.22% |
| **Green Belt Area** | 51.67 | 20.92 | 15.00% |

| Description | Area (acres) | Area (ha) | % of Total plot Area of Lyocell unit |
|---|---|---|---|
| **Parking Area -Trucks, 4 &2 Wheelers** | 3.16 | 1.28 | 0.92% |
| **Area for ETP, STP, and other utilities** | 16.30 | 6.60 | 4.73% |
| **Area for HW, Non HW, SWM, etc.,** | 0.61 | 0.25 | 0.18% |
| **Open Area** | 62.91 | 25.40 | 18.21% |
| **Total plot area of Lyocell Unit** | **344.61** | **139.46** | **100%** |

**Note : Total Built-up area is 235,811.00 Sq.m.*
*Total No.of Trees (20.92@2500 trees/ha) = 52300 Nos.*

### 1.5 The assignment & Scope of the Study :

***Assessment of Existing Environmental Conditions:***

The study establishes the baseline environmental profile for the project area and its 10 km surroundings. Monitoring of air, water, soil, noise, land use, biological and socio-economic parameters was carried out to understand the existing environmental setting in line with the Terms of Reference and MoEF&CC guidelines.

***Prediction and Evaluation of Environmental Impacts:***

Potential environmental impacts likely to arise during construction and operation phases of the Industrial Park and the proposed Lyocell & Tissue Manufacturing Unit were identified and evaluated. The assessment considered baseline status, project activities, and resource utilization to determine the magnitude, extent, and significance of impacts and to propose suitable mitigation measures.

***Formulation of Environmental Management Plan (EMP):***

A detailed Environmental Management Plan has been developed, specifying preventive and control measures for air emissions, wastewater, solid waste, noise, and occupational health. The EMP also defines greenbelt development, environmental monitoring programmes, and budget allocation to ensure continual compliance and sustainability.

***Risk Assessment and Safety Planning:***

Comprehensive risk analysis was undertaken to evaluate process-related and operational hazards. Based on the outcomes, on-site and off-site emergency preparedness plans have been formulated to ensure personnel safety, environmental protection, and uninterrupted operations.

*Table 11. Identified Applicable Statutory*

| S. No. | Acts / Rules | Publishing Year / Amendments | Project Relevance | Objective of Legislation |
|---|---|---|---|---|
| 1 | The Environment (Protection) Act | 1986, amended 1991 | All types of environmental pollutants | Protection and Improvement of the Environment. |
| 1.1 | Environmental | 1986 | All types of | Protection and |

| S. No. | Acts / Rules | Publishing Year / Amendments | Project Relevance | Objective of Legislation |
|---|---|---|---|---|
| | (Protection) Rules | (Amendments in 1999, 2001, 2002, 2002, 2002, 2003, 2004) | Environmental Pollutants | Improvement of the Environment. |
| 1.2 | Hazardous Waste Management Rules | 1989, amendment 2000 and 2003 | Hazardous Wastes generated from industries using hazardous chemicals | Safe handling, generation, processing, treatment, package, storage, transportation, use, reprocessing, collection, conversion, and offering for sale, destruction and disposal of Hazardous Waste. |
| 1.2.1 | Hazardous Waste (Management, Handling and Transboundary Movement) Rules | 2008, Amendment in 2009, 2010 | | |
| 1.2.2 | Hazardous and Other Wastes (Management & Transboundary Movement) Rules | 2016, Amendment in 2016, 2017, 2018, 2019, 2020, 2021, 2022 | | |
| 1.3 | Manufacture Storage and Import of Hazardous Chemicals Rules | 1989, amended 2000 | Hazardous Chemicals - Toxic, Explosive, Flammable, Reactive | Regulate the manufacture, storage and import of Hazardous Chemicals. |
| 1.4 | Chemical Accidents (Emergency Planning, Preparedness and Response) Rules | 1996 | Hazardous Chemicals - Toxic, Explosive, Flammable, Reactive | Emergency Planning Preparedness and Response to chemical accidents. |
| 2 | Factories Act | 1948 | All the Chemicals specified in the chapter 2 | Control of the workplace environment and providing for good health and safety of workers. |
| 3 | The Petroleum Act | 1934 | Class B and C - as defined in the rules are present | Regulate the import, transport, storage, production, refining and blending of |

| S. No. | Acts / Rules | Publishing Year / Amendments | Project Relevance | Objective of Legislation |
|---|---|---|---|---|
| | | | | petroleum. |
| 3.1 | The Petroleum Rules | 2002 | Class B and C - as defined in the rules are present | Regulate the import, transport, storage, production, refining and blending of petroleum. |
| 4 | The Explosives Act | 1884 | Explosive substances as defined under the Act like Boiler, Flammable Hazardous material | To regulate the manufacture, possession, use, sale, transport, export and import of explosives with a view to prevent accidents. |
| 4.1 | The Explosive Rules | 1983 | Explosive substances as defined under the Act | To regulate the manufacture, possession, use, sale, transport, export and import of explosives with a view to prevent accidents. |
| 4.2 | The Gas Cylinder Rules | 2004 | Gases (Toxic, non-toxic and non-flammable, non-toxic and flammable, Dissolved Acetylene Gas, Non-toxic and flammable liquefiable gas other than LPG) | Regulate the import, storage, handling and transportation of gas cylinders with a view to prevent accidents. |
| 4.3 | The Static and Mobile Pressure Vessels (Unfired) Rules | 1981 | Gases (Toxic, non-toxic and non-flammable, non-toxic and flammable, Dissolved Acetylene Gas, Non-toxic and flammable liquefiable gas other than LPG, LPG) | Regulate the import, manufacture, design, installation, transportation, handling, use and testing of mobile and static pressure vessels (unfired) with a view to prevent accidents. |
| 5 | Air (Prevention and Control of Pollution) Act | 1981, amended 1987 | Air pollutants from chemical industries | The prevention, control and abatement of air pollution. |

| S. No. | Acts / Rules | Publishing Year / Amendments | Project Relevance | Objective of Legislation |
|---|---|---|---|---|
| 6 | EIA Notification | 2006 | For all the identified developmental activities in the notification | Requirement of environmental clearance before establishment of or modernization / expansion of identified developmental projects. |
| 7 | Water (Prevention and Control of Pollution) Act | 1974, amended 1988 | Water Pollutants from water polluting industries | The prevention and control of water pollution and also maintaining or restoring the wholesomeness of water. |
| 8 | Public Liability Insurance Act | 1991, amended 1992 | Hazardous Substances | To provide immediate relief to persons affected by accidents involving hazardous substances. |
| 8.1 | Public Liability Insurance Rules | 1991, amended 1993 | Hazardous Substances | To provide immediate relief to persons affected by accidents involving hazardous substances and also for establishing an Environmental Relief fund. |
| 9 | The Motor Vehicle Act | 1988 | Hazardous and Dangerous Goods | To consolidate and amend the law relating to motor vehicles. |
| 9.1 | The Central Motor Vehicle Rules | 1989 | Hazardous and Dangerous Goods | To consolidate and amend the law relating to motor vehicles including to regulate the transportation of dangerous goods with a view. |
| 10 | Fire Safety and Prevention Act | 2007 | Flammable and Explosive | To make more effective provisions |

| S. No. | Acts / Rules | Publishing Year / Amendments | Project Relevance | Objective of Legislation |
|---|---|---|---|---|
| | | | Substances/Chemical | for the prevention and safety measures in various buildings. |
| 11 | Solid Waste Management Rules | 2016 | Solid Waste (Municipal, Residential, Commercial) | To manage segregation, storage, collection, transportation, processing, and disposal of municipal solid waste in an environmentally sound manner. |
| 12 | Plastic Waste (Management and Handling) Rules | 2016, Amended 2021, 2022 | Plastic Waste | Plastic waste minimization, source segregation, recycling. |
| 13 | Battery Waste Management Rules | 2022 | Used Batteries (Lead Acid, Lithium, etc.) | Collection, segregation, transportation, refurbishment and recycling of Waste Battery. |
| 14 | E-Waste (Management) Rules | 2022, Amended 2023, 2024 | Electrical and Electronic Equipment Waste | Manufacture, sale, transfer, purchase, refurbishing, dismantling, recycling and processing of e-waste or electrical and electronic equipment. |
| 15 | Office Memorandum (OM) – *Rationalizing the requirement of greenbelt/green cover for Industrial Estates/Parks and individual industries based on pollution* | 29th October 2025 | Industrial Park and constituent industries for determining the required percentage of greenbelt/green cover area based on the pollution potential category (Red, Orange, Green, White). | To rationalize and standardize greenbelt/green cover requirements under the EIA Notification, 2006, ensuring proportionate allocation depending on pollution potential; promotes effective environmental management and land |

| S. No. | Acts / Rules | Publishing Year / Amendments | Project Relevance | Objective of Legislation |
|---|---|---|---|---|
| | *potential* | | | use optimization for industrial developments. |
| 16 | Office Memoranda on exemption from CTE and SOP for integration of CTE-related safeguards with EC | OMs dated 14.01.2025, 08.10.2025, 24.10.2025 & clarification dated 25.11.2025 | Projects requiring prior EC but exempted from separate CTE under G.S.R. 702(E) & 703(E) | To streamline EC appraisal by integrating applicable environmental safeguards ordinarily covered under CTE into EC conditions, defining SOP for obtaining SPCB/PCC comments through PARIVESH, and avoiding duplication/delay while retaining post-EC CTO and statutory compliances. |
| 17 | Labour act (contract, migrant ) | 2025 | Project Labours | Labour Codes - the Code on Wages, 2019, the Industrial Relations Code, 2020, the Code on Social Security, 2020 and the Occupational Safety, Health and Working Conditions Code, 2020 with effect from 21st November 2025 |
| 18 | Petroleum & Explosives Safety Organisation (PESO) Regulations | Administered under the Explosives Act, 1884; Petroleum Act, 1934; Gas Cylinder Rules, 2016; Static and Mobile Pressure Vessels | Storage, handling and use of petroleum products, flammable liquids, compressed gases, pressure vessels and other hazardous materials within industrial units | To ensure safety in manufacture, storage, handling, transportation and use of petroleum, explosives, compressed gases and pressure vessels through statutory |

| S. No. | Acts / Rules | Publishing Year / Amendments | Project Relevance | Objective of Legislation |
|---|---|---|---|---|
| | | (Unfired) Rules, 2016; | | approvals, inspections and enforcement by PESO |
| 19 | The Boilers Act and Boilers Rules | The Boilers Act, 2025 (Act No. 12 of 2025); notified on 4 April 2025; repeals the Boilers Act, 1923 | Installation, registration, inspection, operation, repair and maintenance of boilers and boiler components in industrial units | To regulate the design, manufacture, erection, inspection and use of boilers and boiler components to ensure safety of life and property from the risk of boiler explosions and to ensure uniformity in registration and inspection across India |
| 20 | Construction and Demolition Waste Management Rules | Construction and Demolition Waste Management Rules, 2016; superseded and updated through C&D Waste Management Rules, 2025 | Generation of construction and demolition waste during site development, infrastructure creation and building construction activities | To ensure environmentally sound management of construction and demolition waste through segregation, on-site storage, collection, transportation, processing, reuse, recycling and disposal, while promoting circular economy principles and minimizing environmental pollution |

## 1.7 TOR COMPLIANCE

Specific and Standard Terms of Reference for Industrial Estates / Parks / Complexes / Areas (Schedule 7(c)).

*Table 12. Compliance report on Specific & Standard Terms of Reference*

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| **Specific Terms of Reference** | | | |
| **1.1** | The natural course of Odai and Nilaviyal odai shall not be modified, obstructed, or diverted under any circumstances. A buffer zone of 30 m to 50m width along both banks of Odai and 15m width along Nilaviyal odai shall be maintained and developed as a greenbelt. A multilayered greenbelt of at least 15 meters width along the project boundary shall be created. PP shall prepare a River Rejuvenation plan to rejuvenate the stretch of the river passing through the project area to maintain fragile ecosystem with the nationally reputed institute further, periodical assessment on the status of the water quality, soil characteristics, etc., should be done by engaging reputed agencies having expertise in the field and status report should be incorporated in six monthly compliance reports. | The existing Odai and Nilaviyal Odai streams within the 796.240 ha project area are retained in their natural alignment. A buffer of 30m on either side of Odai and 15 m along Nilaviyal Odai has been demarcated and will be developed as a greenbelt. These zones are shown in the layout plan. Ground water rejunervation plan taking in the consideration is prepared and given in Annexure - 11 | **Chapter 2 – Land Use Distribution (Table. 18) & Greenbelt Requirement (Table. 19)** |
| **1.2** | A greenbelt of 15m width shall be maintained by the PP all around the Lyocell Manufacturing Unit in addition to the greenbelt to be maintained by the industry. | A dedicated 15 m wide peripheral greenbelt has been planned around the Lyocell and Tissue Manufacturing Unit (139.46 ha plot). The greenbelt covers the entire unit boundary and will consist of native species with high dust-and noise-absorption capacity. | **Chapter 2 – Land Use and Layout (Table 8)** |
| **1.3** | The project proponent shall ensure the protection and conservation of nearby water bodies during the planning, construction, and operational phases of the project. | All natural drainage channels, including the Odai and Nilaviyal Odai, are preserved in their existing alignment without filling or diversion. No wastewater or | **Chapter 2 – Drainage & Stormwater Management (Sec 2.12)** |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| | No encroachment, filling, or discharge of untreated wastewater shall be permitted into these water bodies. Adequate buffer zones and greenbelt development shall be maintained around them. Preventive measures such as silt traps, oil–grease separators, and proper drainage systems shall be implemented to avoid contamination. Regular monitoring of water quality shall be conducted, and compliance reports shall be submitted to the regulatory authority. | treated effluent from the Industrial Park or individual industries is discharged or let out into the Odai or Nilaviyal Odai. Individual industries within the Industrial Park follow Zero Liquid Discharge (ZLD) practices with complete reuse and recycling of treated wastewater within their premises. Silt traps, oil and grease separators, and lined stormwater drains are provided to prevent contamination of surface runoff. | |
| **1.4** | The PP shall not discharge any effluent in to the river, further, PP shall prepare a River Rejuvenation plan to rejuvenate the stretch of the river passing through the project area to maintain fragile ecosystem with the nationally reputed institute further, periodical assessment on the status of the water quality, soil characteristics, etc., should be done by engaging reputed agencies having expertise in the field and status report should be incorporated in six monthly compliance reports. | The project follows a "Zero Liquid Discharge" policy. No common ETP or STP is proposed by SIPCOT; each industry will install its own ZLD system. Periodic water and soil quality assessment will be done and reported to TNPCB in six-monthly compliance reports. Rejuvenation of Odai is included under the EMP plan. Monitoring will be carried out through NABL-accredited reputed agencies. | **Chapter 2 – Wastewater Management (Sec 2.9.2)** |
| **1.5** | The committee noted that windmills are already present at four locations within the proposed industrial area. To avoid obstruction of wind flow and potential operational hazards, plantation of tall trees in these zones should be restricted. Instead, the areas should be developed with low-height shrubs and ground | The windmill buffer areas within the project site are treated as designated no-development zones, wherein no buildings, infrastructure, or tall vegetation are permitted. These zones are maintained exclusively for windmill safety, wind-flow unobstruction, and operational clearance.There are Six existing | **Chapter 2 – Project Components (Sec 2.7.3)** |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| | cover species, which will provide ecological and aesthetic benefits without compromising windmill efficiency. Priority should be given to native, drought-resistant species to ensure sustainability and minimize maintenance requirements. | windmills whose buffer area interfears with the proposed project boundary out of six, three falls within the Project area. SIPCOT has excluded high-canopy trees in these zones and will plant only low-height, drought-tolerant native shrubs and ground covers that do not interfere with wind flow or rotor safety. | |
| **1.6** | Provisions for plantation/afforestation in the plan shall invariably consider complete segregation of the Project area from non-project area around it through at least 30–50 meter greenbelt all along the boundary of the project and at least 50-meter greenbelt around the large water bodies with an intent of making them an undisturbed wilderness. Linear water bodies like river/ canals / nallah shall also be protected by the greenbelt of tree. Enough number green plantation patches shall be created especially in industrial area which shall act as green lungs to mitigate the impact of pollutants and effluents on the human health of the population within the industrial area as well as adjoining commercial and residential areas in the project. | A total greenbelt area of 186.714 ha (23.46% of the project area) is provided within the Industrial Park. This includes 108.503 ha developed by SIPCOT comprising a 10 m wide greenbelt along the project boundary, 30 m greenbelt along Odai, 15 m greenbelt along Nilaviyal Odai, and a 15 m wide greenbelt along the periphery of the Lyocell manufacturing unit. In addition, 78.211 ha of greenbelt is developed within individual industrial plots as per applicable norms. Odai and Nilaviyal odai are protected through dedicated greenbelt buffers, and multiple internal green plantation patches are provided within the industrial area to function as green lungs. | **Table.8 – Greenbelt Requirement** |
| **1.7** | For the purpose of maintaining the 33% greenbelt in the project green/ open spaces/parks shall not be accounted for Only multilayered plantation creating vegetative screens to obstruct the flow of | As per the Office Memorandum dated 29.10.2025 on rationalization of greenbelt/green cover for Industrial Parks, only multilayered plantations forming vegetative screens are considered and | **Table.8 – Greenbelt Requirement** |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| | pollutants shall be created. | green/open spaces and parks are excluded. Accordingly, a total greenbelt area of 186.714 ha (23.46% of the Total area) has been earmarked, with greenbelt requirements for Red, Orange, Green, and White category industries to be implemented as prescribed in the said OM, ensuring full compliance with the revised greenbelt norms. | |
| **1.8** | List of existing and proposed industries and their layout shall be drawn and shall be submitted along with the EIA/EMP report. | A comprehensive industrial zoning plan is prepared showing plots for Textile (Lyocell and other), Engineering and Non-EC industries, commercial zones, and amenities. The layout map is attached in Annexure- 4. | **Annexure – 4 Tentative Layout Map** |
| **1.9** | Categorization of industries as per CPCB/SPCB norms and as per EIA notification, 2006 has to be mentioned. PP shall submit the estimation/assessment of the wastewater generation from the proposed Industries and the feasibility of the proposed Zero Liquid Discharge facility. | Industrial categories are classified per CPCB "Red, Orange, Green, White" standards. All industries will adopt ZLD and install separate effluent treatment systems. | **Chapter 2 – Wastewater Management (Sec 2.9.2)** |
| **1.10** | Provision for Reuse/Recycling of treated wastewater, wherever feasible. Explore possibilities for recycling and reusing treated water in the unit to reduce the freshwater demand and waste disposal. A detailed water harvesting plan needs to be submitted. Provision for Zero liquid discharge whenever techno-economically feasible. Provision for Continuous monitoring of effluent quality/quantity. | The project framework ensures maximum reuse and recycling of treated wastewater. For industrial process requirements, including the Lyocell manufacturing unit and other industrial units, water will be sourced from secondary treated sewage supplied by the Tuticorin Municipal Corporation, which will be further treated through tertiary treatment systems and utilized for process and utility operations. Industrial effluents generated from all units, including the Lyocell unit, will be treated through | **Chapter 2 – Wastewater Management (Sec 2.9.2)** |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| | | dedicated ETPs followed by Zero Liquid Discharge (ZLD) systems and 100% reused within industrial processes, thereby eliminating liquid discharge and reducing freshwater demand. Treated sewage from STPs will be reused for greenbelt development and landscape irrigation. Continuous online monitoring systems will be provided to monitor effluent quality and quantity, ensuring full regulatory compliance. | |
| **1.11** | A detailed rainwater harvesting plan including the provisions for check dams across all major and minor drains/streams and water recharge wells along the banks of these drains/nallah/khad, shall be prepared and submitted as part of the EIA Report. | The Industrial Park includes a comprehensive RWH plan with stormwater drains, percolation pits and recharge wells at strategic locations near Odai channels. Check dams are constructed to facilitate aquifer recharge and reduce run-off velocity. | **Chapter 2 – Rainwater Harvesting & Stormwater Management (Sec 2.12)** |
| **1.12** | PP has to develop and plan greenbelt plantation strategy according to the soil parameters viz soil stabilization, comprehensive soil types, dividing area according to the pH values, and the budget for the greenbelt plantation to be allocated accordingly as the proposed Industrial Area is in nature of acidic soil. | Soil testing indicates slightly acidic conditions (suitable for native species like Neem, Pongamia and Cassia). Plantation species and density planned; accordingly, budget included under EMP. | **Chapter 2 – Land Use and Soil Characteristics** |
| **1.13** | The planning of Industrial Estate should be based on the criteria mentioned in this Ministry's Technical EIA Guidance Manual for Industrial Estate (2009) prepared by IL&FS as well as CPCB's Zoning Atlas Guidelines for siting industries. | The EIA follows MoEFCC 2009 Guidance for Industrial Estates and CPCB Zoning Atlas criteria for site selection, distance from habitation, and buffer zones. | **Chapter 1 – Scope and Methodology (Sec 1.5)** |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| **1.14** | PP also mentioned that the area proposed non-EC category industries where the built-up area for these industries may exceed 20,000 sq. meters. In such cases, the project would fall under Category 8(a)/8(b) of the EIA Notification, 2006, and hence would require a separate Environmental Clearance (EC). Therefore, a separate EC shall be obtained for such area development/construction projects. | SIPCOT has noted that in the non-EC category industrial plots, if the built-up area of any individual unit exceeds 20,000 sq.m, such development shall attract the provisions of Schedule Activity 8(a)/8(b) of the EIA Notification, 2006 and its susequent amendments. In such cases, the concerned unit shall obtain a separate Environmental Clearance (EC) from the competent authority prior to construction, independent of the Industrial Park EC. | **Chapter 1 – ToR Compliance (Sec 1.7)** |
| **1.15** | A Detailed layout of the proposed Industrial area is to be submitted along with the EIA/EMP report. | A detailed layout plan of the proposed SIPCOT Industrial Park has been prepared and submitted with the EIA/EMP report, delineating all land uses, infrastructure, greenbelt, drainage features, and non-developable areas in compliance with the ToR. | **Annexure -3** |
| **1.16** | The layout shall be planned in such a way that all red-category industries with higher pollution potential (highly polluting or hazardous) industries shall be kept away as far as possible from human habitations, and water bodies to minimize environmental and health risks to nearby communities. | The layout has been planned such that Technical Textile and other Textile industries are located to maintaining a minimum separation distance of more than 500 m from human habitations and water bodies. Other red-category industries that do not attract the provisions of the EIA Notification, 2006 are located within the Industrial Park and suitably buffered from settlements and water bodies. | **Chapter 2 – Project Zoning (Sec 2.7.2)** |
| **1.17** | A detailed plan for risk assessment and mitigation plan for the worst-case scenario providing an analysis of potential pollutant dispersion in case of accidents such as chemical spills, fires, or gas leaks. | Preliminary risk aspects identified for Proposed SIPCOT Industrial park, Lyocell unit and chemical storage; detailed RA and DMP is given in chapter 7. A detailed hydro-geological study report | **Chapter 1 – Scope / Cross-ref Ch. 7** |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| | | prepared by HG -Geo Expert team is attached in Annexure - 11 | |
| **1.18** | A detailed hydro-geological study on the catchment area of the drainage system within the core zone and at least 5 km perimeter of the project area shall be conducted. | A detailed hydro-geological study reprot has been prepared for 5km perimeter of project area and attached in Annexure -11 | **Annexure -11** |
| **1.19** | Groundwater Rejuvenation Plan, as well as water body rejuvenation plan, shall be submitted and drainage mapping shall be carried out and a plan for the rejuvenation of groundwater through the aquifers shall be submitted along with the EIA/EMP report with budgetary provisions as part of the Environmental Management Plan in consultation with gram panchayat for the restoration of structures, construction and maintenance of greenbelt buffer, garland drains for the Industrial Area. | With the total rainwater harvestable from the proposed plot area considering peak rainfall scenario , Groundwater and water body rejuvenation plan is prepared and Given in Annexure - 11 | **Annexure - 11** |
| **1.2** | The Water balancing chart and its resources for obtaining the groundwater shall be submitted. | No groundwater extraction is proposed for the project. The entire water requirement of 66308 KLD will be met through SIPCOT's desalination supply (10437 KLD), domestic supply (430 KLD), and treated wastewater sources — including 20,000 KLD of tertiary-treated sewage from Tuticorin Municipal Corporation and 28,562 KLD of treated effluent reuse within industries. The detailed water balance chart and source distribution have been prepared and submitted, clearly demonstrating zero dependency on groundwater | **Chapter 2 – Water Requirement (Sec 2.8.2)** |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| | | resources. | |
| **1.21** | PP shall submit a clarification regarding the purpose and requirement for setting up Petrol and diesel storage units in the proposed Industrial Estate. Further, details of the mode of receipt of petroleum products and distribution methodology, etc. Safety features and area required for the same etc. to be highlighted and submitted. | No common petrol or diesel storage is proposed by SIPCOT. The Lyocell unit and other Individual industries will maintain its own PESO-approved fuel storage for captive power and DG backupFuel will be received through authorized oil tankers, with all safety measures as per statutory norms. | **Chapter 2 – Infrastructure Services (Sec 2.8.1)** |
| **1.22** | PP shall specify their commitment regarding the power generated through renewable sources like Solar etc. | SIPCOT and the Lyocell manufacturing unit are committed to promoting the use of renewable energy sources within the industrial park. The Lyocell unit will install 5–8 MW rooftop solar power systems and solar street lighting across the facility, while SIPCOT will implement solar-powered streetlights and common area lighting within the park infrastructure. | **Chapter 2 – Power Requirement (Sec 2.8.1)** |
| **1.23** | PP shall calculate and submit the carbon footprint of the proposed Industrial Area in the detailed EIA/EMP Report. | Lifecycle analysis is carried out to assess the total carbon footprint on account of proposed development and given in Annexure - 8 | Annexure -8 |
| **1.24** | Detailed air quality study for each point source to be conducted along with the Micro metallurgical data. | Micrometeorological monitoring (Mar–May 2025) done on-site; wind rose and ambient AQ data used for dispersion analysis. In Operational phase Each individual Industries will will conduct Point source with the Micro metallurgical data. | **Chapter 3 – Air Environment (Sec 3.5)** |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| **1.25** | The industrial layout/zones shall be planned in such a way that no tree can be felled/transplanted unless exigencies demand. Where absolutely necessary, tree felling shall be with prior permission from the concerned Authority. Where the trees need to be cut/transplanted with prior permission from the concerned local Authority, a compensatory plantation in the ratio of 1:10 (i.e. planting of 10 trees for every 1 tree that is cut/non-survival of any transplanted tree) shall be done and maintained. Plantations to be ensured species (cut) to species (planted). All the plantation will be done by the State Forest Department as deposit work and not by private contractors. | The project layout has been planned to minimize tree felling. Of the 65 existing trees, 30 trees fall within road and amenity plots. 20 trees (18 Palm and 2 Neem) are proposed to be felled due to site exigencies, after obtaining prior permission from the DFO. Compensatory plantation shall be undertaken in a 1:10 ratio of the same species within the proposed greenbelt area (108.503 ha, 271258 Nos. of trees). Plantation will be carried out in consultation with the DFO. | **Chapter 2 – Project Zoning (Sec 2.7.2); Greenbelt Requirement (Table 8)** |
| **1.26** | The plan for afforestation should be such that it is free from pesticides with flowering plants of native species for attracting bees and insects, which in turn is beneficial to agriculture. Farmers around the project site shall be involved in developing such an afforestation Plan. | Plantation will use native species like Neem, Pongamia, Cassia and Tabebuia; no chemical fertilizers or pesticides used; Local farmers will be engaged through community-based agreements for plantation, watering, and maintenance activities | **Chapter 2 – Greenbelt Development Plan (Sec 2.7.3)** |
| **1.27** | Details of Onsite and Offsite emergency plans as per provisions of the MSIHC Rules need to be submitted. | SIPCOT will not handle hazardous chemicals. Onsite and Offsite Emergency Plans under the MSIHC Rules shall be prepared and implemented by individual industries handling hazardous chemicals, in coordination with the District Authorities, as applicable. | **Chapter 1 – ToR Compliance / Cross-ref Ch. 7** |
| **1.28** | Obtain the most recent wind data relevant to the area of the proposed | Wind data recorded for March–May 2025; wind rose shows predominant | **Chapter 3 – Meteorology** |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| | industrial park, ensuring that the data reflects prevailing wind directions and speeds over an extended period of at least one year, and create a Wind Rose Diagram that accurately represents the collected wind data. | SSW direction. | **(Sec 3.4)** |
| **1.29** | Carry out a study with a reputed University/Social Institute like TISS on measuring the impact of the Project on the Health of Human beings and measures to monitor and mitigate the same. | The present proposal is for area development of Industrial ready plots with all common services like Road , Fresh Water supply, development, development of Greenbelt & Stormwater drain etc A detailed impact study has been conducted by NABET accredited Environmental consultant on the aspects of Social Impacts and welfare & mitigative measures . | **Annexure - 6** |
| **1.3** | Activity-wise, a time-bound action plan along with budgetary provision for occupational health & surveillance, environment management plan, and greenbelt development plan. Assessment of the carrying capacity of transportation load on roads inside the notified industrial premises shall be carried out and submitted. | A detailed Environmental Management Plan (EMP) has been prepared with activity-wise, phase-wise implementation schedule with allocated budget INR 10636 lakhs for Proposed SIPCOT Industrial park and INR 24600.0 lakhs for the Lyocell unit; traffic load and road capacity studied for NH-138 connectivity. | **Chapter 2 – Project Cost (Sec 2.10) & Chapter 3 Traffic Survey (Sec 3.13)** |
| **1.31** | In addition to the above, the EIA/EMP report shall also address issues such as i) Effective fugitive emission control measures for process, transportation, packing, etc. ii) use of cleaner fuels, and iii) best available technology for the plant. | Air pollution control measures include dust suppression, paved roads, low-Sulphur fuel DG sets and use of green technologies for industrial units. | **Chapter 2 – Air Pollution Control Measures (Sec 2.9.1)** |
| **Standard Terms of Reference for (Townships/ Area Development Projects / Rehabilitation Centres)** | | | |
| **1.** | **Project Details** | | |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| **1.1** | Need and benefits of the project. | The project addresses the demand–supply gap for Technical Textiles and allied industries in southern Tamil Nadu. It promotes industrial decentralization, regional employment, and economic development. The park supports the "Make in India" initiative by providing ready industrial infrastructure for both export-oriented and non-EC category industries. | **Chapter 2 – Need for Project (Sec 2.2)** |
| **1.2** | Submit data for built-up area for each building, the use and occupancy classification in line with NBC 2016 also to be indicated [for differential functional requirements]. | Total built-up area of the Lyocell & Tissue Manufacturing Unit is **235,811 m²**, classified under "Industrial Occupancy" (as per NBC 2016). Other plots are categorized for industrial sheds, warehouses, amenities, and administrative facilities as per SIPCOT's standard zoning practice. | **Chapter 2 – Project Details (Sec 2.4 & Table 34 )** |
| **1.3** | The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out. | The total capital cost of the Industrial Park is ₹666.11 Crores. This includes cost of land development, infrastructure, internal roads, water supply network, stormwater drainage, street lighting, and greenbelt development. Environmental Management Plan Budget 10636.0 lakhs has been integrated into this allocation, covering plantation, monitoring, and mitigation measures | **Chapter 2 – Project Cost (Sec 2.10 & Table 33)** |
| **2.** | **Land Environment** | | |
| **2.1** | Examine details of land use as per Master Plan and land use around 10 km radius of the project site. | The site lies in Allikulam and adjoining villages under Thoothukudi District, GO issued by | **Chapter 2 – Land Use (Sec 2.4 &** |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| | Analysis should be made based on latest satellite imagery for land use with raw images. Check on flood plain of any river. | Govt. for development of Industrial park vide G.O.(Ms).No.100 dated 26.02.2021 . No part of the site falls within a floodplain or CRZ. The area slopes gently (average elevation 32–38 m AMSL) and natural drainage follows the Odai and Nilaviyal Odai system, which are retained and buffered. | **Table 6) Chapter 3 – Land Environment (Sec 3.9 & Table 71)** |
| **3** | **Land Acquisition and R&R** | | |
| **3.1** | Submit details of environmentally sensitive places, land acquisition status, rehabilitation of communities/villages and present status of such activities. | The total extent of 796.240 ha was approved under **G.O. (Ms) No. 100 dated 26.02.2021**. The land is government-owned land. Vallanadu Reserve Forest & Blackbuck Sanctuary are located 13.71 km SW, and the ESZ boundary is 13.27 km SW from the project site. | **Chapter 2 – Land Details (Sec 2.3 & Table 5)** |
| **4** | **Environmental Monitoring And Management** | | |
| **4.1** | Examine baseline environmental quality along with projected incremental load due to the project. | Baseline Environmetal studies conducted and the details are given in chapter – 3. The predicted Impacts on air quality are done in Cumulative Impact analysis and given in Annexure – 10 Specific controls for Air control system, waste water control system, and Noise control on equipments all are prescribed in chapter -3. | **Chapter 3 – Description of Environment (Sec 3.1–3.12) Chapter 4 – Anticipated Impacts (Sec 4.1–4.4)** |
| **4.2** | Environmental data to be considered in relation to the project development would be (a) land, (b) groundwater, (c) surface water, (d) air, (e) bio-diversity, (f) noise and vibrations, (g) socio economic and health. | **Land:** The project area mainly comprises barren/scrub and agricultural land with flat topography. Land use conforms to SIPCOT zoning norms, and 23.46% of the total area is will be developed with greenbelt. This complies with the recently published OM 29.10.2025. **Groundwater:** Quality at all Ten | **Chapter 3 – Baseline Environment (Sec 3.4–3.12)** |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| | | monitoring locations meets IS 10500:2012 standards. The area is classified as "Safe" (16.06% development) by CGWB. No groundwater extraction is proposed; Water sourced from Desalination Plant and treated municipal water will be used.<br>**Surface Water:** Quality at Ten locations meets CPCB Class "C" criteria, suitable for drinking after conventional treatment. Zero Liquid Discharge (ZLD) will be maintained through complete reuse of treated effluent and sewage.<br>**Air:** Ambient air quality parameters ($PM_{10}$, $PM_{2.5}$, $SO_2$, $NO_2$) are within NAAQS limits, and AQI is rated "Good." Adequate stack height, APCS, and dust suppression systems will be provided by the Individual industries.<br>**Biodiversity:** No forest or eco-sensitive zone lies within 10 km. Fifteen Schedule-I species recorded; a separate Wildlife Conservation Plan is attached in Annexure - 7.<br>**Noise & Vibration:** Noise levels are within CPCB limits for industrial and residential areas. DG sets are acoustically enclosed, and PPEs will be provide to workers.<br>**Socio-Economic & Health:** The area has good literacy, infrastructure, and healthcare access. The project will generate employment, improve local economy, and implement periodic occupational health surveillance. | |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| **4.3** | Submit Roles and responsibility of the developer etc for compliance of environmental regulations under the provisions of EP Act. | SIPCOT, as the Developer, shall ensure compliance with the Environment (Protection) Act, 1986 by:<br><br>1. Constituting a dedicated Environmental Managemnt Cell to oversee Environmental related activities.<br>2. Obtaining and maintaining statutory approvals, including EC, CTE, CTO, and complying with all conditions of MoEF&CC/ SEIAA/TNPCB.<br>3. Implementing the approved EMP and ensuring proper operation of environmental infrastructure such as wastewater, stormwater, solid waste, and greenbelt systems.<br>4. SIPCOT shall instruct the individual industries to obtain all statutory clearance and comply with all regulatory norms.<br>5. Ensuring scientific management of all waste streams in accordance with applicable Rules under the EP Act.<br>6. Developing and maintaining the required greenbelt as per EC conditions and MoEF&CC guidelines.<br>7. Submitting half-yearly EC compliance reports and the annual Environmental Statement (Form-V) within prescribed timelines.<br>8. Ensuring that all industrial | **Chapter 10 – EMP (Sec 10.2)** |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| | | units and contractors within the Industrial Park comply with relevant environmental regulations.<br>9. Reporting any environmental incidents or deviations to the regulatory authorities as required. | |
| **4.4** | Examine separately the details for construction and operation phases both for Environmental Management Plan and Environmental Monitoring Plan with cost and parameters. | The Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMoP) have been examined and detailed separately for construction and operational phases, including activity-wise mitigation measures, monitoring parameters, frequency, responsibilities, and associated capital and recurring costs. | **Chapter 10– EMP (Sec 10.5 & Tables 141–142) Chapter 6 (Sec 6.3)** |
| **4.5** | Possible carbon footprint contribution from each activities and mitigation measures proposed shall be included as part of Environment Management Plan. | Lifecycle assessment carried out by NABET accredited Environmental consultant is given in Annexure -8 | **Annexure - 8** |
| **5** | **Drainage** | | |
| **5.1** | Submit a copy of the contour plan with slopes, drainage pattern of the site and surrounding area. Any obstruction of the same by the project. | A topographical contour map and drainage layout are provided. The terrain has a gentle slope toward the southeast. Natural drainage via Odai and Nilaviyal Odai is retained with stormwater collection and recharge structures integrated along the flow path. | **Chapter 2 – Topography & Drainage (Sec 2.3.1 & 2.12)** |
| **6** | **Forest** | | |
| **6.1** | Submit the details of the trees to be felled for the project, if any . | The project site contains a total of 65 trees, comprising 41 Palm tree, 20 Vadali, 2 Neem, 1 Vagai, and 1 Manjanathi, along with scattered shrubs. The existing trees will be carefully replanted and preserved at | **Chapter 2 – Project Description (Sec 2.7.3)** |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| | | suitable locations within the site. Along internal roads and greenbelt zones, as part of the landscape and greenbelt development plan. | |
| **6.2** | Submit the present land use and permission required for any conversion such as forest, agriculture etc. | Govt has issued GO for establishing the Industrial Park vide government order (G.O. 100/2021). No forest or agricultural land diversion is applicable. | **Chapter 2 – Land Details (Sec 2.3)** |
| **7** | **Water Environment** | | |
| **7.1** | Ground water classification as per the Central Ground Water Authority. | The site falls under the Thoothukudi block, which is classified as "Safe" by CGWA. Groundwater levels range from 12–18 m bgl. | **Chapter 3 – Water Environment (Sec 3.8 & Table 65)** |
| **8** | **Water Management** | | |
| **8.1** | Examine the details of Source of water, water requirement, use of treated waste water and prepare a water balance chart. | The total water requirement of 66308 KLD for the SIPCOT Industrial Park, including all individual industries, will be met from multiple sources. About 10,867 KLD will be supplied from SIPCOT's sources — comprising 10,437 KLD from the desalination plant and 430 KLD of fresh water for domestic use. In addition, 26266 KLD of secondary treated STP water from Thoothukudi Municipal Corporation will be supplied, of which 20,000 KLD is allocated to the Lyocell unit for tertiary treatment and process use, while the remaining 7,495.98 KLD will cater to other industries and greenbelt. Further, 28,562 KLD of treated effluent water from individual ETPs and common facilities will be reused within their premises, and 633 KLD of treated | **Chapter 2 – Water Requirement (Sec 2.8.2 & Table 25)** |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| | | sewage from individual STPs will be used for greenbelt irrigation. No groundwater extraction is proposed. SIPCOT will function as the developer and water supplier, ensuring supply through its distribution system; it will not utilize the treated or tertiary water for its own consumption. The entire system will operate under a Zero Liquid Discharge (ZLD) arrangement. | |
| **8.2** | Rain water harvesting proposals should be made with due safeguards for ground water quality. | The park includes a detailed RWH system with check dams, recharge pits, and stormwater collection drains designed to maximize infiltration and minimize runoff. | **Chapter 2 – Rainwater Harvesting & Stormwater Management (Sec 2.12)** |
| **8.3** | Maximize recycling of water and utilization of rain water. Examine details. | Each industrial unit will install ZLD systems; treated effluent reused for cooling towers, utilities, and greenbelt irrigation. | **Chapter 2 – Wastewater Management (Sec 2.9.2)** |
| **8.4** | Examine soil characteristics and depth of ground water table for rainwater harvesting | Site soils are sandy clay loam with moderate permeability; water table 12–18 m bgl, suitable for recharge harvesting. | **Chapter 2 – Soil Conditions (Sec 2.4)** |
| **8.5** | Permission from CGWA for abstraction of groundwater, if any, including dewatering during basement excavation. | No groundwater extraction by SIPCOT or any member Industries. | **Chapter 2 – Water Management (Sec 2.8.2)** |
| **9** | **Waste Management** | | |
| **9.1** | Examine details of solid waste generation treatment and its disposal. | Solid waste during construction will be reused for backfilling and leveling. During operation, municipal solid waste from amenities and other individual industries will be collected and disposed through TNPCB- | **Chapter 2 – Waste Management (Sec 2.9.4 & Table 28)** |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| | | authorized vendors. | |
| **9.2** | Construction & Demolition Waste Management Plan shall be prepared as part of EMP providing details of demolition activities involved along with quantification and disposal mechanism. | Construction waste will be reused for road sub-base and leveling; excess will be sent to authorized C&D waste recyclers. | **Chapter 2 – Waste Management (Sec 2.9.4)** |
| **10** | **Energy Requirements** | | |
| **10.1** | A certificate of adequacy of available power from the agency supplying power to the project along with the load allowed for the project. | In TamilNadu , TANGEDCO is the nodal agency to provide power supply. Adequate generation and distribution capacity is available . 2 Nos. of Amenities Plot is earmarked for setting up TANGEDCO Sub station . | **Chapter 2 – Power Requirement (Sec 2.8.1)** |
| **10.2** | Examine and submit details of use of solar energy and alternative source of energy to reduce the fossil energy consumption. Energy conservation and energy efficiency. | SIPCOT proposes solar-powered streetlights and rooftop solar installations on administrative buildings; promotion of solar power for industrial users under net metering scheme.<br>Lyocell : In line with energy conservation measures, the project also proposes installation of 5–8 MW rooftop solar power systems and solar street lighting across the industrial complex to supplement captive power generation and promote renewable energy use within the site (Comply with Renewable Consumption Obligation (RCO) Notification, S.O.4421 (E) 27th September, 2025). | **Chapter 2 – Power Requirement (Sec 2.8.1)** |
| **10.3** | DG sets are likely to be used during construction and operational phase of the project. Emissions from DG sets must be taken into consideration while | SIPCOT has not proposed any DG sets. Individual industries will be instructed to follow applicable rules and regulations. DG sets, where used, will conform to CPCB-II | **Chapter 2 – Infrastructure Services (Sec 2.8.1)** |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| | estimating the impacts on air environment. | norms and include acoustic enclosures and stack height as per TNPCB standards. | |
| **11** | **Road and Traffic** | | |
| **11.1** | Examine road/rail connectivity to the project site and impact on the traffic due to the proposed project. Present and future traffic and transport facilities for the region should be analysed with measures for preventing traffic congestion and providing faster trouble free system to reach different destinations in the city. | The project site is well-connected to NH-7A (2.75 km SSE) and Thoothukudi Port (15 km). The internal road network follows a grid layout with 30–45 m ROWs to handle industrial traffic. | **Chapter 2 – Accessibility & Connectivity (Sec 2.3.2)** |
| **11.2** | A detailed traffic and transportation study should be made for existing and projected passenger and cargo traffic. | Baseline traffic survey conducted; additional industrial traffic assessed to remain within service capacity of NH-7A with planned widening and access control. | **Chapter 3 – Traffic Survey (Sec 3.13 & Tables 111–114)** |
| **11.3** | Examine the details of transport of materials for construction which should include source and availability. | Construction materials such as sand, aggregates, and cement will be sourced from licensed quarries and transported in covered trucks to prevent spillage and dust. | **Chapter 2 – Construction Plan (Sec 2.5)** |
| **12** | **Disaster Management Plan** | | |
| **12.1** | Submit details of a comprehensive Disaster Management Plan including emergency evacuation during natural and man-made disaster. This should cover details of vulnerabilities due to natural and manmade hazards (earthquake, flooding, cyclone, landslides, fire etc.) and details of disaster mitigation efforts for buildings and infrastructure through structural sufficiency and Fire and Life Safety compliance in | A comprehensive Disaster Management Plan covering natural and man-made disasters, including emergency evacuation and mitigation measures in line with NBC, 2016. | **Chapter 7 – Disaster Management Plan (Sec 7.4)** |

| S. No. | ToR Points | Compliances | Citation in EIA Report |
|---|---|---|---|
| | line with National Building Code NBC, 2016. | | |
| **13** | **Court Cases** | | |
| **13.1** | Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given. | No court cases or litigation filed against SIPCOT. | **Chapter 1 – Introduction** |
| **14** | **Miscellaneous** | | |
| **14.1** | Any further clarification on carrying out the above studies including anticipated impacts due to the project and mitigative measure, project proponent can refer to the model ToR available on Ministry website http://moef.nic.in/Manual/Townships. | The EIA is prepared in accordance with MoEF&CC's Model ToR and Guidance Manual (2009). | **Chapter 1 – Scope & Methodology (Sec 1.5)** |

# 2. INTRODUCTION OF PROJECT

## 2.1 TYPE OF PROJECT

1. ***Type:***
   ***Activity: 7(c)*** – Industrial Estates / Parks / Complexes / Areas, Export Processing Zones (Infrastructure for Industrial Development)
   ***Category: A*** *(as the total area exceeds 500 ha and includes a pre-defined Category 'B' activity).Also the Industrial park will occupy other Technical Texile Industries of Category A or B projects.*
2. ***Pre-defined Unit under: 5(d) Category 'B'*** – Man-Made Fibre Manufacturing (Lyocell & Tissue Unit) *with an associated* ***1(d) Category 'B'*** – Captive Co-gen Power Plant (135 MW).
   *Minor Activity:* ***8(b) Category 'B'*** – Industrial Sheds and Buildings exceeding 20,000 sq.m but below 1,50,000 sq.m.
3. ***New / Expansion / Change in Product Mix:***

   ***New Project*** *– Development of a Greenfield Industrial Park with a pre-defined Lyocell & Tissue Manufacturing Unit.*

## 2.2 NEED OF THE PROJECT

**SIPCOT Industrial Park :**

The development of the proposed **SIPCOT Industrial Park in Thoothukudi District**, is part of Tamil Nadu's ongoing efforts to expand organized industrial infrastructure and promote regionally balanced economic development. The project is aligned with the State's objectives to facilitate large-scale industrial investment, generate employment opportunities, and strengthen export potential.

Thoothukudi District, with its strategic proximity to Thoothukudi Port and established transport networks, has been identified as a suitable location for industrial expansion, particularly for industries requiring direct access to port infrastructure. The Industrial Park will create the necessary infrastructure framework to attract manufacturing industries, facilitate industrial operations, and support ancillary services, contributing to the State's and the country's economic growth.

The Government of Tamil Nadu has sanctioned vide under **G.O. No. 100, dated 26.02.2021** the acquisition of 904.40 hectares of land; of which, 796.240 hectares is being developed as an Industrial Park. This includes **788.742 hectares** of patta land and **7.498 hectares** of poramboke land**.** The detailed land particulars are provided in **Annexure–1,** G.O. Details**.**

In addition to strengthening Tamil Nadu's industrial base, the project is expected to:

- Generate direct and indirect employment
- Support infrastructure development in underdeveloped regions
- Enhance the State's contribution to exports and industrial output.

## 2.3 PROJECT LOCATION

The Industrial Park is proposed at:

- **Villages :** Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram And Therkusillukkanpatti Villages,
- **Taluks & District :** Thoothukudi Taluk & District
- **State :** Tamil Nadu

**Survey Numbers**: 1-/1, 1-/2, 1/3A, 1/3B, 1/3C, 1/3D, 1-/4, 1/5A, 1/5B, 1/5C, 1/6,8,10A, 1/7, 1-/9, 1/10B, 6-/1, 6-/2, 6-/3, 6/4A, 6/4B1, 6/4C, 6/4D, 6/4E, 6/4F, 6-/5, 6/6A, 6/6B, 7, 8/1,2,4A, 8/1,2,4B, 8-/10, 8/-11, 8-/3, 8-/5, 8/6,8, 8-/7, 8-/9, 10-/1, 10-/2, 10-/3, 10-/4,16, 10-/5, 10/6A, 10/6B, 10/6C, 10/7A, 10/7B, 10/7C, 10-/8, 10/9A, 10/9B, 10-/11,12, 10-/13, 10-/14, 11-/1A, 11/1B, 11-/2, 11-/3, 11-/4, 11-/5, 11-/6, 11-/7, 12/1A, 12/1B, 12/1C, 12/1D, 12/1E, 12/2A, 12/2B, 12-/3, 12-/4, 12-/5, 12-/6, 12-/7, 13/1A, 13/1B, 13/1C, 13/1D, 13/2A, 13/2B, 13-/3, 13-/4, 13-/5, 14-/1, 14-/10, 14-/11, 14-/12, 14-/13, 14-/14, 14-/15, 14-/16, 14-/17, 14-/2, 14-/3, 14-/4, 14-/5, 14-/6, 14-/7, 14-/8, 14-/9, 15/1A, 15/1B, 15-/2, 15/3A, 15/3B, 15/3C, 15/3D, 15-/4, 16-/1, 16/2A, 16/2B, 16/3,4,5, 16/6A, 16/6B, 17/1A, 17/1B, 17/1C, 17/1D, 17-/2, 17-/3, 18-/2, 18-/8, 18-/9, 18-/10, 18/11A, 18/11B, 18/11C, 18/12A, 18/12B, 18/12C, 18/13, 18/14, 18/15, 18/16, 18/17, 18/18A, 18/18B, 18/19, 18/1A, 18/1B, 18/1C, 18/1D, 18/1E, 18/1F, 18/1G, 18/1H, 18/1I, 18/1J, 18/1K, 18/3A, 18/3B, 18/3C, 18/3D, 18/3E, 18/3F, 18/3G, 18/4A1, 18/4A2, 18/4B, 18/4C, 18/5A, 18/5B, 18/5C, 18/6A, 18/6B, 18/6C, 18/7A, 18/7B, 18/7C, 19/1A, 19/1B, 19/1C, 19/1D, 19/1E, 19-/2, 19-/3, 19-/4, 19/5,8A, 19/5,8B, 19/5,8C, 19-/6, 19-/7, 19-/9, 20-/1, 20-/2, 20-/3, 20-/4, 20-/5, 20-/6, 20/7A, 20/7B, 20/8A, 20/8B, 20/8C, 20/8D, 20/9A, 20/9B, 20-/10, 20-/11, 20-/12, 20/13, 20/14, 20/15A, 20/15B, 20/15C, 20/16A, 20/16B, 20/17, 20/18, 20/20, 20/21, 20/22, 20/23, 20/24, 21, 22-/1, 22/2A, 22/2B, 22-/4, 23-/1, 23/2A1, 23/2B, 23/3A, 23/3B, 23/4A, 23/4B, 23/4C, 23/4D, 24, 25/1,3A, 25/1,3B, 25/1,3C, 25/1,3D, 25/1,3E, 25/1,3F, 25/1,3G, 25/1,3H, 25/1,3I, 25/1,3J, 25/2A, 25/2B, 25/2C, 25/2D, 25/4A, 25/4B, 25/4C, 25/4D, 25/4E, 25/4F, 25/4G, 25/4H, 25/4I, 25/5,7A, 25/5,7B, 25-/6, 25/8A,9A,10A, 25/8B,9B,10B1, 25/8B,9B,10B2, 25/8C,9C,10C1, 25/8C,9C,10C2, 25/8C,9C,10C3, 26/1A, 26/1B, 26/1C, 26/1D, 26/1E, 26/1F, 26/1G, 26-/2, 27, 28-/10, 28/1A, 28/1B, 28/1C, 28/2A, 28/2B, 28/2C, 28/2D, 28/3A, 28/3B, 28/3C, 28/4A, 28/4B, 28/4C, 28/4D, 28-/5, 28-/6, 28-/7, 28-/8, 28/9A, 28/9B, 29-/10, 29/1A, 29/1B, 29/1C, 29-/2, 29/3A, 29/3B, 29-/4, 29-/5, 29-/6, 29-/7, 29-/8, 29-/9, 30-/1, 30-/2, 30/3,4A, 30/3,4B, 30/3,4C, 30/5A, 30/5B, 30/6A, 30/6B, 30/6C, 30/7A, 31-/1, 31-/2, 31-/3, 31-/4, 31-/5, 31-/6, 32, 33-/1, 33/2A, 33/2B, 33/2C, 34-/1, 34-/2, 35, 36, 37-/1, 37-/2, 37-/3, 38-/1, 38-/2, 38-/3, 38-/4, 39/1A, 39/1B, 39/1C, 39-/2, 40/1A, 40/1B, 40/1C, 40/1D, 40/2, 40/3A, 40/3B, 40/3C, 40/4A, 40/4B, 40/4C, 40/4D, 40/5, 40/7, 41/1A, 41/1B, 41/2, 42/1A, 42/1B, 42/1C, 42/1D, 42/1E, 42/1F, 42/1G, 42/1H, 42/1I, 42/2, 42/3,4A1, 42/3,4A2, 42/3,4A3, 42/3,4A4, 42/4B, 42/4C, 42/5, 43, 45/1,2A, 45/1,2B, 47/1,2, 47/3A, 47/3B, 47/3C, 47/3D, 48/1, 48/2, 49, 50/1A, 50/1B, 50/1C, 50/2A, 50/2B, 51/10, 51/1A, 51/1B, 51/1C, 51/1D, 51/2A, 51/2B, 51/2C, 51/3, 51/4A, 51/4B, 51/5, 51/6, 51/7, 51/8, 51/9, 52/1, 52/2, 53/1, 53/2, 54/1, 54/2, 55/1, 55/2, 55/3, 55/4, 56/1, 56/2, 56/3 of Allikulam Village, 335, 337, 338, 340, 342, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 358, 360, 362, 364, 372, 373, 375, 376, 381, 382, 383, 385, 386, 387, 388, 391, 395, 400, 401, 402, 403, 406, 434, 435, 438, 444, 445, 446, 447, 448, 449, 450, 456, 459, 461, 462, 463, 464, 465, 466, 282/1, 282/2, 282/3, 282/4, 282/5, 283/1A, 283/1B, 283/1C, 283/1D, 283/1E, 283/2, 283/3,

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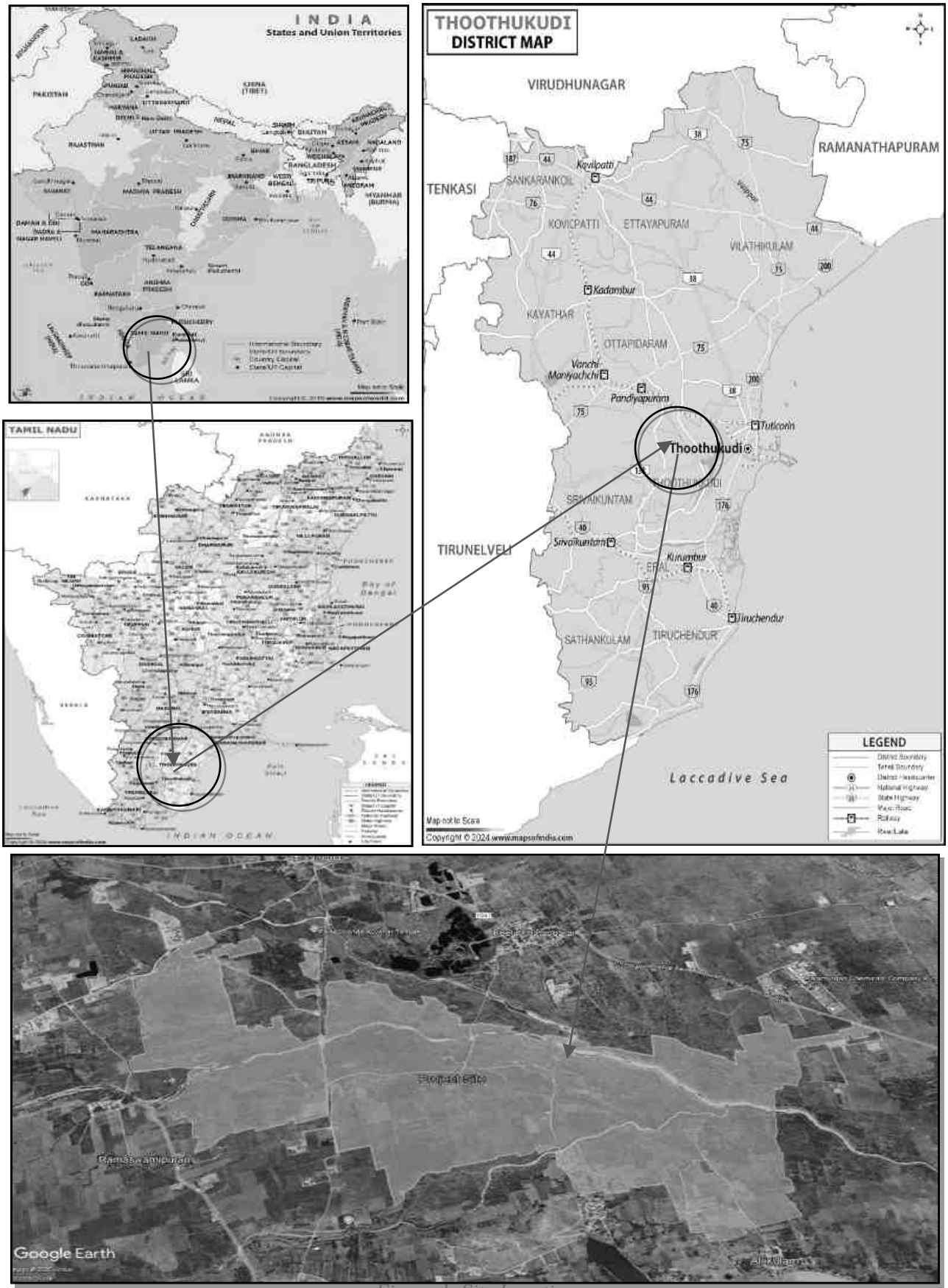



*Figure 1. Site Location*

**Coordinates :**




*Figure 2. Site Coordinates*

*Table 13. Coordinates of the project site*

| Point Nos. | Latitude (N) | Longitude (E) | Direction |
|---|---|---|---|
| 1 | 8°46'34.11"N | 78° 2'48.80"E | E |
| 2 | 8°46'34.49"N | 78° 2'41.02"E | E |
| 3 | 8°45'58.90"N | 78° 1'56.30"E | SE |
| 4 | 8°45'51.78"N | 78° 1'53.72"E | SE |
| 5 | 8°45'59.75"N | 78° 1'26.81"E | S |
| 6 | 8°46'3.64"N | 78° 1'28.24"E | S |
| 7 | 8°46'22.27"N | 78° 1'9.12"E | S |
| 8 | 8°46'39.43"N | 78° 0'27.06"E | S |
| 9 | 8°47'13.71"N | 78° 0'24.24"E | SW |
| 10 | 8°47'15.88"N | 78° 0'14.08"E | SW |
| 11 | 8°47'17.44"N | 77°59'49.74"E | SW |
| 12 | 8°47'50.77"N | 77°59'44.77"E | W |
| 13 | 8°47'55.88"N | 77°59'50.44"E | W |
| 14 | 8°48'32.96"N | 78° 0'21.28"E | NW |
| 15 | 8°48'18.80"N | 78° 0'33.19"E | NW |

| Point Nos. | Latitude (N) | Longitude (E) | Direction |
|---|---|---|---|
| 16 | 8°47'56.84"N | 78° 0'49.48"E | N |
| 17 | 8°47'53.97"N | 78° 0'54.22"E | N |
| 18 | 8°47'25.31"N | 78° 1'14.77"E | N |
| 19 | 8°47'5.70"N | 78° 1'37.12"E | NE |
| 20 | 8°47'0.51"N | 78° 1'53.51"E | NE |
| 21 | 8°46'41.26"N | 78° 2'7.62"E | NE |
| 22 | 8°46'51.92"N | 78° 2'25.96"E | NE |
| 23 | 8°48'3.26"N | 78° 0'39.99"E | N |
| 24 | 8°48'8.34"N | 78° 0'43.34"E | N |
| 25 | 8°48'9.58"N | 78° 0'47.56"E | NW |
| 26 | 8°48'0.41"N | 78° 0'43.13"E | NW |
| 27 | 8°47'56.98"N | 78° 0'41.74"E | NW |
| 28 | 8°47'58.93"N | 78° 0'34.71"E | NW |
| 29 | 8°47'56.00"N | 78° 0'33.68"E | NW |
| 30 | 8°47'55.65"N | 78° 0'39.51"E | NW |

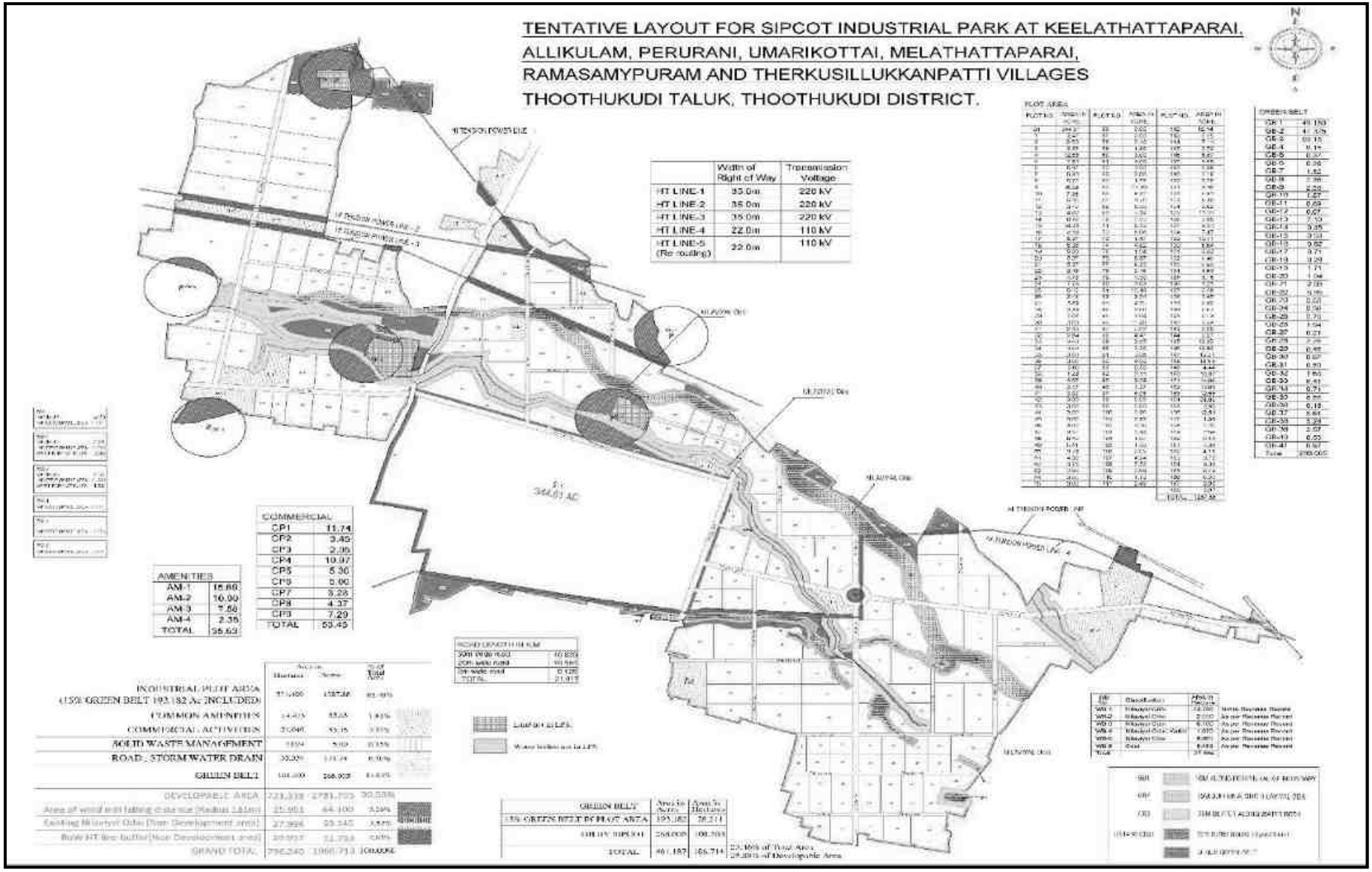



*Figure 3. Tentative Layout for the SIPCOT Industrial Park*

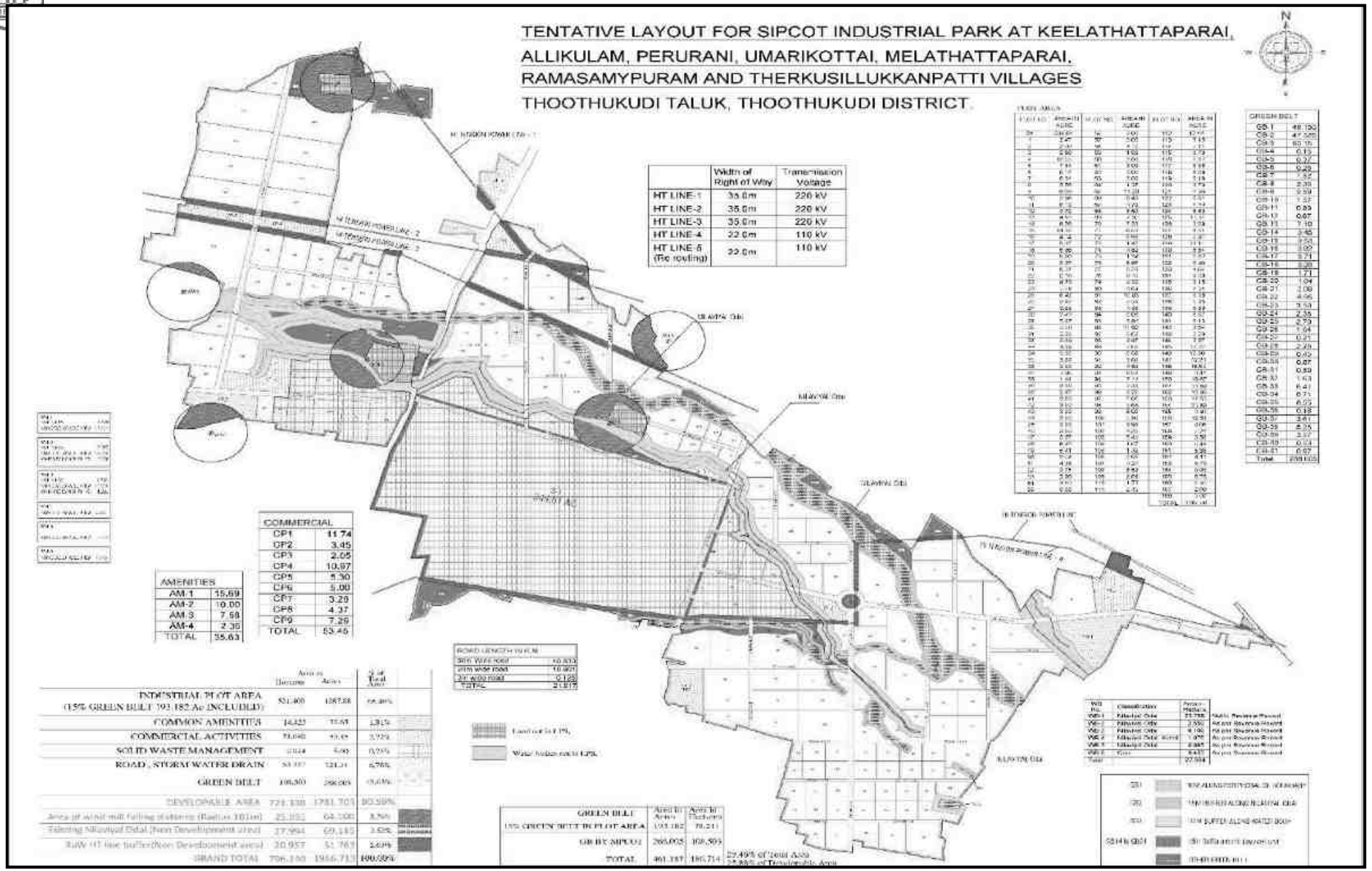



*Figure 4. Zonation Map of SIPCOT Industrial Park (For Technical Textile and other Textile Industries*

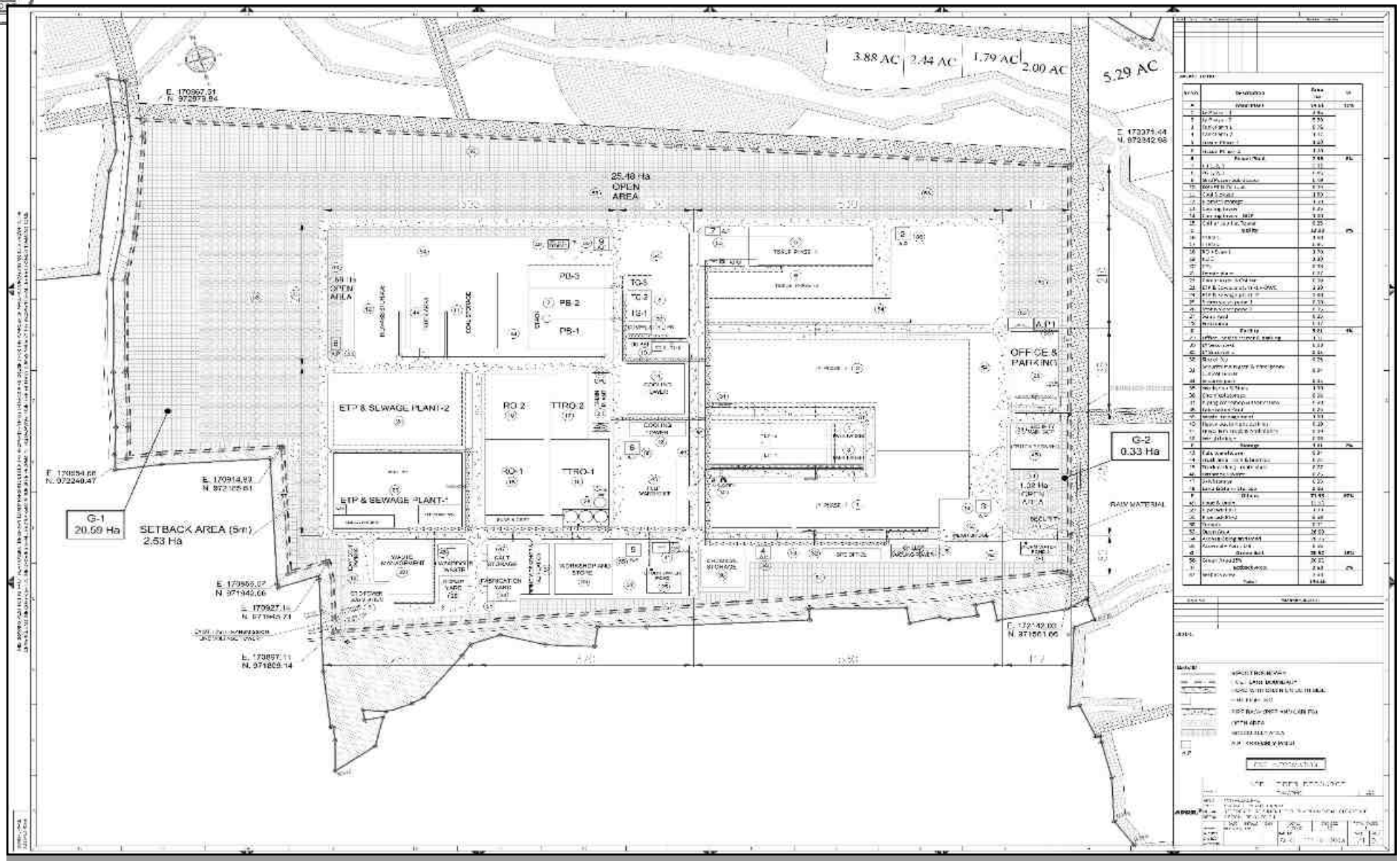



*Figure 5. Tentative Layout map for Lyocell and Tisse Manufacturing Unit*

**Site Photograph :**



*Figure 6. Site Photographs*

### 2.3.1 Topographical Map

The site falls within the {Topo Map No. 58L01 & 58H13} of Thoothukudi District, with general elevation at 32-38 m. Slopes are distinct with natural drainage flowing from North & Northwest to Southeast , finally confluence with the Natural drainage Korampallam at the outskirts of Thoothukudi.

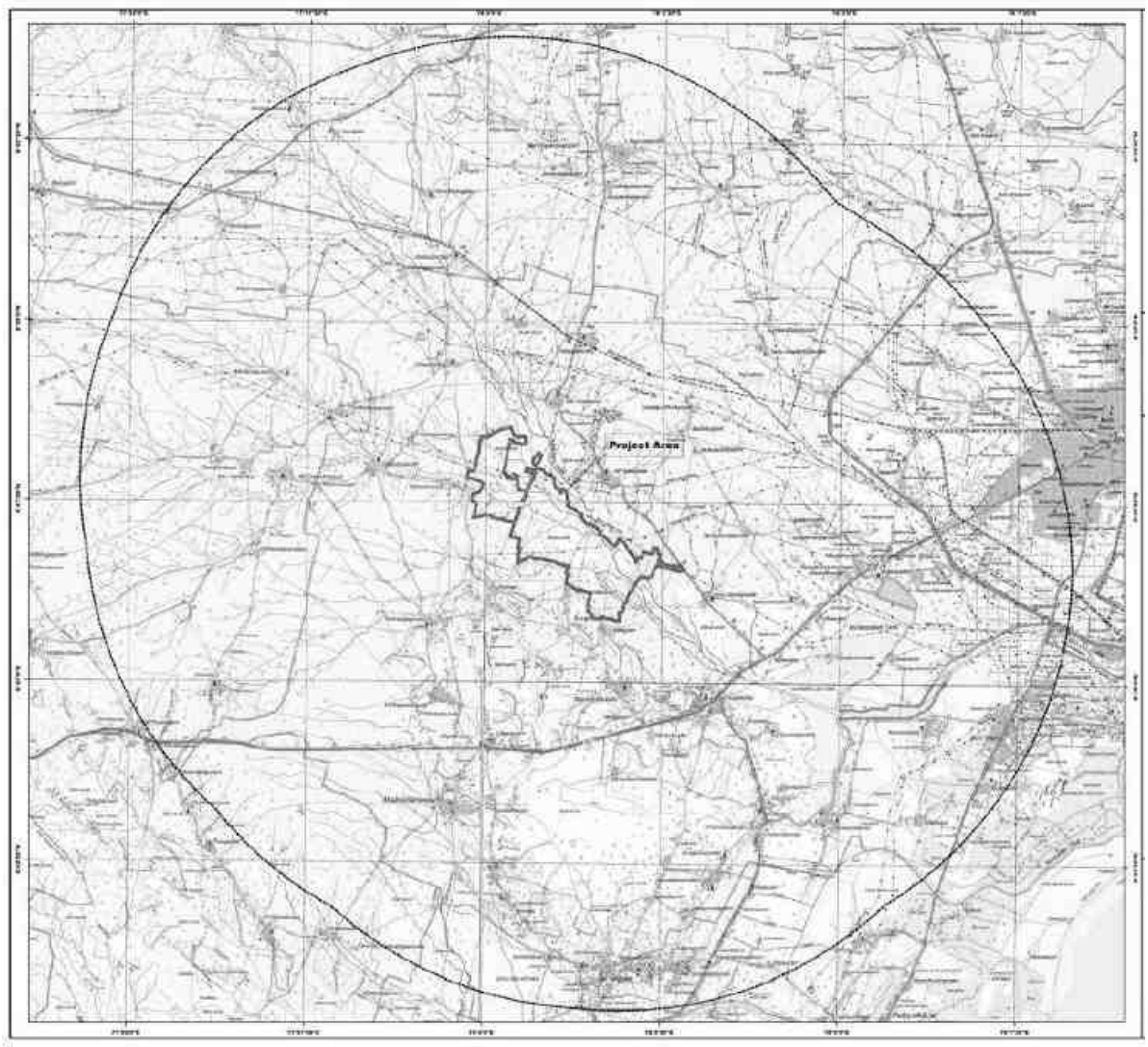



*Figure 7.Topo Map of Study Area*

*Table 14. Environmental Features and Sensitive Receptors Around SIPCOT Industrial Park (Within 10 km Radius)*

| Environmental Feature / Sensitive Receptor | Approximate Distance (km) | Direction (from Project Site) |
|---|---|---|
| **Water Bodies** | | |
| Nilviyal odai Within Project Area | Odai Within Project Area | Passing through the site |
| Odai within Project Area | Odai Within Project Area | Passing through the site |
| Pond near Project Area | 0.21 | NE |
| Pond near Project Area | 0.31 | NW |
| Pond near Project Area | 0.39 | SSW |
| Allikulam Pond | 0.43 | S |
| Pond near Perurani | 0.80 | S |
| Pond near Allikulam | 0.80 | SSE |
| Swimming Pond near Perurani | 1.01 | S |

| Environmental Feature / Sensitive Receptor | Approximate Distance (km) | Direction (from Project Site) |
|---|---|---|
| Neeravi Pond Perurani | 1.13 | SW |
| Pond near Perurani | 1.25 | WSW |
| Perurani Pond | 1.28 | SW |
| Kadamba Kulam ( Fishing Pond ) | 1.53 | SSE |
| Pond near Perurani | 1.56 | SW |
| Pond near Mel Kuttudankadu | 1.90 | S |
| Pond Elim (Kanchan Kulam) | 2.07 | SSE |
| Vepan Pond | 2.11 | SW |
| Pond near Umari kkottai | 2.39 | NW |
| Pond near Putupatti | 3.04 | SSW |
| Koram Pallam Tank | 3.52 | SE |
| Pond near Varthagareddypatti | 3.52 | SW |
| Pond near Varthagareddypatti | 3.60 | SW |
| periya Kulam water body | 3.80 | SW |
| Pond Bethesda | 3.85 | SSE |
| Senkulam River (River Port) | 4.49 | ENE |
| Pond near Korampallam | 5.06 | E |
| Pond near Korampallam Check Dam | 5.38 | SE |
| North Channal | 6.31 | SSE |
| Pond near Jambulinga Puram | 6.84 | NNE |
| Canal near Tiruvai Puram | 7.18 | SSE |
| Pond near Melmatan | 7.68 | NNE |
| Pond near Sakkammal Puram | 7.73 | SSE |
| Canal near Peykulam | 7.75 | SSE |
| Canal near Brahmapuram | 8.10 | SSE |
| Canal near Manakkudu | 8.50 | SSE |
| Sivathaiya Puram Pond | 8.57 | SSE |
| **Nearby Area** | | |
| Allikulam Village | 0.16 | S |
| **Densely Populated Area** | | |
| Thoothukudi Corporation Area | 2.0 | SE |
| **Inland, Coastal, Marine Waters** | | |
| Gulf of Mannar | 14.63 | ENE |
| **State/National Boundaries** | | |
| International Boundary towards Bay of Bengal | 14.63 | ENE |
| **ASI Monuments** | | |
| Sirupadu (Iron age burial site) | 4.75 | E |
| The Panchalankurichi Fort | 14.06 | N |

| Environmental Feature / Sensitive Receptor | Approximate Distance (km) | Direction (from Project Site) |
|---|---|---|
| Sivagalai | 14.75 | S |
| Korkai | 14.80 | SEE |
| **Reserve Forest & Wildlife Sanctuary** | | |
| Vallanadu RF & Blackbuck Sanctuary | 13.71 | SW |
| **Eco-Sensitive Zone** | | |
| Vallanadu Blackbuck Sanctuary ESZ | 13.27 | SW |
| **Inter State Boundary** | | |
| No Inter State Boundary within 15 km Radius | | |
| **Protected Flora/Fauna Habitats (breeding, nesting, foraging, resting, overwintering, migration)** | | |
| Gulf of Mannar – 14.63 (ENE) | | |
| **Defence Installation** | | |
| No Defence Installation within 15 km Radius | | |
| **Areas Already Subjected to Pollution or Environmental Damage** | | |
| SIPCOT Industrial Complex, Thoothukudi | 5.07 | N |
| SIPCOT Furniture Park | 7.48 | NE |

*Table 15. Nearby Facilities, Institutions, and Infrastructure in the Vicinity of SIPCOT Industrial Park*

| Identified Sensitive Receptor (Name & Location) | Approx. Distance (km) | Direction (Relative to Project Boundary) |
|---|---|---|
| **Hospitals** | | |
| Jacob Hospital, Pudukottai | 3.03 | SE |
| Sree Aicort Maharaja Clinic, Sekkarakkudi | 4.43 | W |
| Primary Health Centre, Sekkarakkudi | 5.01 | W |
| Government Hospital, Sekkarakkudi | 5.02 | W |
| Rapha Hospital and Pharmacy, Ayyanadaippu | 5.34 | ENE |
| Nallathambi Hospital, Periyanayagapuram | 5.93 | ENE |
| Selvaa Hospital, Sawyerpuram | 8.93 | S |
| **Post Offices** | | |
| Branch Post Office, Mela Thattaparai | 1.34 | NE |
| Post Office, Melakuttudakadu | 2.05 | S |
| Post Office, Pudukottai | 2.93 | SE |
| Senthil Postal Service Centre, Pudukottai | 2.96 | SE |
| Kumaragiri Panchayat Office (Post Office), Pudukottai | 3.36 | SE |
| Post Office, Sekkarakkudi | 4.93 | W |
| Post Office, Mudivaithanendal | 6.02 | SW |
| Post Office, Kulayankarisal | 7.57 | SE |

| Identified Sensitive Receptor (Name & Location) | Approx. Distance (km) | Direction (Relative to Project Boundary) |
|---|---|---|
| Post Office, Sawyerpuram | 9.29 | S |
| **Places of Worship** | | |
| Sri Sappani Madan Temple, Allikulam | 0.21 | SSE |
| Sri Muthu Mariamman Temple, Allikulam | 0.31 | S |
| Sri Alagiya Thiruveattai Ayyanar Temple, Allikulam | 0.31 | SSW |
| Sri Perumal Temple, Allikulam | 0.33 | S |
| Sri Vinayagar Temple, Allikulam | 0.37 | S |
| Sri Parvathi Parameswari Amman Temple, Allikulam | 0.37 | S |
| Sri Muthumari Amman Temple, Allikulam | 0.41 | SW |
| Sri Thadikaraswami Temple, Thoothukudi | 0.42 | S |
| Mullai Marathu Sudalaimadan Swamy Temple, Thoothukudi | 0.50 | S |
| Kaliamman Temple, Melathattaparai | 0.90 | NE |
| Nallamadasamy Temple, Melathattaparai | 1.14 | NE |
| Shri Angala Parameshwari Temple, Melathattaparai | 1.15 | NE |
| Sri Uchinimakali Amman Temple, Melathattaparai | 1.23 | NE |
| Ellammal Temple, Melathattaparai | 1.25 | NE |
| Shri Nagamma Temple, Melathattaparai | 1.33 | NE |
| Sri Sappandimadasamy Temple, Melathattaparai | 1.42 | NE |
| Church of God, Melathattaparai | 2.31 | NE |
| **Schools** | | |
| Annai Subasri Vidhyalaya Nursery & Primary School, Melathattaparai | 0.95 | NNE |
| TDTA School, Melathattaparai | 1.25 | NE |
| Anganwadi Centre (Elementary School), Melathattaparai | 1.34 | NNE |
| Govt School, Melathattaparai | 2.84 | NNE |
| Soosaipandiapuram Primary School, Kuttudankadu | 3.02 | SSE |
| TDTA PSP Hr Sec School, Pudukottai | 3.34 | SE |
| Aananthi Pappa Home, Pudukottai | 3.36 | SE |
| TNDTA St. Augustine Primary School, Pudukottai | 3.37 | SE |
| **Banks** | | |
| Indian Overseas Bank ATM, Pudukottai | 3.05 | SE |
| Tamilnad Mercantile Bank, Pudukottai | 3.12 | SE |
| Indian Overseas Bank ATM, Pudukottai | 3.18 | SE |
| ICICI Bank, Pudukottai | 3.19 | SE |
| Axis Bank ATM, Thattaparai | 7.48 | NNE |
| Indian Overseas Bank ATM, Pudiyamputhur | 7.61 | NNE |

### 2.3.2 Accessibility & Connectivity

*Table 16. Connectivity and Transportation Infrastructure Near Project Site*

| Name / Description | Approximate Distance (km) | Direction (from Project Site) |
|---|---|---|
| **Road** | | |
| Kovilpatti–Ottapidaram–Pudukottai–Eral Village Road | Adjacent to Project Area | E |
| Santhanamari–Ammankovil Street | 0.85 | SSW |
| Amman Kovil Street | 1.12 | NE |
| Perurani Road | 1.25 | S |
| NH-138 | 2.75 | SSE |
| NH-38 | 5.10 | NE |
| Therku veerapandiapuram Road | 5.48 | NNE |
| **Railway Station** | | |
| Thattapparai Railway Station | 2.78 | NNE |
| Kailasa Puram Railway Station | 4.66 | NNW |
| Milavittan Railway Station | 5.94 | NE |
| Pandia Puram Railway Station | 9.01 | NW |
| **Airport** | | |
| Tuticorin Airport | 4.27 | S |
| **Port** | | |
| V.O. Chidambaranar Port (Thoothukudi Port) | 15.0 | SE |




*Figure 8. Connectivity Map of Project Site*

### 2.3.3 List of Industries in 10 km Buffer zone

*Table 17. List of Industries (around 10 km Buffer zone)*

| Industry Name | Approx. Distance (km) | Direction |
|---|---|---|
| Balamurugan Chemicals Pvt. Ltd. | 0.19 | N |
| Alba Titania | 0.35 | N |
| V.N.M.A.D Firm Warehouse | 0.86 | N |
| Twinplast Polymers Pvt. Ltd. | 1.09 | N |
| Fauna International | 3.04 | SW |
| Anitha Industries (Boiling Unit) | 4.41 | E |
| Messiah Ash Bricks | 4.99 | E |
| Ecogreen Cleatech Pvt. Ltd. | 5.13 | NE |
| MM ICE | 5.19 | E |
| V.V. Titanium Pigments Pvt. Ltd. | 5.14 | N |
| Maris Associates Private Limited | 5.37 | SE |
| Easternbulk Lime Products Pvt. Ltd. | 5.38 | N |
| St. John Freight System (P) Ltd. | 5.45 | E |
| Kader Investment & Trading | 5.50 | E |
| Amulya Sea Foods | 5.56 | NE |
| Arasan Vinayan Technology (P) Ltd. | 5.56 | NE |
| S.K.S.C. Natarajan & Bros. | 5.59 | E |
| Jeya Industries & Engineering | 5.61 | E |

| Industry Name | Approx. Distance (km) | Direction |
|---|---|---|
| Marivel Ediback (P) Ltd. | 5.60 | SE |
| Shaleo Marine Foods | 5.67 | NE |
| Maheswari Salt Trading Co. | 5.80 | NE |
| P.S.S. Krishnamoorthy Exports | 5.83 | E |
| M.M. Nagalingam Refineries | 5.87 | E |
| M.V. Subramanian (HDPE Bags) | 5.90 | E |
| Yentop Manickam Edible Oil | 5.79 | NE |
| M.G.M. Edible Oil (P) Ltd. | 5.76 | NE |
| Philips Foods India Ltd. | 5.93 | NE |
| Ninans Ltd. (Sea Foods) | 5.94 | NE |
| Ninans Ltd. (Cold Storage / Ice Plant) | 5.95 | NE |
| Britto Sea Foods Exports Pvt. Ltd. | 6.03 | NE |
| Baby Marine Eastern Exports Pvt. Ltd. | 6.03 | E |
| Genex | 6.03 | E |
| Arasan Air Products (P) Ltd. | 6.04 | E |
| Ramesh Flowers Pvt. Ltd. | 6.12 | NE |
| Handy Water Base India Ltd. | 6.21 | NE |
| Narmatha Industries | 6.22 | NE |
| K.T.V. Health Food Products (India) Pvt. Ltd. | 6.30 | NE |
| N.C. John & Sons Ltd. | 6.28 | NE |
| GEE GEE Kay Pvt. Ltd. | 7.41 | N |
| Santhosh Fly Ash | 7.50 | NE |
| Vaini Fly Ash Brick & Block Manufacturers | 7.57 | NE |
| ARM Build Products | 7.64 | NE |
| Radium Industries | 7.85 | NE |
| Xylosuisse Private Limited | 8.04 | N |
| Ferron Steels | 8.51 | SW |
| Intersnack Cashew India Pvt. Ltd. | 8.96 | S |
| K.R. Packaging Industries | 9.06 | NW |
| Harikrishnan Power & Technology Pvt. Ltd. | 9.10 | N |
| Vinfast Auto India Pvt.Ltd., | 9.20 | N |
| NPM Fish Meal and Oil Products | 9.20 | SW |
| Ind Barath Thermal Power Ltd. | 9.50 | E |
| Coco Tufters Ltd. | 9.66 | NE |
| Kalpaka Chemicals Pvt. Ltd. | 10.63 | N |
| Tuticorin Alkali Chemicals & Fertilizers Ltd. | 10.65 | SE |
| Shriraam Engineering | 11.20 | E |
| Ammayapper Road Ways | 12.14 | SE |
| Tuty Minerals | 12.49 | N |
| Tuticorin Salt & Marine Chemicals Ltd. | 14.89 | E |

| Industry Name | Approx. Distance (km) | Direction |
|---|---|---|
| SEPC Power Pvt. Ltd. | 15.00 | E |
| Zirconium Complex (Unit of NFC) | 15.00 | SE |
| Kaleesuwari Agro Industries Pvt. Ltd. | 15.00 | E |
| **Quarry/Blue metals/Crushers near project area** | | |
| KR Blue Metals | 0.08 | NW |
| Amman Crushers | 0.33 | N |
| PSU Blue Metals | 0.37 | N |
| Amman Blue Metals | 0.96 | N |
| **Future Industries** | | |
| P R Seeds and Grains Pvt. Ltd. | 5.93 | E |
| Vinfast Auto India Pvt.Ltd., | 9.20 | N |
| Grovjoint India Pipe Fittings Private Limited | 10.02 | NE |
| Southern Petrochemical Industries Corporation Limited | 10.36 | NE |

SIPCOT is in the process of proposing new individual industrial park schemes at Therkkuveerapandiyapuram, Vadakku Silukkanpatti, Meelavittan and Mudivaithangal, which are located within a radial distance of 10 km from the proposed SIPCOT Industrial Park, Allikulam. At present, these schemes are in the preliminary stage, wherein the processes of land acquisition and/or land alienation are yet to be finalized. Consequently, the exact extent, location, and land use plan of these proposed schemes are not presently finalized.

Therefore, these proposed schemes have not been considered as part of the cumulative impact assessment in the present EIA study for the Allikulam Industrial Park. However, it is clarified that once the respective schemes are finalized and taken up for environmental clearance, the proposed SIPCOT Industrial Park at Allikulam shall be duly considered as part of the cumulative environmental impact assessment, for those schemes. Accordingly, cumulative environmental impacts shall be assessed independently for each respective scheme during their EIA study.

### 2.3.4. Seismicity

Thoothukudi district lies in the southern part of Tamil Nadu along the east coast of India. As per the Bureau of Indian Standards (BIS) Seismic Zoning Map of India (IS: 1893– Part 1: 2025), **Thoothukudi falls under Seismic Zone – II**, which is categorized as a **Low Damage Risk Zone**.

This indicates that the region is **seismically stable** with a **low probability of significant earthquake occurrence**. The area is primarily influenced by intraplate stresses within the Peninsular Shield and has not experienced any major damaging earthquakes in recorded history.

However, **micro-seismic activities** may occur due to regional tectonic movements along minor lineaments or faults within the **southern granulite terrain**.

**Seismic Zone Classification:** Zone–II (Low Seismic Risk)

**Zone Factor (Z):** 0.10 (as per IS 1893:2025)

**Nature of Seismic Hazard:** Low

**Structural Design Implication:** All buildings and structures are to be designed as per **IS: 1893 (Part-1)-2025** and **IS: 4326-2013**, adopting Zone II design parameters for safety against seismic loading.

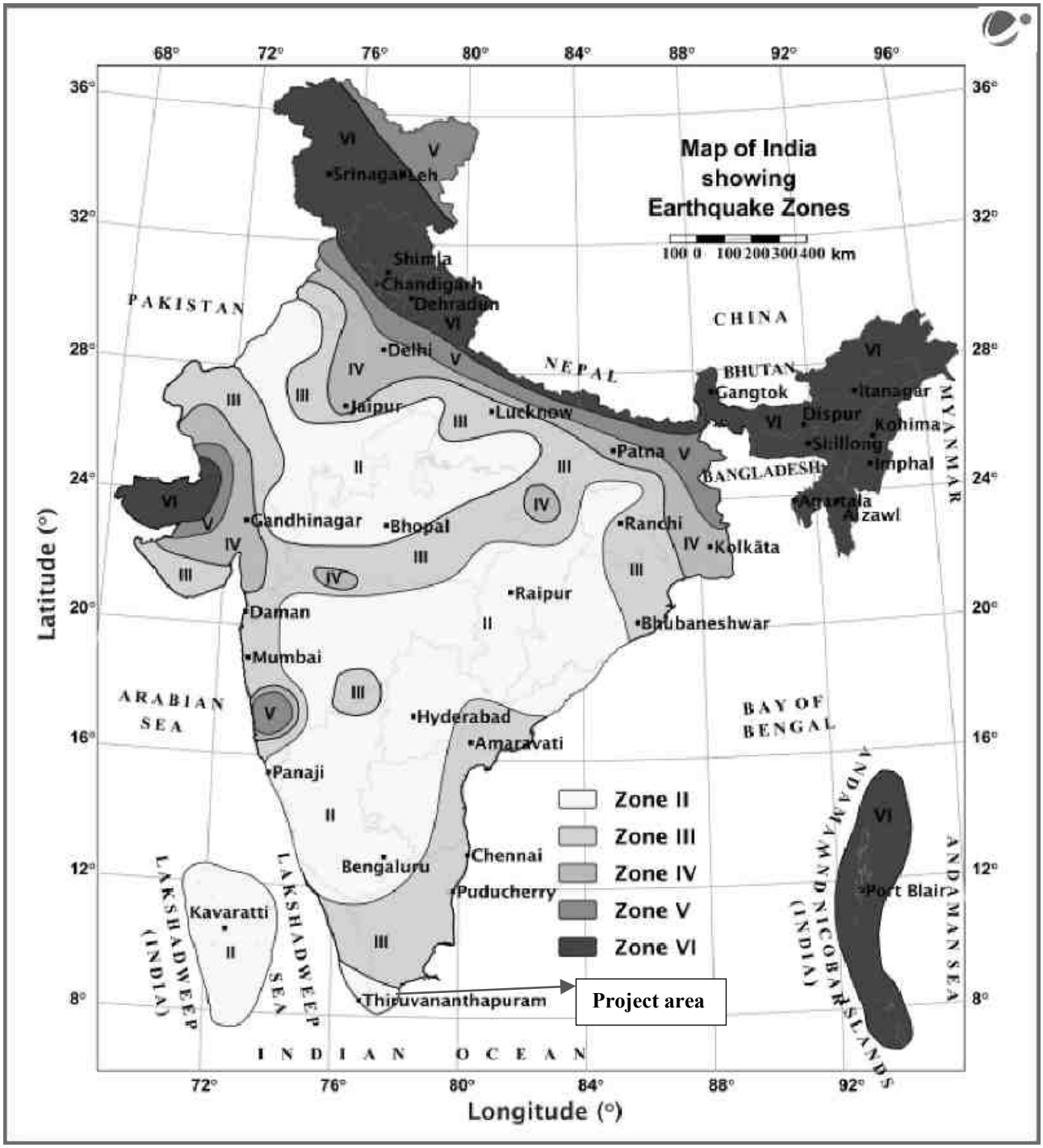



*Figure 9. Map Showing Seismicity of the Area*

*Source : Revised Seismic Zonation Map under the updated Earthquake Design Code (BIS, 2025)*

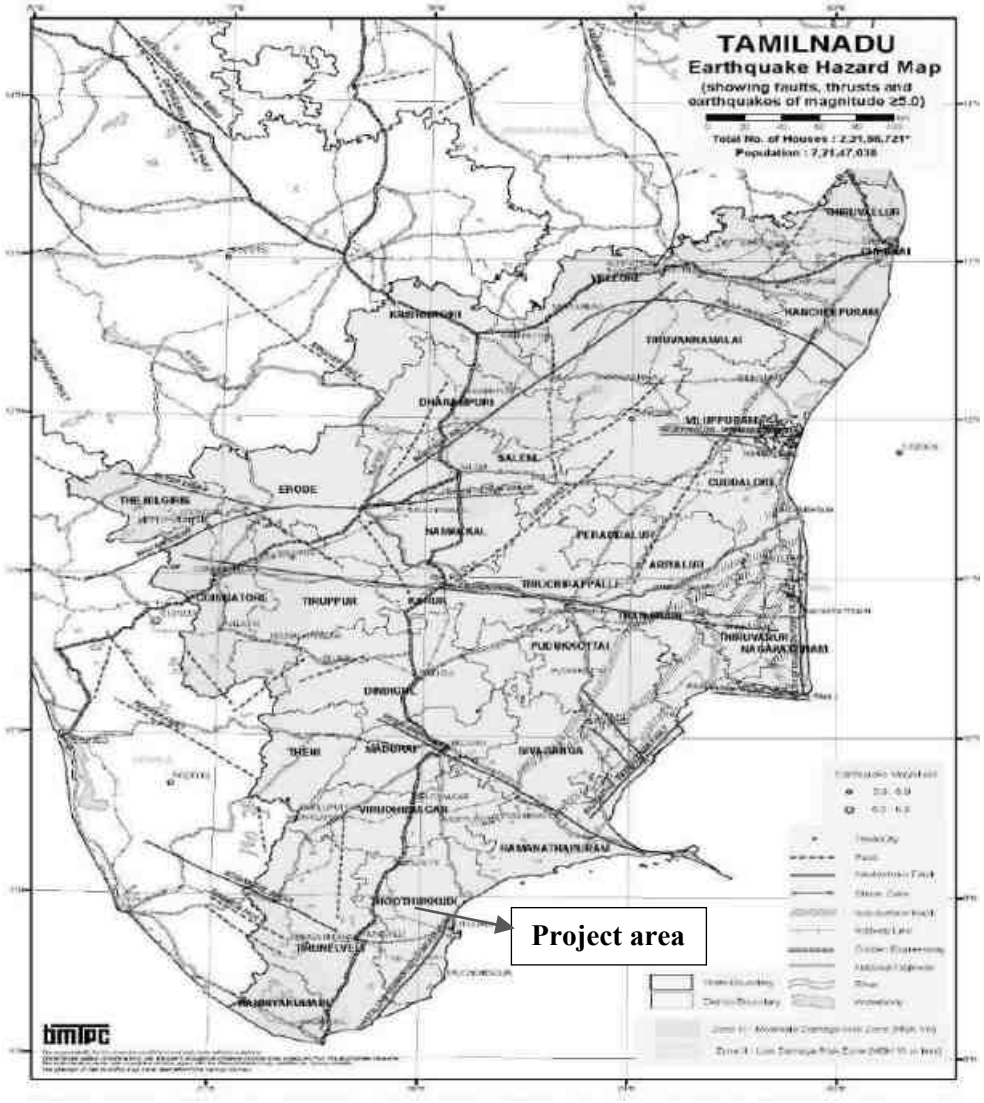



*Figure 10. Earthquake HazardMap – BMTPC.*

## 2.4 SIZE OR MAGNITUDE OF OPERTAION

*Table 18. Project Details - SIPCOT Industrial Park*

| S. No. | Particulars | Unit | Project Details |
|---|---|---|---|
| 1. | Total area for Industrial Park | ha | 796.240 |
| | | Acres | 1966.713 |
| 1.1 | Total Developable area | ha | 721.338 |
| 1.2 | Non-developable area (Wind mill falling distance) | ha | 25.951 |
| 1.3 | Non-developable area (Existing Nilaviyal Odai) | ha | 27.994 |
| 1.4 | Non-developable area (RoW HT line buffer) | ha | 20.957 |

| S. No. | Particulars | | Unit | Project Details |
|---|---|---|---|---|
| 2. | Greenbet Development | | ha | 186.714 |
| | | | % | 23.46 |
| 3. | SIPCOT Industrial Park | Project Cost | INR Lakhs | 66611 |
| | | EMP Capital Cost | INR Lakhs | 10636.0 |
| | | EMP Recurring Cost | INR Lakhs | 132.0 |

### 2.4.1 Plot area Distribution

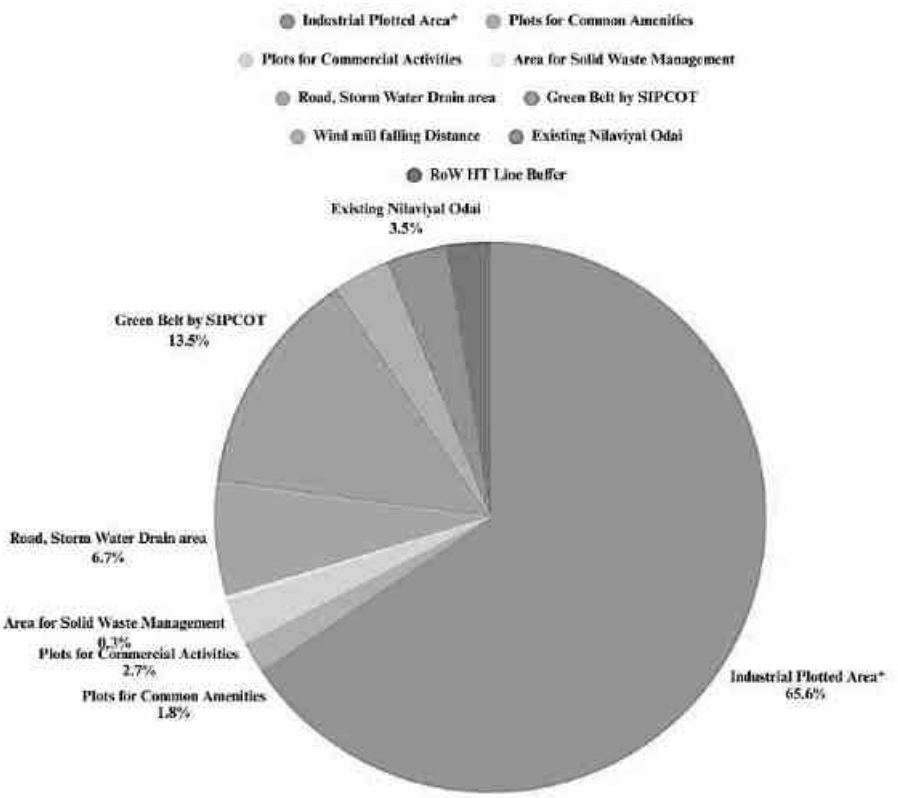
**SIPCOT Industrial Park :**

*Table 19. Land Use Distribution Details of SIPCOT Industrial Park*

| S.No | Description | Unit | Area (Ha) | Area (Acres) | % of Total area |
|---|---|---|---|---|---|
| 1 | Industrial Plot Area* ( including 15% (193.182 acres) greenbelt as applicable to red category Industries ) | Hectare | 521.409 | 1287.88 | 65.48 |
| 2 | Plots for Common Amenities | Hectare | 14.425 | 35.63 | 1.81 |
| 3 | Plots for Commercial Activities | Hectare | 21.64 | 53.45 | 2.72 |
| 4 | Area for Solid Waste Management | Hectare | 2.024 | 5.00 | 0.25 |
| 5 | Road, Storm Water Drain area | Hectare | 53.337 | 131.74 | 6.70 |
| 6 | Greenbelt by SIPCOT (30 m on either side of Water body, 15 m on either side of Nilaviyal Odai & 15m along the Periphery of Lyocell unit and 10 m Periphery all along the boundary) | Hectare | 108.503 | 268.005 | 13.63 |
| **Total Developable area** | | **Hectare** | **721.338** | **1781.71** | **90.59** |
| 7 | Area of windmill falling distance (Radius 181m) | Hectare | 25.951 | 64.100 | 3.26 |
| 8 | Existing Nilaviyal Odai (Non-developable area) | Hectare | 27.994 | 69.145 | 3.52 |
| 9 | RoW HT Line Buffer (Non-developable area) | Hectare | 20.957 | 51.763 | 2.63 |
| **Total Non-developable area** | | **Hectare** | **74.902** | **185.008** | **9.41** |
| **Grand Total area of the Industrial Park** | | **Hectare** | **796.24** | **1966.71** | **100%** |

(*Note: Includes greenbelt area to be provided by individual Units to meet MoEF&CC norms as per recent OM dated 29.11.2025)

*Figure 11. Area Distribution chart*




As per Government Order (G.O.) No. 100 dated 26.02.2021, an aggregate land extent of 904.40 hectares has been sanctioned for the proposed industrial development project. This comprises 788.742 hectares of patta (private) land and 7.498 hectares of poramboke (government) land. The patta lands have been procured through direct purchase and mutual agreements with respective landowners, while the poramboke lands have been earmarked by the Government of Tamil Nadu for industrial use in accordance with the provisions of the said G.O. Of the total approved area, 796.240 hectares have been specifically allocated for the establishment of the Industrial Park, which will encompass industrial plots, utility corridors, infrastructure facilities, common amenities, greenbelt development, and internal access roads, as delineated in the approved Layout Plan.The project area spans across six villages, namely Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram, and Therkusillukkanpatti. A detailed village-wise breakup of land extent, including the abstract area, exempted portions, and corresponding LPS (Land Purchase Scheme) details, is provided in **Annexures 1 and 2**.

### 2.4.2. Production Capacity - SIPCOT Industrial Park

The Proposed Industrial Park at Allikulam by SIPCOT, is intended for providing developed industrial plots with associated infrastructure such as roads, drainage, utilities, and greenbelt.

*Table 20. Product & By Product Details - SIPCOT Industrial Park*

| S. No. | Product & By-Products | Total area (in Hectare) |
|---|---|---|
| 1. | Total Development area | 721.338 |
| 2. | Total Non-development area (RoW HT Line Buffer is 20.957 ha & Existing Nilaviyal Odai is 27.994 ha) | 48.951 |
| 3. | Windmill Falling distance | 25.951 |
| 4. | Total Plot area | 796.240 |

## 2.5 PROPOSED SCHEDULE AND COMPLETION TIMELINE

The project is being submitted for Environmental Clearance (EC) for the proposed Indrustrial Park. The tentative timeline of the project is as follows:

1. Public Hearing – February 2025
2. EIA Appraisal – April 2026
3. Obtaining EC combined with CTE – May 2026

## 2.6 TECHNOLOGY AND PROCESS DESCRIPTION

The proposed project involves the development of an Industrial Park, and SIPCOT does not engage in any manufacturing or processing activity within the park. Therefore, there is no industrial process or production sequence associated with SIPCOT for this project. The role of SIPCOT is limited to creating and providing the necessary infrastructure for future industrial units, without undertaking any process operations itself.

The proposed project involves the development of an industrial park accommodating Technical Textile and other Textile industries, along with other non-EC category industries. Each individual industry will submit its own detailed information on raw materials, manufacturing process, technology, production capacity, and plant layout at the time of obtaining Consent to Establish (CTE) and Consent to Operate (CTO) from the Tamil Nadu Pollution Control Board (TNPCB) and comply with the applicable environmental norms and conditions stipulated therein.

Regulatory oversight, monitoring, and enforcement of compliance shall be carried out by TNPCB and other statutory authorities, as applicable.

For the purpose of the present EIA study, a tentative description of representative industrial processes including a pre-defined industry engaging under schedule activity 5(d), 1(d) and 8(b) under Category ‘B’ has been outlined in **Section 2.7.1 and 2.11** The estimated pollution load from both process and utility operations of these industries has been duly considered in the environmental impact assessment and prediction studies.

## 2.7 PROJECT DESCRIPTION

### 2.7.1 Types of some industrial units, processes /products in the proposed Industrial area

The proposed SIPCOT Industrial Park at Allikulam, Thoothukudi District, extends over 796.240 hectares (1966.713 acres) and is envisioned as a industrial park promoting Technical Textile, Man-Made Fibre (MMF) industries, and clean, low-pollution manufacturing sectors.

The park is strategically designed to promote industrial diversification and employment generation.The total industrial plot area accounts for 521.409 hectares (1287.88 acres) of the total land extent, distributed between EC category (Technical Textile/MMF) and Non-EC category industries, with well-planned supporting infrastructure and green spaces.

**EC Category Industries (Red) (Technical Textile / Man-Made Fibre Zone)**

An extent of 202.43 hectares (500 acres) within the Industrial Park has been earmarked for Technical Textile and Man-Made Fibre (MMF) industries, which fall under Schedule 5(d) of the EIA Notification, 2006 and subsequent amendments. These industries are classified under the Environment Clearance (EC) category and will obtain prior clearance from the regulatory authority before commencement.

**Types of Industries and Products**

The EC category zone will accommodate industries engaged in:

- Production of Man-Made Fibres and Filaments such as Man-made fibre, Tissue and other regenerated Technical textile Industries.
- Polymer preparation and fibre spinning units using closed-loop solvent recovery systems.
- Downstream value-added processing units such as fibre finishing, laminating, and surface modification.
- High-performance fabric and composite material production units catering to industrial, medical, and automotive applications.

*Table 21. List of stacks for Technical and other Textile Units*

| S. No. | Stack attached to | Capacity | Standard Emission Limit |
|---|---|---|---|
| **1** | **Project Developer -SIPCOT** | | |
| **Point source emissions :** NIL.<br>(No DG sets / boilers / stacks envisaged ) | | | |
| 2 | **Plot S-1 : Proposed Stacks Details for Lyocell and Tissue Manufacturing Unit** | | |
| 2.1 | DG Sets<br>(4 Nos.) | 2500 kVA | As per CPCB Emission Standard for DG:<br>PM: 75 mg/Nm$^3$<br>CO: 150 mg/Nm$^3$ |

| S. No. | Stack attached to | Capacity | Standard Emission Limit |
|---|---|---|---|
| | | | NOx: 360 mg/Nm³<br>$SO_2$- 2 mg/Nm³<br>1. **Diesel consumption for 2500 kVA DG set is considered** approx. 400 LPH.<br>2. **Density of diesel** - 0.845 Kg/Litres.<br>3. **Sulphur content (BS VI) - 0.001%** = 10 ppm = 0.00001 Kg S/Kg diesel. |
| 2.2 | Boilers (3 Nos.) | 280 TPH | Notification S.O. 3305(E) dated 7 December 2015<br>SO2: 100 mg/Nm3<br>NOx: 100 mg/Nm3<br>PM: 30 mg/Nm3<br>Fuel: Coal +15% biomass |
| **3** | **Technical Textile and other Textile Units -19 Nos.** | | |
| 3.1 | DG Sets (19 Nos.) | 1010 kVA each | CPCB DG emission standards applicable to HSD<br>Stack height as per CPCB norms. |
| 3.2 | Boilers (19 Nos.) | 2 TPH each | Emissions as per CPCB norms applicable to Coal fired<br>Stack height as per CPCB guidelines. |

*Table 22. Stack details for the Technical textile and Technical Textile and other Textile units.*

| S. No. | Stack attached to | Capacity | Stack height (m) | Stack dia. m | Stack velocity m/s | APCM Detail | Emission load in kg/hr of all utilities | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | $PM_{10}$ | $PM_{2.5}$ | NOx | SOx | CO |
| 1 | DG Sets (4 Nos.) | 2500 kVA | 30 | 0.6 | 20 | Adequate stack height | 0.80 | 0.64 | 7.18 | 0.03 | 1.59 |
| 2 | Power Boiler-3 | 280 TPH | 60 | 1.2 | 18 | ESP | 0.22 | 0.17 | 10.91 | 2.18 | 4.37 |
| 3 | DG Sets (19 Nos.) | 1010 kVA | 30 | 0.45 | 14 | Acoustic enclosure with stack | 0.30 | 0.24 | 2.80 | 0.03 | 0.90 |
| 4 | Boilers (19 Nos.) | 2 TPH | 33 | 1.00 | 15 | Dust collectors with stack | 0.35 | 0.26 | 1.80 | 0.10 | 0.60 |
| 13 | DG Sets (5 Nos.) | 62.5 kVA each | 22 | 0.30 | 10 | Acoustic enclosure with stack | 0.03 | 0.02 | 0.25 | 0.003 | 0.08 |

All such industries will establish individual Effluent Treatment Plants (ETPs) and adopt Zero Liquid Discharge (ZLD) systems to recycle treated water. Air Pollution Control Systems (APCS) such as scrubbers and bag filters will be installed to maintain emission standards.

**Non-EC Category Industries (Red,Orange, Green and White Category Units)**

The remaining 318.979 hectares (787.88 acres) of the industrial plot area are earmarked for Non-EC category industries, primarily falling under Red, Orange, Green, and White categories as per TNPCB classification. These industries are characterized by low pollution potential and will require only Consent to Establish (CTE) and Consent to Operate (CTO) from TNPCB under the Water and Air Acts. Non EC category industry also needs to adopt ZLD process. No wastewater is allowed discharge outside the industry.

**Types of Industries Proposed**

Typical industries expected in this zone include:

- Aerospace/Defense Installation.
- Electrical and electronic component assembly and fabrication
- Engineering workshops and precision component machining units
- Small-scale equipment manufacturing and service units
- Warehousing, logistics, and maintenance facilities

*Table 23.List of stacks for Non-EC Category industries*

| S. No. | Stack attached to | Capacity | Standard Emission Limit |
|---|---|---|---|
| 1 | **Other Industrial Units (149 Nos. of Plots)** | | |
| 1.1 | DG Sets (64 Nos.) | 62.5 kVA each | CPCB DG emission standards applicable. Stack height as per CPCB norms. |
| 1.2 | DG Sets (46 Nos.) | 125 kVA each | CPCB DG emission standards applicable. Stack height as per CPCB norms. |
| 1.3 | DG Sets (26 Nos.) | 500 kVA each | CPCB DG emission standards applicable. Stack height as per CPCB norms. |
| 1.4 | DG Sets (12 Nos.) | 625 kVA each | CPCB DG emission standards applicable. Stack height as per CPCB norms. |
| 1.5 | Boilers (21 Nos.) | 2.0 TPH each | Emissions as per CPCB / MoEF&CC norms. Stack height as per CPCB guidelines. |
| 1.6 | Boilers (16 Nos.) | 3.0 TPH each | Emissions as per CPCB / MoEF&CC norms. Stack height as per CPCB guidelines. |
| 1.7 | Boilers (13 Nos.) | 4.0 TPH each | Emissions as per CPCB / MoEF&CC norms. Stack height as per CPCB guidelines. |

*Table 24. Stack details for the Non-EC Category Industries.*

| S.No. | Stack attached to | Capacity | Stack height (m) | Stack dia. (m) | Stack velocity (m/s) | APCM Detail | Emission load in kg/hr of all utilities | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | $PM_{10}$ | $PM_{2.5}$ | $NO_x$ | $SO_x$ | CO |
| 1. | DG Sets (64 Nos.) | 62.5 kVA each | 4.0 | 0.30 | 10 | Acoustic enclosure with stack | 0.04 | 0.03 | 0.30 | 0.004 | 0.10 |
| 2. | DG Sets (46 Nos.) | 125 kVA each | 4.5 | 0.30 | 12 | Acoustic enclosure with stack | 0.07 | 0.05 | 0.60 | 0.006 | 0.20 |
| 3. | DG Sets (26 Nos.) | 500 kVA each | 7.2 | 0.45 | 14 | Acoustic enclosure with stack | 0.18 | 0.14 | 1.40 | 0.015 | 0.45 |
| 4. | DG Sets (12 Nos.) | 625 kVA each | 8 | 0.45 | 14 | Acoustic enclosure with stack | 0.22 | 0.17 | 1.80 | 0.020 | 0.60 |
| 5. | Boilers (21 Nos.) | 2.0 TPH each | 12 | 1.20 | 18 | Common stack | 0.20 | 0.15 | 0.90 | 0.06 | 0.30 |
| 6. | Boilers (16 Nos.) | 3.0 TPH each | 18 | 1.20 | 18 | Cyclone separator with stack | 0.28 | 0.21 | 1.30 | 0.08 | 0.45 |

| S.No. | Stack attached to | Capacity | Stack height (m) | Stack dia. (m) | Stack velocity (m/s) | APCM Detail | Emission load in kg/hr of all utilities | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | $PM_{10}$ | $PM_{2.5}$ | $NO_x$ | $SO_x$ | CO |
| 7. | Boilers (13 Nos.) | 4.0 TPH each | 30.5 | 1.00 | 15 | Acoustic enclosure with stack | 0.60 | 0.45 | 3.20 | 0.18 | 1.10 |

These industries will generate minor quantities of wastewater, which will be treated and reused within premises. Each unit will develop its own domestic sewage and effluent treatment systems and comply with TNPCB's Red/ Orange/Green/White standards.

*Table 25. Summary of Industrial Area Zoning*

| Category | Type of Industries / Activities | Extent (ha) | Environmental Classification | Regulatory Requirement |
|---|---|---|---|---|
| **EC Category** | Technical Textiles, Man-Made Fibre (Lyocell, Tissue and other Technical Textile) (Red Category) | 202.43 | Schedule 5(d) – EC Category along with an associated 1(d) Category 'B' – Captive Co-gen Power Plant (135 MW). | Prior Environmental Clearance |
| **Non-EC Category** | Aerospace/Defense Installation, Auto Components, Electrical, Engineering and Warehousing (Red/Orange/Green/White Category ) | 318.979 | Red/Orange/ Green/White | CTE & CTO from TNPCB |
| **Total Industrial Plot Area** | | **521.409** | | |

### 2.7.2 Project Zoning

The proposed SIPCOT Industrial Park is designed with a well-defined zoning plan to ensure systematic, environmentally compatible, and industrial development. The zoning concept integrates industrial, commercial, amenity, greenbelt, infrastructure, and buffer areas, aligning with planning and environmental guidelines prescribed under the EIA Notification, 2006 and its subsequent amendments.

The Industrial Park is planned with 25.42% of the total industrial plot area allocated for Environment Clearance (EC) category industries, specifically falling under Schedule 5(d), 1(d) and 8 (a) of the EIA Notification, 2006. These primarily include industries associated with Electric Vehicle (EV) products, such as battery compounds, electrolytes, and related components, which require prior Environmental Clearance due to their process characteristics and raw material handling.

The remaining 41.77% of the industrial plot area is designated for non–EC category industries, which include EV battery separator and cathode manufacturing units, E-vehicle component fabrication units, automobile parts, assembly units, and other low-impact engineering and manufacturing sectors that do not fall under the purview of the EIA Notification, 2006.

*Table 26. Zonation of Industrial Park*

| S. No. | Type of Industries | Description / Industrial Activity under EC category | Revised Approx. Percentage of Allocation after EAC Meeting |
|---|---|---|---|
| **1.** | 5(d) – Man-Made Fibre Manufacturing Industries (Lyocell) and other Technical Textile Industries attracting EIA Notification 2006 and its subsequent Amendments. | Man-Made Fibre (MMF) manufacturing units such as Man made fibre and Tissue production including associated chemical preparation, spinning, and finishing sections along with 1(d) Captive Co-gen power plant. | **25.42%** |
| **2.** | Other Non-EC Category Industries such as Aerospace/Defense Installation, Engineering, Automobile Components and Ancillary Units, as per the EIA Notification, 2006 and its subsequent amendments | Non-EC industries including Aerospace/Defense Installation, Engineering, Automobile Components and light engineering units | **40.06%** |
| **Total** | | | **65.48%** |

***Note :** Total Industrial Plotted area is 521.409 ha ( 65.48%)*2.7.3 Project Components

### 2.7.3.1 Industrial Plot area

The proposed Industrial Park includes 169 designated plots earmarked for various categories of industries, with a cumulative industrial area of 521.409 hectares. The detailed plot area allocation is provided in Table 22.

*Table 27. Industrial Plot Area Details of SIPCOT Industrial Park*

| Plot No. | Area (Acre) | Plot No. | Area (Acre) | Plot No. | Area (Acre) |
|---|---|---|---|---|---|
| S1 | 344.61 | 56 | 3.00 | 112 | 12.14 |
| 1 | 2.47 | 57 | 3.00 | 113 | 5.15 |
| 2 | 2.50 | 58 | 3.10 | 114 | 7.11 |
| 3 | 2.66 | 59 | 1.98 | 115 | 3.70 |
| 4 | 12.55 | 60 | 3.00 | 116 | 6.87 |
| 5 | 7.84 | 61 | 3.00 | 117 | 5.58 |
| 6 | 6.17 | 62 | 3.00 | 118 | 6.08 |

| Plot No. | Area (Acre) | Plot No. | Area (Acre) | Plot No. | Area (Acre) |
|---|---|---|---|---|---|
| 7 | 6.34 | 63 | 3.00 | 119 | 5.19 |
| 8 | 5.76 | 64 | 1.37 | 120 | 2.70 |
| 9 | 6.29 | 65 | 11.20 | 121 | 4.36 |
| 10 | 7.36 | 66 | 8.42 | 122 | 5.81 |
| 11 | 6.10 | 67 | 4.76 | 123 | 6.30 |
| 12 | 3.72 | 68 | 6.50 | 124 | 5.60 |
| 13 | 4.82 | 69 | 7.37 | 125 | 11.31 |
| 14 | 8.76 | 70 | 7.33 | 126 | 3.09 |
| 15 | 14.35 | 71 | 6.53 | 127 | 4.51 |
| 16 | 4.14 | 72 | 6.96 | 128 | 7.47 |
| 17 | 5.37 | 73 | 1.47 | 129 | 13.11 |
| 18 | 5.36 | 74 | 4.82 | 130 | 6.64 |
| 19 | 5.20 | 75 | 1.34 | 131 | 5.82 |
| 20 | 5.37 | 76 | 9.97 | 132 | 6.46 |
| 21 | 5.37 | 77 | 9.23 | 133 | 4.64 |
| 22 | 2.16 | 78 | 9.16 | 134 | 3.63 |
| 23 | 4.73 | 79 | 4.30 | 135 | 3.15 |
| 24 | 7.78 | 80 | 4.63 | 136 | 4.21 |
| 25 | 6.42 | 81 | 10.03 | 137 | 5.38 |
| 26 | 2.42 | 82 | 2.24 | 138 | 5.45 |
| 27 | 3.89 | 83 | 4.35 | 139 | 6.80 |
| 28 | 2.43 | 84 | 9.06 | 140 | 6.67 |
| 29 | 7.07 | 85 | 3.94 | 141 | 6.13 |
| 30 | 3.00 | 86 | 11.60 | 142 | 3.54 |
| 31 | 2.35 | 87 | 5.62 | 143 | 2.29 |
| 32 | 2.84 | 88 | 4.47 | 144 | 3.27 |
| 33 | 3.00 | 89 | 2.65 | 145 | 12.22 |
| 34 | 3.00 | 90 | 3.38 | 146 | 12.96 |
| 35 | 3.00 | 91 | 3.06 | 147 | 12.31 |
| 36 | 3.00 | 92 | 4.59 | 148 | 16.53 |
| 37 | 3.00 | 93 | 8.53 | 149 | 4.44 |
| 38 | 1.44 | 94 | 3.11 | 150 | 19.67 |
| 39 | 3.05 | 95 | 2.39 | 151 | 14.89 |
| 40 | 2.47 | 96 | 3.27 | 152 | 13.95 |
| 41 | 3.00 | 97 | 5.05 | 153 | 12.55 |
| 42 | 3.00 | 98 | 6.68 | 154 | 31.89 |
| 43 | 3.00 | 99 | 5.00 | 155 | 3.83 |
| 44 | 3.00 | 100 | 5.96 | 156 | 12.54 |
| 45 | 3.00 | 101 | 2.92 | 157 | 4.06 |
| 46 | 3.00 | 102 | 4.26 | 158 | 7.24 |
| 47 | 3.57 | 103 | 5.44 | 159 | 2.58 |
| 48 | 8.42 | 104 | 1.67 | 160 | 6.48 |
| 49 | 5.41 | 105 | 1.39 | 161 | 5.38 |
| 50 | 3.74 | 106 | 2.05 | 162 | 4.11 |
| 51 | 4.38 | 107 | 4.24 | 163 | 8.76 |
| 52 | 3.75 | 108 | 5.53 | 164 | 8.06 |

| Plot No. | Area (Acre) | Plot No. | Area (Acre) | Plot No. | Area (Acre) |
|---|---|---|---|---|---|
| 53 | 2.86 | 109 | 2.69 | 165 | 6.78 |
| 54 | 3.00 | 110 | 1.73 | 166 | 6.35 |
| 55 | 3.00 | 111 | 2.45 | 167 | 2.99 |
| - | - | - | - | 168 | 3.07 |
| - | - | - | - | **Total** | **1287.88** |

### 2.7.3.2 Common Facilities

An extent of **14.425 ha (35.63 acres)** has been earmarked within the industrial park for amenities, distributed across designated plots AM-1 to AM-4. These areas are reserved to accommodate a range of essential common services and support facilities necessary for the effective functioning of the industrial park.

*Table 28. Amenity Plot Details*

| Category | Area (acres) | Area (hectare) |
|---|---|---|
| AM-1 | 15.69 | 6.352 |
| AM-2 | 10.00 | 4.048 |
| AM-3 | 7.58 | 3.070 |
| AM-4 | 2.36 | 0.955 |
| **TOTAL** | **35.63** | **14.425** |

Provisions for the following have been planned within the park limits:

Common amenities will be development of water supply, Fire Station, Power supply through TANGEDCO.,etc. and SIPCOT project office with First aid centre. The design ensures walkable access and safety compliance throughout the park

### 2.7.3.3 Commercial area

The proposed industrial park includes a well-planned commercial area spanning 21.640 hectares (53.45 acres), distributed across eleven plots (CP1 to CP9) as per the approved layout. These commercial plots are strategically allocated to accommodate commercial development that will complement and support the industrial activities within the park. Development within these zones will be undertaken in accordance with SIPCOT guidelines and local planning regulations, ensuring seamless integration with the overall infrastructure of the industrial park. The provision of dedicated commercial spaces will enhance the operational efficiency of the park by offering necessary services and amenities. Each commercial plot is envisage to equipped with one DG set of 125 kVA capacity, intended for standby power requirements. Emissions from the DG sets shall comply with CPCB norms, and stack height shall be provided in accordance with CPCB guidelines.

| Plot | Area (Acre) | Area (Hectare) |
|---|---|---|
| CP1 | 11.74 | **4.75** |
| CP2 | 3.45 | **1.40** |
| CP3 | 2.05 | **0.83** |
| CP4 | 10.97 | **4.44** |

| Plot | Area (Acre) | Area (Hectare) |
|---|---|---|
| CP5 | 5.30 | **2.15** |
| CP6 | 5.00 | **2.02** |
| CP7 | 3.28 | **1.33** |
| CP8 | 4.37 | **1.77** |
| CP9 | 7.29 | **2.95** |
| **TOTAL** | **53.45** | **21.64** |

### 2.7.3.4 Greenbelt Development

The proposed project incorporates an extensive greenbelt development plan as an integral component of its environmental management strategy. A total area of **186.714 hectares (461.187 acres)**, constituting **23.46% of the total project area**, has been earmarked for greenbelt development, significantly exceeding the minimum statutory requirements.

**The greenbelt distribution is as follows:**

- **Greenbelt Along Water Bodies and Internal Buffers (Developed by SIPCOT):**

  A total of **108.503 hectares**, accounting for 13.63% of the total developable area, has been designated for greenbelt development along natural drainage features and internal buffers. This includes a 30-meter-wide greenbelt on either side of the water body , a 15-meter-wide greenbelt on either side of the Nilaviyal Odai & 15m along the Periphery of Lyocell unit and 10m all along the boundary. This green corridor, comprising approximately 271258 trees (@2,500 trees/ha), will function as a natural ecological buffer — mitigating surface runoff, improving the micro-climate, and strengthening habitat connectivity across the industrial park.

- **Greenbelt within Industrial Plots (Developed by Individual Industries):**

  In addition to SIPCOT's initiatives, individual industries within **Red/Orange/ Green/White** categories will collectively develop **78.211 hectares** of greenbelt within their premises, representing 9.83% of the total developable area. This corresponds to about 195528 trees (@2,500 trees/ha), ensuring compliance with prescribed norms and enhancing overall vegetative cover.

**Primary Functions and Benefits of the Proposed Greenbelt:**

- Serve as an air pollution sink by attenuating dust, gaseous emissions, and particulate matter.
- Act as a noise buffer, minimizing the propagation of industrial and vehicular noise to adjacent areas.
- Enhance site aesthetics and improve the visual landscape.
- Support soil stabilization, groundwater recharge, and microclimate regulation within the industrial park.
- Provide ecological habitat, thereby promoting local biodiversity.
- Assist in meeting national and state-level environmental clearance and compliance

requirements as per CPCB and TNPCB norms.

- It regulates the microclimate, enhance the carbon sequestration, better rain water percolation thereby improving the ground water table.

**Species Selection, Existing Tree Inventory and Greenbelt Development Approach :**

The greenbelt will predominantly consist of native and adaptive plant species with high pollution-tolerance capacity, multi-tier canopy structure, fast growth, and low water requirements. Plantation design will include shade trees, ornamental shrubs, and ground cover. There are about 65 Nos. of existing trees within the Project site, comprising 41 Palm, 20 Vadali, 1 Vagai, 2 Neem and 1 Manjanathi, along with scattered shrubs. In total 30 Nos of grown-up trees (28 Palm trees and 2 Neem trees) are in the proposed road development and amenity plots. Though care will be exercised to transplant the trees within the project site. There will be a minimum of 20 trees 18 Palm tree and 2 Neem tree will be necessitated to cut. SIPCOT will compensate those number of trees by planting 10 trees for every 1 tree felldown (of the same species) within the proposed greenbelt development in an area of 108.503 ha, 271258 Nos. of trees .

*Table 29. Greenbelt Area Breakup*

| Description | | Unit | Area (Ha) | % of Total Area | No: of Trees @2500 |
|---|---|---|---|---|---|
| **Developed by SIPCOT** | Greenbelt by SIPCOT (30 m on either side of Water body (Odai) , 15 m on either side of Nilaviyal Odai & 15m along the Periphery of Lyocell unit and 10m all along the boundary) | Hectare | 108.503 | 13.63% | 271258 |
| **Developed by Individual Industries** | Greenbelt within Industrial Plot Area – Red/Orange/Green/ White Category (@ 15%) | Hectare | 78.211 | 9.83% | 195528 |
| **Total Greenbelt within the Industrial Park** | | **Hectare** | **186.714** | **23.46** | **466786** |

*Figure 12. Greenbelt Zone details*

| Greenbelt | Area (Acres) |
|---|---|
| GB-1 | 49.150 |
| GB-2 | 47.325 |

| Greenbelt | Area (Acres) |
|---|---|
| GB-3 | 93.15 |
| GB-4 | 0.15 |
| GB-5 | 0.37 |

| Greenbelt | Area (Acres) |
|---|---|
| GB-6 | 0.26 |
| GB-7 | 1.52 |
| GB-8 | 2.36 |
| GB-9 | 2.59 |
| GB-10 | 1.57 |
| GB-11 | 0.89 |
| GB-12 | 0.67 |
| GB-13 | 7.10 |
| GB-14 | 0.45 |
| GB-15 | 0.53 |
| GB-16 | 0.82 |
| GB-17 | 0.71 |
| GB-18 | 0.28 |
| GB-19 | 1.71 |
| GB-20 | 1.04 |
| GB-21 | 2.09 |
| GB-22 | 6.95 |
| GB-23 | 3.50 |
| GB-24 | 2.36 |

| Greenbelt | Area (Acres) |
|---|---|
| GB-25 | 2.70 |
| GB-26 | 1.94 |
| GB-27 | 0.21 |
| GB-28 | 2.26 |
| GB-29 | 0.45 |
| GB-30 | 0.87 |
| GB-31 | 0.59 |
| GB-32 | 1.63 |
| GB-33 | 6.41 |
| GB-34 | 0.71 |
| GB-35 | 8.55 |
| GB-36 | 0.18 |
| GB-37 | 3.61 |
| GB-38 | 5.28 |
| GB-39 | 3.57 |
| GB-40 | 0.53 |
| GB-41 | 0.97 |
| **TOTAL** | **268.005** |

### 2.7.3.5 Roads Development

An area of **53.337 ha (6.70%)** has been allocated for internal roads and storm water drains within the Industrial Park. The road network is designed to ensure smooth traffic flow and easy access to all industrial plots, commercial zones, and common facilities. Proper drainage and street lighting will be provided along both sides of the roads.The total length of new roads proposed is 21.917 km within the Industrial Park.

| Road Type | Length (km) |
|---|---|
| 30 m Wide Road | 10.830 |
| 20 m Wide Road | 10.961 |
| 3 m Wide Road | 0.126 |
| **TOTAL** | **21.917** |

## 2.8 INFRASTRUCTURE REQUIREMENT FOR THE PROJECT

### 2.8.1 Power Requirement

The total power requirement for the SIPCOT Industrial Park, Allikulam during the operational phase is estimated at 145 MVA.Power supply will be sourced from the Tamil Nadu Generation and Distribution Corporation (TANGEDCO) through a proposed 110/33 kV substation within the Industrial Park. Internal distribution will be through 33 kV and 110 kV underground cable networks, ensuring reliable and uninterrupted supply to all industrial, commercial, and common facility zones. SIPCOT will not provide common backup. Individual industries will arrange their own DG sets or alternate energy solutions

### 2.8.2 Water requirement

**During Construction Phase:**

During the construction phase, the total water requirement is estimated at 175 KLD, which will be met from the SIPCOT Desalination Plant (75 KLD) and authorized private tanker suppliers (100 KLD).The water will be utilized for construction activities, dust suppression, and domestic use for about 625 workers engaged during peak construction activity. No groundwater extraction is proposed during the construction phase.

**During Operational Phase :**

During the operational phase, the total water requirement for the SIPCOT Industrial Park is estimated at 66308 KLD.Freshwater will be sourced from the SIPCOT-owned 60 MLD Desalination Plant at Thoothukudi, while secondary treated sewage from the Tuticorin Municipal Corporation will be used for non-potable purposes such as flushing and greenbelt irrigation.In addition, treated effluents and treated sewage from individual industries will be reused and recycled within their premises, minimizing freshwater dependency and achieving near zero discharge operation.

*Table 30. Water Requirement and Source during Operational Phase*

| S. No. | Water Usage | Quantity (KLD) | SIPCOT Supply (KLD) | | Individual Units' Scope (KLD) | |
|---|---|---|---|---|---|---|
| | | | Desalination Plant Water | Secondary Treated STP Water | Treated Effluents | Treated Sewage |
| **1** | Domestic | 430 | 430 | 0 | 0 | 0 |
| **2** | Flushing | 344 | 0 | 344 | 0 | 0 |
| **3** | Greenbelt | 6535 | 0 | 5902 | 0 | 633 |
| **4** | Use in Industries, Commercial & Amenities | 58,999 | 10437* | 20000** | 28562 | 0 |
| **Total** | | **66308** | **10867** | **26246** | **28562** | **633** |

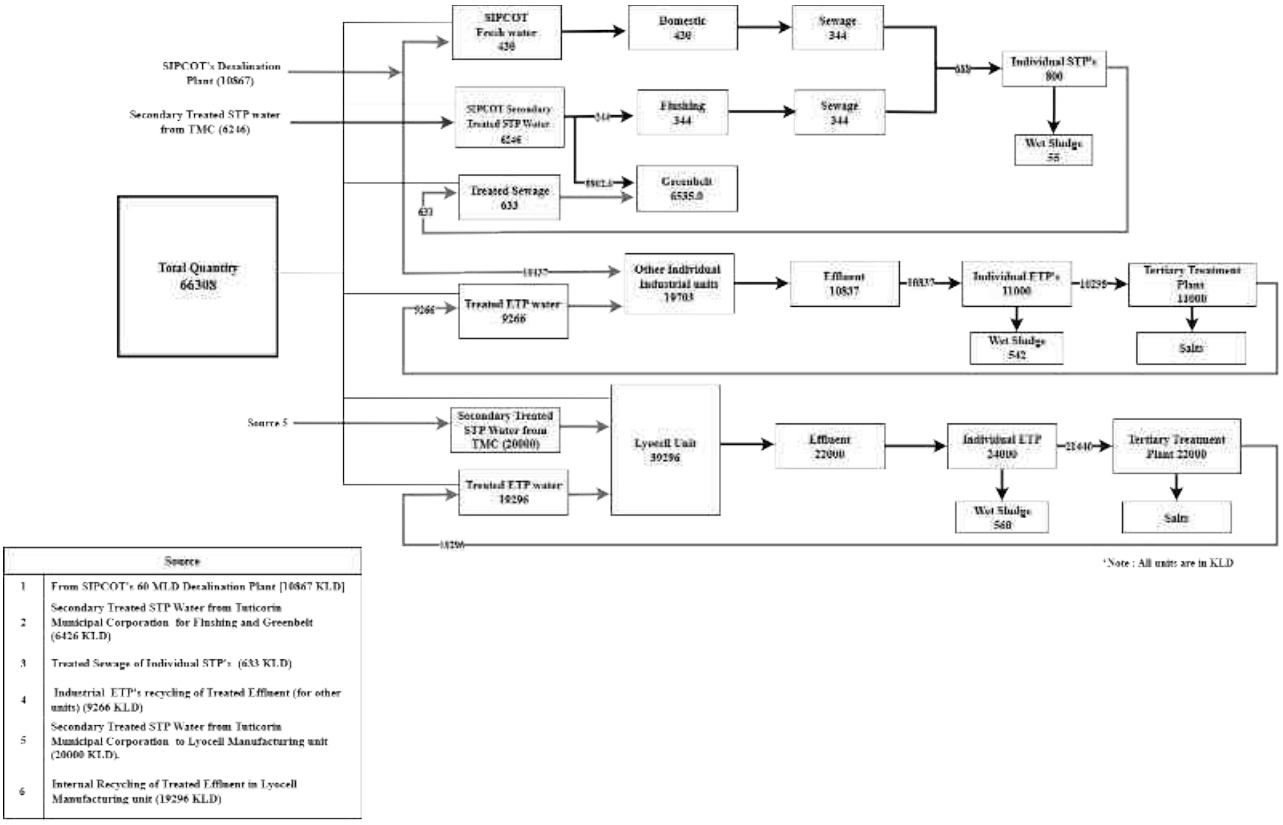



*Figure 13. Water Balance Diagram*

**Note 1:**

10867 KLD of freshwater will be supplied from the SIPCOT Desalination Plant for industrial and commercial usage.

20,000 KLD of secondary treated sewage from Tuticorin Municipal Corporation will be treated in a tertiary plant and used in process & utility operations at the Lyocell manufacturing unit.

6246 KLD of secondary treated sewage will be used for flushing and greenbelt irrigation.

**Note 2:**

Water requirement for support areas:

For Amenities (14.425 ha @ 3.0 KL/ha/day) → **43.5 KLD**

For Commercial Area (21.640 ha @ 12.36 KL/ha/day) → **267.5 KLD**

For Greenbelt (186.714 ha @ 35 KL/ha/day) → **6535.0 KLD**

### 2.8.3 Manpower Requirement

The development of the SIPCOT Industrial Park is expected to generate substantial employment opportunities during both the construction and operational phases. Direct employment will arise from construction activities, park management, maintenance, and utility services. Indirect employment will be generated through contracting agencies, transportation, material supply chains, food and service vendors, and support industries.

*Table 31. Details of Employment (Construction phase for 2 years)*

| **Employment Generation during Construction Phase** | | | |
|---|---|---|---|
| **Permanent Employment [Xc]** | | **Temporary / Contractual Employment [Yc]** | |
| Nos of Permanent Employment [Apc] | 25 | Nos of Temporary / Contractual Employment [Acc] | 600 |
| Period of Employment (313) [Bpc] | 616 | Period of Employment [Bcc] | 616 |
| No. of Man Days- Xc [Apc]* [Bpc] | 15400 | No. of Man Days, Yc [Acc]* [Bcc] | 369600 |
| **Sub-Total C= [Xc] + [Yc] = 385000** | | | |

*Table 32. Details of Employment (Operation phase for 1 year)*

| **Employment Generation during Operation Phase** | | | |
|---|---|---|---|
| **Permanent Employment [Xc]** | | **Temporary / Contractual Employment [Yc]** | |
| Nos of Permanent Employment [Apo] | 2025 | Nos of Temporary / Contractual Employment [Aco] | 18225 |
| Period of Employment [Bpo] | 313 | Period of Employment [Bco] | 313 |
| No. of Man Days- Xco [Apo]* [Bpo] | 633825 | No. of Man Days, Yo [Aco]* [Bco] | 5704425 |
| **Sub-Total O= [Xo] + [Yo] = 6338250** | | | |
| **Grand Total = C+O = 6533875** | | | |

* Note : Operational phase manpower details include SIPCOT's Employment by Individual industries,Commercial Units, Amenity providers and SIPCOT.

## 2.9 MITIGATION MEASURES PROPOSED FOR THE PROJECT TO MEET THE ENVIRONMENTAL STANDARDS

### 2.9.1 Air Pollution Control Measures

The Industrial Park will accommodate various types of industries, including textile, engineering, and supporting units. Air emissions will mainly arise from utility sources such as DG sets, boilers, and

process stacks of individual industries.

**To control air pollution, the following measures are proposed:**

- All industries will install adequate Air Pollution Control Systems (APCS) such as bag filters, dust collectors, or wet scrubbers, depending on process requirements.
- Stack heights will conform to CPCB/TNPCB standards for proper dispersion of flue gases.
- Paved internal roads and regular water sprinkling will be adopted to control dust generation within the park.
- Total Greenbelt development over Industrial park is 186.714 ha, which will serve as a natural barrier for dust and gaseous emissions.
- Continuous monitoring of ambient air quality will be carried out at selected locations within the park.

### 2.9.2 Wastewater generation and Management

- Wastewater from the Industrial Park will mainly originate from domestic sources and industrial processes of individual units.
- Domestic sewage from common facilities will be treated in dedicated STPs established within the park.
- Individual industries will install Effluent Treatment Plants (ETPs) for process effluent treatment, followed by reuse and recycling to achieve Zero Liquid Discharge (ZLD).
- Treated effluent (28562 KLD) from industries will be reused for utilities and process needs within the park.
- No wastewater discharge outside the park premises is proposed.

### 2.9.3 Noise Management

Noise levels within the Industrial Park will primarily arise from industrial operations, vehicular movement, and construction activities. During the construction phase, noise will be generated from earthmoving equipment, machinery, and transport vehicles. Activities will be restricted to daytime hours, and all construction equipment will be fitted with acoustic enclosures and maintained regularly to minimize noise emissions.

During the operation phase, major noise sources will include industrial machinery, DG sets, and vehicle movement within the park.

**Noise management measures will include:**

- Installation of acoustic enclosures/silencers for DG sets by individual industries.
- Regular maintenance and lubrication of rotating equipment.
- Provision of greenbelt around the park and along internal roads to act as a natural noise barrier.

- Scheduling of material transport and heavy vehicle movement during daytime.
- Personal protective equipment (PPE) such as earplugs and earmuffs for workers in high-noise zones.

Each industry within the park will ensure compliance with the Noise Pollution (Regulation and Control) Rules, 2000, and maintain ambient noise levels within prescribed limits for industrial and mixed-use zones.

### 2.9.4 Municipal Solid Waste generation and Management

Municipal solid waste (MSW) will be generated from industrial canteens, offices, commercial areas, and worker facilities.

- Solid waste will be collected separately as biodegradable and non-biodegradable waste at source.
- Biodegradable waste will be processed through organic waste converters or composting units.
- Non-biodegradable and recyclable waste will be handed over to authorized recyclers.

A dedicated Solid Waste Management Facility covering 2.024 ha has been allocated within the park for integrated handling of MSW, E-waste, and plastic waste will be given to authorized recyclers by Individual Industries.

*Table 33. Municipal Solid Waste Generation & Disposal*

| S.No | Municipal Solid Waste | Quantity (kg/day) | Disposal Method |
|---|---|---|---|
| **Construction Phase (625 Nos)** | | | |
| 1 | Organic waste | 168.75 | Will be collected and composed in Organic waste convertors |
| 2 | Inorganic waste | 112.50 | Will be collected in bins and sent to TNPCB-authorized recyclers. |
| **Operation Phase (20,250 Nos)** | | | |
| 1 | Organic waste | 6210 | Individual industries will segregate the wastes; organic waste will be composted and used as manure within units |
| 2 | Inorganic waste | 4140 | Inorganic waste will be handed over to TNPCB-authorized recyclers by Individual Industries. |

### 2.9.5 Hazardous Waste Generation and Management

- SIPCOT proposed to allot 5 acres of area for Solid Waste Management one or multiple service providers will be engaged to long term contractual agreement PPP model to establish Solid Waste Management Facility including E-waste, Battery waste and plastic waste and other waste. Upon allotment of entire plots, 5 acres of land will be allotted to the contractor selected through tendering process for the establishment of Solid waste management facility (Sheds for recovery and recycling facility) including Shed for E-Waste Management on PPP mode
- Hazardous waste will primarily be generated from process industries, DG sets, and utility

operations.

- Each industrial unit will obtain authorization under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.
- Used oil and waste oil from DG sets will be collected in leak-proof containers and handed over to TNPCB-authorized recyclers/reprocessors.
- Sludge from STP will be dewatered and will be used as manure.
- Sludge from ETP will be dewatered and disposed of through authorized TSDF facilities.
- A common hazardous waste storage area will be developed within the industrial park for temporary storage before disposal.
- All handling, transport, and disposal practices will comply with CPCB and TNPCB guidelines.

### 2.9.6 Other Waste

**Plastic waste :**

*Table 34. Details of Plastic Waste Generation and Disposal Method*

| Name of the waste | Source | Qty (TPA) | Mode of disposal | Mode of Transport |
|---|---|---|---|---|
| Plastic waste | Individual industries and commercial units | Intermittent and unit-specific | Plastic Waste will be generated within the Individual Industries will segregated and disposed to TNPCB Authorised Recyclers.. | Road |

**E-waste**

*Table 35. Details of E-Waste Generation and Disposal Method*

| Name of the waste | Source | Qty (TPA) | Mode of disposal | Mode of Transport |
|---|---|---|---|---|
| E-waste | Individual industries and commercial units | Intermittent and unit-specific | E-Waste will be generated within the Individual Industries will be segregated and disposed to TNPCB Authorised Recyclers. | Road |

**Battery waste**

*Table 36. Details of Battery Waste Generation and Disposal Method*

| Name of the waste | Source | Qty (TPA) | Mode of disposal | Mode of Transport |
|---|---|---|---|---|
| Batteries Waste | Individual industries and commercial units | Intermittent and unit-specific | Battery Waste will be generated within the Individual Industries will segregate and disposed to TNPCB Authorised Recyclers. | Road |

**Bio-Medical waste**

*Table 37. Details of Bio-Medical Waste Generation and Disposal Method*

| Name of the waste | Source | Qty (TPA) | Mode of disposal | Mode of Transport |
|---|---|---|---|---|
| Bio-medical waste | Individual industries and commercial units | Intermittent and unit-specific | Bio-Medical Waste will be generated within the Individual Industries will segregate and disposed to TNPCB Authorised Recyclers. | — |

## 2.10 PROJECT COST

The total project cost for the development of SIPCOT Industrial Park at Allikulam, Thoothukudi District is estimated at ₹66,611.00 lakhs (i.e., ₹666.11 Crores). The cost includes land development, road infrastructure, storm water management, power and water supply systems, greenbelt, and other common amenities within the park.

*Table 38. Project Cost of SIPCOT Industrial Park*

| S.No. | Project Components | Amount (Rs. in lakhs) |
|---|---|---|
| 1. | Land Cost | 16061 |
| 2. | Land development cost | 200 |
| 3. | Roads and drains | 28419 |
| 4. | Desilting and revetment of odai | 1860 |
| 5. | Street Light | 1193 |
| 6. | Water supply system | 5765 |
| 7. | Amenity Infrastructure | 575 |
| 8. | Greenbelt development | 100 |
| 9. | Rain water harvesting | 50 |
| 10. | Solid waste handling facility | 100 |
| 11. | Preliminary and Preoperative expenses | 12288 |
| | **Total** | **66611** |

## 2.11 LYOCELL AND TISSUE MANUFACTURING UNIT :

### 2.11.1 Identification of Project & Project Proponent

Proposed Lyocell and Tissue Manufacturing Unit will be set up by **M/s. APRIL FIBER RESOURCE PRIVATE LIMITED** through an MOU between SIPCOT & the Company for the specific purpose.

### 2.11.2 Brief Description of Nature of the Project:

A total area of 344.61 acres within the Industrial Park is allocated for the establishment of a Lyocell and Tissue manufacturing unit, integrated with a Captive Co-gen Power Plant. The facility is intended to support domestic Lyocell and Tissue production requirements and ensure reliable, self-contained energy supply for manufacturing operations.

The proposed Lyocell and Tissue manufacturing unit will be developed in compliance with all regulatory requirements and environmental standards applicable to the site and the intended industrial activities.

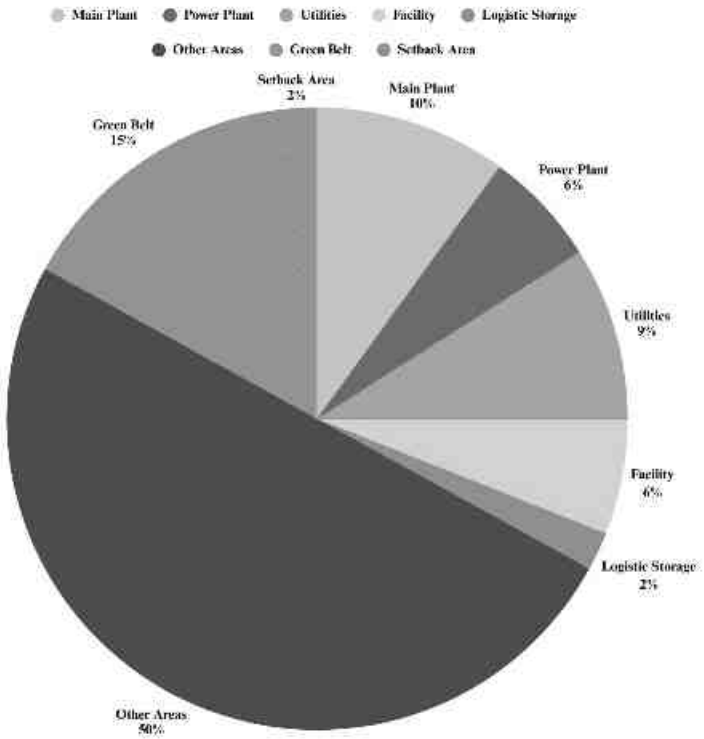
### 2.11.3 Plot area Distribution

*Table 39. Plot area Distribution -Lyocell and Tissue Manufacturing Unit*

| Sr No | Description | Area (ha) | % |
|---|---|---|---|
| **A** | **Main Plant** | **14.61** | **10%** |
| 1 | Ly Phase – 1 | 3.96 | |
| 2 | Ly Phase – 2 | 5.5 | |
| 3 | Tank Farm 1 | 0.78 | |
| 4 | Tank Farm 2 | 1.17 | |
| 5 | Tissue Phase 1 | 1.6 | |
| 6 | Tissue Phase 2 | 1.6 | |
| **B** | **Power Plant** | **7.96** | **6%** |
| 7 | PB 1, 2, 3 | 2.32 | |
| 8 | GT 1, 2, 3 | 0.45 | |
| 9 | Grid Power Sub Station | 0.49 | |
| 10 | DG SET & Oil tank | 0.19 | |
| 11 | Coal Storage | 1.5 | |
| 12 | Biomass Storage | 1.5 | |
| 13 | Cooling Tower | 0.25 | |
| 14 | Cooling Tower – BOP | 1 | |
| 15 | Chiller Cooling Tower | 0.25 | |
| **C** | **Utility** | **13.23** | **9%** |
| 16 | TTR 1 | 1.5 | |
| 17 | TTR 2 | 0.85 | |
| 18 | RO + Evap 1 | 1.7 | |
| 19 | RO 2 | 1.3 | |
| 20 | CPU | 0.08 | |
| 21 | Demin Plant | 0.27 | |
| 22 | Compressor & Chiller | 0.18 | |
| 23 | ETP & Sewage Plant – 1 + OWC | 3.3 | |

| Sr No | Description | Area (ha) | % |
|---|---|---|---|
| 24 | ETP & Sewage Plant – 2 | 3.3 | |
| 25 | Storm Water Pond 1 | 0.3 | |
| 26 | Storm Water Pond 2 | 0.15 | |
| 27 | Scrap Yard | 0.25 | |
| 28 | Fire Pump | 0.07 | |
| **D** | **Facility** | **5.21** | **4%** |
| 29 | Office, health center & parking | 1.17 | |
| 30 | LV Security – 1 | 0.03 | |
| 31 | LV Security – 2 | 0.03 | |
| 32 | Site Office | 0.25 | |
| 33 | Security main gate & emergency control center | 0.04 | |
| 34 | Security post | 0.03 | |
| 35 | Workshop & Store | 1 | |
| 36 | Chemical Storage | 0.56 | |
| 37 | Piping workshop & fabrication | 0.5 | |
| 38 | Fabrication Yard | 0.25 | |
| 39 | Waste management | 1 | |
| 40 | Heavy equipment parking | 0.19 | |
| 41 | L&FC, Fire Truck & Ambulance | 0.09 | |
| 42 | Weigh bridge | 0.08 | |
| **E** | **Storage** | **3.01** | **2%** |
| 43 | Pulp warehouse | 0.94 | |
| 44 | Truck area – coal & biomass | 0.75 | |
| 45 | Truck parking – main plant | 0.77 | |
| 46 | Hazardous Waste | 0.25 | |
| 47 | Salt Storage | 0.25 | |
| 48 | Lime & Stone Storage | 0.05 | |
| **F** | **Others** | **71.98** | **52%** |
| 49 | Road & Drain | 12.53 | |
| 50 | Piperack Ph – 1 | 1.79 | |
| 51 | Piperack Ph – 2 | 0.68 | |
| 52 | Temple | 0.11 | |
| 53 | Open Area | 28.09 | |
| 54 | Area Building and Road | 28.23 | |
| 55 | Assembly Point 1–9 | 0.56 | |
| **G** | **Green Belt** | **20.92** | **15%** |
| 56 | Green Area 15% | 20.92 | |
| **H** | **Setback Area** | **2.53** | **2%** |

| Sr No | Description | Area (ha) | % |
|---|---|---|---|
| 57 | Setback Area | 2.53 | |
| **Total** | | **139.46** | **100%** |




### 2.11.4 Need for the Project and its Importance to the Country & the Region:

The proposed **Lyocell and Tissue manufacturing unit** will address the critical need for enhancing India's domestic capacity for Lyocell and Tissue production. The growing demand for technical textiles, industrial fabrics, and high-performance materials requires significant expansion of local Fibre manufacturing capabilities. The proposed Project also envisages a Captive Co-gen Power Plant of 135 MW , using Coal & Biomass fired Boilers.

Presently, India imports a substantial portion of its Lyocell and Tissue requirements, which affects the competitiveness of the technical textile and other industry sector, increases dependency on external markets. The demand for quality Tissue products in India is rapidly increasing due to rising hygiene awareness, urban lifestyle changes, and growth in healthcare and hospitality sectors. However, domestic production remains insufficient, leading to significant import dependency. The proposed Tissue manufacturing facility within the Industrial Park at Allikulam and other adjacent villages will enhance local production capacity and reduce reliance on imports. The project will contribute to self-reliance, support regional economic growth, and generate employment. It aligns with national priorities of boosting indigenous manufacturing in essential sectors

**Key Need for the Project:**

- Growing demand for hygiene products across India
- High dependency on imported Tissue products
- Need to boost domestic manufacturing capacity
- Employment generation in the region
- Strengthen India's self-reliance in Lyocell production
- Support technical textile and other industries critical to defence, automotive, medical, and infrastructure sectors
- Reduce reliance on imported raw materials.
- Enhance Tamil Nadu's standing as a key player in Fibre manufacturing and Technical textile a exports.
- Provide stable, self-contained energy supply to support continuous industrial operations through the integrated Captive Co-gen Power Plant.

The location of the Lyocell and Tissue with Captive Co-gen Power Plant facility offers strategic advantages:

Immediate connectivity to **Thoothukudi Port**, supporting export-oriented production

Access to established road, rail, and air transport networks

Availability of contiguous land for large-scale, integrated Fibre manufacturing

In addition to its industrial impact, the project is expected to generate employment, support skill development, and contribute to regional economic growth in southern Tamil Nadu.

**2.11.5 Import vs Indigenous Production:**

The proposed Lyocell and Tissue Manufacturing unit is designed to strengthen domestic production capacity in the Lyocell segment, which is currently reliant on imports to meet market demand. Currently, the domestic production of Lyocell fibre in India is very limited, with only a few small-scale or pilot facilities operating in select regions such as Gujarat and Andhra Pradesh. The country relies heavily on imports to meet the growing demand for high-grade and specialty Lyocell fibres used in apparel, technical textiles, and hygiene applications. Nearly 70–80% of India's Lyocell requirement is presently met through imports from countries such as Austria, China, Indonesia, and South Korea, where large integrated facilities are established. The limited indigenous production is primarily due to high capital investment, energy-intensive solvent recovery systems, and restricted availability of domestic technology for large-scale manufacturing. Establishing an indigenous Lyocell fibre manufacturing unit within SIPCOT Industrial Park, Allikulam, will significantly reduce import dependency, promote local value addition, and support national initiatives such as *Make in India* and the *National Technical Textile Mission*, thereby strengthening India's self-reliance in sustainable fibre production..

**2.11.6 Export Possibility**

India's Lyocell fibre market is currently import-dependent; however, with the establishment of large-scale indigenous manufacturing facilities, there is strong potential for export of Lyocell fibre and its blended variants to major global textile markets. Growing international demand in regions such as Europe, North America, and East Asia presents a significant opportunity for Indian producers.

The proposed Lyocell manufacturing unit at SIPCOT Industrial Park, Allikulam, will not only cater to domestic needs but also operate as a potential export-oriented facility. The project site is strategically located just about 15 km from V.O. Chidambaranar Port (Tuticorin Port), providing excellent connectivity for the export of finished fibres and the import of raw materials. This close proximity ensures reduced logistics cost and faster turnaround for international shipments.

With surplus production capacity and the advantage of port access, the unit can effectively export to Bangladesh, Vietnam, Indonesia, Sri Lanka, and other textile-manufacturing nations. Combined with benefits, the project is well-positioned to contribute to India's emergence as a global supplier of sustainable Lyocell fibres, enhancing foreign exchange earnings and supporting the country's green manufacturing vision.

### 2.11.7 Domestic/Export Markets

The Lyocell and Tissue Manufacturing Complex is geared toward addressing supply gaps in India's domestic market while positioning itself as a competitive exporter. Within India, demand for Lyocell -based products is rising across textiles, hygiene, and specialty applications, providing robust local market opportunities. On the global front, the complex is expected to supply high-quality Fibre and tissue to Technical textile and nonwoven markets in Asia-Pacific, the Middle East, and Europe. Its dedicated manufacturing capacity, combined with port access just 15 km away, allows it to scale export operations efficiently, meet international quality standards, and contribute to India's Technical textile and other industries export portfolio

### 2.11.8 PRODUCT & BY PRODUCTS:

The facility is planned to be executed in two phases with the following production details:

*Table 40 Product & By-Product Details (Lyocell Manufacturing Unit)*

| Particulars | Unit | Quantity Proposed | Remarks |
|---|---|---|---|
| **Major Activity (5(d))** | | | |
| Lyocell | TPA | 300,000 | Phase 1: 150,000<br>Phase 2 : 150,000 |
| Tissue | TPA | 100,000 | Phase 1 : 50,000<br>Phase 2 : 50,000 |
| **Minor Activity (1(d))** | | | |
| Captive Power Generation | MW | 135 | Phase-1 : 90 MW<br>Phase-2 : 45 MW |
| **Minor Activity (8(b))** | | | |
| Industrial Sheds & other building | Sq.m | 235,811 | - |

### 2.11.9 Description and Details of the Process

Within the park, a dedicated Lyocell Manufacturing Unit will be established as an integrated facility to support the technical textile sector.

**The process involves:**

- Handling and storage of raw materials such as polymers and chemical inputs
- Fibre production through dissolution of pulp, filtration, regeneration, washing & drying
- Final product finishing, quality control, and packaging for domestic supply and export markets
- In-house power generation to ensure a reliable, uninterrupted energy source for Fibre production operations

The facility will incorporate modern, energy-efficient technologies and stringent environmental management systems, with emphasis on resource optimization, emission control, and water conservation.

This project contributes significantly to the domestic manufacturing capacity for Lyocell and Tissue, reducing reliance on imports and enhancing the competitiveness of India's Technical textile sector.

The proposed Tissue Manufacturing Unit is designed to produce premium-quality tissue paper for hygiene and consumer applications. The process begins with dissolving pulp sheets in water to create a uniform slurry, which is then fed into a tissue machine. As the slurry passes through a series of drying cylinders, it forms continuous tissue sheets. These sheets are subsequently processed using winders to convert them into rolls of varying widths and diameters, tailored to market requirements. The finished rolls are then packaged and stored in a dedicated warehouse for dispatch. The facility will be equipped with state-of-the-art machinery, advanced water recycling systems, and robust quality control measures to ensure operational efficiency and consistent product quality.

### 2.11.10 Raw Material Details for Lyocell and Tissue Manufacturing unit

*Table 41. Product-wise Raw Materials and Transportation Details of Lyocell and Tissue Manufacturing Unit*

| S. No. | Raw Material | CAS No. | Planned Capacity | Means of Storage | Transportation Mode | No. of Tankers / Trailers per Day (or Shipment Details) |
|---|---|---|---|---|---|---|
| 1 | Solvent | 7529-22-8 | 540 m³ (610 T) | Tank within dyke wall | Local – Tanker | 5 tankers of 20 m³ capacity per week |
| 2 | Sodium Hydroxide (NaOH) | 1310-73-2 | 400 m³ (600 T) | Tank within dyke wall | Local – Tanker | 2 tankers of 20 m³ capacity per day |
| 3 | Hydrochloric Acid (HCl) | 7647-01-0 | 200 m³ (450 T) | Tank within dyke wall | Local – Tanker | 4 tankers of 20 m³ capacity per week |

| S. No. | Raw Material | CAS No. | Planned Capacity | Means of Storage | Transportation Mode | No. of Tankers / Trailers per Day (or Shipment Details) |
|---|---|---|---|---|---|---|
| 4 | Ferric Chloride ($FeCl_3$) | 7705-08-0 | 10 T | HDPE bags | Local – Truck | 1 truck per month |
| 5 | Propyl Gallate | 121-79-9 | 4 T | 200 kg drums in chemical warehouse | Local – Truck | 1 truck per month |
| 6 | Sodium Hypochlorite (NaOCl) | 7681-52-9 | 50 $m^3$ | Tank within dyke wall | Local – Tanker | 3 tankers of 10 $m^3$ capacity per month |
| 7 | Soft Finish | – | 250 T | Drums in chemical warehouse | Import (Tuticorin Port) – Sea / Truck | 60 T per shipment (3 containers per shipment) |
| 8 | Hydroxylamine (HA) | 7803-49-8 | 40 T | Drums in chemical warehouse | Local – Truck | 2 trucks per month |
| 9 | Pulp (for Product A & B) | 65996-61-4 | 35,000 T | Bales in pulp warehouse | Import (Tuticorin Port) – Sea / Truck | 10,000 T per shipment; 50 trucks per day for 6 days |
| 10 | Coal | 125612-26-2 | 50,000 T | Loose in covered shed | Import (Tuticorin Port) – Sea / Truck | 30,000–40,000 T per shipment; 100–150 trips of 25 T each per day for 12 days |
| 11 | Biomass | – | 15,000 T | Loose in covered shed | Local – Truck | 24 trips per day |
| 12 | Pulp (additional) | 65996-61-4 | 10,000 T | Bales | Import (Tuticorin Port) – Sea / Truck | 5,000 T per shipment; 50 trips per day for 3 days |
| 13 | Lime | – | 45 T | Loose in covered shed | Local – Truck | 3 trucks per day |
| 14 | Sand | – | 45 T | Loose in covered shed | Local – Truck | 4 trucks per day |
| 15 | Diesel | – | 250 $m^3$ | Tank within dyke wall | Local – Tanker | As per requirement (occasional) |

### 2.11.11 List of Major Machinery and Equipment

The proposed Lyocell and Tissue Manufacturing unit will be supported by a Captive Power Plant (CPP) to ensure uninterrupted power and steam supply for process operations. The CPP is designed with efficient combustion and energy recovery systems to minimize emissions and maximize thermal efficiency. The major equipment proposed for the plant includes CFBC Boilers, Steam Turbine Generators, and Coal/Biomass Handling Systems.

*Table 42. List of Major Machinery and Equipment*

| Major Equipment Description | Proposed No. & Capacity – Phase I | Proposed No. & Capacity – Phase II | Remarks |
|---|---|---|---|
| Power Boiler – CFBC (70:30 Coal to Biomass) | 2 × 280 TPH | 1 × 280 TPH | Coal / Biomass fired |
| Steam Turbine Generator | 2 × 45 MW | 1 × 45 MW | – |
| Coal Handling Area | 150 TPH | – | Covered system with mechanical loaders |

### 2.11.12 Manufacturing Process and Technology

The Lyocell and Tissue Manufacturing unit within the SIPCOT Industrial Park will adopt state-of-the-art manufacturing processes for Lyocell and Tissue production, supported by an integrated Captive Co-gen Power Plant to ensure operational stability.

*Table 43.Manufacturing Process of Lyocell Manufacturing unit*

| Manufacturing Process | |
|---|---|
| **The Lyocell Manufacturing Process** | |
| **Dissolution** | Dissolution of the pulp fibers (Lyocell) and mixing with the solvent. |
| **Filtration** | The above solution is filterd to remove undissolved Lyocell & impurities. |
| **Regeneration** | The filtered solution is extruded through a orifice spinneret and sent through the spinning machine , where it is cut to the required staple length & sent for washing |
| **Washing** | Resulting fibers are washed & residual solvent is recovered and recycled |
| **Drying** | Washed Fibres are opened up and send to the dryer where the moisture is removed. |
| **Packing** | The dryed Fibre is sent to the baling press where it is packed as bales and sent to ware house for dispatch |
| **Tissue Manufacturing Process** | |
| **Pulping** | Pulp sheets are dissolved in water |

| | |
|---|---|
| **Tissue Machine** | Slurry is passed through dryer cylinder and form tissue paper. |
| **Winder** | Tissue paper is passed through winders to make Multiple sheet rolls and cut in various width and diameter rolls as per the market requirements |
| **Warehouse** | Customer rolls from winders are stored in warehouse before dispatch. |

**Key Technological Features:**

- Use of advanced polymer processing technologies, including controlled melting, extrusion, spinning, and Fibre texturizing
- Energy-efficient systems across all production stages to optimize resource utilization
- Comprehensive environmental management measures, including wastewater treatment systems designed to achieve **Zero Liquid Discharge (ZLD)**
- Installation of emission control equipment and monitoring systems to meet regulatory standards
- Incorporation of clean technology and waste minimization strategies across operations

The facility is designed to align with global best practices in technical textile production while meeting national objectives for environmental sustainability and resource efficiency.

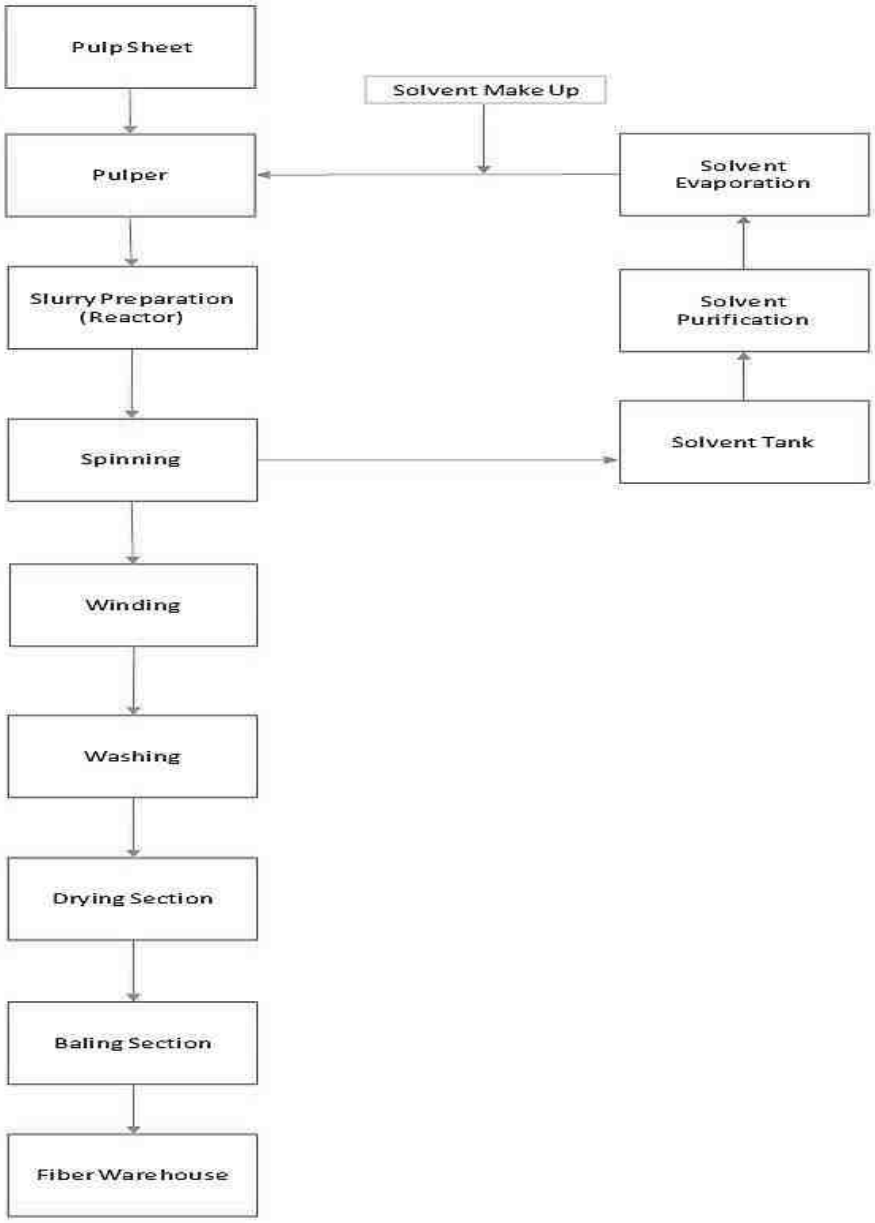



*Figure 14. Process Flow of Lyocell*

### 2.11.13 Details of Products and Storage

The proposed Lyocell and Tissue manufacturing unit within the SIPCOT Industrial Park at Allikulam will produce Lyocell and Tissue products in two development phases. Both products will be in solid form and stored safely within the designated storage area using appropriate containment methods to prevent contamination or material loss.

The details of the proposed products, their physical state, production capacity, and storage mode are presented in Table 39.

*Table 44. Details of Products and their Storage*

| Product Name | Physical State | Planned Capacity (Tons) | | Means of Storage |
|---|---|---|---|---|
| | | Phase I | Phase II | |
| **Lyocell (i.e., Man Made Fibre)** | Solid | 9,000 | 6,750 | Bales |
| **Tissue** | Solid | 3,000 | 2,250 | Rolls & Cartons |

### 2.11.14 Resource Optimization, Recycling and Reuse

The Lyocell is designed to operate with high levels of resource efficiency, minimizing consumption and maximizing reuse wherever feasible.

**Proposed Resource Management Initiatives:**

- Treated effluent from the manufacturing process will be fully recycled and reused, ensuring compliance with **Zero Liquid Discharge (ZLD)**
- Rainwater harvesting infrastructure will be integrated to supplement the facility's water requirements
- Advanced process controls will be implemented to optimize raw material use, energy efficiency, and waste reduction
- Internal recycling loops for water and other process materials will be established to reduce environmental footprint.

The proposed Tissue manufacturing facility is designed with a focus on resource optimization, recycling, and reuse to ensure sustainable operations. The process incorporates efficient water management systems, where water used in pulping and tissue formation is treated and recycled within the plant. Advanced machinery with low energy consumption will be deployed to minimize power usage. Additionally, process waste such as pulp residues and off-cuts will be collected and reused where feasible or disposed of responsibly, ensuring minimal environmental impact and maximum resource efficiency.

The facility will implement resource conservation measures aligned with industry best practices and applicable environmental regulations, contributing to sustainable production while ensuring operational efficiency.

### 2.11.15 Availability of Water, Its Source, Energy/Power Requirement and Source

**Water Requirement and Source**

The water requirement for the proposed Lyocell manufacturing facility will be sourced through supply from Tuticorin Municipal Corporation on a long-term contractual arrangement. Tertiary Treated STP water from Common Sewerage Treatment plant will be utilized to meet the plant's operational needs, with provisions for water recycling to reduce freshwater dependency. Domestic freshwater demand willbe met from SIPCOT fresh water supply.

*Table 45.Water Requirement Table for Lyocell and Tissue Manufacturing Unit*

| Sl. No | Water Requirement | Unit | Proposed | Particulars |
|---|---|---|---|---|
| 1 | **Source of Water Supply** | KLD | 39296 | Tuticorin Municipal Corporation- Tertiary Treatment Plant through pipeline |
| 1A | **Proposed Treatment at Lyocell unit** | Tertiary treatment comprising of multimedia filtration, Ultra filtration & RO systems for incoming raw water | | |
| 2 | **Tertiary Treated STP water** | KLD | 20000 | (**Phase 1:** 10,000) (**Phase 2 :** 10,000 ) |
| 3 | **Recycled Tertiary Treated in-house Effluent** | KLD | 19296 | (**Phase 1:** 9,648 ) (**Phase 2 :** 9,648 ) |

The project is designed to integrate water recycling measures, reducing the demand for fresh water and promoting sustainable resource utilization.

**Wastewater Treatment :**

*Table 46.Waste Water Treatment(Lyocell and Tissue Manufacturing Unit)*

| Category | Description | Proposed (KLD) | Technology |
|---|---|---|---|
| | Ph1 | Ph2 | |
| Trade Effluent | 11,000 | 11,000 | Pre treatment consisting of degradation of organic matter by Fe-C treatment<br>EGSB reactor & sedimentation<br>Ozone treatment (Optional) |
| Treated Effluent Recovery Plant | 9648 | 9648 | Equalization tank - RO systems - Evaporator - Crystallizer & dryer for achieving Zero liquid discharge |

**2.11.16 Employment Generation (Direct and Indirect) from the Project:**

The Lyocell and Tissue Manufacturing Complex will create direct employment through plant operations, production, quality control, administration, and maintenance activities. Additionally, indirect employment will be generated across logistics, raw material supply, packaging, distribution, and ancillary services. The project will contribute to local livelihood enhancement by offering opportunities for both skilled and unskilled workers and is expected to support skill development initiatives, thereby strengthening the regional workforce base.

The proposed project is expected to generate employment for approximately 315 personnel during the construction phase, covering various categories such as skilled, semi-skilled, and unskilled labor, as well as supervisory and administrative staff. During the operational phase, the project is anticipated to create approximately 1000 employment opportunities, comprising 100 direct jobs within the industrial units and associated facilities, and 900 indirect jobs generated through ancillary services, supply chains, logistics, and support sectors

*Table 47. Details of Employment (Construction) at Lyocell and Tissue Manufacturing Unit*

| Employment Generation during Construction Phase | | | |
|---|---|---|---|
| **Permanent Employment [Xc]** | | **Temporary / Contractual Employment [Yc]** | |
| Nos. of Permanent Employment [Apc] | 15 | Nos. of Temporary / Contractual Employment [Acc] | 300 |
| Period of Employment [Bpc] | 313 | Period of Employment [Bcc] | 313 |
| Nos. of Man Days- Xc, [Apc]* [Bpc] | 4695 | Nos. of Man Days, Yc [Acc]* [Bcc] | 93900 |
| **Total C = [Xc] + [Yc] = 98595** | | | |

*Table 48. Details of Employment (operation) at Lyocell and Tissue Manufacturing Unit*

| Employment Generation during Operational Phase | | | |
|---|---|---|---|
| **Permanent Employment [Xc]** | | **Temporary / Contractual Employment [Yc]** | |
| Nos. of Permanent Employment [Apc] | 350 | Nos. of Temporary / Contractual Employment [1000][Acc] | 650 |
| Period of Employment [Bpc] | 313 | Period of Employment (365) [Bcc] | 313 |
| No. of Man Days- Xc, [Apc]* [Bpc] | 109550 | No. of Man Days, Yc [Acc]* [Bcc] | 203450 |
| **Total O = [Xc] + [Yc] = 313000** | | | |
| **Grand Total = C+O = 411595** | | | |

### 2.11.17 Energy / Power Requirement

The proposed Lyocell and Tissue manufacturing facility will be supported by a dedicated Captive Co-generation Power Plant and boiler system to ensure uninterrupted and self-reliant operations. The energy system is designed to meet both process and utility demands through phased development of captive generation, renewable integration, and emergency backup.

In line with energy conservation measures, the project also proposes installation of 5–8 MW rooftop solar power systems and solar street lighting across the industrial complex to supplement captive power generation and promote renewable energy use within the site (Comply with Renewable Consumption Obligation (RCO) Notification, S.O.4421 (E) 27th September, 2025).

*Table 49. Power & Energy Requirement (Lyocell Manufacturing Unit )*

| Particular | Unit | Proposed | Phases |
|---|---|---|---|
| **Power Generation** | | | |
| Source | - | Steam Turbine Generator (STG) | |
| Power load in MW | MW | 135MW (3x45 MW) | **Phase 1 -**2 x 45MW, **Phase 2 -**1 x 45MW |
| **Power Back up & Fuel for DG sets** | | | |
| Capacity of D.G. Sets | kVA | upto 10,000 kVA (4X 2500 kVA) | - |
| Fuel Type & Quantity for DG Sets in kVA | kVA | HSD, 400 LPH for each DG | |

### 2.11.18 Fuel Requirement and Source

The proposed Lyocell manufacturing facility includes a Captive Co-generation Power Plant (CPP) designed to operate on a combination of coal and biomass-based fuels to ensure sustainable and reliable power generation. The total estimated fuel requirement and confirmed linkages are summarized below.

*Table 50. Fuel Requirement and Source (Lyocell Manufacturing Unit)*

| S.No | Fuel | Quantity | Imported / Domestic | Sources / Location | Mode of Transportation |
|---|---|---|---|---|---|
| **Coal** | | | | | |
| 1 | Coal | 30,000 MT/M | Imported | Indonesia, South Africa, Australia, Russia | By Dump trucks from Thoothukudi Port to site |
| 2 | Coal | 30,000 MT/M | Domestic | Talcher Coalfields (Odisha); Tilapia II & III (Odisha); IB Valley (Chhattisgarh, MCL); Raniganj Coalfields (West Bengal); Nagpur | By Dump trucks from domestic source to site |
| **Biofuel** | | | | | |
| 3 | Biomass Briquettes | 27,500 MT/M | Local / Imported | Local sources / Authorized suppliers | By Dump trucks from biomass source to site |
| 4 | Rice Husk / Saw Dust / Other Biomass | 27,500 MT/M | Local / Imported | Local sources / Authorized suppliers | |
| **High-Speed Diesel (HSD)** | | | | | |
| 5 | High-Speed Diesel | 500 $m^3$ / annum | Domestic | Indian Oil Corporation Ltd. (IOCL) | By tanker trucks from respective supply units to site |
| | | | | Hindustan Petroleum Corporation Ltd. (HPCL) | |
| | | | | Bharat Petroleum Corporation Ltd. (BPCL) | |
| | | | | Nayara Energy (formerly Essar Oil) | |
| | | | | Reliance Industries Ltd. (RIL) | |

### 2.11.19 Emissions Details

**Air Pollution Control Measures**

*Table 51. Stack details (Lyocell Manufacturing Unit )*

| Stack Attached to | Nos. of Stacks | Pollutants Emitted | Pollution control measures | APCs | Remark |
|---|---|---|---|---|---|
| **Power boiler** | **One** | Particulate Matter | < 3 (Dry 6% O2 ) mg/Nm3. | Electrostatic precipitators will be installed | CSMS for control Single stack for 3 boilers ESP installed for each boiler |
| | | SOX | < 100 (Dry 6% O2 ) mg/Nm3. | Dry limestone injection system used for $SO_2$ reduction. | |
| | | NOX | < 100 (Dry 6% O2 ) mg/Nm3. | Advanced NOx reduction technologies will be employed, including combustion optimization and selective catalytic/non-catalytic reduction. | |
| | | Mercury (Hg) | < 0,03 (Dry 6% O2 ) mg/Nm3 | Mercury control measures include activated carbon injection and process adjustments to minimize emissions. | |
| **Lyocell** | **4-6 points** | VOC | <50 mg/Nm3 | Scrubbed before venting | - |

**2.11.20 Fugitive Emission**

The Lyocell and Tissue Manufacturing Unit will have specific fugitive emission sources, such as:

- Particulate matter from raw material (pulp) handling and transfer
- Dust emissions from cutting, shredding, and packaging operations

Minor vapour releases from process areas, depending on operational conditions To control and mitigate fugitive emissions, the facility will adopt:

- **Covered conveyor systems** and enclosed transfer points to minimize material spillage
- **Bag filters / dust collectors** at critical dust-generating operations
- **Regular water sprinkling or misting systems** in the coal handling areas, fly ash handling unit, material storage yards and truck loading zones.
- **Proper ventilation and local exhaust systems** in enclosed process areas
- **Periodic ambient air quality monitoring** to ensure compliance with regulatory standards

Additionally, a **dense greenbelt** will be developed around the plant periphery to act as a dust and noise barrier, reducing the spread of fugitive emissions to surrounding areas.

### 2.11.21 Generation of Noise & Vibration and its Mitigation Measures

The Lyocell and Tissue Manufacturing Complex will generate noise and vibration from:

- Process equipment (e.g. pumps, compressors)
- Boiler operations and Captive Co-gen Power Plant (STG)
- Material handling systems, cutting, and packaging units
- Vehicle movement within the plant area

**Mitigation Measures:**

Installation of **acoustic enclosures** and silencers for high-noise equipment like DG sets, turbines, and compressors

- **Regular maintenance** of machinery to minimise mechanical noise and vibration
- Use of **vibration isolation pads and dampers** under heavy equipment
- Designating **restricted access zones** near high-noise areas, with worker PPE (earplugs, earmuffs)
- Continuous **ambient noise monitoring** to ensure compliance with CPCB standards
- Development of a **greenbelt buffer** around the plant boundary to reduce offsite noise propagation.

### 2.11.22 Solid Waste Management

*Table 52.Category-wise Waste Generation and Proposed Treatment Methods*

| S. No. | Nature of Waste | Unit | Quantity | Disposal Method |
|---|---|---|---|---|
| 1 | Biodegradable waste | kg/day | 360 | Organic waste will be treated and the manure will be used for greenbelt development within the premises. |
| 2 | Non-Biodegradable waste | kg/day | 240 | Handed over to TNPCB authorized Recyclers |
| **Total** | | **kg/day** | **600** | - |
| Source : CPHEEO,2016 | | | | |

### 2.11.23 Waste Minimization, Recycle/Reuse/Recovery Techniques, and Energy Conservation Measures

The proposed **Lyocell and Tissue manufacturing facilities** are designed to operate with a high degree of **resource efficiency** and **environmental sustainability**, emphasizing waste minimization, recycling, and energy conservation across all operations.

**Resource Optimization and Waste Minimization**

The plant design incorporates closed-loop systems to minimize waste generation and maximize reuse. Advanced process controls will be adopted to ensure efficient utilization of raw materials, reduce process losses, and maintain operational efficiency.

**Water Conservation and Recycling**

The project is conceived as a Zero Liquid Discharge (ZLD) facility. All treated effluents from the process will be completely recycled and reused within the system.

Internal water-recycling loops will be established to minimize freshwater consumption.

Rainwater harvesting structures will be integrated to augment the facility's water resources and reduce dependency on external supplies.

**Material Recovery and Reuse**

Process residues, off-cuts, and pulp rejections will be collected, segregated, and reused in the production cycle wherever technically feasible.

Non-recyclable process waste will be disposed of responsibly through authorized vendors in compliance with applicable waste management rules.

**Energy Conservation**

- The facility will employ energy-efficient machinery and variable frequency drive systems (VFDs) to optimize power consumption.
- Heat recovery systems and optimized process integration will be implemented to reduce thermal losses.
- Regular energy audits will be conducted to identify opportunities for further reduction in energy consuption.
- Incorporation of renewable energy sources, including 5–8 MW rooftop solar systems and solar street lighting across the facility.

**Sustainable Operations**

Both Lyocell fibre and Tissue production units are designed around the principles of circular economy and resource sustainability**.** By combining advanced manufacturing technology with efficient resource management, the project aims to achieve minimal environmental impact while maintaining high productivity and operational reliability.

### 2.11.24 Cost of the project – Lyocell and Tissue Manufacturing Unit

The estimated project cost for the proposed Lyocell Manufacturing Unit is approximately **INR 4,953 Crores**, which includes capital investment towards land, plant infrastructure, captive co-generation power plant, boilers, process equipment, utilities, and other supporting facilities.

The company has proposed a **Capital EMP cost and towards Social welfare & Community development program INR 246 Crores**. In addition, a **recurring EMP cost of INR 4.5 Crores per annum** is estimated to ensure the continuous operation and maintenance of environmental safeguards during the operational phase.

This significant investment is expected to:

Generate substantial direct and indirect employment opportunities in the region

Attract further investments in Technical textile and other value chain industries, such as garment manufacturing and fabric processing.

Position the SIPCOT Industrial Park as a **strategic industrial hub for Lyocell and Tissue production with seamless export capabilities through Thoothukudi Port**

The investment in the Lyocell and Tissue Manufacturing Unit with Captive Co-gen Power Plant is expected to have a transformative impact on the region's industrial landscape, aligning with the state's long-term vision for sustainable and globally competitive industrial growth.

## 2.12 RAINWATER HARVESTING & STORM WATER MANAGEMENT

Rainwater harvesting and stormwater management for the proposed SIPCOT Industrial Park have been planned based on quantitative hydrological assessment, standard runoff estimation formulae, site-specific rainfall data, land-use characteristics, and appropriate runoff coefficients. The system integrates roof-top rainwater harvesting, stormwater detention, groundwater recharge, and controlled discharge, and is adequate to manage runoff generated under both average and peak rainfall conditions without causing downstream impacts.

### 2.12.1 Rainfall and Design Basis

| Parameter | Value |
|---|---|
| Average annual rainfall (R) | 0.69615 m |
| Peak rainfall | 0.21 m per day |
| Number of rainy days | 43 |
| Average rainfall duration (T) | 8 hours (28,800 seconds) |

### 2.12.2 Formulae Adopted

**Runoff Volume (Average Condition)**

$$V = R \times A \times C$$

**Average Daily Runoff**

$$V_{day} = \frac{V_{annual}}{\text{Number of Rainy Days}}$$

**Peak Runoff Discharge**

$$Q = \frac{V_{peak}}{T}$$

Where
R = Average annual rainfall in metres
A = Catchment area in square metres
C = Runoff coefficient
T = Rainfall duration in seconds

### 2.12.3 Runoff Coefficients Adopted

Runoff coefficients have been adopted as per **CPHEEO guidelines and standard hydrological practice**.

| Surface Type | Runoff Coefficient (C) |
|---|---|
| Roof-top areas | 0.9 |
| Paved and compacted areas | 0.7 |
| Greenbelt and pervious areas | 0.3 |

### 2.12.4 Roof-top Rainwater Harvesting System

Roof-top rainwater harvesting will be implemented at the individual plot level. SIPCOT does not propose a common rainwater harvesting system. Each industry shall harvest a minimum of 50 percent of roof-top runoff within the plot as per TNPCB and BIS norms.

**System components include**:

- Roof-top downpipes connected to collection chambers
- Storage sumps or recharge pits within individual plots
- Overflow connections to the stormwater drainage network

### 2.12.5 Groundwater Recharge Structures

**Percolation Pits**

Percolation pits are proposed along the stormwater drainage network and greenbelt areas to enhance groundwater recharge.

| Parameter | Specification |
|---|---|
| Shape | Circular |
| Diameter | **1.0 m** |
| Depth | **3.5 m** |
| Effective storage per pit | **2.75 m³** |
| Number of pits | **615 Nos.** |
| Total recharge capacity | **1,691 m³** |

The pits will be provided with graded filter media comprising boulders, gravel, and sand, along with silt traps at the inlet to prevent clogging.

### 2.12.6 Stormwater Drainage Network

The stormwater drainage system comprises internal drains along roads and plots, and a peripheral Drain to safely convey runoff.

| Component | Specification |
|---|---|
| Drain width | **1.5 m** |
| drain depth | **1.2 m** |
| Total Drain length | **28,650 m** |
| Appurtenances | Silt traps and sedimentation chambers |

The stormwater drains provide a **temporary detention capacity of approximately 53,261 m³**, contributing significantly to peak runoff attenuation.

### 2.12.7 Storage Ponds within Lyocell Unit

Two storage ponds are proposed within the Lyocell Manufacturing Unit for temporary storage of roof-top runoff.

| Parameter | Provision |
|---|---|
| Number of ponds | 2 Nos. |
| Purpose | Roof-top runoff storage |

| Parameter | Provision |
|---|---|
| Holding capacity | **Three days of roof-top runoff** |
| Function | Peak flow attenuation and reuse |

### 2.12.8 Parshall Flume Arrangements

Parshall flumes are proposed near the final outfall locations for monitoring stormwater discharge.

| Parameter | Provision |
|---|---|
| Location | Near final outfalls |
| Design discharge | **0.17 KL per second** |
| Function | Flow measurement and compliance monitoring |

### 2.12.9 Peak Runoff Management

Under peak rainfall of 0.21 m per day, the incremental runoff generated from the proposed development is estimated at 42,036 KLD, corresponding to a peak inflow of approximately 1.46 KL per second. Due to the combined effect of roof-top harvesting, stormwater detention, percolation pits, and storage ponds, the attenuated discharge at the outfall is limited to approximately 0.17 KL per second, ensuring non-erosive and regulated discharge into Nilaviyal Odai.

### 2.12.10 Conclusion

The rainwater harvesting and stormwater management measures are sufficient to manage runoff from the proposed SIPCOT Industrial Park under both average and peak rainfall conditions, while enhancing groundwater recharge and safeguarding downstream odais.

# 3. DESCRIPTION OF ENVIRONMENT

## 3.1 INTRODUCTION

To cover environmental baseline studies, following aspects have been covered :-
The baseline data is generated through field study within the impact zone (Core Zone and Buffer Zone) for various components of the environment viz. Air, Noise, Soil, Water, Land, Ecology and Socio-economic. The baseline environmental studies have been done from March 2025 to May 2025 by M/s Perfact Researchers Pvt. Ltd. in a study area of 10 km radius from the project site. While generating the baseline status of the physical and biological environment of the study area, the concept of impact zone has been considered. The impact zone selection is based on preliminary screening and modeling studies. The data collection had been done as given below:
Field Survey and site visit:-

- Primary monitoring of key environmental parameters like Air, Noise, Soil, Water, Land, Ecology and Socio Economic survey during the post monsoon season.
- Consultation with local people, government departments such as the Forest department, Panchayats etc.
- Literature review on secondary information available for the study area.

## 3.2. BASE MAPS OF THE AREA

### 3.2.1 Google Image of the Project Site

Map showing Study area & Close view of the study area with 1 km Buffer radius is given below

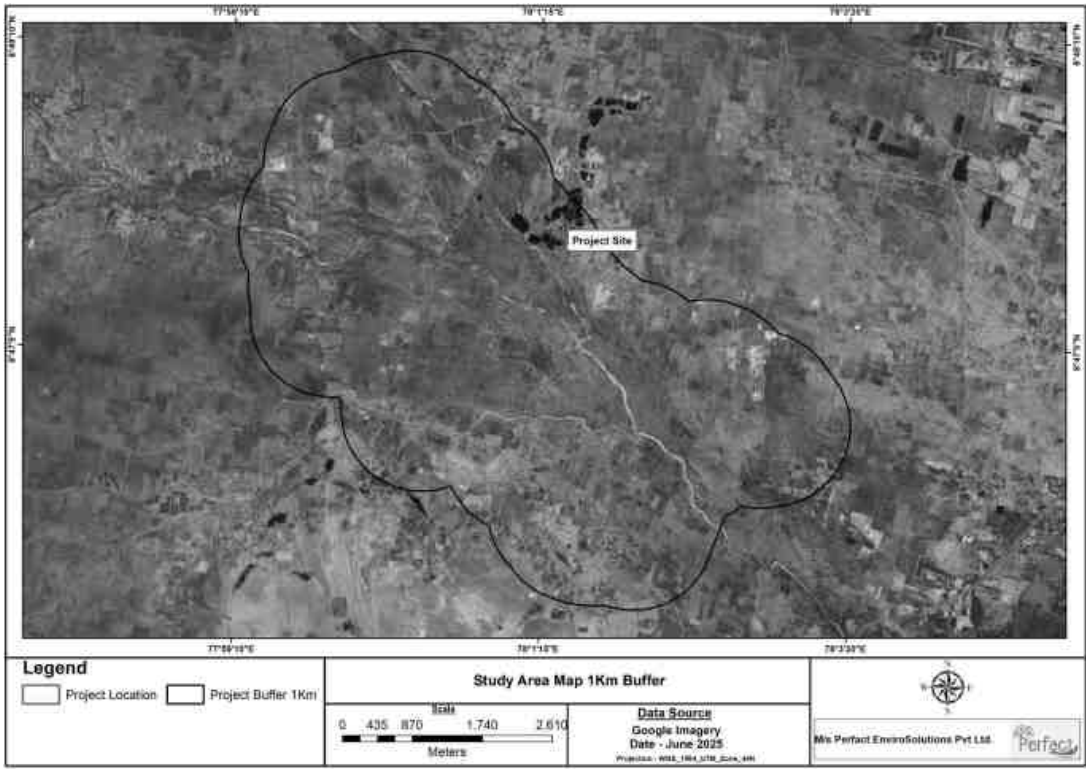



*Figure 14. Study Area Map 1 km Buffer*

### 3.2.2 Topographical Map

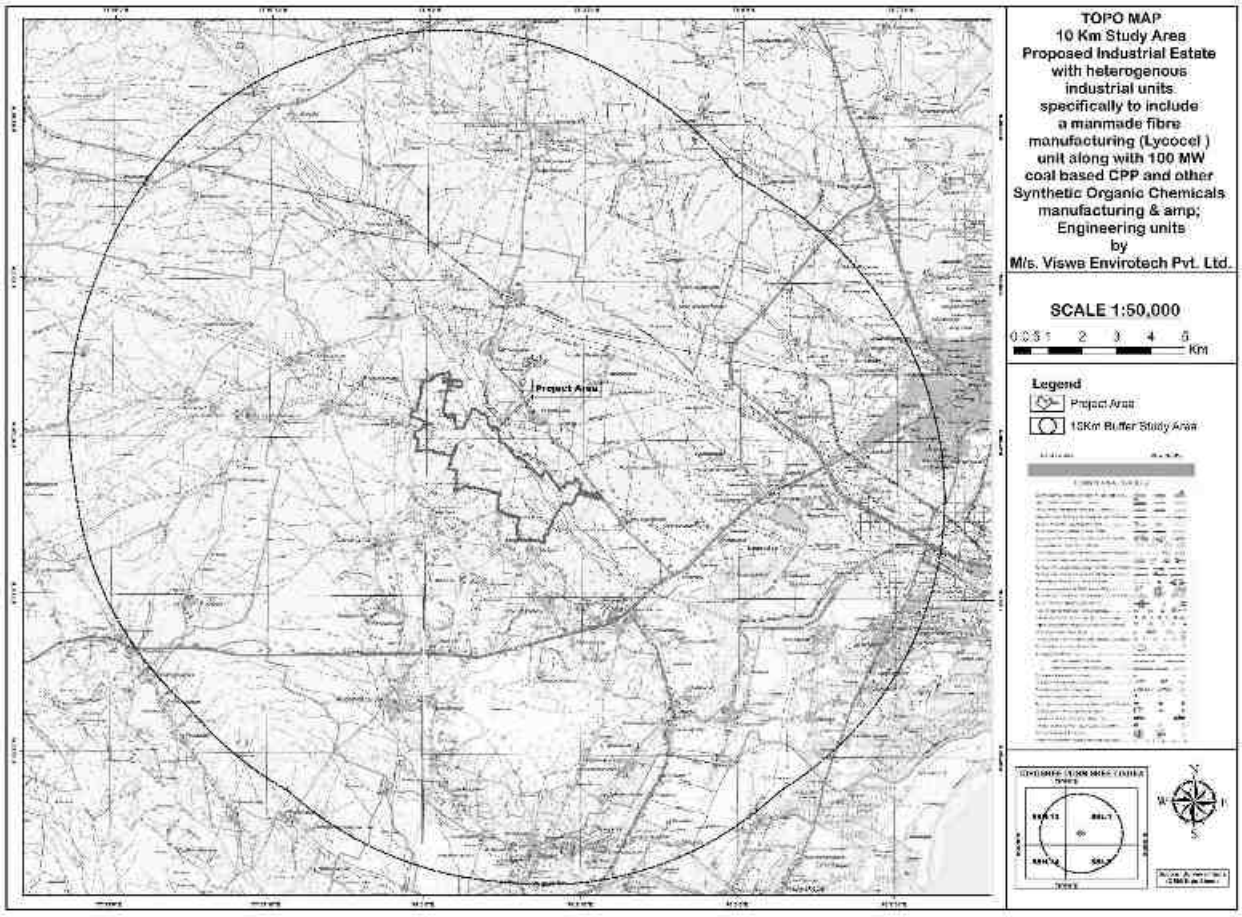



*Figure 15. Topographic Map of Study area*

### 3.2.3 Accessibility Map for Environmental Monitoring

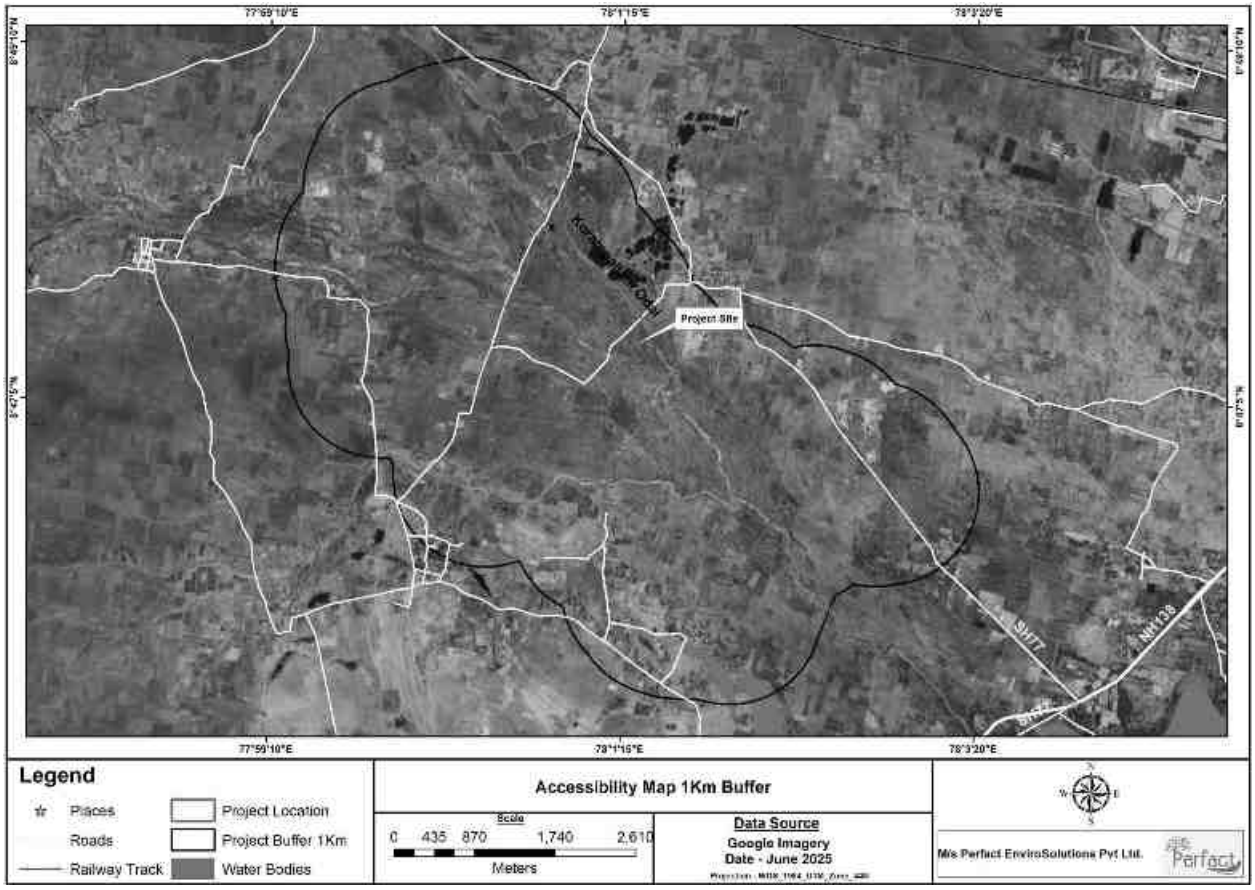



*Figure 16. Accessibility Map 1 km*

### 3.2.4 DEM Map

Digital Elevation Model (DEM) Map with 10 km radius is given below:

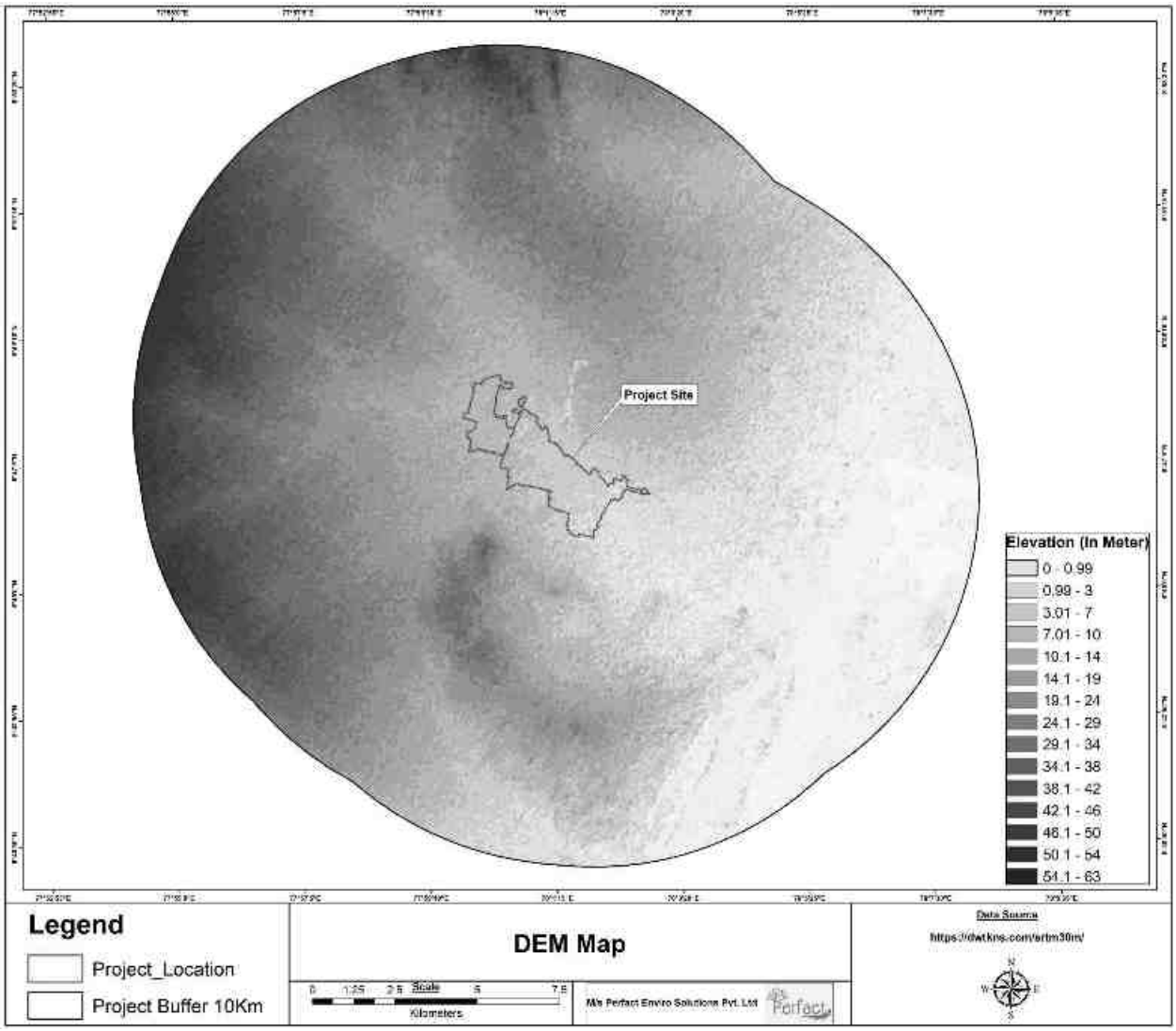



*Figure 17. DEM Map*

### 3.2.5 Village Map

Village Map with 10 km radius is given below:

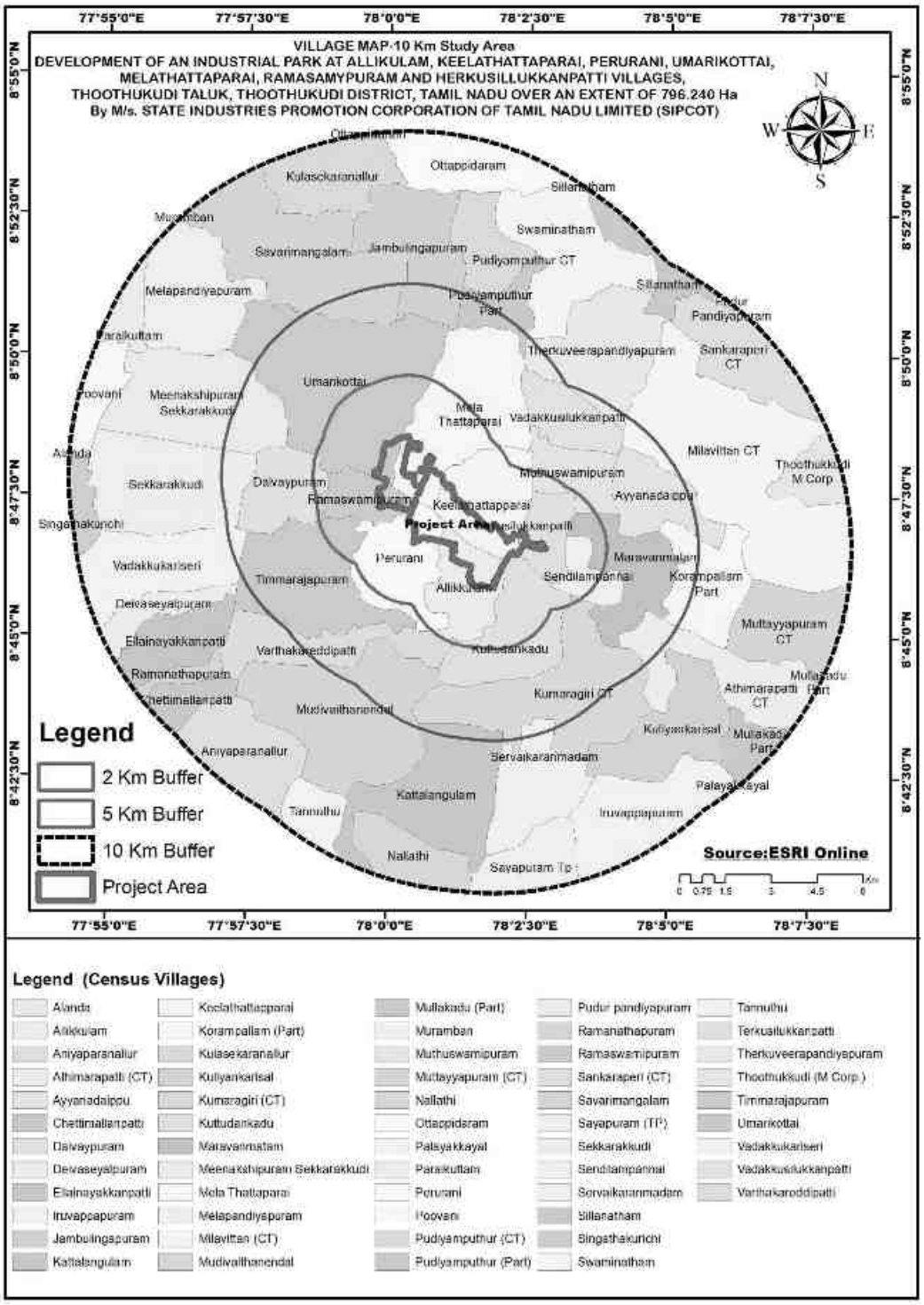



*Figure 18. Village Map of the Study Area*

## 3.3 METHODOLOGY OF BASELINE DATA COLLECTION

*Table 48. Methodology of baseline data collection*

| S. No. | Functional Area | Methodology |
|---|---|---|
| 1. | Micro-Meteorological Data | Site specific Micro-Meteorological Data has been used for the study. The important parameters considered are temperature, humidity & wind speed. |
| 2. | Ambient Air Quality | The ambient air quality monitoring was done to assess the ambient air quality in the summer season March, 2025 to May 2025. The guidelines for selections of ambient air monitoring stations given in IS – 5182( part 14), 2000 were followed. |
| 3. | Water Quality | To assess the water quality of the proposed area, Grab, Composite sampling done for water sample collection. Water samples were taken as per the Standard Methods (IS & APHA, 23rd Edition 2017). Necessary precautions were taken for the preservation of samples. The physical parameters viz. pH, temperature and conductivity were measured at site using a portable water analyser. |
| 4. | Ambient Noise Quality | At each station noise level was monitored for 24-hours. For each measurement, dB (A) readings were taken for every 15 minutes for 24 hrs once in a season to get Leq values. |
| 5. | Soil Quality | Augur method was used for soil sampling and samples were collected below 15 cm depth after removing the upper crust. |
| 6. | Topography, Land-form and Land Use | The land use/ land cover map has been generated on a 1:50,000 scale using Satellite imagery, topographical maps, Survey of India and ground truth information. |
| 7. | Biological Environment | Primary and secondary data collection has been done by the Ecology and Biodiversity team for the study of flora and fauna in the core and Buffer Zone. |
| 8. | Socio Economic Environment | For demography and socioeconomics, block wise data has been collected and used for the assessment of impacts. |

## 3.4 METEOROLOGY

Before dwelling on the various aspects of air quality, it would be in the fitness of things to discuss the meteorological status of the area as the dispersion of fugitive emission depends largely on the meteorological conditions of the area. The selection of sampling stations is mainly guided by the predominant wind direction during the monitoring season in the area.

### 3.4.1 Climatic Conditions (As Per Indian Meteorology Department Data, Thoothukudi New Port, Tamil Nadu)

The meteorological data from Indian Meteorological Station was processed for the nearest IMD station at Thoothukudi New Port which has been utilized for the study The Important parameters considered are temperature, Humidity, Wind Speed, Wind Direction and Rainfall. The meteorological data of the last 15 years (2010-2025) as recorded at Thoothukudi New Port are given below:

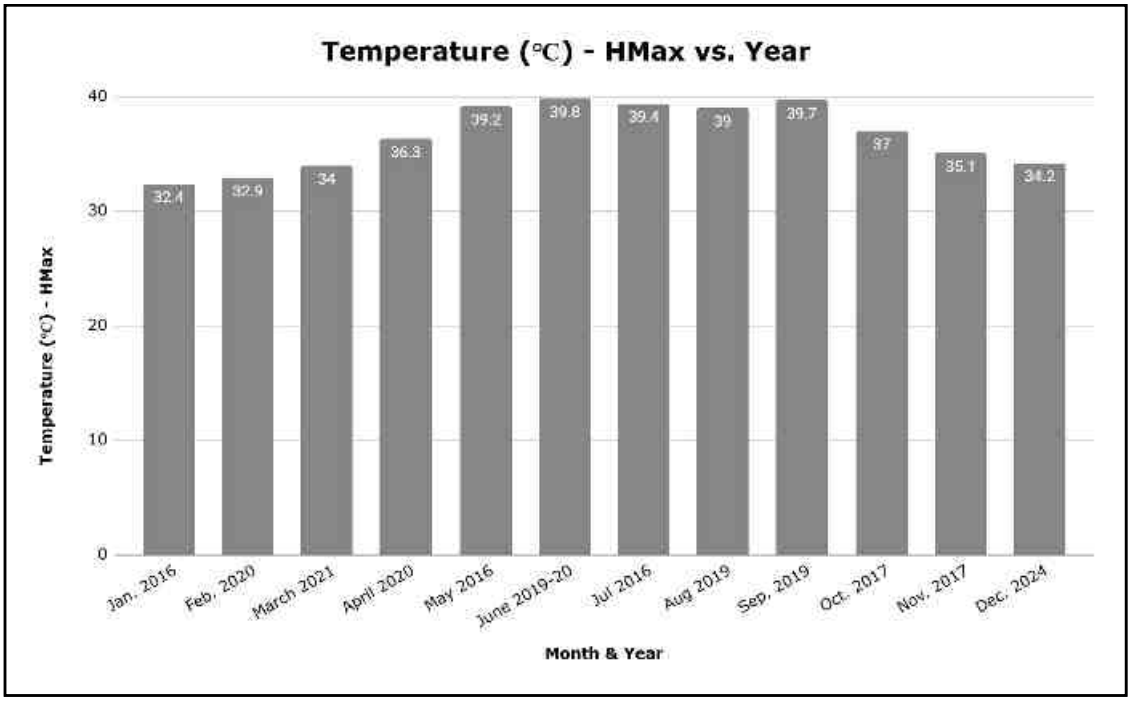
### 3.4.2 Temperature

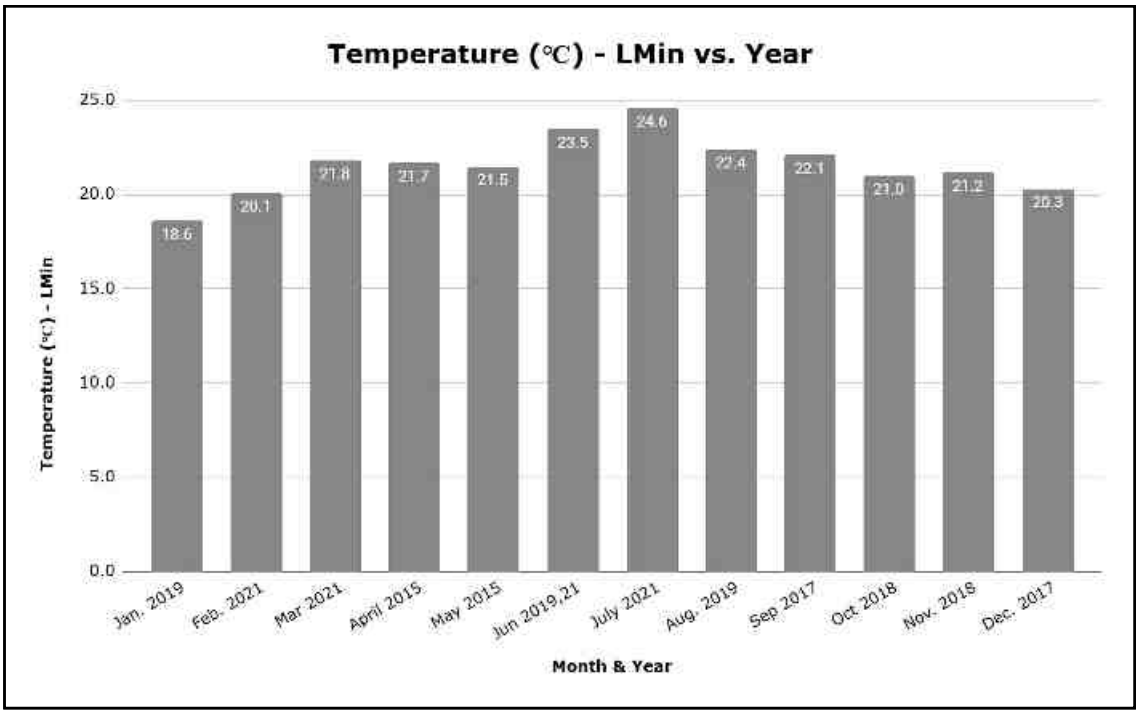
The maximum temperature of the area was recorded as 39.8°C in June 2019 & 2020 whereas the minimum temperature of the area was recorded as 18.6°C in January 2020. Data of the maximum and minimum temperature are given below.

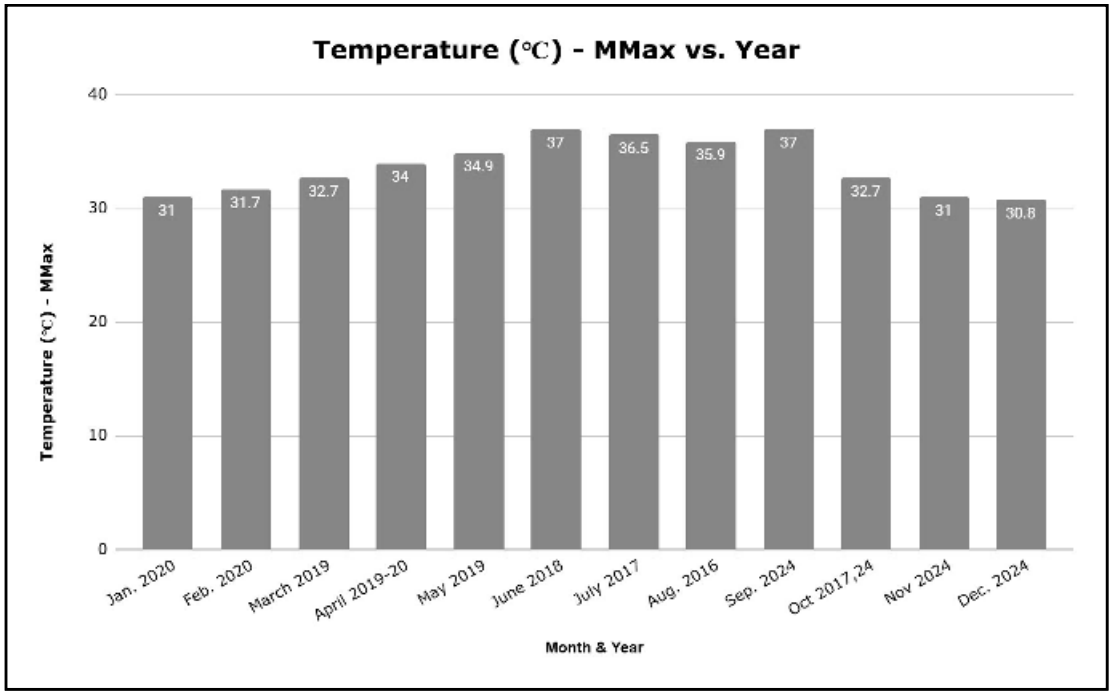
*Table 49. Temperature*

| Month | Temperature (℃) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Year | HMax | Year | LMin | Year | MMax | Year | MMin |
| January | 2016 | 32.4 | 2019 | 18.6 | 2020 | 31 | 2019 | 21.0 |
| February | 2020 | 32.9 | 2021 | 20.1 | 2020 | 31.7 | 2015 | 22.5 |
| March | 2021 | 34 | 2021 | 21.8 | 2019 | 32.7 | 2015,21 | 24.5 |
| April | 2020 | 36.3 | 2015 | 21.7 | 2019-20 | 34 | 2015 | 24.8 |
| May | 2016 | 39.2 | 2015 | 21.5 | 2019 | 34.9 | 2015 | 25.8 |
| June | 2019-20 | 39.8 | 2019,21 | 23.5 | 2018 | 37 | 2021 | 25.8 |
| July | 2016 | 39.4 | 2021 | 24.6 | 2017 | 36.5 | 2019 | 25.8 |
| August | 2019 | 39 | 2019 | 22.4 | 2016 | 35.9 | 2019 | 25.6 |
| September | 2019 | 39.7 | 2017 | 22.1 | 2024 | 37.0 | 2018 | 25.1 |
| October | 2017 | 37.0 | 2018 | 21.0 | 2017,24 | 32.7 | 2018 | 23.9 |
| November | 2017 | 35.1 | 2018 | 21.2 | 2024 | 31 | 2018 | 23.3 |
| December | 2024 | 34.2 | 2017 | 20.3 | 2024 | 30.8 | 2017 | 22.9 |

**(Source: IMD, Station- Thoothukudi New Port, 2010 - 2025)**


Temperature (°C) - HMax vs. Year
Temperature (°C) - HMax
40
30
20
10
0
32.4
32.9
34
36.3
39.2
39.8
39.4
39
39.7
37
35.1
34.2
Jan. 2016
Feb. 2020
March 2021
April 2020
May 2016
June 2019-20
Jul 2016
Aug 2019
Sep. 2019
Oct. 2017
Nov. 2017
Dec. 2024
Month & Year


Temperature (°C) - LMin vs. Year
Temperature (°C) - LMin
25.0
20.0
15.0
10.0
5.0
0.0
18.6
20.1
21.8
21.7
21.5
23.5
24.6
22.4
22.1
21.0
21.2
20.3
Jan. 2019
Feb. 2021
Mar 2021
April 2015
May 2015
Jun 2019,21
July 2021
Aug. 2019
Sep 2017
Oct 2018
Nov. 2018
Dec. 2017
Month & Year



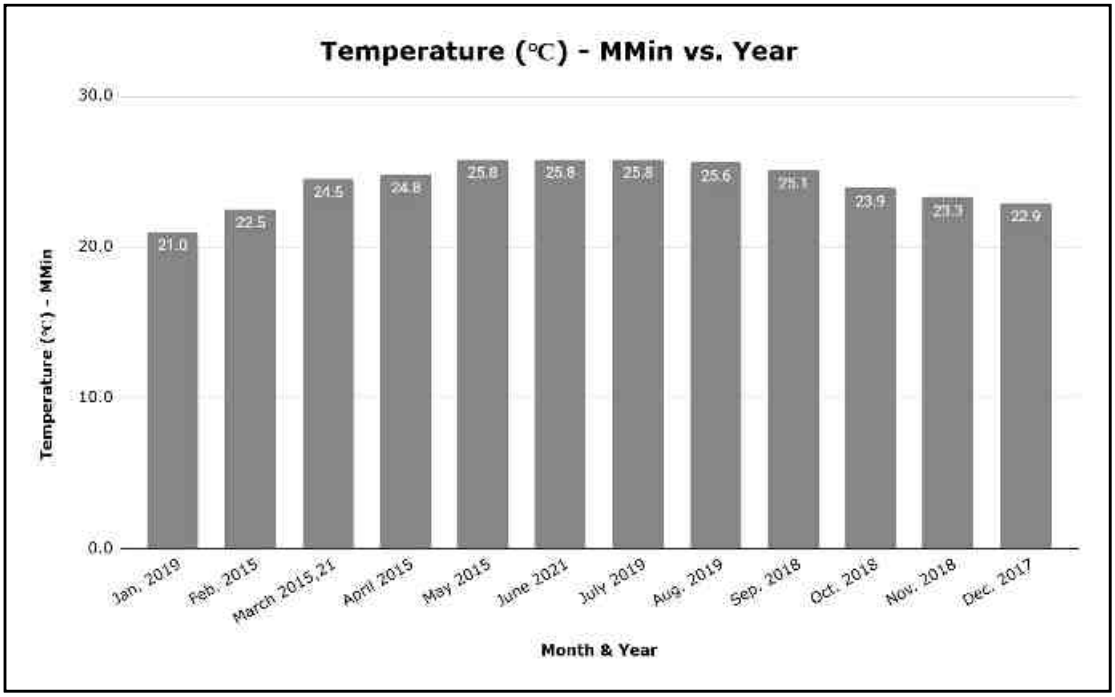




*Figure 19. Highest Maximum Temperature, Lowest Minimum Temperature, Mean Maximum Temperature, Mean Minimum Temperature*

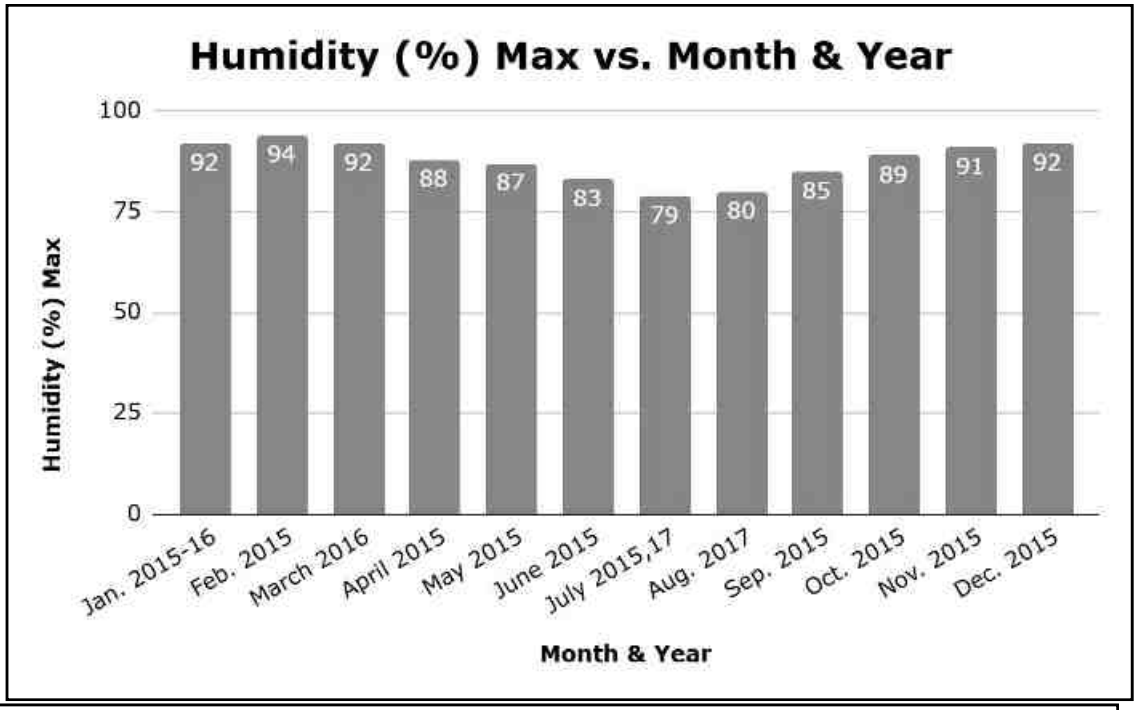
### 3.4.3 Relative Humidity

The Maximum relative humidity was recorded as 94% in February 2015. Minimum relative humidity was recorded as 58% in June 2018 & 2020.

*Table 50. Relative Humidity*

| Month | Humidity (%) | | | |
|---|---|---|---|---|
| | Year | MMax | Year | MMin |
| January | 2015-16 | 92 | 2018 | 70 |
| February | 2015 | 94 | 2018 | 68 |
| March | 2016 | 92 | 2018 | 71 |
| April | 2015 | 88 | 2018 , 2021 | 74 |
| May | 2015 | 87 | 2019, 2021 | 72 |
| June | 2015 | 83 | 2018, 2020 | 58 |
| July | 2015,17 | 79 | 2018 | 58 |
| August | 2017 | 80 | 2018 | 61 |
| September | 2015 | 85 | 2016, 2024 | 60 |
| October | 2015 | 89 | 2017 | 70 |
| November | 2015 | 91 | 2017 | 72 |
| December | 2015 | 92 | 2017 | 74 |

*(Source: IMD, Station- Thoothukudi New Port, 2010 - 2025)*



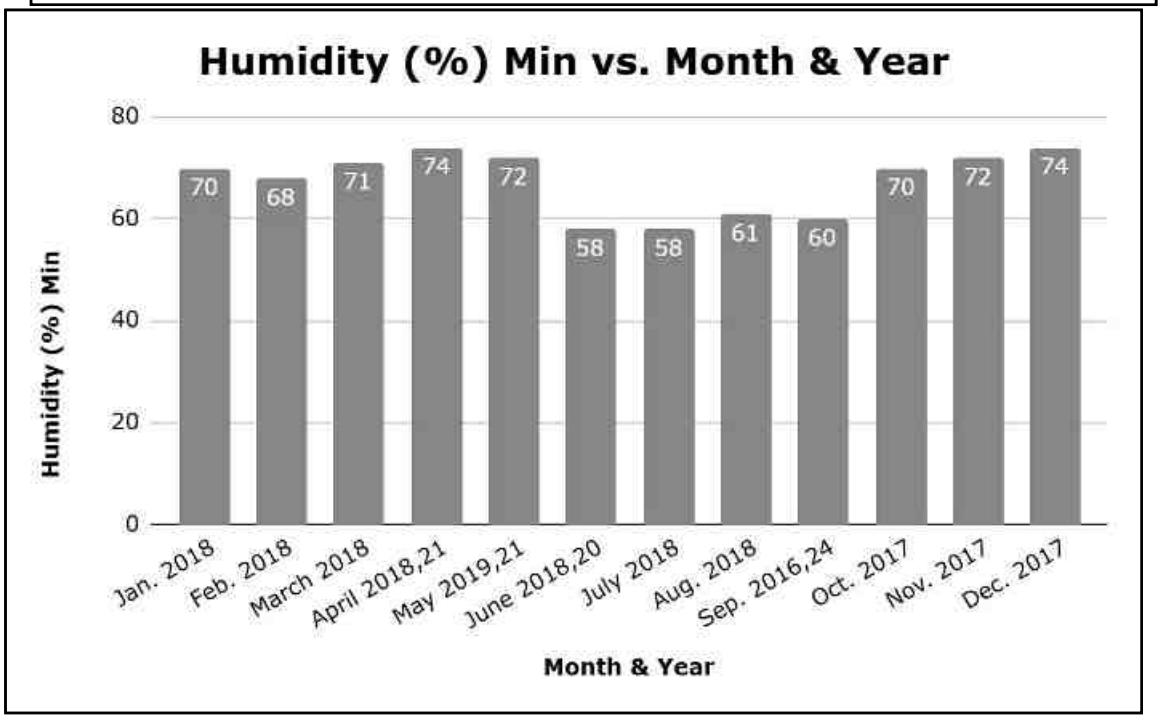




*Figure 20. Maximum Humidity & Minimum Humidity*

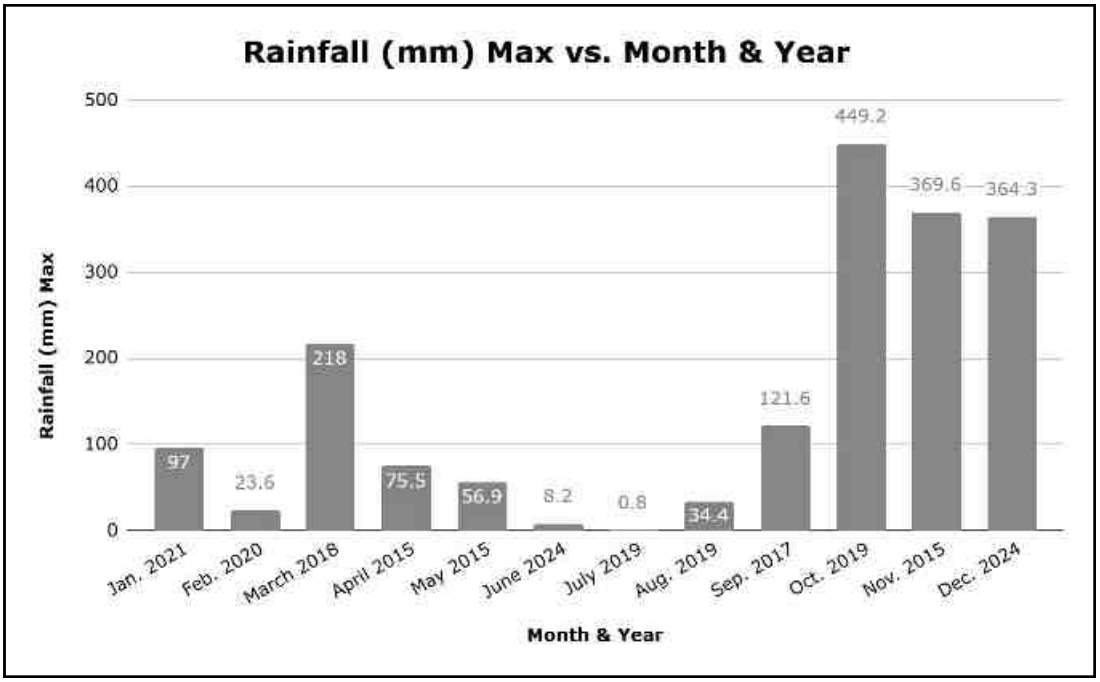
### 3.4.4 Rainfall

The maximum rainfall was recorded in October (up to 449.2 mm) in 2019. The annual mean rainfall based on the IMD data recorded was 696.15 mm. From data, it is clear that the maximum time of year remains moist, the wet months exceed dry months. September, October, November, December, January, February and March are the wettest months.

*Table 51. Rainfall*

| Month | Rainfall (mm) | | | | |
|---|---|---|---|---|---|
| | Year | Max | Year | Min | Average |
| January | 2021 | 97 | 2018 | 3.56 | 20.37 |
| February | 2020 | 23.6 | 2015 | 0.5 | 5.31 |
| March | 2018 | 218 | 2021 | 0.6 | 51.61 |
| April | 2015 | 75.5 | 2019 | 0.1 | 19.89 |
| May | 2015 | 56.9 | 2017 | 0.2 | 21.99 |
| June | 2024 | 8.2 | 2015 | 0.6 | 2.06 |
| July | 2019 | 0.8 | 2017, 2024 | 0.3 | 0.2 |
| August | 2019 | 34.4 | 2021 | 3 | 9.8 |
| September | 2017 | 121.6 | 2018 | 1.6 | 35.7 |
| October | 2019 | 449.2 | 2016 | 15.4 | 161.59 |
| November | 2015 | 369.6 | 2019 | 151.6 | 205.86 |
| December | 2024 | 364.3 | 2021 | 11.7 | 161.77 |

(Source: IMD, Station- Thoothukudi New Port, 2010 - 2025)



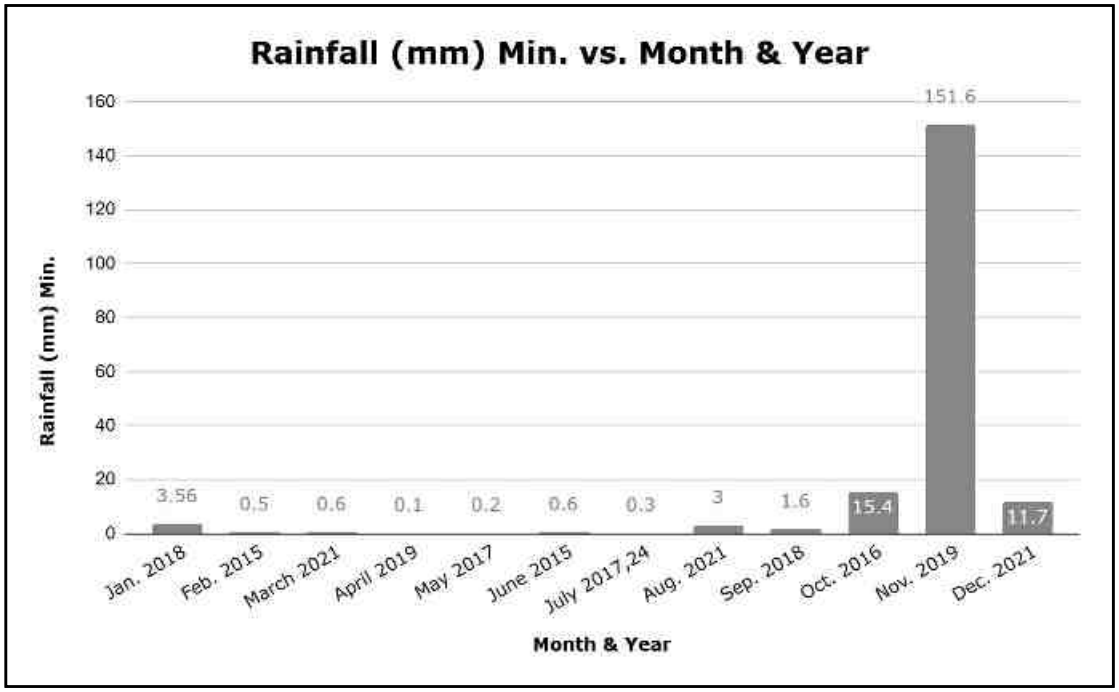




*Figure 21. Maximum Rainfall & Minimum Average Rainfall*

### 3.4.5 Wind Speed

The maximum wind speed was recorded in July (29.1 km/hr) in 2018 and minimum wind speed was recorded in August (1.0 km/hr) in 2024.

*Table 52. Wind Speed*

| Month | Wind speed (km/hr) | | | |
|---|---|---|---|---|
| | Year (MMax) | MMax (°C) | Year (MMin) | MMin (°C) |
| January | 2015 | 19.7 | 2019, 2021 | 9 |
| February | 2018 | 23.5 | 2019 | 5.8 |
| March | 2018 | 21.8 | 2020 | 5.5 |
| April | 2017 | 22.2 | 2021 | 1.3 |
| May | 2017 | 24.4 | 2019 | 4.7 |
| June | 2015 | 28.8 | 2024 | 1.5 |
| July | 2018 | 29.1 | 2024 | 3.1 |
| August | 2019 | 21.4 | 2024 | 1 |
| September | 2015 | 22.2 | 2024 | 2.5 |
| October | 2015 | 16.1 | 2024 | 1.2 |
| November | 2017 | 14.2 | 2021 | 1.3 |
| December | 2015 | 17.2 | 2024 | 2.7 |

(Source: IMD, Station- Thoothukudi New Port, 2010 - 2025)

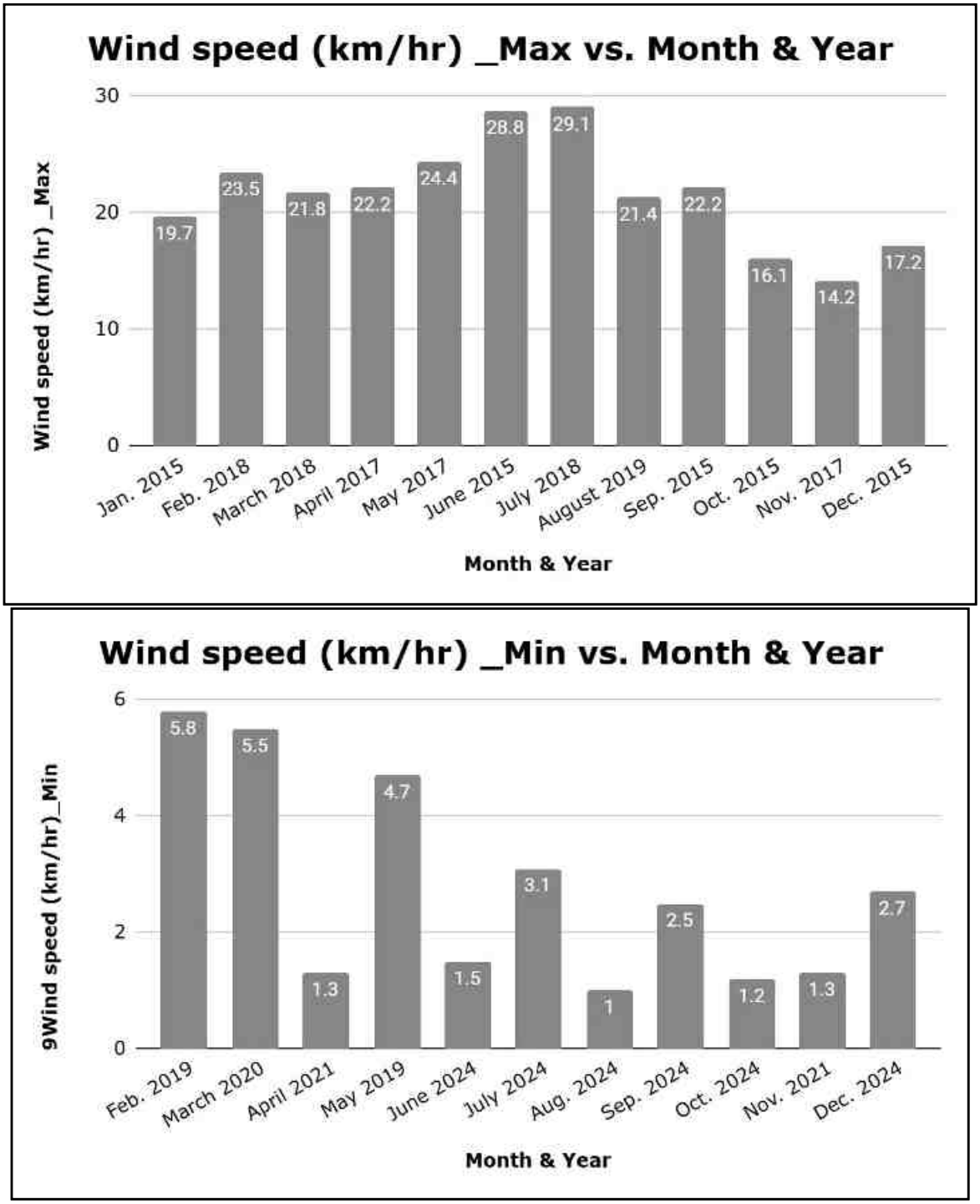



*Figure 22. Maximum Wind Speed & Minimum Wind speed*

### 3.4.6 Wind Direction

*Table 53. Wind Direction*

| Month | Wind Direction | |
|---|---|---|
| | Predominant Wind Direction | Calm (%) |
| January | East | 0.2% |
| February | East | 0.3% |
| March | South South West | 4.5% |
| April | South | 9.5% |
| May | South West | 8.9% |
| June | West | 4.2% |
| July | West | 4.0% |
| August | West | 8.6% |
| September | West | 7.8% |
| October | South West | 16.1% |
| November | North East | 12.3% |
| December | North East | 5.7% |

(Source: IMD, Station- Thoothukudi New Port, 2010 - 2025)

The predominant wind direction for the monitoring period (March 2025 to May 2025) is blown from SouthWest.

**Windrose Diagram**

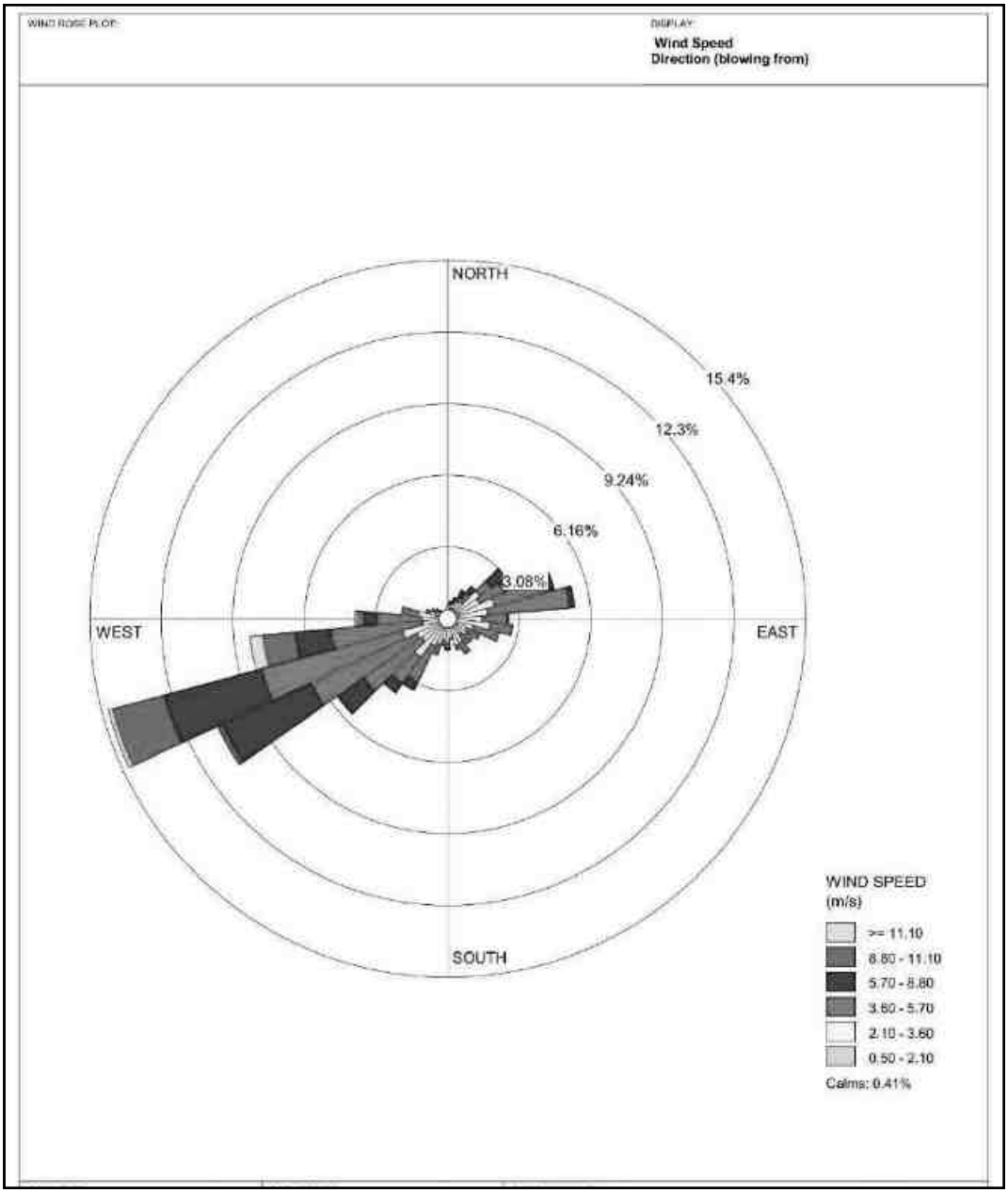



*Figure 23. Micro met season Windrose Diagram*

### 3.4.7 Onsite season specific measured Micro-Meteorological Data (March, 2025 to May 2025)

*Table 54. Micro-meteorological Data*

| Month | Temperature($^0$C) | | | Relative Humidity (%) | | | Wind Speed (m/s) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Max | Min | Mean | Max | Min | Mean | Max | Min | Mean |
| March | 33.80 | 25.30 | 28.80 | 93.35 | 40.57 | 73.20 | 8.40 | 0.19 | 3.47 |
| April | 34.87 | 27.18 | 30.00 | 89.95 | 47.34 | 73.50 | 6.62 | 0.34 | 3.50 |

| Month | Temperature($^0$C) | | | Relative Humidity (%) | | | Wind Speed (m/s) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Max | Min | Mean | Max | Min | Mean | Max | Min | Mean |
| May | 35.53 | 27.31 | 30.52 | 92.94 | 44.83 | 72.74 | 12.08 | 0.32 | 5.92 |

## 3.5 AMBIENT AIR QUALITY

The ambient air quality monitoring was done to assess the ambient air quality. Monitoring was carried out at 10 stations for the month of March, 2025 to May, 2025. The guidelines for selections of ambient air monitoring stations given in IS – 5182 parts 14, 2000 were followed. These guidelines state that, "when the objective of air sampling is to identify the contribution from specific sources of pollution, the sampling locations should be located in upwind and the downwind direction of such sources".

### 3.5.1 Sampling Station Selection

The guidelines for the selection of ambient air monitoring stations given in IS – 5182 parts 14,2000 were followed. These guidelines state that, "when the objective of air sampling is to identify the contribution from specific sources of pollution, the sampling locations should be located in upwind and the downwind direction of such sources".

Criteria for site selections: The selection of the ambient air quality monitoring sites in the core zone and buffer zone (around the project area) was based on screening the region for such important factors as meteorological conditions, sensitive environmental locations, human settlement and the surrounding geographical features.

- The meteorological features considered were wind speed and direction.
- Environmental sensitivity was considered with regards to the proximity and density of human settlements to the project site and location of such sensitive places as schools and hospitals around the project site.
- The desktop study was conducted to critically analyze the above factors using wind rose map, topographical map, and land use map to check for the correct representation of the locations around the project site.
- Based on the above factors, the location of Air sampling stations for (March, 2025 to May, 2025).

### 3.5.2 Ambient Air Sampling Locations (March, 2025 to May, 2025)

*Table 55. Ambient Air Sampling Locations*

| Location no. | Sampling Location | Latitude & Longitude | Distance & Direction from Project Boundary | Wind Direction | Environmental Significance | Zone |
|---|---|---|---|---|---|---|
| A1 | Onsite, West | 8°47'15.51"N, 78° 0'24.98"E | Within site | Upwind | Industrial Area | Core Zone |
| A2 | Onsite, East | 8°46'39.47"N, 78° 2'20.02"E | Within site | Cross-wind | Industrial Area | Core Zone |
| A3 | Onsite, North | 8°47'7.09"N, 78° 1'25.23"E | Within site | Cross-wind | Industrial Area | Core Zone |

| Location no. | Sampling Location | Latitude & Longitude | Distance & Direction from Project Boundary | Wind Direction | Environmental Significance | Zone |
|---|---|---|---|---|---|---|
| A4 | Onsite, South | 8°46'15.61"N, 78° 1'29.11"E | Within site | Cross-wind | Industrial Area | Core Zone |
| A5 | Thiruvanthapuram | 8°46'16.71"N, 78° 1'11.45"E | 1.05 km WSW | Upwind | Residential Area | Buffer Zone |
| A6 | Therku Silukkanpatti | 8°46'7.73"N, 78° 2'59.27"E | 1.41 km SE | Downwind | Residential Area | Buffer Zone |
| A7 | Keela Thatapparai | 8°47'51.23"N, 78° 1'43.19"E | 1.69 km N | Cross-wind | Residential Area | Buffer Zone |
| A8 | Kuttudankadu | 8°44'57.91"N, 78° 1'55.52"E | 2.47 km S | Cross-wind | Residential Area | Buffer Zone |
| A9 | Korampallam | 8°47'5.33"N, 78° 5'34.49"E | 5.15 km, E | Cross-wind | Residential area | Buffer Zone |
| A10 | Therkku Veerapandiyapuram | 8°49'38.35"N, 78° 3'56.17"E | 5.81 km , NE | Downwind | Residential area | Buffer Zone |

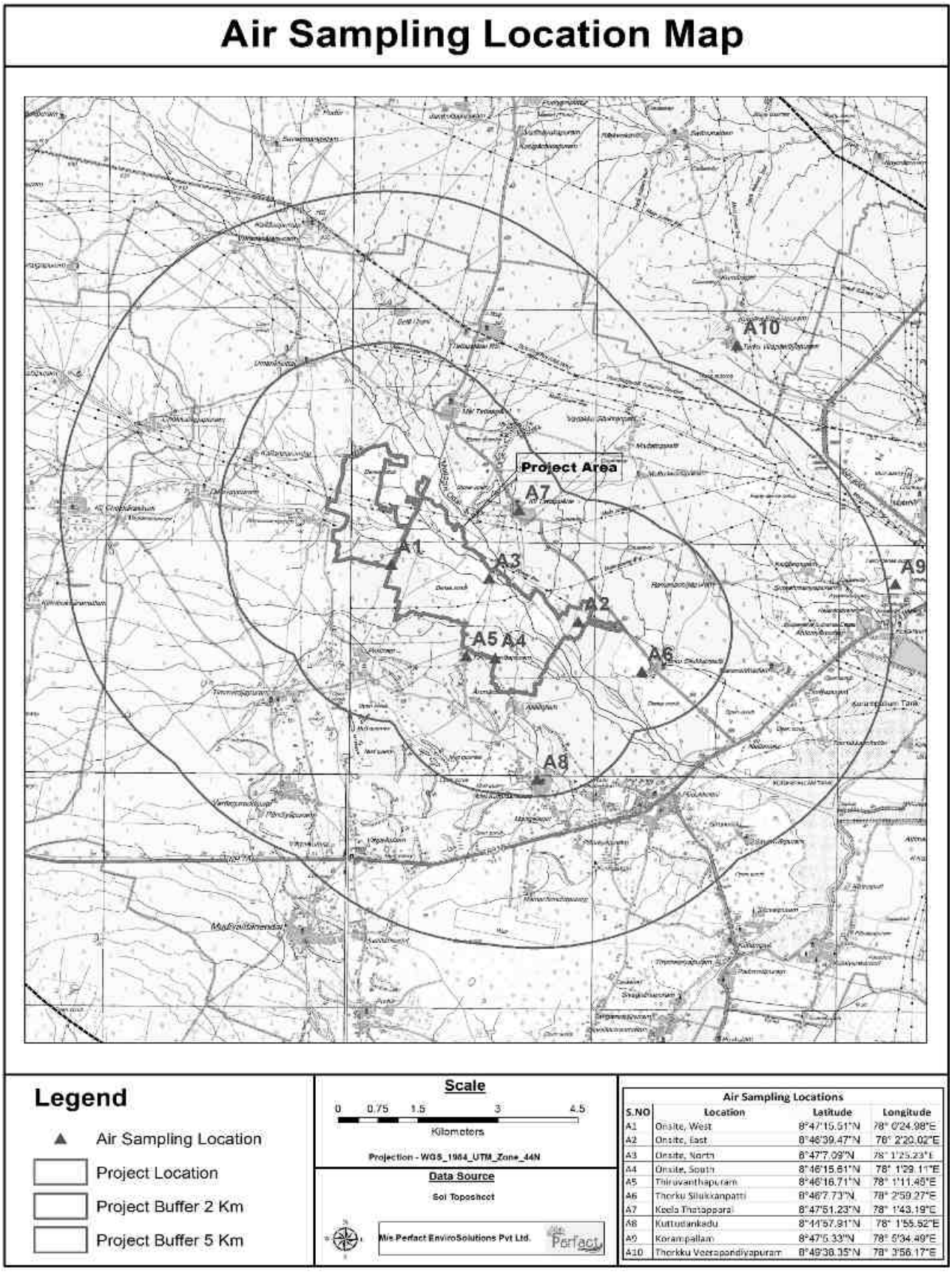



*Figure 24. Ambient Air Quality Sampling Locations*

### 3.5.3 Sampling Procedure

Respirable Dust Samplers were used to collect samples for $PM_{10}$ and $PM_{2.5}$ in ambient air at a flow rate of 1.2 $m^3$/min. The ambient air was sucked through the cyclone and filter paper by a blower. Samples of gases were drawn at a flow rate of 0.5 litres per minute and were analysed in the laboratory.

Monitoring was conducted in respect of the following parameters:

- Particulate Matter ($PM_{10}$)
- Particulate Matter ($PM_{2.5}$)
- Sulphur Dioxide ($SO_2$)
- Nitrogen Dioxide ($NO_2$)
- Carbon Monoxide (CO)

This procedure was adopted because there are short-term variations and low concentration of gaseous pollutants was expected.

### 3.5.4 Analytical methods followed for ambient air quality monitoring

- Particulate Matter ($PM_{2.5}$) (US EPA Quality Assurance HandBook (Vol.II) Part II, Quality Assurance Guideline Document, 2.12): Particulate Matter ($PM_{2.5}$) was analyzed by the Gravimetric Method. Particulate matter was collected on the 37 mm diameter glass microfiber Filter Paper. PM2.5 value is determined from the values of volume of air passed through Ambient Fine Dust Sampler.

- Particulate Matter ($PM_{10}$) (IS: 5182 Part 23:2006): Particulate Matter ($PM_{10}$) was analyzed by the Gravimetric Method. It was carried out by Respirable Dust sampler as per IS: 5182(Part 23):2006. Particulate matter was collected on the GF/A Filter Paper. Particles with aerodynamics diameter less than the cut-point of the inlet are collected by the filter. The mass of these particles is determined by the difference in filter weight prior to and after sampling.

- Sulphur dioxide ($SO_2$) (IS: 5182; Part - II - 2001): Sulphur dioxide is absorbed by aspirating a measured air sample through a solution of Potassium or sodium tetrachloromercurate, TCM. This procedure results in the formation of a dichloro sulphite mercurate complex. The Sulphite Ion produced during sampling is reacted with sulphamic acid, formaldehyde and pararosaniline to form an azo dye and then determined colorimetrically.

- Nitrogen Oxides (IS: 5182; Part – VI – 2006): Nitrogen dioxide is collected by bubbling air through a sodium hydroxide- sodium arsenite solution to form a stable solution of sodium Nitrite. The Nitrite Ion produced during sampling is reacted with hydrogen peroxide, Sulphanilamide and NEDA to form an azodye and then determined colorimetrically.

- Carbon monoxide (CO) (IS:5182; Part -10-1999): Samples containing Carbon monoxide in the range of 0 to 100 mg/$m^3$ are analyzed on a non-dispersive infrared absorption gas analyser, namely, an electro-optical spectrophotometer with no spectral dispersion component. It may consist of a single or double source of infrared energy and one or more infrared detectors separated by an optical cell or cells to one or more of which the sample flows, whereby the specific spectral absorption of the component of interest is determined.

### 3.5.5 Ambient Air Quality Results

At each station ambient air quality parameters i.e $PM_{10}$, $PM_{2.5}$, $SO_2$, $NO_x$ & CO were monitored at 10 locations weekly for 3 months (March 2025 to May 2025) 24 hourly at uniform intervals.

*Table 56. Ambient Air Quality Results (PM10 & PM2.5)*

| Location | Min | Max | Mean | 98th Percentile | Min | Max | Mean | 98th Percentile |
|---|---|---|---|---|---|---|---|---|
| | PM2.5 (Standard – 60 µg/m3) | | | | PM10 (Standard – 100 µg/m3) | | | |
| A1 | 13.54 | 21.28 | 17.07 | 20.46 | 22.12 | 35.69 | 26.83 | 32.48 |
| A2 | 16.09 | 25.28 | 20.28 | 24.31 | 26.28 | 42.41 | 31.88 | 38.59 |
| A3 | 14.37 | 22.58 | 18.11 | 21.71 | 23.46 | 37.87 | 28.46 | 34.46 |
| A4 | 15.22 | 23.91 | 19.18 | 22.99 | 24.85 | 40.11 | 30.15 | 36.5 |
| A5 | 16.39 | 25.75 | 20.65 | 24.76 | 26.76 | 43.19 | 32.46 | 39.3 |
| A6 | 17.91 | 28.14 | 22.57 | 27.06 | 29.25 | 47.21 | 35.48 | 42.96 |
| A7 | 17.29 | 27.17 | 21.79 | 26.13 | 28.24 | 45.58 | 34.26 | 41.47 |
| A8 | 19.18 | 30.13 | 24.17 | 28.98 | 31.32 | 50.55 | 37.99 | 46 |
| A9 | 18.54 | 29.13 | 23.37 | 27.95 | 30.27 | 48.86 | 36.73 | 44.55 |
| A10 | 10.97 | 17.24 | 13.83 | 16.55 | 17.91 | 28.91 | 21.73 | 26.35 |

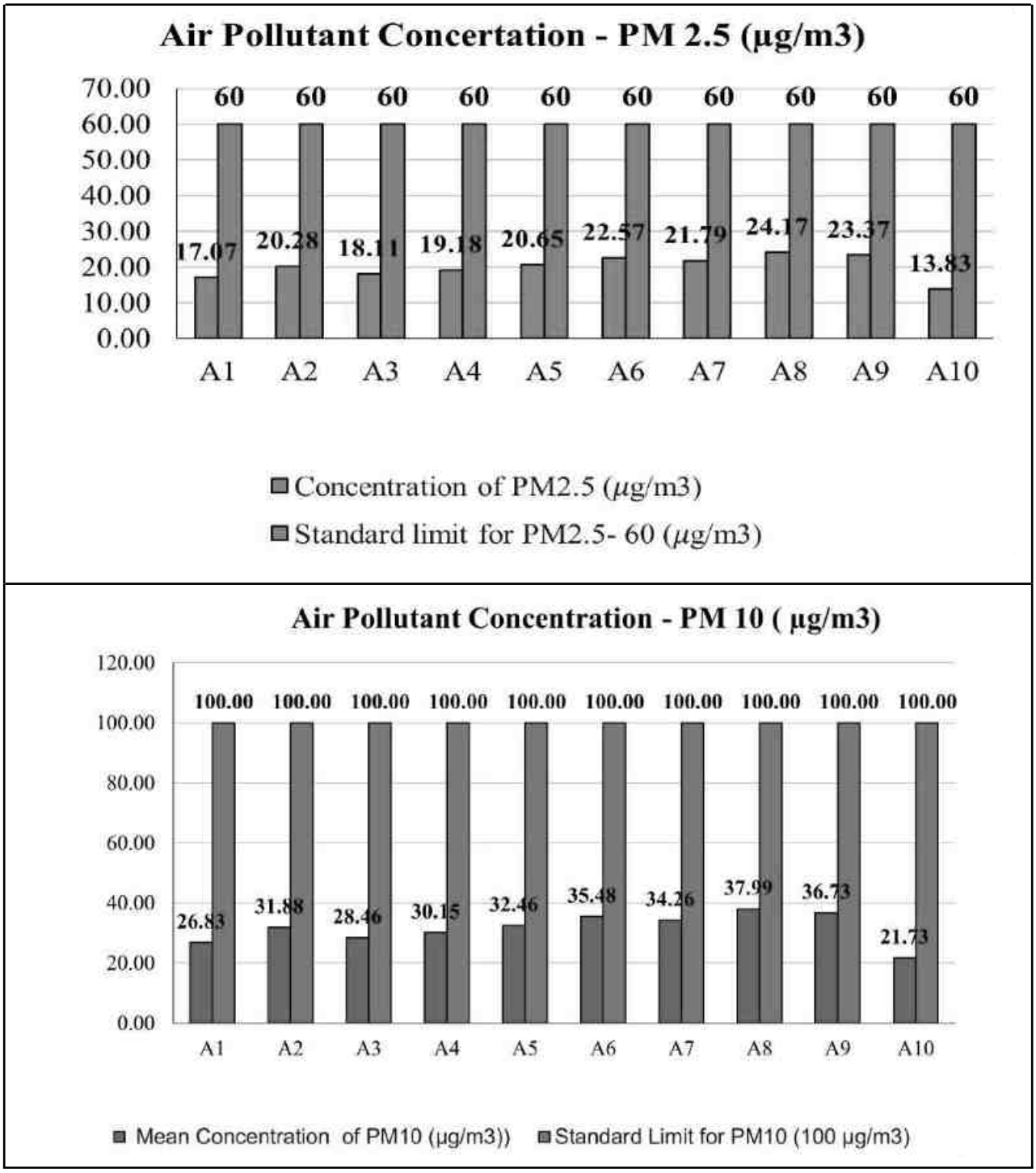
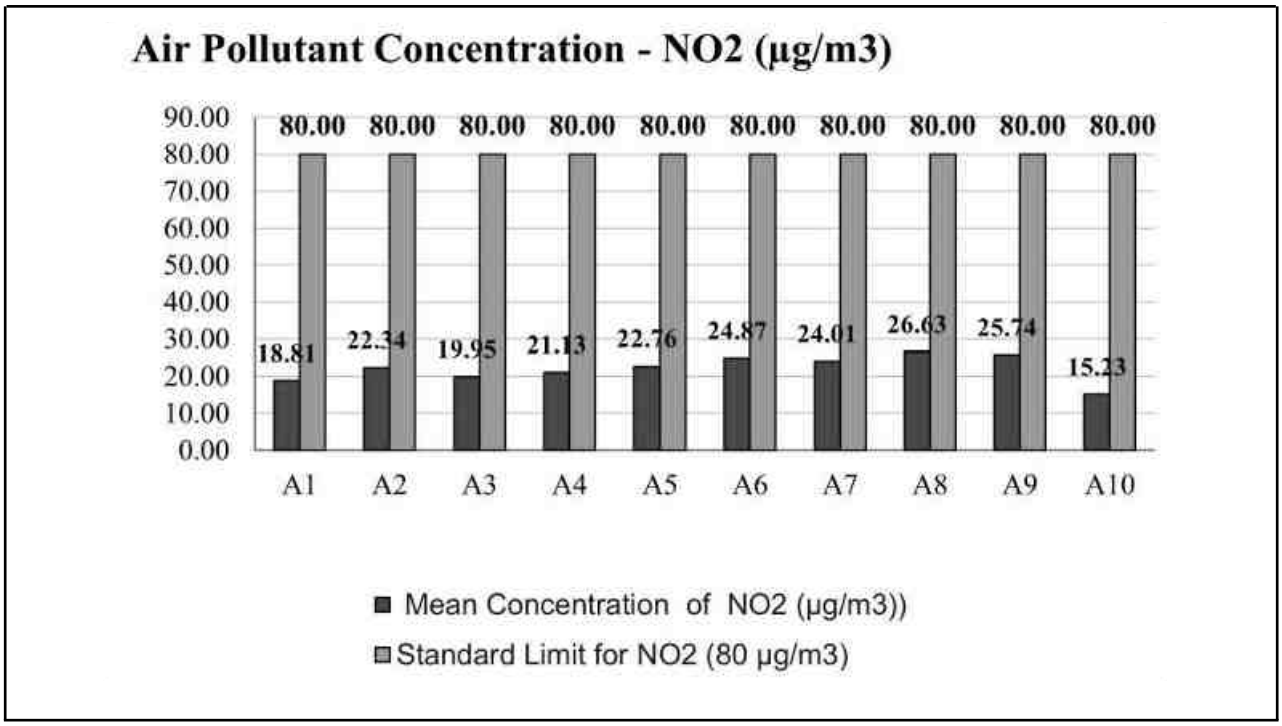



*Figure 25. Ambient Air Quality Results (PM10 & PM2.5)*

*Table 57.Ambient Air Quality Results for SO2 & NO2*

| Location | Min | Max | Mean | 98th Percentile | Min | Max | Mean | 98th Percentile |
|---|---|---|---|---|---|---|---|---|
| | $NO_2$ (Standard – 80 µg/m$^3$) | | | | $SO_2$ (Standard – 80 µg/m$^3$) | | | |
| A1 | 14.00 | 23.61 | 18.81 | 22.94 | 4.93 | 9.53 | 7.14 | 8.31 |

| Location | Min | Max | Mean | 98th Percentile | Min | Max | Mean | 98th Percentile |
|---|---|---|---|---|---|---|---|---|
| | $NO_2$ (Standard – 80 µg/m$^3$) | | | | $SO_2$ (Standard – 80 µg/m$^3$) | | | |
| A2 | 16.63 | 28.05 | 22.34 | 27.26 | 5.86 | 11.32 | 8.48 | 9.88 |
| A3 | 14.85 | 25.04 | 19.95 | 24.34 | 5.23 | 10.11 | 7.58 | 8.82 |
| A4 | 15.73 | 26.52 | 21.13 | 25.78 | 5.54 | 10.71 | 8.03 | 9.34 |
| A5 | 16.94 | 28.56 | 22.76 | 27.76 | 5.97 | 11.53 | 8.64 | 10.06 |
| A6 | 18.51 | 31.22 | 24.87 | 30.34 | 6.52 | 12.60 | 9.44 | 11.0 |
| A7 | 17.87 | 30.14 | 24.01 | 29.3 | 6.30 | 12.17 | 9.12 | 10.62 |
| A8 | 19.82 | 33.43 | 26.63 | 32.49 | 6.98 | 13.50 | 10.11 | 11.77 |
| A9 | 19.16 | 32.32 | 25.74 | 31.40 | 6.75 | 13.05 | 9.78 | 12.0 |
| A10 | 11.34 | 19.12 | 15.23 | 18.55 | 3.99 | 7.72 | 5.78 | 7.10 |



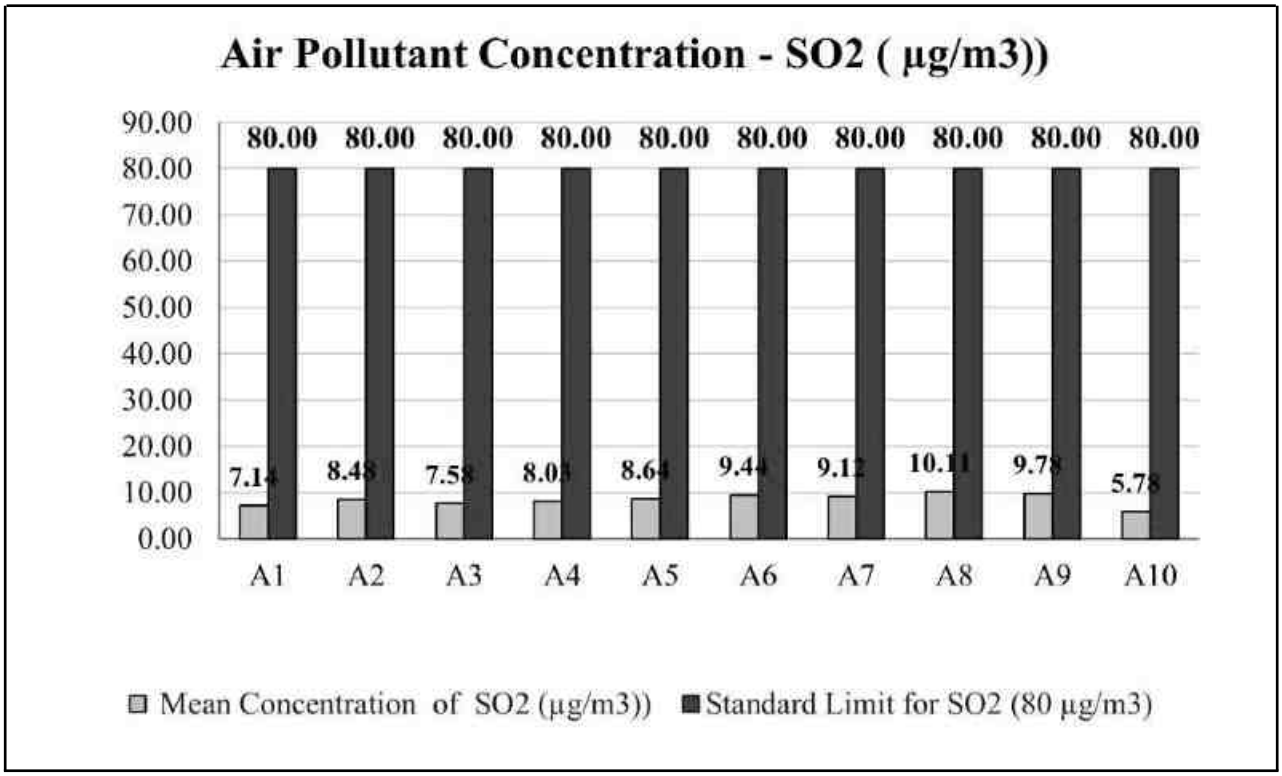



*Figure 26. Ambient Air Quality Results for SO2 & NO2*

*Table 58. Ambient air quality results for CO*

| Location | Min | Max | Mean | 98th Percentile |
|---|---|---|---|---|
| | CO (Standard-2 mg/m$^3$) | | | |
| A1 | 0.42 | 0.71 | 0.56 | 0.69 |
| A2 | 0.50 | 0.84 | 0.67 | 0.82 |
| A3 | 0.45 | 0.75 | 0.60 | 0.73 |
| A4 | 0.47 | 0.80 | 0.63 | 0.77 |
| A5 | 0.51 | 0.86 | 0.68 | 0.83 |
| A6 | 0.56 | 0.94 | 0.75 | 0.91 |
| A7 | 0.54 | 0.90 | 0.72 | 0.88 |
| A8 | 0.59 | 1.00 | 0.80 | 0.97 |
| A9 | 0.57 | 0.97 | 0.77 | 0.95 |
| A10 | 0.34 | 0.57 | 0.46 | 0.55 |

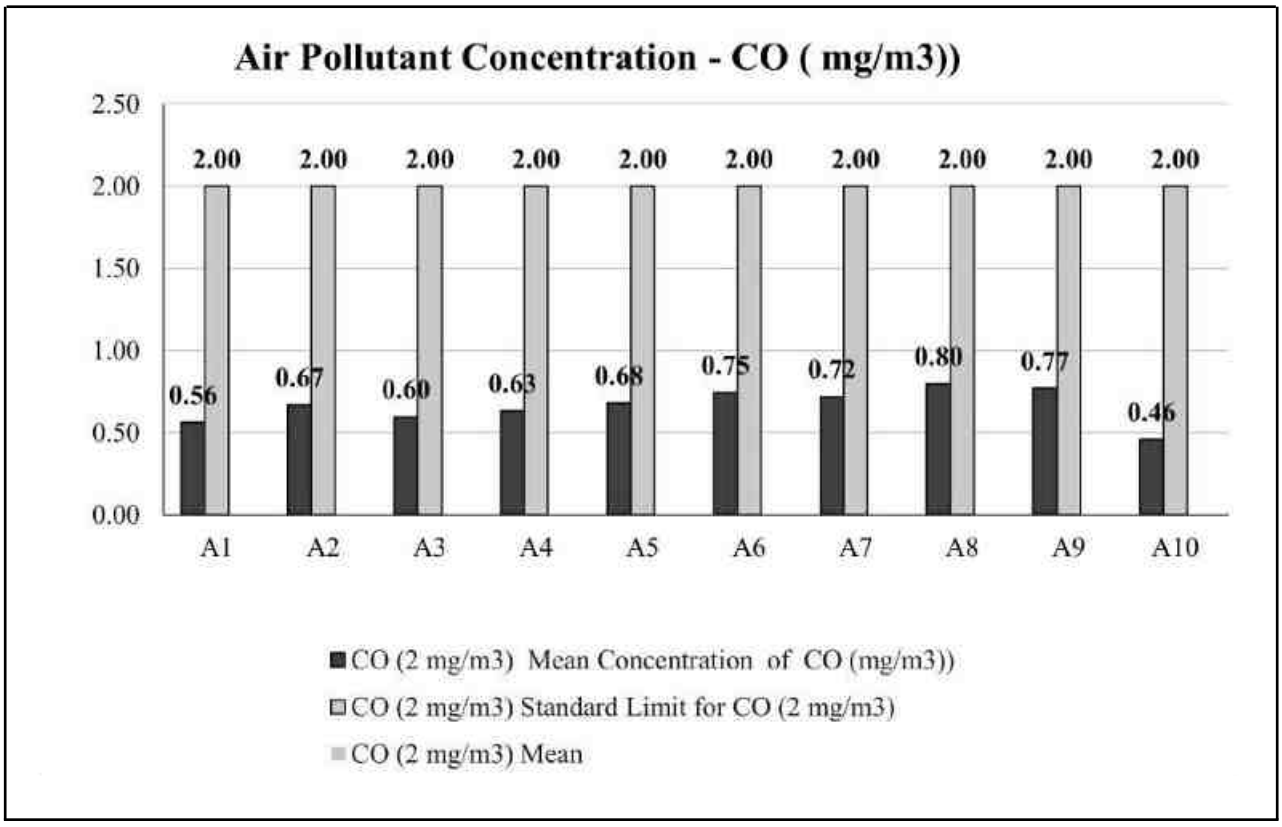


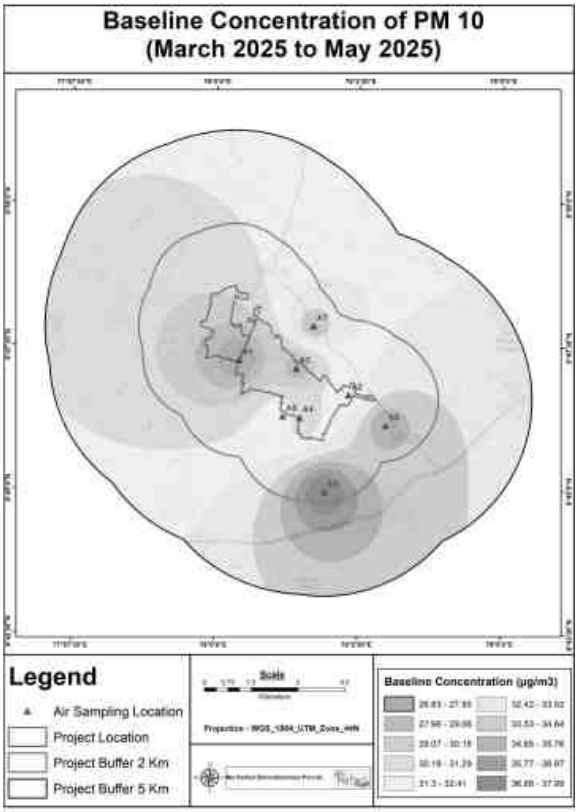

*Figure 27. Ambient air quality results for CO*

### 3.5.5.2. Inverse Distance Weighted (IDW) Interpolation

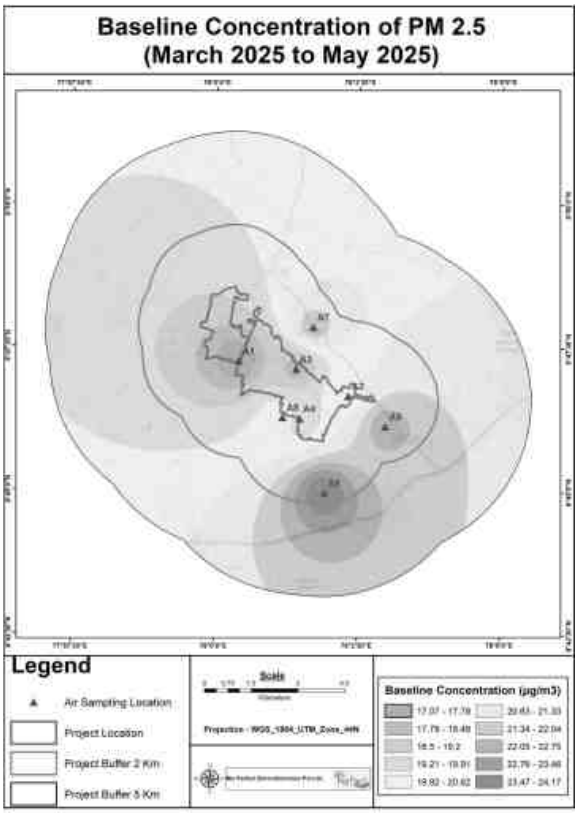
The IDW technique computes an average value for unsampled locations where sampling was not possible using values from nearby weighted locations.

The IDW interpolation has been done for the buffer zone by which the concentration of the ambient air parameters are plotted with respect to the baseline known concentration. The maximum concentration range in the Buffer areas for all the parameters are given below based on IDW Maps.

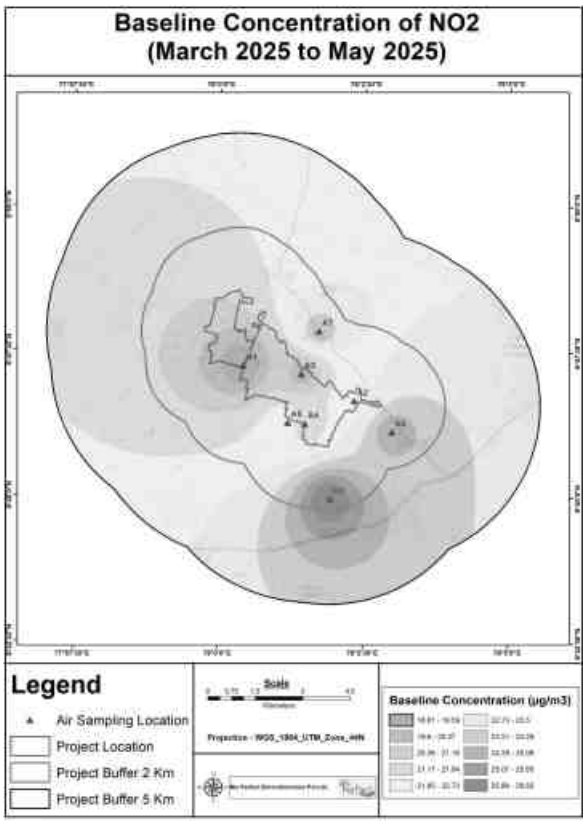
**Baseline Concentration of PM 10 (March 2025 to May 2025)**



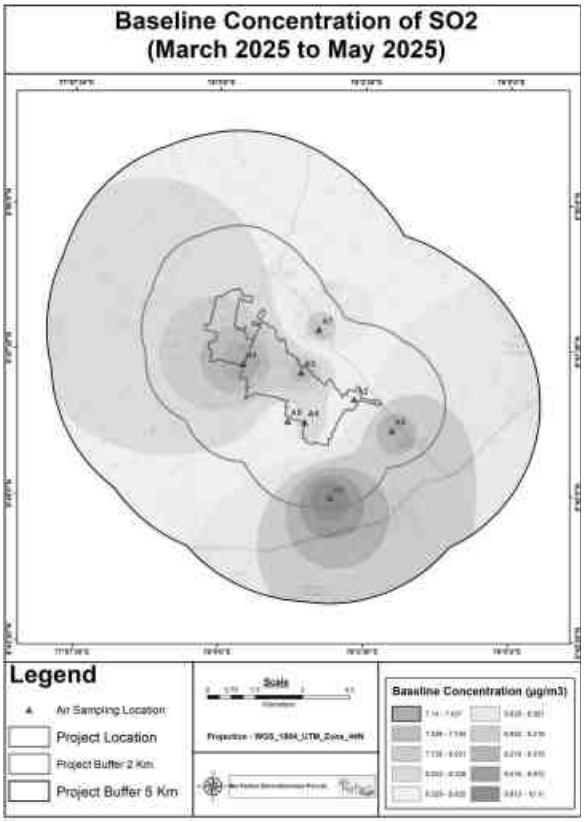

**Baseline Concentration of PM 2.5 (March 2025 to May 2025)**




**Baseline Concentration of NO2 (March 2025 to May 2025)**




**Baseline Concentration of SO2 (March 2025 to May 2025)**



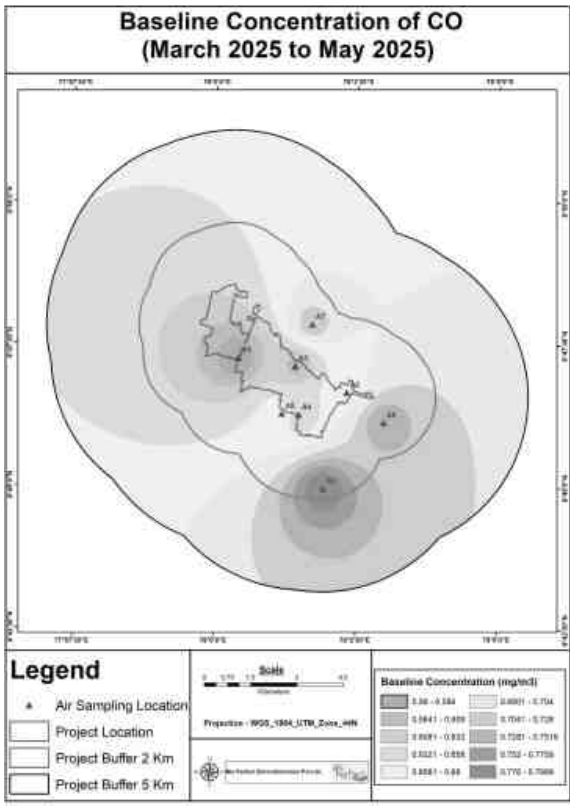



*Figure 28. IDW Maps*

*Table 59. IDW Ambient Air Result*

| Parameters | $PM_{10}$ ($\mu g/m^3$) | $PM_{2.5}$ ($\mu g/m^3$) | $NO_2$ ($\mu g/m^3$) | $SO_2$ ($\mu g/m^3$) | CO ($mg/m^3$) |
|---|---|---|---|---|---|
| Maximum Concentration in buffer zone | 50.55 | 30.13 | 33.43 | 13.50 | 1.00 |

### 3.5.6. Air Quality Index

As per CPCB guidelines, the worst sub index in a location is the AQI of that region (Source: https://cpcb.nic.in/National-Air-Quality-Index/). The results show that $PM_{10}$ has a good sub index over all the sampling sites. Therefore, the $PM_{10}$ has been considered for calculating the overall AQI. The table given below shows the Air Quality Index (AQI) range & category.

| AQI RANGE | AQI CATEGORY | AQI RANGE | AQI CATEGORY |
|---|---|---|---|
| Good (0–50) | Minimal Impact | Poor (201–300) | Breathing discomfort to people on prolonged exposure |
| Satisfactory (51–100) | Minor breathing discomfort to sensitive people | Very Poor (301–400) | Respiratory illness to the people on prolonged exposure |
| Moderate (101–200) | Breathing discomfort to the people with lung, heart disease, children and older adults | Severe (>401) | Respiratory effects even on healthy people |

(*Computed using: CPCB, AQI CALCULATOR*)

*Figure 29. AQI Range with Category*

*Table 60. AQI of the Sampling Locations.*

| Sampling Station | Sub-index Parameter | AQI Value | AQI Range |
|---|---|---|---|
| A1 | $PM_{10}$ | 35.69 | **Good** |
| A2 | $PM_{10}$ | 42.41 | **Good** |
| A3 | $PM_{10}$ | 37.87 | **Good** |
| A4 | $PM_{10}$ | 40.11 | **Good** |
| A5 | $PM_{10}$ | 43.19 | **Good** |
| A6 | $PM_{10}$ | 47.21 | **Good** |
| A7 | $PM_{10}$ | 45.58 | **Good** |
| A8 | $PM_{10}$ | 50.55 | **Good** |
| A9 | $PM_{10}$ | 48.86 | **Good** |
| A10 | $PM_{10}$ | 28.91 | **Good** |

### 3.5.7 Data Interpretation

The ambient air quality results are summarized in the above tables:

**Core zone:** The mean value of $PM_{2.5}$ ranges from (17.07-20.28 µg/m$^3$) & $PM_{10}$ at core zone locations ranges from (26.83-31.88 µg/m$^3$) $NO_2$ ranges from (18.81-22.34 µg/m$^3$), $SO_2$ ranges from (7.14-8.48 µg/m$^3$), $CO_2$ (0.56-0.67 mg/m$^3$) which are within the limits of National Ambient Air Quality Standards (NAAQS).
As per the Air Quality Index by CPCB, the air quality of the core zone is found Good during the sampling period from March 2025 to May 2025.

**Buffer zone:** The mean value of PM2.5 ranges from (13.83–24.17 µg/m3) & PM10 at core zone locations ranges from (21.73–37.99 µg/m3) NO2 ranges from (15.23–26.63 µg/m3), SO2 ranges

from (5.78–10.11 µg/m3), CO (0.46–0.80 mg/m3) which are within the limits of National Ambient Air Quality Standards (NAAQS).As per the Air Quality Index by CPCB, the air quality of the buffer zone is found to be Good during the sampling period from March 2025 to May 2025.

Conclusions: As per the Air Quality Index by CPCB & NAAQS, the air quality of the Core & buffer zone within the standard during the sampling period from March 2025 to May 2025.

## 3.6 Noise Level

### 3.6.1 Methodology

At each station noise level was monitored for 24-hours simultaneously. For each measurement, dB (A) readings were taken for every 15 minutes for 24 hrs ones in a season to get Leq values.As per CPCB guidelines, the site of an area shall be selected such that it meets the land use pattern e.g. Commercial, Residential, Industrial. To assess the noise level of the proposed area, following stations were selected.

Criteria for site selection:

The baseline study of noise levels in the study area of 3 km has been carried out by selecting the noise monitoring locations based on the following criteria:

The site selection for noise quality monitoring were selected following the CPCB guidelines:

1. As per CPCB guidelines, the sites of an area for noise quality monitoring were selected such that it meets the land use pattern e.g. Commercial, Residential, Industrial, and silent zone. Silence zone is defined as an area comprising not less than 100 m around hospitals,educational institutions and courts. As per the site location, the type of location that was selected: industrial location, roads, and residential area, lies within the core and buffer area.
2. The presence of Noise sensitive receptors (environmental and ecological) in the vicinity of the project site were selected for noise quality monitoring. These included schools, hospitals, old age homes, religious places, etc.
3. Proximity of the noise generating source to the human settlements.The major source of noise in the site surrounding the area is increased urbanization, vehicular movement at day time and ambient base noise at night. The impacts from these sources are expected to be captured in the levels of noise measured in the site-specific background noise monitoring study.

Based on the above factors, overall 10 stations were selected.

**Quality Assurance:**

The noise level meter was calibrated immediately prior to and following each measurement event to check for the accuracy of measurement using an acoustic calibrator.

### 3.6.2 Ambient Noise Sampling Station (March 2025 to May 2025)

*Table 61. Ambient Noise Sampling Locations*

| Location No. | Sampling Location | Latitude & Longitude | Distance & Direction from Project Boundary | Environmental Significance | Zone |
|---|---|---|---|---|---|
| N1 | Onsite, West | 8°47'15.51"N, 78° 0'24.98"E | Within site | Industrial Area | Core Zone |
| N2 | Onsite, East | 8°46'39.47"N, 78° 2'20.02"E | Within site | Industrial Area | Core Zone |
| N3 | Onsite, North | 8°47'7.09"N, 78° 1'25.23"E | Within site | Industrial Area | Core Zone |
| N4 | Onsite, South | 8°46'15.61"N, 78° 1'29.11"E | Within site | Industrial Area | Core Zone |
| N5 | Thiruvanthapuram | 8°46'16.71"N, 78° 1'11.45"E | 1.05 km WSW | Residential Area | Buffer Zone |
| N6 | Therku Silukkanpatti | 8°46'7.73"N, 78° 2'59.27"E | 1.41 km SE | Residential Area | Buffer Zone |
| N7 | Keela Thatapparai | 8°47'51.23"N, 78° 1'43.19"E | 1.69 km N | Residential Area | Buffer Zone |
| N8 | Kuttudankadu | 8°44'57.91"N, 78° 1'55.52"E | 2.47 km S | Residential Area | Buffer Zone |
| N9 | Korampallam | 8°46'58.18"N, 78° 5'43.74"E | 5.39 km, NE | Residential Area | Buffer Zone |
| N10 | Therkku Veerapandiyapuram | 8°49'38.45"N, 78° 3'55.49"E | 2.48 km , NE | Residential Area | Buffer Zone |

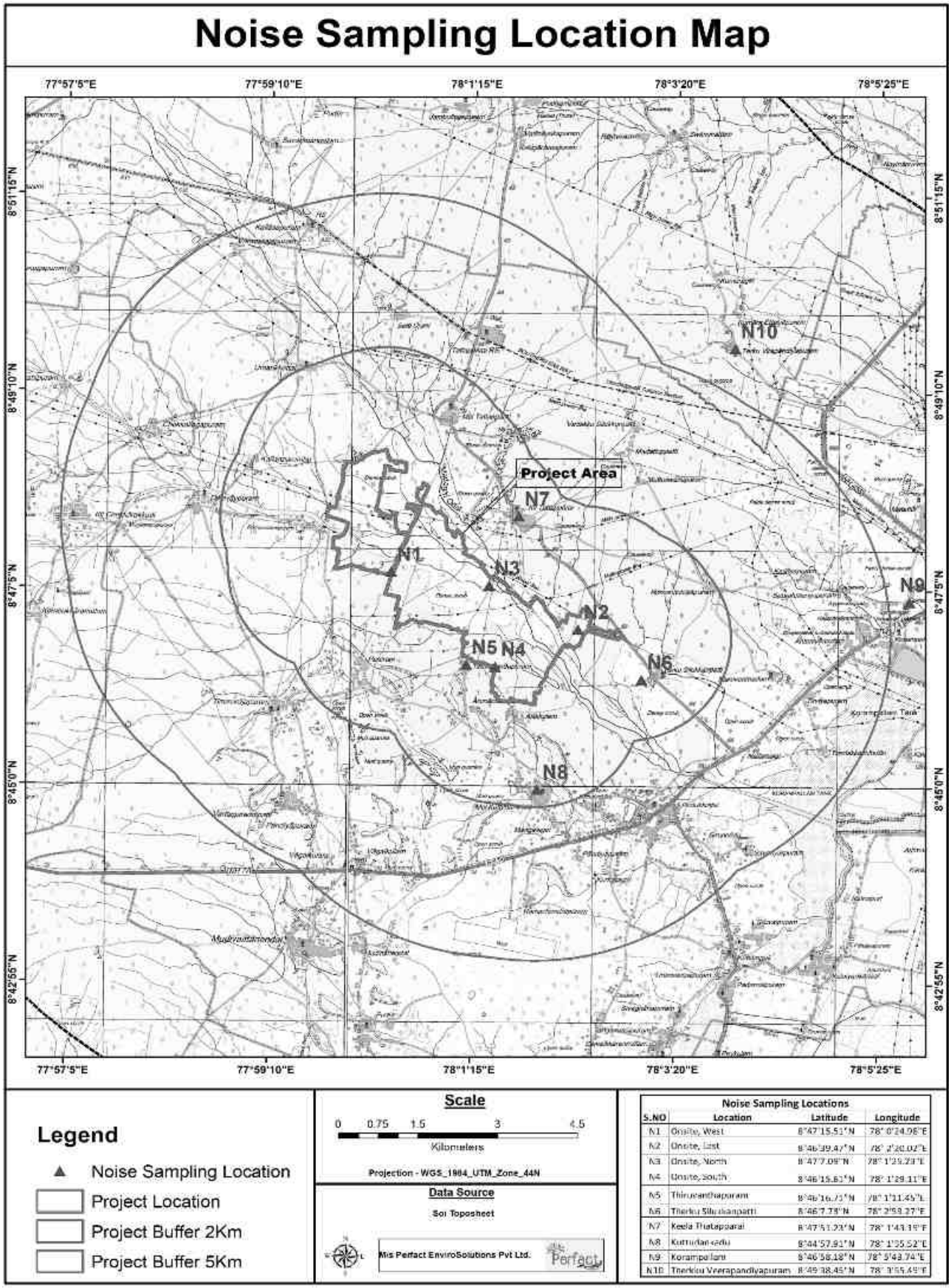



*Figure 30. Noise Sampling Map*

**Core Zone :**

*Table 62. Ambient Noise Quality (Core Zone)*

| Location No. | Sampling Location | Zone | Day Time Leq (dB(A)) (6:00 A.M. – 10:00 P.M.) | Night Time Leq (dB(A)) (10:00 P.M. – 6:00 A.M.) | Day time (6.00 A.M to 10.00 P.M) | Night time (10.00P.M to 6.00 A.M ) |
|---|---|---|---|---|---|---|
| N1 | Onsite, West | Industrial area | 41.6 | 38.6 | 75 | 70 |
| N2 | Onsite, East | Industrial area | 48.4 | 43.2 | 75 | 70 |
| N3 | Onsite, North | Industrial area | 40.6 | 36.4 | 75 | 70 |
| N4 | Onsite, South | Industrial area | 46.9 | 39.5 | 75 | 70 |

**Buffer Zone:**

*Table 63. Ambient Noise Quality (Buffer Zone).*

| Location No. | Location Name | Zone | Leq (Day, dB(A)) | Leq (Night, dB(A)) | Day time (6.00 A.M to 10.00 P.M) | Night time (10.00P.M to 6.00 A.M ) |
|---|---|---|---|---|---|---|
| N5 | Thiruvanthapuram | Residential Area | 54.3 | 41.9 | 55 | 45 |
| N6 | Therku Silukkanpatti | Residential Area | 53.7 | 42.6 | 55 | 45 |
| N7 | Keela Thatapparai | Residential Area | 52.6 | 41.8 | 55 | 45 |
| N8 | Kuttudankadu | Residential Area | 55.2 | 44.6 | 55 | 45 |
| N9 | Korampallam | Residential Area | 47.1 | 43.7 | 55 | 45 |
| N10 | Therkku Veerapandiyapuram | Residential Area | 49.2 | 43.6 | 55 | 45 |

The Ambient Noise Quality results are summarized above. The results are discussed below:

**Core Zone :**

The ambient noise level during day time at the proposed project site varies from 40.6 dB (A) to 48.4 dB (A) which are within the day time standard limit of Industrial area ~75 dB (A). During night the noise level at the project site ranges from 36.4 dB (A) to 43.2 dB (A) which are within the night time standard limit of Industrial area 70.0 dB (A).

Buffer Zone:

**Residential Area:**

N5: The ambient noise level at Thiruvanthapuram is 54.3 dB (A) which is within the daytime noise standard limit of the Residential area of ~ 55.0 dB (A). During the night the noise level was recorded at 41.9 dB (A) which is within the night-time noise standard limit of ~ 45.0 dB (A).

N6: The ambient noise level at Therku Silukkanpatti is 53.7 dB (A) which is within the daytime noise standard limit of Residential area ~ 55.0 dB (A). During the night the noise level was recorded at 42.6 dB (A) which is within the night-time noise standard limit of ~ 45.0 dB (A).

N7: The noise level at Keela Thatapparai is 52.6 dB (A) which is within the daytime noise within the standard limit of Residential area ~ 55.0 dB (A). During the night the noise level was recorded at 41.8 dB (A) which is within the night-time noise standard limit of ~ 45.0 dB (A).

N8: The noise level at Kuttudankadu is 55.2 dB (A) which is above the standard limit of Residential area ~ 55.0 dB (A). During the night the noise level was recorded at 44.6 dB (A) which is within the night-time noise standard limit of ~ 45.0 dB (A).

N9: The noise level at Korampallam is 47.1 dB (A) which is within the daytime noise within the standard limit of Residential area ~ 55.0 dB (A). During the night the noise level was recorded at 43.7 dB (A) which is within the night-time noise standard limit of ~ 45.0 dB (A).

N10: The noise level at Therkku Veerapandiyapuram is 49.2 dB (A) which is within the daytime noise within the standard limit of Residential area ~ 55.0 dB (A). During the night the noise level was recorded at 43.6 dB (A) which is within the night-time noise standard limit of ~ 45.0 dB (A).

## 3.7 HYDROLOGY & GEOLOGY

The objective of this study is to establish the baseline from a hydrological, hydrogeological, and geological perspective of the area corresponding to the "Proposed Development of an Industrial Park" located at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu by M/s SIPCOT. The project is located between Latitude: 8°45'52.44"N - 8°48'31.84"N and, Longitude: 77°59'46.38"E - 78°2'40.67"E. Subsequently, to assess the impact of the proposed activity and to suggest proper mitigation measures.

### Climate & Rainfall

The climate of Thoothukudi District is classified as hot semi-arid, bordering on dry summer tropical savanna. The region experiences moderate to low rainfall, high summer temperatures, and relatively high humidity during the monsoon season. Based on IMD data, the maximum annual rainfall recorded was 449.2 mm in October 2019, with October also experiencing the highest number of rainy days. The maximum temperature in the area reaches about 39.8°C, particularly during June, which is typically the hottest month of the year. The coolest months are December

and January, with minimum temperatures dropping to around 18.6°C in January. The relative humidity varies seasonally, ranging from 58% to 94%.

*Source: IMD, Station- Thoothukudi New Port, 2010 - 2025*

### 3.7.1 Topography

**Core zone**

Topographically, the proposed site area is almost flat. The minimum elevation of the project site is 32 m AMSL in the east of the site, whereas the maximum elevation is 38 m AMSL in the north close to the project boundary.

**Buffer zone**

The buffer area is almost flat topography. The maximum elevation of 82 m AMSL is in the north close to the periphery, whereas the minimum elevation is 20 m AMSL in the southeast close to the periphery, as shown in the map given section 2.3.3.

### 3.7.2 Geology

**Regional Geology**

Geologically the area is characterized by the Thoothukudi district represents a well-developed lithopackage of meta-sedimentary sequence inter banded with charnockite Group of rocks. The rock types exposed are of quartzite, calc-granulite, garnet-biotite-sillimanite gneiss, garnet quartz-feldspathic gneiss and garnet-biotite-cordierite gneiss belonging to Khondalite Group of rock. Charnockite and pyroxene Granulite are the Charnockite Group. Hornblende-biotite gneiss belongs to the Migmatitic Complex. Besides, basic intrusive (pyroxenite) and acid intrusive (granite). The younger intrusions are represented by pegmatite and quartz veins. Evidence of development of incipient / patchy charnockite along the shear plane is noticed in the district along the Western Ghat high hills.

Rock type found in the area belong to the Khondalite and Charnockite groups and Migmatite Complex of Easter Ghats Supergroup (Archaean Age), which are unconformably overlain by Tertiary and Quaternary sediments. Garnet-biotite-sillimanite gneiss, quartzite, calc-granulite and limestone of Khondalite group with epidiorite occurring as narrow linear bands. The Charnockite group is represented by acid variants. These rock types occur as xenoliths within the Migmatite Complex occupy a major part of the area, comprising medium grained hornblende-biotite gneiss and garnet-biotite gneiss. Gypsum, limestone, beach sand, kankar and shell limestone are the Economic minerals of the district. Hard Rocks - 73% Sedimentary Rocks - 27% Crystalline Limestone, Multi color dimension stone, rough stone/gravel, garnet and ilmenite sand are notable economic importance minerals found in Thoothukudi District. Minor occurrences of Quartzite are also reported in the district and Stratigraphic succession of the area are as follows:

*Table 64. Stratigraphic succession of the area*

| Age | Period | Formation | Lithology |
|---|---|---|---|
| Quaternary | Holocene to Recent | Alluvium Colluvium | Red Soil, Coastal Sand, Clay, River Alluvium, Laterite, Red Teri, Kankar, Tuffaceous Kankar, Shell, Limestone, and Calcareous Sandstone. |
| Tertiary | Mio-Pliocence | Panamparai Sandstone | Hard Compact Calcareous Sandstone, Shell Limestone. |
| Proterozoic | Precambrian | Crystalline Complex | Charnockite, Mixed Composite Gneiss, Pelitic gneiss, Calc-Granulite and Quartzite. |

*Source: District survey report of Thoothukudi (Department of Geology and Mining) 2019*

## 3.7.3. Hydrology

### 3.7.3.1 Drainage

**Core Zone**

- The project site is drained by the Nilaviyal Odai and water body. These streams flow within the project site from north and west to east-southeast respectively.
- The core zone has dendritic drainage patterns having first to third order streams.

**Buffer Zone**

- The buffer zone is also drained by the Nilaviyal Odai and water body.
- The first to third order streams in northwest direction join together to form ephemeral Nilaviyal Odai, which flows from northwest to east through the project site.
- The first to fourth order stream in west direction join together to form Nilaviyal Odai, which flows from west to east through the project site.
- The confluence of the Nilaviyal Odai and Water Body are located within the project site near the northern boundary.
- The buffer zone comprises various water bodies such as drains, ponds, and lakes etc.
- The area has a dendritic drainage pattern having first to fourth-order streams.

- The rainwater flows and slopes of the area both towards the eastern periphery.

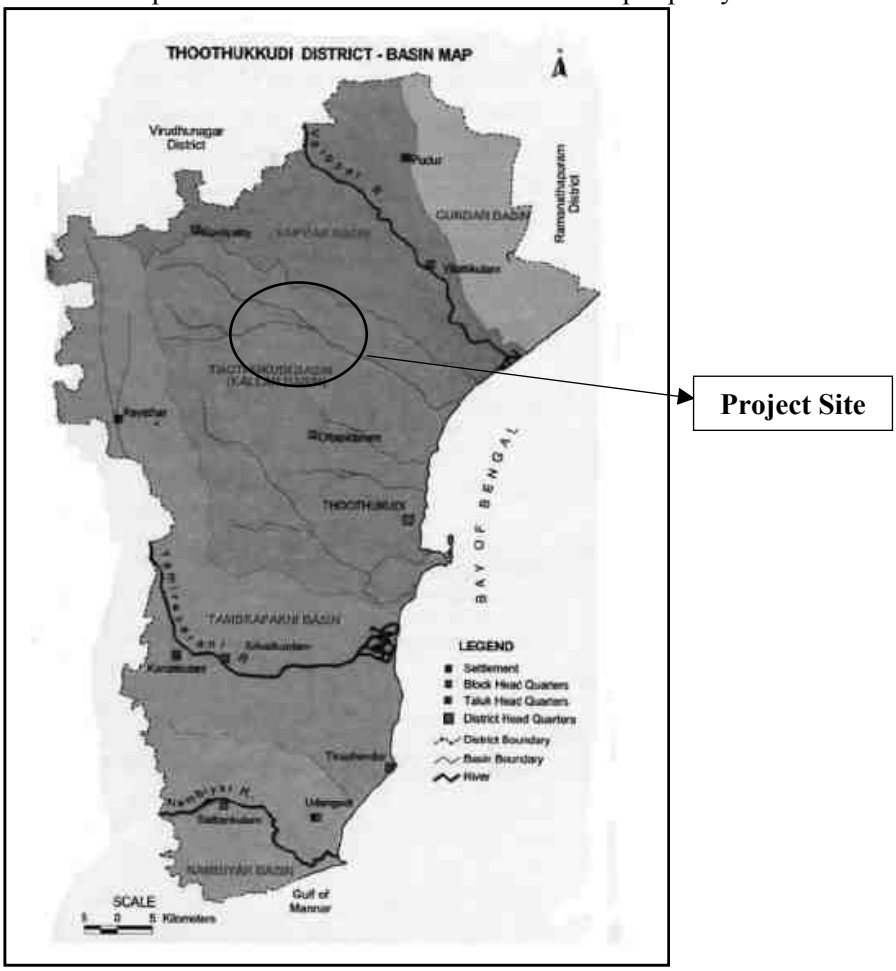



*Figure 15. River basin*

### 3.7.3.2 Flood History

The Odai and Nilaviyal odai in the study area are ephemeral, with flow occurring primarily during the monsoon season. Based on local information and secondary sources, there are no records of significant flooding associated with the odai and nilaviyal odai. They generally carry runoff from the surrounding terrain during periods of heavy rainfall but do not pose a major flood risk to the project area. However, Odai and Nilaviyal odai pass through project site, therefore flood precautions should be taken during the monsoon season.

### 3.7.4 Geohydrology

As per the Central Ground Water Board (CGWB) report, the area is underlain by both porous and fissured formations. The important aquifer systems in the area comprise:

i) Unconsolidated and semi-consolidated formations, and

ii) Weathered and fractured crystalline rocks.

The porous formations in the district include sandstones and clays of Recent to Sub-Recent and Tertiary (Quaternary) age. The recent formations, consisting mainly of sands, clays, and gravels, are confined to the major drainage courses of the area. Groundwater in these formations occurs under both water

table (unconfined) and confined conditions and is developed through dug wells and filter points. The alluvium also forms a productive aquifer system in the region.

The occurrence and movement of groundwater in the crystalline rocks occur under unconfined conditions within joints and fissures and depend on the nature, extent, and interconnection of the fracture zones.

The pre-monsoon depth to water level in the area ranges from 1.20 to 12.12 m below ground level (BGL), while the post-monsoon water level varies from 0.33 to 9.24 m BGL.

*Source: District Groundwater Brochure Thoothukudii District, Tamil Nadu 2009*

As per the CGWB Report, water level varies from 0.33-12.12 mBGL, while during our primary survey, the groundwater level was found at about 13.6 m BGL. The detailed hydrogeology study report is attached as Annexure – 11.

### 3.7.4.1 Groundwater Development

The area falls under the taluka and district Thoothukudi. As per the CGWB report (2023-24), the area falls under the safe category with the stage of groundwater development at about 16.06%.

*Table 65. Details of Thoothukudi Taluka Groundwater Resource*

| Taluka | Total Annual Groundwater (Ham) Recharge | Annual Extractable Groundwater Resource (Ham) | Total Extraction (Ham) | Annual GW Allocation for for Domestic Use as on 2025 (Ham) | Net Groundwater Availability for future use (Ham) | Stage of Groundwater Development (in %) | Category |
|---|---|---|---|---|---|---|---|
| Thoothukudi | 408.72 | 367.83 | 59.09 | 87.55 | 228.38 | 16.06 | Safe |

*Source: Cgwb Report Of Dynamic Groundwater Resources Of Tamil Nadu 2024*

## 3.8 WATER QUALITY

### 3.8.1 Sampling Station (March 2025 to May 2025)

To assess the water quality of the proposed area, a total of 18 stations were selected, comprising 8 groundwater and 10 surface water locations. The details and locations of the water sampling stations are provided below:

*Table 66. Groundwater Sampling Locations*

| Location No. | Sampling Location | Latitude & Longitude | Distance & Direction from Project Boundary | Source of Water | Environmental Significance / Zone |
|---|---|---|---|---|---|
| GW1 | Onsite /Nearby | 8°46'15.61"N, 78° 1'29.11"E | Within site | Ground Water | Core Zone |
| GW2 | Thiruvanthapuram | 8°46'18.53"N, 78° 1'11.36"E | 1.05 km WSW | Ground Water | Buffer Zone |
| GW3 | Therku Silukkanpatti | 8°46'11.34"N, 78° 3'8.09"E | 1.41 km SE | Ground Water | Buffer Zone |
| GW4 | Keela Thatapparai | 8°47'46.68"N, 78° 1'34.69"E | 1.69 km N | Ground Water | Buffer Zone |

| Location No. | Sampling Location | Latitude & Longitude | Distance & Direction from Project Boundary | Source of Water | Environmental Significance / Zone |
|---|---|---|---|---|---|
| GW5 | Kuttudankadu | 8°45'18.67"N, 78° 1'43.11"E | 2.47 km S | Ground Water | Buffer Zone |
| GW6 | Perurani | 8°46'19.17"N, 78° 0'8.67"E | 2.94 km SW | Ground Water | Buffer Zone |
| GW7 | Melathattaparai | 8°48'58.76"N, 78° 1'3.57"E | 3.92 km NNW | Ground Water | Buffer Zone |
| GW8 | Allikulam | 8°45'39.32"N, 78° 1'37.10"E | 1.25 km SSW | Ground Water | Buffer Zone |

*Table 67. Surface Water Sampling Locations.*

| Location No. | Sampling Location | Latitude & Longitude | Distance & Direction from Project Boundary | Environmental Significance / Zone |
|---|---|---|---|---|
| SW1 | Nilaviyal Odai Upstream | 8°47'5.44"N, 78° 1'30.94"E | Within the site | Core Zone |
| SW2 | Odai onsite | 8°46'36.28"N, 78° 1'11.75"E | Within the site | Core Zone |
| SW3 | Odai onsite | 8°47'22.18"N, 78° 1'11.01"E | Within the site | Core Zone |
| SW4 | Thiruvanthapuram Pond | 8°46'1.74"N, 78° 1'7.75"E | Within the site | Core Zone |
| SW5 | Pond near Keela Thatapparai | 8°47'48.21"N, 78° 1'11.56"E | 0.46 km N | Buffer Zone |
| SW6 | Allikulam Pond | 8°45'33.80"N, 78° 1'48.91"E | 0.53 km SE | Buffer Zone |
| SW7 | Perurani Pond | 8°46'12.63"N, 78° 0'26.49"E | 0.65 km SW | Buffer Zone |
| SW8 | Elim Pond | 8°44'43.77"N, 78° 2'25.69"E | 2.12 km SSE | Buffer Zone |
| SW9 | Bethesda pond | 8°44'8.75"N, 78° 3'20.68"E | 4.12 km, SE | Buffer Zone |
| SW10 | Pond near Korampallam | 8°46'26.52"N, 78° 5'37.95"E | 5.28 km, E | Buffer Zone |

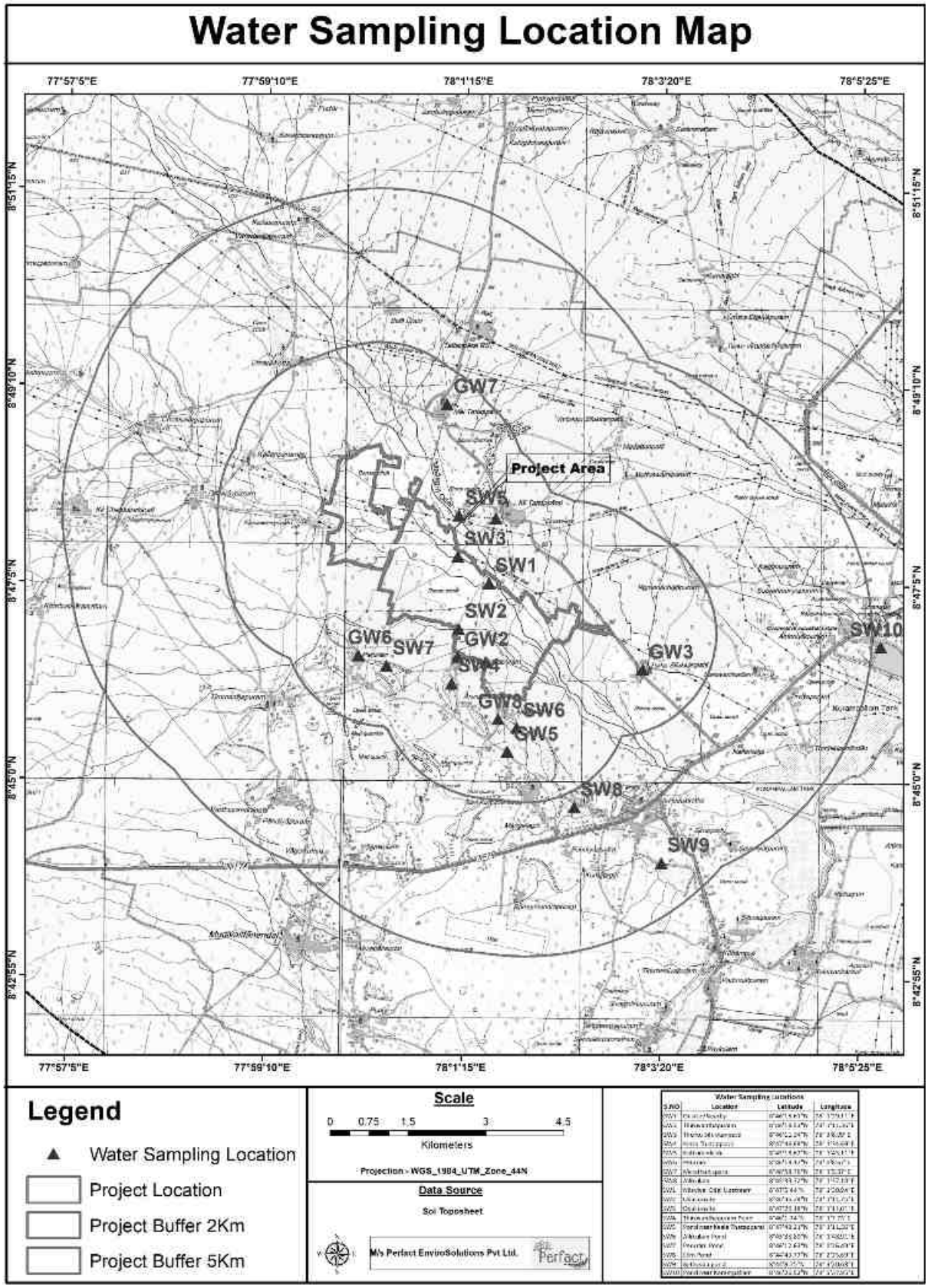



*Figure 32. Water sampling map*

### 3.8.1.1 Criteria of Selection of Sampling Locations

Quality assurance for sampling

- Water samples were collected in accordance with Standard Methods prescribed by IS and APHA (23rd Edition,2017).
- All sampling equipment, collection bottles, and storage containers were thoroughly cleanedandsterilized in the laboratory before use.
- Care was taken to prevent contamination during handling; the bottle lip and inner surfaces were nevertouchedduringsampling.
- Prior to collection, each bottle was rinsed three times with the sample water before being filled.
- At each monitoring site, samples were collected from the upstream direction, ensuring water flowed directly towards the sampler to avoid human-induced contamination.
- Three replicate samples were collected from each location and stored in cold boxes for preservation.
- Samples were transported between the sampling sites and the laboratory coldboxes to maintain sample integrity.

### 3.8.1.2 Sampling Frequency and Sampling Techniques

- In line with standard practices, grab sampling was conducted at eight locations for groundwater, while composite sampling was carried out for surface water sites, following IS and APHA(23rd Edition, 2017) procedures.
- Appropriate preservation techniques were applied to ensure the accuracy of results.
- Physical parameters such as pH, temperature, and electrical conductivity were measured in the field using a portable water quality analyzer

Quality assurance during sample analysis:

- Samples were transported to the laboratory for analysis of the selected water quality parameters.
- Analytical procedures strictly followed the American Public Health Association's Standard Methods for the Examination of Water and Wastewater.
- Only analytical-grade chemicals were used, and double deionized water (Milli-Q system,Millipore)was employed for all analytical work.
- All glassware and sample containers were thoroughly cleaned and rinsed with double distilled water prior to use.
- Both the glassware and the sample containers used for the analysis were thoroughly cleaned and rinsed with double distilled water before analysis.

As evident from the sampling locations for water quality assessment, it represented surface and groundwater.

### 3.8.1.3 Ground Water Quality Results (March 2025 to May 2025)

*Table 68. Ground Water Quality Result*

| Parameter / Details | Unit | IS 10500:2012 (Drinking Water Standard) | W1 Nearby site | W2 Thiruvanthapuram (1.05km WSW) | W3 Therku Silukkanpatti (1.41km SE) | W4 Keela Thatapparai (1.69km N) | W5 Kuttudankadu (2.47km S) | W6 Perurani (2.94km SW) | W7 Melathattaparai (3.92km NNW) | W8 Allikulam (1.25km SSW) |
|---|---|---|---|---|---|---|---|---|---|---|
| Colour | Hazen | 5.0 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Odour | - | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable |
| Turbidity | NTU | 1.0 | BDL (DL-1) | BDL (DL-1) | BDL (DL-1) | BDL (DL-1) | BDL (DL-1) | BDL (DL-1) | BDL (DL-1) | BDL (DL-1) |
| pH (at 25°C) | - | 6.5–8.5 | 6.64 | 7.08 | 6.95 | 6.97 | 6.95 | 7.35 | 7.1 | 6.93 |
| Temperature | °C | Not specified | 24.1 | 24.2 | 24.0 | 25.1 | 24.6 | 24.4 | 24.3 | 24.8 |
| Conductivity | µmho/cm | Not specified | 4453 | 771 | 1965 | 1612 | 1029 | 254 | 463 | 1554 |
| Total Dissolved Solids (TDS) | mg/l | 500 | 190<br>1.50 | 542.88 | 784.85 | 1201.90 | 495.76 | 140.80 | 313.10 | 726.88 |
| Chloride (as Cl) | mg/l | 250 | 519.0 | 262.0 | 339.0 | 81.0 | 117.0 | 34.0 | 43.0 | 237.0 |
| Fluoride (as F) | mg/l | 1.0 | 0.5 | 0.1 | 0.1 | 0.4 | BDL (DL-0.1) | 0.3 | BDL (DL-0.1) | BDL (DL-0.1) |
| Total Hardness (as CaCO3) | mg/l | 200 | 1484 | 212 | 600 | 784 | 336 | 88 | 204 | 560 |

| Parameter / Details | Unit | IS 10500:2012 (Drinking Water Standard) | W1 Nearby site | W2 Thiruvanthapuram (1.05km WSW) | W3 Therku Silukkanpatti (1.41km SE) | W4 Keela Thatapparai (1.69km N) | W5 Kuttudankadu (2.47km S) | W6 Perurani (2.94km SW) | W7 Melathattaparai (3.92km NNW) | W8 Allikulam (1.25km SSW) |
|---|---|---|---|---|---|---|---|---|---|---|
| Iron (as Fe) | mg/l | 1.0 | BLQ (LOQ-0.05) | BLQ (LOQ-0.05) | BLQ (LOQ-0.05) | BLQ (LOQ-0.05) | BLQ (LOQ-0.05) | BLQ (LOQ-0.05) | BLQ (LOQ-0.05) | BLQ (LOQ-0.05) |
| Sulphate (as SO4) | mg/l | 200 | 645.50 | 40.58 | 92.75 | 595.50 | 34.12 | 8.92 | 19.32 | 116.00 |
| Nitrate Nitrogen (as NO3–N) | mg/l | 45.0 | 47.70 | 62.10 | 114.40 | 97.20 | 9.46 | 20.80 | 8.60 | 70.20 |
| Nitrite Nitrogen (as NO2–N) | mg/l | Not specified | BLQ (LOQ-0.02) | BLQ (LOQ-0.02) | BLQ (LOQ-0.02) | BLQ (LOQ-0.02) | BLQ (LOQ-0.02) | BLQ (LOQ-0.02) | BLQ (LOQ-0.02) | BLQ (LOQ-0.02) |
| Alkalinity (as CaCO3) | mg/l | 200 | 260 | 128 | 160 | 300 | 272 | 92 | 264.00 | 216 |
| Sodium (as Na) | mg/l | Not specified | 46.30 | 27.20 | 38.40 | 41.40 | 9.70 | 8.37 | 11.09 | 7.75 |
| Potassium (as K) | mg/l | Not specified | 16.10 | 8.30 | 10.10 | 13.00 | 0.94 | 0.64 | 1.56 | 0.93 |

Note: Aluminium, Boron, Iron, Nitrite Nitrogen, Total Chromium, Fluoride, Nickel, Manganese, Copper, Mercury, Cadmium, Arsenic, Lead, Zinc, Lithium, Iron ,TSS, Ammonical Nitrogen& Nitrite Nitrogen are below detection level (Source of standards: IS: 10500 : 2012, Laboratory: M/s Perfact Researchers Pvt. Ltd (NABL Accredited)

### *3.8.1.4 Ground Water Quality Result Interpretation*

The water quality of the buffer zone shows that

1. The Total Dissolved Solids (TDS) of the sampling locations ranges from 140.8 mg/l to 1201 mg/l. The TDS of sampling locations are within the acceptable limit of 500 mg/l & permissible limit i.e. 2000 mg/l respectively.
2. The Total Hardness of the sampling locations ranges from 88 mg/l to 784 mg/l. The Total Hardness of sampling locations are within the acceptable limit of 200 mg/l & permissible limit of 600 mg/l respectively.
3. The Alkalinity of the sampling locations ranges from 92 mg/l to 300 mg/l. The alkalinity of sampling locations are within the acceptable limit of 200 mg/l & permissible limit i.e. 600 mg/l respectively.
4. The Chloride Concentration of the sampling locations ranges from 34 mg/l to 339 mg/l. The Chloride concentration of sampling locations are within the acceptable limit of 250 mg/l & permissible limit i.e. 1000 mg/l respectively.

**Conclusion**

- The groundwater quality parameters (buffer zone) are within the IS 10500:2012 (Drinking water standard).

### 3.8.1.5. Surface Water Quality Results (March, 2025 to May 2025)

*Table 69. Surface Water Quality Result*

| Parameter / Details | Unit | SW1 Nilaviyal Odai Upstream | SW2 Drain onsite | SW3 Odai onsite | SW4 Thiruvanthapuram Pond (0.43km S) | SW5 Pond near Keela Thatapparai (0.46km N) | SW6 Allikulam Pond (0.53km SE) | SW7 Perurani Pond (0.65km SW) | SW8 Elim Pond (2.12km SSE) | SW9 Bethesda Pond (4.12km SE) | SW10 Pond near Korampallam (5.28km E) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Colour | Hazen | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Odour | - | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable |
| Turbidity | NTU | BDL (DL-1) | BDL (DL-1) | BDL (DL-1) | BDL (DL-1) | BDL (DL-1) | 98.0 | 83.2 | 36.7 | 1.7 | 2.7 |
| pH (at 25°C) | - | 6.94 | 7.41 | 7.5 | 7.2 | 7.4 | 7.2 | 7.1 | 7.06 | 7.05 | 7.36 |
| Temperature | °C | 24.9 | 25.1 | 25.3 | 24.1 | 25.0 | 25.2 | 24.7 | 24.9 | 25.3 | 25.1 |
| Conductivity | µmho /cm | 6100 | 65 | 79 | 323 | 601 | 290 | 340 | 214.0 | 234.8 | 382.0 |
| Total Dissolved Solids (TDS) | mg/l | 2387.57 | 89.20 | 67.00 | 194.00 | 484.89 | 186.20 | 226.00 | 161.05 | 188.0 | 250.0 |
| Chloride (as Cl) | mg/l | 1178.0 | 36.0 | 20.0 | 48.0 | 54.0 | 58.0 | 56.0 | 29.0 | 39.0 | 33.0 |
| Fluoride (as F) | mg/l | 0.9 | 0.4 | 0.3 | 0.1 | 0.2 | BDL (DL-0.1) | 0.9 | 0.1 | BDL (DL-0.1) | BDL (DL-0.1) |
| Total Hardness (as CaCO3) | mg/l | 1800 | 36 | 40 | 120 | 188 | 60 | 128 | 76 | 80.0 | 120.0 |
| Calcium (as Ca) | mg/l | 417 | 10 | 11 | 32 | 45 | 22 | 32 | 26 | 27.0 | 35.0 |
| Magnesium (as Mg) | mg/l | 184.7 | 2.9 | 2.9 | 9.7 | 18.5 | 4.0 | 11.7 | 2.9 | 2.9 | 7.8 |

| Parameter / Details | Unit | SW1 Nilaviyal Odai Upstream | SW2 Drain onsite | SW3 Odai onsite | SW4 Thiruvanthapuram Pond (0.43km S) | SW5 Pond near Keela Thatapparai (0.46km N) | SW6 Allikulam Pond (0.53km SE) | SW7 Perurani Pond (0.65km SW) | SW8 Elim Pond (2.12km SSE) | SW9 Bethesda Pond (4.12km SE) | SW10 Pond near Korampallam (5.28km E) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulphate (as SO4) | mg/l | 0.20 | 0.40 | 0.30 | 25.46 | 83.00 | 31.07 | 34.14 | 16.8 | BLQ (LOQ-0.05) | BLQ (LOQ-0.05) |
| Nitrate Nitrogen | mg/l | 0.83 | 0.28 | 1.53 | 7.58 | 6.02 | 36.20 | 11.20 | 7.8 | 37.0 | 58.7 |
| Nitrite Nitrogen | mg/l | 0.21 | BDL (DL-0.02) | BDL (DL-0.02) | 0.0 | 0.02 | 0.2 | 0.20 | 0.05 | 7.8 | 3.4 |
| Alkalinity | mg/l | 300 | 35 | 35.00 | 100.00 | 105.00 | 60.00 | 104.00 | 76.0 | 0.34 | 0.04 |
| Aluminium (as Al) | mg/l | BLQ (LOQ-0.02) | BLQ (LOQ-0.02) | BLQ (LOQ-0.02) | BLQ (LOQ-0.02) | BLQ (LOQ-0.02) | BLQ (LOQ-0.02) | BLQ (LOQ-0.02) | BLQ (LOQ-0.02) | 80.0 | 108.0 |
| Boron | mg/l | BDL (DL-0.1) | BDL (DL-0.1) | BDL (DL-0.1) | BDL (DL-0.1) | BDL (DL-0.1) | BDL (DL-0.1) | BDL (DL-0.1) | BDL (DL-0.1) | BLQ (LOQ-0.02) | BLQ (LOQ-0.02) |
| Phosphate | mg/l | BDL (DL-0.1) | BDL (DL-0.01) | BDL (DL-0.01) | BDL (DL-0.1) | BDL (DL-0.1) | 0.67 | 0.39 | 0.29 | BDL (DL-0.1) | BDL (DL-0.1) |
| Sodium (as Na) | mg/l | 14.20 | 16.85 | 3.24 | 14.53 | 11.64 | 32.54 | 22.86 | 10.7 | BDL (DL-0.1) | BDL (DL-0.1) |
| Potassium (as K) | mg/l | 1.97 | 2.07 | 1.76 | 2.96 | 3.05 | 1.84 | 2.96 | 1.0 | 23.7 | 19.6 |
| BOD (3 Days at 27°C) | mg/l | 3.2 | 8.2 | 28.0 | 14.0 | 20.0 | 28.0 | 4.0 | 34.0 | 4.5 | 2.9 |
| COD | mg/l | 10 | 20 | 84 | 40 | 60 | 70.0 | 10.0 | 90.0 | BLQ (LOQ-0.02) | BLQ (LOQ-0.02) |
| DO | mg/l | 6.0 | 6.5 | 3.9 | 4.7 | 4.8 | 4.4 | 5.4 | 4.1 | BLQ (LOQ-0.01) | BLQ (LOQ-0.01) |
| Ammonical Nitrogen | mg/l | 0.2 | BDL (DL-0.1) | BDL (DL-0.1) | 0.2 | 0.3 | 0.3 | 0.4 | 0.2 | BLQ (LOQ-0.05) | BLQ (LOQ-0.05) |

| Parameter / Details | Unit | SW1 Nilaviyal Odai Upstream | SW2 Drain onsite | SW3 Odai onsite | SW4 Thiruvanthapuram Pond (0.43km S) | SW5 Pond near Keela Thatapparai (0.46km N) | SW6 Allikulam Pond (0.53km SE) | SW7 Perurani Pond (0.65km SW) | SW8 Elim Pond (2.12km SSE) | SW9 Bethesda Pond (4.12km SE) | SW10 Pond near Korampallam (5.28km E) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (NH3-N) | | | | | | | | | | | |
| TSS | mg/l | 14.00 | 31.00 | 33.00 | 66.0 | 24.0 | 138.0 | 100.0 | 80.0 | BLQ (LOQ-0.02) | BLQ (LOQ-0.02) |
| Oil & Grease | mg/l | 3.6 | 4.8 | 6.2 | 6.4 | BDL (DL-3) | 5.8 | 4 | 5 | BLQ (LOQ-0.001) | BLQ (LOQ-0.001) |
| Total Coliform | MPN/ 100ml | 109.0 | 141.0 | 278.0 | 141.0 | 94.0 | 54.0 | 84.0 | 70.0 | BLQ (LOQ-0.001) | BLQ (LOQ-0.001) |

*Note: Aluminium, Boron, Iron, Nitrite Nitrogen, Total Chromium, Fluoride, Nickel, Manganese, Copper, Mercury, Cadmium, Arsenic, Lead, Zinc, Lithium, Iron ,TSS, Ammonical Nitrogen& Nitrite Nitrogen are below detection level (Source of standards: IS: 10500, Laboratory: M/s Perfect Researchers Pvt. Ltd (NABL Accredited)*

*Table 70.Surface water Designated best Use by CPCB*

| Designated-Best-Use | Class of Water | Criteria |
|---|---|---|
| Drinking Water Source without conventional treatment but after disinfection | A | pH between 6.5 and 8.5<br>Dissolved Oxygen 6 mg/l or more<br>Biochemical Oxygen Demand 5 days 20 ℃ 2 mg/l or less |
| Outdoor bathing (Organised) | B | pH between 6.5 and 8.5<br>Dissolved Oxygen 5 mg/l or more<br>Biochemical Oxygen Demand 5 days 20 ℃ 3 mg/l or less |
| Drinking water source after conventional treatment and disinfection | C | pH between 6 to 9<br>Dissolved Oxygen 4 mg/l or more<br>Biochemical Oxygen Demand 5 days 20 ℃ 3 mg/l or less |
| Propagation of Wildlife and Fisheries | D | pH between 6.5 to 8.5<br>Dissolved Oxygen 4 mg/l or more<br>Free Ammonia (as N) 1.2 mg/l or less |
| Irrigation, Industrial Cooling, Controlled Waste disposal | E | pH between 6.0 to 8.5<br>Electrical Conductivity at 25 ℃ micro mhos/cm Max. 2250<br>Boron Max. 2 mg/l |

*(Source: Surface Water quality criteria as per CPCB)*

### 3.8.1.6. Data Interpretation

Surface water samples were collected from 10 locations namely Nilaviyal Odai Upstream, Drain onsite, Odai onsite, Thiruvanthapuram Pond, Pond near Keela Thatapparai, Allikulam Pond, Perurani Pond, Elim Pond, Bathesda pond and Pond near Korampallam. As per the samples collected and analyzed from locations SW1, SW2, SW3, SW4, SW5, SW6, SW7, SW8, SW9 & SW10. surface water quality is meeting the criteria defined by class "C" as per the CPCB criteria. It is suitable for drinking water after conventional treatment and disinfection.

1. The surface water quality of the Nilaviyal Odai Upstream shows that the values of the parameters including TDS, total hardness chloride, fluoride, calcium, magnesium, iron, sulphate, nitrate nitrogen and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Nilaviyal Odai Upstream can be placed in Class "B" i.e. Outdoor bathing (Organised).

2. The Surface water quality of the Drain onsite shows that the parameters including Turbidity, TSS, Nitrate nitrogen, BOD, COD & iron content are within the EPA discharge standards. BOD & DO value indicating that the surface water quality of Drain onsite can be placed in Class "C" i.e., Drinking Water Source without conventional treatment but after disinfection per CPCB surface water quality - Designated Best Use Water Quality Criteria.

3. The surface water quality of the Odai onsite shows that the values of the parameters including TDS, total hardness, calcium, magnesium, and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Odai onsite can be placed in Class "E". i.e., Irrigation, Industrial Cooling, Controlled Waste disposal.

4. The surface water quality of the Thiruvanthapuram Pond shows that the values of the parameters including TDS, total hardness chloride, fluoride, calcium, magnesium, iron, sulphate, nitrate nitrogen and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Thiruvanthapuram Pond can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality - Designated Best Use Water Quality Criteria.

5. The surface water quality of the Pond near Keela Thatapparai shows that the values of the parameters including nitrate nitrogen, chloride, fluoride, calcium, magnesium, iron and alkalinity are within the IS drinking water quality standards. BOD & DO value indicating that the surface water quality of the Pond near Keela Thatapparaican be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality - Designated Best Use Water Quality Criteria.

6. The surface water quality of the Allikulam Pond shows that the values of the parameters including TDS, total hardness, calcium, magnesium, and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Allikulam Pond can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality- Designated Best Use Water Quality Criteria.

7. The surface water quality of the Perurani Pond shows that the values of the parameters including TDS, total hardness, calcium, magnesium, and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Perurani Pond can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality- Designated Best Use Water Quality Criteria.

8. The surface water quality of the Elim Pond shows that the values of the parameters including TDS, total hardness, calcium, magnesium, and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Elim Pond can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality- Designated Best Use Water Quality Criteria.

9. The surface water quality of the Bethesda Pond shows that the values of the parameters including TDS, total hardness, calcium, magnesium, and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Bethesda Pond can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality- Designated Best Use Water Quality Criteria.

10. The surface water quality of the Pond near Korampallam shows that the values of the parameters including TDS, total hardness, calcium, magnesium, and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Pond near Korampallam can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality- Designated Best Use Water Quality Criteria.

## 3.9 LAND ENVIRONMENT

### 3.9.1 Geomorphological Map

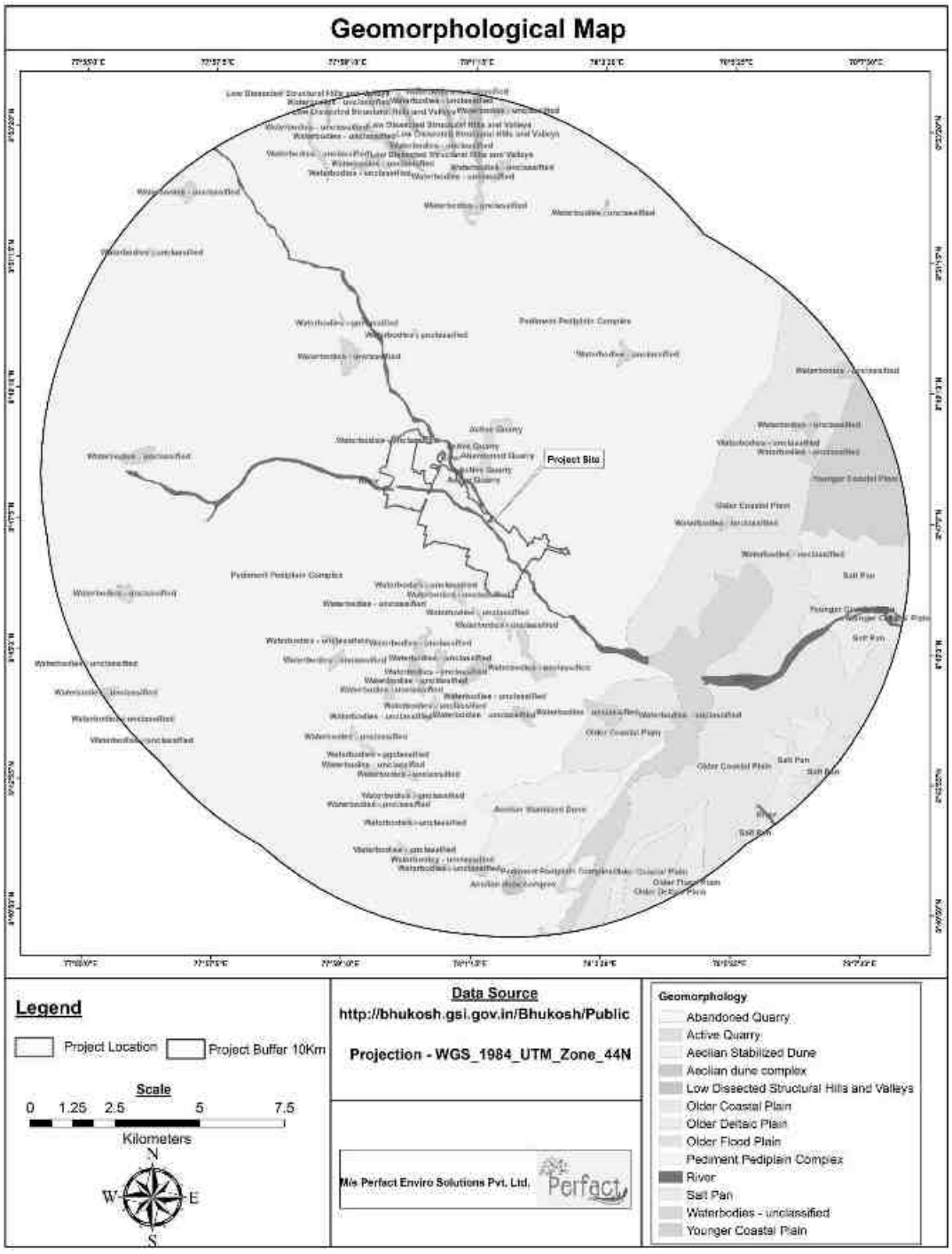



*Figure 33. Geomorphological Map*

### 3.9.2. DEM Map

**Digital Elevation Model**

Digital Elevation Models are data files that contain the elevation of the terrain over a specified area,

usually at a fixed grid interval over the "Bare Earth". The intervals between each of the grid points will always be referenced to some geographical coordinate system. This is usually either latitude-longitude or UTM (Universal Transverse Mercator) coordinate systems. The closer together the grid points are located, the more detailed the information will be in the file. The details of the peaks and valleys in the terrain will be better modeled with small grid spacing than when the grid intervals are very large. Elevations other than at the specific grid point locations are not contained in the file. As a result, peak points and valley points not coincident with the grid will not be recorded in the file. For practical purposes this "Bare Earth" DEM is generally synonymous with a Digital Terrain Model (DTM).

**Data Used**

**A. Remote sensing data**

- LANDSAT-8 - Used for FCC Image (Resolution 30m) (Date – 14-09-2025)
- Google Earth Image - Used for preparation of Land Use/Land Cover Data (Quickbird Resolution 0.6m Date- June 2025)
- ISRO Classification - Used for map preparation

**B. Collateral Data**

The study area comprises a 10 km buffer from the periphery of the project site. In this study Topo sheets 58L01 & 58H13 with 1:50,000 Scale was acquired from Survey of India (SOI).

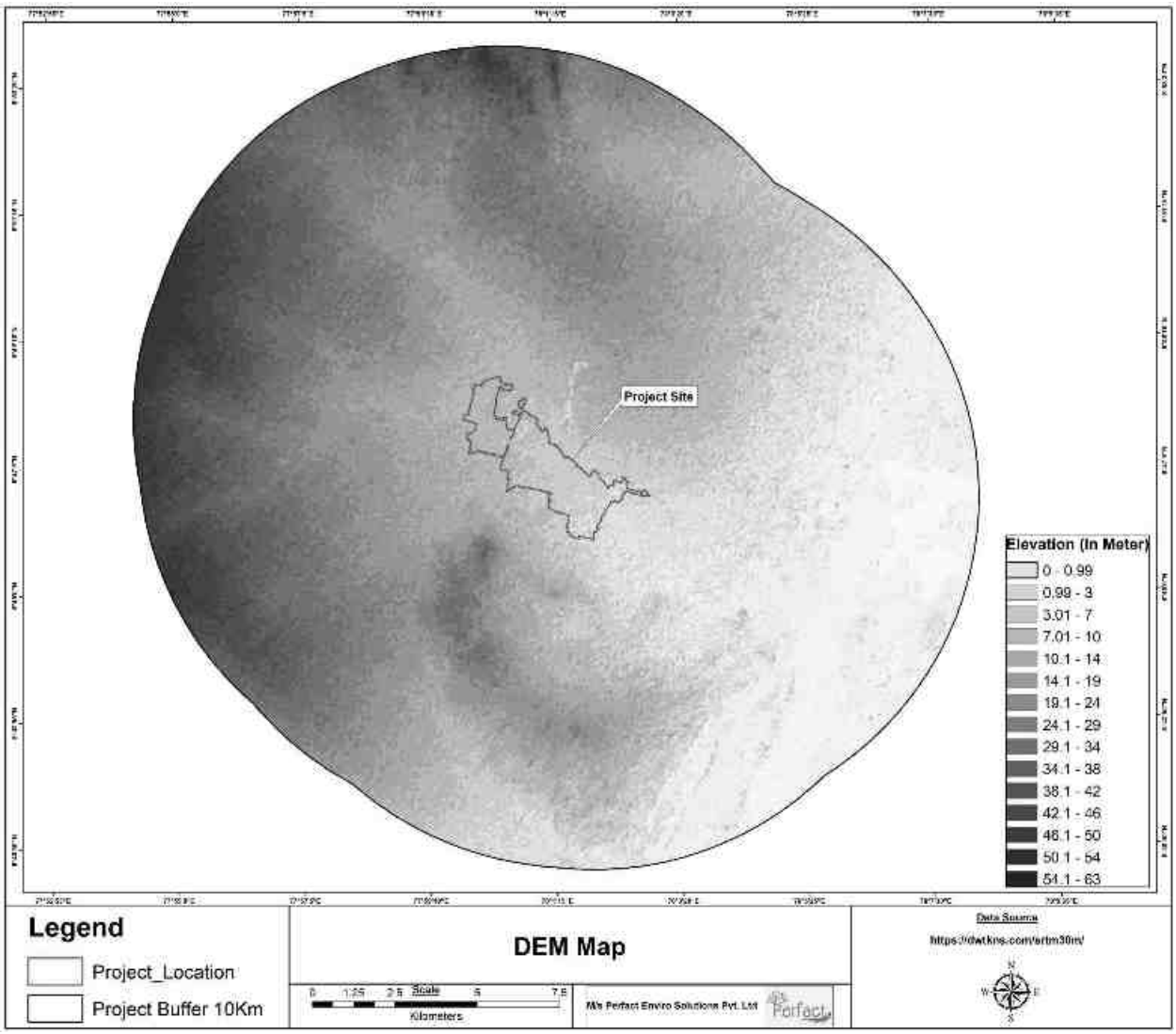



*Figure 34. Digital Elevation Model of the Study Area*

### 3.9.3. Land Use

The land use/ land cover map has been generated on 1:50,000 scale using digital classification of Imagery. Based on the methodology developed for the present land use/ land cover, categories have been grouped under the following major land use/land cover categories. The data analysis process involves examining the data using various image processing techniques by a digital computer. Its application in the field of environmental management is of great prominence.

### 3.9.4. Methodology

The methodology applied comes under following steps:

Image Extraction:

Satellite images for the Area of Interest were created through Image processing software.

Geo-Rectification:

Geometric correction includes correction for geometric distortions due to sensor, earth geometry variations and conversion of the data to real world coordinates (e.g. Latitude and Longitude) on the Earth's surface. The satellite imagery was geometrically rectified with reference to the geo-referenced toposheets and vector data.

Image Enhancement:

Image enhancement is one of the important image processing functions primarily done to improve the appearance of the imagery to assist in visual interpretation and analysis. Various options of image enhancement techniques were tried out to get the best image for visual interpretation. Histogram equalized stretch enhancement techniques were applied to the imagery of the study area for better interpretation of different features in the satellite imagery.

### 3.9.5 INTERPRETATION OF SATELLITE IMAGE

Visual interpretation techniques have been used for digitization of geographical features for different land use and vegetation cover classes based on spatial patterns of geographic features. Spectral signatures represent various land use classes. Image interpretation keys are developed based on image characteristics like color, tone, size, shape, texture, pattern, shadow, association etc, which enables interpretation of satellite images for ground features. Statistics of geographic features have been developed for impact assessment due to project activity.

After the above process the final LULC map has been prepared. The Flow chart of the methodology is given below:

## Flow Chart for Methodology of LULC Map Preparation

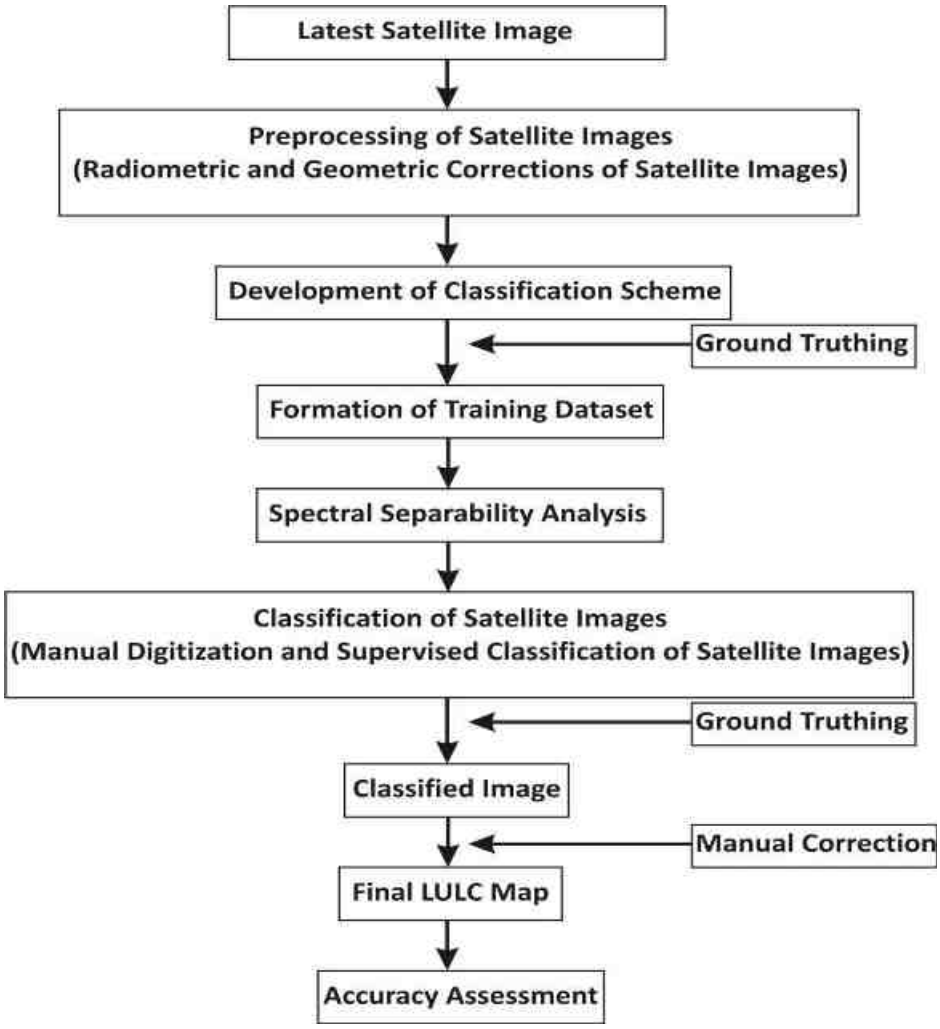



*Figure 35. Flow chart for methodology for LULC Map Preparation*

**Pre-field Interpretation of Satellite Data**

False color images are a representation of a multi-spectral image produced using bands other than visible red, green and blue as the red, green and blue components of an image display. The False Colour Composite (FCC) of LANDSAT satellite imagery having 30m spatial resolution satellite data and SOI toposheet at 1:50,000 scale was used for pre-field interpretation work. Taking the help of toposheets and by using the image elements, the features were identified. Each feature was identified on image by their image elements like tone, texture, color, shape, size, pattern and association. A tentative legend in terms of land cover and land use was formulated. The sample area for field check is selected covering all the land use/land cover feature cum image characteristics.

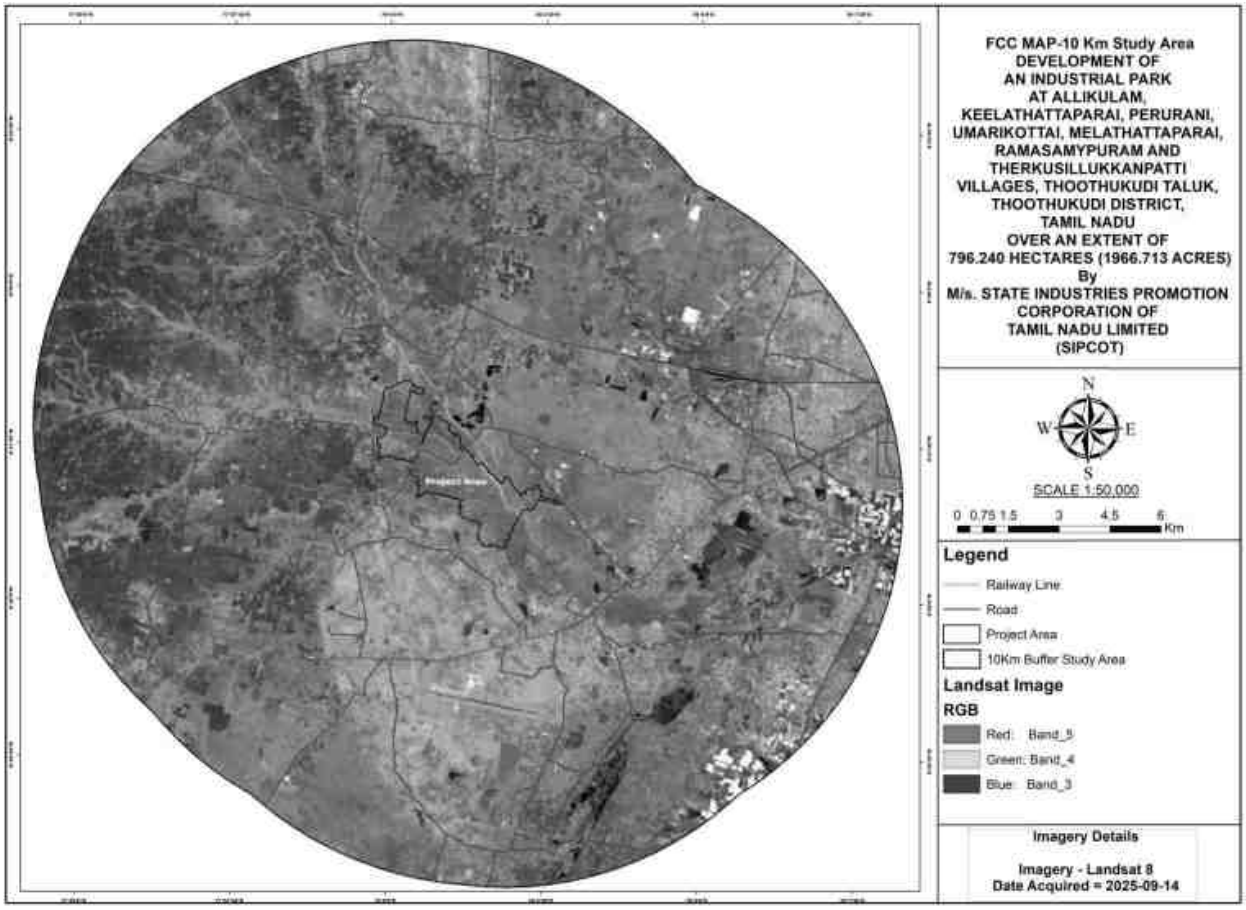



*Figure 36. FCC Map*

### 3.9.6 RESULTS AND CONCLUSIONS:

After the above process, the final LULC map has been prepared & the land use/ land cover map has been generated on 1:50,000 scale using digital classification of Imagery. Based on the methodology developed for the present land use/ land cover, categories have been grouped under the following major land use/land cover categories

*Table 71.Major land use/land cover categories of study area (10 Km Radius Buffer zone)*

| S. No. | Category | | Area in Sq. km | Area In Ha | Percentage |
|---|---|---|---|---|---|
| | Lable-I | Label-II | | | |
| 1 | Agriculture Land (41.95%) | Agriculture; Crop Land | 192.8966 | 19289.7 | 39.89% |
| | | Agriculture; Fallow Land | 3.413125 | 341.3 | 0.71% |
| | | Agriculture; Plantation | 6.560105 | 656.0 | 1.36% |
| 2 | Builtup Land (16.32%) | Builtup Rural | 15.72118 | 1572.1 | 3.25% |
| | | Builtup Urban | 59.58659 | 5958.7 | 12.32% |
| | | Builtup Mining/Industrial | 3.609647 | 361.0 | 0.75% |
| 3 | Barren Land (37.09%) | Barren; Scrub Land | 179.3701 | 17937.0 | 37.09% |
| 4 | Wet Land (4.64%) | Wetland; Waterbody Lake/Pond | 17.39774 | 1739.8 | 3.60% |
| | | Wetland; Waterbody | 5.045859 | 504.6 | 1.04% |

| S. No. | Category | | Area in Sq. km | Area In Ha | Percentage |
|---|---|---|---|---|---|
| | Lable-I | Label-II | | | |
| | | River/Stream/Canal | | | |
| | **Total** | | **483.6009** | **48360.1** | **100.00%** |

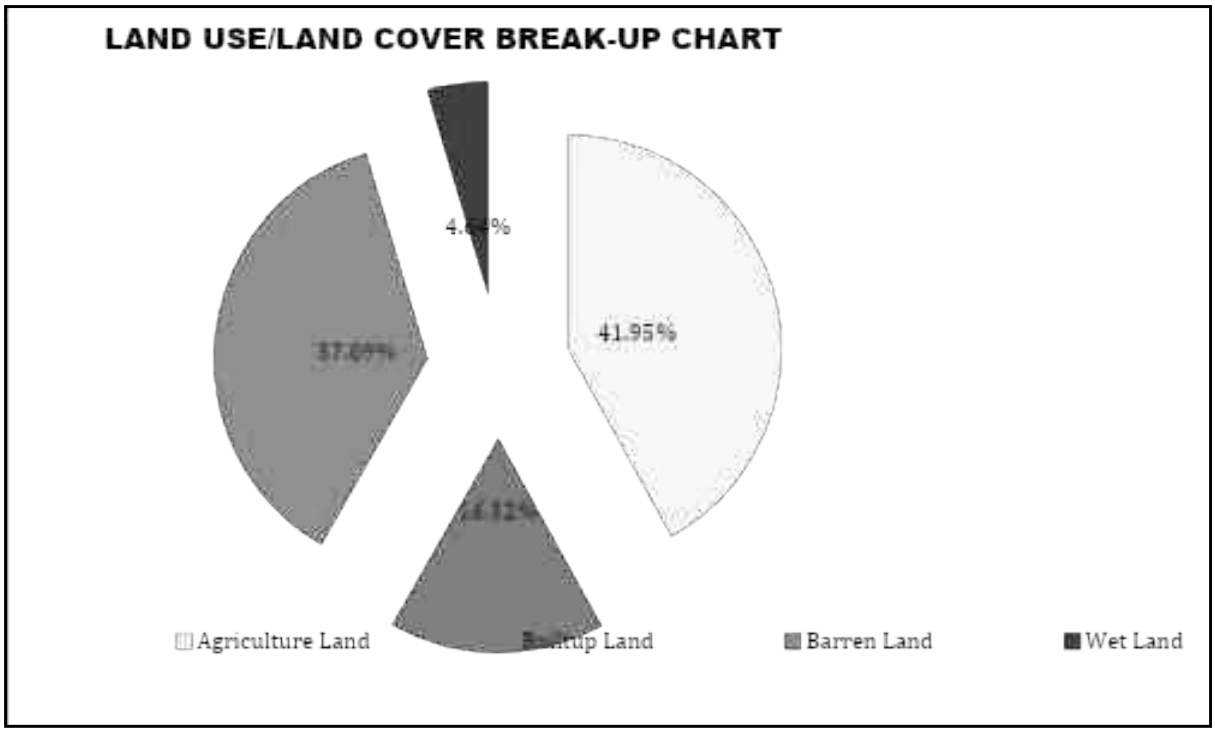



*Figure 37. Land use*

- **Agriculture Land:**

  Based on analyzed imagery and ground truth, Crop land area extents have been extracted. The Agricultural Land area is about 20287.0 hectares which is 41.95 percent of the total 10 km radius study area.

- Built up Land:

  Based on analysis of imagery, using GIS and ground truth the total built up area is about 7891.7 hectares which is 16.32 percent of the total study area.

- Waste/Barren Land:

  Barren Land area occupies around 17937 ha which is 37.09 percent of the study area.

- Wet Land-Water Bodies:

Based on satellite data and ground truth, the total area covered by the inland wetland, river and water bodies is 2244.4 hectares which is 4.64 percent of the total study area.

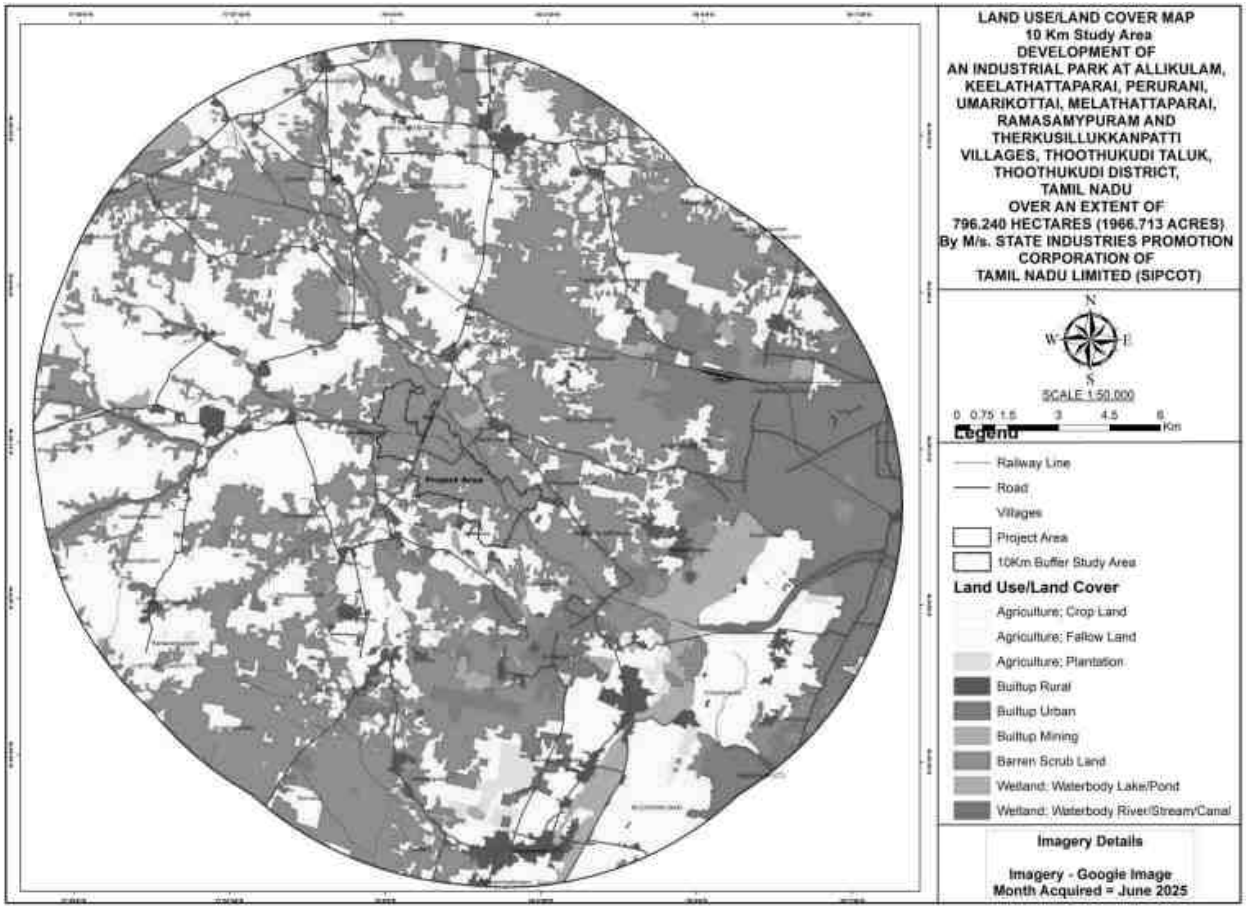



*Figure 38. Land Use and Land Cover Map*

## 3.10 SOIL QUALITY

### 3.10.1 Soil

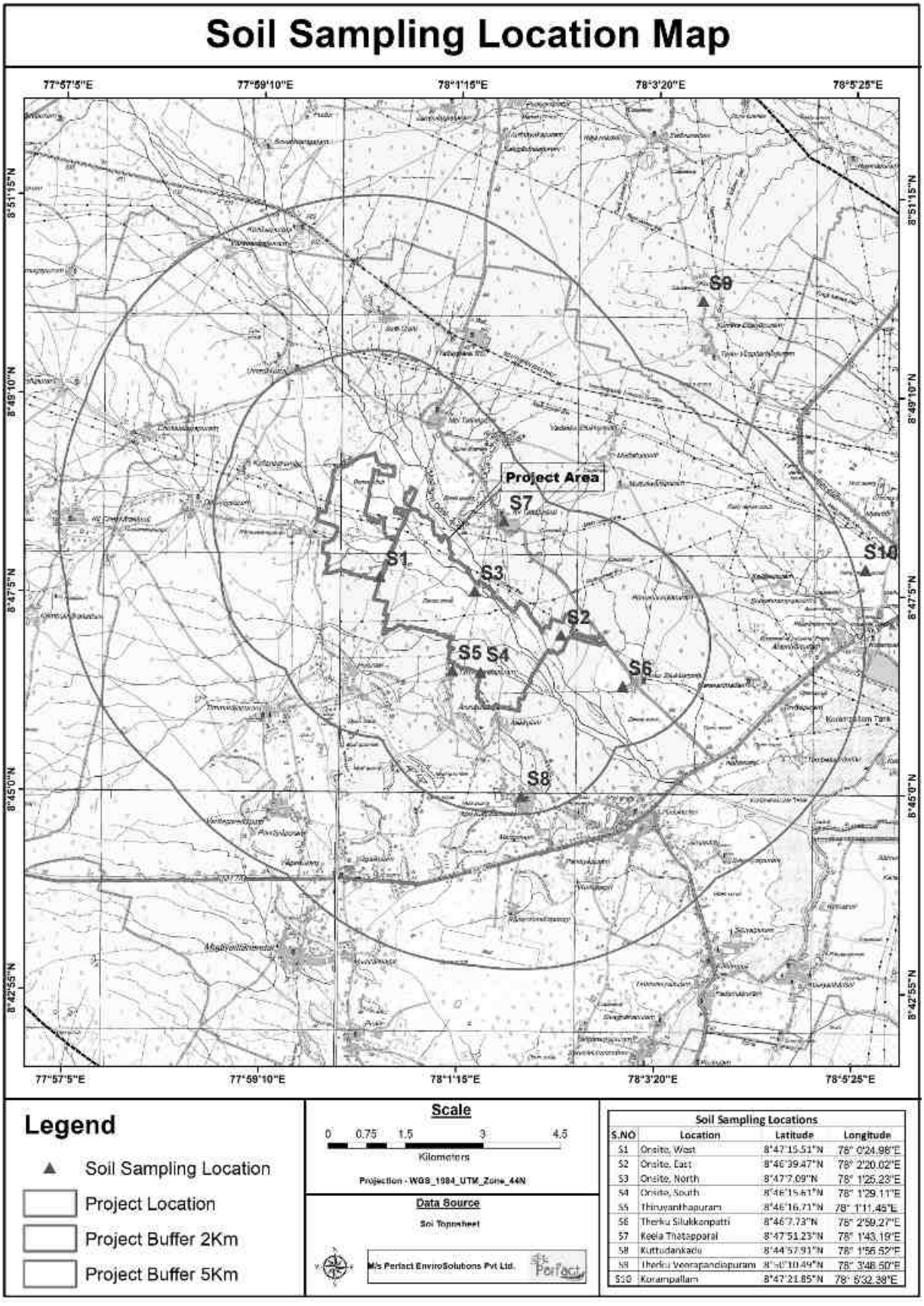
The major soil types of the region are red soil, black soil, brown soil, alluvial soil & mixed soil. The soil of the study area is Coarse grained charnockite type.

### 3.10.2 Sampling Location

*Table 72. Offsite Soil Sampling Location*

| Location No. | Sampling Location | Latitude & Longitude | Distance & Direction from Project Boundary | Environmental Significance / Zone |
|---|---|---|---|---|
| S1 | Onsite, West | 8°47'15.51"N, 78° 0'24.98"E | Within site | Core Zone |
| S2 | Onsite, East | 8°46'39.47"N, 78° 2'20.02"E | Within site | Core Zone |
| S3 | Onsite, North | 8°47'7.09"N, 78° 1'25.23"E | Within site | Core Zone |

| Location No. | Sampling Location | Latitude & Longitude | Distance & Direction from Project Boundary | Environmental Significance / Zone |
|---|---|---|---|---|
| S4 | Onsite, South | 8°46'15.61"N, 78° 1'29.11"E | Within site | Core Zone |
| S5 | Thiruvanthapuram | 8°46'16.71"N, 78° 1'11.45"E | 1.05km WSW | Buffer Zone |
| S6 | Therku Silukkanpatti | 8°46'7.73"N, 78° 2'59.27"E | 1.41km SE | Buffer Zone |
| S7 | Keela Thatapparai | 8°47'51.23"N, 78° 1'43.19"E | 1.69km N | Buffer Zone |
| S8 | Kuttudankadu | 8°44'57.91"N, 78° 1'55.52"E | 2.47km S | Buffer Zone |
| S9 | Therku Veerapandiapuram | 8°50'10.49"N, 78° 3'48.50"E | 6.75 km NE | Buffer Zone |
| S10 | Korampallam | 8°47'21.85"N, 78° 5'32.38"E | 5.22 km NE | Buffer Zone |




Soil Sampling Locations

| S.NO | Location | Latitude | Longitude |
|---|---|---|---|
| S1 | Onsite, West | 8°47'15.51"N | 78° 0'24.98"E |
| S2 | Onsite, East | 8°46'39.47"N | 78° 2'20.02"E |
| S3 | Onsite, North | 8°47'7.09"N | 78° 1'25.23"E |
| S4 | Onsite, South | 8°46'15.61"N | 78° 1'29.11"E |
| S5 | Thiruvanthapuram | 8°46'16.71"N | 78° 1'11.45"E |
| S6 | Theriu Silukkanpatti | 8°46'7.73"N | 78° 2'59.27"E |
| S7 | Keela Thatapparai | 8°47'51.23"N | 78° 1'43.19"E |
| S8 | Kuttudankadu | 8°44'57.91"N | 78° 1'56.52"E |
| S9 | Theriu Veerapandiapuram | 8°48'10.49"N | 78° 3'48.50"E |
| S10 | Korampallam | 8°47'21.85"N | 78° 5'32.38"E |

*Figure 39. Soil sampling Location Map*

### 3.10.3 Sampling Procedure and Analysis

Augur method was used and samples were collected below 15 cm depth after removing the upper crust. Samples from each spot were well mixed with hand on a clean polythene sheet. About 1 kg of soil was retained after the quartering process. This sample was kept for some time for air-drying at room temperature, stored in a polythene bag with a label at the top. Soil Quality Results are summarized below on the next page.

### 3.10.4 Physical & Chemical Properties of Soil

*Table 73. Physical & Chemical Properties of Soil*

| Land Type | Unit | Permanent pastures and other grazing lands: | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | | Onsite West | Onsite East | Onsite North | Onsite South | Thiruvantha Puram | Thenku Silukan Patti | Keelathatta parai | Kuttadankadu | Therkkuvera pandiapuram | Korampallam |
| **Physical Characteristics** | | | | | | | | | | | |
| Color | – | 4/3 Brown | 4/3 Brown | 4/3 Brown | 4/3 Brown | 6/3 Dull Brown | 4/3 Brown | 4/3 Brown | 5/6 Bright Brown | 4/3 Brown | 4/3 Brown |
| Texture | Sand % | 33.2 | 22.8 | 31.8 | 29.1 | 31.1 | 27.9 | 28.4 | 31.0 | 24.8 | 33.5 |
| | Silt % | 18.8 | 13.8 | 28.5 | 20.0 | 18.1 | 26.9 | 15.9 | 19.6 | 22.1 | 19.1 |
| | Clay % | 48.0 | 63.3 | 39.6 | 50.8 | 50.6 | 45.1 | 55.6 | 49.3 | 53.0 | 47.3 |
| Moisture content | % | 1.1 | 2.7 | 1.6 | 1.3 | 2.5 | 2.3 | 1.8 | 1.9 | 0.6 | 1.0 |
| Electric Conductivity | µS/cm | 417.5 | 123.7 | 512.1 | 129.2 | 125.9 | 194.6 | 301.8 | 323.7 | 245.0 | 218.5 |
| Bulk density | g/cc | 1.39 | 1.42 | 1.21 | 1.18 | 1.29 | 1.32 | 1.43 | 1.29 | 1.35 | 1.40 |
| Porosity | % | 28.7 | 33.4 | 27.4 | 31.9 | 33.3 | 32.5 | 36.1 | 29.6 | 32.7 | 28.70 |
| **Chemical Characteristics** | | | | | | | | | | | |
| pH | - | 7.83 | 7.82 | 7.76 | 7.49 | 7.95 | 7.63 | 7.30 | 7.45 | 7.29 | 7.12 |
| Organic Matter | % | 0.68 | 0.41 | 0.75 | 1.02 | 0.58 | 0.58 | 0.71 | 0.75 | 0.88 | 1.16 |
| Available Nitrogen | mg/kg | 64.2 | 54.4 | 72.6 | 98.8 | 66.4 | 62.6 | 70.8 | 74.6 | 86.4 | 108.60 |
| Available Calcium | mg/kg | 92.3 | 52.3 | 105.3 | 57.6 | 58.8 | 62.3 | 74.5 | 80.1 | 75.8 | 70.30 |
| Available Magnesium | mg/kg | 57.3 | 46.1 | 65.5 | 36.4 | 36.1 | 38.4 | 42.9 | 55.3 | 51.9 | 38.7 |
| Available Potassium | mg/kg | 52.80 | 42.90 | 56.10 | 32.90 | 28.70 | 31.30 | 34.50 | 45.30 | 41.80 | 29.30 |
| Nitrate Nitrogen | mg/kg | 64.8 | 30.4 | 40.8 | 56.4 | 36.2 | 34.8 | 38.6 | 40.4 | 48.80 | 62.2 |

| Land Type | Unit | Permanent pastures and other grazing lands: | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | | Onsite West | Onsite East | Onsite North | Onsite South | Thiruvantha Puram | Thenku Silukan Patti | Keelathatta parai | Kuttadankadu | Therkkuvera pandiapuram | Korampallam |
| Available Phosphorus | mg/kg | 7.72 | 6.40 | 7.74 | 9.75 | 2.29 | 3.71 | 7.16 | 15.03 | 7.17 | 10.73 |
| Chloride | mg/kg | 124.25 | 35.50 | 142.00 | 17.75 | 62.13 | 44.38 | 53.25 | 79.88 | 35.50 | 26.63 |
| Cation Exchange Capacity | meq/100gm | 18.30 | 20.70 | 17.50 | 18.80 | 20.10 | 18.80 | 20.30 | 18.90 | 16.50 | 17.30 |
| Available Sulphur | mg/kg | 1.53 | 1.95 | 1.38 | 2.58 | 1.59 | 2.18 | 3.44 | 3.69 | 2.13 | 1.59 |
| Available Sodium | mg/kg | 104.50 | 62.80 | 115.30 | 67.90 | 58.40 | 67.90 | 76.50 | 88.70 | 76.40 | 81.30 |
| Bicarbonate | mg/kg | 134.20 | 122.00 | 122.00 | 85.40 | 146.40 | 109.80 | 122.00 | 109.80 | 97.60 | 85.40 |
| Texture Class | | Clay | Clay | Clay Loam | Clay | Clay | Clay | Clay | Clay | Clay | Clay |
| Water Holding capacity | % | 52 | 60 | 50 | 52 | 52 | 56 | 54 | 50 | 52 | 48 |
| SAR | (mEq/100 g) | 17.1 | 7.4 | 11.0 | 14.1 | 8.9 | 8.6 | 9.1 | 10.5 | 12.1 | 16.4 |

### 3.10.5. Data Interpretation

**Core Zone :** After analyzing the samples collected from the site, it shows that the soil texture is 4/3 Brown, pH is 7.49-7.83 Amount of primary nutrients like Organic matter is 0.41-1.02 %, the available nitrogen 54.4-98.8 mg/kg is low to medium and available Potassium 32.90-56.10 mg/kg is medium to high & the available Phosphorus 6.40-9.75 mg/kg is medium to high range.

The overall fertility of this soil would be considered moderate to low. .Although phosphorus and potassium levels are adequate, the low organic matter content and low to medium nitrogen levels are critical limiting factors. Since soil fertility is determined by the combined availability of primary nutrients and organic matter, the soil of the study area is therefore classified as moderate to low fertility. Based on the above parameters, soil amendments such as organic manure and balanced fertiliser application would be required to improve nutrient availability and enhance soil fertility.

**Buffer Zone:** 6/3 Dull Brown, 4/3 Brown, 5/6 Bright Brown, pH ranges from 7.12 to 7.95 Amount of primary nutrients like Organic matter 0.41 to 1.16%, the Available Nitrogen 62.6 to 108.60 mg/kg is low to high range, the Available Phosphorus 2.29 mg/kg to 15.03 mg/kg is low to high range, Available Potassium 28.70 mg/kg to 52.80 mg/kg is low to high range.

The overall fertility of this soil would be considered moderate. The soil has good potential due to its clay loam texture and relatively neutral pH, but the fertility is limited by low to medium levels of organic matter, nitrogen, and potassium.

## 3.11 BIOLOGICAL ENVIRONMENT

The ecological environment within and around the proposed Industrial Park development by M/s. State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT) encompasses a complex interplay of biotic and abiotic components—comprising native vegetation, faunal assemblages, soil and microbial communities, and supporting environmental factors—that collectively maintain ecological functions and ecosystem services in the region.

The site lies within the tropical dry and semi-arid climatic zone of Tamil Nadu, with seasonal rainfall, high temperatures, and soils ranging from red sandy loams to clayey alluvial deposits, supporting predominantly dry deciduous vegetation and agricultural activities. Ecologically, the landscape represents a heterogeneous mosaic of cultivated lands, patches of natural vegetation, small water courses, and human settlements, sustaining local biodiversity including flora, birds, small mammals, reptiles, amphibians, and invertebrates. These features play a crucial role in maintaining habitat connectivity, groundwater recharge, and ecosystem resilience. However, the ecological integrity of the area remains susceptible to anthropogenic pressures arising from large-scale land conversion, soil compaction, stormwater runoff, air and noise pollution, and associated infrastructural development. Without effective mitigation measures, these activities have the potential to fragment habitats, alter hydrological regimes, and impact local biodiversity and ecosystem services.

### 3.11.1 Objective

The objective of this study is in accordance with the Terms of Reference (ToR), primarily concentrating on a detailed inventory of the species (flora and fauna) identified in the mining lease expanse and in the vicinity encompassing a 10 km radius. As such, the key objectives involve assessing the ecological health of the existing flora and fauna and their habitats, creating foundational data, and evaluating potential project induced impacts on the biological environmentt.

Terrestrial and Arboreal Ecology and Biodiversity

- Scrutinization the key characteristics of the vegetation, with an emphasis on the various types of natural forests, the most frequently encountered and dominant floral species, associated families, the occurrence of man-made plantations, Exotic plant species, and any indications of habitat deterioration in the area of interest.
- One of the objectives against the current study entails recognizing the prevailing habitat and land cover categories within the study region, such as forests, wetlands, agricultural areas, and urban development *etc*.
- Evaluation of the crop-diversity of the study area, along with an assessment allied to the native plant species with commercial and ethnomedicinal values.
- Identification of the susceptible plant and animal species in respect to their long-term survivability on the basis of IUCN Red Data List.
- Identification of the Schedule I species (as per WLPA, 1972 and the amendments thereafter).

### 3.11.2. Survey Methodology

- Baseline survey Period- March 2025 to May 2025
- Expanse of Study Area- 314.16 square kilometers ($\pi r^2 = \pi.10^2 \approx 314.16$).
- Survey Approach

The primary and secondary survey that included the core zone—the area allocated for mining leases—as well as a buffer zone that extended 10 km surrounding the core zone was used to assess the biological variety of the area. Primary and secondary surveys were the main focus of the survey methodology. The adjacent land and water regions were taken into account for the assessments associated with natural vegetation. The process used for establishing a thorough inventory of the study area's floral variety and habitat categories using original observations and secondary data. Furthermore, the local population's traditional ecological knowledge supported these findings.

Investigations toward fauna species were carried out in day time (considering both direct and Indirect survey) usually by visual encounters and tracking animal calls, footprints, excreta evidence, scents of particular animals, etc., in order to gather ground truthing. A comprehensive listing of the study area's animal species was created by gathering primary and secondary records. Understanding the existing faunal life in the study region is additionally significantly helped by the insights offered by the locals. To improve and streamline the process of identifying different species, the surveys included photographic evidence. Consequently, the following is a summary of the environmental indicators associated with biological factors for the current course of action:

- Species composition of flora and fauna.
- Flora: Species diversity, predominant floral species, economic significance, and commercial values.
- Fauna: Species diversity, Composition, related families, Conservation status, *etc*.

**Primary Survey:**

A conscious effort was made to clearly note the variety of plant species, including aquatic flora, during the field study, with a focus on the most common species and their habitats. Through visual observations, the existence of animal species, including birds, reptiles, and mammals, was carefully assessed. The information that locals in the study region supplied was essential for guiding current projects. Understanding the distinctive characteristics of animals in a particular area requires a significant investment of time and effort. In addition to collecting direct observations of species, ecological studies often documented indirect evidence of their presence, such as animal odors, footprints, droppings, and vocalizations. Furthermore, the confirmation of the existence of wildlife was made easier by talking to locals, who shared insightful information and mentioned how frequently animals interacted in the survey region.

The early morning hours of 7:00 to 9:00 am and the late afternoon hours of 3:30 to 5:00 pm were set aside for the avifauna survey. During the day, surveys of animals, amphibians, reptiles, and vegetation were carried out, along with from 9:00 am to 4:00 pm, butterflies were observed. A comprehensive survey of the bird species was carefully documented at each sample location, resulting in the creation of an extensive list. Binoculars and reputable field guides made it easier to identify different kinds of birds, guaranteeing precise species identification.

**Secondary Survey:**

Many secondary sources, including books, research projects, and research papers, have provided support for the data and conclusions drawn from the primary survey. Additionally, the Divisional Forest Officer's verified list of plants and animals for the present project serves as a valuable additional source of information.

**Species Inventorization:**

After merging primary data with information from desktop analysis, the biological diversity record of the study region for the current project was finally acquired and completed.

**Survey Limitation**

- Insufficient Vegetation Density: The limited density of vegetation has restricted the variety of sampling sites, thereby hindering the observation of species and the collection of relevant data.
- Fragmentation of Natural Environments: Agricultural practices and human activities have led to the fragmentation of natural environments, posing challenges for a thorough assessment of ecological patterns.
- Seasonal Limitations: The timing of the survey may not have aligned with the peak seasons for biodiversity, potentially resulting in the absence of migratory species or seasonal plant growth.

- Limitation in Survey Stretch: The surveys were exclusively conducted in daylight, thereby confining the observed bird activities to the hours of daylight. No surveys were performed at night.
- Shorter Timeframe: The rapid surveys were executed over a limited timeframe, resulting in the report's omission of any analysis regarding seasonal variability in the data.

### 3.11.3. Cropping Pattern

During the baseline environmental monitoring period from March 2025 to May 2025 in Thoothukudi District, Tamil Nadu, the prevailing agricultural activity reflected the district's dryland farming system adapted to semi-arid climatic conditions. The principal crops cultivated during this summer (pre-monsoon) season included pearl millet (cumbu), black gram, and green gram, which are well-suited to limited rainfall and residual soil moisture. Sowing generally commenced in April, with harvesting occurring in June–July depending on local irrigation availability. Groundnut was also grown as a major oilseed crop, particularly in irrigated tracts, with sowing undertaken in late April and harvesting by June–July. In areas supported by well or tank irrigation, sunflower, sesame (gingelly), and maize were cultivated on a smaller scale for both commercial and fodder purposes. Perennial crops such as cashew, banana, and coconut formed part of the agricultural landscape, contributing to farm income but not adhering to the short seasonal cycle. Vegetables like brinjal, lady's finger, and chilli were cultivated in select irrigated pockets to meet local market demand. This diverse cropping pattern was primarily governed by soil type, availability of irrigation sources, and prevailing temperature and rainfall conditions during the April–June period, ensuring livelihood sustenance under semi-arid environmental conditions.
https://agritech.tnau.ac.in/agriculture/agri_agrometeorology_croppingpattern_southernzone.html

### 3.11.4. Forest Type and Dominant Flora and Fauna Species

Thoothukudi District, located in the southeastern part of Tamil Nadu, lies within the dry and arid zone of the Deccan Plateau and is characterized by sparse vegetation and limited forest cover. The district's forest types are primarily tropical dry deciduous and thorn forests, influenced by the region's low rainfall and high temperature. These forests are mostly found in the western and northwestern parts of the district, particularly in areas with undulating terrain and shallow soils. The vegetation is dominated by hardy and drought-resistant species.

In some coastal and inland areas, scrub jungles and grasslands occur, providing habitat for small mammals, reptiles, and birds adapted to dry conditions. The coastal belt of Thoothukudi, extending along the Gulf of Mannar, supports mangrove forests and littoral vegetation, particularly in estuarine and lagoon ecosystems.

Flora of the study area

*Table 74. List o f floral species in the study area*

| S. No. | Botanical name | Common Indian Name | Family | Habit |
|---|---|---|---|---|
| 1 | *Abrus precatorius* | Gunja | Fabaceae | Liana |
| 2 | *Acacia auriculiformis* | Earleaf Acacia | Fabaceae | Tree |
| 3 | *Acacia chundra* | Lal Khair | Fabaceae | Tree |
| 4 | *Acacia horrida* | Prickly Acacia | Fabaceae | Tree |
| 5 | *Acacia holosericea* | Silky Wattle | Fabaceae | Tree |

| S. No. | Botanical name | Common Indian Name | Family | Habit |
|---|---|---|---|---|
| 6 | *Acacia nilotica* | Babul | Fabaceae | Tree |
| 7 | *Acacia planifrons* | Umbrella Thorn | Fabaceae | Tree |
| 8 | *Acacia senegal* | Gum Arabic Tree | Fabaceae | Tree |
| 9 | *Acacia melanoxylon* | Australian Blackwood | Fabaceae | Tree |
| 10 | *Aegle marmelos* | Bael | Rutaceae | Tree |
| 11 | *Ailanthus excelsa* | Tree of Heaven | Simaroubaceae | Tree |
| 12 | *Albizia amara* | Kattumurai | Fabaceae | Tree |
| 13 | *Albizia lebbeck* | Siris | Fabaceae | Tree |
| 14 | *Anacardium occidentale* | Cashew | Anacardiaceae | Tree |
| 15 | *Annona squamosa* | Custard Apple | Annonaceae | Tree |
| 16 | *Anogeissus latifolia* | Dhaura | Combretaceae | Tree |
| 17 | *Azadirachta indica* | Neem | Meliaceae | Tree |
| 18 | *Barringtonia acutangula* | Freshwater Mangrove | Lecythidaceae | Tree |
| 19 | *Bauhinia malabarica* | Malabar Bauhinia | Fabaceae | Tree |
| 20 | *Bauhinia racemosa* | Bidi Leaf Tree | Fabaceae | Tree |
| 21 | *Borassus flabellifer* | Palmyra Palm | Arecaceae | Tree |
| 22 | *Caesalpinia pulcherrima* | Peacock Flower | Fabaceae | Tree |
| 23 | *Canthium coromandelicum* | Coromandel Ebony | Rubiaceae | Shrub |
| 24 | *Carica papaya* | Papaya | Caricaceae | Shrub |
| 25 | *Cassia fistula* | Amaltas | Fabaceae | Tree |
| 26 | *Casuarina equisetifolia* | Casuarina | Casuarinaceae | Tree |
| 27 | *Catunaregam spinosa* | Mountain Pomegranate | Rubiaceae | Shrub |
| 28 | *Ceiba pentandra* | Silk Cotton Tree | Malvaceae | Tree |
| 29 | *Cissus quadrangularis* | Hadjod | Vitaceae | Liana |
| 30 | *Cissus vitiginea* | Woodbine | Vitaceae | Liana |
| 31 | *Cissus heyneana* | Climbing Grape | Vitaceae | Liana |
| 32 | *Citrus aurantiifolia* | Lime | Rutaceae | Shrub |
| 33 | *Citrus limon* | Lemon | Rutaceae | Shrub |
| 34 | *Cocos nucifera* | Coconut | Arecaceae | Tree |
| 35 | *Coccinia grandis* | Ivy Gourd | Cucurbitaceae | Liana |
| 36 | *Cocculus hirsutus* | Broom Creeper | Minispermaceae | Liana |
| 37 | *Commiphora berryi* | Indian Myrrh | Burseraceae | Shrub |
| 38 | *Cordia sebestena* | Scarlet Cordia | Boraginaceae | Shrub |
| 39 | *Ctenolepis garcini* | Garcin's Vine | Cucurbitaceae | Liana |
| 40 | *Crateva religiosa* | Sacred Garlic Pear | Capparaceae | Tree |
| 41 | *Dalbergia spinosa* | Thorny Rosewood | Fabaceae | Shrub |
| 42 | *Dalbergia sissoo* | Shisham | Fabaceae | Tree |
| 43 | *Delonix elata* | White Gulmohar | Fabaceae | Tree |
| 44 | *Delonix regia* | Gulmohar | Fabaceae | Tree |
| 45 | *Dichrostachys cinerea* | Sickle Bush | Fabaceae | Tree |
| 46 | *Dichrostachys santapaui* | Santapau's Sickle Bush | Fabaceae | Tree |
| 47 | *Erythrina variegata* | Indian Coral Tree | Fabaceae | Tree |
| 48 | *Eucalyptus tereticornis* | Eucalyptus | Myrtaceae | Tree |
| 49 | *Ficus benghalensis* | Banyan | Moraceae | Tree |
| 50 | *Ficus mollis* | Hairy Fig | Moraceae | Tree |
| 51 | *Ficus religiosa* | Peepal | Moraceae | Tree |

| S. No. | Botanical name | Common Indian Name | Family | Habit |
|---|---|---|---|---|
| 52 | *Flacourtia indica* | Governor's Plum | Salicaceae | Shrub |
| 53 | *Flueggea virosa* | White Berry Bush | Phyllanthaceae | Shrub |
| 54 | *Gliricidia sepium* | Gliricidia | Fabaceae | Tree |
| 55 | *Gmelina arborea* | Gmelina | Lamiaceae | Tree |
| 56 | *Guettarda speciosa* | Sea Gardenia | Rubiaceae | Tree |
| 57 | *Hardwickia binata* | Anjan | Fabaceae | Tree |
| 58 | *Holoptelea grandis* | Indian Elm | Ulmaceae | Tree |
| 59 | *Lannea coromandelica* | Indian Ash Tree | Anacardiaceae | Tree |
| 60 | *Lawsonia inermis* | Henna | Lythraceae | Shrub |
| 61 | *Lysiloma latisiliquum* | Wild Tamarind | Fabaceae | Tree |
| 62 | *Leucaena leucocephala* | Subabul | Fabaceae | Tree |
| 63 | *Madhuca longifolia* | Mahua | Sapotaceae | Tree |
| 64 | *Mangifera indica* | Mango | Anacaridiaceae | Tree |
| 65 | *Manilkara zapota* | Chikoo | Sapotaceae | Tree |
| 66 | *Melia azedarach* | Chinaberry | Meliaceae | Tree |
| 67 | *Millingtonia hortensis L* | Indian Cork Tree | Bigononiaceae | Tree |
| 68 | *Morinda coreia* | Indian Mulberry | Rubiaceae | Tree |
| 69 | *Moringa oleifera* | Drumstick Tree | Moringaceae | Tree |
| 70 | *Muntingia calabura* | Singapore Cherry | Muntingiaceae | Tree |
| 71 | *Nyctanthes arbor-tristis* | Parijat | Oleaceae | Tree |
| 72 | *Pandanus odorifer* | Screw Pine | Pandanaceae | Shrub |
| 73 | *Parkinsonia aculeata* | Jerusalem Thorn | Fabaceae | Tree |
| 74 | *Pergularia daemia* | Trellis Vine | Apocynaceae | Liana |
| 75 | *Peltophorum pterocarpum* | Copperpod | Fabaceae | Tree |
| 76 | *Pongamia pinnata* | Karanja | Fabaceae | Tree |
| 77 | *Phyllanthus acidus* | Star Gooseberry | Phyllanthaceae | Shrub |
| 78 | *Phyllanthus emblica* | Amla | Phyllanthaceae | Tree |
| 79 | *Pisonia grandis* | Lettuce Tree | Nyctaginaceae | Shrub |
| 80 | *Pithecellobium dulce* | Manila Tamarind | Fabaceae | Tree |
| 81 | *Plumeria rubra* | Frangipani | Apocynaceae | Shrub |
| 82 | *Polyalthia longifolia* | Ashoka Tree | Annonaceae | Tree |
| 83 | *Prosopis chilensis* | Chile Prosopis | Fabaceae | Tree |
| 84 | *Prosopis juliflora* | Mesquite | Fabaceae | Tree |
| 85 | *Psidium guajava* | Guava | Myrtaceae | Tree |
| 86 | *Rivea hypocrateriformis* | Morning Glory Creeper | Convolvulaceae | Liana |
| 87 | *Sapindus emarginatus* | Soapnut Tree | Sapindaceae | Tree |
| 88 | *Sapindus trifoliatus* | Soapberry | Sapindaceae | Tree |
| 89 | *Spathodea campanulata* | African Tulip Tree | Bignoniaceae | Tree |
| 90 | *Saraca asoca* | Ashoka Tree | Fabaceae | Tree |
| 91 | *Senna siamea* | Siamese Cassia | Fabaceae | Tree |
| 92 | *Syzygium cumini* | Jamun | Myrtaceae | Tree |
| 94 | *Tabebuia rosea* | Pink Trumpet Tree | Bigononiaceae | Tree |
| 95 | *Tamarindus indica* | Tamarind | Fabaceae | Tree |
| 96 | *Tecomella undulata* | Rohida | Bigononiaceae | Tree |
| 97 | *Tectona grandis* | Teak | Lamiaceae | Tree |
| 98 | *Terminalia arjuna* | Arjun | Combretaceae | Tree |
| 99 | *Terminalia catappa* | Indian Almond | Combretaceae | Tree |

| S. No. | Botanical name | Common Indian Name | Family | Habit |
|---|---|---|---|---|
| 100 | *Thespesia populnea* | Portia Tree | Malvaceae | Tree |
| 101 | *Thespesia populneoides* | Seaside Mahoe | Malvaceae | Tree |
| 102 | *Tinospora sinensis* | Guduchi | Menispermaceae | Liana |
| 103 | *Ziziphus jujuba* | Ber | Rhamanaceae | Shrub |
| 104 | *Ziziphus xylopyrus* | Wild Jujube | Rhamanaceae | Shrub |

## Fauna of the Study area:

A comprehensive study of the local fauna within the study area was conducted through both primary and secondary surveys, with a focus on birds, mammals, and herpetofauna. Given that the study was limited to a single season and data was extensive, secondary sources were also utilized to enhance our ecological biodiversity assessment. This included an extensive review of existing literature, such as research papers, recent articles, dissertations, topographical maps, and textbooks, to identify critical corridors and the presence of any endangered species near the project area.

**A. Mammals**

*Table 75. List of Mammals in the study area*

| S. No. | Common Name | Scientific Name | Family | IUCN Status | WLPA Schedule 2022 |
|---|---|---|---|---|---|
| 1 | Asian Palm Civet | *Paradoxurus hermaphroditus* | Viverridae | LC | I |
| 2 | Rusty-spotted Cat | *Prionailurus rubiginosus* | Felidae | NT | I |
| 3 | Bonnet macaque | *Macaca radiata* | Cercopithecidae | V | I |
| 4 | Indian Brown Mongoose | *Urva fusca* | Herpestidae | LC | I |
| 5 | Ruddy Mongoose | *Urva smithii* | Herpestidae | LC | I |
| 6 | Small Indian Civet | *Viverricula indica* | Viverridae | LC | I |
| 7 | Common Palm Civet | *Paradoxurus musangus* | Viverridae | LC | – |
| 8 | Wild Boar | *Sus scrofa* | Suidae | LC | II |
| 9 | Black-naped Hare / Indian Hare | *Lepus nigricollis* | Leporidae | LC | II |
| 10 | Indian Porcupine | *Hystrix indica* | Hystricidae | LC | I |

**B. Reptiles**

*Table 76. List of Reptiles in the study area*

| S. No. | Scientific Name | Common Name | Family | IUCN status | WPA Schedule (Amendment), 2022 |
|---|---|---|---|---|---|
| 1 | *Cnemaspis indica* | Indian day gecko | Gekkonidae | LC | - |
| 2 | *Cnemaspis ornata* | Ornate day gecko | Gekkonidae | LC | - |

| S. No. | Scientific Name | Common Name | Family | IUCN status | WPA Schedule (Amendment), 2022 |
|---|---|---|---|---|---|
| 3 | *Calotes calotes* | Common greenfield forest | Agamidae | LC | - |
| 4 | *Calotes ellioti* | Elliot's forest lizard | Agamidae | LC | - |
| 5 | *Calotes nemoricola* | Nilgiri forest lizard | Agamidae | NT | - |
| 6 | *Mabuya macularicus* | Bronze grass skink | Scincidae | LC | - |
| 7 | *Varanus griseus* | Desert Monitor | Varanidae | LC | I |
| 8 | *Chamaeleo zeylanicus* | Indian Chameleon | Chamaeleonidae | LC | I |
| 9 | *Fowlea piscator* | Checkered Keelback | Colubridae | LC | I |
| 10 | *Lycodon aulicus* | Indian wolf snake | Colubridae | LC | - |
| 11 | *Trimeresurus gramineus* | Bamboo Pit Viper | Viperidae | LC | - |
| 12 | *Trimeresurus malabaricus* | Malabar Pit Viper | Viperidae | LC | - |

## C. Birds

*Table 77 . List of Birds in the study area*

| S. No. | Scientific Name | Common Name | Family | WPA Schedule (Amendment), 2022 |
|---|---|---|---|---|
| 1. | *Phalacrocorax niger* | Little Cormorant | Phalacrocoracidae | Sch II |
| 2. | *Arodeola grayii* | Pond Heron | Ardeidae | Sch II |
| 3. | *Bubulcus ibis* | Cattle Egret | Ardeidae | Sch II |
| 4 | *Milvus migrans* | Pariah kite | Accipitridae | Sch II |
| 5 | *Haliastur indus* | Brahminy Kite | Accipitridae | Sch I |
| 6 | *Accipiter bad ius* | Shikra | Accipitridae | Sch I |
| 7 | *Falco tinnunculus* | Kestrel | Falconidae | Sch II |
| 8 | *Gallus sodneratii* | Grey Junglefowl | Phasianidae | Sch I |
| 9 | *Vanellus indicus* | Red wattled Lapwing | Charadriidae | Sch II |
| 10 | *Trerod pompadora* | Grey fronted Green Pigeon | Columbia | Sch II |
| 11 | *Trerod phoenicoptera* | Green Pigeon | Columbidae | Sch II |
| 12 | *Streptopelia chinensis* | Spotted Dove | Columbidae | Sch II |
| 13 | *Psittacula krameri* | Rose ringed Parakeet | Psittacidae | Sch II |
| 14 | *Eudynamys scolopacea* | Koel | Cuculidae | Sch II |
| 15 | *Centropus sinensis* | Coucal | Cuculidae | Sch II |
| 16 | *Caprimulgus asiaticus Latham* | Indian Little Night jar | Caprimulgidae | Sch II |
| 17 | *Ceryle rudis* | Pied Kingfisher | Alcedlnidae | Sch II |
| 18 | *Halcyon smyrnensis* | Whitebreasted Kingfisher | Alcedinidae | Sch II |
| 19 | *Merops lescbenaulti* | Chestnutheaded Bee-Eater | Meropidae | Sch II |
| 20 | *Coracias bengbalensis* | Indian Roller | Coraciidae | Sch II |
| 21 | *Upupa epops* | Hoopoe | Upupidae | Sch II |
| 22 | *Megalaima viridis* | Small Green Barbet | Capitonidae | Sch II |
| 23 | *Dinopium benghalense* | Golden backed Woodpecker | Picidae | Sch II |

| S. No. | Scientific Name | Common Name | Family | WPA Schedule (Amendment), 2022 |
|---|---|---|---|---|
| 24 | *Pitta brachyura* | Indian Pitta | Pittidae | Sch II |
| 25 | *Oriolus oriolus* | Golden Oriole | Oriolidae | Sch II |
| 26 | *Dicrurus adsimilis* | Black Drongo | Dicruridae | Sch II |
| 27 | *Acridotheres tristis* | Indian Myna | Sturnidae | Sch II |
| 28 | *Dendrocitta vagabunda* | Indian Treepie | Corvidae | Sch II |
| 29 | *Corvus splendens* | Indian House Crow | Corvidae | - |
| 30 | *Tephrodornis pondicerianus* | Indian Wood Shrike | Vangidae | Sch II |
| 31 | *Pycnonotus cafer* | Red vented Bulbul | Pycnonotidae | Sch II |
| 32 | *Muscicapa albicaudata* | Nilgiri Verditer Flycatcher | Muscicapidae | Sch II |
| 33 | *Orthotomus sutorius* | Tailor Bird | Cisticolidae | Sch II |
| 34 | *Copsychus saularis* | Magpie-Robin | Muscicapidae | Sch II |
| 35 | *Myiophonus horsfieldi* | Malabar Whistling Thrush | Muscicapidae | Sch II |
| 36 | *Parus xanthogenys* | Yellow cheeked Tit | Paridae | Sch II |
| 37 | *Motacilla maderaspatensis* | Large Pied Wagtail | Motacillidae | Sch II |
| 38 | *Nectarinia asiatica* | Purple Sunbird | Nectariniidae | Sch II |
| 39 | *Zosterops pajpebrosa* | White Eye | Zosteropidae | Sch II |
| 40 | *Passer domesticus* | House Sparrow | Passeridae | Sch II |
| 41 | *Elanus caeruleus* | Black winged Kite | Accipitridae | Sch II |
| 42 | *Ictinaetus malayensis* | Black Eagle | Accipitridae | Sch II |
| 43 | *Ocyceros griseus* | Malabar Grey Hornbill | Accipitridae | Sch I |
| 44 | *Acridotberes fuscus* | Jungle Myna | Accipitridae | Sch II |
| 45 | *Pericrocotus cionamomeus* | Small Minivet | Accipitridae | Sch I |

Amphibians

*Table 78. List of Amphibians in the study area*

| S. No. | Zoological Name | Common Name | Family | IUCN Status |
|---|---|---|---|---|
| 1. | *Duttaphrynus stomaticus* | Common Indian Toad | Bufonidae | LC |
| 2. | *Holobatrachus tigerinus* | Indian Bull Frog | Bufonidae | LC |

Schedule I species:

Based on both our primary and secondary surveys, as well as the compiled table above, we have identified a total of 15 species listed under Schedule I of the Wildlife Protection Act, indicating their endangered status and necessitating conservation efforts (https://www.iucnredlist.org.) Accordingly a detailed conservation plan for these scheduled species will be submitted separately. The conservation plan has been attached at ***Annexure 7.***

*Table 79. List of schedule I species*

| S. No. | Scientific Name | Common Name | WLPA Schedule 2022 |
|---|---|---|---|
| 1 | Paradoxurus hermaphroditus | Asian Palm Civet | I |
| 2 | Prionailurus rubiginosus | Rusty-spotted Cat | I |

| S. No. | Scientific Name | Common Name | WLPA Schedule 2022 |
|---|---|---|---|
| 3 | Macaca radiata | Bonnet macaque | I |
| 4 | Urva fusca | Indian Brown Mongoose | I |
| 5 | Urva smithii | Ruddy Mongoose | I |
| 6 | Viverricula indica | Small Indian Civet | I |
| 7 | Hystrix indica | Indian Porcupine | I |
| 8 | Varanus griseus | Desert Monitor | I |
| 9 | Chamaeleo zeylanicus | Indian Chameleon | I |
| 10 | Fowlea piscator | Checkered Keelback | I |
| 11 | Haliastur indus | Brahminy Kite | I |
| 12 | Accipiter badius | Shikra | I |
| 13 | Gallus sonneratii | Grey Junglefowl | I |
| 14 | Ocyceros griseus | Malabar Grey Hornbill | I |
| 15 | Pericrocotus cinnamomeus | Small Minivet | I |

## 3.12 SOCIO-ECONOMIC ENVIRONMENT

### 3.12.1 Objectives of conducting SE study

To evaluate the Socio Economic condition of the area.

- To assess the demographic feature
- To assess the work participation rate
- To assess the various amenities
- To evaluate the Quality of life Index.
- To assess the impact of Application for grant of Development of an Industrial Park on the SE condition of the area.

To assess various gaps need to be filled for Environmental conditions in surrounding villages

- Gaps in availability for Training and skill development canters.
- Gaps in Sanitation facility
- Gaps in Drinking Water
- Gaps in Solid waste management
- Gaps in Health facilities
- Gaps in Education system available
- Gaps in Infrastructure/Road condition
- Gaps in Electrification including Solar lights

### 3.12.3 Study Area

The study area for the project has been considered a 10 km peripheral area from the project site. Depending upon their proximity, The Study area was divided into three zones viz Zone-I (0-2 Km), Zone-II (02 Km to 05 Km) & Zone-III (5Km to 10Km).This includes:

Study Area Zone-I: Includes village settlements & Urban area located within the 2 Km radius from

the project site. (No. of village: 8, No. Urban area: Nil)

Study Area Zone-II: Includes village settlements & Urban area located within the 2 to 5 Km radius from the project site. (No. of villages: 10, No. Urban area: 1)

Study Area Zone-III: Includes village settlements & Urban area located within the 5 to 10 Km radius from the project site. (No. of villages: 31, No. Urban area: 7)

### 3.12.4 Methodology

Socio-economic survey is based on proportionate, stratified and random sampling methods. Secondary data from census records, statistical hard books, topo sheets, health records and relevant official records available with Govt. agencies. Primary data collection through questionnaire

Collection of secondary Data

- Identifying villages in 10Km radius from the project boundary as per PCA (Primary Census Abstract) Census 2011.
- On the basis of available census data, 2011 identifying different aspects of socio-economic conditions.
- Analysis of the secondary data.

ii) Collection of Primary Data

- 60% villages (5 out of 8 villages) up to 2 km from the project site are selected,
- 10% villages (1 out of 10 villages) from 2 to 5 km, and one village from 5 to10 km distance from the project site are also selected to study the primary survey. These villages justify the overall socio-economic scenario of the study area.
- Preparation of list of villages and questionnaire for survey.
- Carrying out site visits.
- Physical survey for sanitation, drinking water facilities, availability of banks, primary health centers, roads, education facilities and source of income of the villagers.
- Focus Group Discussion (FGD).
- Collection of the relevant Photographs.

iii) Collection of Secondary & Primary Data

- Developing socio economic significance and influence to the local community.

#### 3.12.4.1 Habitation in the Study Area

I. District Thoothukkudi

The project area lies in Thoothukkudi District of Tamil Nadu, located along the southeastern coast of India. The district is bounded by Tirunelveli in the west, Virudhunagar in the northwest, and the Gulf of Mannar in the east. Thoothukkudi city is the district headquarters and serves as a major centre for administration, trade, industry, and port activities.

Administratively, the district is divided into 8 talukas—Thoothukkudi, Tiruchendur, Srivaikuntam, Sathankulam, Vilathikulam, Ettayapuram, Ottapidaram, and Kovilpatti.

Economically, Thoothukkudi is known for its port-based industries, salt production, fishing, and power generation, along with agriculture and small-scale industries. Geographically, the district has coastal plains and semi-arid inland areas.

As per Census 2011, key demographic details are as follows:

- Total Population: 1,750,176
- Population Growth (2001–2011): 11.32%
- Population Density: 369 persons/km²
- Urban Population: 50.10%
- Rural Population: 49.90%
- Sex Ratio: 1,023 females/1000 males
- Child Population (0–6 years): 10.50%
- Child Sex Ratio: 963 females/1000 boys
- Literacy Rate: 86.16% (Male: 91.14%, Female: 81.33%)
- Social Composition: SC – 19.88%, ST – 0.28%, Others – 79.84%

II. Total habitats in the Study Area (10 Km radius)

The villages/Urban within the study area are further classified into three categories, depending upon their proximity to the project site as per Table below:

*Table 80. List of Village/Urban within Study Area*

| Sr.No | Village/Urban Name | Sr.No | Village/Urban Name |
|---|---|---|---|
| **Within 2 km (8 Village, 0 Urban)** | | | |
| 1 | Umarikottai | 5 | Perurani |
| 2 | Mela Thattaparai | 6 | Allikkulam |
| 3 | Keelathattapparai | 7 | Terkusilukkanpatti |
| 4 | Ramaswamipuram | 8 | Kuttudankadu |
| **More than 2 km and less than equal to 5 km (10 Villages, 1 Urban)** | | | |
| 9 | Jambulingapuram | 14 | Dalvaypuram |
| 10 | Pudiyamputhur (Part) | 15 | Timmarajapuram |
| 11 | Vadakkusilukkanpatti | 16 | Maravanmatam |
| 12 | Ayyanadaippu | 17 | Varthakareddipatti |
| 13 | Muthuswamipuram | 18 | Mudivaithanendal |
| URBAN | | | |
| 19 | Kumaragiri (CT) | | |
| **More than 5 km and less than equal to 10 km (31Villages, 7 Urban)** | | | |
| 20 | Ottappidaram | 36 | Mullakadu (Part) |
| 21 | Kulasekaranallur | 37 | Alanda |
| 22 | Muramban | 38 | Poovani |
| 23 | Paraikuttam | 39 | Meenakshipuram Sekkarakkudi |
| 24 | Melapandiyapuram | 40 | Sekkarakkudi |
| 25 | Savarimangalam | 41 | Vadakkukariseri |
| 26 | Swaminatham | 42 | Singathakurichi |
| 27 | Therkuveerapandiyapuram | 43 | Deivaseyalpuram |
| 28 | Sillanatham | 44 | Ellainayakkanpatti |
| 29 | Pudur pandiyapuram | 45 | Chettimallanpatti |
| 30 | Korampallam (Part) | 46 | Aniyaparanallur |
| 31 | Sendilampannai | 47 | Tannuthu |
| 32 | Ramanathapuram | 48 | Nallathi |
| 33 | Kattalangulam | 49 | Iruvappapuram |
| 34 | Servaikaranmadam | **50** | Palayakkayal |

| Sr.No | Village/Urban Name | Sr.No | Village/Urban Name |
|---|---|---|---|
| 35 | Kuliyankarisal | | |
| URBAN | | | |
| 51 | Pudiyamputhur (CT) | 55 | Athimarapatti (CT) |
| 52 | Sankaraperi (CT) | 56 | Thoothukkudi (M Corp.) |
| 53 | Milavittan (CT) | 57 | Sayapuram (TP) |
| 54 | Muttayyapuram (CT) | | |

*Source: PCA Census 2011, District: Thoothukkudi State- Tamil Nadu.*

### III. Villages Selected for Socio Study Using Primary Survey

Depending upon their proximity to the project site, the village level information has been compiled for the villages which were selected as per Methodology. The main objective of the socio-economic study is to collect social and economic information about the area and to identify the expected impacts due to the project activities and to provide the appropriate mitigation measures.

Based on Methodology prepared and followed by team SE, few questionnaires were filled for 7 villages (as per Table 2.4.3) to identify and record the demography, Source of Income & Working Pattern, Infrastructure Facilities, Cropping Pattern, Farmer Category, Disease Prevalence and Need based gaps is prepared.

*Table 81.List of Villages (Primary Survey)*

| S. No | Name of Village | Direction | Study Area Zone |
|---|---|---|---|
| 1 | Umarikottai | NE | Zone-I (0-2 Km) |
| 2 | Mela Thattaparai | NNW | Zone-I (0-2 Km) |
| 3 | Keelathattapparai | N | Zone-I (0-2 Km) |
| 4 | Allikkulam | SSW | Zone-I (0-2 Km) |
| 5 | Terkusilukkanpatti | SE | Zone-I (0-2 Km) |
| 6 | Vadakkusilukkanpatti | NE | Zone-II (2-5Km) |
| 7 | Therkuveerapandiyapuram | NE | Zone-III (5-10Km) |

*Source: Physical survey Team SE*

### 3.12.4.2 Demographic Structure of Study Area

As per details extracted from, PCA Census 2011 the Demographic details such as household, total population, sex ratio, %age of SC and %age of ST population, literacy rate and employment pattern are summarized.

*Table 82. Demographic Structure of Study Area*

| Study area | | Total Household | Population | | | 0-6 Child Population | Sex Ratio | SC % | ST % | Others % |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Total | Male | Female | | | | | |
| Zone-I | Rural | 3923 | 14586 | 7249 | 7337 | 1747 | 1012 | 37.8 | 0.1 | 62.1 |
| | Urban | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Zone-II | Rural | 5989 | 21851 | 10922 | 10929 | 2489 | 1001 | 31.4 | 0.1 | 68.5 |
| | Urban | 3428 | 13344 | 6735 | 6609 | 1595 | 981 | 10.8 | 0.1 | 89.1 |
| Zone-III | Rural | 19405 | 72982 | 36456 | 36526 | 7946 | 1002 | 36 | 0.1 | 63.9 |
| | Urban | 96801 | 379053 | 189804 | 189249 | 40898 | 997 | 12.2 | 0.2 | 87.6 |
| Overall Rural | | 29317 | 109419 | 54627 | 54792 | 12182 | 1003 | 35.3 | 0.1 | 64.6 |
| Overall Urban | | 100229 | 392397 | 196539 | 195858 | 42493 | 997 | 12.2 | 0.2 | 87.6 |
| Overall Study Area | | 129546 | 501816 | 251166 | 250650 | 54675 | 998 | 17.2 | 0.1 | 82.7 |

*Source: PCA Census 2011, District: Thoothukkudi State- Tamil Nadu.*

I. Demographic Structure of Villages Selected for Primary survey:

Demographic detail of the villages PCA Census 2011 are compared with data extracted from surveyed by primary survey team of Perfact and Tabulated below:

*Table 83.Demographic Structure of Surveyed Village*

| S. No. | Particulars | As per PCA Census 2011 | Surveyed in 2025 by Team Perfact |
|---|---|---|---|
| 1 | Total HouseHold | 2578 | 3231 |
| 2 | Total Population | 9563 | 10174 |
| 3 | Average Household Size | 3.7 | 3.1 |
| 4 | Total Male | 49.7% | 49.8% |
| 5 | Total Female | 50.3% | 50.2% |
| 6 | Sex Ratio | 1012 | 1008 |
| 7 | Total SC population | 41.7% | 42% |
| 8 | Total ST population | 0.1% | 0.1% |
| 9 | Total others population | 58.3% | 58% |

Demographic Report (2011–2025)

- Total Households: 2,578 → 3,231
- Total Population: 9,563 → 10,174
- Average Household Size: 3.7 → 3.1
- Male Population: 49.7% → 49.8%
- Female Population: 50.3% → 50.2%
- Sex Ratio (females per 1000 males): 1,012 → 1,008
- SC Population: 41.7% → 42%
- ST Population: 0% → 0%
- Other Population: 58.3% → 58%

Summary: The area saw an increase in households and population, a slight decrease in household size, a stable gender ratio, and slight growth in SC population.

### 3.12.4.4 Literacy Details of Study area

Data extracted from PCA Census 2011, Literacy Detail of villages in study area are compared with details of Villages surveyed by the primary survey team of Perfact.

*Table 84. Literacy Details of study area*

| Study Area | | Population above 0-6 Years | | | Literate | | | |
|---|---|---|---|---|---|---|---|---|
| | | Total | Male | Female | Total | Overall % | Male (%) | Female (%) |
| Zone-I | Rural | 12839 | 6343 | 6496 | 10821 | 84.3 | 90.9 | 77.8 |
| | Urban | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Zone-II | Rural | 19362 | 9628 | 9734 | 16972 | 87.7 | 92.9 | 82.5 |
| | Urban | 11749 | 5940 | 5809 | 10815 | 92.1 | 95 | 89 |
| Zone-III | Rural | 65036 | 32423 | 32613 | 54962 | 84.5 | 90.7 | 78.4 |
| | Urban | 338155 | 168964 | 169191 | 310678 | 91.9 | 94.7 | 89.1 |
| Overall Rural | | 97237 | 48394 | 48843 | 82755 | 85.1 | 91.2 | 79.1 |
| Overall Urban | | 349904 | 174904 | 175000 | 321493 | 91.9 | 94.7 | 89.1 |
| Overall Study Area | | 447141 | 223298 | 223843 | 404248 | 90.4 | 93.9 | 86.9 |

Source: PCA Census 2011, District: Thoothukkudi State- Tamil Nadu.

I. Literacy Details of Surveyed Villages

Demographic details of the village's PCA Census 2011 are compared with data extracted from surveys by the primary survey team of Perfact and Tabulated below.

*Table 85. Literacy Details of Surveyed villages*

| S No. | Particulars | As per PCA Census 2011 | Surveyed in 2024 by Team Perfact |
|---|---|---|---|
| 1 | Overall Literacy (%) | 80.2% | 87% |
| 2 | Male Literacy (%) | 88.6% | 93% |
| 3 | Female Literacy (%) | 72.9% | 82% |

Source: PCA Census 2011 and Primary Survey by Team Perfact

Overall Literacy in the surveyed villages is 87% as compared to PCA Census 2011 was 80.2%.

### 3.12.4.5 Work Force/Employment Pattern of study area

The workforce/employment in the study area as per Census 2011 is prepared.

*Table 86. Workforce/Employment Pattern of Study area*

| Study area | | Total Population | Total Working Population | % Total Working Population | % Non-working Population | % Main-working Population | % Marginal working Population |
|---|---|---|---|---|---|---|---|
| Zone-I | Rural | 14586 | 6538 | 44.8 | 55.2 | 72.9 | 27.1 |
| | Urban | 0 | 0 | 0 | 0 | 0 | 0 |
| Zone-II | Rural | 21851 | 9280 | 42.5 | 57.5 | 80.6 | 19.4 |
| | Urban | 13344 | 4835 | 36.2 | 63.8 | 84.7 | 15.3 |
| Zone-III | Rural | 72982 | 34102 | 46.7 | 53.3 | 82.6 | 17.4 |
| | Urban | 379053 | 138169 | 36.5 | 63.5 | 93.5 | 6.5 |
| Overall Rural | | 109419 | 49920 | 45.6 | 54.4 | 81 | 19 |
| Overall Urban | | 392397 | 143004 | 36.4 | 63.6 | 93.2 | 6.8 |
| Overall Study Area | | 501816 | 192924 | 38.4 | 61.6 | 90 | 10 |

Source: PCA Census 2011, District: Thoothukkudi State- Tamil Nadu

### 3.12.4.6 Main Workforce Employment Pattern for study area

The main workers employment pattern in the study area as per Census 2011 is prepared.

*Table 87. Main Workforce Employment Pattern for study area*

| Study area | | Total no of Main Workforce | Cultivators % | Agricultural Labour % | Household Industries % | Others % |
|---|---|---|---|---|---|---|
| Zone-I | Rural | 4763 | 11.7 | 28.8 | 3.8 | 55.7 |
| | Urban | 0 | 0 | 0 | 0 | 0 |
| Zone-II | Rural | 7481 | 3.5 | 18.4 | 3 | 75.1 |
| | Urban | 4094 | 2.2 | 6.8 | 1.1 | 89.9 |
| Zone-III | Rural | 28167 | 9.8 | 36.8 | 2 | 51.4 |
| | Urban | 129150 | 0.5 | 2.7 | 1.7 | 95.1 |
| Overall Rural | | 40411 | 8.9 | 32.4 | 2.4 | 56.3 |
| Overall Urban | | 133244 | 0.6 | 2.8 | 1.7 | 94.9 |
| Overall Study Area | | 173655 | 2.5 | 9.7 | 1.9 | 85.9 |

Source: PCA Census 2011, District: Thoothukkudi State- Tamil Nadu.

*Includes, Non Agricultural Labour, Govt. Job, Private service, Self Employed, etc

**I.** Source of Income & Workforce Pattern in Surveyed Villages:

The main sources of income in the surveyed area are agriculture and agricultural labour, private and government jobs, daily wage labour, self-employment, shops, businesses, and animal husbandry etc.

**II.** Crop Pattern for Surveyed Villages:

The main crop from District Census Handbook 2011 of villages in study area are compared with details of Villages surveyed by the primary survey team of Perfact as summarized below.

*Table 88. Crop Pattern for surveyed village*

| S.No. | Village Name | As per District Census Handbook 2011 | Surveyed in 2025 by Team Perfact |
|---|---|---|---|
| 1 | Umarikottai | Maize, Bajra, Black Gram | Maize, Bajra, Black Gram |
| 2 | Mela Thattaparai | Whole green germ, Black Gram, Sesame seeds | Whole green germ, Black Gram, Sesame seeds |
| 3 | Keelathattapparai | Whole green germ, Black Gram, Sesame seeds | Whole green germ, Black Gram, Sesame seeds |

| | | | |
|---|---|---|---|
| 4 | Allikkulam | Flowers, Paddy | Flowers, Paddy |
| 5 | Terkusilukkanpatti | Pulses, Black Gram | Pulses, Black Gram |
| 6 | Vadakkusilukkanpatti | Whole green germ, Black Gram, Sesame seeds | Whole green germ, Black Gram, Sesame seeds |
| 7 | Therkuveerapandiyapuram | Bulrush,Whole green germ, Black Gram | Bulrush,Whole green germ, Black Gram |

Source: District Census Handbook 2011 and Primary Survey by Team Perfact

The main crops in the surveyed villages are Maize, Bajra, Black Gram, Whole Green Gram, Sesame seeds, Jasmine, Paddy, Pulses, Flowers and Bulrush. These are grown across all villages in different combinations.

### 3.12.4.7 Diseases in Surveyed Villages:

Disease prevalence: No major diseases reported; only minor seasonal ailments (1–5%).

### 3.12.5 Population Growth & Projected Population of Study Area

Census data from 2001 and 2011 were analyzed to understand the population growth trend in the study area of Thoothukkudi District. The analysis shows that the decadal growth rate is 17.92% in Zone I, 20.06% in Zone II, and 14.26% in Zone III. In comparison, Thoothukkudi District recorded an overall decadal growth rate of 11.32%. The details are presented in Table below.

*Table 89. Population Growth & Projected Population of Study Area*

| Particulars | Total Population as on 2001 | Total Population as on 2011 | Decadal Growth Rate % | Yearly Growth Rate % | Projected Population (As on 2025) | | |
|---|---|---|---|---|---|---|---|
| | | | 2001-2011 | | Total | Male | Female |
| 0-2 Km Zone-I | 12369 | 14586 | 17.92 | 1.79 | 18696 | 9291 | 9405 |
| 2-5Km Zone-II | 29315 | 35195 | 20.06 | 2.01 | 46469 | 23313 | 23156 |
| 5-10 Km Zone-III | 395625 | 452035 | 14.26 | 1.43 | 551121 | 275856 | 275265 |
| Study Area | 437309 | 501816 | 14.75 | | 616286 | 308460 | 307826 |
| Kachchh district | 1,572,273 | 1,750,176 | 11.32 | | | | |

*Source: Census Data 2001 & 2011.*

### 3.12.6 Infrastructure Available

### 3.12.6.1 Infrastructure Available in Study Area

The result of infrastructure resources based on the District Census Handbook 2011 is attached as summarized below.

Education: As per 2011 records, the study area (10 km radius) of Thoothukkudi District comprises 49 villages and 8 urban areas across Zones I, II, and III, with 44 villages having government primary schools. In rural areas, there are 77 government and 37 private primary schools, along with 28 government and 15 private middle schools, 7 government and 6 private secondary schools, and 4 government and 5 private senior secondary schools. Urban areas have 31 government and 87 private primary schools, 21 government and 68 private middle schools, 4 government and 40 private secondary schools, and 4 government and 38 private senior secondary schools. Overall, while primary education is widely available in both rural and urban areas,

secondary and senior secondary schools are more concentrated in urban locations.

*Table 90. Zone wise Education Details*

| Education (No. of School) | | Primary School | | Middle School | | Secondary School | | Senior Secondary School | |
|---|---|---|---|---|---|---|---|---|---|
| | | Govt | Private | Govt | Private | Govt | Private | Govt | Private |
| 0-2 Km Zone-I | Rural | 14 | 4 | 4 | 1 | 0 | 0 | 0 | 0 |
| | Urban | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2-5 Km Zone-II | Rural | 17 | 7 | 7 | 2 | 2 | 1 | 1 | 1 |
| | Urban | 5 | 0 | 6 | 4 | 1 | 4 | 1 | 4 |
| 5-10 Km Zone-III | Rural | 46 | 26 | 17 | 12 | 5 | 5 | 3 | 4 |
| | Urban | 26 | 87 | 15 | 64 | 3 | 36 | 3 | 34 |
| Study Area | Rural | 77 | 37 | 28 | 15 | 7 | 6 | 4 | 5 |
| | Urban | 31 | 87 | 21 | 68 | 4 | 40 | 4 | 38 |

Source: District Census Handbook 2011 District: Thoothukkudi State- Tamil Nadu.

Medical/Primary Health Care: There are 5 Primary Health Centres, 27 Primary Sub Centres, 19 Maternity and Child Welfare Centers, 7 TB Clinic, 2 Hospital Allopathi, 10 Dispensary, 7 Family Welfare Centre present in the study area providing health care facilities.

*Table 91. Zone wise Medical/Primary Health Care Details*

| Health Care (Number) | | Primary Health Centre | Primary Health Sub Centre | Maternity and Child Welfare Centre | TB Clinic | Hospital Allopathic | Dispensary | Family Welfare Centre |
|---|---|---|---|---|---|---|---|---|
| 0-2 Km Zone-I | Rural | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| | Urban | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2-5Km Zone-II | Rural | 1 | 5 | 3 | 1 | 0 | 1 | 1 |
| | Urban | - | - | 1 | 0 | 0 | 1 | 0 |
| 5-10 Km Zone-III | Rural | 4 | 20 | 9 | 4 | 0 | 4 | 4 |
| | Urban | - | - | 6 | 2 | 2 | 4 | 2 |
| Study Area | | 5 | 27 | 19 | 7 | 2 | 10 | 7 |

Source: District Census Handbook 2011 District: Thoothukkudi State- Tamil Nadu

Drinking Water: The study area has various sources of drinking water. There are 46 treated and 42 untreated tap water points, 13 covered and 10 uncovered wells, 13 hand pumps, 18 tube wells/boreholes, 3 springs, and 1 river/canal. Zone III has the highest number of sources, while traditional sources like wells and hand pumps are still important in rural areas.

*Table 92. Zone wise Drinking Water Details*

| Drinking Water | Tap Water-Treated | Tap Water Untreated | Covered Well | Uncovered Well | Hand Pump | Tube Wells/ Borehole | Spring | River/ Canal |
|---|---|---|---|---|---|---|---|---|
| Zone-I | 7 | 8 | 2 | 1 | 2 | 3 | 1 | 0 |
| Zone-II | 9 | 9 | 4 | 4 | 4 | 4 | 1 | 0 |
| Zone-III | 30 | 25 | 7 | 5 | 7 | 11 | 1 | 1 |
| Study Area | 46 | 42 | 13 | 10 | 13 | 18 | 3 | 1 |

Source: District Census Handbook 2011 District: Thoothukkudi State- Tamil Nadu.

Drainage and Sanitation Facilities: The study area has 42 open drains, 4 places with no drainage, 2 pucca drains covered with tiles, 29 uncovered pucca drains, and 28 open kuccha drains. Sanitation facilities include 13 areas under the Total Sanitation Campaign and 7 community toilet complexes. Zone III has the most facilities, but there is a need to improve covered drainage and sanitation coverage.

*Table 93. Zone wise Drinking Water Details*

| Drainage & sanitation | Open Drainage | No Drainage | Pucca Drainage Covered with Tiles Slabs | Pucca Drainage Uncovered | Open Kuccha Drainage | Total Sanitation Campaign | Community Toilet Complex (excluding Bath) |
|---|---|---|---|---|---|---|---|
| Zone-I | 8 | 0 | 0 | 5 | 6 | 3 | 1 |
| Zone-II | 9 | 1 | 1 | 6 | 5 | 5 | 2 |
| Zone-III | 25 | 3 | 1 | 18 | 17 | 5 | 4 |
| Study Area | 42 | 4 | 2 | 29 | 28 | 13 | 7 |

*Source: District Census Handbook 2011 District: Thoothukkudi State- Tamil Nadu.*

Communication: Communication facility is present in the form of the post office, sub-post office, landline, etc.

*Table 94. Zone wise Communication Details*

| Communication | Post Office | Sub Post Office | Telephone | Public Call Office | Mobile Phone Coverage | Common Service Centre |
|---|---|---|---|---|---|---|
| Zone-I | 1 | 5 | 8 | 6 | 8 | 1 |
| Zone-II | 2 | 5 | 10 | 7 | 10 | 2 |
| Zone-III | 3 | 25 | 28 | 22 | 31 | 3 |
| Study Area | 6 | 35 | 46 | 35 | 49 | 6 |

Source: District Census Handbook 2011 District: Thoothukkudi State- Tamil Nadu.

Transportation: A public bus facility is available in all villages of the study area. Other facilities in the form of autos, taxis, vans, etc are also available in the study area.

*Table 95. Zone wiseTransportation Details*

| Transportation | Public Bus Service | Railway Station | Auto/Modified Autos | Taxi | Vans |
|---|---|---|---|---|---|
| Zone-I | 8 | 1 | 4 | 3 | 4 |
| Zone-II | 10 | 0 | 3 | 2 | 2 |
| Zone-III | 31 | 2 | 12 | 10 | 12 |
| Study Area | 49 | 3 | 19 | 15 | 18 |

Source: District Census Handbook 2011 District: Thoothukkudi State- Tamil Nadu.

Road Approach: All villages in the study area have blacktop roads. In addition, 43 villages have gravel roads, 25 have water-bound macadam roads, and all villages have weather roads and footpaths.

*Table 96. Zone wise Road Details*

| Road | Black Topped Road | Gravel Roads | Water Bound Macadam | All Weather Road | Footpath |
|---|---|---|---|---|---|
| Zone-I | 8 | 7 | 2 | 8 | 8 |
| Zone-II | 10 | 9 | 4 | 10 | 10 |

| | | | | | |
|---|---|---|---|---|---|
| Zone-III | 31 | 27 | 19 | 31 | 31 |
| Study Area | 49 | 43 | 25 | 49 | 49 |

Source: District Census Handbook 2011 District: Thoothukkudi State- Tamil Nadu.

Bank Facilities: Out of 49 villages, 3 villages have commercial banks & 8 Agricultural Credit Societies & 49 Self - Help Groups are available. There are 9 Cooperative banks within the study area.

*Table 97. Zone wise Bank Facilities Details*

| Bank | Commercial Bank | Cooperative Bank | Agricultural Credit Societies | Self - Help Group |
|---|---|---|---|---|
| Zone-I | 0 | 1 | 1 | 8 |
| Zone-II | 1 | 1 | 1 | 10 |
| Zone-III | 2 | 7 | 6 | 31 |
| Study Area | 3 | 9 | 8 | 49 |

Source: District Census Handbook 2011 District: Thoothukkudi State- Tamil Nadu.

Power Supply: The study area has good electricity coverage. Power is available for domestic use in all villages, for agriculture in 38, for commercial use in 33, and for all users in 38 villages. Zone III has the most coverage, while Zones I and II have fewer electrified areas.

*Table 98. Zone wise Power Details*

| Electricity | Power Supply for Domestic Use | Power Supply for Agriculture Use | Power Supply for Commercial Use | Power Supply for All Users |
|---|---|---|---|---|
| Zone-I | 8 | 5 | 6 | 5 |
| Zone-II | 10 | 7 | 5 | 8 |
| Zone-III | 31 | 26 | 22 | 25 |
| Study Area | 49 | 38 | 33 | 38 |

Source: District Census Handbook 2011 District: Thoothukkudi State- Tamil Nadu.

### 3.12.6.2 Infrastructure Available in Surveyed Villages

The infrastructure details from PCA Census 2011 of villages in the study area are compared with details of Villages surveyed by the primary survey team of Perfact as summarized below.

*Table 99. Primary survey of Education*

| Educational Facilities | Anganwadi (available in No. of villages) | Govt. Primary School (available in No. of villages) | Govt. Middle School (available in No. of villages) | Govt. Secondary School (available in No. of villages) | Govt. Senior Secondary School (available in No. of villages) |
|---|---|---|---|---|---|
| By Primary Survey (7 villages) | 12 | 12 | 6 | 0 | 0 |
| Census 2011(7 villages) | 7 | 12 | 5 | 0 | 0 |

*Table 100. Primary survey of Health Care*

| Health Care facilities | Asha Workers (available in No. of villages) | Private Clinic (available in No. of villages) | Dispensary (available in No. of villages) | Primary Health center (available in No. of villages) | Sub-cente (available in No. of villages)r |
|---|---|---|---|---|---|
| By Primary Survey (7 villages) | 7 | 7 | 0 | 1 | 1 |
| Census 2011(7 villages) | 7 | - | 0 | 0 | 2 |

*Table 101. Primary survey of Drinking Water*

| Drinking water Facilities | Hand Pump (available in No. of villages) | PWS Individual (Govt) Pipe Line (available in No. of villages) | Uncovered Well | Tube Wells/ Borehole (available in No. of villages) | Tank/ Pond / Lake/ River (available in No. of villages) |
|---|---|---|---|---|---|
| By Primary Survey (7 villages) | 0 | 7 | 1 | 7 | 1 |
| Census 2011 (7 villages) | 2 | - | 1 | 1 | 1 |

*Table 102. Primary survey of Transportation*

| Transportation Facilities | Public Bus (available in No. of villages) | Car/Auto (available in No. of villages) | Vans/Taxi (available in No. of villages) | Railway Station(available in No. of villages) |
|---|---|---|---|---|
| By Primary Survey (7 villages) | 7 | 7 | 7 | 1 |
| Census 2011(7 villages) | 7 | 2 | 1 | 1 |

*Table 103. Primary survey of Communication Facilities*

| Communication Facilities | Panchayat Office | Phone Recharge Office | Mobile Phone Coverage (available in No. of villages) |
|---|---|---|---|
| By Primary Survey (7 villages) | 7 | 7 | 7 |
| Census 2011(7 villages) | - | - | - |

*Table 104. Primary survey of Roadapproch*

| Road Facilities | Black Topped (Pacca Road) (available in No. of villages) | Gravel (Kutcha) Road (available in No. of villages) | Water Bound Macadam (available in No. of villages) | Foot path (available in No. of villages) |
|---|---|---|---|---|
| By Primary Survey (7 villages) | 7 | No | No | 7 |
| Census 2011(7 villages) | 7 | 7 | 2 | 7 |

*Table 105.Primary survey of Bank Facilities*

| Bank Facilities | ATM (available in No. of villages) | Commercial Bank (available in No. of villages) | Co-operative Bank (available in No. of villages) |
|---|---|---|---|
| By Primary Survey (7 villages) | 1 | 1 | 0 |

*Table 106. Primary survey of Power*

| Power Facilities | Whether Electrifie ? (available in No. of villages) | No of individual connections (available in No. of villages) | Whether street lights are present? (available in No. of villages) | Electricity available for Agricultural Purpose ? (available in No. of villages) | Solar lighting (available in No. of villages) |
|---|---|---|---|---|---|
| By Primary Survey (7 villages) | 7 | 7 | 7 | No | No |

*Table 107. Primary survey of Sanitation Facilities*

| Sanitation Facilities | Open Drainage (available in No. of villages) | Public Toilets (available in No. of villages) | Individual Toilets (available in No. of villages) |
|---|---|---|---|
| By Primary Survey (7 villages) | 7 | No | 7 |

### 3.12.7 Quality of Life Assessment

Quality of life (QoL) indicates the overall status of socio-economic aspects in each area. Quality of life (QoL) is defined as a function between "objective conditions" and "subjective attitudes" involving a defined "area" of concern.

The "objective conditions" are numerically measurable artifacts of a physical, sociological event or economic event. Objective conditions may be defined as any number, which stands for a given quantity of a variable of interest if it is independent of subjective opinion.

Infrastructure related and Services related 15 social demographic indicators were selected to ascertain the Quality-of-life index. Every present QOL indicator has 10 points and for the absence zero points are given. Allocation of the weightage to the Economic variables is made owing to the significance of social demographic data. Infrastructure related variables were assigned 70% weightage. Services related variables were assigned 30% weightage.

Following social demographic indicators were selected:

Infrastructure:
Anganwadi Centre, Govt. Primary School, Govt. Vocational Training Centre ITI, Govt. PHC/SC,Tap Water Untreated, River & Canal, Total Sanitation Campaign, Metal Road, Community Centre, Commercial Bank, Agricultural Credit Society.

Services:
Self Help Group; Electric Power (Domestic); Telephone/mobile; Mode of transportation.

The summarized calculation of above indicators is annexed as Annexure 8. The outcome of the study is given below:
The maximum score obtained by a village is 8.3 and the minimum score is 1,7 the average score in the study area is 5,9 Based on the results the following criteria is defined:

*Table 108. Results of the services*

| Average Score Group | Performance Group | Freq of Villages | Percentage |
|---|---|---|---|
| 1.7-3.4 | Poor | 2 | 4% |
| 3.5-5.0 | Fair | 6 | 12% |
| 5.1-6.6 | Good | 28 | 57% |
| 6.7& above | Excellent | 13 | 27% |

Thus, as per above index about 27% villages stand Excellent, 57% villages are Good and 12% villages in the study area are in the Fair group. 2 Villages (4%) in the study area are in the Poor performance group.

**INFERENCE:**

The project is located in Allikulam, Keelathattaparai, Perurani, Umarkottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages (Zone I), which has a good of shows good & Excellent performance with a score of 5.2 to 7.0 while two villages in Zone III have poor performance.

*Table 109. Result Table*

| Name of Village | Score obtained | Study Area Zone | Name of Village | Score obtained | Study Area Zone |
|---|---|---|---|---|---|
| Sendilampannai | 1.7 | Zone-III | Tannuthu | 3.0 | Zone-III |

### 3.12.8 Key Findings and Summary of Primary Data Collection

**1. Demographics and Literacy**

**Households and Population:**

- The number of households varies from 198 to 684 across villages.
- Total population ranges from 700 to 2,010, with males slightly outnumbering females in most villages.

**Gender Distribution:**

Male population is consistently higher than the female population in all surveyed villages.

**Literacy Rates:**

- Overall literacy ranges from 60% to 97%, with male literacy higher (80–98%) than female literacy (60–95%), showing a notable gender gap.

**Caste Distribution:**

- SC households range from 12% to 73%, ST households are absent, and Other categories vary between 27% to 88%.

**Roads:**

- Black-topped roads are available in all villages.
- All-weather roads and footpaths are present in some villages, while Kuchha and water-bound macadam roads are absent.

**Toilet Availability:**

- 100% of households have individual toilets; no public toilets or open defecation reported.

**Electrification:**

- All villages are fully electrified with individual connections.
- Power supply is consistent for domestic and commercial use, though agricultural power supply is absent.
- Streetlights exist, but solar lighting is not implemented.

**Water Sources:**

- Primary drinking sources include supply water and tube wells/bore wells, ensuring reliable availability.

**Transportation:**

- All villages have access to public buses, autos, vans, taxis, cycles/bikes, and cars.
- Railway stations are present only in one village.

**Educational Facilities**

- Anganwadi centers: Present in all villages (1–3 per village).
- Primary schools: Present in all villages.
- Middle and high schools: Largely absent, except a few middle schools.
- Colleges: None in any village.

## 2.15 CRITICAL GAPS IDENTIFIED ACROSS ALL VILLAGES

The identified gaps in the villages, as analyzed in the document, are:

- Education & Skill Development:
  Middle schools exist in some villages; no High Schools or Colleges.
- Need: Libraries and Skill Development Centres.

Sanitation & Waste Management:

- Household toilets available, but no public toilets.
- Drainage is open kuccha, solid waste disposal basic.
- Need: Drainage, public toilets, formal Solid Waste Management

Health Facilities:

- PHCs are mostly absent; private clinics/ASHA present.
- Need: PHC expansion, ambulance, medicine supply.

Electrification & Lighting:

- Fully electrified; streetlights exist, no solar lighting.
- Need: LED streetlights, solar lighting, agricultural power.

Connectivity & Transport:

- Roads mostly black-topped; footpaths and all-weather roads missing in some villages.
- Need: Improve all-weather roads, footpaths, transport links.

Public Utilities:

- Mobile coverage is good; banks largely absent; community halls exist only in some villages.
- Need: Banks and community halls.

Livelihood & Agriculture:

- Agriculture dominant; diverse crops including Bajra, Black Gram, Maize, Whole Green Gram, Sesame seeds.
- Need: Agriculture support programs, training, irrigation, market access.

### 3.12.9 Cultural & Aesthetic Attributes – Thoothukkudi District

Cultural Practices: Thoothukkudi is known for its rich Tamil culture and coastal traditions. Major festivals celebrated are Pongal, Deepavali, Navaratri, and Easter, along with temple festivals like the Ther Thiruvizha at Tiruchendur Murugan Temple. Folk arts such as *Karagattam*, *Oyilattam*, and *Villu Pattu* are popular. The Our Lady of Snows Basilica is a major pilgrimage centre.

Historical Context: Thoothukkudi has been an important port and trade centre since ancient times. It played a vital role in the freedom movement, being the birthplace of V.O. Chidambaranar. The district's old churches, temples, and lighthouses reflect colonial and Tamil architecture.

Modern Integration: The district has developed into an industrial and port hub, hosting major industries like SPIC and Sterlite Copper. Despite this growth, Thoothukkudi retains its traditional festivals, crafts, and coastal culture.

#### 3.12.9.1 Aesthetic Attributes

Traditional: Includes Tiruchendur Murugan Temple, ancient churches, colonial buildings, and beaches. Local crafts include palm-leaf products, shell works, and pearl jewellery.

Modern: Modern structures blend traditional Tamil designs with modern architecture. Murals and art inspired by the sea and local culture are used in buildings.

Cultural Aesthetics: Festivals like Ther Thiruvizha and the Our Lady of Snows Festival highlight Thoothukkudi's vibrant mix of music, dance, art, and devotion.

## 3.13 TRAFFIC SURVEY

**Traffic Survey:**

Traffic survey is a very important parameter to assess the impact due to the proposed project on local existing transportation. Baseline Study for NH-138 Thoothukudi-Tirunelveli Road is the main access road to Project Site. and one Approach Road 2 lane Two Way ,8 Meter Kovilpatti to Ottapidaram Road Undivided Road (App.Road) is there.

### 3.13.1 Methodology

- Manual counting of vehicle plying on the roads
- To maintain the precision of the report, manual shift is given to the surveyor.
- The vehicles are then calculated by converting the same in PCU values.
- PCU values are used to convert various vehicles into one standard vehicle i.e., passenger car units.

**Conversion Factor (Ref: IRC 106, 1990):**

PCU values are used to convert various vehicles into one standard vehicle i.e. Passenger car units (PCU). The PCU values as per IRC are as given below:

*Table 110. PCU values as per IRC*

| S. No. | VEHICLE TYPE | PCU VALUE |
|---|---|---|
| 1 | Car | 1 |
| 2 | Two-wheeler | 0.5 |
| 3 | Truck/bus | 2.2 |
| 4 | Auto | 1.2 |
| 5 | LCV | 2 |
| 6 | Tractor and Trailer | 5 |
| 7 | Cycle rickshaw | 0.5 |

### 3.13.2 Factors and Assumptions: Version Factor (Ref: IRC 106, 1990)

**Road Identification:**

A traffic survey was carried out on both sides (up & down) of the Thoothukudi-Tirunelveli Road and Approach Road also. Thoothukudi-Tirunelveli Road is a Four lane two-way road 16 Mtr (Divided Road) with 1mtr space on either side and Approach road is 2 Lane 2 Way Road, 8 Mtr. Undivided Road (App. Road Kovilpatti to Ottapidaram). Vehicles were observed and the count was recorded for 24 hours. The table below represents the total no. of vehicles over 24-hour duration.

**I. Traffic Analysis: 4 Lane 2 Way Road, 16 Meters With Divider (NH-138 Thoothukudi-Tirunelveli Road)**

*Table 111. Traffic Analysis - NH-138*

| Hours | Baseline | | | | | Incremental | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Car | Bus/ Truck | Two Wheeler | Others/ Auto | PCU/ Hr | PCU/ Hr | Incremental + Baseline PCU/Hr | Capacity of Road in PCU/Hr | LOS Baseline | LOS of Incremental + Baseline | % increase |
| 06:00- 07:00 | 456 | 144 | 296 | 22 | 947 | 4 | 951 | 5143 | 0.184 | 0.185 | 0.422 |
| 07:00- 08:00 | 469 | 152 | 312 | 30 | 995 | 0 | 995 | 5143 | 0.194 | 0.194 | 0.000 |
| 08:00-09:00 | 513 | 162 | 369 | 28 | 1088 | 2 | 1090 | 5143 | 0.211 | 0.212 | 0.184 |
| 09:00-10:00 | 590 | 153 | 413 | 28 | 1167 | 4 | 1171 | 5143 | 0.227 | 0.228 | 0.343 |
| 10:00-11:00 | 613 | 183 | 426 | 27 | 1261 | 0 | 1261 | 5143 | 0.245 | 0.245 | 0.000 |
| 11:00-12:00 | 587 | 166 | 512 | 31 | 1245 | 4 | 1249 | 5143 | 0.242 | 0.243 | 0.321 |
| 12:00-13:00 | 546 | 190 | 520 | 36 | 1267 | 3 | 1270 | 5143 | 0.246 | 0.247 | 0.237 |
| 13:00-14:00 | 523 | 212 | 498 | 25 | 1268 | 3 | 1271 | 5143 | 0.247 | 0.247 | 0.237 |
| 14:00-15:00 | 490 | 225 | 395 | 28 | 1216 | 0 | 1216 | 5143 | 0.236 | 0.236 | 0.000 |
| 15:00-16:00 | 520 | 190 | 423 | 24 | 1178 | 2 | 1180 | 5143 | 0.229 | 0.229 | 0.170 |
| 16:00-17:00 | 601 | 210 | 477 | 26 | 1333 | 1 | 1334 | 5143 | 0.259 | 0.259 | 0.075 |
| 17:00-18:00 | 556 | 186 | 521 | 24 | 1255 | 3 | 1258 | 5143 | 0.244 | 0.245 | 0.239 |
| 18:00-19:00 | 612 | 192 | 466 | 23 | 1295 | 1 | 1296 | 5143 | 0.252 | 0.252 | 0.077 |

| Hours | Baseline | | | | | Incremental | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Car | Bus/ Truck | Two Wheeler | Others/ Auto | PCU/ Hr | PCU/ Hr | Incremental + Baseline PCU/Hr | Capacity of Road in PCU/Hr | LOS Baseline | LOS of Incremental + Baseline | % increase |
| 19:00-20:00 | 623 | 169 | 396 | 28 | 1226 | 1 | 1227 | 5143 | 0.238 | 0.239 | 0.082 |
| 20:00-21:00 | 650 | 240 | 413 | 21 | 1410 | 3 | 1413 | 5143 | 0.274 | 0.275 | 0.213 |
| 21:00-22:00 | 692 | 210 | 321 | 15 | 1333 | 0 | 1333 | 5143 | 0.259 | 0.259 | 0.000 |
| 22:00-23:00 | 710 | 260 | 241 | 17 | 1423 | 1 | 1424 | 5143 | 0.277 | 0.277 | 0.070 |
| 23:00-24:00 | 756 | 220 | 136 | 10 | 1320 | 0 | 1320 | 5143 | 0.257 | 0.257 | 0.000 |
| 24:00-01:00 | 785 | 234 | 128 | 6 | 1371 | 0 | 1371 | 5143 | 0.267 | 0.267 | 0.000 |
| 01:00-02:00 | 652 | 241 | 130 | 5 | 1253 | 1 | 1254 | 5143 | 0.244 | 0.244 | 0.080 |
| 02:00-03:00 | 623 | 235 | 101 | 6 | 1198 | 0 | 1198 | 5143 | 0.233 | 0.233 | 0.000 |
| 03:00-04:00 | 550 | 224 | 89 | 4 | 1092 | 0 | 1092 | 5143 | 0.212 | 0.212 | 0.000 |
| 04:00-05:00 | 523 | 198 | 96 | 3 | 1010 | 1 | 1011 | 5143 | 0.196 | 0.197 | 0.099 |
| 05:00-06:00 | 510 | 212 | 104 | 4 | 1033 | 3 | 1036 | 5143 | 0.201 | 0.201 | 0.290 |
| **Average** | **590** | **200** | **324** | **20** | **1216** | **2** | **1218** | **5143** | **0.24** | **0.24** | **0.16** |

- Carrying Capacity at **NH-138 Thoothukudi-Tirunelveli Road** =5143 PCU/hr
- Existing traffic density at **NH-138 Thoothukudi-Tirunelveli Road**= 1216 PCU/hr
- Existing LOS (Without Project) = 0.24 i.e., Cat "A"
- Proposed+Existing traffic from Site= 1218 PCU/hrLOS (With Project) = 0.24 i.e. Cat "A"

**II. Traffic Analysis: Approach Road 2 lane Two Way , 8 Meter (MDR : Kovilpatti to Ottapidaram Road)**

*Table 112. Traffic Analysis - Approach Road*

| Hours | Baseline | | | | | Incremental | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Car | Bus/ Truck | Two Wheeler | Others/ Auto | PCU/ Hr | PCU/ Hr | Incremental+ Baseline PCU/Hr | Capacity of Road in PCU/Hr | LOS Baseline | LOS of Incremental + Baseline | % increase |
| 06:00- 07:00 | 32 | 20 | 102 | 0 | 127 | 4 | 131 | 2143 | 0.059 | 0.061 | 3.150 |
| 07:00- 08:00 | 42 | 23 | 111 | 1 | 149 | 0 | 149 | 2143 | 0.070 | 0.070 | 0.000 |
| 08:00-09:00 | 43 | 30 | 128 | 0 | 173 | 2 | 175 | 2143 | 0.081 | 0.082 | 1.156 |
| 09:00-10:00 | 56 | 26 | 132 | 0 | 179 | 4 | 183 | 2143 | 0.084 | 0.085 | 2.232 |
| 10:00-11:00 | 59 | 25 | 145 | 1 | 188 | 0 | 188 | 2143 | 0.088 | 0.088 | 0.000 |
| 11:00-12:00 | 46 | 29 | 126 | 0 | 173 | 4 | 177 | 2143 | 0.081 | 0.083 | 2.315 |
| 12:00-13:00 | 57 | 30 | 136 | 1 | 192 | 3 | 195 | 2143 | 0.090 | 0.091 | 1.561 |
| 13:00-14:00 | 43 | 25 | 123 | 0 | 160 | 3 | 163 | 2143 | 0.074 | 0.076 | 1.881 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 14:00-15:00 | 40 | 26 | 98 | 0 | 146 | 0 | 146 | 2143 | 0.068 | 0.068 | 0.000 |
| 15:00-16:00 | 48 | 31 | 135 | 1 | 185 | 2 | 187 | 2143 | 0.086 | 0.087 | 1.082 |
| 16:00-17:00 | 56 | 36 | 111 | 1 | 192 | 1 | 193 | 2143 | 0.090 | 0.090 | 0.521 |
| 17:00-18:00 | 55 | 25 | 125 | 0 | 173 | 3 | 176 | 2143 | 0.080 | 0.082 | 1.739 |
| 18:00-19:00 | 57 | 38 | 106 | 1 | 195 | 1 | 196 | 2143 | 0.091 | 0.091 | 0.513 |
| 19:00-20:00 | 66 | 34 | 123 | 0 | 202 | 1 | 203 | 2143 | 0.094 | 0.095 | 0.494 |
| 20:00-21:00 | 43 | 19 | 156 | 0 | 163 | 3 | 166 | 2143 | 0.076 | 0.077 | 1.843 |
| 21:00-22:00 | 50 | 22 | 144 | 1 | 172 | 0 | 172 | 2143 | 0.080 | 0.080 | 0.000 |
| 22:00-23:00 | 40 | 19 | 98 | 0 | 131 | 1 | 132 | 2143 | 0.061 | 0.062 | 0.765 |
| 23:00-24:00 | *36* | 19 | *87* | 1 | 123 | 0 | 123 | 2143 | 0.057 | 0.057 | 0.000 |
| 24:00-01:00 | *30* | 16 | *60* | 0 | 95 | 0 | 95 | 2143 | 0.044 | 0.044 | 0.000 |
| 01:00-02:00 | *22* | 15 | *46* | 0 | 78 | 1 | 79 | 2143 | 0.036 | 0.037 | 1.282 |
| 02:00-03:00 | *18* | 14 | *59* | 0 | 78 | 0 | 78 | 2143 | 0.037 | 0.037 | 0.000 |
| 03:00-04:00 | *16* | 18 | *45* | 0 | 78 | 0 | 78 | 2143 | 0.036 | 0.036 | 0.000 |
| 04:00-05:00 | *20* | 22 | *60* | 0 | 98 | 1 | 99 | 2143 | 0.046 | 0.046 | 1.016 |
| 05:00-06:00 | *23* | 27 | *52* | 1 | 110 | 3 | 113 | 2143 | 0.051 | 0.053 | 2.737 |
| **Average** | **42** | **25** | **105** | **0** | **148** | **2** | **150** | **2143** | **0.07** | **0.07** | **1.01** |

- Carrying Capacity at **MDR Kovilpatti to Ottapidaram Road** = 2143 PCU/hr
- Existing traffic density at **MDR Kovilpatti to Ottapidaram Road**= 148 PCU/hr
- Existing LOS (Without Project) = 0.06 i.e. Cat "A"
- Proposed+Existing traffic from Site=150 PCU/hr
- LOS (With Project) = 0.06 i.e. Cat "A"

### 3.13.3 Summary of Traffic Survey

*Table 113.Traffic Analysis Summary*

| | Parameter | Existing (without project) | Proposed (with project) | After Expansion |
|---|---|---|---|---|
| **NH-138 Thoothukudi-Tirunelveli Road)** | **Width (m)** | 16 | | |
| | **Carrying Capacity (PCU/Hr)** | 5143 | | |
| | **Traffic (PCU/Hr)** | 1216 | 2 | 1218 |
| | **LOS** | 0.24 **i.e., Cat "A"** | - | 0.24 **i.e., Cat "A"** |
| **MDR (Kovilpatti to Ottapidaram Road )** | **Width (m)** | 8 | | |
| | **Carrying Capacity (PCU/Hr)** | 2143 | | |
| | **Traffic (PCU/Hr)** | 148 | 2 | 150 |
| | **LOS** | 0.06 **i.e., Cat "A"** | - | 0.06 **i.e., Cat "A** |

*Table 114.LOS Data*

| S. No. | LOS Value (Ratio of V:C) (V/C) | Category | Inference based on IRC 106: 1990 |
|---|---|---|---|
| 1 | 0-0.2 | A | Represents a condition of free flow; individual users are generally unaffected by others in the traffic and this condition is generally considered in the Excellent Category. |
| 2 | 0.2-0.4 | B | Represents a condition of stable flow; individual users have a level of comfort and convenience but less than that of A. |
| 3 | 0.4-0.6 | C | Represents a condition of zonal stable flow; individual users are starting in a bit of discomfort; users start to feel inconvenience due to presence of other users on the road. The general level of discomfort increases and there is a noticeable decline in convenience. |
| 4 | 0.6-0.8 | D | Represents the level of stable flow; Level of comfort of users is poor and discomfort is significant in the flow of traffic. This category traffic streams are extremely susceptible to traffic problems. |
| 5 | 0.8-1 | E | Represents operating conditions close to capacity level; freedom to traffic stream is low and the speed is relatively uniform but very less. Comfort and convenience is relatively poor and discomfort is visible. |
| 6 | 1 or above | F | Breakdown Flow; These streams often break down, susceptible to long delays and therefore there is huge discomfort in these streams. |

### 3.13.4 Conclusion

**Road 1.** The carrying capacity of the NH-138 Thoothukudi-Tirunelveli Road is much higher than the traffic volume. The traffic (to & fro) from the "M/s. SIPCOT" will not create traffic congestion. NH-138 Thoothukudi-Tirunelveli Road The volume/capacity ratio is likely to change from 0.24 to 0.24 with LOS being "A" to "A"

**Road 2.** The carrying capacity of the MDR Kovilpatti to Ottapidaram Road (App. Road) is much higher than the traffic volume. The traffic (to & fro) from the "M/s. SIPCOT." will not create traffic congestion.MDR

Kovilpatti to Ottapidaram Road(Approach Road The volume/capacity ratio is likely to change from 0.06 to 0.06 with LOS being “A” to “A”

# 4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The establishment of the SIPCOT Industrial Park at Allikulam, Thoothukudi District, over an area of 796.240 hectares, will involve large-scale industrial, infrastructure, and utility development. The project includes industrial plots for Technical Textile and other Textile Industries (EC Category) and Non-EC category industries (Red, Orange, Green, and White), along with associated infrastructure facilities such as internal roads, water supply network, stormwater drainage, power substation, solid waste management facility, and greenbelt development.

This chapter identifies and evaluates the potential environmental impacts likely to arise during both the construction phase and the operational phase of the project. The assessment is based on the nature, magnitude, and duration of anticipated impacts on environmental components such as air, water, land, noise, ecology, and socio-economic environment.

The evaluation has been carried out by correlating the proposed project activities with the baseline Environmental conditions of the study area during both the construction and operational phases of the project.

The primary objectives of this assessment are to:

- Identify and quantify potential environmental impacts.
- Recommend appropriate mitigation and management measures to minimize adverse effects.
- Ensure compliance with applicable environmental regulations and standards.
- Enhance positive impacts such as local employment, infrastructure development, and regional economic growth.

The anticipated environmental impacts and corresponding mitigation measures are discussed in detail for the following key environmental components:

- Air Environment
- Water Environment
- Noise Environment
- Land Environment
- Biological Environment
- Socio-Economic Environment

## 4.1 IMPACTS ASSESSMENT METHODOLOGY

For the proposed project, the impact assessment has been undertaken in the following steps:

- Identification of potential interactions between project activities and environmental receptors.
- Evaluation of environmentally significant impacts likely to occur during both construction and operational phases.

Based on this preliminary assessment, the major environmental components and indices that are likely to be affected due to the project are summarized below:

- **Land Use / Land Cover:**

  The proposed industrial park by the State Industries Promotion Corporation of Tamil Nadu (SIPCOT) is located across Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram, and Therkusillukkanpatti Villages in Thoothukudi Taluk, Thoothukudi District. Development of the industrial park will result in conversion of existing barren and scrubland into planned industrial and infrastructure zones.

- **Air Environment:**

  Air quality may be affected due to **dust generation** from construction activities, **vehicle movement**, and **material handling**. During operation, emissions are expected from **boilers, DG sets, process stacks, and Air Pollution Control Systems (APCS)**. Vehicular emissions during transportation of raw materials and products will also contribute marginally to ambient air concentrations.

- **Noise Environment:**

  Temporary noise levels may increase during construction due to movement of heavy vehicles, machinery, and material handling. During operation, continuous noise may be generated from **boilers, DG sets, APCS units, and process equipment**.

- **Water Environment :**

  Possible impacts on water quality may arise from **surface runoff** during construction, as well as **sewage generation and wastewater discharge** from construction and industrial operations. Water will also be used in manufacturing processes, **boilers, cooling systems**, and for **domestic purposes**, resulting in the generation of wastewater requiring treatment before reuse. wastewater generation that will be treated through ZLD process and reused in compliance with regulatory norms.No Disposal

  **Soil Environment:**

  Soil quality may be impacted by **excavation activities**, **construction debris**, and potential contamination from **dust deposition, oil, grease, or chemical-laden wastewater**. As a mitigation measure, topsoil, wherever encountered, will be carefully stripped and stored separately and later reused for greenbelt development and landscaping activities. All fuel, oil, and chemical storage areas will be provided with impervious flooring along with adequate secondary containment to prevent seepage and soil contamination. Proper management of construction debris and good housekeeping practices will be ensured to minimize soil degradation. Periodic monitoring of soil quality will be carried out to enable early detection of any contamination and timely corrective action.

- **Storage and Handling of Chemicals, Solid and Hazardous Waste:**

Improper storage, handling, or disposal of chemicals and waste materials may pose risks to soil and water quality. Appropriate containment, storage, and disposal facilities will be provided in compliance with regulatory norms.

- **Ecology and Biodiversity :**

  Construction and operation activities may cause minor disturbances to **local flora and avifauna** due to dust, noise, and emissions. However, the overall impact is expected to be minimal with implementation of greenbelt development and environmental safeguards.

- **Socio-Economic Environment:**

  The project will generate **positive impacts** by creating direct and indirect employment opportunities and supporting local economic growth. Minor **negative impacts** may occur from temporary construction-related disturbances, vehicular movement, and emissions from industrial operations.

- **Occupational Health, Community Health, and Safety:**

  Workers may be exposed to **dust, noise, and waste materials** during both construction and operation phases. A structured **Occupational Health and Safety Management Plan (OHSMP)** will be implemented to safeguard worker health and ensure community safety.

## 4.2 POTENTIAL IMPACTS DURING CONSTRUCTION PHASE

The construction phase of the proposed SIPCOT Industrial Park at Allikulam will involve extensive activities such as site preparation, leveling, excavation, construction of roads, drains, buildings, and installation of utilities. These activities are likely to cause temporary and localized environmental impacts on air, water, land, soil, noise, and ecology due to dust generation, vehicular movement, material handling, and construction waste. Minor impacts on the socio-economic environment are expected due to the influx of labour and increased local traffic. However, these impacts will be short-term, reversible, and manageable through the implementation of appropriate mitigation measures and environmental management practices.

### 4.2.1. Activity – Construction of Structure

Aspects:

- Dust Generation
- Generation of Broken raw material
- Generation of Scrap materials
- Noise from construction equipment & machinery
- Soil Contamination
- Site preparation (fencing, boundary & clearing of site).
- Excavation, backfilling and levelling
- Hauling and dumping of earth materials & construction spoils.
- Construction of internal roads, drains & water supply.
- Painting and finishing.
- Cleaning, landscaping and plantations.
- Generation of C&D waste

- Traffic congestion & safety impacts

*Table 115. Construction of New Structure*

| Environmental Components | Anticipated Impact | Proposed Mitigation Measures |
|---|---|---|
| Air Environment | -Emission from power boiler set, DG sets.<br>-Site preparation, approach roads, excavation, drilling, foundation, deployment of machinery, erection, transportation, dumping will cause dust and gaseous emissions.<br>-Dust generation during material handling<br>-Handling of Construction waste can cause the generation of dust which can cause problems in breathing to the construction workers and nearby population. Emission of VOCs from paints can cause irritation in eyes, nose and throat and can cause difficulty in breathing and nausea. | -Stack of adequate height will be provided.<br>-Dust emission can be localized by handling limited quantities and water sprinkling.<br>-Construction Waste will be stored properly and covered with tarpaulin cover.<br>-Noise masks will be provided to the laborers working in dust-prone areas. |
| Water Environment | - Material preparation, Earth works, crushing of stones, cutting and modification of the terrain, alteration of drainage systems and soil erosion affect the water quality<br>-Utilization of water may impact the water demand of the vicinity.<br>-During the construction period, Stagnation of water & Run off water may lead to breeding of mosquitoes & run off can lead to soil erosion.<br>-Improper disposal of Construction waste if it comes in contact with the water body, may deteriorate its quality. | -In-house ETP treated water shall be used for construction/installation phase, no ground or fresh water will be used.<br>-During the construction period, runoff from the construction site shall not be allowed to stand (water logging) or enter the roadside or nearby Canal.<br>-The runoff due to rain water from the site shall be collected and reused.<br>-Proper channelization of surface runoff will be done with flow towards the drainage system. |
| Land Use | - 15% Greenbelt within Industrial Plot area.<br>- Greenbelt (30m on either side of Odai, 15m on either side of 7154m | The greenbelt within the industrial plots will cover 78.211 hectares (9.83%), developed by individual industries in accordance with the |

| Environmental Components | Anticipated Impact | Proposed Mitigation Measures |
|---|---|---|
| | long Nilaviyal Odai & 15 m greenbelt around the periphery of the Lyocell unit, and a 10 m greenbelt all along the project boundary) | mandatory 15% greenbelt requirement. The greenbelt developed by SIPCOT along water bodies and buffer zones, comprising a 30 m wide greenbelt on either side of the 4,780 m long water body (Odai), a 15 m wide greenbelt on either side of the 7,154 m long Nilaviyal Odai, 15 m greenbelt around the periphery of the Lyocell unit, and a 10 m greenbelt all along the project boundary, will cover 108.503 hectares (13.63%). Accordingly, the total greenbelt area within the industrial park amounts to 186.714 hectares, accounting for 23.46% of the total project area. |
| Soil Environment | -The topography of the site and the pervious nature of the soil will cause erosive surface flows & reduce the susceptibility to soil erosion.<br>- Significant surface features such as gullies, streams or rivers in close proximity to the site that could be affected by soil erosion.<br>- Improper disposal of Construction waste. | - Construction will be either disposed off weekly to the Construction Waste site or utilized in internal road formation for the proposed project.<br>-Periodically monitoring of soil quality will be conducted to enhance soil quality. |
| Noise & Vibration | - Structural work, deployment of machinery, approach of road construction and erection of roads will result in noise and vehicular traffic.<br>- Noise generation from DG set.<br>- Vibration will be due to construction equipment like cutter and driller and will be limited as it will be operated intermittently and the vibration area is limited to 1m radius. | - DG set will be put under an acoustic enclosure. The noise generation will be limited to 1 m radius.<br>- Machines and equipment will be properly greased, lubricated and regularly maintained and shall be provided with anti-vibration pads. |
| Hydrology & Geology | • Alteration of natural surface drainage patterns due to site | • Natural drainage channels, |

| Environmental Components | Anticipated Impact | Proposed Mitigation Measures |
|---|---|---|
| | grading, road construction, and built-up areas. Possible siltation of nearby water bodies and odais during construction activities.<br>• Temporary impacts on groundwater recharge due to excavation, soil compaction, and construction activities. | including Nilaviyal Odai, will be retained, protected, and integrated into the site drainage design without obstruction.<br>• A comprehensive stormwater management plan will be implemented, including lined drains, silt traps, and sedimentation pits to manage runoff and prevent erosion.<br>• Rainwater harvesting structures, recharge pits, and percolation trenches will be provided to enhance groundwater recharge.<br>• Construction activities will be phased and scheduled to minimize earth disturbance, especially during monsoon seasons.<br>• Excavated materials will be properly managed and reused to the extent possible for backfilling and landscaping.<br>• Buffer greenbelts along water bodies will be developed to stabilize soil and reduce sediment inflow. |
| Solid & Hazardous Waste | - Due to construction workers solid waste will be generated.<br>- Packaging waste will be generated.<br>- Construction debris & waste materials approx will be generated.<br>- Generation of used oil from DG set | - Recyclable construction waste material will be sold to authorized recyclers.<br>- Packaging waste will be sold to authorized recyclers.<br>-The construction debris will be used within the site for road laying. |

| Environmental Components | Anticipated Impact | Proposed Mitigation Measures |
|---|---|---|
| Socio-Economic | - Positive impact by giving employment to the local people.<br>- Increase in local economic activity.<br>-Increased noise and dust emission might cause irritation to workers and nearby people.<br>-Accidents during installation might lead to loss of life to workers. | - Equipment like PPEs and nose masks will be provided to workers.<br>-Safety equipment will be provided to workers. |
| Ecology & Biodiversity | - During to construction phase, the existing vegetation removal required as a result loss of ecological habitats.<br>- Increase in PM level will result in deposition of dust on Leaves which may cause decrease in respiration rate of flora and fauna.<br>-Increased noise during construction activities may lead to displacement of existing nearby fauna. | -Water sprinkling will be done to reduce the dust generation.<br>-Dust suppression system (water spray) will be installed as per the requirement at the construction site.<br>-Barricading will be done to avoid entry of any stray animals into the construction site.<br>-Increasing the greenbelt parallelly in the proposed area and the density of the greenbelt will be increased in the existing plant area. |

### 4.2.2. Activity —Installation of Machineries and Utilities

Aspects

- Emission of dust
- Increased PM level
- Generation of noise
- Soil contamination

*Table 116.Installation of Machinery*

| Environmental components | Impact | Proposed Mitigation Measures |
|---|---|---|
| Air Environment | Dust will be generated due to the installation of the machineries and other equipment within the project site, which may cause respiratory problems to the workers and decrease the aesthetic look of the area | -Water sprinkling will be done to reduce the dust generation<br>-Flexible dust suppression system (water spray) shall be done. Soil or mud that will be generated from the project site during the installation of machinery will be properly stacked and covered within the project site for the due course of time and if required water sprinkling will be done on the muck so that it may not blow off. |
| Water Environment | No major impact envisaged | None |
| Land Use | -Installation of different machineries will decrease the aesthetic beauty of the site. | -Greenbelt area of 108.503 ha will be maintained to enhance the aesthetic beauty of the project site. (as per MoEF&CC OM dated 29.10.2025) |
| Soil Environment | None | None |
| Socio-Economic | -Increased noise and dust emission might cause irritation to workers and nearby people. The noise level generation will be 80-85 dB (A) during installation. | - Equipment like PPEs like earmuffs/ear plugs and nose masks will be provided to workers. |
| Ecology & Biodiversity | -Increased PM Level will result in deposition of dust on leaves which may cause decrease in Transpiration rate of flora<br>-Increased noise will cause disturbance of existing avi-fauna; however, avifauna is not restricted to one place for a long time, thus it will not result in their displacement. | -Water sprinkling will be done to reduce the dust generation.<br>-All the construction activities will be carried out during the daytime. No activity will be done during late evenings which is the roosting time for the avian population.<br>-All the machinery will be provided with vibration isolators in accordance with their vibration generation. |
| Noise & Vibration | - Drilling and hammering for installation of different equipment/machinery may generate noise and vibration.<br>- Drilling at high frequency may cause annoyance, problems like speech interference, headache, Auditory impact. | - Drilling machines used will be of reputed make and in good condition and drillers may be provided anti-vibration gloves and earmuffs/plugs.<br>-Construction machinery will be properly lubricated and equipped with vibration isolator wherever possible<br>-Provision of protective devices like |

| Environmental components | Impact | Proposed Mitigation Measures |
|---|---|---|
| | | earmuffs/plugs to the workers will be done. |
| Hydrology & Geology | None | None |
| Solid Waste | -Solid waste and fabrication waste generated from unpacking of machines and equipment if not properly managed result in decrease the aesthetic value of the site | -All the solid waste will be properly collected, stored and given to the recycler. |

**4.2.3. Activity –Operation of Construction machinery (Concrete mixing machinery, DG sets, JCB, etc.)**

Aspects

- Used oil generation
- Air emission
- Dust generation
- Oil and Chemical spillage
- Noise generation

*Table 117.Operation of Construction Machinery*

| Environmental components | Impact | Proposed Mitigation Measures |
|---|---|---|
| Air Environment | -Emissions from the use of construction machinery will cause respiratory problems to the workers at site and nearby population.<br>-Pollutants emitted from the stack will increase the Ground Level Concentration of pollutants which will affect the respiratory health of people in a nearby area.<br>-Generation of dust from the operation of construction machinery.<br>-Spillage of HSD, used oil, chemicals may result in emission of VOCs in the air environment which may cause irritation in eyes, nose and throat, difficulty breathing and nausea. | -Adequate stack shall be provided in order to minimize the GLC<br>-Low Sulphur fuel shall be used in operation of DG sets.<br>-Personal Protective Equipment like nose masks shall be provided to the construction workers.<br>-Proper maintenance of construction equipment/ machineries, etc.<br>-Dust suppression and water sprinkling system will be installed for suppression of particulates |

| Environmental components | Impact | Proposed Mitigation Measures |
|---|---|---|
| Water Environment | -Spillage of oil & chemicals, if in any case encounters with water bodies can deteriorate the groundwater & surface water body which in turn may affect life also. | - Hazardous waste limited to used oil only.<br>-Used oil stored in HDPE drums in covered, designated area.<br>- Disposal through TNPCB/CPCB - authorized recyclers only.<br>- Immediate collection and management of oil spills and cement residues.<br>- No contamination of soil or water ensured through proper handling. |
| Land Use | None | None |
| Soil Environment | -Chemical degradation of soil may occur while refueling vehicles transporting construction materials and servicing of vehicles through breakage due to wear and tear. | -Procedures for maintenance of equipment would ensure that this risk is minimized, and clean-up response is rapid if any spill occurs.<br>-Lubricating waste oil will be collected separately in drums and handed over to the authorized outside agency. |
| Socio-Economic | -Noise due to operation of DG Set and machinery.<br>-Impact due to sudden slip/breakage of machinery can cause injury to workers. | -DG Sets will be enclosed in an acoustic enclosure & will be used during the emergency.<br>-Provision of Ear Plugs to workers can reduce the impact of noise on Ears of Workers can reduce the impacts. |
| Ecology & Biodiversity | -Increase in PM level will result in deposition of dust on leaves which may cause decrease in Transpiration rate of flora.<br>-Increased noise will cause disturbance of existing avi-fauna; however, avifauna is not restricted to one place for a long time, thus it will not result in their displacement. | -Water sprinkling will be done at the site to reduce dust emission.<br>-All the construction activities will be carried out during the daytime. No activity will be done during late evenings which is the roosting time for the avian population.<br>-Acoustically enclosed DG sets will be provided along with vibration pads.<br>-All the machinery used will be provided with vibration isolators in accordance with their vibration generation. |
| Noise & Vibration | -Noise and vibration generated due to the operation of machinery and equipment may cause physiological and | -Noise & vibration due to the running of concrete mixture/Pneumatic hammer m/c will be prevented by provision of |

| Environmental components | Impact | Proposed Mitigation Measures |
|---|---|---|
| | psychological effects on laborers like annoyance, problems like speech interference, sleep disturbance, headache, Auditory impact, increase in heartbeat of elderly people. Running of machinery will cause vibration generation in the immediate surrounding area. | protective devices like earmuff/plugs to the workers and keeping the machine in an enclosed system with a provision of vibration isolator.<br>-Greenbelt area of 78.211 (9.83 % of plot area) will be developed at the project site which will act as a barrier and help in reducing noise levels at the project site as a result of attenuation of noise generated due to plant operations and transportation.<br>-Less noise producing machinery will be purchased and shall be properly lubricated and regularly maintained. |
| Hydrology & Geology | None | None |
| Solid & Hazardous Waste | -Waste generated from construction machinery including waste oil, grease, and any other may cause nuisance if not maintained properly. | -All the waste generated will be properly disposed of as per solid waste management rules, 2016 |

**4.2.4. Activity – Transportation (Raw Material, Labour)**

Aspects

- Vehicular emission
- HSD/petrol leakage
- Road congestion & breakage of roads
- Noise generation
- Dust Emission

*Table 118. Transportation Impact and Mitigation Measures*

| Environmental components | Impact | Proposed Mitigation Measures |
|---|---|---|
| Air Environment | -Gaseous emissions from vehicles used for transportation will affect the health of construction workers and nearby population. | -Vehicles with valid PUC certificates will be used for transportation of construction material.<br>-Construction material shall be transported in closed and covered trucks.<br>- Improved combustion efficiency, catalytic converters, and reformulated gasoline shall be used to reduce VOC emissions from vehicles.<br>- Water sprinkling shall be carried out for dust suppression from movement of transport vehicles.<br>- Plantation of trees around the project periphery will be carried out. |
| Water Environment | -Leakage of HSD/ petrol from vehicles, if in any case comes in contact with the water body then it may deteriorate the groundwater & surface water body quality. This in turn may affect aquatic life also.<br>-Vehicular emission & dust emission if deposited over the surface of the water body may deteriorate the water quality and thereby affect aquatic life and make water unfit for consumption.<br>-If raw material falls down near or on the water body it can deteriorate the water quality. | -PUC certified vehicles will be used, so that HSD/ petrol leakage does not occur & air emissions will be maintained within the prescribed limit & thereby restricting its deposition on the water bodies.<br>-The vehicles carrying construction material and construction debris will be cleaned before they are permitted to ply on the road and covered vehicles will be used to reduce the dust emission & thereby restricting its deposition on the water body.<br>-Wheel washing arrangement of construction vehicles will be provided at site.<br>-Adequate drainage will be provided. |
| Land Use | None | None |
| Soil Environment | -Contamination of soil may occur due to HSD/ petrol seepage into the soil if any spillage occurs or while refueling (HSD petrol) of vehicles transporting construction materials and servicing of vehicles. | -Procedures for maintenance of vehicles would ensure that this risk is minimized, and clean-up response is rapid if any spill occurs. Lubricating waste oil shall be collected separately in drums and handed over to the authorized outside agency.<br>- Trucks used for transportation of |

| Environmental components | Impact | Proposed Mitigation Measures |
|---|---|---|
| | | materials will be fitted with tailgates that close properly and with tarpaulins to cover the materials. |
| Socio-Economic | -Due to the construction of the project there will be an increase in usage of vehicles which will have a direct impact on traffic load on the existing roads in the area. Due to which there will be a traffic jam, chaos, discomfort, safety issues on the roads.<br>- Indirect employment generation due to transportation will be there, hence, the economic condition of their families will improve. The purchasing power of people will increase. Hence, there will be overall development of the area. | -Existing road width is sufficient to handle the load of increased traffic.<br>- Adequate parking is provided for trucks, cars within the factory premises.<br>-There will be a positive impact due to increase in employment and other indirect requirements. |
| Ecology & Biodiversity | - Due to the movement of vehicles, the dust will produce which affect the road side plant's respiration rate. | - Water sprinkling shall be carried out for dust suppression from movement of transport vehicles. |
| Noise & Vibration | -Due to transportation of construction materials and machinery for installation high levels of noise may be generated which may cause physiological & psychological effects.<br>- There will not be much impact due to vibration on the project. | -Barriers of noise absorbing materials with adequate height will be maintained throughout the boundary of the project site.<br>-Greenbelt within the project site will be done which will dampen the noise. |
| Hydrology & Geology | None | None |
| Solid & Hazardous Waste | -Due to improper handling & transportation of raw material such as RMC & waste during transportation, littering of waste will occur leading to unhygienic conditions. | -Proper care will be taken while handling & transportation of raw material such as RMC & waste during transportation to avoid littering of it on roads and sites. |

**4.2.5. Activity –Working & Daily Activity of Construction Labor**

Aspects

- Vehicular movement of construction materials
- Solid waste & E-waste generation
- Water requirement & waste water disposal

*Table 119. Working & Daily Activity of Construction Labor*

| Environmental components | Impact | Proposed Mitigation Measures |
|---|---|---|
| Air Environment | -Bio-degradable waste generation may lead to odour problems if not stored properly & treated within time. | -The generated organic waste will be collected properly & will be treated in OWC. |
| Water Environment | -For construction laborers, 430 KLD of Domestic water shall be sourced from sourced from supply from Tuticorin Municipal Corporation on a long-term contractual arrangement and this will lead to wastewater. If the wastewater is not properly disposed off, then it can deteriorate the surface water quality of nearby water bodies. | -Water required for domestic use will be 430 KLD which will be sourced from supply from Tuticorin Municipal Corporation on a long-term contractual arrangement. Domestic wastewater is generated from the plant and it is sent to a STP.<br>-Temporary toilets will be made. |
| Land Use | None | None |
| Soil Environment | -Impact on soil due to improper disposal of solid waste & liquid waste. | - Segregation of solid waste at source and disposal through authorized agencies only.<br>- Provision of designated, lined storage areas for construction waste.<br>- Collection and treatment of wastewater through suitable temporary treatment facilities (e.g., septic tank/soak pit or mobile STP).<br>- Regular site housekeeping and timely removal of waste to prevent soil contamination. |
| Socio-Economic | -Improper disposal of Solid waste & wastewater from labors may cause nuisance due to smell if not properly managed & treated. | -The generated organic waste will be collected and disposed of by an approved vendor. |
| Ecology & Biodiversity | None | None |
| Noise & Vibration | None | None |
| Hydrology & Geology | None | None |

| Environmental components | Impact | Proposed Mitigation Measures |
|---|---|---|
| Solid & Hazardous Waste | -Improper storage and disposal of Biodegradable waste will enhance the risk of microbial contamination and will enhance the risk of disease occurrence and cause foul smell. It will attract the vectors. | -Solid waste from the laborers will be properly collected, stored in respective color coded containers.<br>-The generated organic waste will be collected properly and will be sent to the Solid waste Handling Site.<br>-Recyclable materials like aluminum, steel, wood pieces, cement bags, plastic containers, cartons, glass etc. will be given to recyclers. |

## 4.3. POTENTIAL IMPACT DURING OPERATION PHASE FOR SIPCOT INDUSTRIAL PARK & LYOCELL AND TISSUE MANUFACTURING UNIT

### 4.3.1. Activity – Loading, unloading & storage of raw material

- Aspects
- Generation of dust particles
- Generation of Noise
- Generation of solid waste, packaging material
- Generation of empty barrels.

*Table 120. Loading, Unloading & Storage of Raw Material*

| Environmental Components | Impact | Mitigation Measures |
|---|---|---|
| Air Environment | - Point Source- Nil<br>- Fugitive emission - Nil<br>- Spillage/leakage of raw materials during loading or unloading may generate flue gases, VOCs which may cause irritation in the eyes of the workers and mucous membrane, acute respiratory illness, stress-related disorder and may also affect their immune system.<br>-Very less dust will be generated during the loading or unloading activity. | -Workers are trained properly regarding handling of raw materials/chemicals, PPE like nose mask and goggles have been provided to the workers.<br>-Transfer of liquid raw materials in reactors and storage tanks is being done through pipelines and pumps to avoid spillage/leakage.<br>-Raw material dumping should be restricted to closed sheds.<br>- Water sprinkling will be done for the dust suppression.<br>- Loading or unloading activity will be mechanically supported. |
| Water Environment | - If dust particles are spread out in the neighborhood of the shed it may contaminate the water | -Dust particles should not spill in water and soil. -The storage of raw materials will be in a pucca earmarked area with flooring where washing will be done and washed water |

| Environmental Components | Impact | Mitigation Measures |
|---|---|---|
| | | channelized to ETP.<br>- Water sprinkling for dust suppression. |
| Land Use | - No impact | - |
| Soil Environment | - The dust, if uncontrolled emission occurs over the neighborhood soil, will settle on the top soil. | - Periodic Sweeping of the surface<br>- Periodic washing and washed water will be sent to ETP. |
| Socio-Economic | - The truck drivers and cleaners may create unwanted interaction with the neighborhood area.<br>- Traffic density will increase. | - Restrooms for the truck drivers and other people also who are coming in the factory premises.<br>- Adequate parking is provided within the factory premises. |
| Ecology & Biodiversity | -Vehicular emission like $NO_2$, NO etc. can inhibit the growth of plants and premature leaves senescence.<br>- Traffic density will increase. | -Water sprinkling is done to reduce dust generation. |
| Noise & Vibration | - Loading and unloading of raw materials will not cause much of a significant impact on noise level of the area, it may only cause physiological effects like annoyance to the workers.<br>- Noise due to transportation | - Limited to plant area<br>- Regular checking of PUC. |
| Hydrology & Geology | None | None |
| Solid & Hazardous Waste | - Improper handling of raw material may cause its littering thereby generating the waste. | - Solid waste generated from the site is collected and sent to an authorized recycler. |

### 4.3.2. Activity –Manufacturing Process of Products Aspects of Lyocell and Tissue Unit

- Water requirement
- Generation of Process, scrubbing and other steam wastewater
- eneration of Heat
- Air Emissions from Boiler
- Generation of Solid & Hazardous waste
- Energy and Steam requirement
- Generation of Noise & Vibration
- Spillage/leakage from Reactor vessel
- Generation of odour
- Generation of Flue gases, VOCs
- Generation of fumes, etc.

*Table 121. Manufacturing Process*

| Environmental Components | Impact | Mitigation Measures |
|---|---|---|
| Air Environment | - Emission from all production equipment.<br>-Emission from DG sets, Boilers<br>- Process emissions will be from the vents attached to the process reactor from which pollutants/gasses $H_2S$, $SO_2$, VOCs, & HCl will be released in the form of flue gasses which will degrade the ambient air quality of the area by increasing GLC and may cause eye irritation and acute respiratory illness to the people nearby.<br>- Dust emission during material handling. | -Acoustic enclosures with adequate stack height is provided for DG set<br>- Wet Scrubbers with adequate stack height will be provided for M23 Gas Incinerators.<br>- Adequate stack height of 90-120m is provided for Boilers.<br>- Ambient air quality will be monitored regularly.<br>- APCS like Alkali Scrubber Adequate Stack Height will be installed in accordance with CPCB norms and to avoid emissions from process pollutants, measures like continuous scrubbing off acidic gases and harmful particulates, with water for production of by-product will be done. |
| Water Environment | - The Proposed freshwater load will be 10867 KLD for domestic purpose and other uses.<br>- Water sprinkling & Cleaning of area may lead to contamination of the groundwater and soil.<br>- Due to manpower 688 KLD sewage water will be generated. | - About 28,562 KLD of industrial wastewater will be generated from various process and utility sources. This will be treated in individual ETPs, and the treated effluent will be fully reused within the industries for process and utility needs, ensuring zero discharge. Sewage (688 KLD) will be treated in an STP, and the treated sewage (633 KLD) will be reused for greenbelt irrigation, reducing freshwater consumption.<br><br>- Groundwater recharging with rainwater harvesting during the rainy season. |
| Land Use | - Production plant area, Solid waste storage/ Disposal Area | |
| Soil Environment | No Impact | - |
| Socio-Economic | Revenue increase through increased production<br>- Permanent and contractual | None |

| Environmental Components | Impact | Mitigation Measures |
|---|---|---|
| | employment will be generated. | |
| Ecology & Biodiversity | -No impact | - Greenbelt area will be 186.714 ha (23.46%) which will be maintained to enhance the aesthetic beauty of the project site. |
| Noise & Vibration | -Noise: Boiler, DG set, material transportation, etc.<br>Vibration: Due to machinery and DG set. | -Heavy equipments will have noise suppressors installed in the shed in order to localize the noise pollution<br>- workers will be given a PPE/Ear muffler and controlled exposure will be allowed at a time period for 20 mins.<br>-It will be re-checked and assured that mufflers systems will be installed in engines of machineries which helps in reduction of noise.<br>-Silencers of all the machineries and equipment will be checked and old worn out machineries replaced by new and less noisy machineries/equipment.<br>-Sufficient oiling and lubrication will be done to all the parts of the machineries to ensure that minimal noise will be generated. |
| Hydrology & Geology | No impact | - |
| Solid & Hazardous Waste | Used or spent oil, Wastes or residues containing oil, Empty barrels/ containers/ liners contaminated with hazardous chemicals/ wastes, Chemical sludge from wastewater treatment, Any process/ distillation residue - HW will be impacting the workers and nearby villagers. | -Proper care will be taken while handling & transportation, PPE will be used.<br>- Organic MSW during construction phase will be 168.75 kg/day & 6,210 kg/day will bw generate during operational phase will be disposed off by Inhouse OWC<br>- Inorganic MSW during construction phase will be 112.5 kg/day & 4140 kg/day will bw generate during operational phase |

| Environmental Components | Impact | Mitigation Measures |
|---|---|---|
| | | will be sold to authorized recyclers.<br>- Hazardous waste & used oil will sent to authorized recyclers.<br>- Discarded barrels will be recovered and reused or to CPCB authorized recyclers. |

**4.3.3. Activity – Operation of Manufacturing process & Equipment (Boiler, DG set, ETP, etc)**

Aspects of Lyocell and Tissue unit

- Generation of waste gases, PM, SOx, $NO_x$, $PM_{2.5}$, VOC, Cl.
- Generation of Sludge, used oil.
- Water requirement and generation of wastewater
- Generation of Noise & vibration
- Generation of waste water
- Requirement of Fuel
- Generation of Ash
- Spillage/leakage
- Generation of Hazardous waste

*Table 122. Operation of Manufacturing machinery & Equipment*

| Environmental Components | Impact | Mitigation Measures |
|---|---|---|
| Air Environment | -Flue gas emissions (SO2, NOx & PM2.5 and PM10 will be generated from a stack attached with a boiler. | -To prevent emissions, APCS like adequate stack height, Wet Scrubber with adequate stack height, as dust collector will be installed with appropriate stacks in accordance with CPCB norms.<br>-Regular maintenance of valves, pipes etc will be done. PPEs are provided to the workers. |
| Water Environment | -Utilisation of water may impact the water demand of the vicinity and improper disposal of waste water generated may affect the quality of nearby surface water body & ground water.<br>-The waste water If not properly disposed off, then it can deteriorate the surface water quality of nearby water | - The process wastewater generated will be 28,562 KLD from Industrial process, Utilities, Commercials and form Amenities sources. This will be treated in individual ETPs, and the treated effluent will be fully reused within the industries for process and utility needs, ensuring zero discharge. Sewage (688 KLD) will be treated in an STP, and the treated sewage (633 KLD) will be reused for greenbelt irrigation, reducing freshwater |

| Environmental Components | Impact | Mitigation Measures |
|---|---|---|
| | bodies by increasing the no. of pathogens, BOD, COD, TSS etc and making water unfit for consumption. It will also affect aquatic life. | consumption.<br>- Groundwater recharging with rainwater harvesting during the rainy season. |
| Land Use | None | - |
| Soil Environment | - | - |
| Socio-Economic | None | None |
| Ecology & Biodiversity | -NOx, SOX, VOC, and other gaseous emissions from the boilers, DG set inhibit the growth of plants and premature leaves senescence.<br>-Untreated water can deteriorate the plant/tree. | -All the machinery will be installed with an appropriate air pollution control system. |
| Noise & Vibration | -During the operation of machinery, noise and vibration may be generated from the machinery which may cause speech interference, annoyance, hearing impairment, increase in heartbeat/ blood pressure in the workers. | -Machineries of the reputed make and less noise producing will be purchased.<br>-Stationary machineries and equipment will<br>be properly enclosed by enclosures and provided with dampeners for minimizing noise generated due to vibration of machineries.<br>-Silencers of all the machineries and equipment will be checked and old worn out machineries will be replaced by new and less noisy machinery/equipment.<br>-Sufficient oiling and lubrication will be done to all the parts of the machineries to ensure that minimal noise is generated.<br>-Greenbelt/greenery will be developed along most of the periphery of the project area as well as along roads. Greenbelt area will be 186.714 (23.46%). |
| Hydrology & Geology | - | - |
| Solid & Hazardous Waste | STP/ETP sludge, and used oil will be generated which are hazardous, which may cause harm if come into contact. | -Proper Care of waste will be taken while handling & transportation, PPE will be provided.<br>-Organic MSW during construction phase |

| Environmental Components | Impact | Mitigation Measures |
|---|---|---|
| | Sludge and any other may cause nuisance if not maintained properly. | will be 168.75 kg/day & 6210 kg/day will bw generate during operational phase will be disposed off by Inhouse OWC also, biodegradable waste (will be Treatment in inhouse organic waste convertor (OWC) and use manure for horticulture development purposes in the premises). Inorganic MSW during construction phase will be 112.5 kg/day & 4140 kg/day will bw generate during operational phase will be sold to authorized recyclers and non biodegradable waste (given to authorized recycler). |

**4.3.4. Activity – Transportation of Raw material, finished product, waste etc.**

Aspects of Lyocell and Tissue unit

- Vehicular Emission and Dust emission
- Littering of solid waste
- Road congestion & Breakage of roads
- Noise Generation
- Spillage/leakage of raw material

*Table 123. Transportation of Raw Material, finished product, waste, etc.*

| Environmental Components | Impact | Mitigation Measures |
|---|---|---|
| Air Environment | -Gaseous emissions from vehicles used for transportation will affect the respiratory health of staff and nearby population. | -Vehicles with valid PUC certificates are being used for transportation.<br>- Tree Plantation all around the periphery has been done.<br>-Proper maintenance of vehicles are done periodically to ensure no leakage from the vehicles<br>-Vehicular transportation is done shift wise in order to reduce the stress on the roads.<br>-Proper maintenance and cleaning of vehicles and tyres are done in order to reduce dust generation.<br>-The transportation of the raw material, & products is being done in covered trucks & tempos. |

| Environmental Components | Impact | Mitigation Measures |
|---|---|---|
| Water Environment | If dust emitted or spillage/leakage gets deposited on the water body it can deteriorate the water quality. | -Trucks used are fully covered during transportation to the project by road. |
| Land Use | None | None |
| Soil Environment | - | - |
| Socio-Economic | -Dust and emission from movement of vehicles are likely to cause some impacts on the working population within the immediate vicinity of the project site.<br>-Traffic congestion in the area | -The present road conditions are reasonably good for proposed movement of traffic, the site is connected to the National Highway.<br>-Preventive maintenance is carried out for vehicles and pollution checks on a periodic basis.<br>-Materials transported are fully covered during transportation to the project site by road. |
| Ecology & Biodiversity | -Increased noise due to vehicular transportation will cause disturbance of existing avi-fauna, however, avifauna is not restricted to one place for a long time, thus it will not result in their displacement. | -Water sprinkling is being done to reduce the dust generation<br>-Vehicular movements for transportation of raw material are carried out only in day-time and try to avoid unnecessary honking with the help of sign boards. |
| Noise & Vibration | -Due to transportation of construction materials and machinery for installation high levels of noise may be generated which may cause physiological & psychological effects on workers like annoyance, speech interference, headache, Auditory impact, increase in heartbeat of elderly people.<br>- There will not be much impact due to vibration on the project. | -Silencers are checked in the vehicles used for transportation of materials.<br>-No honking zone is maintained.<br>-Reverse horn in the transportation vehicles is banned.<br>-Only PUC certified vehicles are allowed for transportation<br>-Maintenance of vehicles is done on a regular basis.<br>-Tree Plantation within the project site has been done which will dampen the noise. |
| Hydrology & Geology | - | - |
| Solid & Hazardous Waste | -. | - |

### 4.3.5. Activity - Working & daily activity of staff, Visitors

Aspects

- Solid & e-waste generation
- Water requirement & wastewater generation

*Table 124. Working & daily activity of staff, Visitors*

| Environmental Components | Impact | Mitigation Measures |
|---|---|---|
| Air Environment | - Generation of minor odour if biodegradable waste is not handled properly.<br>- Dust and vehicular emissions from internal movement of staff and visitors. | - Each industry shall provide proper storage and timely disposal of biodegradable waste to prevent odour generation.<br>- Organic waste shall be treated in in-house Organic Waste Converter (OWC) and used as manure for landscaping within the premises.<br>- Use of PUC-certified vehicles and periodic maintenance to minimize exhaust emissions. |
| Water Environment | - Domestic wastewater generation from staff and visitor facilities may deteriorate surface or groundwater quality if not properly treated.<br>- No groundwater abstraction is proposed for the project. | - Each industry shall provide Sewage Treatment Plant (STP) for domestic wastewater; treated water to be reused for gardening and flushing.<br>- Water supply will be provided by SIPCOT through desalinated and treated sources; no impact on local groundwater anticipated. |
| Land Use | - No change in land use pattern due to staff or visitor activities. | - None required; activities confined within industrial and administrative areas. |
| Soil Environment | - Potential minor contamination due to improper waste disposal. | - Each industry shall ensure proper segregation, collection, and disposal of solid and domestic waste through authorized vendors to prevent soil contamination. |
| Socio-Economic | - Positive impact through direct and indirect employment generation and local service demand. | - Employment preference to local population; maintain good housekeeping and safety practices within facilities. |
| Ecology & Biodiversity | - Negligible impact due to human presence and minor emissions. | - Maintain and enhance greenbelt development within plots and common areas. |
| Noise & Vibration | - Minor noise due to vehicular movement of staff and visitors. | - Maintain vehicles in good condition; enforce speed limits and “No Honking” within park premises. |
| Hydrology & Geology | - Improper stormwater handling or infiltration of untreated sewage could affect groundwater quality.<br>- Possible siltation if surface runoff | - Each industry shall maintain separate stormwater and sewage systems to avoid cross-contamination.<br>- Stormwater from rooftops shall be routed |

| Environmental Components | Impact | Mitigation Measures |
|---|---|---|
| | not controlled.<br>- Improper segregation or storage of municipal waste may lead to odour, microbial growth, or vector nuisance.<br>- Improper hazardous waste handling may pose health and fire hazards. | through a closed drain network with rainwater harvesting pits to promote groundwater recharge.<br>- Each industry shall segregate solid waste at source.<br>- Biodegradable waste to be processed in OWC; recyclable waste to be sold to authorized recyclers.<br>- Hazardous waste to be stored in designated, impervious areas and disposed of to authorized TSDFs as per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016. |
| Solid & Hazardous Waste | - Generation of minor odour if biodegradable waste is not handled properly.<br>- Dust and vehicular emissions from internal movement of staff and visitors. | - Each industry shall provide proper storage and timely disposal of biodegradable waste to prevent odour generation.<br>- Organic waste shall be treated in in-house Organic Waste Converter (OWC) and used as manure for landscaping within the premises.<br>- Use of PUC-certified vehicles and periodic maintenance to minimize exhaust emissions. |

## 4.4. SUMMARY OF IMPACT & MITIGATION

### 4.4.1. Air Environment

During both the construction and operational phases of the proposed SIPCOT Industrial Park at Allikulam, air quality may be affected due to emissions of Particulate Matter ($PM_{10}$, $PM_{2.5}$), $SO_2$, $NO_2$, $CO_2$, and Volatile Organic Compounds (VOCs) generated from land leveling, excavation, vehicular movement, material handling, operation of boilers, DG sets, and process stacks. These emissions could lead to a temporary increase in ground-level concentrations (GLC) and may cause respiratory discomfort or minor effects on local flora, fauna, and aesthetics of the surrounding environment.

To control such impacts, each individual industry and the Lyocell Manufacturing Unit (Man- Made Fibre Unit) within the park will install suitable Air Pollution Control Systems (APCS) such as Wet Scrubbers, Bag Filters, or Electrostatic Precipitators (ESPs), along with adequate stack heights as per CPCB/TNPCB norms. In addition, dust suppression systems, regular water sprinkling, and plantation of native tree species will be implemented across the park. Vehicles with valid PUC certificates will be used for transportation of construction materials, raw materials, wastes, and finished products to

minimize vehicular emissions. Dust extraction and compression systems will be provided in material handling areas, and workers will be equipped with appropriate Personal Protective Equipment (PPE) such as nose masks and respirators.

With the implementation of these mitigation measures, including continuous ambient air quality monitoring, use of covered trucks for transportation of dusty materials, and effective fugitive dust control practices, the overall pollutant concentrations are expected to remain well within the National Ambient Air Quality Standards (NAAQS, 2009). A multi-tier greenbelt comprising pollution-tolerant species will be developed to enhance particulate trapping and gaseous absorption. In addition, real-time emission monitoring, along with periodic compliance reporting, will be ensured to strengthen air quality management and maintain a clean and healthy air environment within and around the SIPCOT Industrial Park.

CEPI : The Thoothukudi CEPI core zone, classified as a severely polluted area, is located at an approximate distance of about 2.0 km from the proposed project site. The presence of this CEPI-identified area within the regional study area has been duly recognized and considered in the preparation of the EIA Report. Accordingly, the baseline environmental assessment, impact prediction, and mitigation measures have been undertaken with due regard to the existing environmental sensitivities of the region, including cumulative environmental considerations.

### 4.4.2 Water Environment

The activities likely to impact the water environment include the manufacturing process, operation of machinery and utilities, and the daily activities of staff, workers, and visitors. The associated aspects may include generation of wastewater, potential water scarcity, alteration of local water quality, and groundwater depletion risks if not properly managed. Improper handling of wastewater could lead to deterioration of aquatic ecosystems and pose risks of water-borne diseases to nearby communities. For the Lyocell Manufacturing Unit (Man- Made Fibre Unit), the source of water supply will be the Tuticorin Municipal Corporation through a dedicated tertiary-treated water pipeline, with a total requirement of 39,296 KLD. Of this, 20,000 KLD of secondary treated sewage will be received from Tuticorin and further treated to tertiary quality for use in process and utility operations, while 19,296 KLD will be met through in-house treated effluent reuse (Phase I: 9,648 KLD and Phase II: 9,648 KLD). Treated effluent from the manufacturing process will be fully recycled and reused, ensuring compliance with Zero Liquid Discharge (ZLD).

For the SIPCOT Industrial Park, the freshwater supply will be sourced from the SIPCOT-owned 60 MLD Desalination Plant, with a total freshwater allocation of 10,867 KLD (10,437 KLD desalinated water + 430 KLD domestic supply). The total water requirement for the park is 66308 KLD, which includes treated effluent reuse (28,562 KLD) and secondary treated sewage (6246 KLD).

The total water requirement for the SIPCOT Industrial Park is estimated at 66308 KLD, inclusive of both Lyocell and other industries. The water requirement for amenities is 43.5 KLD, for the commercial area is 267.5 KLD, and for the greenbelt is 6535 KLD. All treated wastewater and treated sewage will be reused within the industrial park, and no groundwater extraction is proposed.

Rainwater harvesting structures will be developed to enhance groundwater recharge and maintain a sustainable water balance.

### 4.4.3 Land Use

During the construction phase, temporary changes in land use may occur due to site preparation, grading, excavation, and movement of construction materials and machinery. These activities may cause localized compaction and disturbance of surface soil. To avoid adverse impacts on soil quality, construction wastes will be collected and disposed of separately, and solid and hazardous wastes will be stored in sealed, labeled drums to prevent open disposal or soil contamination. Reuse of excavated material for backfilling and road formation will further minimize land disturbance.

During the operational phase, the land use will be permanently converted into an organized industrial zone in accordance with the approved master plan. The land use distribution comprises 521.409 hectares allocated for industrial plots, inclusive of 15% internal greenbelt (193.182 acres) within the plots, 14.425 hectares for common amenities, 21.640 hectares for commercial activities, 53.337 hectares for roads and stormwater drains, and 108.503 hectares for greenbelt developed by SIPCOT along water bodies, buffer zones, and site boundaries.The SIPCOT-developed greenbelt includes a 30 m wide greenbelt on either side of the water body (Odai), a 15 m wide greenbelt on either side of the Nilaviyal Odai, 15 m greenbelt around the periphery of the Lyocell unit, and a 10 m wide greenbelt along the project boundary. The total developable area works out to 721.338 hectares. The non-developable areas comprise 25.951 hectares falling within the windmill falling distance (radius 181 m), 27.994 hectares under the existing Nilaviyal Odai, and 20.957 hectares earmarked as the HT transmission line Right-of-Way buffer. These areas shall be maintained in their existing natural condition to preserve the prevailing drainage pattern and safety buffers within the industrial park.

Each industry will utilize its allotted plot in accordance with TNPCB environmental norms, ensuring no encroachment on natural drainage channels and compliance with mandatory greenbelt provisions. Implementation of proper stormwater management, paved internal roads, and erosion control measures will further ensure land stability and prevent degradation.

### 4.4.4 Soil Environment

The soil in the SIPCOT Industrial Park at Allikulam area is predominantly red sandy loam, moderately permeable, and largely barren, making it suitable for industrial development with minimal disturbance to agricultural or ecologically sensitive land. However, construction and operational activities may cause localized impacts on soil quality and stability if not properly managed. During the construction phase, activities such as site grading, excavation, vehicle movement, and material storage may lead to soil erosion, compaction, and minor contamination from fuel or oil leaks. These impacts will be temporary and mitigated through reuse of excavated earth for backfilling, silt traps and drainage management, and collection and safe disposal of construction debris. During the operational phase, potential soil contamination could occur from loading and unloading of raw materials, operation of process equipment (boilers, DG sets, APCS, etc.), handling of chemicals, and transportation or spillage of hazardous materials and wastes from the individual

industries. Such incidents may cause chemical degradation, reduced permeability, and loss of soil fertility, indirectly affecting other environmental components like air, water, and ecology.

To minimize these risks, each individual industry within the park will provide impervious flooring, bunded storage areas, and leak-proof pipelines for all fuel and chemical handling zones. All tankers, drums, and containers used for raw materials or waste will be ISO-certified and sourced from approved vendors to prevent leakage. Spill kits and emergency response procedures will be in place to ensure quick containment and cleanup in case of accidental releases.

Regular equipment maintenance, inspection of storage areas, and training of personnel in safe material handling will further reduce the possibility of contamination. The extensive greenbelt development will stabilize topsoil, reduce erosion, and improve infiltration capacity. With these measures in place, the project is not expected to cause any significant or long-term adverse impact on soil quality or productivity.

### 4.4.5 Socio-Economic

The proposed SIPCOT Industrial Park at Allikulam will have both positive and negative socio-economic impacts on the surrounding region. During the construction phase, temporary impacts such as dust generation, waste accumulation, vehicular movement, and noise may cause minor inconvenience and short-term annoyance to nearby settlements. In addition, uncontrolled emissions could lead to respiratory discomfort among sensitive receptors if not properly managed. However, these impacts will be localized and short-lived and will be minimized by the Individual industries through the implementation of Air Pollution Control Systems (APCS), Effluent Treatment Plants (ETP), and strict waste management and housekeeping practices. Construction activities will be confined strictly within the project boundary, ensuring no interference with community areas or agricultural lands. On the positive side, the project will contribute significantly to regional socio-economic development by generating direct and indirect employment opportunities during both construction and operation phases. The establishment of industries will promote ancillary business growth, enhance local income levels, and contribute to state revenue generation. Priority will be given to local employment, skill enhancement, and community welfare initiatives under Corporate Environmental Responsibility (CER) programs. To ensure community well-being, all industrial safety protocols will be followed, and Material Safety Data Sheets (MSDS) will be maintained. Continuous environmental monitoring, proper segregation and disposal of wastes, and adherence to good housekeeping and occupational health practices will further reduce any adverse impacts on the nearby population.

Overall, with effective environmental management and community-oriented planning, the proposed development will result in a net positive socio-economic impact, enhancing livelihood opportunities and infrastructure in the Thoothukudi region while ensuring the health and safety of the surrounding population.

### 4.4.6 Ecology & Biodiversity

The major activities which would have an impact on the Ecology and Biodiversity in the project area and the surroundings would be site preparation, excavation, manufacturing process, operation of machinery & equipment, transportation, loading & unloading of raw material. The aspects of the activities would be dust emission, increase in GLC, increase in noise level, soil erosion, noise generation, water contamination, vehicular emission and waste generation which would directly /indirectly impact in decrease in transpiration rate of flora, loss of habitat, decrease in plant/tree cover, disturbance to avi-fauna and other species, premature senescence of floral species and hence decrease in population of local faunal species in the area and the surroundings. To minimize such impacts, mitigation measures individual industries will provide provision of air pollution control equipment, scrubbing system to the vents, provision and proper maintenance of green area, installation of water sprinkling systems and dust suppression system, provision of noise barriers, maintenance of vehicular movement near the project site and proper disposal and treatment of wastes generated from the project site. Vehicular movement for transportation of raw material will be carried out only in day-time and will try to avoid unnecessary honking with the help of sign boards. Greenbelt/ greenery will be developed along most of the periphery of the project area as well as along roads.

### 4.4.7 Noise and Vibration

The major noise-generating activities during both the construction and operational phases of the SIPCOT Industrial Park at Allikulam will include the operation of heavy machinery, vehicular movement, and transportation of raw materials and finished products. Continuous operation of equipment such as boilers, DG sets, compressors, pumps, and construction machinery may lead to elevated noise levels and localized vibration in the immediate surroundings. Excessive noise exposure may cause physiological and psychological effects such as fatigue, stress, and hearing discomfort to workers, and may temporarily disturb the nearby population and fauna, leading to a marginal reduction in local biodiversity.

To minimize these impacts, the following mitigation measures will be implemented by Individual industry :

- Restriction of noise-generating activities strictly within the project area and only during permitted hours.
- Periodic maintenance and lubrication of all mechanical equipment to ensure smooth and quiet operation.
- Installation of noise control systems such as acoustic enclosures, silencers, mufflers, and vibration isolators on DG sets and heavy machinery.
- Provision of Personal Protective Equipment (PPE) such as earplugs and earmuffs to workers in high-noise zones.
- Establishment of greenbelt areas and vegetative barriers to attenuate noise propagation.
- Implementation of a “No Honking Zone” within the industrial park to minimize vehicular noise.

- Regulation of vehicular speed and traffic flow during construction and operation phases to reduce cumulative noise and vibration impacts.

With these measures in place, the noise and vibration levels are expected to remain within the permissible limits prescribed by the CPCB Noise Pollution (Regulation and Control) Rules, 2000, ensuring a safe and comfortable working and living environment within and around the SIPCOT Industrial Park.

### 4.4.8 Hydrology and Geology

The proposed development of the SIPCOT Industrial Park at Allikulam may have minor impacts on the hydrological and geological characteristics of the area during both the construction and operational phases. Activities such as excavation, manufacturing operations, machinery use, and transportation can influence the natural drainage pattern, groundwater recharge, and surface water quality if not properly managed. Potential impacts include wastewater generation, solid and hazardous waste disposal, and spillage or leakage of fuels and process chemicals, which may lead to deterioration of surface water and groundwater quality. Improper waste handling could also cause localized changes in soil permeability and affect natural drainage channels. To prevent these impacts, all wastewater from process, domestic, and utility operations will be properly channelized and treated before reuse or disposal. Each industry within the park will implement Zero Liquid Discharge (ZLD) through dedicated Effluent Treatment Plants (ETPs) and Sewage Treatment Plants (STPs). Proper stormwater drainage systems will be developed to ensure complete separation between clean stormwater and industrial effluents. Accordingly, the collected strom water along the internal roads will be discharged to the near by water bodies to maintain the natural drainage patten of the area. Regular inspection and maintenance of potential leakage points such as pipelines, joints, pumps, reactors, and storage vessels will be carried out, and leak detectors will be installed in critical areas. In the event of accidental spills, dry adsorbents or cotton will be used for cleaning instead of water to avoid contamination of runoff. Solid waste, e-waste, and biomedical waste generated from the project will be segregated, stored in impervious containers, and disposed of through authorized recyclers or TSDFs to avoid infiltration or leaching into the subsurface.

With these mitigation measures, the project's impact on hydrology and geology will remain insignificant, ensuring the protection of surface and groundwater resources and the long-term geological stability of the area.

### 4.4.9 Solid and Hazardous Waste

SIPCOT will not generate or handle hazardous waste directly. However, individual industries within the SIPCOT Industrial Park will be responsible for obtaining Hazardous Waste Authorisation from the Tamil Nadu Pollution Control Board (TNPCB) under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

Each industry shall ensure that hazardous waste is segregated, safely stored in covered and impervious areas, properly labelled, and disposed of only through authorised TSDFs or recyclers. Transportation of such waste will be carried out by authorised transporters with valid manifests.

SIPCOT's role will be limited to providing infrastructure and ensuring compliance oversight, while the individual industries remain responsible for safe handling and disposal of hazardous waste.

### 4.4.10 Traffic density

During the construction and operational phases of the SIPCOT Industrial Park at Allikulam, an increase in traffic density is anticipated due to the transportation of construction materials, machinery, raw materials, and finished products. Heavy vehicles such as trucks, tippers, and tempos will be used for material movement, resulting in temporary traffic congestion and dust generation along the access roads and internal routes. The increase in vehicular activity, particularly during construction and shift change hours, may momentarily affect road users and working personnel in the immediate vicinity.

However, the existing road infrastructure in and around the project area is adequate to handle the projected traffic volume, as confirmed by the traffic survey results provided in Chapter 3, Section 3.1. The impact will be short-term and manageable with the adoption of appropriate mitigation measures.

To minimize traffic-related impacts, the following measures will be implemented:

- Dust suppression systems (water sprinkling) will be used along haul roads and at construction sites.
- All construction materials will be fully covered during transportation to prevent dust and material spillage.
- Vehicular movement will be regulated, especially during shift changes, by allowing phased entry and exit of vehicles.
- Preventive maintenance and periodic pollution checks will be mandatory for all vehicles to ensure compliance with emission standards.
- Dedicated parking and loading/unloading zones will be provided within the site to prevent roadside congestion.
- Speed limits and directional signage will be installed to improve traffic safety.

With these measures in place, the anticipated traffic increase will be well accommodated by the existing road network, and no significant long-term impact on traffic density or transportation infrastructure is expected.

# 5. ANALYSIS OF ALTERNATIVES

The Analysis of Alternatives evaluates different potential sites and configurations considered for establishing the proposed SIPCOT Industrial Park in Thoothukudi District, Tamil Nadu, with the objective of identifying the most environmentally compatible, socially acceptable, and economically feasible option. The proposed Industrial Park is planned to accommodate Lyocell and tissue manufacturing units under Schedule 5(d) & 1(d) of the EIA Notification 2006 and its subsequent amendments, along with other allied engineering and textile-based industries. The Government of Tamil Nadu, through SIPCOT, aims to promote industrial growth and balanced regional development in southern Tamil Nadu, especially in the Thoothukudi region, where there is high potential for technical textile and allied sectors.

During the site selection stage, SIPCOT carried out a comparative analysis of three alternative locations within Thoothukudi District, considering environmental sensitivity, land availability, infrastructure connectivity, and socio-economic factors. The three sites examined were:

1. Mettupacheri
2. Allikulam and nearby villages (including Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram, and Therkusillukkanpatti)
3. Subramaniyapuram

Each site was assessed based on parameters such as land use pattern, soil characteristics, ecological sensitivity, proximity to human settlements, accessibility to road/rail/air/sea networks, availability of water and power, and the need for rehabilitation and resettlement (R & R).

A site-matrix approach following the MoEF&CC Technical Guidance was applied, assigning weighted scores to each environmental and infrastructural criterion. The analysis concluded that the Allikulam and adjacent villages site achieved the highest environmental compatibility and feasibility score, with minimal displacement and optimal infrastructure connectivity.

The detailed village-wise breakup, indicating the abstract area, exempted area, and corresponding LPS extent, is provided in Annexure -1 & 2. The assessment for the site is presented below:

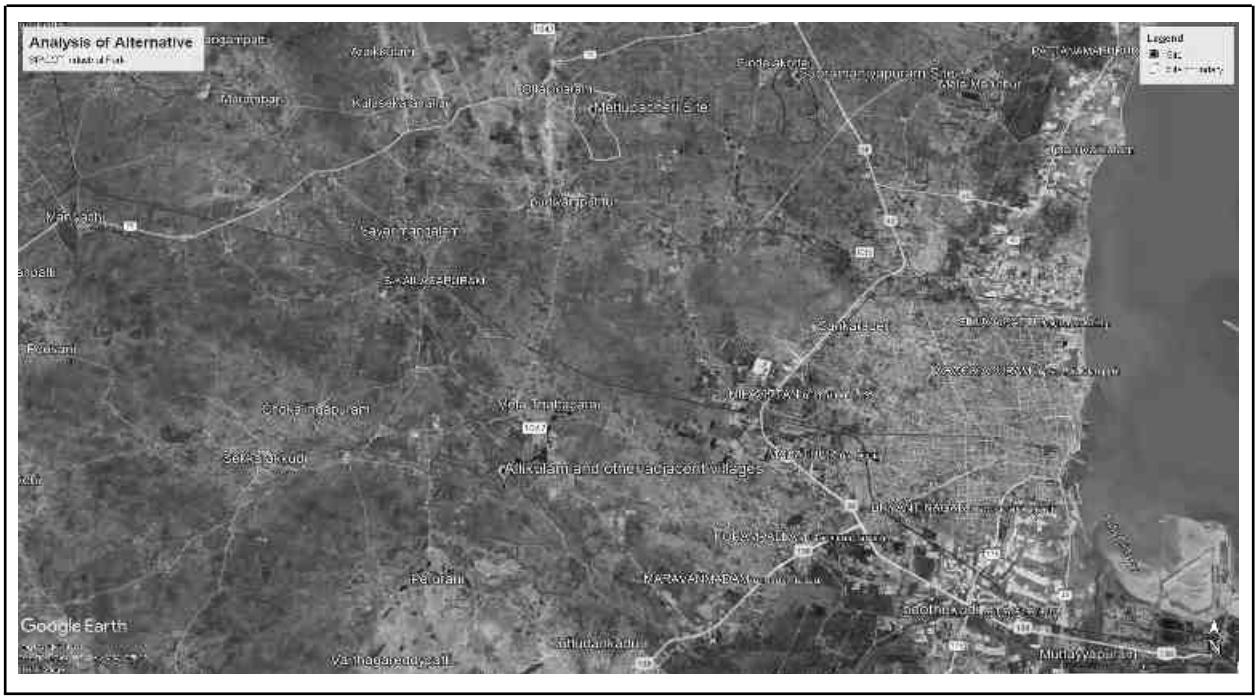



*Figure 16. Google Earth View Showing Analysis of Alternative Locations*

## 5.1 SITE MATRIX - ENVIRONMENTAL ANALYSIS OF ALTERNATIVE SITES (SIPCOT INDUSTRIAL PARK)

The above mentioned three sites were inspected in person, collected relevant land data, revenue records and availability of contiguous land nearby the villages. Based on the study a choice matrix was constructed using Standard set of guidelines and set of recommendations in the Technical Guidance document of MoEF&CC.

The environmental compatibility of the location which is with respect to the following were studied and compared for all the three locations:

- Area
- Access
- Soil Conditions
- Ecological Index
- R & R Requirements

The Site Matrix was evaluated for the above said deciding criteria and the same is presented in **Table 5.1.**

*Table 53.SITE Matrix - Environmental Analysis of Alternative Sites (SIPCOT Industrial Park)*

| S.No | Environmental Attributes | Mettupacheri | Subramaniyapuram | Allikulam and nearby villages |
|---|---|---|---|---|
| 1 | Nearby habitat | Large size Human Settlement within 1 Km | More than 500 Household within 1 Km | Less than 200 Household within 1 Km |
| 2 | Availability of condiguous land | Government Lands available , condiguous land not available (Patta Land) | Government Lands available, condiguous land not available (Patta Land) | Condiguous Lands available within Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages to an extent of 900 hectare. |
| 3 | Change in land use | Dry Agricultural | Dry Agricultural | Dry Agricultural land G.O issued for Industrial Land use |
| 4 | No. of tree cuttings | More No. of trees, either to be cut or replanted | More No. of trees, either to be cut or replanted | About 65 trees are only available.there will be a 20 trees, 18 Palm tree and 2 Neem tree will be necessitated to cut. SIPCOT will compensate those number of trees by planting 10 trees for every 1 tree felldown( of the same species) within the proposed greenbelt development |
| 5 | Road Access Availability | No Direct Access | Close to NH38 | Connecting Road from the Plot to NH7A/138 is at 2.75 km SSE is available |
| 6 | Soil Characteristics | Red Sandy Soil & Black soil | Red Sandy Soil & Black soil | Red Sandy Soil & Black soil |
| 7 | Site Condition | No Activity, Partially Barren | No Activity, Partially Barren | No Activity, Fully Barren and grown with thorny shrubs and bushes |
| 8 | Air | Good | Good | Good |
| 9 | Water | No Water Source | No Water Source | Ponds are avilable in nearby villages |
| 10 | Noise | Insignificant | Insignificant | Insignificant |
| 11 | RR Plan | RR Plan is nessasitated | RR Plan is nessasitated | No displacement as the area has no settlement, No RR Plan is required |
| 12 | Project Cost - Budgetary Estimate | More | More | Less |

## 5.2 SITE MATRIX - SELECTION CRITERIA (INDUSTRIAL PARK – SIPCOT)

*Table 54. Site Matrix - Selection Criteria (Industrial Park – SIPCOT)*

| S.No | Selection Criteria | Mettupacheri | Subramaniyapuram | Allikulam and adjacent villages |
|---|---|---|---|---|
| 1 | Land Availability | Limited due to Non-availability of condiguous land | Limited due to Non-availability of condiguous land | More than 900 ha available |
| 2 | Connectivity (Road, Rail, Air and Seaport) | By Road | By Road | By Road, Rail, Air and Sea port are well connected |
| 3 | Soil Conditions | Red Sandy Soil & Black soil | Red Sandy Soil & Black soil | Red Sandy Soil & Black soil |
| 4 | Ecological Sensitivity | Yes | Yes | No |
| 5 | Change in land use | Required | Required | G.O for industries use is available |
| 6 | Interference with fresh water sources & Utilisation of Secondary Treated Sewage | Nil | Nil | Fresh water will be sourced from SIPCOT Desalination Plant & Secondary Treatment Sewage will be sourced from Tuticorin Corporation. |
| 7 | R & R Requirements | Yes | Yes | No |
| 8 | Project development timeline | Needs more time | Needs more time | Within schedule |
| 9 | Economics | More | More | Less |

## 5.3 SITE MATRIX - SCORE (CHOICE OF SITE SELECTION)

*Table 55. Site Matrix - Score (Choice of Site Selection)*

| S.No | Selection Criteria | Weighted score | Mettupacheri | Subramaniyapuram | Allikulam and adjacent villages |
|---|---|---|---|---|---|
| 1 | Land Availability | 200 | 50 | 100 | 200 |
| 2 | Road Access | 200 | 50 | 50 | 200 |
| 3 | Soil Conditions | 100 | 100 | 100 | 100 |
| 4 | Ecological Sensitivity | 200 | 100 | 100 | 200 |

| | | | | | |
|---|---|---|---|---|---|
| 5 | Change in land use | 200 | 100 | 100 | 150 |
| 6 | Interference with fresh water sources & Utilisation of Secondary Treated Sewage | 200 | 50 | 50 | 150 |
| 7 | R & R Requirement | 200 | 50 | 50 | 200 |
| 8 | Project Timeline | 100 | 25 | 25 | 75 |
| 9 | Economics | 100 | 25 | 25 | 75 |
| **Total score** | | **1500** | **600** | **650** | **1250** |
| **Choice Ranking** | | | **III** | **II** | **I** |

The site comprising Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram, and Therkusillukkanpatti villages has secured a score of 1250 out of 1500, the highest among all evaluated locations.

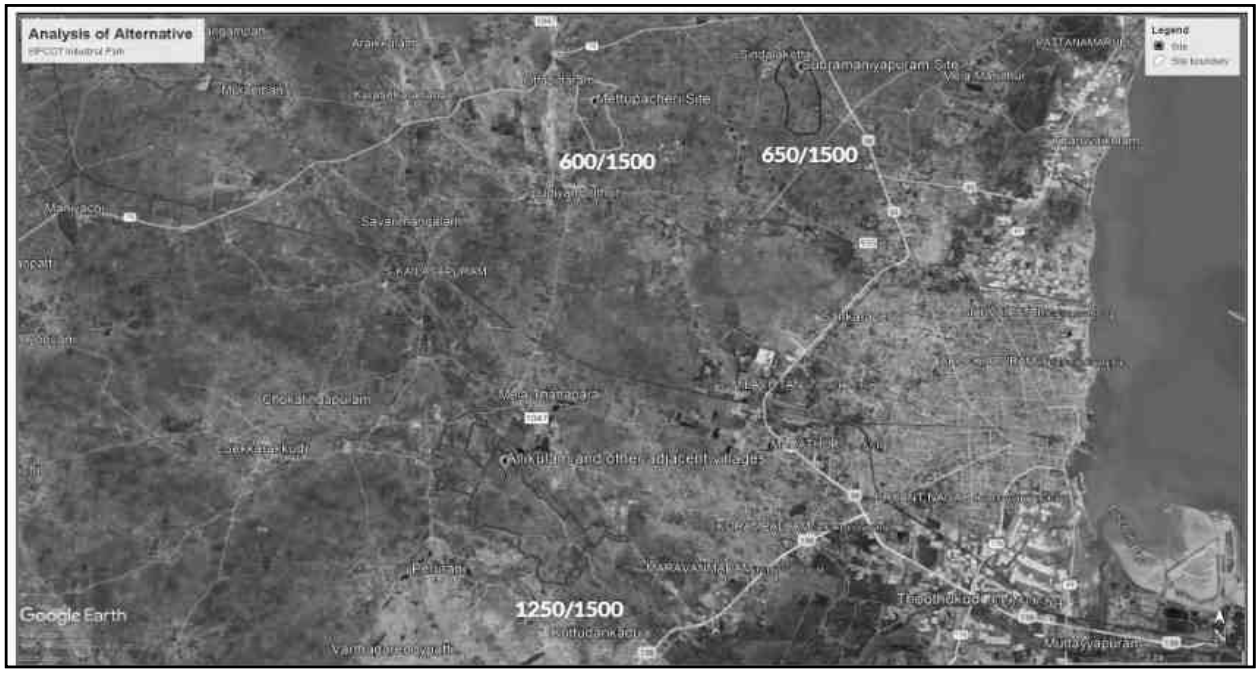



*Figure 17. Site Matrix - Score (Choice Of Site Selection)*

## 5.4 SITE SELECTION

The proposed SIPCOT Industrial Park is a greenfield development project identified by the State Industries Promotion Corporation of Tamil Nadu (SIPCOT) for establishing an Industrial park catering primarily to Man-Made Fibre (MMF) industries and allied engineering sectors. The site selection was carried out through a systematic evaluation of three potential locations—Mettupacheri, Subramaniyapuram, and Allikulam with adjacent villages—based on parameters such as

environmental sensitivity, land availability, infrastructure connectivity, and socio-economic factors. Among these, the Allikulam site, encompassing the villages of Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram, and Therkusillukkanpatti, was found to be the most suitable owing to its large contiguous dryland, minimal habitation, and excellent access to transport and utilities.

As per Government Order (G.O.) No. 100 dated 26.02.2021, a total land extent of 904.4 hectares has been approved for the project, comprising 788.742 hectares of patta (private) land and 7.498 hectares of poramboke (government) land earmarked for industrial use. Out of this, 796.240 hectares have been designated for the development of the industrial park, which includes areas for industrial plots, infrastructure facilities, utilities, greenbelt, common amenities, and access roads in accordance with the approved layout plan. The land parcels are distributed across six villages as mentioned above, and the detailed village-wise breakup is provided in the annexure -2 of the report.

The land use breakup indicates that the total developable area is 721.338 hectares (1,781.705 acres), comprising 521.409 hectares allocated for industrial plots, inclusive of 15% internal greenbelt (193.182 acres) within the industrial plot area, 14.425 hectares for common amenities, 21.640 hectares for commercial activities, 2.024 hectares for solid waste management facilities, and 53.337 hectares for roads and storm water drains. In addition, a greenbelt developed by SIPCOT along water bodies, consisting of 30 m buffer on either side of the water body (Odai) and 15 m buffer on either side of the Nilaviyal Odai, occupies 108.503 hectares, forming part of the developable area as reflected in the master plan. The non-developable areas include 25.951 hectares falling within the windmill falling distance (radius 181 m), 27.994 hectares under the existing Nilaviyal Odai, and 20.957 hectares earmarked as RoW buffer for the HT transmission line, which shall be maintained in their existing natural condition. Accordingly, the total project area works out to 796.240 hectares (1,966.713 acres).

The project site is well-connected through multiple modes of transport. The NH-7A (Thoothukudi–Tirunelveli Highway) is located about 2.75 km SSE of the site, providing easy road access, while Tattaparai Railway Station is about 2.78 km northwest. The Tuticorin Airport (Vagaikulam) lies approximately 4.27 km south, and the Tuticorin Port is situated around 15 km southeast, enabling seamless logistics and export-import operations.

In terms of infrastructure and utilities, the total power requirement for the industrial park is estimated at 145 MVA, along with 82 MVA for the Lyocell Unit. A 110/33 kV substation is proposed within the park, to be established and operated by TANGEDCO, with underground power distribution to ensure safety and efficiency. For the Lyocell and Tissue manufacturing Unit, power will be generated through a Steam Turbine Generator (3 × 45 MW) with DG backup (4 × 2500 kVA). The total water requirement for the park is about 66308 KLD, sourced mainly from the SIPCOT-owned 60 MLD desalination plant. Of this, 39,296 KLD will be met through tertiary treated sewage from the Tuticorin Municipal Corporation for the Lyocell and Tissue Manufacturing Unit, while the balance will be allocated for industrial, commercial, amenity, and greenbelt purposes. The site also includes a well-

planned road network totaling 21.723 km, comprising 30 m, 20 m, and 10 m wide roads to ensure smooth internal circulation.

The project is expected to generate significant employment opportunities. During the construction phase, approximately 625 workers will be employed, while during the operational phase, the project will create around 20,250 job opportunities, including 2,025 Nos direct and 18,225 Nos. indirect employments through ancillary and support services.

A comprehensive greenbelt covering 186.714 hectares, accounting for 23.46% of the total project area, will be developed within the industrial park. This includes 78.211 hectares of greenbelt developed by individual industries within their respective industrial plots in accordance with the mandatory 15% greenbelt requirement, and 108.503 hectares of greenbelt developed by SIPCOT along natural drainage features, the project periphery, and internal buffer zones.The SIPCOT-developed greenbelt comprises a 30 m wide plantation corridor on either side of water bodies (Odai), a 15 m wide corridor on either side of the Nilaviyal Odai, 15 m wide greenbelt along the periphery of the Lyocell unit, and a 10 m wide greenbelt all along the project boundary, together accounting for 13.63% of the total project area. Overall, the proposed greenbelt development effectively achieves the prescribed green cover requirement for the industrial park.

This extensive vegetative network will function as an ecological buffer, supporting ambient air quality enhancement, noise mitigation, and local microclimate moderation. The project site is devoid of habitation and environmentally sensitive features; therefore, no rehabilitation or resettlement (R&R) measures are required.

Considering the above advantages—ample contiguous land, robust infrastructure, superior connectivity, minimal social impact, and favorable environmental setting—the Allikulam site has been finalized as the most suitable location for establishing the SIPCOT Industrial Park in Thoothukudi District.

## 5.5 SITE TECHNOLOGY

The proposed SIPCOT Industrial Park at Allikulam is a greenfield development project designed to host Lyocell and Tissue Manufacturing Industry and allied engineering industries. The park aims to integrate modern, resource-efficient, and environmentally sustainable technologies into its design and operation. The overall infrastructure planning by SIPCOT focuses on providing essential utilities—such as power, water, internal roads, stormwater drainage, and greenbelt—while ensuring that individual industries within the park adopt appropriate pollution control and waste management systems in compliance with statutory requirements.

The technological framework for the project emphasizes sustainability, energy efficiency, and compliance with the Environmental Impact Assessment (EIA) Notification, 2006, TNPCB guidelines, and other applicable environmental standards.

**Infrastructure and Utility Technology**

1. **Power Supply and Distribution:**

The total projected power requirement for the industrial park is 145 MVA, along with an additional 82 MVA for the proposed Lyocell and Tissue Manufacturing Unit . A 110/33 kV substation will be established within the park by TANGEDCO to ensure reliable and uninterrupted power supply to all industrial plots. Internal power distribution will be carried out through underground cabling networks, which minimize transmission losses and enhance operational safety. For the Lyocell unit, captive power generation using Steam Turbine Generators (3 × 45 MW) is proposed, supplemented by DG backup units (4 × 2500 kVA). All installations will conform to Central Electricity Authority (CEA) and TANGEDCO standards.

2. **Water Supply and Management:**

The primary source of water for the industrial park will be the SIPCOT-owned 60 MLD Desalination Plant at Thoothukudi, supplying 10,437 KLD of desalinated water along with 430 KLD of domestic supply. For the Lyocell manufacturing unit, the water supply will be supplemented by 20,000 KLD of secondary treated sewage from the Tuticorin Municipal Corporation, which will be further treated to tertiary quality through an on-site treatment plant. The total water requirement for all project activities—including industrial operations, commercial areas, amenities, and greenbelt development—is estimated at 66308 KLD. The internal water distribution network will consist of underground HDPE pipelines equipped with flow meters, isolation valves, and pressure-regulating systems to ensure efficient and metered water distribution across the park.

3. **Wastewater Management:**

SIPCOT has not proposed a Common Effluent Collection, Conveyance, or Treatment System (CETP/ECCS) for the park. Instead, each industrial unit will establish its own wastewater treatment facility—such as an Effluent Treatment Plant (ETP) and/or Sewage Treatment Plant (STP)—as applicable to their operations. All industries will ensure that wastewater generated is treated to meet TNPCB discharge standards before reuse or disposal. Treated water will be reused within individual premises for process requirements, greenbelt irrigation, and dust suppression, thereby promoting recycling and zero discharge wherever feasible.

4. **Solid Waste Management:**

A dedicated Solid Waste Management Zone of 2.024 hectares has been allocated within the industrial park layout for collection, storage, and transfer of solid waste. Each industry will be responsible for handling and disposing of its own solid and hazardous wastes in compliance with the Solid Waste Management Rules, 2016, and the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016. Recyclable and non-hazardous waste will be sent to TNPCB-authorized recyclers or co-processing units, while organic waste generated from common areas and canteens will be treated in on-site composting facilities.

5. **Stormwater Drainage System:**

The stormwater drainage network has been designed based on the natural topography and drainage pattern of the site, ensuring integration with the existing Nilaviyal Odai and other

natural watercourses. The drainage system will include lined surface drains, collection pits, silt traps, and recharge pits, ensuring both safe conveyance and groundwater recharge. The total road and stormwater drain area covers 53.337 hectares, designed to handle runoff from intense rainfall events while minimizing soil erosion and localized flooding.

6. **Greenbelt Development and Buffer Zones:**

To control air emissions and enhance greenery, a total of 186.714 hectares of land within the industrial park has been earmarked for greenbelt development. Of this, 108.503 hectares will be developed by SIPCOT along the project periphery, major water bodies, internal buffer zones, the Nilaviyal Odai, the periphery of the Lyocell unit, and along the site boundary, while 78.211 hectares will be developed within individual industrial plots in compliance with the mandatory 15% greenbelt requirement. The SIPCOT-developed greenbelt includes a 30 m wide plantation corridor on either side of major water bodies (Odai), a 15 m wide corridor on either side of the Nilaviyal Odai, a 15 m wide greenbelt around the periphery of the Lyocell unit, and a 10 m wide greenbelt all along the project boundary. The greenbelt will comprise native and pollution-tolerant species laid out in a three-tier plantation structure, in line with CPCB guidelines, and will function as an effective environmental buffer for attenuating dust, noise, and fugitive emissions.

7. **Road and Transportation Network:**

The internal transportation network will consist of 21.723 km of roads designed for smooth industrial logistics. This includes 11.037 km of 30 m-wide roads, 10.536 km of 20 m-wide roads, and 0.150 km of 10 m-wide roads. Roads will be developed with asphaltic pavement, stormwater drains, street lighting, and pedestrian walkways for safe movement of personnel and vehicles. The site's proximity to NH-7A (2.75 km SSE), Tattaparai Railway Station (2.78 km NW), Tuticorin Airport (4.27 km S), and Tuticorin Port (15 km SE) ensures seamless regional and international connectivity.

**Conclusion :**

The SIPCOT Industrial Park at Allikulam will integrate modern and low-impact technologies across all infrastructure components. SIPCOT will develop the core infrastructure—including power distribution, water supply, road network, drainage, and greenbelt—while individual industries will implement their own wastewater and waste management systems as per regulatory norms. With a total greenbelt area of 186.714 ha (23.46% of Total area) , advanced infrastructure, and strategic connectivity.

# 6. ENVIRONMENTAL MONITORING PROGRAM

## 6.1 TECHNICAL ASPECTS OF MONITORING IN THE EFFECTIVENESS OF MITIGATION MEASURES

The primary objective of the Environmental Monitoring Programme is to develop a systematic, site-specific framework for monitoring key environmental parameters within the identified impact area — both during the construction phase and post-commissioning of the project. This programme serves to evaluate the effectiveness of mitigation measures and environmental management practices implemented for the proposed project, in relation to the existing environmental conditions and the anticipated impacts identified during the appraisal stage.

The organizational framework for environmental management, including the Environment Management Cell (EMC) *SIPCOT*, is presented in Chapter 10 of this report.

The monitoring plan for the proposed Industrial Park outlines the following aspects:

- The proposed mitigation measures formulated to protect and preserve environmental quality at the project site and in its surrounding areas.
- Detailed management plans, including the Greenbelt Development Plan, Solid Waste Management Plan, and other relevant environmental management strategies.
- The Environmental Monitoring Programme to be carried out during both the construction and operational phases of the project.
- The cost components associated with the installation and operation of pollution control and monitoring systems at the site.

For each environmental attribute, the plan defines:

- The parameters to be monitored,
- The location and frequency of monitoring,
- The duration and methodology of monitoring,
- The applicable environmental standards, and
- The roles and responsibilities for implementation, supervision, and reporting.

## 6.2 OBJECTIVES

- Ensure day to day operational activities are conducted in a manner in compliance with the applicable regulatory approvals including legislation and industry standards.
- Evaluate the adequacy of mitigation and pollution control measures implemented for reducing the adverse impacts caused during the construction and operation stage and suggest additional mitigation measures, if appropriate, in the light of the results.
- Define a detailed framework to monitor and document for achieving full compliance with statutory requirements.

- Encourage good environmental management practices through planning, commitment and continuous improvement.
- Develop clearly defined environmental monitoring program designed to assess the nature and extent of environmental impacts of the proposed operations and progressively refine such programs against the targets.
- Define roles and responsibilities of site personnel and ensure that all people onsite are fully informed of their responsibilities and accountabilities with regard to the environment.
- To comply with all regulations stipulated by the Central Pollution Control Board (CPCB)/ State Pollution Control Board (SPCB) related to air emission and liquid effluent discharge as per air and water pollution control act/ laws To handle hazardous wastes as per the Hazardous and Other Wastes (Management, Handling and Transboundary Movement) Rules 1989 and subsequent amendment in 2016.
- Review, improve and update environmental management procedures and standards.
- Establish response procedures for actual/potential environmental impacts including community complaints and ensure corrective action is taken.
- Perspective budgeting and allocation of funds for environmental management expenditure, Continuous development and search for innovative technologies for a cleaner and better environment.

## 6.3. ENVIRONMENTAL MONITORING PROGRAMME

Monitoring will be carried out to assess the quality of environment during construction phase and after commissioning of the project. An environmental monitoring programme is important as it provides useful information and helps to:

- Verify the predictions on environmental impacts presented in this study assist in detecting the development of any unwanted environmental situation, and thus, provides opportunities for adopting appropriate control measures, and identify the effectiveness of mitigation measures suggesedted in EMP.

### 6.3.1 Environmental Monitoring Program – Construction Phase

*Table 56. Monitoring Plan - Construction Phase*

| S. No. | Type of Monitoring | Frequency of Monitoring | Parameter | Location | Number Per Year | Responsibility |
|---|---|---|---|---|---|---|
| 1 | Ambient Air Quality | Six Monthly | Particulate Matter ($PM_{2.5}$) Particulate Matter ($PM_{10}$) Sulphur Dioxide ($SO_2$) Nitrogen Oxides | 2 in Core Zone & 2 in Buffer Zone | 8 | -EMC (Air Incharge) & Contractor |

| S. No. | Type of Monitoring | Frequency of Monitoring | Parameter | Location | Number Per Year | Responsibility |
|---|---|---|---|---|---|---|
| | | | ($NO_x$) Volatile Organic Compound (VOCs) Carbon monoxide (CO) | | | |
| 2 | Water Quality for drinking water | Six Monthly | All parameters mentioned in IS:10500 | One drinking water sample | 2 | -EMC (Water Incharge) & Contractor |
| 3 | Water Quality for Construction purpose | Six Monthly | All parameters mentioned in IS:456 | One construction water sample | 2 | -EMC (Water Incharge) & Contractor |
| 4 | Ambient Noise Level | Six Monthly | Day and Night noise level | 2 in Core Zone & 2 in Buffer Zone | 8 | -EMC (Noise Incharge) & Contractor |
| 5 | Soil Quality | Six Monthly | All parameters to check soil Fertility | 2 in Core Zone & 2 in Buffer Zone | 8 | -EMC (Soil Incharge) & Contractor |

***Note :***

- *Each individual industry within the park will have its own stack, process, and DG monitoring program, to be conducted separately under TNPCB consent conditions.*
- *SIPCOT's role is limited to ambient and infrastructure-level monitoring to evaluate the effectiveness of mitigation measures and ensure overall environmental compliance.*

### 6.3.1 Environmental Monitoring Program – Operational Phase

*Table 57. Monitoring Plan - Operational Phase*

| S. No. | Area of Monitoring | Number of Sampling Stations | Frequency of Sampling | Parameters to be Analyzed | Number per Year | Responsibility |
|---|---|---|---|---|---|---|
| **1** | **Ambient Air Quality** | 3 stations – one upwind, one downwind, and one within | Half Yearly | $PM_{10}$, $PM_{2.5}$, $SO_2$, $NO_x$, CO, VOCs and other parameters as per NAAQS | 6 | EMC (Air In-charge) / NABL-Accredited Laboratory |

| S. No. | Area of Monitoring | Number of Sampling Stations | Frequency of Sampling | Parameters to be Analyzed | Number per Year | Responsibility |
|---|---|---|---|---|---|---|
| | | project site | | (2009) | | |
| **2** | **Noise** | 3 locations within the study area | Half Yearly | Equivalent Continuous Noise Levels (Leq – Day and Night) | 6 | EMC (Noise In-charge) / External Monitoring Agency |
| **3** | **Water (Surface & Ground Water)** | 2 sampling points (1 surface water & 1 groundwater near the site) | Half Yearly | As per IS:10500:2012 (drinking) and IS:2296:1992 (surface water) | 4 | EMC (Water In-charge) / NABL-Accredited Laboratory |
| **4** | **Solid Waste Management Area** | 1 location – designated solid waste storage / transfer area | Half Yearly | Quantity generated, segregation efficiency, and disposal records | 2 | EMC (Solid Waste In-charge) / Authorized Disposal Agency |
| **5** | **Soil** | 3 locations within the study area (1 on-site & 2 in buffer area) | Half Yearly | Physico-chemical properties, nutrients (N, P, K) and heavy metals | 6 | EMC (Soil In-charge) / NABL-Accredited Laboratory |
| **6** | **Greenbelt / Plantation Monitoring** | Entire greenbelt area (~145.440 ha) | Yearly | Survival rate, canopy cover, species composition | 1 | EMC (Horticulture In-charge) |

***Note :***

- *Each individual industry within the park will have its own stack, process, and DG monitoring program, to be conducted separately under TNPCB consent conditions.*
- *SIPCOT's role is limited to ambient and infrastructure-level monitoring to evaluate the effectiveness of mitigation measures and ensure overall environmental compliance.*

## 6.4 SUBMISSION OF COMPLIANCE REPORT

SIPCOT shall submit periodic compliance reports to the Regional Office of MoEF&CC, Chennai, as per the conditions stipulated in the Environmental Clearance (EC). The compliance reports will be submitted half-yearly, i.e., on or before 1st June and 1st December of every year, in electronic format through the PARIVESH portal and in hard copy to the Regional Office.The report will cover the status of implementation of environmental management measures, results of environmental monitoring, and progress of greenbelt and infrastructure development within the Industrial Park. SIPCOT will also maintain a compliance register at the project site containing copies of all monitoring data, laboratory reports, and records of actions taken to ensure continued adherence to EC conditions.

Additionally, individual industrial units operating within the SIPCOT Industrial Park shall submit their respective compliance reports to the Tamil Nadu Pollution Control Board (TNPCB) and MoEF&CC, wherever applicable, in accordance with their Consent to Operate (CTO) and Environmental Clearance conditions.

### 6.4.1 Environmental Clearance

The proposed SIPCOT Industrial Park at Allikulam, Thoothukudi District requires Environmental Clearance (EC) under the provisions of the EIA Notification, 2006 and its subsequent amendments, issued by the Ministry of Environment, Forest and Climate Change (MoEF&CC).Since the total project area exceeds 500 hectares and the development includes a pre-defined Category 'B' industry — Man-Made Fibre Manufacturing Unit under Schedule 5(d), the overall project attracts the provisions of Schedule 7(c) of the EIA Notification, 2006, and is classified as Category "A".Accordingly, the project will be appraised at the central level by MoEF&CC, New Delhi, as per the Specific Conditions applicable to industrial estates or parks housing pre-defined activities requiring prior environmental clearance. The Environmental Clearance will be obtained after preparation of the EIA/EMP Report and completion of the Public Hearing process in accordance with the approved Terms of Reference (ToR).

### 6.4.2 Hazardous Waste Management

SIPCOT will not generate or handle hazardous waste directly. However, individual industries within the SIPCOT Industrial Park will be responsible for obtaining Hazardous Waste Authorisation from the Tamil Nadu Pollution Control Board (TNPCB) under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

Each industry shall ensure that hazardous waste is segregated, safely stored in covered and impervious areas, properly labelled, and disposed of only through authorised TSDFs or recyclers. Transportation of such waste will be carried out by authorised transporters with valid manifests. SIPCOT's role will be limited to providing infrastructure and ensuring compliance oversight, while the individual industries remain responsible for safe handling and disposal of hazardous waste.

### 6.4.3 CGWA Clearance

The proposed project does not involve any abstraction of groundwater. All freshwater requirements will be met through SIPCOT's 60 MLD Desalination Plant and treated wastewater from the Thoothukudi Municipal Corporation CSTP.Hence, no permission from the Central Ground Water Authority (CGWA) is required.To support groundwater recharge, rainwater harvesting structures and recharge pits will be incorporated within the park layout.

### 6.4.4 FOREST CLEARANCE

The project area does not include any forest land, and there are no reserved or protected forests within or adjacent to the site. Accordingly, Forest Clearance under the Forest (Conservation) Act, 1980 is not applicable to the SIPCOT Industrial Park at Allikulam.

### 6.4.5 ANNUAL RETURN

SIPCOT is required to submit the Environmental Statement (Form V) for each financial year ending on March 31, to the Tamil Nadu Pollution Control Board (TNPCB) on or before September 30 of the same year. This submission is a standard regulatory requirement and a condition of the Environmental Clearance (EC) granted to SIPCOT for the industrial park as a whole. Although SIPCOT primarily functions as an infrastructure provider, it holds the statutory responsibility to file Form V for the overall park. In addition, each individual industry or unit operating within the park must independently submit its own Form V to TNPCB as per Rule 14 of the Environment (Protection) Rules, 1986. Thus, both SIPCOT and the respective industries are accountable for annual environmental reporting and compliance.

# 7. ADDITIONAL STUDIES

## 7.1 INTRODUCTION

As per the Terms of Reference issued vide letter No TO25A3102TN5260559N, dated 21.09.2025 by Ministry of Environment, Forest, and Climate Change (MoEFCC), As per the TOR Additional Studies are required to be carried out for the proposed project.

## 7.2 PUBLIC CONSULTATION

Details will be incorporated after the Public Hearing is conducted.

## 7.3 RISK ASSESSMENT AND HAZARD IDENTIFICATION

### 7.3.1 Definition

Risk Assessment is a systematic process used to identify, evaluate, and quantify potential hazards associated with project activities that may pose a threat to human health, property, or the environment. It involves determining the likelihood and consequence of hazardous events and developing appropriate mitigation and control measures to minimize such risks.Hazard Identification refers to the process of recognizing and categorizing potential sources of harm such as flammable materials, chemicals, storage facilities, heavy equipment operation, and transport activities within the project area.

In the context of the SIPCOT Industrial Park at Allikulam, risk assessment focuses on identifying potential risks during construction and operational phases, including chemical storage, transportation, fire hazards, fuel handling, and occupational exposure. The objective is to ensure that all foreseeable risks are anticipated, assessed, and managed proactively through the implementation of robust safety systems, emergency preparedness plans, and monitoring mechanisms.

### 7.3.2 METHODOLOGY

The Risk Assessment Methodology for the proposed SIPCOT Industrial Park at Allikulam is based on the systematic identification and evaluation of potential hazards arising from project activities during both the construction and operational phases. The assessment considers the likelihood of occurrence and the severity of consequences using professional judgment and standard qualitative techniques.The methodology involves developing a risk matrix that combines the probability of occurrence and potential impact to determine the risk significance level (low, moderate, or high). This approach enables prioritization of control measures and formulation of an appropriate risk management strategy.

Hazard Identification (HAZID) has been carried out by considering all relevant aspects such as raw materials, storage systems, material handling methods, fuel and chemical use, equipment operation, and emergency conditions. Possible containment failure scenarios—such as tank leaks, ruptures, or

spillages in storage areas—have been evaluated qualitatively to assess their potential impact on personnel, property, and the environment.

The outcome of this assessment provides the basis for defining preventive and mitigative measures, including engineering controls, operational safety practices, emergency response planning, and training requirements, ensuring that all identified risks are adequately managed and minimized.

### 7.3.3 Types of Hazards

A hazard is a chemical or physical condition that has the potential to cause damage to people, property, or the environment. There are two types of hazards associated with the Proposed unit. The classification of Hazard is given below in the Table 7.1 :

*Table 58. Classification of Hazards*

| S. No. | Description | Hazards | Cause |
|---|---|---|---|
| 1 | Natural | Earthquake | Seismic activity (Zone II) |
| | | Flood | Heavy Rainfall |
| 2 | Manmade | Fire & Explosion | Explosive material |
| | | | Short circuiting |
| | | | EDC cracking furnace |
| | | | Oil storage |
| | | | Leakage from process |
| | | Electrical Accidents | Short circuiting |
| | | | Non insulated wires |
| | | Chemical Spillage | Unsafe handling of Hazardous chemicals |
| | | | Improper storage |
| | | | Failure of Storage containers |
| | | | Improper disposal |
| | | Leakages or releases of toxic Chemicals | Unsafe Handling |
| | | | Improper Storage |
| | | | Failure of Storage Containers |
| | | Mechanical / Boiler Accidents | Overpressure, poor maintenance, or equipment failure in boilers, compressors, or reactors in the captive power plant and utility areas |

## 7.4 DISASTER MANAGEMENT PLAN

The Disaster Management Plan (DMP) is designed to establish a structured framework for effective management of emergencies that may arise within or around the SIPCOT Industrial Park at Allikulam. The plan defines the organizational structure, responsibilities, reporting mechanisms, and coordination procedures required to mitigate, respond to, and recover from emergencies affecting personnel, property, operations, and the surrounding community.

The primary purpose of this DMP is to ensure timely response, resource mobilization, and communication in the event of any incident or disaster. This will be achieved by:

- Describing procedures to address emergencies impacting employees, contractors, equipment, nearby residents, and the environment.
- Defining clear roles and responsibilities of the Incident Response Group (IRG) and key personnel at the site.
- Identifying and coordinating external emergency resources available to assist the IRG during a crisis.
- Ensuring Incident Controllers are empowered to manage on-site emergencies effectively.
- Authorizing the Site Controller to oversee and coordinate strategic emergency responses.
- Ensuring the EHS Management Review Committee provides overall coordination for emergencies that extend beyond site-level response.
- Integrating the DMP with the existing Disaster Management Plan of nearby industries and the District Disaster Management Authority (DDMA) to ensure joint preparedness and mutual aid capability.

### 7.4.1 Objectives of the Disaster Management Plan

The key objectives of the DMP are to:

- Identify, assess, and classify potential hazards and emergency scenarios relevant to industrial park operations.
- Protect human life, property, and the surrounding environment.
- Minimize damage and disruption to industrial operations and the local community.
- Define clear roles and responsibilities of all personnel during emergencies.
- Establish effective communication channels with statutory authorities such as TNPCB, Fire & Rescue Services, and District Administration.
- Provide procedures for evacuation, rescue, medical aid, and rehabilitation.
- Maintain readiness for mutual aid support with nearby industries and agencies.
- Ensure compliance with the National Building Code (NBC) 2016, Part IV – Fire and Life Safety, and other relevant safety regulations.

### 7.4.2 Methodology

The risk assessment and disaster planning methodology recognizes that, despite preventive measures and engineered safeguards, a residual risk always remains that could trigger an emergency situation. Therefore, preparedness through planning, training, and coordination is essential.

In accordance with Section 41B of the Factories Act, 1948 (as amended in 1987), every industry operating within the SIPCOT Industrial Park is required to prepare an On-site Emergency Plan, identifying the hazards, control measures, and actions to be taken during an emergency. SIPCOT, as the industrial estate developer, shall coordinate with individual industries to ensure these plans are consolidated into a comprehensive Off-site Disaster Management Plan for the entire industrial park,

in coordination with the District Disaster Management Authority (DDMA), Fire & Rescue Services, and TNPCB.

The DMP focuses on reducing the severity and consequences of hazardous incidents and ensuring that preventive, preparedness, and response measures are effectively implemented. It is not a substitute for maintaining high operational safety and housekeeping standards but acts as a support framework to manage unforeseen emergencies through training, drills, and continuous review.

**7.4.3 Classification of Emergencies**

Emergencies can be categorized into the following three (3) broad levels on the basis of seriousness and response requirement.

Level-I: This is an emergency or an incident which

- Can be effectively and safely managed and contained within the site, location or installation by the available resources.
- It has no impact outside the site, location or installation.

Level-II: This is an emergency or an incident which

- Cannot be effectively and safely managed or contained at the location or installation by the available resources and additional support is alerted or required.
- Is having or has the potential to have an effect beyond the site, location or installation and where external support of mutual aid partners may be involved.

Level-III: This is an emergency or an incident with off-site impact which

- Could be catastrophic and is likely to affect the population, property and environment inside and outside the installation.
- Management and control are done by the District Administration.

Although Level-III emergencies fall under the purview of the District Authority, until the Authority steps in, it should be the responsibility of the concerned unit to manage the emergency. Based on the QRA study, chances of Level-III emergencies occurring are negligible.

**7.4.4 Emergency Preparedness Plan (EPP)**

Incidents, accidents and contingency preparedness should be accounted for during the construction and operation process. Emergency Preparedness Plan (EPP) is prepared as per the National Environmental Emergency Plan and OSHA guidelines. According to these guidelines, an environmental emergency plan would essentially provide the following information:

1. Assignment of duties and responsibilities among the authorities, participating agencies, response team, their coordinators and/or those responsible for the pollution incident.
2. Relationship with other emergency plans.
3. Are porting systems that ensure rapid notification in the event of a pollution incident.
4. The establishment of a focal point for coordination and directions connected to the

implementation of the plan.

5. Response operations should always cover these four phases: - Discovery and alarm
   - Evaluation, notification and plan invocation - Containment and counter measures
   - Cleanup and disposal
6. Identification of expertise and response resources available for assistance for the implementation of plan.
7. Directions on the necessary emergency provisions applicable to the handling, treatment or disposal of certain pollutants.
8. Link to the local community for assistance, if necessary.
9. Support measures, such as procedures for providing public information, carrying out surveillance, issuing post-incident reports, review and updating of the plan, and periodic exercising of the plan.

**7.4.4.1 Emergency Organisation**

It is recommended to set up an Emergency Organization. A senior executive who has control over the affairs of the Plant would be heading the Emergency Organization. He would be designated as Site Controller. In the case of stores, utilities, open areas which are not under the control of production heads, executives responsible for maintenance of utilities would be designated as Incident Controllers. All the Incident Controllers would be reporting to the Site Controller.

Each Incident Controller organizes a team responsible for controlling the incident with the personnel under his control. Shift in-charge would be the Reporting Officer, who would report the incident to the IncidentController.

Emergency Coordinators would be appointed who would undertake the responsibilities like fire fighting, rescue, rehabilitation, transport and support services. For these purposes, Security in-charge, staff of the Personnel Department/ Essential services would be engaged. All these personnel would be designated as key personnel.

In each shift, electrical supervisor, pump house in-charge and other maintenance staff would be drafted for emergency operations. In the event of Power communication system failure, some of the staff members in the office/ Plant offices would be drafted and their services would be utilized as messengers for quick passing of communications. All these personnel would be declared as essential personnel.

**7.4.4.2 Emergency Communication**

Whosoever notices an emergency situation such as fire, growth of fire, leakage etc. would inform his immediate superior and Emergency Control Center. The person on duty in the Emergency Control Centre would appraise the site controller. Site controller verifies the situation from the Incident Controller of that area or the shift in-charge and takes a decision aboutimplementingOn-Site Emergency Plan. This would be communicated to all the Incident Controllers and Emergency Coordinators. Simultaneously, the emergency warning system would be activated on the instructions of the Site Controller.

### 7.4.4.3 Emergency Responsibilities

The responsibilities of the key personnel are appended below:

#### 7.4.4.3.1 Site Controller

On receiving information about an emergency, he/she would rush to the Emergency Control Centre (ECC) and take charge of the ECC and the situation. He /She would assess the magnitude of the situation in consultation with the incident controller and decide:

- Whether affected area needs to be evacuated.
- Whether personnel who are at assembly points need to be evacuated.
- Declares Emergency and orders for operation of emergency sirens.
- Organizes announcement by public address system about location of emergency.
- Assesses the areas which are likely to be affected, and need to be evacuated or alerted.
- Maintains a continuous review of possible development and assesses the overall situation to decide whether shutting down any section or whole of the Plant is required.
- Directs personnel of rescue, rehabilitation, transport, fire brigade, medical and other designated mutual support systems, locally available, for meeting emergencies.
- Controls evacuation of affected areas. If the situation is likely to go out of control or effects are likely to go beyond the premises of the factory, inform the District Emergency Authority, Police, and Hospital and seek their intervention and help.
- Informs Inspector of factories, Deputy Chief Inspector of factories, SPCB and other statutory authorities.
- Give a public statement,if necessary.
- Keeps record of chronological events and prepares an investigation report and preserves the evidence.

After managing the emergent situation and bringing the normalcy at the workplace, he /she makes a statement accordingly.

#### 7.4.4.3.2 Incident Controller

The Responsibilities of the Incident Controller are mentioned below:

- Assembles the incident control team.
- Directs operations within the affected areas with the priorities for safety to personnel, minimizes damage to the plant, property and environment and minimizes the loss of materials.
- Directs the shutting down and evacuation of plants and areas likely to be adversely affected by the emergency.
- Ensures that all-key personnel help is sought.
- Provides advice and information to the Fire and Security officer and the local Fire Services as and when they arrive.
- Ensuresthatallnon-essentialworkers/staffoftheaffectedareasevacuated to the appropriate assembly points and the areas are searched for victims, if any
- Understands the need for preservation of evidence so as to facilitate any inquiry into the cause and circumstances, which resulted or escalated the emergency.

- Coordinates with emergency services at the site.
- Provides tools and safety equipment to the team members.
- Keep in touch with the team and advise them regarding the method of control to be used.
- Keep the Site Controller informed continuously about the progress being made.

**7.4.4.3.3 Emergency Coordinator: Rescue and Fire-Fighting**

The Responsibilities are mentioned below:

- Rushes to the Emergency Control Centre after knowing about the emergency.
- Helps the Incident Controller in containment of the emergency.
- Ensures fire pumps in operating conditions and instructs pump house operators to be ready for any emergency.
- Guides the fire fighting crew i.e. Firemen, trained Plant personnel and security staff.
- Organizesshiftingthefirefightingfacilitiestotheemergencysite,ifrequired.
- Takes guidance of the Incident Controller for firefighting as well as assesses the requirements of outside help.
- Arranges the traffic control at the gate and the incident area.
- Directs the security staff to the incident site to take part in the emergency operations under his guidance and supervision.
- Evacuates the people in the Plant or in the nearby areas as advised by the site controller.
- Searches for any casualties and arranges proper aid for them.
- Assembles search and evacuation team.
- Decides paths for the workers evacuating the site
- Maintains law and order in the area, and if necessary, seeks the help of police and local administration.
- Arranges safety tools/equipment for the members of his team.

**7.4.4.3.4 Emergency Coordinator: Medical, Mutual Aid, Rehabilitation, Transport and Communication**

- The event of failure of electric supply and thereby internal telephone, sets up communication points and establishes contact with the Emergency Control Center (ECC) in the event of failure of electric supply and communication network.
- Organizes medical treatment to the injured and if necessary, will shift them to nearby hospitals.
- Mobilizes extra medical help from outside, if necessary
- Keeps a list of qualified first aid providers of the factory and seek their assistance.
- Maintains first aid and medical emergency requirements.
- Make sure that all safety equipment is made available to the emergency team.
- Assists Site Controller with necessary data and coordinates the emergency activities.
- Assists Site Controller in updating emergency plans.
- Maintains liaison with Civil Administration
- Ensures availability of canteen facilities and maintenance of rehabilitation centers.
- Remains in liaison with Site Controller / Incident Controller.
- Ensures availability of necessary cash for rescue / rehabilitation and emergency expenditure.
- Controls rehabilitation of affected areas at the end of emergency.
- Makes available diesel/petrol for transport vehicles engaged in emergency operation

### 7.4.4.4 Emergency Facilities

#### 7.4.4.4.1 Emergency Control Centre

During the emergency, the office block would function as an Emergency Control Centre. It would have an external Telephone & Fax facility. All the Incident Controllers, Officers, senior personnel would be available there.

The following information and equipment will be provided at the ECC.

- Intercom,telephone
- Firesuit/ gastight goggles / gloves /helmets
- Factory layout, emergency siteplan
- Emergency lamp /torchlight
- Plan indicating locations of hazardous inventories, Plant control room, sources of safety equipment, work road plan, assembly points, rescue locations,vulnerable zones,escape routes.
- Hazardchart
- Self-contained breathing apparatus
- Hand tools, wind direction, wind velocity indications Public Address Megaphone, Hand bell, Telephone directories (Internal andExternal).
- Address with telephone numbers of key personnel, Emergency coordinator.
- Important addresses, telephone numbers of experts from outside, government agencies, neighboring industries etc.
- Emergency shutdown procedures.
- Nominal roll of employees.

#### 7.4.4.4.2 Emergency Medical Facilities

Gas masks and general first aid materials for dealing with chemical burns, fire burns etc. would be maintained in the medical Centre as well as in the emergency control room. Private medical practitioners' help would be sought. Government hospitals would be approached for emergency help.

Apart from Plant first aid facilities, external facilities would be augmented. Names of Medical Personnel, Medical facilities nearby town would be prepared and updated. Necessary specific medicines for emergency treatment of burnt patients and for those affected by toxicity would be maintained.

Breathing apparatus and other emergency medical equipment would be provided and maintained. The help of nearby industrial managements in this regard would also be taken on a mutual support basis.

#### 7.4.4.4.3 Fire Fighting Facilities

First Aid and Fire Fighting equipment suitable for emergencies should be maintained as per statutory requirements/ TAC Regulations. A fire hydrant line covering major areas would be laid. It would be maintained at 6 kg / sq.cm. pressure.

### 7.4.4.5 Emergency Actions

#### 7.4.4.5.1 Emergency Warning

Communication of emergency would be made familiar to the personnel inside the plant and people outside. An emergency warning system would be established.

#### 7.4.4.5.2 Emergency Shutdown

There are a number of facilities which can be provided to help in dealing with hazardous conditions. The suggested arrangements are:

- Stop feed
- Deluge contents
- Remove heat
- Transfercontents

Methods of removing additional heat include removal by the normal cooling arrangements or by the use of an emergency cooling system. Cooling facilities which vaporize liquid may be particularly effective, since a big increase in vaporization can be obtained by reducing pressure.

#### 7.4.4.5.3 Evacuation of Personnel

Emergency shutdown procedures and escape. The time office maintains a copy of deployment of employees in each shift at the Emergency Communication Centre. If necessary, persons can be evacuated by rescue teams.

## 7.5 GENERAL SAFETY AND OCCUPATIONAL SAFETY

It is of utmost importance to take into account the safety of the plant personnel irrespective of the plant size. Proper safety measures should be followed in this regard.

- These include the use of Personal Protective Equipment (hand gloves, dust masks, face shield,goggles,apron, etc.) during working.
- Avoid contact with the raw materials without the use of Personal protective equipment.
- A schedule should be prepared for regular maintenance of each unit and the same should be followed regularly.
- Allthevalves, which are prone to open and spill inflammable/toxic material due to accident impact,mustbe placed with a suitable guard.
- The unit's management should ensure that all rotating machines and moving parts are provided with appropriate guards and the guards are put back in the position after check-up and maintenance.
- All the control systems are being periodically checked for their reliability and accuracy.
- Proper ventilation to be provided in areas where there are chances of a build-up of hazardous gases, chemicals and causing fire hazards

### 7.5.1 General Working Conditions

#### 7.5.1.1 Housekeeping

- All the passages, floors, and stairways should be maintained in good condition. The system should be available to deal with any spillage of dry or liquid chemicals at the plant.
- Sufficient disposable bins should be clearly marked, and these should be suitably located in the plant.
- Chemical storage area specifically designed as prechemical properties
- Walkways should be clearly marked and free from obstructions.
- In the plant,precaution,andinstructions should be displayedatstrategiclocations.
- All pits, sumps should be properly covered or securely fenced.
- Roads/walkways within the plant should be maintained neat and clean.

#### 7.5.1.2 Ventilation

- Adequate ventilation should be provided in the work floor environment.
- The work environment should be assessed and monitored regularly.
- Local ventilation is most effective method for controlling dust and gaseous emissions at workfloor

#### 7.5.1.3 Electrical Safety

- A licensed electrician has deployed to complete all temporary wiring and electrical installations required for construction activities.
- Approved Rubber mat will be provided below the MCC panels and near the electrical junction.
- Electric proof hand gloves will be available to avoid electrical shock.
- Fuses and circuit breakers (ELCB's) are used to protect motherboards, conductors and equipment to avoid short circuiting and electric shock. MCB's and fuses are also to be used to protect the electrical equipment from over current and over voltage.
- Extension cords for equipment or as part of a temporary wiring system shall not be damagedorcompromisedin any way andinsulation must be of the highestgrade.
- The joints of electrical wires avoided or an extension cord can be used if needed
- Anytime electrical equipment will be deactivated for repair, or circuits will be shutoff, the equipment will be locked out and tagged at the point where it can be energized.
- Proper earthing is ensured for all equipment and electrical panels.
- Temporary lights are not suspended by their cords.
- The employer will provide the necessary safety equipment, supplies and monitoring equipment to their personnel.
- To follow the Lock Out Tag Out (LOTO) system.

#### 7.5.1.4 WorkPermit

Safety Permit will be taken for job in case of:

- Work on line opening involving hazardous chemicals
- Work involving entry into tanks, vessels or work on pipelines.
- Work involving hot jobs like gas cutting, welding, burning, lighting etc. required tobe done in the battery limit /hazardous area of the plant.
- When it is required to carry out hot work on or adjacent (within 7 mt. Radius) to tank / vessel containing inflammable liquid /gas /solid, rubberlines equipment and piping.
- Work involving electric shock or hazards from starting up of equipment.
- When the work is to be done on the roof of buildings.
- Working at a height above 2 mt. Where working arrangements like ladders, stairs, platforms,railingetc.are notavailable.
- Work involving excavation and digging jobs in plant / factory premises.

ColdWork Permit will be taken for job in case of:

- Work below 2 m height.
- Work where no inflammable material available within 7 m Radius.
- Work on pipeline – where hazardous material or height work is not to be carried out.
- Excavation and digging jobs inside plant /factory premises.
- Any maintenance job which does not follow Safety permit criteria.

Jobs will be extended beyond office hours or non-working days:

- Permit must be revalidated by and permitted with the consent of DGM / HOD.
- The responsible person of the concerned department should present till the validity of extension of permit.
- Shift in-charge (permit issuer) will personally take care of the situation and take
- necessary safety precautions like using PPE, Isolation, Decontamination, Draining, Venting, depressurization etc.
- In case of an emergency breakdown job - outside working hours (apart from ‘G’ shift timings) - Shift In charge (issuer) and Permittee will take care of the whole job by due concern with the Safety Department by following all the SOPs and SafetyGuidelines.

**7.5.1.5 Working at Height**

- Examine ropes, hooks for defects before putting them into service. Use chains or cables to suspend tackle overtonners.
- Each man handling the falls should know how to tie the rope knots properly and safely.
- Make sure that supports to which hoists are attached are strong enough to withstand the loads to which they will be subject.
- Do not tie knots to retain cables run through chains and hooks.
- Use cable clamps or wedge sockets, manila rope is not to be used for slings on material contaminated with acid.
- Care should be exercised in selecting equipment to snug taglines. Be sure it is strong enough to withstand the load.
- Hoisting equipment operators should keep their eyes on the man giving signals. Don't allow

- Cables to stack up on the side of the drum. In giving signals to the Crane Operator, keep attention on the load.
- As a matter of safety, all this equipment should be inspected every year and each year a different color code is to be used to show and exhibit that the equipment has been checked.
- Hoist ropes must not be used if more than thr.ee outside adjacent wires are broken within a length of one lay or if outer wires are worn 2/3 of their original diameter, or if marked corrosion appears.
- Truck cranes must be properly blocked and be on firm footing before lifting a heavy load with a lowroom.
- Employees must stand clean off the swing of the crane and keep out from under suspended loads.

**7.5.1.6 Boiler Safety**

Boiler shall be installed as per the Boiler Rules with all the safety equipment and instruments. Start-up and shut down procedures shall be formulated and complied with. Boiler operation will be carried out by qualified personnel with a boiler proficiency certificate. Boiler inspections will be done as per rules.

Hazards associated with BoilerRoom:

- Risk OfExplosion
- High Pressure steam
- Combustion Gases
- Moving Machinery
- Hot Surfaces

Safety aspects:

- Waterlevel
- Safety Valve
- Steamvalves/traps
- Flame scanner system
- Burner control system
- Use of protective clothing like face shield along with safety glasses
- Fire safety plans shall include the locations of fire alarms, fire extinguishers, the main electrical breaker,fire main,and exits for each area of the facility
- Lock Out Tag OutSystem

**7.5.2 Engineering Control**

- Drains and vents will be provided on chemical pipe lines to pump suction.
- Checking schedule/maintenance Schedule for Pump, Control valves, Air Instrument system and Instrument will be prepared
- Testing, inspection and certification will be carried out for all pressure vessels, lifting tackles and storage tanks as per Factories Act.

- Calibration will be carried out to maintain the flow indicator.
- Mechanical sealed pumps will be used to avoid and reduce leakages and fugitive emissions.
- Double mechanical seals will be provided for agitators
- Workplace monitoring will be carried out.
- Removal of combustible scrap and debris (wood, clearing/ grubbing material) from the site daily and to store it at designated places.
- Spill prevention control will be provided to limit the risk of hazardous material release into the environment.
- Secondary control will be provided for material transfer in the form of leakage collection tray.
- Alarm system will be provided for deviation of temperature, Pressure and level in storage tanks.
- Cooling arrangement will be provided for the storage tank in case of fire/Heat.
- A double earthing system/Earthing grid will be provided for tanks, piping and road tankers.
- Proper labeling will be provided for all equipment and materials.
- Safety systems like Emergency Shut Down (ESD) switches will be provided for proper functioning.
- Sprinkler systems, gas/fire detectors and Remote operated valves (ROV) will be provided as safety systems.
- Lightning protection systems will be provided to cover tank farms.
- Windsocks at various locations to know the direction of wind in case of a leak or fire.
- Proper ventilation will be provided to keep the area well-ventilated to avoid
- accumulation of gas/ vapors and to keep it below PEL/ TWL values.
- Everyfloor, working place and passage will be free from protruding nails,splinters, holes or looseboards.
- Working surfaces will be dry to prevent slips and falls.
- Occupational health centers will be developed to cater any emergency.
- Competent and authorized contractors will be deployed for transport of hazardous material and to follow the Motor vehicles act strictly for hazardous material transportation.

## 7.6 R&R ACTION PLANS

No Resettlement and Rehabilitation (R&R) activities are required for the proposed SIPCOT Industrial Park at Allikulam, Thoothukudi District. The Government of Tamil Nadu has already sanctioned the acquisition of land for the project under G.O. No. 100, Industries (SIPCOT-1) Department, dated 26.02.2021, for a total extent of 904.40 hectares. Out of this, 796.240 hectares are being developed as the Industrial Park area.

The acquired land comprises approximately 788.742 hectares of patta land and 7.498 hectares of poramboke land. The acquisition was carried out through the Tamil Nadu Industrial Development procedures following due legal and administrative processes. No habitations, residential structures, or settlements are located within the project area; hence, no physical displacement or loss of livelihood has occurred due to the project.

# 8. PROJECT BENEFITS

The proposed SIPCOT Industrial Park at Allikulam, Thoothukudi District, will be a key driver for industrial, economic, and social development in southern Tamil Nadu. The park, developed over 796.240 hectares, will accommodate industries in Man-Made Fibre (Lyocell / Technical Textile) and other non-EC category sectors, contributing to the diversification and modernization of the regional industrial base.

The Lyocell unit will produce environment-friendly regenerated Lyocell , a key raw material for the technical textile and apparel sector, supporting both domestic and export markets. The integration of the Lyocell plant within the industrial park enhances the overall value chain.

The benefits of the project are detailed below.

## 8.1 ENVIRONMENTAL BENEFITS

- The Lyocell manufacturing process, compared to conventional viscose fibre production, is a closed-loop and eco-friendly process that recovers and reuses over 99% of the solvent (NMMO), minimizing chemical discharge and reducing environmental pollution.
- A substantial greenbelt of 186.714 ha (23.46%) will be developed across the industrial park, including 78.211 hectares within individual industrial plots. This extensive greenbelt will serve as a natural buffer, enhancing air quality, reducing noise levels, and contributing to microclimate stability within the project area.
- The project will adopt sustainable stormwater management through a network of drains and recharge pits, facilitating groundwater recharge and minimizing surface runoff losses.
- Rainwater harvesting structures will be integrated within common areas and industrial plots, enhancing local hydrological balance and reducing dependency on external water sources.
- SIPCOT will provide a dedicated solid waste management area for common collection and segregation, ensuring scientific handling and disposal of non-hazardous wastes generated from park-level facilities.
- The park design promotes low-emission transport, paved internal roads, and dust suppression systems to maintain ambient air quality during both construction and operation.
- Individual industries will follow Zero Liquid Discharge (ZLD) principles, ensuring that no untreated wastewater is discharged into the environment, protecting both surface and groundwater quality.
- The project will contribute to carbon reduction through use of renewable energy, solar lighting, and energy-efficient infrastructure for administrative and common facilities.
- Overall, the environmental layout aligns with the objectives of sustainable site development, conserving natural drainage and improving the ecological health of the surrounding region.

## 8.2 ECONOMIC BENEFITS

- The industrial park will attract significant domestic and foreign investments, particularly in technical textiles, man-made fibres (Lyocell), and other allied sectors, promoting industrial diversification and export potential.
- The project will generate considerable employment opportunities during both construction and operational phases.
    - **Direct Employment**: 25 during Construction phase and 2025 in Operation Phase
    - **Indirect Employment**: 600 during Construction phase and 18225 in Operation Phase
- Establishment of the park will catalyze ancillary industries such as transportation, warehousing, equipment supply, packaging, and commercial services, contributing to the regional economy.
- The project will create a strong industrial ecosystem, stimulating entrepreneurship and enhancing micro, small, and medium enterprises (MSMEs) in the vicinity.
- Enhanced industrial output will increase the State's GDP, foreign exchange earnings, and tax revenues through sales, service, and value addition.
- The presence of modern industrial infrastructure will improve the competitiveness of Tamil Nadu in attracting global textile and fibre investments, complementing initiatives like the PM MITRA Mega Textile Park and Tamil Nadu Textile Policy 2019.
- The improved road network, utilities, and logistics will strengthen regional connectivity with the Thoothukudi Port, encouraging export-oriented industrial growth.

## 8.3 SOCIAL BENEFITS

- The establishment of the SIPCOT Industrial Park and the Lyocell manufacturing unit will result in direct and indirect employment, improving livelihoods for local residents in Allikulam, Umarikottai, Keelathattaparai, Perurani, and adjoining villages.
- The project will result in substantial socio-economic upliftment of the surrounding communities by improving employment prospects and supporting local economic activity.
- Priority will be given to the local workforce for both skilled and unskilled positions, thereby reducing rural-to-urban migration and improving income stability.
- Development of the industrial park will lead to the creation of peripheral infrastructure such as housing, healthcare, and educational institutions, improving the overall living standards in the region.
- Overall, the project will uplift the living standards and quality of life of local communities through inclusive developmen, grievance redressal mechanisms, and transparent communication systems.
- The following welfare measures are envisaged as part of the project development:

- Provision of safe drinking water through RO units, storage facilities, and distribution pipelines.
- Support to healthcare facilities through medical camps and basic equipment.
- Improvement of government schools with classroom and digital learning support.
- Establishment of skill development and training centres aligned with industrial employment needs.
- Development of sanitation facilities and community-level waste management systems.
- Greenbelt development and community plantation activities.
- Improvement of basic community infrastructure such as street lighting and small civic works.

## 8.4 OTHER TANGIBLE BENEFITS

- The proposed industrial park, along with the Lyocell fibre plant, aligns with the objectives of the Tamil Nadu Textile Policy 2019, the PM MITRA Mega Textile Mission, and Vision Tamil Nadu 2030, promoting value chain integration in the textile sector.
- Lyocell fibre is biodegradable and produced from renewable cellulose sources, and its manufacturing process involves high solvent recovery, supporting efficient resource use.
- The project will act as a growth catalyst for establishing supporting industries such as dyeing, finishing, fabric production, and garment manufacturing, creating an integrated textile ecosystem in southern Tamil Nadu.
- The project's proximity to the Thoothukudi Port ensures excellent access to export markets in Southeast Asia, Europe, and the Middle East, making it a key driver for international trade from the region.
- SIPCOT's investment in common infrastructure — including internal roads, stormwater drains, utilities, solid waste management facilities, and greenbelt buffers — will improve the operational efficiency and environmental performance of all industries, including the Lyocell plant.
- The project will transform the Thoothukudi–Virudhunagar corridor into a major industrial cluster, promoting balanced regional growth and strengthening Tamil Nadu's reputation as a leader in sustainable manufacturing.

# 9. ENVIRONMENTAL COST BENEFIT ANALYSIS

The proposed SIPCOT Industrial Park at Allikulam, Thoothukudi District, along with the Lyocell and Tissue Manufacturing Unit, represents a significant initiative by the Government of Tamil Nadu to promote sustainable industrial growth, regional economic development, and employment generation in southern Tamil Nadu.

The environmental cost-benefit analysis evaluates the net positive outcome of the project by comparing the environmental costs (resource use, emissions, and ecological impacts) with the economic, social, and environmental benefits expected to arise from project implementation.

## 9.1 COMPARATIVE ANALYSIS

### SIPCOT Industrial Park

The environmental costs associated with the development of the SIPCOT Industrial Park are limited to temporary impacts during construction, such as land disturbance, dust generation, and minor noise from machinery operation. These are short-term and reversible. The long-term benefits, including planned infrastructure, environmental safeguards, and greenbelt development, far outweigh the short-term impacts.

Environmental investments have been made in:

- A total of 186.714 ha (23.46 %) of greenbelt will be developed to serve as a natural pollution buffer.
- Stormwater Drain and rainwater harvesting systems for groundwater recharge.
- Dedicated solid waste management area for common waste collection and disposal.
- Wide internal roads and drains to reduce dust and enhance stormwater control.

### Lyocell & Tissue Manufacturing Unit

For the Lyocell and Tissue Manufacturing Unit, environmental costs mainly relate to **process emissions, wastewater generation, and solid waste management**. However, these are minimized through advanced environmental technologies, including:

- Zero Liquid Discharge (ZLD) system ensuring no effluent discharge.
- Electrostatic Precipitators (ESPs) and Wet Scrubbers for air pollution control.
- Closed-loop solvent recovery system (99% NMMO recovery), minimizing chemical loss.
- Energy-efficient boilers and process automation for reduced emissions and energy use.
  Compared to conventional viscose fibre production, Lyocell technology offers far lower environmental impact, making it a preferred sustainable fibre manufacturing process.

## 9.2 ECONOMIC BENEFIT

**SIPCOT Industrial Park**

- The SIPCOT Industrial Park will attract large-scale industrial investment from domestic and foreign firms, particularly in technical textiles, automobile components, and allied sectors.
- The project will generate approximately ₹2,000 – ₹3,000 crore in investment, contributing significantly to the state's GDP and tax revenues.
- Employment generation:
  - **Direct Employment**: 25 during Construction phase and 2025in Operation Phase
  - **Indirect Employment**: 600 during Construction phase and 18225 in Operation Phase
- The infrastructure development will lead to growth in transport, logistics, and small businesses, fostering regional economic stability and balanced industrial distribution across Tamil Nadu.

**Lyocell & Tissue Manufacturing Unit**

- The Lyocell unit represents a high-value investment in fibre manufacturing, reducing India's dependence on imported man-made fibres.
- The project will support export-oriented production, contributing to foreign exchange earnings and strengthening the technical textile sector.
- Generation of approximately 100 direct and 900 indirect jobs during operation, including skilled technical positions.
- Promotion of ancillary industries such as yarn production, weaving, dyeing, finishing, and packaging, thereby creating a complete textile value chain within the park.

## 9.3 SOCIAL AND ENVIRONMENTAL BENEFIT

**SIPCOT Industrial Park**

- The project will improve **infrastructure and connectivity**, benefiting nearby villages with better roads, streetlights, drainage, and sanitation facilities.
- SIPCOT's CSR/CER initiatives will focus on education, healthcare, skill development, and women empowerment in surrounding communities.
- Improved industrial employment opportunities will reduce rural migration and enhance household income in nearby villages.
- The park's environmental planning — including greenbelt, rainwater harvesting, and stormwater management — ensures a sustainable industrial environment.
- The following welfare measures are envisaged as part of the project development:
  - Provision of safe drinking water through RO units, storage facilities, and distribution pipelines.
  - Support to healthcare facilities through medical camps and basic equipment.
  - Improvement of government schools with classroom and digital learning support.

- Establishment of skill development and training centres aligned with industrial employment needs.
- Development of sanitation facilities and community-level waste management systems.
- Greenbelt development and community plantation activities.
- Improvement of basic community infrastructure such as street lighting and small civic works.

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**Lyocell & Tissue Manufacturing Unit**

- The Lyocell fibre is biodegradable, non-toxic, and recyclable, contributing to a circular economy and reduction of plastic-based fibres.
- The technology uses a closed solvent system, ensuring no release of harmful chemicals into the environment.
- The unit will implement worker safety programs, occupational health monitoring, and environmental awareness training to ensure safe operations.
- Socio-economically, the Lyocell project will catalyze skill development, job creation, and industrial training programs for local youth in advanced fibre manufacturing technologies.

## 9.4 CONCLUSION

The overall cost-benefit analysis demonstrates that both the SIPCOT Industrial Park and the Lyocell & Tissue Manufacturing Unit offer significant environmental, economic, and social advantages, with limited and manageable environmental costs.

While the initial environmental costs include land preparation, construction emissions, and infrastructure development, these are temporary and fully mitigated through planned environmental management measures.

The long-term benefits—such as employment generation, export growth, local infrastructure enhancement, technology transfer, renewable resource utilization, and environmental sustainability—far outweigh the short-term impacts.

The proposed developments will therefore result in a net positive environmental and socio-economic outcome, aligning with the goals of sustainable industrial growth, Make in India, and Tamil Nadu's Vision 2030.

# 10. ENVIRONMENT MANAGEMENT PLAN

## 10.1 INTRODUCTION

The Environment Management Plan (EMP) is a site-specific plan developed to ensure that the project is implemented in an environmentally sustainable manner where all stakeholders including the project proponents, contractors and subcontractors, including consultants, understand the potential environmental risks arising from the proposed project and take appropriate actions to properly manage that risk. Adequate environment management measures need to be incorporated during the entire planning, construction and operating stages of the project to minimize any adverse environmental impact and assure sustainable development of the area.

The Environment Management Plan presented below will be followed and regular monitoring of relevant parameters as stated in the post – project monitoring schedule will be carried out. The Environment Management Plan will be proactive in nature and will be upgraded if new facilities or modification of existing facilities, with environmental concerns, come up at a later stage.

*Table 59. Details of the Project*

| S. No. | Particulars | | Unit | Details |
|---|---|---|---|---|
| 1 | Date of Grant of ToR | - | - | TOR: Identification No. TO25A3102TN5260559N dated 21.09.2025 |
| 2 | Baseline Study Period | - | - | March 2025 to May 2025 (Summer Season) |
| 3 | Date of Public Hearing | - | - | Pending |
| 4 | Plot Area Details | Total Land area | ha | 796.240 |
| | | Technical Textile & Other Textile units | | 202.43 ha (139.46 ha will be a single Plot (S-1) allotted for Lyocel and Tissue manufacturing Unit (Man Made Fibre unit & Captive Co-gen Power plant and Remaining plots allotted for Other Technical Textile Industries) |
| | | Other Non – EC category Industries | | 318.979 |
| | | Commercial & Amenities | | 36.065 |

| S. No. | Particulars | | Unit | Details |
|---|---|---|---|---|
| 5 | Greenbelt Area | Total Greenbelt area Development | ha | 186.714 ha (23.46 % of the Development area) |
| | | Developed by SIPCOT | | 108.503 |
| | | Developed by Individual Industry (15%) | | 78.211 |
| 6 | Project Cost | Total Project Cost | INR Crores | 666.11 |
| 7 | Total Water Requirement | SIPCOT Industrial Park | KLD | 66308 |
| | | Lyocell Manufacturing Unit | | 39296 (sourced from Tuticorin Municipal Corporation- Tertiary Treatment Plant through pipeline) |
| 8 | Fresh Water | SIPCOT Industrial Park | KLD | 10867 (sourced from SIPCOT owned 60 MLD Desalination plant) |
| | | Lyocell Manufacturing Unit | | - |
| 9 | Total Treated Wastewater for reuse | SIPCOT Industrial Park | KLD | 16761.98 |
| | | Lyocell and Tissue Manufacturing Unit | | 19296 |

## 10.2. ORGANIZATIONAL ROLE AND RESPONSIBILITY

Management Policy

The company has a written policy for safety, Health and Environment Management. Through this policy, the company management commits itself to the following objectives:

- Meet all the relevant laws, regulations and international agreements.
- Conduct its activities safely, protecting the health of all employees and the product's users.
- Reduce the adverse environmental impacts to a practicable minimum at an acceptable cost to the company and society.

Encourage continuous improvement in safety, health and environment performance.

Environment Management

- Periodic review of environmental status;
- Implementation and maintenance of green buffer areas;
- Review of ETP, Boilers, DG operations and maintenance of APCS;

- Monitoringofcollectionandtreatment of waste;
- Compliance to conditions stipulated in Environmental Clearances (EC) and consents;
- Implementation ofEMP;
- Undertake awareness activities for industries and residential areas.

**Social Management**

- Undertake continuous engagement with local community;
- Address grievances of the complex, local community and residents.

### 10.2.1 Corporate Environmental Commitment

M/s State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT) will adopt a strong Environmental Policy endorsed by its Board of Directors, underscoring the company's commitment to environmental sustainability and responsible industrial growth. This policy provides a structured framework to ensure that all operations are conducted with minimal environmental impact while fully complying with applicable environmental laws, regulations, and standards. Environmental considerations are integrated into all levels of decision-making, promoting a proactive approach to sustainable manufacturing, especially in support of the renewable energy sector. The policy also aligns with individual industry commitment to Health, Safety, Environment, and Quality (HSEQ) excellence.

### 10.2.2 Standard Operating Procedures for Environmental Compliance

To operationalize its Environmental Policy, individually detailed Standard Operating Procedures (SOPs) will be developed to ensure full regulatory compliance. These SOPs outline systematic processes for identifying, managing, and preventing non-compliance or deviations from environmental clearance conditions and applicable legal standards. The SOPs include periodic environmental audits, inspections, and clearly defined corrective action mechanisms. Regular training and awareness programs are conducted for employees at all levels to reinforce knowledge of regulatory requirements and best environmental practices. A structured monitoring framework is also implemented to track air, water, noise and soil quality to ensure that operations remain within permissible limits at all times.

### 10.2.3 Hierarchical System for Environmental Management

Individual industries will follow a tiered environmental management system to ensure effective implementation of environmental safeguards. At the operational level, an Environmental Officer is designated to monitor daily environmental performance and implement mitigation measures recommended in the EIA and Environmental Clearance. An Environment Manager supervises all compliance-related activities, conducts inspections, prepares reports, and ensures timely submission of returns to regulatory authorities. At the corporate level, the Head – Environment & Compliance ensures alignment of site-level activities with corporate environmental policies and strategic goals. Regular updates on environmental performance are reviewed by Senior Management and key insights are shared with the Board of Directors to support continuous environmental improvement.

### 10.2.4 Non-Compliance Reporting Mechanism

To maintain accountability and transparency, an internal reporting system for environmental non-compliances will be formed individually. Any deviation or violation is documented by the Environment Manager and reviewed by the site leadership. Monthly and quarterly environmental performance reports are submitted to senior management, and any significant non-compliance is escalated to the Board of Directors. Externally, the company is committed to disclosing major environmental incidents through sustainability disclosures and ensures timely corrective actions with regular follow-up to ensure effective resolution.

### 10.2.5 Commitment to Environmental Excellence

All individuals will be committed to achieving environmental excellence through responsible manufacturing and continuous improvement. By integrating environmentally sound technologies, complying with statutory requirements, and embedding sustainability into its operations, the company ensures its activities contribute positively to environmental conservation and community well-being.

## 10.3. ROLE OF PROJECT PROPONENT (TOP MANAGEMENT)

Each individual will have ultimate responsibility for implementing the provisions of the EMP. This will include the management of environmental impacts, monitoring of contractor performance as well as development of mechanisms for dealing with environmental problems. The proponent will also ensure that the activities of its contractors during the installation and implementation of which will be required through contractual documentation. In order to facilitate this, the regular site inspections and their noting will be documented by the PP/Contractor. The organizational structure of the company is presented below.

### 10.4.1 Role of Contractor

Contractors will also be expected to demonstrate commitment to the environmental monitoring programs at all levels in the contractor's management structure. It will be ensured the following:

- The Contractors involved in the project will be responsible for implementation of and adherence to,all the mitigation measures outlined in the EIA;
- Appropriate experienced and qualified personnel are employed as the Contractor's Environmental Manager
- All the environmental incidents to be reported at the earliest;
- To maintain records of all the inspections conducted;
- A program of regular self-inspection and audit will be developed and implemented.

## 10.4. MONITORING, REPORTING AND DOCUMENTATION

- Reporting of environmental, health, safety and social performance reports or checklist, incident record register etc. will be developed and implemented through a program of reporting and reviewing throughout the project.
- Reports from inspection, audits and other improvement programs will be regularly communicated;

- All complaints and enquiries will be addressed with records maintained in an assigned register by the safety officer of each contractor;
- Internal and external reporting mechanism will be developed, internal reporting will comprise the concerned officials from the Environment management team, the representatives of the contractors and the top management.
- The internal reporting will be undertaken on quarterly basis while the external reporting will be undertaken half yearly.
- Annual environmental report known as 'Environment statement' as per FORM V of the EPA Rules, 1986, six monthly compliance reports as per EC of MoEFCC, compliance reports as per CTE/CTO etc. will be submitted to the regulatory authorities.

## 10.5 ENVIRONMENT MANAGEMENT PLAN

An Environment Plan has been developed following the identification of impacts and mitigation measures. The mitigation measures suggested will be as according to the monitoring schedule.

The EMP includes the following:

- Mitigations suggested for adverse environmental and social impacts and associated risks;
- Personnel responsible for implementing the mitigation measures at various stages of the project;
- The mitigation measures suggested in Chapter 4 would be implemented. This will reduce the impact on the environment due to the proposed project. To facilitate easy implementation, the recommendations suggested are grouped in different phases.

All the above reports will be documented in the documentation system as per the requirement of MoEFCC and other relevant regulatory authorities.

### 10.5.1 Air Emission

#### 10.5.1.1 Flue Gas Stack

*Table 60. Flue Gas Stack Details of Lyocell Manufacturing unit*

| Stack ID | Source of Emission | Fuel Type | Stack Height above GL (in m) | MoC | APCS | Emissions | Standard Limit ($mg/Nm^3$) |
|---|---|---|---|---|---|---|---|
| 1. | Power boiler | Coal/ Biomass | 90-120 | MS | ESP installed for each boiler | PM, SO2, NOx, Hg | PM- < 30 (Dry 6% O2 ), SO2- < 100 (Dry 6% O2, NOx- < 100 (Dry |

| Stack ID | Source of Emission | Fuel Type | Stack Height above GL (in m) | MoC | APCS | Emissions | Standard Limit (mg/Nm$^3$) |
|---|---|---|---|---|---|---|---|
| | | | | | | | 6% O2 ) & Hg- < 0.03 (Dry 6% O2 ) |
| 2. | Captive Power Generation | Coal: Biomass in 70 :30 ratio | 90-120 | MS | ESP and connected to a common Stack | NOx,PM,CO,HCs, SO2, and CO2 | PM ≤ 0.25 g/Nm³, NOx ≤ 9.2 g/kWh , HC ≤ 0.66 g/kWh, CO ≤ 3.5 g/kWh |

### 10.5.1.2 Process Stack

*Table 61. Process Gas Stack Details of Lyocell Manufacturing unit*

| Stack ID | Process | Source of Emission | Stack Height above GL (m) | MoC | APCS | Pollutants | Standard Emission Limit (mg/Nm$^3$) |
|---|---|---|---|---|---|---|---|
| 1. | Lyocell unit | - | 120 | MS | Scrubbed before venting | VOC | < 50 |

*Note: SIPCOT doesn't envisage any back up DG power units. However, each Individual Industrial units will install Air pollution control devices as required for their processes, utilities and backup DG sets as per their requirement.*

### 10.5.1.3 Fugitive Emission & Control Measures

- Fugitive emissions primarily arise from raw material handling, transfer, crushing, screening, and storage operations within the plant.
- VOC emissions originate mainly from storage and handling of fuels, solvents, and chemicals.
- These emissions, though non-stack in nature, contribute to ambient air quality deterioration and worker exposure if not controlled.

- Appropriate Air Pollution Control Systems (APCS) will be installed to maintain emissions within the CPCB/SPCB norms applicable to individual units.
- Collected dust from APCS will be recycled in the process or disposed of safely as per statutory norms.

*Note: The SIPCOT Industrial Park itself will have minimal direct fugitive emissions, mainly limited to the construction phase, including dust from site leveling, material movement, and vehicular traffic. During the operational phase, fugitive emissions are expected to arise from internal roads, common utility areas, and material handling zones, but will largely be under the responsibility of individual industries.*

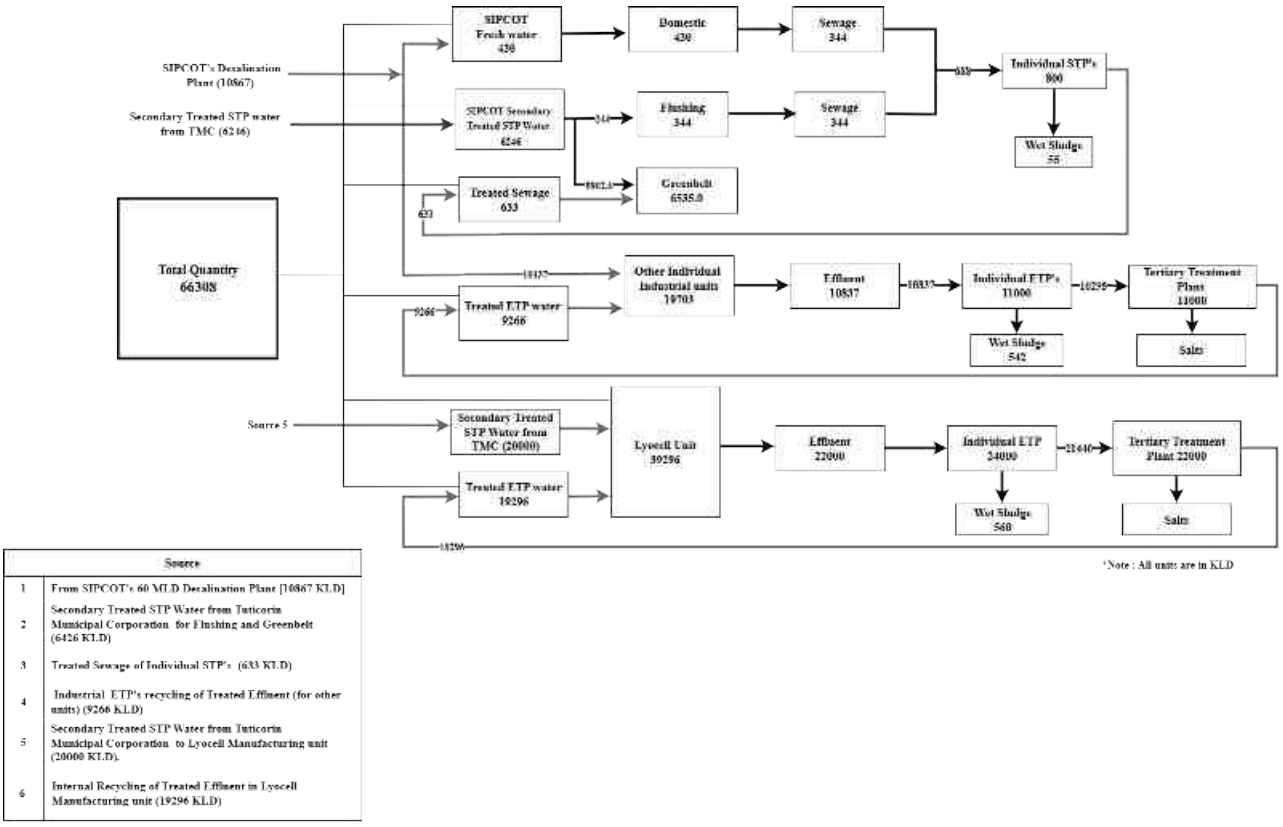
### 10.5.2 Water consumption, Wastewater generation & Disposal Details

***Source of water supply:*** Freshwater will be sourced from SIPCOT owned 60 MLD Desalination plant and Sewage water will be sourced from Tuticorin Municipal Corporation- Tertiary Treatment Plant through pipeline.

Daily water requirement for the SIPCOT Industrial Park will be 66308 KLD, out of which 10867 KLD will be fresh water, 6246 KLD will be secondary treated STP water, and Total water requirement is 39296 KLD , In which 20000 KLD of secondary treated sewage will be supplied to the Lyocell and Tissue Manufacturing Unit (for tertiary treatment and process use).

*Table 62. Water Requirement Details for - SIPCOT Industrial Park*

| S. No. | Water Usage | Quantity (KLD) | SIPCOT Supply (KLD) | | Individual Units' Scope (KLD) | |
|---|---|---|---|---|---|---|
| | | | Desalination Plant Water | Secondary Treated STP Water | Treated Effluents | Treated Sewage |
| **1** | Domestic | 430 | 430 | 0 | 0 | 0 |
| **2** | Flushing | 344 | 0 | 344 | 0 | 0 |
| **3** | Greenbelt | 6535 | 0 | 5902 | 0 | 633 |
| **4** | Use in Industries, Commercial & Amenities | 58,999 | 10437* | 20000** | 28562 | 0 |
| **Total** | | **66308** | **10867** | **26246** | **28562** | **633** |




| | Source |
|---|---|
| 1 | From SIPCOT's 60 MLD Desalination Plant [10867 KLD] |
| 2 | Secondary Treated STP Water from Tuticorin Municipal Corporation for Flushing and Greenbelt (6426 KLD) |
| 3 | Treated Sewage of Individual STP's (633 KLD) |
| 4 | Industrial ETP's recycling of Treated Effluent (for other units) (9266 KLD) |
| 5 | Secondary Treated STP Water from Tuticorin Municipal Corporation to Lyocell Manufacturing unit (20000 KLD). |
| 6 | Internal Recycling of Treated Effluent in Lyocell Manufacturing unit (19296 KLD) |

**Note 1:**

10867 KLD of freshwater will be supplied from the SIPCOT Desalination Plant for industrial and commercial usage.

20,000 KLD of secondary treated sewage from Tuticorin Municipal Corporation will be treated in a tertiary plant and used in process & utility operations at the Lyocell manufacturing unit.

6246 KLD of secondary treated sewage will be used for flushing and greenbelt irrigation.

**Note 2:**

Water requirement for support areas:

For Amenities (14.425 ha @ 3.0 KL/ha/day) → **43.5 KLD**

For Commercial Area (21.640 ha @ 12.36 KL/ha/day) → **267.5 KLD**

For Greenbelt (186.714 ha @ 35 KL/ha/day) → **6535 KLD**

*Table 63. Water Requirement Details for -Lyocell Manufacturing unit*

| S. No | Water Requirement | Unit | Proposed | Particulars |
|---|---|---|---|---|
| 1 | Source of Water Supply | KLD | 39296 | Tuticorin Municipal Corporation- Tertiary Treatment Plant through pipeline |

| S. No | Water Requirement | Unit | Proposed | Particulars |
|---|---|---|---|---|
| 1A | Proposed Treatment at Lyocell Manufacturing unit | Tertiary treatment comprising of multimedia filtration, Ultra filtration & RO systems for incoming raw water | | |
| 2 | Tertiary Treated STP water | KLD | 20000 | (Phase 1: 10,000)<br>(Phase 2 : 10,000 ) |
| 3 | Recycled Tertiary Treated in-house Effluent | KLD | 19296 | (Phase 1: 9,648 )<br>(Phase 2 : 9,648 ) |

**10.5.2.1 Wastewater And Its Management**

The total water requirement for the SIPCOT Industrial Park at Allikulam is 66308 KLD, sourced from SIPCOT's 60 MLD desalination plant (10867 KLD) and secondary treated sewage from Thoothukudi Municipal Corporation (6246 KLD), including supply for the Lyocell Manufacturing Unit. Water will be utilized for domestic, flushing, greenbelt, and industrial activities, with complete internal recycling through individual ZLD systems.

All individual industries, including the Lyocell unit, will treat their effluents in ETPs followed by tertiary treatment and reuse within their premises. Domestic sewage will be treated in individual STPs, and treated water will be reused for flushing and gardening. No untreated effluent or sewage will be discharged outside the park. SIPCOT will provide the water conveyance and drainage network, while industries will ensure 100% reuse of treated water, maintaining a zero liquid discharge (ZLD) system.

**10.5.2.2 Details of Proposed Trade Effluent Treatment Plant**

SIPCOT, as the project proponent for the industrial park, does not envisage any common Trade Effluent Treatment Plant (TETP) within the park. Each individual industry proposed within the SIPCOT Industrial Park shall establish its own effluent treatment facility in line with the Tamil Nadu Pollution Control Board (TNPCB) norms.

Accordingly, the design, capacity, and mode of treatment and disposal of trade effluent will be finalized by the respective industries based on the nature and quantum of effluent generated from their specific manufacturing processes.

SIPCOT will, however, ensure that each industry:

- Obtains Consent to Establish (CTE) and Consent to Operate (CTO) from TNPCB prior to operation.
- Provides adequate on-site treatment to meet the prescribed discharge standards.
- Disposes of the treated effluent only as permitted by TNPCB, either through on-site reuse/recycling or discharge to designated drains meeting regulatory norms.

Thus, no centralized CETP or TETP is proposed under the SIPCOT scope of development.

### 10.5.3 Hazardous, Non- Hazardous, Solid Waste & Other Wastes Identification, Quantification, Storage, and Disposal

**a) Solid Waste:-**

*Table 2.18. Solid waste details*

| S. No | Municipal Solid Waste | Quantity (kg/day) | Disposal Method |
|---|---|---|---|
| **Construction Phase (625 Nos)** | | | |
| **1** | Organic waste | 168.75 | Will be collected and composed in Organic waste convertors |
| **2** | Inorganic waste | 112.5 | Will be collected in bins and sent to TNPCB-authorized recyclers. |
| **Operation Phase (20,250 Nos)** | | | |
| **1** | Organic waste | 6210 | Individual industries will segregate the wastes; organic waste will be composted and used as manure within units |
| **2** | Inorganic waste | 4140 | Inorganic waste will be handed over to TNPCB- authorized recyclers by Individual Industries. |

**2. Hazardous Waste Generation and Management**

SICOT proposed to allot 5 acres of area for Solid Waste Management one or multiple service providers will be engaged to long term contractual agreement PPP model to establish Solid Waste Management Facility including E-waste, Battery waste and plastic waste and other waste.Upon allotment of entire plots, 5 acres of land will be allotted to the contractor selected through tendering process for the establishment of Solid waste management facility (Sheds for recovery and recycling facility) including Shed for E-Waste Management on PPP mode

Hazardous waste will primarily be generated from process industries, DG sets, and utility operations.

- Each industrial unit will obtain authorization under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.
- Used oil and waste oil from DG sets will be collected in leak-proof containers and handed over to TNPCB-authorized recyclers/reprocessors.
- Sludge from ETP/STP will be dewatered and disposed of through authorized TSDF facilities.
- A common hazardous waste storage area will be developed within the industrial park for temporary storage before disposal.
- All handling, transport, and disposal practices will comply with CPCB and TNPCB guidelines.

**3. Plastic Waste :**

*Table 64. Details of Plastic Waste Generation and Disposal Method*

| Name of the waste | Source | Qty (TPA) | Mode of disposal | Mode of Transport |
|---|---|---|---|---|
| Plastic waste | Individual industries and commercial units | Intermittent and unit-specific | Plastic Waste be will generated within the Individual Industries will segregated and disposed to TNPCB Authorised Recyclers. | Road |

**4. E-Waste**

*Table 65. Details of E-Waste Generation and Disposal Method*

| Name of the waste | Source | Qty (TPA) | Mode of disposal | Mode of Transport |
|---|---|---|---|---|
| E-waste | Individual industries and commercial units | Intermittent and unit-specific | E- Waste generated within the Individual Industries will segregated and disposed to TNPCB Authorised Recyclers. | Road |

**5. Battery Waste**

*Table 66. Details of Battery Waste Generation and Disposal Method*

| Name of the waste | Source | Qty (TPA) | Mode of disposal | Mode of Transport |
|---|---|---|---|---|
| Batteries Waste | Individual industries and commercial units | Intermittent and unit-specific | Battery Waste generated within the Individual Industries will segregated and disposed to TNPCB Authorised Recyclers. | Road |

**6. Bio-Medical Waste**

*Table 67. Details of Bio-Medical Waste Generation and Disposal Method*

| Name of the waste | Source | Qty (TPA) | Mode of disposal | Mode of Transport |
|---|---|---|---|---|
| Bio-medical waste | Individual industries and commercial units | Intermittent and unit-specific | Bio-medical Waste be will generated within the Individual Industries will segregated and disposed to TNPCB Authorised Recyclers. | — |

### 10.5.4 Noise Pollution

The SIPCOT Industrial Park, as an infrastructure development project, will generate noise and vibration primarily during the construction phase due to activities like excavation, grading, heavy vehicle movement, and equipment use. During the operational phase, the park itself will have limited noise and vibration sources, mainly from vehicular traffic on internal roads and utilities, while major contributions will come from the individual industries operating within the park.

### 10.5.5 Fuel Requirement

SIPCOT, as the project proponent, does not envisage any common fuel storage or distribution facility within the proposed industrial park. The Lyocell manufacturing unit, however, will establish a dedicated Captive Co-generation Power Plant (CPP) with its own fuel storage and handling system, designed to utilize a mix of coal, biomass-based fuels, and high-speed diesel (HSD) for backup power.

For all other industries proposed within the park, the type and quantity of fuel will vary depending on their specific manufacturing processes and operational requirements. Each individual industry shall independently assess, procure, store, and utilize its required fuel in compliance with the statutory provisions and safety standards prescribed by the Petroleum and Explosives Safety Organisation (PESO), the Tamil Nadu Pollution Control Board (TNPCB), and other competent authorities.

## 10.6 EMP IMPLEMENTATION BUDGET

### i) Project Cost

*Table 68. Project cost*

| S.No. | Project Components | Amount (Rs. in lakhs) |
|---|---|---|
| 12. | Land Cost | 16061 |
| 13. | Land development cost | 200 |
| 14. | Roads and drains | 28419 |
| 15. | Desilting and revetment of odai | 1860 |
| 16. | Street Light | 1193 |
| 17. | Water supply system | 5765 |
| 18. | Amenity Infrastructure | 575 |
| 19. | Greenbelt development | 100 |
| 20. | Rain water harvesting | 50 |
| 21. | Solid waste handling facility | 100 |
| 22. | Preliminary and Preoperative expenses | 12288 |

| S.No. | Project Components | Amount (Rs. in lakhs) |
|---|---|---|
| | **Total** | **66611** |

**ii) EMP Capital Cost**

*Table 69. EMP Capital cost*

| S. No. | Particulars | Unit | Proposed |
|---|---|---|---|
| 1 | Storm water drains & Groundwater rejuvenation Plan | INR Lakhs | 8526 |
| 2 | Desilting and Revetment of odai and Rainwater Harvesting | INR Lakhs | 1910 |
| 3 | Greenbelt development | INR Lakhs | 100 |
| 4 | Solid waste handling facility | INR Lakhs | 100 |
| **Total (in Lakhs)** | | | **10636** |

**iii) Recurring Cost**

*Table 70. Recurring cost*

| S. No. | Particulars | Unit | Recurring Expenses (Lakhs) |
|---|---|---|---|
| 1 | Environmental Monitoring during construction and Operational Phase | INR | 2 |
| 2. | Desilting and Revetment of odai, Storm Water Drain and Rainwater Harvesting | INR | 50 |
| 3 | Greenbelt development | INR | 50 |
| 4 | Solid waste handling facility | INR | 30 |
| **Total (in Lakhs)** | | | **132** |

## 10.7 LYOCELL AND TISSUE MANUFACTURING UNIT :

### 10.7.1 Project Cost

The tentative total project cost is **₹4,593.00 crore**, of which ₹4,398.28 crore is allocated towards plant and machinery

### 10.8.2 EMP Capital Cost

The total capital cost earmarked for the implementation of the Environmental Management Plan (EMP) for the proposed project is **₹24,600 lakhs**, covering provisions for pollution control measures,

environmental monitoring systems, greenbelt development, waste management facilities, occupational health and safety infrastructure, and other statutory environmental safeguards.

### 10.8.3 Recurring Cost

The recurring cost earmarked for the implementation of the Environmental Management Plan (EMP) for the proposed project is **₹450 lakhs per annum**, which includes expenses towards environmental monitoring, operation and maintenance of pollution control systems, greenbelt maintenance, waste management, occupational health and safety measures, and other ongoing environmental safeguards.

### 10.8.4 Occupational Health and Safety Measures & Budget Allocation

| S. No. | Description | Amount (INR Lakhs) |
|---|---|---|
| 1 | Workers will be subjected to primary health check-up before they are employed to ascertain their health conditions. Thereafter, Regular Medical check-up & First Aid facility will be organized for workers to evaluate the adverse impact if any on these persons due to the proposed activity. Occupational health surveillance programmes shall be done yearly. A Medical Officer and full-fledged medical staff are recruited. | 60 |
| 2 | Infrastructure facilities such as sanitation, fuel, restroom, canteen etc. shall be provided to the labour force during construction as well as to the casual workers including truck drivers during the operation phase. | 40 |
| **Total** | | 100 |

# 11. SUMMARY & CONCLUSION

## 11.1 PROJECT DESCRIPTION

State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT), established in 1971, stands as the apex body for industrial infrastructure development in Tamil Nadu. Over the past five decades, SIPCOT has been instrumental in establishing more than 50 Industrial Parks including 8 Special Economic Zones (SEZs) across 24 districts, spanning over 48,926 acres. SIPCOT proposes "Development of An Industrial Park At Allikulam at Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram And Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu. The total project cost will be INR 666.11 Cr. The land is owned by M/s State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT). The project aims to establish a planned industrial estate accommodating both Environmental Clearance (EC) and non-EC category industries, including a pre-defined Lyocell (Man-Made Fibre) Manufacturing Unit.

The Lyocell Manufacturing Unit is the major activity within the park and falls under Schedule 5(d) and other technical textile manufacturing industries – Man-Made Fibre Manufacturing, Category 'B' of the EIA Notification, 2006 and its Subsequent amendments. Associated minor activities include a Captive Co-generation Power Plant under Schedule 1(d) and Industrial Sheds & Buildings under Schedule 8(b).

Since Total plot area exceeds 500 hectares and the proposed industrial park includes a predefined Category 'B' industry, Man-Made Fibre Manufacturing Unit Schedule 5(d), the entire project attracts the provisions of Schedule 7(c) – *Industrial Estates/Parks/Complexes/Areas* and is thus classified as a Category 'A' project, with the applicability of the Specific Condition for industrial parks with predefined activities with applicability to public hearing.

## 11.2 DESCRIPTION OF THE ENVIRONMENT

**Study Period:**
Monitoring was carried out in the Summer Season from March 2025 - May 2025.

**Ambient Air Quality:**

**Core zone:** The mean value of PM2.5 ranges from (17.07-20.28 µg/m3) & PM10 at core zone locations ranges from (26.83-31.88 µg/m3) NO2 ranges from (18.81-22.34 µg/m3), SO2 ranges from (7.14-8.48 µg/m3), CO2 (0.56-0.67 mg/m3) which are within the limits of National Ambient Air Quality Standards (NAAQS).

As per the Air Quality Index by CPCB, the air quality of the core zone is found Good during the sampling period from March 2025 to May 2025.

**Buffer zone:** The mean value of PM2.5 ranges from (13.83–24.17 µg/m3) & PM10 at core zone locations ranges from (21.73–37.99 µg/m3) NO2 ranges from (15.23–26.63 µg/m3), SO2 ranges from (5.78–10.11 µg/m3), CO (0.46–0.80 mg/m3) which are within the limits of National Ambient

Air Quality Standards (NAAQS).As per the Air Quality Index by CPCB, the air quality of the buffer zone is found to be Good during the sampling period from March 2025 to May 2025.

As per the Air Quality Index by CPCB, the air quality of the buffer zone is found to be Good during the sampling period from March 2025 to May 2025.

Conclusions: As per the Air Quality Index by CPCB & NAAQS, the air quality of the Core & buffer zone within the standard during the sampling period from March 2025 to May 2025.

**Ambient Noise Quality:**

**Core Zone:**

The ambient noise level during day time at the proposed project site varies from 40.6 dB (A) to 48.4 dB (A) which are within the day time standard limit of Industrial area ~75 dB (A). During night the noise level at the project site ranges from 36.4 dB (A) to 43.2 dB (A) which are within the night time standard limit of Industrial area 70.0 dB (A).

**Buffer Zone – Residential Area:**

N5: The ambient noise level at Thiruvanthapuram is 54.3 dB (A) which is within the daytime noise standard limit of the Residential area of ~ 55.0 dB (A). During the night the noise level was recorded at 41.9 dB (A) which is within the night-time noise standard limit of ~ 45.0 dB (A).

N6: The ambient noise level at Therku Silukkanpatti is 53.7 dB (A) which is within the daytime noise standard limit of Residential area ~ 55.0 dB (A). During the night the noise level was recorded at 42.6 dB (A) which is within the night-time noise standard limit of ~ 45.0 dB (A).

N7: The noise level at Keela Thatapparai is 52.6 dB (A) which is within the daytime noise within the standard limit of Residential area ~ 55.0 dB (A). During the night the noise level was recorded at 41.8 dB (A) which is within the night-time noise standard limit of ~ 45.0 dB (A).

N8: The noise level at Kuttudankadu is 52.2 dB (A) which is above the standard limit of Residential area ~ 55.0 dB (A). During the night the noise level was recorded at 44.6 dB (A) which is within the night-time noise standard limit of ~ 45.0 dB (A).

N9: The noise level at Korampallam is 47.1 dB (A) which is within the daytime noise within the standard limit of Residential area ~ 55.0 dB (A). During the night the noise level was recorded at 43.7 dB (A) which is within the night-time noise standard limit of ~ 45.0 dB (A).

N10: The noise level at Therkku Veerapandiyapuram is 49.2 dB (A) which is within the daytime noise within the standard limit of Residential area ~ 55.0 dB (A). During the night the noise level was recorded at 43.6 dB (A) which is within the night-time noise standard limit of ~ 45.0 dB (A).

**Groundwater Quality:**

The Total Dissolved Solids (TDS) of the sampling locations ranges from 140.8 mg/l to 1901.5 mg/l. The TDS of sampling locations are within the acceptable limit of 500 mg/l & permissible limit i.e. 2000 mg/l respectively.

The Total Hardness of the sampling locations ranges from 88 mg/l to 1484 mg/l. The Total Hardness of sampling locations are within the acceptable limit of 200 mg/l & permissible limit of 600 mg/l respectively.

The Alkalinity of the sampling locations ranges from 92 mg/l to 300 mg/l. The alkalinity of sampling locations are within the acceptable limit of 200 mg/l & permissible limit i.e. 600 mg/l respectively.

The Chloride Concentration of the sampling locations ranges from 34 mg/l to 519 mg/l. The Chloride concentration of sampling locations are within the acceptable limit of 250 mg/l & permissible limit i.e. 1000 mg/l respectively.

**Conclusion:**
The groundwater quality parameters (buffer zone) are within the IS 10500:2012 (Drinking water standard).

**Surface Water Quality :**

Surface water samples were collected from 10 locations namely Nilaviyal Odai Upstream, Drain onsite, Odai onsite, Thiruvanthapuram Pond, Pond near Keela Thatapparai, Allikulam Pond, Perurani Pond, Elim Pond, Bethesda Pond and Pond near Korampallam.

As per the samples collected and analyzed from locations SW1, SW2, SW3, SW4, SW5, SW6, SW7, SW8,SW9 & SW10 surface water quality is meeting the criteria defined by class "C" as per the CPCB criteria. It is suitable for drinking water after conventional treatment and disinfection.

The surface water quality of the **Nilaviyal Odai Upstream** shows that the values of the parameters including TDS, total hardness chloride, fluoride, calcium, magnesium, iron, sulphate, nitrate nitrogen and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Nilaviyal Odai Upstream can be placed in Class "B" i.e. Outdoor bathing (Organised).

The **Surface water quality of the Drain onsite** shows that the parameters including Turbidity, TSS, Nitrate nitrogen, BOD, COD & iron content are within the EPA discharge standards. BOD & DO value indicating that the surface water quality of Drain onsite can be placed in Class "C" i.e., Drinking Water Source without conventional treatment but after disinfection per CPCB surface water quality - Designated Best Use Water Quality Criteria.

The **surface water quality of the Odai onsite** shows that the values of the parameters including TDS, total hardness, calcium, magnesium, and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Odai onsite can be placed in Class "E". i.e., Irrigation, Industrial Cooling, Controlled Waste disposal.

The **surface water quality of the Thiruvanthapuram Pond** shows that the values of the parameters including TDS, total hardness chloride, fluoride, calcium, magnesium, iron, sulphate, nitrate nitrogen and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Thiruvanthapuram Pond can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality - Designated Best Use Water Quality Criteria.

The **surface water quality of the Pond near Keelathatapparai** shows that the values of the parameters including nitrate nitrogen, chloride, fluoride, calcium, magnesium, iron and alkalinity are within the IS drinking water quality standards. BOD & DO value indicating that the surface water quality of the Pond near Keela Thatapparai can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality - Designated Best Use Water Quality Criteria.

The **surface water quality of the Allikulam Pond** shows that the values of the parameters including TDS, total hardness, calcium, magnesium, and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Allikulam Pond can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality- Designated Best Use Water Quality Criteria.

The **surface water quality of the Perurani Pond** shows that the values of the parameters including TDS, total hardness, calcium, magnesium, and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Perurani Pond can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality- Designated Best Use Water Quality Criteria.

The **surface water quality of the Elim Pond** shows that the values of the parameters including TDS, total hardness, calcium, magnesium, and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Elim Pond can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality- Designated Best Use Water Quality Criteria.

The surface water quality of the Bethesda Pond shows that the values of the parameters including TDS, total hardness, calcium, magnesium, and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Bethesda Pond can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality- Designated Best Use Water Quality Criteria.

The surface water quality of the Pond near Korampallam shows that the values of the parameters including TDS, total hardness, calcium, magnesium, and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Pond near Korampallam can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality- Designated Best Use Water Quality Criteria.

**Biological Environment :**

The baseline ecological study indicates that the core and buffer zones primarily comprise dry deciduous vegetation interspersed with agricultural lands, open scrub, and human habitation. The flora mainly includes *Prosopis juliflora, Azadirachta indica, Albizia amara, Calotropis gigantea, and Cenchrus ciliaris,* while faunal species such as *house crow, Indian myna, cattle egret, common toad, and garden lizard* are commonly observed.

As documented in the Wildlife Conservation Plan, certain Schedule-I species under the Wildlife (Protection) Act, 1972 have been identified within the study area based on primary and secondary surveys. Reserved Forests, wildlife sanctuaries, and eco-sensitive zones are present in the surrounding region; however, no Reserve Forest, wildlife sanctuary, national park, or notified Eco-Sensitive Zone is located within a 10 km radius of the project site. The nearest protected areas, including Vallanadu Reserve Forest and Vallanadu Wildlife Sanctuary, are situated beyond the 10 km influence zone.

The existing vegetation in the study area largely represents secondary growth influenced by anthropogenic activities. Based on the baseline ecological conditions and the findings of the Wildlife Conservation Plan, the project is not anticipated to result in significant ecological impacts, subject to strict implementation of the proposed mitigation measures, including greenbelt development, habitat management, and monitoring provisions.

**Socio-Economic Environment :**

The socio-economic study covering the 10 km radius around the project site indicates that the region consists of rural and peri-urban settlements with agriculture as the dominant occupation, followed by small-scale trade, transport, and service activities. The area shows a balanced gender ratio**,** moderate to high literacy levels**,** and stable demographic growth**.**

Infrastructure facilities such as schools, healthcare centers, roads, and electricity are available in most villages. The population exhibits a satisfactory quality of life, with no significant displacement or rehabilitation issues anticipated.

The establishment of the SIPCOT Industrial Park is expected to create direct and indirect employment opportunities**,** promote industrial growth**,** and strengthen socio-economic conditions of nearby communities through improvement in infrastructure, skill development, and allied business activities.

## 11.3 ANTICIPATED ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

**Air environment**

Impacts on ambient air would be mainly due to the emission of Volatile Organic Compounds (VOC's), SO2, CO2, PM, SO2, NO2 generation, dust generation which could lead to an increase in

ground concentration level (GLC), respiratory problems, damage to flora and fauna and aesthetic properties in the environment and increase the level of toxic chemicals to other aspect of environment indirectly. APCS like Wet Scrubber, adequate stack heights are being installed. Plantation of native tree species, installation of water sprinkling systems and dust compression systems in the nearby areas, provision of proper nose masks to laborers, Vehicles with valid PUC certificates will be used for transportation etc. shall be done. Vehicles with valid PUC certificates will be used for transportation of construction material, raw material, waste and finished products.

**Water Environment**

The total water requirement for the project is **66308 KLD**, including 10867 KLD of freshwater from the SIPCOT 60 MLD desalination plant, 26426 KLD of treated wastewater from Thoothukudi Municipal Corporation, and 39,296 KLD of tertiary-treated sewage for the Lyocell unit.

SIPCOT's role is limited to providing water supply and drainage infrastructure. Individual industries are responsible for managing their own process and domestic wastewater.All industries, including the Lyocell unit, shall operate Zero Liquid Discharge (ZLD) systems to ensure no untreated effluent is released. SIPCOT will maintain stormwater drains and rainwater harvesting pits to prevent contamination and enhance groundwater recharge. No groundwater extraction is proposed.

**Land Use**

Land use change is limited to converting identified land (acquired under G.O. No. 100, dated 26.02.2021) into planned industrial, commercial, and green zones. There will be no impact on agricultural or forest land. During construction, excavated earth and debris will be reused for site leveling and road formation. Construction and solid wastes will be collected and segregated to prevent open dumping. Individual industries will manage their waste within their plots as per TNPCB norms; SIPCOT will not undertake industrial waste handling. Impact on Landuse will be due to Construction wastes during the construction phase and leakage of solid and hazardous wastes. Both Construction wastes and solid and hazardous wastes shall be collected and managed separately and avoid open disposal.

**Soil quality**

The impact on soil quality will mainly arise from the operations of individual industries within the SIPCOT Industrial Park, such as loading and unloading of raw materials, operation of boilers and process equipment, handling of chemicals, and transportation of raw materials, products, and wastes. These activities may cause soil erosion, spillage of hazardous substances, or deposition of solid and chemical wastes, which could degrade soil fertility and permeability if unmanaged. To minimize such impacts, each industry shall ensure proper treatment and disposal of wastes, maintain impervious flooring and containment in chemical storage areas, regularly inspect and maintain pipelines and equipment to avoid leakage, and use ISO-certified drums and containers for safe storage and transport. Spill kits will be made available to handle accidental releases, and greenbelt development within individual plots will aid in dust suppression and soil stabilization. With these measures, no significant adverse impact on soil quality is anticipated from industrial activities, including those of the Lyocell Manufacturing Unit.

**Noise Levels**

The major activities which would have an impact on the environment would be operation of machinery and transportation. The aspects of the activities would be an increase in noise level and increased noise generation which could lead to physiological and psychological problems to workers and nearby population, increased vibration in the nearby areas and an indirect decrease in the biological diversity in the nearby area. To minimize such impacts, mitigation measures like restriction of activities in the limited project area, proper maintenance of equipment and machinery, maintenance of noise barriers, provision of protective devices like earmuffs, compactors, silencers etc., installation of green area in the nearby area, provision of No-Honking Zone in the area, maintenance of vehicular and traffic movement etc. would be adapted in the project site.

**Ecology & Biodiversity**

The major activities which would have an impact on the Ecology and Biodiversity in the project area and the surroundings would be site preparation, excavation, manufacturing process, operation of machinery & equipment, transportation, loading & unloading of raw material. The aspects of the activities would be dust emission, increase in GLC, increase in noise level, soil erosion, noise generation, water contamination, vehicular emission and waste generation which would directly /indirectly impact in decrease in transpiration rate of flora, loss of habitat, decrease in plant/tree cover, disturbance to avi-fauna and other species, premature senescence of floral species and hence decrease in population of local faunal species in the area and the surroundings. To minimize such impacts, mitigation measures like provision of air pollution control equipment, scrubbing system to the vents, provision and proper maintenance of green area, installation of water sprinkling systems and dust suppression system, provision of noise barriers, maintenance of vehicular movement near the project site and proper disposal and treatment of wastes generated from the project site. Vehicular movement for transportation of raw material will be carried out only in day-time and will try to avoid unnecessary honking with the help of sign boards. Greenbelt/greenery will be developed along most of the periphery of the project area as well as along roads.

**Solid and Hazardous Waste**

The solid and hazardous waste management responsibilities lie entirely with the individual industries operating within the SIPCOT Industrial Park, as SIPCOT will not generate or handle any such wastes. The solid wastes generated from the proposed industrial units will be reused or recycled for beneficial purposes within the process or disposed of through authorized vendors, in compliance with the Solid Waste Management Rules, 2016. Each industry shall ensure that no solid waste is dumped within its premises or outside the park area.

The hazardous wastes generated from individual industrial operations will be stored, handled, and disposed of in accordance with the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, after obtaining necessary authorization from the Tamil Nadu Pollution Control Board (TNPCB). Such wastes will be collected in labeled drums and stored in designated covered sheds with impervious flooring and leachate control. Disposal shall be carried out only through authorized hazardous waste recyclers, users, or the Common Hazardous Waste Treatment, Storage and Disposal Facility (CHWTSDF).

**Hydrology and Geology**

The major activities which would have an impact on the hydrology and geology would be excavation, manufacturing process, operation of machinery & equipment, working of daily activity of laborers, staff and visitors and transportation. The aspects of the activities are generation of Solid Waste, E-Waste and Bio-Medical Waste, Waste water generation, spillage/leakage of waste/chemical which would impact in deterioration of water quality (in both Surface Water and Groundwater). To minimize such impacts, mitigation measures proper channelization of waste water and proper disposal, all probable leakage areas such as pipelines, joints, pumps and structure of reactor/ storage vessel inspection, installation of leak Detector(s), case of spills of chemicals, dry adsorbents/cotton shall be used for cleaning instead of water and Proper treatment and disposal of Waste water shall be adapted in the project site.

**Socio-Economic**

The proposed SIPCOT Industrial Park at Allikulam will bring significant socio-economic development to the surrounding region. As SIPCOT functions solely as the infrastructure provider, the direct socio-economic benefits will primarily result from the establishment and operation of individual industries, including the Lyocell and Tissue Manufacturing Unit and other non-EC category units. These industries will generate substantial employment opportunities for local people during both the construction and operational phases, improving household income and reducing rural-to-urban migration.

The project will also lead to the development of supporting sectors such as transport, warehousing, small-scale manufacturing, and service-based businesses, boosting the local economy. Improved road infrastructure, lighting, and drainage networks developed under the project will enhance overall connectivity and quality of life for nearby communities. As no displacement of people is involved and the land acquisition has been carried out through due legal process, no resettlement or rehabilitation (R&R) activities are required. The project will thus contribute positively to regional economic growth, livelihood enhancement, and social well-being in Thoothukudi District.

## 11.5 ADDITIONAL STUDIES

Several additional studies were undertaken as part of the EIA for the proposed SIPCOT Industrial Park at Allikulam, including the Traffic Impact Study, Socio-Economic Assessment, and Occupational Health & Safety (OHS) evaluation. The traffic study assessed existing and projected vehicle movement and recommended measures such as road widening, signage installation, and speed control to ensure safe movement within and around the industrial park. The socio-economic study evaluated the local population profile, livelihood pattern, and infrastructure facilities, emphasizing that the project will enhance employment opportunities and regional development through initiatives. The OHS study identified potential occupational hazards and recommended regular health check-ups, use of PPE, and worker safety training.

## 11.6 PROJECT BENEFITS

The benefits due to the proposed project are given below:

- Capital Investment: Estimated project investment of ₹ 666.11 Crores will be the Capital Investment for the SIPCOT Industrial Park, Thoothukudi District, Tamil Nadu.
- Employment Generation: Employment potential of approximately :
    - Direct Employment: 25 No. during Construction phase and 2025 No. in Operation Phase
    - Indirect Employment: 600 No. during Construction phase and 18225 No. in Operation Phase
- Boost to Local Businesses: support industries will benefit from supply chain and logistics demands utilising seaport , airport rail & road (NH) connectivity
- Industrial Growth: Facilitates regional industrialization and promotes balanced economic development in backward districts.
- Improved Infrastructure: Development of roads, drainage, water supply, and waste management infrastructure will benefit surrounding villages.
- Skill Development: Industrial growth will be supported by initiatives to enhance workforce skills through training and capacity-building programs, facilitated in coordination with government-approved skill development agencies.
- Urbanization and Lifestyle Improvement: Increased economic activity is expected to lead to better access to education, healthcare, and amenities.
- Through a structured Social Welfare and community development program , the project will contribute to the welfare of communities within 10 Km radius of the project Conclusion.

## 11.7 ENVIRONMENT MANAGEMENT PLAN

The effective management system involves proper and regular monitoring of the environment components for continual improvement. Based on the project descriptions and the activities associated, the Environment Management plan has been prepared for all the valued Components for which the Budget of INR 10636 lakhs as capital cost & INR 431 Lakhs as recurring cost has been proposed by M/s State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT). Work zone monitoring shall be carried out by the HSE department every month for gaseous pollutants and dust. Records will be kept in standard Form as per Factories Rules. Location for sampling shall be identified. Quarterly and half yearly monitoring will be done by 3rd party during the operation phase.

## 11.8 CONCLUSION

The development of the proposed SIPCOT Industrial Park in Thoothukudi District, is part of Tamil Nadu's ongoing efforts to expand organized industrial infrastructure and promote regionally balanced economic development. The project is aligned with the State's objectives to facilitate large-scale industrial investment, generate employment opportunities, and strengthen export potential. Thoothukudi District, with its strategic proximity to Thoothukudi Port and established transport

networks, has been identified as a suitable location for industrial project particularly for industries requiring direct access to port infrastructure. The Industrial Park will create the necessary infrastructure framework to attract manufacturing industries, facilitate industrial operations, and support ancillary services, contributing to the State's and the country's economic growth.

# 12. DISCLOSURE OF CONSULTANTS ENGAGED

## PROJECT CONSULTANT

**M/s. ITCOT Limited (ITCOT)** , is a reputed Central Public Sector Consultancy Organisation found in 1979 as a joint venture of leading Financial Institutions, State Industry Development Corporations and Banks. The company is registered under Companies Act, 1956 on 17th July 1979. The Registered Office of the company is located at 50-A, Greams Road, Chennai, Tamil Nadu - 600 006.ITCOT has more than 46 years of track record in offering various industrial and technical consultancy services to Govt. departments, Banks, Financial Institutions, Corporate, SME, etc. ITCOT is known for impartial and client neutral approach. ITCOT is an approved consultancy agency for the provision of various consultancy services such as preparation of Techno-Economic Feasibility Report, Techno-Economic Appraisal Report, Detailed Project Report, Project Appraisals, Project Management Consultancy, Tender Process Management, Lender's Independent Engineer, Owner's Engineer, Environment Impact Assessment, Cluster Development, Statutory Compliance Consulting, Energy & Environmental Consulting, Financial Restructuring, Asset valuation, Skill Assessment etc., to Govt. departments, Banks, Financial Institutions, Industrial Development agencies, Corporates, SME, etc. for industrial growth and development.

## ENVIORNMENT CONSULTANT

**M/s. Perfact EnviroSolutions Pvt. Ltd,** established by experienced environmental and related experts, provides specialized services in the field of Environment and Pollution Control for all types of Industrial, Construction , Biodiversity Mining, Aerial Ropeway and other related fields. Our transparent and professional approach, commitment to excellent quality and service, and timely deliveries have contributed to create a name in the field of environment. We have a core group of highly qualified experts from various fields like Environment, Forestry, Chemistry, Civil Engineering, Geology, Social Sciences, Electronics and Telecommunication with rich and diversified experience in the field of environment and pollution control. Perfact Enviro Solutions Pvt. Ltd management, experience, excellence, professionalism and ultimate satisfaction has helped in achieving the heights of success in their specialized field of environment.

This EIA/EMP Study has been carriedout by M/s. Perfact EnviroSolutions Pvt. Ltd. accredited by QCI-NABET for 7(c) – 'A' Category.

**ACCREDITATIONS OBTAINED**

- ISO-9001:2015 Certification
- ISO-14001:2015 Certification
- QCI – NABET Scheme for Accreditation of EIA Consultant Organizations

*Table 71. List of FAEs Involved (Category A)*

| S. No. | Functional Areas | Name of Expert(s) | Involvement (Period & Task) |
|---|---|---|---|
| 1. | EIA Coordinator | Mrs. Rachna Bhargava - 7(c)<br>Mr. Praveen Bhargava - 5(d)<br>Mr. Partho Mukherjee - 1(d)<br>Mr. Muthukumaran Ganpathi Narayanan - 8(b) | We had visited the site with the FAEs to assess the project site and the study area. Coordinated With the experts and prepared the impact assessment methodology. Identification and Prediction of the impact assessment, Formulation of the Environment Management Plan, Technical Review.<br>Period of Involvement: May 2025 - Dec 2025 |
| 2 | AP | Dr. Nipun bhargava | I had visited the site to assess the site conditions in the surrounding area. After assessing the Air pollution sources. Made Sampling plan & conducted monitoring; based on the results and the site specific details along with Project Specific Details obtained , I have prepared the Impact Mitigation measures<br>Period of Involvement: May 2025 - Dec 2025 |
| 3 | AQ | Dr. Nipun bhargava | I had visited the site for the assessment of the sources and the emissions. After studying, I calculated the model input data related to the proposed emissions and micrometeorology interpretation of modeling results and development of EMP.<br>Period of Involvement: May 2025 - Dec 2025 |
| 4 | WP | Mr. Muthukumaran Ganpathi Narayanan | I had visited the site to assess the water sources and its water quality in the study area. After studying the Water pollution sources have prepared Sampling plan & collected samples ; based on the results from the lab and the site specific details along with Project Specific Details obtained, I have prepared the Impact Mitigation measures.<br>Period of Involvement: May 2025 - Dec 2025 |
| 5 | RH | Dr. Nipun bhargava | I had visited the site to assess the site conditions in the surrounding area and identified hazards. After assessing the risk and hazard, I prepared the Impact Mitigation measures.<br>Period of Involvement: May 2025 - Dec 2025 |

| S. No. | Functional Areas | Name of Expert(s) | Involvement (Period & Task) |
|---|---|---|---|
| 6 | SE | Mrs. Rachna Bhargava | I had visited the site to collect the baseline status of socio-economic conditions and studied Villages in study areas using Topographical maps and extracted Secondary data from Census of India. Then was involved in preparing a socio economic study report using the primary survey and secondary data which includes impact and mitigation measures.<br>Period of Involvement: May 2025 - Dec 2025 |
| 7 | NV | Mr. Muthukumaran Ganpathi Narayanan | I had visited the site to assess the site conditions in the surrounding area. After assessing the Noise pollution sources have prepared the Impact Mitigation measures.<br>Period of Involvement: May 2025 - Dec 2025 |
| 8 | SHW | Mr Praveen Bhargava | I had visited the site to assess the Solid waste sources and status in the study area. After studying the sources have prepared the Impact report and suggested Mitigation measures and development of EMP.<br>Period of Involvement: May 2025 - Dec 2025 |
| 9 | HG | Mr Santosh Pant | The physical observation of the study area including Ground water sources and its water quality was made. After studying the Water pollution sources, the Impact report was prepared and Mitigation measures were suggested<br>Period of Involvement: May 2025 - Dec 2025 |
| 10 | Geo | Mr Santosh Pant | I had visited the site to assess the geology of the study area. After studying I have prepared the Impact report and suggested mitigation measures<br>Period of Involvement: May 2025 - Dec 2025 |
| 11 | SC | Mr Praveen Bhargava | I had visited the site to assess the site conditions in the surrounding area. After assessing the type of soil and need of Soil Conservation, Prepared the Impact Mitigation measures accordingly.<br>Period of Involvement: May 2025 - Dec 2025 |
| 12 | LU | Mr. Rajneesh Maurya | I was involved in preparing a Land Use map using Satellite Imagery, Google maps after primary survey.<br>Period of Involvement: May 2025 - Dec 2025 |
| 13 | EB | Mrs. Tulika Rawat | I was involved in preparing the Electrical Load Assessment and Power Supply Plan, including estimating connected load, diversity factors, transformer sizing, and feeder alignment, based on |

| S. No. | Functional Areas | Name of Expert(s) | Involvement (Period & Task) |
|---|---|---|---|
| | | | the proposed land-use plan and infrastructure layout. Period of Involvement: May 2025 - Dec 2025 |

**List of FAEs Involved (Category B)**

*Table 72. List of FAEs Involved (Category B)*

| S. No. | Functional Areas | Name of Expert(s) | Involvement (Period & Task) |
|---|---|---|---|
| 1. | AP | Mr. GMK | I had visited the site to assess the site conditions in the surrounding area. After assessing the Air pollution sources. Made Sampling plan & conducted monitoring; based on the results and the site specific details along with Project Specific Details obtained, I have prepared the Impact Mitigation measures<br>Period of Involvement: May 2025 - Dec 2025 |
| 2. | AQ | Mrs. Shweta Rajput | I had visited the site for the assessment of the sources and the emissions. After studying, I calculated the model input data related to the proposed emissions and micrometeorology interpretation of modeling results and development of EMP.<br>Period of Involvement: May 2025 - Dec 2025 |
| 3. | WP | Mrs. Shweta Rajput | I had visited the site to ascertain the water sources and its water quality in the study area. After studying the Water pollution sources have prepared Sampling plan & collected samples ; based on the results from the lab and the site specific details along with Project Specific Details obtained, I have prepared the Impact Mitigation measures.<br>Period of Involvement: May 2025 - Dec 2025 |
| 4. | RH | Mr. Muthukumaran Ganpathi Narayanan | I had visited the site to assess the site conditions in the surrounding area and identified hazards. After assessing the risk and hazard, I prepared the Impact Mitigation measures.<br>Period of Involvement: May 2025 - Dec 2025 |
| 5. | NV | Mr. Partho Sarathi Mukherjee | I had visited the site to assess the site conditions in the surrounding area. After assessing the Noise pollution sources have prepared the Impact Mitigation measures.<br>Period of Involvement: May 2025 - Dec 2025 |

| S. No. | Functional Areas | Name of Expert(s) | Involvement (Period & Task) |
|---|---|---|---|
| 6. | GEO | Mrs. Saloni Sharma | I had visited the site to assess the physical observation of the study area. After studying the site, an Impact & mitigation report is prepared.<br>Period of Involvement: May 2025 - Dec 2025 |

# Section E (Annexures)

# Annexure 1.1 - G.O.(MS).no.100 dated 26.02.2021

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சுருக்கம்

SIPCOT
18 MAR 2021
CHENNAI-600 032

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தொழில் துறை – சிப்காட் – நில எடுப்பு – தூத்துக்குடி மாவட்டம் மற்றும் வட்டம் – அல்லிக்குளம், இராமசாமிபுரம், கீழத்தட்டப்பாறை, மேலத்தட்டப்பாறை, உமரிக்கோட்டை, பேரூரணி, தெற்கு சிலுக்கன்பட்டி ஆகிய கிராமங்கள் – சிப்காட் தொழிற்பூங்காவில் எண்ணெய் சுத்திகரிப்பு ஆலை அமைத்தல் – 904.40.00 ஹெக்டேர் நிலங்கள் – நில எடுப்பு/நில உரிமை மாற்றம் செய்திட தமிழ்நாடு தொழிலியல் நோக்கங்களுக்கான நில எடுப்புச் சட்டம், 1997 (தமிழ்நாடு சட்டம் 10/1999) மூலம் கையகப்படுத்தல் – நிர்வாக அனுமதி – ஆணை – வெளியிடப்படுகிறது.

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**தொழில் (சிப்காட்–நி.எ) துறை**

**அரசாணை (நிலை) எண்.100**

**நாள்: 26.02.2021**
**மாசி 14, சார்வரி வருடம்,**
**திருவள்ளுவர் ஆண்டு –2052.**

**படிக்க:**

1. தூத்துக்குடி மாவட்ட ஆட்சியரின் கடித எண். ந.க./இ5/20875/2020, நாள் 1.12.2020.
2. முதன்மைச் செயலர்/நில நிர்வாக ஆணையரின் (மு.கூ.பொ) கடித எண். எச்1/839042/2020, நாள் 1.2.2021.

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**ஆணை:**

பார்வை ஒன்றில் படிக்கப்பட்ட கடிதத்தில், தூத்துக்குடி மாவட்டம் மற்றும் வட்டம், அல்லிக்குளம், இராமசாமிபுரம், கீழத்தட்டப்பாறை, மேலத்தட்டப்பாறை, உமரிக்கோட்டை, பேரூரணி, தெற்கு சிலுக்கன்பட்டி ஆகிய கிராமங்களில் சிப்காட் தொழிற்பூங்காவில் எண்ணெய் சுத்திகரிப்பு ஆலை அமைக்க மொத்த விஸ்தீரணம் 897.49.50 ஹெக்டேர் (2216.81 ஏக்கர்) பட்டா புன்செய் நிலங்களை தொழிலியல் நோக்கங்களுக்கான நில எடுப்புச் சட்டம், 1997 (தமிழ்நாடு சட்டம் 10/1999)–ன் கீழ் நில எடுப்பு செய்திடவும், விஸ்தீரணம் 6.90.50 ஹெக்டேர் அரசு புறம்போக்கு நிலங்களை நில உரிமை மாற்றம் செய்திடவும், அரசின் நிர்வாக ஒப்புதல் வழங்கிடவும், மேற்படி நில எடுப்புகளை மேற்கொள்ள சிறப்பு பணியிடங்களை தோற்றுவித்திடவும் தூத்துக்குடி மாவட்ட ஆட்சியர் கோரியுள்ளார். அதன்படி, நில எடுப்பு மற்றும் நில உரிமை மாற்றம் செய்யப்பட உள்ள நிலங்கள் விபரம் :

| கிராமம் | நில எடுப்பு | | நில உரிமை மாற்றம் |
|---|---|---|---|
| | விஸ்தீரணம் (ஹெக். ஏர்ஸ்) | | |
| | நன் செய் | புன்செய் | புறம் போக்கு |
| அல்லிக்குளம் | – | 185.96.50 | 0.49.00 |
| கீழத்தட்டப்பாறை | – | 189.64.50 | 3.50.50 |
| மேலத்தட்டப்பாறை | – | 173.21.50 | 2.62.00 |
| உமரிக்கோட்டை | – | 106.01.01 | 0 |
| பேரூரணி | – | 140.77.00 | 0.29.00 |
| இராமசாமிபுரம் | – | 95.23.00 | 0 |
| தெற்கு சிலுக்கன்பட்டி | – | 6.66.00 | 0 |
| மொத்தம் | | 897.49.50 | 6.90.50 |

2. மேற்காணும் நில எடுப்புப் பணிகளை மேற்கொள்ள ஏதுவாக கீழ்க்காணும் 9 அலகுக்குரிய பணியிடங்கள் தேவைப்படுவதாகவும், அதில் பட்டியலில் உள்ள வரிசை எண்.1 முதல் 3–ல் குறிப்பிடப்பட்டுள்ள பணியிடங்களை காலமுறை ஊதியத்திலும், வரிசை எண்.4 முதல் 8 வரையுள்ள பணியிடங்களை வெளிமுகமை மூலம் நிரப்பிடலாம் எனவும் மாவட்ட ஆட்சியர் தெரிவித்துள்ளார்:

| வ. எண் | பதவியின் பெயர் | பணியாளர் எண்ணிக்கை (அலகு 1 க்கு) | | மொத்த பணியாளர்கள் எண்ணிக்கை (9 அலகுக்கு) | ஊதிய விகிதம் |
|---|---|---|---|---|---|
| 1. | தனி வட்டாட்சியர் | 1 | 1x9 | 9 | Level 20 (Rs.37700 – 119500) |
| 2. | தனி வருவாய் ஆய்வாளர் (உதவியாளர் நிலையில் ) | 2 | 2x9 | 18 | Level 10 (Rs.20600 – 65500) |
| 3. | வருவாய் உதவியாளர் | 1 | 1x9 | 9 | Level 10 (Rs.20600 – 65500) |
| 4. | தட்டச்சர்/கணினி இயக்குநர் | 1 | 1x9 | 9 | Rs.17000/ per month (Contract Pay) |
| 5. | அலுவலக உதவியாளர் | 1 | 1x9 | 9 | Rs.12000/ per month (Contract Pay) |
| 6. | சார் ஆய்வாளர் (நில அளவை) | 2 | 2x9 | 18 | Rs.22000/ per month (Contract Pay) |
| 7. | வரைவாளர் 1 | 1 | 1x9 | 9 | Rs.22000/ per month (Contract Pay) |
| 8. | புல உதவியாளர் | 4 | 4x9 | 36 | Rs.12000/ per month (Contract Pay) |
| | மொத்தம் | 13 | 13x9 | 117 | |

3. மேலும், நில எடுப்புப் பணிகளை துரிதப்படுத்தவும், 9 அலகுகளில் பணிபுரியும் அலுவலர்களின் பணிகளை கண்காணித்திடவும் ஒரு மாவட்ட வருவாய் அலுவலர் தலைமையிலான கீழ்காணும் அலுவலகம் தேவைப்படுவதாகவும், அதில் பட்டியலில் காணும் வரிசை எண்.1 முதல் 5–ல் குறிப்பிடப்பட்டுள்ள பணியிடங்களை காலமுறை ஊதியத்திலும், வரிசை எண்.6–ல் குறிப்பிடப்பட்டுள்ள பணியிடங்ளை வெளிமுகமை மூலம் நிரப்பிடலாம் எனவும் தூத்துக்குடி மாவட்ட ஆட்சியர் தெரிவித்துள்ளார் :

| வ. எண். | பதவியின் பெயர் | பணியாளர் எண்ணிக்கை | ஊதிய விகிதம் |
|---|---|---|---|
| 1. | தனி மாவட்ட வருவாய் அலுவலர் (நில எடுப்பு) | 1 | Level 26 (Rs.61900 – 196700) |
| 2. | துணை ஆட்சியர் (ஒருங்கிணைப்பு அலுவலர்) | 1 | Level 22 (Rs.56100 – 177500) |
| 3. | தனி வட்டாட்சியர் | 1 | Level 20 (Rs.37700 – 119500) |
| 4. | வருவாய் உதவியாளர் | 2 | Level 10 (Rs.20600 – 65500) |
| 5. | இளநிலை உதவியாளர் | 2 | Level 8 (Rs.19500 – 62000) |
| 6. | அலுவலக உதவியாளர் | 1 | Rs.12000/- per month (Contract Pay) |
| | மொத்தம் | 8 | |

4. மேற்கண்ட நில எடுப்புப் பணிகளை மேற்கொள்ள தோராய நிர்வாக செலவினங்கள் கீழ்கண்டவாறு தூத்துக்குடி மாவட்ட ஆட்சியர் தெரிவித்துள்ளார் :

| வ. எண். | விபரம் | தொகை (ரூபாயில்) |
|---|---|---|
| 1. | மொத்த இழப்பீடுத் தொகை | 42,95,17,410/- |
| 2. | நிர்வாக செலவினத் தொகை ( 14.5 % * 429517410 ) | 6,22,80,024/- |
| | மொத்தம் | 49,17,97,434/- |

5. பார்வை ஒன்றில் படிக்கப்பட்ட கடிதத்தில், தூத்துக்குடி மாவட்ட ஆட்சியரின் பரிந்துரை அறிக்கையினை ஏற்று தூத்துக்குடி வட்டம், அல்லிக்குளம், இராமசாமிபுரம், கீழத்தட்டப்பாறை, மேலத்தட்டப்பாறை, உமரிக்கோட்டை, பேரூரணி, தெற்கு சிலுக்கன்பட்டி ஆகிய கிராமங்களில் மொத்தம் 2251.14 ஏக்கர் நிலங்கள், சிப்காட் தொழிற்பூங்காவில் எண்ணெய் சுத்திகரிப்பு ஆலை அமைக்க தமிழ்நாடு தொழிலியல் நோக்கங்களுக்கான நில எடுப்புச் சட்டம், 1997 (தமிழ்நாடு சட்டம் 10/1999)-ன் கீழ் நிர்வாக அனுமதி மற்றும் மேற்கண்ட நில எடுப்பு பணிகளை மேற்கொள்ள மாவட்ட ஆட்சியர் பத்தி 2 மற்றும் 3-இல் கோரியுள்ளபடி 9 அலகுகள் கொண்ட பணியாளர்களை ஏற்படுத்தவும், அதற்கான நிதி ஒதுக்கீடு செய்யுமாறும் பார்வை இரண்டில் படிக்கப்பட்ட கடிதத்தில் முதன்மைச் செயலாளர்/நில நிர்வாக ஆணையர் (மு.கூபொ.) கேட்டுக் கொண்டுள்ளார்.

6. முதன்மைச் செயலர்/நில நிர்வாக ஆணையர் மற்றும் தூத்துக்குடி மாவட்ட ஆட்சியரின் கருத்துருவினை கவனமுடன் ஆராய்ந்து, தூத்துக்குடி மாவட்டம் மற்றும் வட்டம், அல்லிக்குளம், இராமசாமிபுரம், கீழத்தட்டப்பாறை, மேலத்தட்டப்பாறை, உமரிக்கோட்டை, பேரூரணி, தெற்கு சிலுக்கன்பட்டி ஆகிய கிராமங்களில் சிப்காட் தொழிற்பூங்காவில் எண்ணெய் சுத்திகரிப்பு ஆலை அமைக்க தமிழ்நாடு தொழிலியல் நோக்கங்களுக்கான நில எடுப்புச் சட்டம், 1997 (தமிழ்நாடு சட்டம் 10/1999)-ன் கீழ் விஸ்தீரணம் 897.49.50 ஹெக்டேர் புன்செய் நிலங்களை நிலஎடுப்பு செய்திடவும், விஸ்தீரணம் 6.90.50 ஹெக்டேர் அரசு புறம்போக்கு நிலங்களை நில உரிமை மாற்றம் செய்திடவும் ஆக மொத்தம் 904.40.00 ஹெக்டேர் நிலங்களுக்கும் மற்றும் மேற்கண்ட நில எடுப்பு பணிகளை மேற்கொள்ள மாவட்ட ஆட்சியர் கோரியுள்ளபடி தனி வட்டாட்சியர் தலைமையின் கீழ் மொத்தம் 13 பணியாளர்கள் வீதம் 9 அலகுகள் கொண்ட பணியிடங்களை ஏற்படுத்தவும், ஒரு மாவட்ட வருவாய் அலுவலர் தலைமையின் கீழ் 8 பணியாளர்கள் கொண்ட தலைமை அலுவலகம் ஏற்படுத்தவும், அதற்கான நிதி ஒதுக்கீடு செய்யவும் கீழ்க்காணும் நிபந்தனைகளுடன் நிர்வாக அனுமதி வழங்கி அரசு ஆணையிடுகிறது :

அ) மேற்படி கிராமங்களிலுள்ள அரசு புறம்போக்கு நிலங்களை சிப்காட் நிறுவனத்திற்கு நில உரிமை மாற்றம் செய்வதற்கு முன்மொழிவினை நில நிர்வாக ஆணையர் சென்னை-5 வழியாக அரசின் வருவாய்த்துறைக்கு அனுப்பிவைக்க வேண்டும்.

ஆ) அரசு புறம்போக்கு நிலங்களை சிப்காட் நிறுவனத்திற்கு நில உரிமை மாற்றம் செய்ய சம்பந்தப்பட்ட ஊராட்சிகளின் ஒப்புதல் பெறப்பட வேண்டும்.

இ) மேற்படி புறம்போக்குகளில் நீர் நிலைகள் இருப்பின் சம்பந்தப்பட்ட செயற்பொறியாளர் (நீவஆ) அவர்களிடம் தடையில்லாச்சான்று பெறவேண்டும்.

ஈ) மேற்படி புறம்போக்குகளில் வாய்க்கால் மற்றும் கால்வாய் ஏதேனும் இருப்பின் முறையான நில அளவைக்கு பின்னர் கல் நட்டும், தண்ணீரை தடைசெய்யாமலும், தூர்க்காமலும், கால்வாயை கடப்பதற்கு சில பாலங்கள் அமைத்தும் தொழிற்சாலைகளிலிருந்து உண்டாகும் கழிவுநீர் நீர்நிலைகளில் செல்லாதவாறும் உள் கட்டமைப்பு வசதிகளை கேட்பு நிறுவனம் ஏற்படுத்தி கொள்ள வேண்டும்.

உ) நில எடுப்பு நடவடிக்கையின்போது உள்ளூர் பொது மக்களிடமிருந்து ஆட்சேபணைகள் ஏதேனும் வரப்பெற்றால் அதன் உண்மைத் தன்மையை நன்கு ஆய்வு செய்து தமிழ்நாடு தொழிலியல் நோக்கங்களுக்கான நில எடுப்புச் சட்டம் 1997 (தமிழ்நாடு சட்டம் 10/99) பிரிவு 3(2)–இன் கீழ் அறிவிக்கை வெளியிடுமுன்னர் உரிய நடவடிக்கைகள் மேற்கொள்ளப்பட வேண்டும்.

ஊ) மேலும் நில எடுப்பு நடவடிக்கையின் போது நில உரிமையாளர்கள்/சம்மந்தப்பட்ட நபர்களிடம் நேரடி பேச்சு வார்த்தையின் மூலமும் நிலங்களை வாங்கிக் கொள்வதற்கும் சிப்காட் நிறுவனத்திற்கு அனுமதி அளிக்கலாம்.

எ) மேலும் நில நிர்வாக சீர்திருத்தச் சட்டம் மற்றும் பூமி தானம் கீழ் கவரப்பட்ட நிலங்களுக்கு மாவட்ட ஆட்சியர் முழு பொறுப்பேற்று நடைமுறைகளில் உள்ள விதிகளின்படி நடவடிக்கை மேற்கொள்ள வேண்டும்.

ஏ) மேற்படி பணியிடங்களுக்கு ஏற்படும் நிர்வாகச் செலவினங்களை சிப்காட் நிறுவனம் ஏற்க வேண்டும்.

7. பத்தி–6–ல் அனுமதிக்கப்பட்டுள்ள தற்காலிகப் பணியாளர்களின் (நில எடுப்பு) ஊதிய செலவினம் மற்றும் நிதி ஒதுக்கீடு தொடர்பான கணக்கு தலைப்புகள் குறித்து இத்துறையால் பின்னர் தனி ஆணையாக வெளியிடப்படும்.

**(ஆளுநரின் ஆணைப்படி)**

**நா. முருகானந்தம்**
**அரசு முதன்மைச் செயலாளர்**

பெறுநர்:
முதன்மைச் செயலர்/
நில நிர்வாக ஆணையர் (மு.கூ.பொ.),
சேப்பாக்கம், சென்னை–5.

மேலாண்மை இயக்குநர்,
சிப்காட்,
19–A, ருக்மணி லஷ்மிபதி சாலை,
எழும்பூர், சென்னை– 600 008.

மாவட்ட ஆட்சியர்,
தூத்துக்குடி மாவட்டம்.

நகல்:

மாண்புமிகு முதலமைச்சர் அலுவலகம்,
சென்னை–600 009.

தொழில் (அ.நி.மு. II) துறை,
சென்னை–600 009.

இ.கோப்பு/உதிரி நகல்.

**// ஆணைப்படி அனுப்பப்படுகிறது //**

**பிரிவு அலுவலர்**

Industries Department – SIPCOT – Land Acquisition – Thoothukudi District and Taluk – Allikulam, Ramasamypuram, Keelathattaparai, Melathattaparai, Umarikottai, Perurani, and Therkusillukkanpatti Villages – Establishment of Oil Refinery Plant within SIPCOT Industrial Park – Acquisition/Transfer of Ownership of 904.40.00 Hectares of Land under the Tamil Nadu Acquisition of Land for Industrial Purposes Act, 1997 (Tamil Nadu Act 10 of 1999) – Administrative Sanction – Order Issued.

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## INDUSTRIES (SIPCOT) DEPARTMENT

**Government Order (Ms) No.100** **Dated: 26.02.2021**
**Maasi 14, Saarvari Year,**
**Thiruvalluvar Year – 2052**

1. District Collector, Thoothukudi District ; Letter No. Na.Ka./I5/20875/2020, dated 01.02.2020.
2. Managing Director, Managing Director, State Industries Promotion Corporation of Tamil Nadu (SIPCOT) **;** letter No. 1/839042/2020, dated 01.02.2021.

**ORDER:**

As stated in the letter read in the first reference, in Thoothukudi Taluk of Thoothukudi District, in the villages of Allikulam, Ramasamypuram, Keelathattaparai, Melathattaparai, Umarikottai, Perurani, and Therkusillukkanpatti, SIPCOT has proposed the establishment of an Oil Refinery Plant. For this industrial purpose, considering the welfare of the industrial sector, in the first phase, patta and punjai lands to an extent of **897.49.50 hectares (2,216.81 acres)** have been directly purchased and registered.In addition, for acquiring the required 6.9050 hectares of government poramboke lands, acquisition has been carried out under the provisions of the Tamil Nadu Land Acquisition Act, 1997 (Tamil Nadu Act 10/1999). The District Collector, Thoothukudi District, has recommended fixation of land cost based on the government guideline value and transfer of land ownership to SIPCOT, in accordance with Government norms. Accordingly, the details of the lands acquired and transferred are as follows:

**Land Alienation Details:**

| Village Name | Land Acquisition | | Land Ownership Transfer |
|---|---|---|---|
| | Land Classification (in Ha) | | |
| | Nanjai | Punjai | Poramboke |
| Allikulam | — | 185.96.50 | 0.49.00 |
| Keelathattaparai | — | 189.64.50 | 3.50.50 |
| Melathattaparai | — | 173.21.50 | 2.62.00 |
| Umarikottai | | 106.01.01 | 0 |
| Perurani | — | 140.77.00 | 0.29.00 |

| | | | |
|---|---|---|---|
| Ramasamypuram | — | 95.23.00 | 0 |
| Therkusillukkanpatti | — | 6.66.00 | 0 |
| **Total** | — | **897.49.50** | **6.9050** |

2. The District Collector has stated that in order to carry out the above land acquisition work, the following 9 types of work will be required. Out of these, the work mentioned in details no. 1 to 3 in the list can be carried out on a periodic basis. The work mentioned in details no. 4 to 8 can be filled on an outsourcing basis.

| S. No | Name of the Post | No. of Posts (Per Unit) | | Total No. of Posts (for 9 Units) | Salary / Pay Scale |
|---|---|---|---|---|---|
| 1 | Special Tahsildar | 1 | 1x9 | 9 | Level 20 (Rs. 37,700 – 1,19,500) |
| 2 | Special Revenue officer (Assistant) | 2 | 2x9 | 18 | Level 10 (Rs. 20,600 – 65,500) |
| 3 | Assistant Revenue officer | 1 | 1x9 | 9 | Level 10 (Rs. 20,600 – 65,500) |
| 4 | Type writer / Computer Operator | 1 | 1x9 | 9 | Rs. 17,000/- per month (Contract Pay) |
| 5 | Clerk | 1 | 1x9 | 9 | Rs. 12,000/- per month (Contract Pay) |
| 6 | Land Surveyor | 2 | 2x9 | 18 | Rs. 22,000/- per month (Contract Pay) |
| 7 | Draftsperson 1 | 1 | 1x9 | 9 | Rs. 22,000/- per month (Contract Pay) |
| 8 | Survey Assistant | 4 | 4x9 | 36 | Rs. 12,000/- per month (Contract Pay) |
| **Total** | | **13** | **13x9** | **117** | |

3. Furthermore, to expedite land acquisition activities and supervise the work of officials in the 9 offices, it has been decided that an office headed by a district-level officer is required. The posts under serial numbers 1 to 5 may be filled in the regular pay scale, while the post under serial number 6 may be filled on an outsourcing basis, as informed by the District Collector, Thoothukudi.

| Sl. No. | Designation | No. of Posts | Pay Scale / Remuneration |
|---|---|---|---|
| 1. | Special District Revenue Officer (Land Acquisition) | 1 | Level 26 (Rs.61,900 – 1,96,700) |
| 2. | Deputy Collector (Coordinating Officer) | 1 | Level 22 (Rs.56,100 – 1,77,500) |
| 3. | Special Tahsildar | 1 | Level 20 (Rs.37,700 – 1,19,500) |
| 4. | Revenue Assistant | 2 | Level 10 (Rs.20,600 – 65,500) |
| 5. | Junior Assistant | 2 | Level 8 (Rs.19,500 – 62,000) |
| 6. | Office Assistant | 1 | Rs.12,000/- per month (Contract Pay) |
| | **Total** | **8** | |

4. The District Collector, Thoothukudi, has informed that the approximate financial requirements for the above land acquisition activities are as follows:

| Sl. No. | Description | Amount (in Rupees) |
|---|---|---|
| 1. | Total Compensation Amount | 42,95,17,410/- |
| 2. | Administrative Expenses (14.5% × 4,29,51,740) | 6,22,80,024/- |
| | **Total** | 49,17,97,434/- |

5. In the letter referred to in Reference 1, based on the recommendation report of the District Collector of Thoothukudi, administrative approval has been granted for the acquisition of a total of 2,251.14 acres of land in Allikulam, Ramasamypuram, Keelathattaparai, Melathattaparai, Umarikottai, Perurani, and Therkusillukkanpatti villages of Thoothukudi Taluk, Thoothukudi District, for the establishment of an oil refinery within the SIPCOT Industrial Park, under the Tamil Nadu Acquisition of Land for Industrial Purposes Act, 1997 (Tamil Nadu Act 10 of 1999).Further, as per Sections 2 and 3 of the District Collector's proposal, the letter in Reference 2, issued by the Principal Secretary / Commissioner of Land Administration (Public), has requested the formation of 9 units of staff to carry out the aforementioned land acquisition work and to allocate the necessary funds for the same.

6. After carefully reviewing the recommendations of the Principal Secretary / Commissioner of Land Administration and the District Collector, Thoothukudi, the Government accords administrative approval for the acquisition of **897.49.50 hectares** of dryland and the transfer of ownership for **6.90.50 hectares** of Government poramboke land, totaling **904.40.00 hectares**, for the establishment of an oil refinery within the SIPCOT Industrial Park located in Allikulam, Ramasamypuram, Keelathattaparai, Melathattaparai, Umarikottai, Perurani, and Therkusillukkanpatti villages of Thoothukudi Taluk and District, under the Tamil Nadu Acquisition of Land for Industrial Purposes Act, 1997 (Tamil Nadu Act 10 of 1999). Further, as per the proposal of the District Collector, the Government has sanctioned the creation of 13 posts across 9 distinct job roles under the leadership of a Special Tahsildar to undertake the above land acquisition activities. Additionally, a head office with 8 personnel under the supervision of a District Revenue Officer shall be established, and the necessary funds will be allocated subject to the specified conditions:

a) The proposal for transferring ownership of Government poramboke lands located in the above-mentioned villages to SIPCOT shall be forwarded to the Revenue Department of the Government through the Commissioner of Land Administration, Chennai – 5.

b) Prior approval must be obtained from the respective Village Panchayats for the transfer of Government poramboke lands to SIPCOT.

c) If any waterbodies are present within the poramboke lands, a No Objection Certificate (NOC) must be obtained from the concerned Executive Engineer of the Water Resources Department.

d) In the event that any porambokke irrigation channels or canals exist, proper land surveying must be carried out. Infrastructure shall be developed to ensure that stone bunds or barriers do not obstruct or divert the natural flow of water. Where necessary, bridges shall be constructed to cross the canals, and appropriate infrastructure shall be established by the project proponent to ensure that wastewater from industrial units does not enter any waterbodies.

e) If objections are raised by local residents during the land acquisition process, their views must be carefully examined. Appropriate action shall be taken in accordance with Section 3(2) of the Tamil Nadu Acquisition of Land for Industrial Purposes Act, 1997 (Tamil Nadu Act 10 of 1999), prior to the issuance of the land acquisition report.

f) During the land acquisition process, SIPCOT may be permitted to acquire lands through direct negotiations with landowners and stakeholders, where feasible.

g) For lands falling under the Land Administration Reform Acts or covered under land grant provisions, the District Collector shall take full responsibility and ensure that due procedures are followed as per existing regulations.

h) The administrative expenses arising from the creation of the above-mentioned posts shall be borne by SIPCOT.

7. Regarding the salary expenditure and budget allocation for the temporary staff (land acquisition) sanctioned in Paragraph 6, the relevant accounting heads will be issued separately by this department through a separate Government Order.

**(By Order of the Governor)**

**N. Muruganantham**
Principal Secretary

**To**
The Principal Secretary /
Commissioner of Land Administration,
Chepauk, Chennai – 5.

Managing Director
SIPCOT
19-A, Rukmani Lakshmipathi Road,
Egmore, Chennai, Tamil Nadu, India – 600008

**District Collector,**
Thoothukudi District.

**Copy to:**
The Hon'ble Chief Minister's Office,
Chennai – 600 009

Industries (Aa.Na.Mu. II) Department,
Chennai – 600 009

**Section Officer**

**//Forwarded by Order of the Government//**

# Annexure 1.2 - G.O(M.s).100 English Notory_SIPCOT_Allikulam

Industries Department – SIPCOT – Land Acquisition.– Thoothukudi District and Taluk – Allikulam, Ramasamypuram, Keelathattaparai, Melathattaparai, Umarikottai, Perurani, and Therkusillukkanpatti Villages – Establishment of Oil Refinery Plant within SIPCOT Industrial Park – Acquisition/Transfer of Ownership of 904.40.00 Hectares of Land under the Tamil Nadu Acquisition of Land for Industrial Purposes Act, 1997 (Tamil Nadu Act 10 of 1999) – Administrative Sanction – Order Issued.

---

## INDUSTRIES (SIPCOT- LA) DEPARTMENT

**Government Order (Ms) No.100**

**Dated: 26.02.2021**
**Maasi 14, Saarvari Year,**
**Thiruvalluvar Year – 2052**

1. District Collector, Thoothukudi District ; Letter No. Na.Ka./I5/20875/2020, dated 01.02.2020.
2. Principal Secretory/Commissioner of Land Administration Letter No. 1/839042/2020, dated 01.02.2021.

**ORDER :**

As stated in the letter read in the first reference, in Thoothukudi Taluk of Thoothukudi District, in the villages of Allikulam, Ramasamypuram, Keelathattaparai, Melathattaparai, Umarikottai, Perurani, and Therkusillukkanpatti, for the establishment of an Oil Refinery Plant in SIPCOT Industrial Park, Thoothukudi District Collector has requested for acquisition of **897.49.50 hectares (2,216.81 acres) of dry patta lands under** provisions of the Tamil Nadu Acquisition of Land for Industrial purpose Act, 1997 (Tamil Nadu Act – 10 of 1999) and for alienation of 6.90.50 hectares of government poramboke lands, and also to issue Administration Sanction, and also for creation of Special posts for acquisition of land. Accordingly, the details of the lands to be acquired and land ownership transfer are as follows:

| Village Name | Land Acquisition | | Land Ownership Transfer |
|---|---|---|---|
| | Extent (in Ha.Ares) | | |
| | Nanjai (Patta Wet land) | Punjai (Patta Dry Land) | Poramboke |
| Allikulam | — | 185.96.50 | 0.49.00 |
| Keelathattaparai | — | 189.64.50 | 3.50.50 |
| Melathattaparai | — | 173.21.50 | 2.62.00 |
| Umarikottai | | 106.01.01 | 0 |
| Perurani | | 140.77.00 | 0.29.00 |
| Ramasamypuram | — | 95.23.00 | 0 |
| Therkusillukkanpatti | — | 6.66.00 | 0 |
| **Total** | | **897.49.50** | **6.90.50** |

NOTARY N. RAJENDIRAN, M.A.,M.Ed.,B.L., CHENNAI Reg. No. 8117/2010 Expiry Dt. 05.07.2030 GOVERNMENT OF INDIA

2. The Thoothukudi District Collector has stated that in order to carry out the above land acquisition work, the following staffs are required for 9 Units. Out of these, the work mentioned in details no. 1 to 3 in the list can be carried out on a periodic basis. The work mentioned in details no. 4 to 8 can be filled on an outsourcing basis.

| S. No | Name of the Post | No. of Posts (Per Unit) | | Total No. of Posts (for 9 Units) | Salary / Pay Scale |
|---|---|---|---|---|---|
| 1 | Special Tahsildar | 1 | 1x9 | 9 | Level 20 (Rs. 37,700 – 1,19,500) |
| 2 | Special Revenue officer (Assistant) | 2 | 2x9 | 18 | Level 10 (Rs. 20,600 – 65,500) |
| 3 | Assistant Revenue officer | 1 | 1x9 | 9 | Level 10 (Rs. 20,600 – 65,500) |
| 4 | Type writer / Computer Operator | 1 | 1x9 | 9 | Rs. 17,000/- per month (Contract Pay) |
| 5 | Clerk | 1 | 1x9 | 9 | Rs. 12,000/- per month (Contract Pay) |
| 6 | Sub Inspector Survey | 2 | 2x9 | 18 | Rs. 22,000/- per month (Contract Pay) |
| 7 | Draftsperson 1 | 1 | 1x9 | 9 | Rs. 22,000/- per month (Contract Pay) |
| 8 | Field Assistant | 4 | 4x9 | 36 | Rs. 12,000/- per month (Contract Pay) |
| **Total** | | **13** | **13x9** | **117** | |

3. Furthermore, Thoothukudi District Collector has informed to expedite land acquisition activities and supervise the work of officials in the 9 Units, it has been decided that an office headed by a District-Revenue officer (DRO) with following posts is required. Out of the posts under serial numbers 1 to 5 may be filled in the regular pay scale, while the post under serial number 6 may be filled on an outsourcing basis, as informed by the District Collector, Thoothukudi.

| Sl. No. | Designation | No. of Posts | Pay Scale / Remuneration |
|---|---|---|---|
| 1. | Special District Revenue Officer (Land Acquisition) | 1 | Level 26 (Rs.61,900 – 1,96,700) |
| 2. | Deputy Collector (Coordinating Officer) | 1 | Level 22 (Rs.56,100 – 1,77,500) |
| 3. | Special Tahsildar | 1 | Level 20 (Rs.37,700 – 1,19,500) |
| 4. | Revenue Assistant | 2 | Level 10 (Rs.20,600 – 65,500) |
| 5. | Junior Assistant | 2 | Level 8 (Rs.19,500 – 62,000) |
| 6. | Office Assistant | 1 | Rs.12,000/- per month (Contract Pay) |
| **Total** | | **8** | |

NOTARY
N. RAJENDIRAN,
M.A.,M.Ed.,B.L.,
CHENNAI
Reg. No. 8117/2010
Expiry Dt.
05.07.2030
GOVERNMENT OF INDIA

4. The District Collector, Thoothukudi, has informed that the approximate financial requirements for the above land acquisition activities are as follows:

| Sl. No. | Description | Amount (in Rupees) |
|---|---|---|
| 1. | Total Compensation Amount | 42,95,17,410/- |
| 2. | Administrative Expenses (14.5% × 4,29,51,740) | 6,22,80,024/- |
| | **Total** | 49,17,97,434/- |

5. In the letter cited in Reference 1, based on the recommendation report of the District Collector of Thoothukudi, administrative approval has been granted for the acquisition of a total of 2,251.14 acres of land in Allikulam, Ramasamypuram, Keelathattaparai, Melathattaparai, Umarikottai, Perurani, and Therkusillukkanpatti villages of Thoothukudi Taluk, Thoothukudi District, for the establishment of an oil refinery within the SIPCOT Industrial Park, under the Tamil Nadu Acquisition of Land for Industrial Purposes Act, 1997 (Tamil Nadu Act 10 of 1999).Further, as per Sections 2 and 3 of the District Collector's proposal, the letter in Reference 2, issued by the Principal Secretary / Commissioner of Land Administration (Public), has requested the formation of 9 units of staff to carry out the aforementioned land acquisition work and to allocate the necessary funds for the same.

6. After carefully reviewing the recommendations of the Principal Secretary / Commissioner of Land Administration and the District Collector, Thoothukudi, the Government accords administrative approval for the acquisition of **897.49.50 hectares** of dryland and the transfer of ownership for **6.90.50 hectares** of Government poramboke land, totaling **904.40.00 hectares**, for the establishment of an oil refinery within the SIPCOT Industrial Park located in Allikulam, Ramasamypuram, Keelathattaparai, Melathattaparai, Umarikottai, Perurani, and Therkusillukkanpatti villages of Thoothukudi Taluk and District, under the Tamil Nadu Acquisition of Land for Industrial Purposes Act, 1997 (Tamil Nadu Act 10 of 1999). Further, as per the proposal of the District Collector, the Government has sanctioned the creation of 13 posts of 9 units job roles under the leadership of a Special Tahsildar to undertake the above land acquisition activities. Additionally, a head office with 8 personnel under the supervision of a District Revenue Officer shall be established, and the necessary funds will be allocated subject to the specified conditions:

a) The proposal for transferring ownership of Government poramboke lands located in the above-mentioned villages to SIPCOT shall be forwarded to the Revenue Department of the Government through the Commissioner of Land Administration, Chennai – 5.

b) Prior approval must be obtained from the respective Village Panchayats for the transfer of Government poramboke lands to SIPCOT.

c) If any waterbodies are present within the poramboke lands, a No Objection Certificate (NOC) must be obtained from the concerned Executive Engineer of the Water Resources Department.

d) In the event that any porambokke irrigation channels or canals exist, proper land surveying must be carried out. Infrastructure shall be developed to ensure that stone bunds or barriers do not obstruct or divert the natural flow of water. Where necessary, bridges shall be constructed to cross the canals, and appropriate infrastructure shall be established by the project proponent to ensure that wastewater from industrial units does not enter any waterbodies.

NOTARY
N. INDIRA, M.A., M.L.
CHENNAI
Reg. No. 8117/2010
Expiry Dt. 05.07.2030
GOVERNMENT OF INDIA

e) If objections are raised by local residents during the land acquisition process, their views must be carefully examined. Appropriate action shall be taken in accordance with Section 3(2) of the Tamil Nadu Acquisition of Land for Industrial Purposes Act, 1997 (Tamil Nadu Act 10 of 1999), prior to the issuance of the land acquisition report.

f) During the land acquisition process, SIPCOT may be permitted to acquire lands through direct negotiations with landowners and stakeholders, where feasible.

g) For lands falling under the Land Administration Reform Acts or covered under land grant provisions, the District Collector shall take full responsibility and ensure that due procedures are followed as per existing regulations.

h) The administrative expenses arising from the creation of the above-mentioned posts shall be borne by SIPCOT.

7. Regarding the salary expenditure and budget allocation for the temporary staff (land acquisition) sanctioned in Paragraph 6, the relevant accounting heads will be issued separately by this department through a separate Government Order.

**(By Order of the Governor)**

**N. Muruganantham**
Principal Secretary

**To**
The Principal Secretary /
Commissioner of Land Administration,
Chepauk, Chennai – 5.

Managing Director
SIPCOT
19-A, Rukmani Lakshmipathi Road,
Egmore, Chennai, Tamil Nadu, India – 600008

District Collector,
Thoothukudi District.

**Copy to:**
The Hon'ble Chief Minister's Office,
Chennai – 600 009

Industries (Aa.Na.Mu. II) Department,
Chennai – 600 009

N. RAJENDIRAN, M.A.,M.Ed.,B.L.,
MS No: 1293/1991
ADVOCATE & NOTARY PUBLIC
GOVERNMENT OF INDIA
No. 1, Jothiramalingam II Cross Street,
West Mambalam, Chennai - 600 033.
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NOTARY
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05.07.2030
GOVERNMENT OF INDIA

**//Forwarded by Order of the Government//**

**Section Officer**

# Annexure 1.3 - GO_213_30_03_1989

GOVERNMENT OF TAMIL NADU

Abstract

ENVIRONMENT CONTROL – Control of Pollution of Water Sources – Location of industries within 1 K.M. from the embankments of rivers, streams, dams etc. – Imposition of restrictions – Orders – Issued.

---

ENVIRONMENT AND FORESTS (EC-I) DEPARTMENT

G.O. Ms. No: 213 Dated the 30th March, 1989.
Read:
(1) G.O. Ms. No:1 Environment Control Dated: 6.2.84
(2) From the Member Secretary, Tamilnadu Pollution Control Board Lr. No:BMS(1)/18878/88 Dated: 23.8.88.
(3) From the Chairman, Tamilnadu Pollution control Board Lr. BMS(1) / 44365/88 Dated: 3.1.88 and letter of even no. Dated: 30.12.88.
ORDER:-

In the Government Order first read above, the Government have ordered, among other things, that no industry causing serious water pollution should be permitted within one kilometer from the embankments of rivers, streams, dams etc. and that the Tamilnadu Pollution Control Board should furnish a list of such industries to all local bodies. It has been suggested that it is necessary to have a sharper definition for water sources so that ephemeral water collections like rain water ponds, drains, sewerages (bio-degradable) etc. may be excluded from the purview of the above order. The Chairman, Tamilnadu Pollution Control Board has stated that the scope of the Government Order may be restricted to reservoirs, rivers and public drinking water sources. He has also stated that there should be a complete ban on location of highly polluting industries within 1 kilometre of certain water sources.

2. The Government have carefully examined the above suggestions. The Government improve a total ban on the setting up of the highly polluting industries mentioned in Annexure – I to this order within one kilometer from the embankments of the water sources mentioned in Annexure II to this order.

3. The Government also direct that under any circumstance if any highly polluting industry is proposed to be set up within one kilometer from the embankments of water sources other than those mentioned in Annexure-II to this order, the Tamilnadu Pollution Control Board should examine the case and obtain the approval of the Government for it.

4. The receipt of this order may be acknowledged.

(BY ORDER OF THE GOVERNOR)

D. SUNDARESAN,
COMMISSIONER AND SECRETARY
TO GOVERNMENT

To
The Chairman,
Tamilnadu Pollution Control Board
32, Santhome High road,
Madras – 600 004.

All Heads of Departments
All Departments of Secretariat, Madras – 9.

ANNEXURE – I

LIST OF HIGHLY POLLUTING INDUSTRIES

1. Distilleries
2. Tanneries, Sago, Sugar, Dairies and Glue
3. Fertilizer
4. Pulp & Paper (with digestor)
5. Chemical units generating trade effluent containing such pollutants which may to pollute air, water and land before treatment and those chemicals which may alter the environmental quality by under going physical, chemical and biological transformation.
6. Petroleum Refinery
7. Textile Dyeing Units
8. Steel Plant (Electroplating, heat treatment etc.)
9. Ceramics

10. Thermal Power Station
11. Basic Drug Manufacturing Units
12. Pesticide
13. Asbestos
14. Foundries

**ANNEXURE II OF G.O. Ms.No:213 E&F (EC-I) Dept. Dated:30.3.89**

**LIST OF RIVERS, STREAMS, RESERVOIRS, ETC.**

| S.No<br>1. | Rivers<br>2. | Tanks and Reservoirs<br>3. | Canals<br>4. | |
|---|---|---|---|---|
| **MADRAS & CHENGALPATTU DISTRICTS** | | | | |
| 1. | Araniyaru | Chembarambakkam Tank<br>Thenneri Hissa Tank<br>Uthiramerur Tank<br>Maduranthagam Tank<br>Parayankalathur Tank<br>Cooum Tank<br>Manimangalam Tank<br>Poondi Reservoir<br>Cholavaram Lake<br>Red Hills Lake | Upper supply Channel (Poondi to Cholavaram)<br>Lower supply Channel (Cholavaram to Redhills)<br>Cheyyar Anicut Main Channel | |
| 2. | Koaratalaiyar | | | |
| 3. | Cooum | | | |
| 4. | Adayar | | | |
| 5. | Palar | | | |
| 6. | Nagari | | | |
| 7. | Nandiyaru | | | |
| 8. | Cheyyar | | | |
| 9. | Kiliyaru | | | |
| 10. | Ongur | | | |
| | | | | |
| **SOUTH ARCOT DISTRICT** | | | | |
| 1. | Varahanadhi | Wellington Reservoir<br>Vidur Reservoir<br>Gomuki Reservoir<br>Manimukthanadhi Reservoir<br>Veeranam Tank<br>Perumal Tank | Sathanur Reservoir Project Canal<br>Sathanur Reservoir Project Right Bank Canal | |
| 2. | Malattaru | | | |
| 3. | Pennaiaru | | Pambai Channel<br>Malattar Channel<br>Raghavian Channel<br>Sithalingamadam Channel<br>Vadamarudur Channel | Thirukkoilur anaicut |
| 4. | Gadilam | | | |
| 5. | Vellar | | | |
| 6. | Coleroon | | | |
| 7. | Tundiaru | | | |
| 8. | Pambaiyar | | | |
| 9. | Gomuki | | Maragadapuram Channel<br>Alargal Channel<br>Kandapakkam Channel | Ellis Choatry Anaicut |
| 10. | Manimukthanadhi | | | |
| 11. | Musukunda Nadhi | | | |
| | | | | |

| | | | | |
|---|---|---|---|---|
| | | | Eralur Channel | |
| 12. | Thurinjalar | | Wellington Reservoir Supply Channel (From Toludur Regulator) | |
| 13. | Vasistanadhi | | Wellington Reservoir Main Canal | |
| 14. | Vadavar | | Wellingdon Reservoir Low Level Canal.<br>Pelandorai Anicut Main Channel | |
| | | | North Rajan Channel<br>South Rajan Channel<br>Kunukkumanniyar Channel | Lower Coleroon Anaicut. |
| | | | Vellar Rajan Channel<br>Veeranam and New Supply Channel | Sethiathope Anaicut |
| | | | Gomuki Reservoir Main Canal | |
| | | | Manimukthanadhi Reservoir Main Canal | |
| | | | Vridhachalam Anaicut Main channels (North & South) | |
| | | | Mehamathur Anaicut Channel | |
| **THANJAVUR DISTRICT** | | | | |
| 1. | Cauvery | | Grand Anaicut Canal<br>Lower Coleroon Anaicut Canals | |
| 2. | Coleroon | | | |
| 3. | Kodamurutty | | | |
| 4. | Arasalar | | | |
| 5. | Veerasholan | | | |
| 6. | Vikramanar | | | |
| 7. | Vennar | | | |
| 8. | Vettar | | | |
| 9. | Vadavar | | | |
| 10. | Koraiyar | | | |
| 11. | Paminiar | | | |
| 12. | Pandavayar | | | |
| 13. | Vellayar | | | |
| 14. | Mulliyar | | | |
| 15. | Ayyanar | | | |

| | | | | |
|---|---|---|---|---|
| **TRICHY DISTRICT** | | | | |
| 1. | Cauvery | Ponnaiyar Reservoirs | North bank Canal South Bank Canal | Kattalai Bed Regulator |
| | | | Kattalai Right-Left Canal | |
| 2. | Amaravathi | | Uyyakondan Channel | |
| 3. | Coleroon | | Nanganur channel | |
| | | | Pullambadi Channel | |
| | | | Ponnaniyar Reservoir new Canal | |
| **PUDUKKOTTAI DISTRICT.** | | | | |
| 1. | Vellar | - | Grand Anicut Canal | |
| 2. | Ambuliyaru | | | |
| 3. | Agniceru | | | |
| 4. | Koraiar | | | |
| **MADURAI DISTRICT** | | | | |
| 1. | Vaigai | Vaigai Reservoir | Gungun Valley Anaicut Canals | |
| 2. | Suriliyar | Sathiar Odai Reservoir | Periyar Main Canal | |
| 3. | Kottakudiar | | Manjalar Canal | |
| | | | Thirumangalam Main Canal | |
| | | | Sathiar Odai Reservoir Canals | |
| **ANNA DISTRICT** | | | | |
| 1. | Shanmughanathi | Palar Porandalar | Palar-Porandalar Main Canal | |
| | | | Thadakulam Tank canals | |
| 2. | Koduvanaru | Parappalar | Ramasandram Anicut Channel (Posappalam) | |
| | | | Vardamahadhi Reservoirs System | |
| 3. | Manjalaru | Vardamanadhi | Vardamahadhi Reservoirs System | |
| 4. | Mamdanadhi | Manjalar | Thirumangalam Main Channel | |
| 5. | Palar-Porandalar | Kodaikanal Lake | Periyar Main Canals | |
| 6. | Parajipalar | Berijam Lake | Murudanadhi Reservoir Left & Right Side | |
| 7. | Vaigai River | Kamaraj Sagar | Mayalaru Reservoir Canals | |
| **RAMANATHAPURAM DISTRICT** | | | | |
| 1. | Vaigai | R.S. Mangalam Tank | -- | |
| 2. | Vaipparu | Ramanad Big Tank | -- | |
| 3. | Vembaru | Kanoor Tank | -- | |
| 4. | | Maranadu Tank | -- | |
| PASUMPON MUTHURAMALINGAM DISTRICT | | | | |
| 1. | Vaigai | -- | Periyar Main Canals | |
| 2. | Manimuthar | | | |
| **KAMARAJAR DISTRICT** | | | | |
| 1. | Vaipparu | Kullur Sandai | -- | |

| | | | |
|---|---|---|---|
| | | Reservoir | |
| 2. | -- | Vembokottai Reservoir | |
| **THIRUNELVELI KATTABOMMAN DISTRICT** | | | |
| 1. | Thamaraparani | Manimuthar<br>Karuppanadhi<br>Ramanadhi<br>Gatana<br>Papanasam<br>Kadamba Tank<br>Vijayanarayar<br>Periyakulam<br>Tenkanai Tank | North Kodamelagian Channel<br>Nadiyunni Channel<br>Kannadian Channel<br>Kodayan Chennel<br>Palayam Channel |
| 2. | Karuppanadhi | | |
| 3. | Chettiar | | |
| 4. | Servalar | | |
| 5. | Manimuthar | | |
| | | | Tirunelveli Channel<br>Tenkal Channel<br>Vadakkal Channel<br>Ramanathi Reservoir |
| | | | |
| | | | |
| | | | |
| | | | Manimuthar Reservoir main Channel-Gatana Reservoir<br>Arasapattu Channel<br>Vadakuruvaipathu Channel Gatana Reservoirs<br>Radhapuram Channel |
| | | | |
| | | | |
| | | | |
| | | | |
| **<u>VOC CHIDAMBARANAR DISTRICT</u>** | | | |
| 1. | Tambaraparani | Korampallam Tank | Marudur Melakkal Channel |
| 2. | Vaippar | | South Main Channel of Srivaikundam Anicut |
| | | | North Main Channel of Srivaikundam Anicut |
| **KANYAKUMARI DISTRICT** | | | |
| 1. | Kodaiyaru | Pechiparai | Padmanabhapuram Puthen Channel |
| 2. | Valliar | Perunchani | Pandiankal |
| 3. | Palayaru | Chittarl | Thovala Channel |
| | | | N.P. Channel |
| | | | Pazhayaru |
| | | | E.K. Kal System |
| | | | A.V.M. Channel |
| | | | Thiruvithancode Canal System |
| | | | Pechiparai Left Bank Canal |
| | | | Pattanamkal System |
| | | | Radhapuram Canal |
| **COIMBATORE DISTRICT** | | | |
| 1. | Bhavani | Parambikulam | Ramakulan Channel |
| 2. | Noyyal | Sholayar | Kallapuram Channel |
| 3. | Amaravathi | Amaravathi | Parambikulam Right Left Canal |
| | | | Parambikulam Main Canal |
| | | | Bhalli Channel system |
| 4. | Aliyar | Aliyar | Vettaikaranpudur Canal |

| | | | |
|---|---|---|---|
| | | Poruvanpallar | Sethumadai Canal |
| | | Thunnokhadam | Udumalpet Canal |
| | | Upper Nivan | Aliyar Feeder Canal |
| | | Lower Nivan | Pollachi canal |
| | | Thirumathi | |
| **NILGIRIS DISTRICT** | | | |
| 1. | Moyar | Upper Bhavani | Avara Halla Canal |
| 2. | Bhavani | Emerald | |
| 3. | Pillur Pallam | Avalanche | |
| 4. | Kulkathurai Halla | Pillur | |
| 5. | Dedarahalla | Kundah | |
| 6. | Avarai Halla | Paikara | |
| 7. | Paikara | Ooty Halla | |
| 8. | Amkour halla | Parson Valley | |
| 9. | Singar | Glemergon | |
| | | Singara | |
| **PERIYAR DISTRICT** | | | |
| 1. | Cauvery | Bhavani Sagar | Modineri Anicut Canals |
| 2. | Bhavani | Uppar | Thadappalli Channel |
| | | | Lower Bhavani Channel |
| | | | Kalingarayan Anicut Canal |
| 3. | Moyar | Uttamalaikarai Odai | Upper Reservoirs canal |
| 4. | Noyyal | Varattapallam | Vattamalai Kaveri odai Reservoirs Canal |
| | | Gunderipallam | Varattappallam Keshmir Canal |
| | | | Gunderipallam Reservoirs right side and left side canals |
| **SALEM DISTRICT** | | | |
| 1. | Cauvery | Mettur Reservoir | Mettur Canals (East & West Bank canals) |
| 2. | Thirumanimuthar | Yercadu Lake | |
| 3. | Vashishtanadhi | | |
| **DHARMAPURI DISTRICT** | | | |
| 1. | Cauvery | Krishnagiri Reservoir | Krishnagiri Reservoir Main Canal |
| 2. | Pennaiyaru | Chinnar Reservoir | Bargur Tank Supply Channel (West & East) |
| 3. | Palar | Thunvalahalli Reservoir | Nedungal Anicut Channel |
| 4. | Chinnar I | Bargur Big Tank | Devarahalli Tank Supply Channel |
| 5. | Chinnar II | Mettur Reservoir | Chinnar Reservoir Right Side Channel |
| 6. | Bargur river | Pambar | |

| | | | | |
|---|---|---|---|---|
| 7. | Pambar | | | |
| 8. | Vaniar | | | |
| 9. | Chinnaru | | | |
| 10. | Palaru | | | |
| **NORTH ARCOT DISTRICT** | | | | |
| 1. | Palar | Sathanur Reservoir | Mahendravadi Channel<br>Kaveri pak Channel<br>Sukkiramallur Channel<br>Dari (Temmampattu) Channel<br>Kavai Channel<br>Govindavadi Channel | Palar Anaicut |
| 2. | Poiney | Dusi Mamandur Tank | | |
| 3. | Cheyyar | Kaveripakkam Tank | | |
| 4. | Pennaiyar | | | |
| 5. | Thurinjilaru | | | |
| | | | | |
| | | | Poiney Eastern Main Channel<br>Poiney Western Main Channel | Poiney Anicut |
| | | | | |
| | | | Sathanur Reservoir Project Canal<br>Sathanur Reservoir Project Right Bank Canal | Sathanur Reservoir |
| | | | | |

D.SUNDARESAN,
COMMISSIONER AND
SECRETARY TO GOVERNMENT

# Annexure 2 - Lease Deed

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தொழில் துறை – சிப்காட் – நில எடுப்பு – தூத்துக்குடி மாவட்டம் மற்றும் வட்டம் – அல்லிக்குளம், இராமசாமிபுரம், கீழத்தட்டப்பாறை, மேலத்தட்டப்பாறை, உமரிக்கோட்டை, பேரூரணி, தெற்கு சிலுக்கன்பட்டி ஆகிய கிராமங்கள் – சிப்காட் தொழிற்பூங்காவில் எண்ணெய் சுத்திகரிப்பு ஆலை அமைத்தல் – 904.40.00 ஹெக்டேர் நிலங்கள் – நில எடுப்பு/நில உரிமை மாற்றம் செய்திட தமிழ்நாடு தொழிலியல் நோக்கங்களுக்கான நில எடுப்புச் சட்டம், 1997 (தமிழ்நாடு சட்டம் 10/1999) மூலம் கையகப்படுத்தல் – நிர்வாக அனுமதி – ஆணை – வெளியிடப்படுகிறது.

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**தொழில் (சிப்காட்–நி.எ) துறை**

**அரசாணை (நிலை) எண்.100**

**நாள்: 26.02.2021**
**மாசி 14, சார்வரி வருடம்,**
**திருவள்ளுவர் ஆண்டு –2052.**

**படிக்க:**

1. தூத்துக்குடி மாவட்ட ஆட்சியரின் கடித எண். ந.க./இ5/20875/2020, நாள் 1.12.2020.
2. முதன்மைச் செயலர்/நில நிர்வாக ஆணையரின் (மு.கூ.பொ) கடித எண். எச்1/839042/2020, நாள் 1.2.2021.

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**ஆணை:**

பார்வை ஒன்றில் படிக்கப்பட்ட கடிதத்தில், தூத்துக்குடி மாவட்டம் மற்றும் வட்டம், அல்லிக்குளம், இராமசாமிபுரம், கீழத்தட்டப்பாறை, மேலத்தட்டப்பாறை, உமரிக்கோட்டை, பேரூரணி, தெற்கு சிலுக்கன்பட்டி ஆகிய கிராமங்களில் சிப்காட் தொழிற்பூங்காவில் எண்ணெய் சுத்திகரிப்பு ஆலை அமைக்க மொத்த விஸ்தீரணம் 897.49.50 ஹெக்டேர் (2216.81 ஏக்கர்) பட்டா புன்செய் நிலங்களை தொழிலியல் நோக்கங்களுக்கான நில எடுப்புச் சட்டம், 1997 (தமிழ்நாடு சட்டம் 10/1999)–ன் கீழ் நில எடுப்பு செய்திடவும், விஸ்தீரணம் 6.90.50 ஹெக்டேர் அரசு புறம்போக்கு நிலங்களை நில உரிமை மாற்றம் செய்திடவும், அரசின் நிர்வாக ஒப்புதல் வழங்கிடவும், மேற்படி நில எடுப்புகளை மேற்கொள்ள சிறப்பு பணியிடங்களை தோற்றுவித்திடவும் தூத்துக்குடி மாவட்ட ஆட்சியர் கோரியுள்ளார். அதன்படி, நில எடுப்பு மற்றும் நில உரிமை மாற்றம் செய்யப்பட உள்ள நிலங்கள் விபரம் :

| கிராமம் | நில எடுப்பு | | நில உரிமை மாற்றம் |
|---|---|---|---|
| | விஸ்தீரணம் (ஹெக். ஏர்ஸ்) | | |
| | நன் செய் | புன்செய் | புறம் போக்கு |
| அல்லிக்குளம் | – | 185.96.50 | 0.49.00 |
| கீழத்தட்டப்பாறை | – | 189.64.50 | 3.50.50 |
| மேலத்தட்டப்பாறை | – | 173.21.50 | 2.62.00 |
| உமரிக்கோட்டை | – | 106.01.01 | 0 |
| பேரூரணி | – | 140.77.00 | 0.29.00 |
| இராமசாமிபுரம் | – | 95.23.00 | 0 |
| தெற்கு சிலுக்கன்பட்டி | – | 6.66.00 | 0 |
| மொத்தம் | | 897.49.50 | 6.90.50 |

2. மேற்காணும் நில எடுப்புப் பணிகளை மேற்கொள்ள ஏதுவாக கீழ்க்காணும் 9 அலகுக்குரிய பணியிடங்கள் தேவைப்படுவதாகவும், அதில் பட்டியலில் உள்ள வரிசை எண்.1 முதல் 3–ல் குறிப்பிடப்பட்டுள்ள பணியிடங்களை காலமுறை ஊதியத்திலும், வரிசை எண்.4 முதல் 8 வரையுள்ள பணியிடங்களை வெளிமுகமை மூலம் நிரப்பிடலாம் எனவும் மாவட்ட ஆட்சியர் தெரிவித்துள்ளார்:

| வ. எண் | பதவியின் பெயர் | பணியாளர் எண்ணிக்கை (அலகு 1 க்கு) | | மொத்த பணியாளர்கள் எண்ணிக்கை (9 அலகுக்கு) | ஊதிய விகிதம் |
|---|---|---|---|---|---|
| 1. | தனி வட்டாட்சியர் | 1 | 1x9 | 9 | Level 20 (Rs.37700 – 119500) |
| 2. | தனி வருவாய் ஆய்வாளர் (உதவியாளர் நிலையில் ) | 2 | 2x9 | 18 | Level 10 (Rs.20600 – 65500) |
| 3. | வருவாய் உதவியாளர் | 1 | 1x9 | 9 | Level 10 (Rs.20600 – 65500) |
| 4. | தட்டச்சர்/கணினி இயக்குநர் | 1 | 1x9 | 9 | Rs.17000/ per month (Contract Pay) |
| 5. | அலுவலக உதவியாளர் | 1 | 1x9 | 9 | Rs.12000/ per month (Contract Pay) |
| 6. | சார் ஆய்வாளர் (நில அளவை) | 2 | 2x9 | 18 | Rs.22000/ per month (Contract Pay) |
| 7. | வரைவாளர் 1 | 1 | 1x9 | 9 | Rs.22000/ per month (Contract Pay) |
| 8. | புல உதவியாளர் | 4 | 4x9 | 36 | Rs.12000/ per month (Contract Pay) |
| | மொத்தம் | 13 | 13x9 | 117 | |

3. மேலும், நில எடுப்புப் பணிகளை துரிதப்படுத்தவும், 9 அலகுகளில் பணிபுரியும் அலுவலர்களின் பணிகளை கண்காணித்திடவும் ஒரு மாவட்ட வருவாய் அலுவலர் தலைமையிலான கீழ்காணும் அலுவலகம் தேவைப்படுவதாகவும், அதில் பட்டியலில் காணும் வரிசை எண்.1 முதல் 5–ல் குறிப்பிடப்பட்டுள்ள பணியிடங்களை காலமுறை ஊதியத்திலும், வரிசை எண்.6–ல் குறிப்பிடப்பட்டுள்ள பணியிடங்ளை வெளிமுகமை மூலம் நிரப்பிடலாம் எனவும் தூத்துக்குடி மாவட்ட ஆட்சியர் தெரிவித்துள்ளார் :

| வ. எண். | பதவியின் பெயர் | பணியாளர் எண்ணிக்கை | ஊதிய விகிதம் |
|---|---|---|---|
| 1. | தனி மாவட்ட வருவாய் அலுவலர் (நில எடுப்பு) | 1 | Level 26 (Rs.61900 – 196700) |
| 2. | துணை ஆட்சியர் (ஒருங்கிணைப்பு அலுவலர்) | 1 | Level 22 (Rs.56100 – 177500) |
| 3. | தனி வட்டாட்சியர் | 1 | Level 20 (Rs.37700 – 119500) |
| 4. | வருவாய் உதவியாளர் | 2 | Level 10 (Rs.20600 – 65500) |
| 5. | இளநிலை உதவியாளர் | 2 | Level 8 (Rs.19500 – 62000) |
| 6. | அலுவலக உதவியாளர் | 1 | Rs.12000/- per month (Contract Pay) |
| | மொத்தம் | 8 | |

4. மேற்கண்ட நில எடுப்புப் பணிகளை மேற்கொள்ள தோராய நிர்வாக செலவினங்கள் கீழ்கண்டவாறு தூத்துக்குடி மாவட்ட ஆட்சியர் தெரிவித்துள்ளார் :

| வ. எண். | விபரம் | தொகை (ரூபாயில்) |
|---|---|---|
| 1. | மொத்த இழப்பீடுத் தொகை | 42,95,17,410/- |
| 2. | நிர்வாக செலவினத் தொகை ( 14.5 % * 429517410 ) | 6,22,80,024/- |
| | மொத்தம் | 49,17,97,434/- |

5. பார்வை ஒன்றில் படிக்கப்பட்ட கடிதத்தில், தூத்துக்குடி மாவட்ட ஆட்சியரின் பரிந்துரை அறிக்கையினை ஏற்று தூத்துக்குடி வட்டம், அல்லிக்குளம், இராமசாமிபுரம், கீழத்தட்டப்பாறை, மேலத்தட்டப்பாறை, உமரிக்கோட்டை, பேரூரணி, தெற்கு சிலுக்கன்பட்டி ஆகிய கிராமங்களில் மொத்தம் 2251.14 ஏக்கர் நிலங்கள், சிப்காட் தொழிற்பூங்காவில் எண்ணெய் சுத்திகரிப்பு ஆலை அமைக்க தமிழ்நாடு தொழிலியல் நோக்கங்களுக்கான நில எடுப்புச் சட்டம், 1997 (தமிழ்நாடு சட்டம் 10/1999)-ன் கீழ் நிர்வாக அனுமதி மற்றும் மேற்கண்ட நில எடுப்பு பணிகளை மேற்கொள்ள மாவட்ட ஆட்சியர் பத்தி 2 மற்றும் 3-இல் கோரியுள்ளபடி 9 அலகுகள் கொண்ட பணியாளர்களை ஏற்படுத்தவும், அதற்கான நிதி ஒதுக்கீடு செய்யுமாறும் பார்வை இரண்டில் படிக்கப்பட்ட கடிதத்தில் முதன்மைச் செயலாளர்/நில நிர்வாக ஆணையர் (மு.கூபொ.) கேட்டுக் கொண்டுள்ளார்.

6. முதன்மைச் செயலர்/நில நிர்வாக ஆணையர் மற்றும் தூத்துக்குடி மாவட்ட ஆட்சியரின் கருத்துருவினை கவனமுடன் ஆராய்ந்து, தூத்துக்குடி மாவட்டம் மற்றும் வட்டம், அல்லிக்குளம், இராமசாமிபுரம், கீழத்தட்டப்பாறை, மேலத்தட்டப்பாறை, உமரிக்கோட்டை, பேரூரணி, தெற்கு சிலுக்கன்பட்டி ஆகிய கிராமங்களில் சிப்காட் தொழிற்பூங்காவில் எண்ணெய் சுத்திகரிப்பு ஆலை அமைக்க தமிழ்நாடு தொழிலியல் நோக்கங்களுக்கான நில எடுப்புச் சட்டம், 1997 (தமிழ்நாடு சட்டம் 10/1999)-ன் கீழ் விஸ்தீரணம் 897.49.50 ஹெக்டேர் புன்செய் நிலங்களை நிலஎடுப்பு செய்திடவும், விஸ்தீரணம் 6.90.50 ஹெக்டேர் அரசு புறம்போக்கு நிலங்களை நில உரிமை மாற்றம் செய்திடவும் ஆக மொத்தம் 904.40.00 ஹெக்டேர் நிலங்களுக்கும் மற்றும் மேற்கண்ட நில எடுப்பு பணிகளை மேற்கொள்ள மாவட்ட ஆட்சியர் கோரியுள்ளபடி தனி வட்டாட்சியர் தலைமையின் கீழ் மொத்தம் 13 பணியாளர்கள் வீதம் 9 அலகுகள் கொண்ட பணியிடங்களை ஏற்படுத்தவும், ஒரு மாவட்ட வருவாய் அலுவலர் தலைமையின் கீழ் 8 பணியாளர்கள் கொண்ட தலைமை அலுவலகம் ஏற்படுத்தவும், அதற்கான நிதி ஒதுக்கீடு செய்யவும் கீழ்க்காணும் நிபந்தனைகளுடன் நிர்வாக அனுமதி வழங்கி அரசு ஆணையிடுகிறது :

அ) மேற்படி கிராமங்களிலுள்ள அரசு புறம்போக்கு நிலங்களை சிப்காட் நிறுவனத்திற்கு நில உரிமை மாற்றம் செய்வதற்கு முன்மொழிவினை நில நிர்வாக ஆணையர் சென்னை-5 வழியாக அரசின் வருவாய்த்துறைக்கு அனுப்பிவைக்க வேண்டும்.

ஆ) அரசு புறம்போக்கு நிலங்களை சிப்காட் நிறுவனத்திற்கு நில உரிமை மாற்றம் செய்ய சம்பந்தப்பட்ட ஊராட்சிகளின் ஒப்புதல் பெறப்பட வேண்டும்.

இ) மேற்படி புறம்போக்குகளில் நீர் நிலைகள் இருப்பின் சம்பந்தப்பட்ட செயற்பொறியாளர் (நீவஆ) அவர்களிடம் தடையில்லாச்சான்று பெறவேண்டும்.

ஈ) மேற்படி புறம்போக்குகளில் வாய்க்கால் மற்றும் கால்வாய் ஏதேனும் இருப்பின் முறையான நில அளவைக்கு பின்னர் கல் நட்டும், தண்ணீரை தடைசெய்யாமலும், தூர்க்காமலும், கால்வாயை கடப்பதற்கு சில பாலங்கள் அமைத்தும் தொழிற்சாலைகளிலிருந்து உண்டாகும் கழிவுநீர் நீர்நிலைகளில் செல்லாதவாறும் உள் கட்டமைப்பு வசதிகளை கேட்பு நிறுவனம் ஏற்படுத்தி கொள்ள வேண்டும்.

உ) நில எடுப்பு நடவடிக்கையின்போது உள்ளூர் பொது மக்களிடமிருந்து ஆட்சேபணைகள் ஏதேனும் வரப்பெற்றால் அதன் உண்மைத் தன்மையை நன்கு ஆய்வு செய்து தமிழ்நாடு தொழிலியல் நோக்கங்களுக்கான நில எடுப்புச் சட்டம் 1997 (தமிழ்நாடு சட்டம் 10/99) பிரிவு 3(2)–இன் கீழ் அறிவிக்கை வெளியிடுமுன்னர் உரிய நடவடிக்கைகள் மேற்கொள்ளப்பட வேண்டும்.

ஊ) மேலும் நில எடுப்பு நடவடிக்கையின் போது நில உரிமையாளர்கள்/சம்மந்தப்பட்ட நபர்களிடம் நேரடி பேச்சு வார்த்தையின் மூலமும் நிலங்களை வாங்கிக் கொள்வதற்கும் சிப்காட் நிறுவனத்திற்கு அனுமதி அளிக்கலாம்.

எ) மேலும் நில நிர்வாக சீர்திருத்தச் சட்டம் மற்றும் பூமி தானம் கீழ் கவரப்பட்ட நிலங்களுக்கு மாவட்ட ஆட்சியர் முழு பொறுப்பேற்று நடைமுறைகளில் உள்ள விதிகளின்படி நடவடிக்கை மேற்கொள்ள வேண்டும்.

ஏ) மேற்படி பணியிடங்களுக்கு ஏற்படும் நிர்வாகச் செலவினங்களை சிப்காட் நிறுவனம் ஏற்க வேண்டும்.

7. பத்தி–6–ல் அனுமதிக்கப்பட்டுள்ள தற்காலிகப் பணியாளர்களின் (நில எடுப்பு) ஊதிய செலவினம் மற்றும் நிதி ஒதுக்கீடு தொடர்பான கணக்கு தலைப்புகள் குறித்து இத்துறையால் பின்னர் தனி ஆணையாக வெளியிடப்படும்.

**(ஆளுநரின் ஆணைப்படி)**

**நா. முருகானந்தம்**
**அரசு முதன்மைச் செயலாளர்**

பெறுநர்:
முதன்மைச் செயலர்/
நில நிர்வாக ஆணையர் (மு.கூ.பொ.),
சேப்பாக்கம், சென்னை–5.

மேலாண்மை இயக்குநர்,
சிப்காட்,
19–A, ருக்மணி லஷ்மிபதி சாலை,
எழும்பூர், சென்னை– 600 008.

மாவட்ட ஆட்சியர்,
தூத்துக்குடி மாவட்டம்.

நகல்:

மாண்புமிகு முதலமைச்சர் அலுவலகம்,
சென்னை–600 009.

தொழில் (அ.நி.மு. II) துறை,
சென்னை–600 009.

இ.கோப்பு/உதிரி நகல்.

**// ஆணைப்படி அனுப்பப்படுகிறது //**

**பிரிவு அலுவலர்**

Industries Department – SIPCOT – Land Acquisition – Thoothukudi District and Taluk – Allikulam, Ramasamypuram, Keelathattaparai, Melathattaparai, Umarikottai, Perurani, and Therkusillukkanpatti Villages – Establishment of Oil Refinery Plant within SIPCOT Industrial Park – Acquisition/Transfer of Ownership of 904.40.00 Hectares of Land under the Tamil Nadu Acquisition of Land for Industrial Purposes Act, 1997 (Tamil Nadu Act 10 of 1999) – Administrative Sanction – Order Issued.

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## INDUSTRIES (SIPCOT) DEPARTMENT

**Government Order (Ms) No.100** **Dated: 26.02.2021**
**Maasi 14, Saarvari Year,**
**Thiruvalluvar Year – 2052**

1. District Collector, Thoothukudi District ; Letter No. Na.Ka./I5/20875/2020, dated 01.02.2020.
2. Managing Director, Managing Director, State Industries Promotion Corporation of Tamil Nadu (SIPCOT) **;** letter No. 1/839042/2020, dated 01.02.2021.

**ORDER:**

As stated in the letter read in the first reference, in Thoothukudi Taluk of Thoothukudi District, in the villages of Allikulam, Ramasamypuram, Keelathattaparai, Melathattaparai, Umarikottai, Perurani, and Therkusillukkanpatti, SIPCOT has proposed the establishment of an Oil Refinery Plant. For this industrial purpose, considering the welfare of the industrial sector, in the first phase, patta and punjai lands to an extent of **897.49.50 hectares (2,216.81 acres)** have been directly purchased and registered.In addition, for acquiring the required 6.9050 hectares of government poramboke lands, acquisition has been carried out under the provisions of the Tamil Nadu Land Acquisition Act, 1997 (Tamil Nadu Act 10/1999). The District Collector, Thoothukudi District, has recommended fixation of land cost based on the government guideline value and transfer of land ownership to SIPCOT, in accordance with Government norms. Accordingly, the details of the lands acquired and transferred are as follows:

**Land Alienation Details:**

| Village Name | Land Acquisition | | Land Ownership Transfer |
|---|---|---|---|
| | Land Classification (in Ha) | | |
| | Nanjai | Punjai | Poramboke |
| Allikulam | — | 185.96.50 | 0.49.00 |
| Keelathattaparai | — | 189.64.50 | 3.50.50 |
| Melathattaparai | — | 173.21.50 | 2.62.00 |
| Umarikottai | | 106.01.01 | 0 |
| Perurani | — | 140.77.00 | 0.29.00 |

| | | | |
|---|---|---|---|
| Ramasamypuram | — | 95.23.00 | 0 |
| Therkusillukkanpatti | — | 6.66.00 | 0 |
| **Total** | — | **897.49.50** | **6.9050** |

2. The District Collector has stated that in order to carry out the above land acquisition work, the following 9 types of work will be required. Out of these, the work mentioned in details no. 1 to 3 in the list can be carried out on a periodic basis. The work mentioned in details no. 4 to 8 can be filled on an outsourcing basis.

| S. No | Name of the Post | No. of Posts (Per Unit) | | Total No. of Posts (for 9 Units) | Salary / Pay Scale |
|---|---|---|---|---|---|
| 1 | Special Tahsildar | 1 | 1x9 | 9 | Level 20 (Rs. 37,700 – 1,19,500) |
| 2 | Special Revenue officer (Assistant) | 2 | 2x9 | 18 | Level 10 (Rs. 20,600 – 65,500) |
| 3 | Assistant Revenue officer | 1 | 1x9 | 9 | Level 10 (Rs. 20,600 – 65,500) |
| 4 | Type writer / Computer Operator | 1 | 1x9 | 9 | Rs. 17,000/- per month (Contract Pay) |
| 5 | Clerk | 1 | 1x9 | 9 | Rs. 12,000/- per month (Contract Pay) |
| 6 | Land Surveyor | 2 | 2x9 | 18 | Rs. 22,000/- per month (Contract Pay) |
| 7 | Draftsperson 1 | 1 | 1x9 | 9 | Rs. 22,000/- per month (Contract Pay) |
| 8 | Survey Assistant | 4 | 4x9 | 36 | Rs. 12,000/- per month (Contract Pay) |
| **Total** | | **13** | **13x9** | **117** | |

3. Furthermore, to expedite land acquisition activities and supervise the work of officials in the 9 offices, it has been decided that an office headed by a district-level officer is required. The posts under serial numbers 1 to 5 may be filled in the regular pay scale, while the post under serial number 6 may be filled on an outsourcing basis, as informed by the District Collector, Thoothukudi.

| Sl. No. | Designation | No. of Posts | Pay Scale / Remuneration |
|---|---|---|---|
| 1. | Special District Revenue Officer (Land Acquisition) | 1 | Level 26 (Rs.61,900 – 1,96,700) |
| 2. | Deputy Collector (Coordinating Officer) | 1 | Level 22 (Rs.56,100 – 1,77,500) |
| 3. | Special Tahsildar | 1 | Level 20 (Rs.37,700 – 1,19,500) |
| 4. | Revenue Assistant | 2 | Level 10 (Rs.20,600 – 65,500) |
| 5. | Junior Assistant | 2 | Level 8 (Rs.19,500 – 62,000) |
| 6. | Office Assistant | 1 | Rs.12,000/- per month (Contract Pay) |
| | **Total** | **8** | |

4. The District Collector, Thoothukudi, has informed that the approximate financial requirements for the above land acquisition activities are as follows:

| Sl. No. | Description | Amount (in Rupees) |
|---|---|---|
| 1. | Total Compensation Amount | 42,95,17,410/- |
| 2. | Administrative Expenses (14.5% × 4,29,51,740) | 6,22,80,024/- |
| | **Total** | 49,17,97,434/- |

5. In the letter referred to in Reference 1, based on the recommendation report of the District Collector of Thoothukudi, administrative approval has been granted for the acquisition of a total of 2,251.14 acres of land in Allikulam, Ramasamypuram, Keelathattaparai, Melathattaparai, Umarikottai, Perurani, and Therkusillukkanpatti villages of Thoothukudi Taluk, Thoothukudi District, for the establishment of an oil refinery within the SIPCOT Industrial Park, under the Tamil Nadu Acquisition of Land for Industrial Purposes Act, 1997 (Tamil Nadu Act 10 of 1999).Further, as per Sections 2 and 3 of the District Collector's proposal, the letter in Reference 2, issued by the Principal Secretary / Commissioner of Land Administration (Public), has requested the formation of 9 units of staff to carry out the aforementioned land acquisition work and to allocate the necessary funds for the same.

6. After carefully reviewing the recommendations of the Principal Secretary / Commissioner of Land Administration and the District Collector, Thoothukudi, the Government accords administrative approval for the acquisition of **897.49.50 hectares** of dryland and the transfer of ownership for **6.90.50 hectares** of Government poramboke land, totaling **904.40.00 hectares**, for the establishment of an oil refinery within the SIPCOT Industrial Park located in Allikulam, Ramasamypuram, Keelathattaparai, Melathattaparai, Umarikottai, Perurani, and Therkusillukkanpatti villages of Thoothukudi Taluk and District, under the Tamil Nadu Acquisition of Land for Industrial Purposes Act, 1997 (Tamil Nadu Act 10 of 1999). Further, as per the proposal of the District Collector, the Government has sanctioned the creation of 13 posts across 9 distinct job roles under the leadership of a Special Tahsildar to undertake the above land acquisition activities. Additionally, a head office with 8 personnel under the supervision of a District Revenue Officer shall be established, and the necessary funds will be allocated subject to the specified conditions:

a) The proposal for transferring ownership of Government poramboke lands located in the above-mentioned villages to SIPCOT shall be forwarded to the Revenue Department of the Government through the Commissioner of Land Administration, Chennai – 5.

b) Prior approval must be obtained from the respective Village Panchayats for the transfer of Government poramboke lands to SIPCOT.

c) If any waterbodies are present within the poramboke lands, a No Objection Certificate (NOC) must be obtained from the concerned Executive Engineer of the Water Resources Department.

d) In the event that any porambokke irrigation channels or canals exist, proper land surveying must be carried out. Infrastructure shall be developed to ensure that stone bunds or barriers do not obstruct or divert the natural flow of water. Where necessary, bridges shall be constructed to cross the canals, and appropriate infrastructure shall be established by the project proponent to ensure that wastewater from industrial units does not enter any waterbodies.

e) If objections are raised by local residents during the land acquisition process, their views must be carefully examined. Appropriate action shall be taken in accordance with Section 3(2) of the Tamil Nadu Acquisition of Land for Industrial Purposes Act, 1997 (Tamil Nadu Act 10 of 1999), prior to the issuance of the land acquisition report.

f) During the land acquisition process, SIPCOT may be permitted to acquire lands through direct negotiations with landowners and stakeholders, where feasible.

g) For lands falling under the Land Administration Reform Acts or covered under land grant provisions, the District Collector shall take full responsibility and ensure that due procedures are followed as per existing regulations.

h) The administrative expenses arising from the creation of the above-mentioned posts shall be borne by SIPCOT.

7. Regarding the salary expenditure and budget allocation for the temporary staff (land acquisition) sanctioned in Paragraph 6, the relevant accounting heads will be issued separately by this department through a separate Government Order.

**(By Order of the Governor)**

**N. Muruganantham**
Principal Secretary

**To**
The Principal Secretary /
Commissioner of Land Administration,
Chepauk, Chennai – 5.

Managing Director
SIPCOT
19-A, Rukmani Lakshmipathi Road,
Egmore, Chennai, Tamil Nadu, India – 600008

**District Collector,**
Thoothukudi District.

**Copy to:**
The Hon'ble Chief Minister's Office,
Chennai – 600 009

Industries (Aa.Na.Mu. II) Department,
Chennai – 600 009

**Section Officer**

**//Forwarded by Order of the Government//**

**Details of lands identified for establishment of SIPCOT Industrial Park at Allikulam, South Silukanpatti, Keelathattaparai, Melathattaparai, Peroorani, Umarikottai, Ramasamypuram villages of Thoothukudi Taluk and district**

**ABSTRACT**

| | Land Extent (in ha) | | |
|---|---|---|---|
| **Village** | **Patta** | **Poramboke** | **Total** |
| Allikulam | 184.692 | 1.753 | 186.445 |
| Therkusillukkanpatti | 6.660 | 0.000 | 6.660 |
| Keelathattaparai | 189.640 | 3.505 | 193.145 |
| Melathattaparai | 97.445 | 1.950 | 99.395 |
| Perurani | 140.770 | 0.290 | 141.060 |
| Umarikottai | 104.180 | 0.000 | 104.180 |
| Ramasamypuram | 65.355 | 0.000 | 65.355 |
| **Total** | **788.742** | **7.498** | **796.240** |
| **Total (in acre)** | **1951.325** | **17.055** | **1966.713** |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Allikulam | 1-/1 | 0.605 | Patta |
| Allikulam | 1-/2 | 0.600 | Patta |
| Allikulam | 1/3A | 0.615 | Patta |
| Allikulam | 1/3B | 0.485 | Patta |
| Allikulam | 1/3C | 0.040 | Patta |
| Allikulam | 1/3D | 0.140 | Patta |
| Allikulam | 1-/4 | 0.170 | Patta |
| Allikulam | 1/5A | 0.640 | Patta |
| Allikulam | 1/5B | 0.060 | Patta |
| Allikulam | 1/5C | 0.605 | Patta |
| Allikulam | 1/6,8,10A | 1.502 | Patta |
| Allikulam | 1/7 | 0.453 | Poramboke |
| Allikulam | 1-/9 | 0.385 | Patta |
| Allikulam | 1/10B | 0.590 | Patta |
| Allikulam | 6-/1 | 0.350 | Patta |
| Allikulam | 6-/2 | 0.310 | Patta |
| Allikulam | 6-/3 | 2.315 | Patta |
| Allikulam | 6/4A | 0.810 | Patta |
| Allikulam | 6/4B1 | 0.800 | Patta |
| Allikulam | 6/4C | 0.405 | Patta |
| Allikulam | 6/4D | 0.425 | Patta |
| Allikulam | 6/4E | 0.400 | Patta |
| Allikulam | 6/4F | 0.400 | Patta |
| Allikulam | 6-/5 | 0.500 | Patta |
| Allikulam | 6/6A | 0.135 | Patta |
| Allikulam | 6/6B | 0.065 | Patta |
| Allikulam | 7 | 0.615 | Patta |
| Allikulam | 8/1,2,4A | 0.985 | Patta |
| Allikulam | 8/1,2,4B | 0.770 | Patta |
| Allikulam | 8-/10 | 0.165 | Patta |
| Allikulam | 8/-11 | 0.085 | Patta |
| Allikulam | 8-/3 | 0.320 | Patta |
| Allikulam | 8-/5 | 0.055 | Poramboke |
| Allikulam | 8/6,8 | 0.410 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Allikulam | 8-/7 | 0.215 | Patta |
| Allikulam | 8-/9 | 0.205 | Patta |
| Allikulam | 10-/1 | 0.745 | Patta |
| Allikulam | 10-/2 | 1.045 | Patta |
| Allikulam | 10-/3 | 0.055 | Poramboke |
| Allikulam | 10-/4,16 | 1.915 | Patta |
| Allikulam | 10-/5 | 0.835 | Patta |
| Allikulam | 10/6A | 0.430 | Patta |
| Allikulam | 10/6B | 0.500 | Patta |
| Allikulam | 10/6C | 0.080 | Patta |
| Allikulam | 10/7A | 0.135 | Patta |
| Allikulam | 10/7B | 0.615 | Patta |
| Allikulam | 10/7C | 0.235 | Patta |
| Allikulam | 10-/8 | 0.540 | Patta |
| Allikulam | 10/9A | 0.590 | Patta |
| Allikulam | 10/9B | 1.035 | Patta |
| Allikulam | 10-/11,12 | 0.480 | Patta |
| Allikulam | 10-/13 | 0.140 | Patta |
| Allikulam | 10-/14 | 0.485 | Patta |
| Allikulam | 11-/1A | 1.120 | Patta |
| Allikulam | 11/1B | 0.755 | Patta |
| Allikulam | 11-/2 | 0.990 | Patta |
| Allikulam | 11-/3 | 0.285 | Patta |
| Allikulam | 11-/4 | 0.325 | Patta |
| Allikulam | 11-/5 | 0.260 | Patta |
| Allikulam | 11-/6 | 0.415 | Patta |
| Allikulam | 11-/7 | 0.455 | Patta |
| Allikulam | 12/1A | 0.660 | Patta |
| Allikulam | 12/1B | 0.650 | Patta |
| Allikulam | 12/1C | 0.580 | Patta |
| Allikulam | 12/1D | 1.035 | Patta |
| Allikulam | 12/1E | 1.810 | Patta |
| Allikulam | 12/2A | 0.750 | Patta |
| Allikulam | 12/2B | 0.790 | Patta |
| Allikulam | 12-/3 | 0.080 | Poramboke |
| Allikulam | 12-/4 | 0.495 | Patta |
| Allikulam | 12-/5 | 0.620 | Patta |
| Allikulam | 12-/6 | 0.130 | Patta |
| Allikulam | 12-/7 | 0.520 | Patta |
| Allikulam | 13/1A | 0.970 | Patta |
| Allikulam | 13/1B | 0.330 | Patta |
| Allikulam | 13/1C | 0.780 | Patta |
| Allikulam | 13/1D | 0.795 | Patta |
| Allikulam | 13/2A | 0.090 | Patta |
| Allikulam | 13/2B | 0.735 | Patta |
| Allikulam | 13-/3 | 0.915 | Patta |
| Allikulam | 13-/4 | 0.820 | Patta |
| Allikulam | 13-/5 | 0.070 | Patta |
| Allikulam | 14-/1 | 0.030 | Patta |
| Allikulam | 14-/10 | 0.340 | Patta |
| Allikulam | 14-/11 | 0.515 | Patta |
| Allikulam | 14-/12 | 0.355 | Patta |
| Allikulam | 14-/13 | 0.100 | Patta |
| Allikulam | 14-/14 | 0.685 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Allikulam | 14-/15 | 0.495 | Patta |
| Allikulam | 14-/16 | 0.065 | Patta |
| Allikulam | 14-/17 | 0.100 | Patta |
| Allikulam | 14-/2 | 0.100 | Patta |
| Allikulam | 14-/3 | 0.535 | Patta |
| Allikulam | 14-/4 | 0.375 | Patta |
| Allikulam | 14-/5 | 0.730 | Patta |
| Allikulam | 14-/6 | 1.005 | Patta |
| Allikulam | 14-/7 | 0.470 | Patta |
| Allikulam | 14-/8 | 0.285 | Patta |
| Allikulam | 14-/9 | 0.100 | Patta |
| Allikulam | 15/1A | 0.500 | Patta |
| Allikulam | 15/1B | 2.060 | Patta |
| Allikulam | 15-/2 | 0.070 | Poramboke |
| Allikulam | 15/3A | 0.540 | Patta |
| Allikulam | 15/3B | 0.490 | Patta |
| Allikulam | 15/3C | 0.540 | Patta |
| Allikulam | 15/3D | 0.200 | Patta |
| Allikulam | 15-/4 | 0.375 | Patta |
| Allikulam | 16-/1 | 0.330 | Patta |
| Allikulam | 16/2A | 0.370 | Patta |
| Allikulam | 16/2B | 0.930 | Patta |
| Allikulam | 16/3,4,5 | 1.435 | Patta |
| Allikulam | 16/6A | 1.015 | Patta |
| Allikulam | 16/6B | 0.590 | Patta |
| Allikulam | 17/1A | 0.060 | Patta |
| Allikulam | 17/1B | 0.580 | Patta |
| Allikulam | 17/1C | 0.920 | Patta |
| Allikulam | 17/1D | 0.090 | Patta |
| Allikulam | 17-/2 | 0.020 | Poramboke |
| Allikulam | 17-/3 | 0.045 | Patta |
| Allikulam | 18-/2 | 0.125 | Poramboke |
| Allikulam | 18-/8 | 0.450 | Patta |
| Allikulam | 18-/9 | 0.260 | Patta |
| Allikulam | 18-/10 | 0.130 | Patta |
| Allikulam | 18/11A | 0.005 | Patta |
| Allikulam | 18/11B | 0.005 | Patta |
| Allikulam | 18/11C | 0.170 | Patta |
| Allikulam | 18/12A | 0.060 | Patta |
| Allikulam | 18/12B | 0.055 | Patta |
| Allikulam | 18/12C | 0.130 | Patta |
| Allikulam | 18/13 | 0.850 | Patta |
| Allikulam | 18/14 | 0.460 | Patta |
| Allikulam | 18/15 | 0.605 | Patta |
| Allikulam | 18/16 | 0.685 | Patta |
| Allikulam | 18/17 | 0.860 | Patta |
| Allikulam | 18/18A | 0.345 | Patta |
| Allikulam | 18/18B | 0.365 | Patta |
| Allikulam | 18/19 | 0.305 | Patta |
| Allikulam | 18/1A | 0.325 | Patta |
| Allikulam | 18/1B | 0.400 | Patta |
| Allikulam | 18/1C | 0.110 | Patta |
| Allikulam | 18/1D | 0.080 | Patta |
| Allikulam | 18/1E | 0.030 | Patta |
| Allikulam | 18/1F | 0.210 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Allikulam | 18/1G | 0.060 | Patta |
| Allikulam | 18/1H | 0.240 | Patta |
| Allikulam | 18/1I | 0.125 | Patta |
| Allikulam | 18/1J | 0.080 | Patta |
| Allikulam | 18/1K | 0.070 | Patta |
| Allikulam | 18/3A | 0.035 | Patta |
| Allikulam | 18/3B | 0.050 | Patta |
| Allikulam | 18/3C | 0.020 | Patta |
| Allikulam | 18/3D | 0.020 | Patta |
| Allikulam | 18/3E | 0.020 | Patta |
| Allikulam | 18/3F | 0.025 | Patta |
| Allikulam | 18/3G | 0.060 | Patta |
| Allikulam | 18/4A1 | 0.295 | Patta |
| Allikulam | 18/4A2 | 0.495 | Poramboke |
| Allikulam | 18/4B | 0.140 | Poramboke |
| Allikulam | 18/4C | 0.175 | Poramboke |
| Allikulam | 18/5A | 0.665 | Patta |
| Allikulam | 18/5B | 0.110 | Patta |
| Allikulam | 18/5C | 0.190 | Patta |
| Allikulam | 18/6A | 0.580 | Patta |
| Allikulam | 18/6B | 0.055 | Patta |
| Allikulam | 18/6C | 0.075 | Patta |
| Allikulam | 18/7A | 0.795 | Patta |
| Allikulam | 18/7B | 0.090 | Patta |
| Allikulam | 18/7C | 0.020 | Patta |
| Allikulam | 19/1A | 1.050 | Patta |
| Allikulam | 19/1B | 0.800 | Patta |
| Allikulam | 19/1C | 0.340 | Patta |
| Allikulam | 19/1D | 0.150 | Patta |
| Allikulam | 19/1E | 0.290 | Patta |
| Allikulam | 19-/2 | 0.180 | Patta |
| Allikulam | 19-/3 | 0.340 | Patta |
| Allikulam | 19-/4 | 0.300 | Patta |
| Allikulam | 19/5,8A | 0.840 | Patta |
| Allikulam | 19/5,8B | 0.800 | Patta |
| Allikulam | 19/5,8C | 0.250 | Patta |
| Allikulam | 19-/6 | 0.085 | Patta |
| Allikulam | 19-/7 | 1.110 | Patta |
| Allikulam | 19-/9 | 0.590 | Patta |
| Allikulam | 20-/1 | 0.755 | Patta |
| Allikulam | 20-/2 | 0.220 | Patta |
| Allikulam | 20-/3 | 0.615 | Patta |
| Allikulam | 20-/4 | 0.085 | Poramboke |
| Allikulam | 20-/5 | 0.195 | Patta |
| Allikulam | 20-/6 | 0.670 | Patta |
| Allikulam | 20/7A | 0.085 | Patta |
| Allikulam | 20/7B | 0.050 | Patta |
| Allikulam | 20/8A | 0.170 | Patta |
| Allikulam | 20/8B | 0.270 | Patta |
| Allikulam | 20/8C | 0.650 | Patta |
| Allikulam | 20/8D | 1.155 | Patta |
| Allikulam | 20/9A | 0.710 | Patta |
| Allikulam | 20/9B | 0.770 | Patta |
| Allikulam | 20-/10 | 1.655 | Patta |
| Allikulam | 20-/11 | 0.505 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Allikulam | 20-/12 | 0.555 | Patta |
| Allikulam | 20/13 | 0.785 | Patta |
| Allikulam | 20/14 | 0.220 | Patta |
| Allikulam | 20/15A | 0.165 | Patta |
| Allikulam | 20/15B | 0.420 | Patta |
| Allikulam | 20/15C | 0.020 | Patta |
| Allikulam | 20/16A | 0.205 | Patta |
| Allikulam | 20/16B | 0.210 | Patta |
| Allikulam | 20/17 | 0.150 | Patta |
| Allikulam | 20/18 | 0.535 | Patta |
| Allikulam | 20/20 | 0.065 | Patta |
| Allikulam | 20/21 | 0.040 | Patta |
| Allikulam | 20/22 | 0.005 | Patta |
| Allikulam | 20/23 | 0.035 | Patta |
| Allikulam | 20/24 | 0.190 | Patta |
| Allikulam | 21 | 0.565 | Patta |
| Allikulam | 22-/1 | 0.455 | Patta |
| Allikulam | 22/2A | 0.735 | Patta |
| Allikulam | 22/2B | 0.445 | Patta |
| Allikulam | 22-/4 | 0.035 | Patta |
| Allikulam | 23-/1 | 0.910 | Patta |
| Allikulam | 23/2A1 | 0.035 | Patta |
| Allikulam | 23/2B | 0.145 | Patta |
| Allikulam | 23/3A | 0.240 | Patta |
| Allikulam | 23/3B | 0.295 | Patta |
| Allikulam | 23/4A | 0.160 | Patta |
| Allikulam | 23/4B | 0.150 | Patta |
| Allikulam | 23/4C | 0.300 | Patta |
| Allikulam | 23/4D | 0.120 | Patta |
| Allikulam | 24 | 0.605 | Patta |
| Allikulam | 25/1,3A | 0.390 | Patta |
| Allikulam | 25/1,3B | 0.230 | Patta |
| Allikulam | 25/1,3C | 0.010 | Patta |
| Allikulam | 25/1,3D | 0.065 | Patta |
| Allikulam | 25/1,3E | 0.040 | Patta |
| Allikulam | 25/1,3F | 0.150 | Patta |
| Allikulam | 25/1,3G | 0.110 | Patta |
| Allikulam | 25/1,3H | 0.110 | Patta |
| Allikulam | 25/1,3I | 0.110 | Patta |
| Allikulam | 25/1,3J | 0.105 | Patta |
| Allikulam | 25/2A | 0.155 | Patta |
| Allikulam | 25/2B | 0.155 | Patta |
| Allikulam | 25/2C | 0.140 | Patta |
| Allikulam | 25/2D | 0.120 | Patta |
| Allikulam | 25/4A | 0.035 | Patta |
| Allikulam | 25/4B | 0.570 | Patta |
| Allikulam | 25/4C | 0.460 | Patta |
| Allikulam | 25/4D | 0.140 | Patta |
| Allikulam | 25/4E | 0.250 | Patta |
| Allikulam | 25/4F | 0.080 | Patta |
| Allikulam | 25/4G | 0.210 | Patta |
| Allikulam | 25/4H | 0.850 | Patta |
| Allikulam | 25/4I | 1.080 | Patta |
| Allikulam | 25/5,7A | 0.770 | Patta |
| Allikulam | 25/5,7B | 0.700 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Allikulam | 25-/6 | 0.870 | Patta |
| Allikulam | 25/8A,9A,10 | 0.790 | Patta |
| Allikulam | 25/8B,9B,10 B | 0.370 | Patta |
| Allikulam | 25/8B,9B,10 B | 0.735 | Patta |
| Allikulam | 25/8C,9C,10 C | 0.375 | Patta |
| Allikulam | 25/8C,9C,10 C | 0.360 | Patta |
| Allikulam | 25/8C,9C,10 C | 0.370 | Patta |
| Allikulam | 26/1A | 0.730 | Patta |
| Allikulam | 26/1B | 0.020 | Patta |
| Allikulam | 26/1C | 0.410 | Patta |
| Allikulam | 26/1D | 0.380 | Patta |
| Allikulam | 26/1E | 0.010 | Patta |
| Allikulam | 26/1F | 0.100 | Patta |
| Allikulam | 26/1G | 0.090 | Patta |
| Allikulam | 26-/2 | 0.405 | Patta |
| Allikulam | 27 | 0.495 | Patta |
| Allikulam | 28-/10 | 0.050 | Patta |
| Allikulam | 28/1A | 0.700 | Patta |
| Allikulam | 28/1B | 0.325 | Patta |
| Allikulam | 28/1C | 0.180 | Patta |
| Allikulam | 28/2A | 0.350 | Patta |
| Allikulam | 28/2B | 0.450 | Patta |
| Allikulam | 28/2C | 0.140 | Patta |
| Allikulam | 28/2D | 0.190 | Patta |
| Allikulam | 28/3A | 0.070 | Patta |
| Allikulam | 28/3B | 0.320 | Patta |
| Allikulam | 28/3C | 0.070 | Patta |
| Allikulam | 28/4A | 0.025 | Patta |
| Allikulam | 28/4B | 0.025 | Patta |
| Allikulam | 28/4C | 0.025 | Patta |
| Allikulam | 28/4D | 0.025 | Patta |
| Allikulam | 28-/5 | 0.085 | Patta |
| Allikulam | 28-/6 | 0.360 | Patta |
| Allikulam | 28-/7 | 0.330 | Patta |
| Allikulam | 28-/8 | 0.350 | Patta |
| Allikulam | 28/9A | 0.030 | Patta |
| Allikulam | 28/9B | 0.025 | Patta |
| Allikulam | 29-/10 | 0.630 | Patta |
| Allikulam | 29/1A | 0.050 | Patta |
| Allikulam | 29/1B | 0.120 | Patta |
| Allikulam | 29/1C | 0.235 | Patta |
| Allikulam | 29-/2 | 0.845 | Patta |
| Allikulam | 29/3A | 0.700 | Patta |
| Allikulam | 29/3B | 0.635 | Patta |
| Allikulam | 29-/4 | 1.190 | Patta |
| Allikulam | 29-/5 | 0.615 | Patta |
| Allikulam | 29-/6 | 0.615 | Patta |
| Allikulam | 29-/7 | 1.300 | Patta |
| Allikulam | 29-/8 | 1.865 | Patta |
| Allikulam | 29-/9 | 0.455 | Patta |
| Allikulam | 30-/1 | 1.345 | Patta |
| Allikulam | 30-/2 | 1.220 | Patta |
| Allikulam | 30/3,4A | 1.630 | Patta |
| Allikulam | 30/3,4B | 0.060 | Patta |
| Allikulam | 30/3,4C | 0.005 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Allikulam | 30/5A | 0.060 | Patta |
| Allikulam | 30/5B | 0.310 | Patta |
| Allikulam | 30/6A | 0.110 | Patta |
| Allikulam | 30/6B | 0.185 | Patta |
| Allikulam | 30/6C | 1.180 | Patta |
| Allikulam | 30/7A | 0.010 | Patta |
| Allikulam | 31-/1 | 0.795 | Patta |
| Allikulam | 31-/2 | 0.890 | Patta |
| Allikulam | 31-/3 | 1.215 | Patta |
| Allikulam | 31-/4 | 0.615 | Patta |
| Allikulam | 31-/5 | 0.400 | Patta |
| Allikulam | 31-/6 | 0.160 | Patta |
| Allikulam | 32 | 0.665 | Patta |
| Allikulam | 33-/1 | 1.285 | Patta |
| Allikulam | 33/2A | 1.170 | Patta |
| Allikulam | 33/2B | 0.040 | Patta |
| Allikulam | 33/2C | 0.005 | Patta |
| Allikulam | 34-/1 | 1.575 | Patta |
| Allikulam | 34-/2 | 0.385 | Patta |
| Allikulam | 35 | 0.225 | Patta |
| Allikulam | 36 | 0.370 | Patta |
| Allikulam | 37-/1 | 0.400 | Patta |
| Allikulam | 37-/2 | 0.290 | Patta |
| Allikulam | 37-/3 | 0.070 | Patta |
| Allikulam | 38-/1 | 0.810 | Patta |
| Allikulam | 38-/2 | 0.810 | Patta |
| Allikulam | 38-/3 | 0.800 | Patta |
| Allikulam | 38-/4 | 0.185 | Patta |
| Allikulam | 39/1A | 0.100 | Patta |
| Allikulam | 39/1B | 0.280 | Patta |
| Allikulam | 39/1C | 3.590 | Patta |
| Allikulam | 39-/2 | 0.295 | Patta |
| Allikulam | 40/1A | 0.015 | Patta |
| Allikulam | 40/1B | 0.425 | Patta |
| Allikulam | 40/1C | 0.010 | Patta |
| Allikulam | 40/1D | 0.410 | Patta |
| Allikulam | 40/2 | 0.260 | Patta |
| Allikulam | 40/3A | 0.150 | Patta |
| Allikulam | 40/3B | 0.355 | Patta |
| Allikulam | 40/3C | 0.190 | Patta |
| Allikulam | 40/4A | 0.340 | Patta |
| Allikulam | 40/4B | 0.265 | Patta |
| Allikulam | 40/4C | 0.500 | Patta |
| Allikulam | 40/4D | 0.665 | Patta |
| Allikulam | 40/5 | 0.260 | Patta |
| Allikulam | 40/7 | 0.285 | Patta |
| Allikulam | 41/1A | 0.620 | Patta |
| Allikulam | 41/1B | 0.600 | Patta |
| Allikulam | 41/2 | 0.185 | Patta |
| Allikulam | 42/1A | 0.260 | Patta |
| Allikulam | 42/1B | 0.445 | Patta |
| Allikulam | 42/1C | 0.155 | Patta |
| Allikulam | 42/1D | 0.165 | Patta |
| Allikulam | 42/1E | 0.155 | Patta |
| Allikulam | 42/1F | 0.160 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Allikulam | 42/1G | 0.135 | Patta |
| Allikulam | 42/1H | 0.120 | Patta |
| Allikulam | 42/1I | 0.215 | Patta |
| Allikulam | 42/2 | 0.125 | Patta |
| Allikulam | 42/3,4A1 | 0.340 | Patta |
| Allikulam | 42/3,4A2 | 0.420 | Patta |
| Allikulam | 42/3,4A3 | 0.395 | Patta |
| Allikulam | 42/3,4A4 | 0.390 | Patta |
| Allikulam | 42/4B | 0.160 | Patta |
| Allikulam | 42/4C | 0.260 | Patta |
| Allikulam | 42/5 | 0.120 | Patta |
| Allikulam | 43 | 0.510 | Patta |
| Allikulam | 45/1,2A | 1.400 | Patta |
| Allikulam | 45/1,2B | 1.435 | Patta |
| Allikulam | 47/1,2 | 0.480 | Patta |
| Allikulam | 47/3A | 0.715 | Patta |
| Allikulam | 47/3B | 0.695 | Patta |
| Allikulam | 47/3C | 0.630 | Patta |
| Allikulam | 47/3D | 0.575 | Patta |
| Allikulam | 48/1 | 0.145 | Patta |
| Allikulam | 48/2 | 0.330 | Patta |
| Allikulam | 49 | 0.615 | Patta |
| Allikulam | 50/1A | 0.085 | Patta |
| Allikulam | 50/1B | 0.075 | Patta |
| Allikulam | 50/1C | 0.340 | Patta |
| Allikulam | 50/2A | 0.010 | Patta |
| Allikulam | 50/2B | 0.445 | Patta |
| Allikulam | 51/10 | 0.180 | Patta |
| Allikulam | 51/1A | 0.715 | Patta |
| Allikulam | 51/1B | 0.375 | Patta |
| Allikulam | 51/1C | 0.350 | Patta |
| Allikulam | 51/1D | 0.160 | Patta |
| Allikulam | 51/2A | 0.090 | Patta |
| Allikulam | 51/2B | 0.235 | Patta |
| Allikulam | 51/2C | 0.250 | Patta |
| Allikulam | 51/3 | 1.090 | Patta |
| Allikulam | 51/4A | 0.455 | Patta |
| Allikulam | 51/4B | 0.225 | Patta |
| Allikulam | 51/5 | 0.085 | Patta |
| Allikulam | 51/6 | 0.200 | Patta |
| Allikulam | 51/7 | 0.060 | Patta |
| Allikulam | 51/8 | 0.160 | Patta |
| Allikulam | 51/9 | 0.065 | Patta |
| Allikulam | 52/1 | 2.640 | Patta |
| Allikulam | 52/2 | 1.060 | Patta |
| Allikulam | 53/1 | 0.930 | Patta |
| Allikulam | 53/2 | 0.050 | Patta |
| Allikulam | 54/1 | 1.150 | Patta |
| Allikulam | 54/2 | 0.050 | Patta |
| Allikulam | 55/1 | 1.395 | Patta |
| Allikulam | 55/2 | 0.655 | Patta |
| Allikulam | 55/3 | 1.295 | Patta |
| Allikulam | 55/4 | 4.310 | Patta |
| Allikulam | 56/1 | 0.100 | Patta |
| Allikulam | 56/2 | 0.405 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Allikulam | 56/3 | 0.050 | Patta |
| Therkusillukkanpatti | 72/3 | 0.770 | Patta |
| Therkusillukkanpatti | 72/4 | 0.340 | Patta |
| Therkusillukkanpatti | 72/5 | 0.410 | Patta |
| Therkusillukkanpatti | 72/6 | 0.370 | Patta |
| Therkusillukkanpatti | 72/7A | 0.360 | Patta |
| Therkusillukkanpatti | 72/7B | 0.380 | Patta |
| Therkusillukkanpatti | 73/5 | 0.810 | Patta |
| Therkusillukkanpatti | 73/6 | 0.855 | Patta |
| Therkusillukkanpatti | 84/5 | 0.235 | Patta |
| Therkusillukkanpatti | 84/6 | 0.855 | Patta |
| Therkusillukkanpatti | 84/7 | 0.815 | Patta |
| Therkusillukkanpatti | 85/1 | 0.460 | Patta |
| Keelathattaparai | 335 | 1.545 | Patta |
| Keelathattaparai | 337 | 0.800 | Patta |
| Keelathattaparai | 338 | 0.495 | Patta |
| Keelathattaparai | 340 | 1.480 | Patta |
| Keelathattaparai | 342 | 1.920 | Patta |
| Keelathattaparai | 344 | 0.365 | Patta |
| Keelathattaparai | 345 | 1.155 | Patta |
| Keelathattaparai | 346 | 0.800 | Patta |
| Keelathattaparai | 347 | 0.410 | Patta |
| Keelathattaparai | 348 | 1.770 | Patta |
| Keelathattaparai | 349 | 0.790 | Patta |
| Keelathattaparai | 350 | 1.730 | Patta |
| Keelathattaparai | 351 | 1.190 | Patta |
| Keelathattaparai | 352 | 1.285 | Patta |
| Keelathattaparai | 353 | 2.815 | Patta |
| Keelathattaparai | 354 | 0.500 | Patta |
| Keelathattaparai | 355 | 1.060 | Patta |
| Keelathattaparai | 356 | 2.645 | Patta |
| Keelathattaparai | 358 | 1.700 | Patta |
| Keelathattaparai | 360 | 1.535 | Patta |
| Keelathattaparai | 362 | 1.185 | Patta |
| Keelathattaparai | 364 | 1.255 | Patta |
| Keelathattaparai | 372 | 3.345 | Patta |
| Keelathattaparai | 373 | 0.710 | Patta |
| Keelathattaparai | 375 | 1.715 | Patta |
| Keelathattaparai | 376 | 3.260 | Patta |
| Keelathattaparai | 381 | 1.620 | Patta |
| Keelathattaparai | 382 | 1.170 | Patta |
| Keelathattaparai | 383 | 0.730 | Patta |
| Keelathattaparai | 385 | 1.160 | Patta |
| Keelathattaparai | 386 | 1.265 | Patta |
| Keelathattaparai | 387 | 1.275 | Patta |
| Keelathattaparai | 388 | 1.390 | Patta |
| Keelathattaparai | 391 | 0.630 | Patta |
| Keelathattaparai | 395 | 0.070 | Patta |
| Keelathattaparai | 400 | 1.025 | Patta |
| Keelathattaparai | 401 | 0.450 | Patta |
| Keelathattaparai | 402 | 0.730 | Patta |
| Keelathattaparai | 403 | 1.015 | Patta |
| Keelathattaparai | 406 | 1.495 | Patta |
| Keelathattaparai | 434 | 3.110 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Keelathattaparai | 435 | 0.600 | Poramboke |
| Keelathattaparai | 438 | 0.650 | Patta |
| Keelathattaparai | 444 | 2.350 | Patta |
| Keelathattaparai | 445 | 0.820 | Patta |
| Keelathattaparai | 446 | 1.135 | Patta |
| Keelathattaparai | 447 | 0.715 | Patta |
| Keelathattaparai | 448 | 1.150 | Patta |
| Keelathattaparai | 449 | 0.335 | Patta |
| Keelathattaparai | 450 | 3.640 | Patta |
| Keelathattaparai | 456 | 0.920 | Patta |
| Keelathattaparai | 459 | 0.450 | Patta |
| Keelathattaparai | 461 | 0.650 | Patta |
| Keelathattaparai | 462 | 1.560 | Patta |
| Keelathattaparai | 463 | 0.620 | Patta |
| Keelathattaparai | 464 | 2.155 | Patta |
| Keelathattaparai | 465 | 0.495 | Patta |
| Keelathattaparai | 466 | 0.260 | Patta |
| Keelathattaparai | 282/1 | 0.140 | Patta |
| Keelathattaparai | 282/2 | 0.550 | Patta |
| Keelathattaparai | 282/3 | 0.960 | Patta |
| Keelathattaparai | 282/4 | 0.990 | Patta |
| Keelathattaparai | 282/5 | 0.130 | Patta |
| Keelathattaparai | 283/1A | 0.780 | Patta |
| Keelathattaparai | 283/1B | 0.810 | Patta |
| Keelathattaparai | 283/1C | 0.400 | Patta |
| Keelathattaparai | 283/1D | 0.420 | Patta |
| Keelathattaparai | 283/1E | 0.740 | Patta |
| Keelathattaparai | 283/2 | 0.400 | Patta |
| Keelathattaparai | 283/3 | 0.400 | Patta |
| Keelathattaparai | 283/4 | 0.310 | Patta |
| Keelathattaparai | 283/5 | 0.370 | Patta |
| Keelathattaparai | 333/1A | 0.940 | Patta |
| Keelathattaparai | 333/1B | 0.930 | Patta |
| Keelathattaparai | 333/2A1 | 0.700 | Patta |
| Keelathattaparai | 333/2A2 | 0.490 | Patta |
| Keelathattaparai | 333/2B | 0.275 | Patta |
| Keelathattaparai | 336/1 | 0.395 | Patta |
| Keelathattaparai | 336/2 | 2.025 | Patta |
| Keelathattaparai | 339/1A | 0.290 | Patta |
| Keelathattaparai | 339/1B | 0.910 | Patta |
| Keelathattaparai | 339/2 | 0.985 | Patta |
| Keelathattaparai | 341/1A1B | 0.160 | Patta |
| Keelathattaparai | 341/1A1C | 0.190 | Patta |
| Keelathattaparai | 341/1A1D | 0.155 | Patta |
| Keelathattaparai | 341/1A1E | 0.290 | Patta |
| Keelathattaparai | 341/1A2 | 0.810 | Patta |
| Keelathattaparai | 341/1B | 0.370 | Patta |
| Keelathattaparai | 341/2 | 0.435 | Patta |
| Keelathattaparai | 343/1 | 0.860 | Patta |
| Keelathattaparai | 343/2 | 0.860 | Patta |
| Keelathattaparai | 343/3 | 0.820 | Patta |
| Keelathattaparai | 357/1 | 1.540 | Poramboke |
| Keelathattaparai | 357/2 | 3.905 | Patta |
| Keelathattaparai | 359/1 | 1.100 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Keelathattaparai | 359/2 | 1.155 | Patta |
| Keelathattaparai | 359/3 | 1.255 | Patta |
| Keelathattaparai | 359/4 | 1.490 | Patta |
| Keelathattaparai | 361/1 | 0.485 | Patta |
| Keelathattaparai | 361/2A | 1.270 | Patta |
| Keelathattaparai | 361/2B | 0.695 | Patta |
| Keelathattaparai | 361/2C | 0.690 | Patta |
| Keelathattaparai | 361/2D | 0.810 | Patta |
| Keelathattaparai | 363/1 | 0.465 | Patta |
| Keelathattaparai | 363/2 | 0.505 | Patta |
| Keelathattaparai | 363/3 | 0.295 | Patta |
| Keelathattaparai | 363/4 | 0.300 | Patta |
| Keelathattaparai | 365/1 | 0.260 | Patta |
| Keelathattaparai | 365/2 | 0.260 | Patta |
| Keelathattaparai | 366/1 | 0.070 | Patta |
| Keelathattaparai | 366/2 | 1.095 | Patta |
| Keelathattaparai | 366/3 | 0.145 | Patta |
| Keelathattaparai | 366/4 | 0.010 | Poramboke |
| Keelathattaparai | 366/5 | 0.045 | Poramboke |
| Keelathattaparai | 367/1 | 0.995 | Patta |
| Keelathattaparai | 367/2 | 0.005 | Patta |
| Keelathattaparai | 367/3 | 0.010 | Poramboke |
| Keelathattaparai | 368/1 | 0.280 | Patta |
| Keelathattaparai | 368/2 | 0.940 | Patta |
| Keelathattaparai | 369/1 | 1.290 | Patta |
| Keelathattaparai | 369/2 | 1.115 | Patta |
| Keelathattaparai | 370/1 | 3.935 | Patta |
| Keelathattaparai | 370/2 | 1.120 | Patta |
| Keelathattaparai | 370/3 | 0.010 | Patta |
| Keelathattaparai | 370/4 | 0.010 | Poramboke |
| Keelathattaparai | 371/1 | 0.925 | Patta |
| Keelathattaparai | 371/2 | 0.090 | Patta |
| Keelathattaparai | 371/3 | 2.630 | Patta |
| Keelathattaparai | 371/4 | 0.700 | Patta |
| Keelathattaparai | 371/5 | 1.000 | Patta |
| Keelathattaparai | 371/6 | 0.090 | Poramboke |
| Keelathattaparai | 374/1 | 1.215 | Patta |
| Keelathattaparai | 374/2 | 1.440 | Patta |
| Keelathattaparai | 374/3 | 2.025 | Patta |
| Keelathattaparai | 374/4 | 0.115 | Poramboke |
| Keelathattaparai | 377/1 | 1.675 | Patta |
| Keelathattaparai | 377/2 | 1.610 | Patta |
| Keelathattaparai | 384/1 | 3.265 | Patta |
| Keelathattaparai | 384/2 | 0.875 | Patta |
| Keelathattaparai | 389/1 | 0.230 | Patta |
| Keelathattaparai | 390/1 | 0.055 | Patta |
| Keelathattaparai | 390/3 | 0.245 | Patta |
| Keelathattaparai | 392/1 | 0.790 | Patta |
| Keelathattaparai | 392/2 | 0.010 | Poramboke |
| Keelathattaparai | 393/1 | 0.075 | Patta |
| Keelathattaparai | 393/2 | 0.015 | Patta |
| Keelathattaparai | 393/3 | 0.010 | Patta |
| Keelathattaparai | 393/4 | 0.725 | Patta |
| Keelathattaparai | 393/5 | 0.625 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Keelathattaparai | 393/6 | 0.980 | Patta |
| Keelathattaparai | 393/7 | 0.025 | Poramboke |
| Keelathattaparai | 394/1 | 0.805 | Patta |
| Keelathattaparai | 394/3 | 0.105 | Patta |
| Keelathattaparai | 394/4 | 0.050 | Patta |
| Keelathattaparai | 394/5 | 0.040 | Poramboke |
| Keelathattaparai | 394/6 | 0.015 | Poramboke |
| Keelathattaparai | 396/1 | 0.860 | Patta |
| Keelathattaparai | 396/3 | 0.155 | Patta |
| Keelathattaparai | 397/1 | 0.840 | Patta |
| Keelathattaparai | 398/1 | 0.925 | Patta |
| Keelathattaparai | 398/2 | 0.430 | Patta |
| Keelathattaparai | 398/3 | 0.415 | Patta |
| Keelathattaparai | 398/4 | 1.590 | Patta |
| Keelathattaparai | 399/1 | 0.705 | Patta |
| Keelathattaparai | 399/2 | 0.005 | Poramboke |
| Keelathattaparai | 404/1 | 0.285 | Patta |
| Keelathattaparai | 404/2 | 0.615 | Patta |
| Keelathattaparai | 405/1 | 1.475 | Patta |
| Keelathattaparai | 405/2 | 1.380 | Patta |
| Keelathattaparai | 407/1 | 1.700 | Patta |
| Keelathattaparai | 407/2 | 1.095 | Patta |
| Keelathattaparai | 408/1 | 1.360 | Patta |
| Keelathattaparai | 408/2 | 0.015 | Patta |
| Keelathattaparai | 408/3 | 0.025 | Poramboke |
| Keelathattaparai | 416/1 | 1.550 | Patta |
| Keelathattaparai | 416/2 | 0.245 | Patta |
| Keelathattaparai | 416/3 | 0.055 | Poramboke |
| Keelathattaparai | 417/1 | 0.380 | Patta |
| Keelathattaparai | 417/2 | 0.695 | Patta |
| Keelathattaparai | 418/1 | 2.255 | Patta |
| Keelathattaparai | 418/2 | 0.050 | Poramboke |
| Keelathattaparai | 419/1 | 0.590 | Poramboke |
| Keelathattaparai | 419/2 | 0.265 | Patta |
| Keelathattaparai | 420/1 | 1.190 | Patta |
| Keelathattaparai | 420/2 | 4.280 | Patta |
| Keelathattaparai | 433/2 | 1.050 | Patta |
| Keelathattaparai | 436/1A | 0.710 | Patta |
| Keelathattaparai | 436/1B | 0.285 | Patta |
| Keelathattaparai | 436/1C | 0.415 | Patta |
| Keelathattaparai | 436/2 | 1.405 | Patta |
| Keelathattaparai | 437/2 | 0.275 | Patta |
| Keelathattaparai | 439/1 | 0.205 | Patta |
| Keelathattaparai | 439/2A | 0.065 | Patta |
| Keelathattaparai | 440/1B | 0.165 | Patta |
| Keelathattaparai | 440/2 | 0.985 | Patta |
| Keelathattaparai | 440/3 | 0.055 | Poramboke |
| Keelathattaparai | 441/1 | 0.045 | Patta |
| Keelathattaparai | 441/3 | 0.970 | Patta |
| Keelathattaparai | 442/1 | 0.065 | Patta |
| Keelathattaparai | 442/3 | 0.380 | Patta |
| Keelathattaparai | 442/4 | 0.010 | Poramboke |
| Keelathattaparai | 443/1 | 0.450 | Patta |
| Keelathattaparai | 443/2 | 0.010 | Poramboke |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Keelathattaparai | 451/2 | 1.260 | Patta |
| Keelathattaparai | 452/1 | 3.090 | Patta |
| Keelathattaparai | 452/2 | 0.130 | Patta |
| Keelathattaparai | 452/3 | 0.010 | Poramboke |
| Keelathattaparai | 452/5 | 0.820 | Patta |
| Keelathattaparai | 452/6 | 0.050 | Poramboke |
| Keelathattaparai | 453/1 | 0.180 | Patta |
| Keelathattaparai | 453/2 | 0.950 | Patta |
| Keelathattaparai | 453/3 | 0.015 | Poramboke |
| Keelathattaparai | 454/1 | 0.775 | Patta |
| Keelathattaparai | 454/2 | 0.805 | Patta |
| Keelathattaparai | 454/3 | 0.010 | Patta |
| Keelathattaparai | 454/4 | 0.015 | Poramboke |
| Keelathattaparai | 460/1 | 0.215 | Patta |
| Keelathattaparai | 460/2 | 0.290 | Patta |
| Keelathattaparai | 460/3 | 0.045 | Poramboke |
| Keelathattaparai | 467/2 | 5.360 | Patta |
| Keelathattaparai | 468/1 | 2.290 | Patta |
| Keelathattaparai | 468/2 | 0.400 | Patta |
| Keelathattaparai | 468/3 | 0.060 | Poramboke |
| Melathattaparai | 151/2 | 1.020 | Patta |
| Melathattaparai | 152 | 0.000 | Patta |
| Melathattaparai | 154/1 | 0.000 | Patta |
| Melathattaparai | 154/2 | 0.000 | Patta |
| Melathattaparai | 155/1A | 0.000 | Patta |
| Melathattaparai | 155/1B | 0.000 | Patta |
| Melathattaparai | 155/2 | 0.265 | Patta |
| Melathattaparai | 156/1 | 0.000 | Patta |
| Melathattaparai | 156/2 | 0.000 | Patta |
| Melathattaparai | 157/1 | 0.500 | Patta |
| Melathattaparai | 157/2 | 0.520 | Patta |
| Melathattaparai | 158/1 | 0.790 | Patta |
| Melathattaparai | 158/2 | 0.765 | Patta |
| Melathattaparai | 159 | 0.000 | Patta |
| Melathattaparai | 160 | 0.000 | Patta |
| Melathattaparai | 161 | 0.000 | Patta |
| Melathattaparai | 162/1 | 0.250 | Patta |
| Melathattaparai | 163/1 | 1.155 | Patta |
| Melathattaparai | 163/2A | 0.000 | Patta |
| Melathattaparai | 163/2B | 0.000 | Patta |
| Melathattaparai | 164/1 | 0.210 | Patta |
| Melathattaparai | 164/2 | 0.210 | Patta |
| Melathattaparai | 165/1 | 0.735 | Patta |
| Melathattaparai | 165/2 | 1.480 | Patta |
| Melathattaparai | 166 | 0.000 | Patta |
| Melathattaparai | 167 | 0.000 | Patta |
| Melathattaparai | 168 | 0.000 | Patta |
| Melathattaparai | 169 | 0.000 | Patta |
| Melathattaparai | 170 | 0.000 | Patta |
| Melathattaparai | 171/1 | 0.000 | Patta |
| Melathattaparai | 171/2 | 0.000 | Patta |
| Melathattaparai | 172 | 0.000 | Patta |
| Melathattaparai | 173/1 | 0.000 | Patta |
| Melathattaparai | 173/2 | 0.000 | Patta |
| Melathattaparai | 174 | 0.000 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Melathattaparai | 175 | 0.965 | Patta |
| Melathattaparai | 176/1A | 0.665 | Patta |
| Melathattaparai | 176/1B | 0.295 | Patta |
| Melathattaparai | 176/3B | 0.185 | Patta |
| Melathattaparai | 177/1 | 0.000 | Patta |
| Melathattaparai | 177/2 | 0.000 | Patta |
| Melathattaparai | 177/3 | 0.125 | Patta |
| Melathattaparai | 177/4 | 0.970 | Patta |
| Melathattaparai | 178 | 0.000 | Patta |
| Melathattaparai | 179 | 0.000 | Patta |
| Melathattaparai | 180/1 | 0.000 | Patta |
| Melathattaparai | 180/2 | 0.000 | Patta |
| Melathattaparai | 181/1 | 0.000 | Patta |
| Melathattaparai | 181/2 | 0.000 | Poramboke |
| Melathattaparai | 182/1 | 0.000 | Patta |
| Melathattaparai | 182/2 | 0.000 | Patta |
| Melathattaparai | 183/1 | 0.000 | Patta |
| Melathattaparai | 183/2 | 0.000 | Patta |
| Melathattaparai | 184/1 | 0.000 | Patta |
| Melathattaparai | 184/2 | 0.000 | Patta |
| Melathattaparai | 185/1 | 0.000 | Patta |
| Melathattaparai | 185/2 | 0.000 | Patta |
| Melathattaparai | 186/1 | 0.000 | Patta |
| Melathattaparai | 186/2 | 0.000 | Patta |
| Melathattaparai | 187/1A | 0.000 | Patta |
| Melathattaparai | 187/1B | 0.000 | Patta |
| Melathattaparai | 187/2 | 0.000 | Patta |
| Melathattaparai | 188 | 0.000 | Patta |
| Melathattaparai | 189/1 | 0.000 | Patta |
| Melathattaparai | 189/2 | 0.000 | Patta |
| Melathattaparai | 190 | 0.000 | Patta |
| Melathattaparai | 191/1 | 0.000 | Patta |
| Melathattaparai | 191/2A | 0.000 | Patta |
| Melathattaparai | 191/2B | 0.000 | Patta |
| Melathattaparai | 191/2C | 0.000 | Patta |
| Melathattaparai | 192 | 0.000 | Patta |
| Melathattaparai | 193 | 0.000 | Patta |
| Melathattaparai | 194 | 0.000 | Patta |
| Melathattaparai | 195/1 | 0.000 | Patta |
| Melathattaparai | 195/2 | 0.000 | Patta |
| Melathattaparai | 195/3 | 0.000 | Patta |
| Melathattaparai | 196 | 0.000 | Patta |
| Melathattaparai | 197/1 | 0.000 | Patta |
| Melathattaparai | 197/2 | 0.000 | Patta |
| Melathattaparai | 197/3 | 0.000 | Patta |
| Melathattaparai | 198 | 0.000 | Patta |
| Melathattaparai | 199/1 | 0.000 | Patta |
| Melathattaparai | 199/2 | 1.060 | Patta |
| Melathattaparai | 199/3 | 0.820 | Patta |
| Melathattaparai | 200 | 0.000 | Patta |
| Melathattaparai | 201/1 | 0.000 | Patta |
| Melathattaparai | 201/2 | 0.000 | Patta |
| Melathattaparai | 202/1 | 0.000 | Patta |
| Melathattaparai | 202/2 | 0.000 | Patta |
| Melathattaparai | 203/1 | 0.000 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Melathattaparai | 203/2 | 0.000 | Patta |
| Melathattaparai | 204 | 0.000 | Patta |
| Melathattaparai | 205/1 | 0.000 | Patta |
| Melathattaparai | 205/2 | 0.000 | Patta |
| Melathattaparai | 206 | 5.520 | Patta |
| Melathattaparai | 207 | 2.300 | Patta |
| Melathattaparai | 208 | 1.950 | Poramboke |
| Melathattaparai | 209/1 | 0.000 | Patta |
| Melathattaparai | 209/2 | 0.000 | Patta |
| Melathattaparai | 210/1 | 0.660 | Patta |
| Melathattaparai | 210/2 | 0.435 | Patta |
| Melathattaparai | 211/1 | 0.890 | Patta |
| Melathattaparai | 211/2 | 0.125 | Patta |
| Melathattaparai | 212 | 1.020 | Patta |
| Melathattaparai | 213 | 0.965 | Patta |
| Melathattaparai | 214 | 2.175 | Patta |
| Melathattaparai | 215 | 1.680 | Patta |
| Melathattaparai | 216/2 | 0.915 | Patta |
| Melathattaparai | 217/1 | 0.785 | Patta |
| Melathattaparai | 217/2 | 0.320 | Patta |
| Melathattaparai | 218/2 | 0.130 | Patta |
| Melathattaparai | 219 | 0.350 | Patta |
| Melathattaparai | 221/2 | 1.210 | Patta |
| Melathattaparai | 222 | 0.320 | Patta |
| Melathattaparai | 223 | 0.520 | Patta |
| Melathattaparai | 224/1 | 0.535 | Patta |
| Melathattaparai | 224/2 | 1.205 | Patta |
| Melathattaparai | 225 | 0.750 | Patta |
| Melathattaparai | 226/1 | 1.290 | Patta |
| Melathattaparai | 226/2 | 0.415 | Patta |
| Melathattaparai | 227 | 0.860 | Patta |
| Melathattaparai | 228 | 0.730 | Patta |
| Melathattaparai | 229/1 | 0.675 | Patta |
| Melathattaparai | 229/2 | 0.850 | Patta |
| Melathattaparai | 230/1 | 0.655 | Patta |
| Melathattaparai | 230/2 | 0.625 | Patta |
| Melathattaparai | 231/1 | 1.535 | Patta |
| Melathattaparai | 231/2 | 1.500 | Patta |
| Melathattaparai | 232/1 | 0.895 | Patta |
| Melathattaparai | 232/2 | 0.835 | Patta |
| Melathattaparai | 233 | 2.010 | Patta |
| Melathattaparai | 234 | 2.195 | Patta |
| Melathattaparai | 235 | 1.285 | Patta |
| Melathattaparai | 236/1 | 0.285 | Patta |
| Melathattaparai | 236/2A | 1.190 | Patta |
| Melathattaparai | 236/2B | 1.190 | Patta |
| Melathattaparai | 237 | 0.700 | Patta |
| Melathattaparai | 238/1 | 0.735 | Patta |
| Melathattaparai | 238/2 | 0.730 | Patta |
| Melathattaparai | 238/3 | 1.220 | Patta |
| Melathattaparai | 239 | 0.730 | Patta |
| Melathattaparai | 240/1 | 0.415 | Patta |
| Melathattaparai | 240/2 | 0.405 | Patta |
| Melathattaparai | 241 | 1.155 | Patta |
| Melathattaparai | 242 | 1.335 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Melathattaparai | 243 | 0.775 | Patta |
| Melathattaparai | 244 | 1.070 | Patta |
| Melathattaparai | 245 | 1.210 | Patta |
| Melathattaparai | 246 | 0.900 | Patta |
| Melathattaparai | 247/1 | 0.680 | Patta |
| Melathattaparai | 247/2 | 0.305 | Patta |
| Melathattaparai | 248 | 1.245 | Patta |
| Melathattaparai | 249 | 2.095 | Patta |
| Melathattaparai | 250/1 | 0.480 | Patta |
| Melathattaparai | 250/2 | 0.555 | Patta |
| Melathattaparai | 250/3 | 1.220 | Patta |
| Melathattaparai | 251/1A | 0.560 | Patta |
| Melathattaparai | 251/1B | 1.075 | Patta |
| Melathattaparai | 251/2A | 0.580 | Patta |
| Melathattaparai | 251/2B | 0.060 | Patta |
| Melathattaparai | 252 | 1.810 | Patta |
| Melathattaparai | 253 | 0.345 | Patta |
| Melathattaparai | 254/1 | 0.505 | Patta |
| Melathattaparai | 254/2 | 0.605 | Patta |
| Melathattaparai | 254/3 | 2.455 | Patta |
| Melathattaparai | 254/4 | 1.050 | Patta |
| Melathattaparai | 255 | 0.710 | Patta |
| Melathattaparai | 256/1 | 2.020 | Patta |
| Melathattaparai | 256/2 | 0.395 | Patta |
| Melathattaparai | 257/2 | 1.230 | Patta |
| Melathattaparai | 258/1 | 0.175 | Patta |
| Melathattaparai | 258/2 | 0.595 | Patta |
| Melathattaparai | 259 | 1.525 | Patta |
| Melathattaparai | 260/1 | 0.670 | Patta |
| Melathattaparai | 260/2 | 0.955 | Patta |
| Melathattaparai | 260/3 | 0.225 | Patta |
| Melathattaparai | 261 | 1.105 | Patta |
| Melathattaparai | 262/1,2A | 1.515 | Patta |
| Melathattaparai | 262/2B | 1.570 | Patta |
| Melathattaparai | 263 | 1.200 | Patta |
| Melathattaparai | 264 | 1.735 | Patta |
| Perurani | 172/1 | 0.535 | Patta |
| Perurani | 172/2 | 0.195 | Patta |
| Perurani | 172/3 | 0.170 | Patta |
| Perurani | 172/4 | 0.145 | Patta |
| Perurani | 172/5 | 0.105 | Patta |
| Perurani | 172/6 | 0.135 | Patta |
| Perurani | 172/8 | 0.580 | Patta |
| Perurani | 173/1 | 0.955 | Patta |
| Perurani | 173/2 | 0.860 | Patta |
| Perurani | 173/3 | 1.210 | Patta |
| Perurani | 174/1A | 0.850 | Patta |
| Perurani | 174/1B | 0.730 | Patta |
| Perurani | 174/2A | 0.270 | Patta |
| Perurani | 174/2B | 0.490 | Patta |
| Perurani | 174/3 | 1.020 | Patta |
| Perurani | 175/1 | 0.630 | Patta |
| Perurani | 175/2 | 1.280 | Patta |
| Perurani | 176/1 | 0.630 | Patta |
| Perurani | 176/2 | 0.330 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Perurani | 176/3 | 0.370 | Patta |
| Perurani | 176/4 | 0.735 | Patta |
| Perurani | 197/1 | 0.290 | Patta |
| Perurani | 197/2 | 0.730 | Patta |
| Perurani | 197/3 | 0.940 | Patta |
| Perurani | 197/4 | 0.965 | Patta |
| Perurani | 197/5 | 1.160 | Patta |
| Perurani | 197/6 | 0.735 | Patta |
| Perurani | 198/1 | 0.395 | Patta |
| Perurani | 198/2 | 0.405 | Patta |
| Perurani | 198/3 | 0.795 | Patta |
| Perurani | 199/1 | 0.430 | Patta |
| Perurani | 199/2 | 0.420 | Patta |
| Perurani | 199/3 | 0.415 | Patta |
| Perurani | 199/4A | 0.380 | Patta |
| Perurani | 199/4B | 0.390 | Patta |
| Perurani | 199/5 | 1.225 | Patta |
| Perurani | 200/1 | 0.825 | Patta |
| Perurani | 200/2 | 1.385 | Patta |
| Perurani | 201/1A | 0.465 | Patta |
| Perurani | 201/1B | 0.475 | Patta |
| Perurani | 201/1C | 0.475 | Patta |
| Perurani | 201/1D | 1.190 | Patta |
| Perurani | 201/2A | 0.660 | Patta |
| Perurani | 201/2B | 0.635 | Patta |
| Perurani | 202/1 | 0.695 | Patta |
| Perurani | 202/2 | 0.370 | Patta |
| Perurani | 202/3 | 0.430 | Patta |
| Perurani | 202/4 | 0.780 | Patta |
| Perurani | 203/1 | 0.485 | Patta |
| Perurani | 203/2 | 0.705 | Patta |
| Perurani | 203/3 | 1.110 | Patta |
| Perurani | 203/4 | 1.650 | Patta |
| Perurani | 204/1 | 1.685 | Patta |
| Perurani | 204/2 | 0.315 | Patta |
| Perurani | 204/3 | 0.390 | Patta |
| Perurani | 206/1 | 0.285 | Patta |
| Perurani | 206/2 | 0.300 | Patta |
| Perurani | 206/3 | 1.115 | Patta |
| Perurani | 206/4 | 1.340 | Patta |
| Perurani | 206/5 | 0.510 | Patta |
| Perurani | 206/6 | 0.730 | Patta |
| Perurani | 207/1 | 0.540 | Patta |
| Perurani | 207/2 | 1.520 | Patta |
| Perurani | 207/3 | 0.665 | Patta |
| Perurani | 207/4 | 0.810 | Patta |
| Perurani | 207/5 | 0.500 | Patta |
| Perurani | 207/6 | 0.370 | Patta |
| Perurani | 211/1 | 0.600 | Patta |
| Perurani | 211/2 | 0.290 | Poramboke |
| Perurani | 211/3 | 0.585 | Patta |
| Perurani | 213 | 3.575 | Patta |
| Perurani | 214/1 | 0.390 | Patta |
| Perurani | 214/2 | 1.115 | Patta |
| Perurani | 214/3 | 0.520 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Perurani | 214/4 | 0.880 | Patta |
| Perurani | 214/5 | 0.505 | Patta |
| Perurani | 214/6 | 0.405 | Patta |
| Perurani | 214/7 | 0.485 | Patta |
| Perurani | 214/8 | 0.480 | Patta |
| Perurani | 214/9 | 0.220 | Patta |
| Perurani | 215/1 | 0.840 | Patta |
| Perurani | 215/2 | 0.525 | Patta |
| Perurani | 215/3 | 0.310 | Patta |
| Perurani | 215/4 | 0.940 | Patta |
| Perurani | 215/5A | 0.430 | Patta |
| Perurani | 215/5B | 0.775 | Patta |
| Perurani | 215/5C | 0.485 | Patta |
| Perurani | 215/5D | 0.500 | Patta |
| Perurani | 215/5E | 0.470 | Patta |
| Perurani | 218/1 | 0.300 | Patta |
| Perurani | 218/2 | 0.290 | Patta |
| Perurani | 218/3 | 0.155 | Patta |
| Perurani | 218/4 | 0.200 | Patta |
| Perurani | 218/5 | 0.270 | Patta |
| Perurani | 218/6 | 0.275 | Patta |
| Perurani | 219/1 | 0.350 | Patta |
| Perurani | 219/2 | 0.150 | Patta |
| Perurani | 222 | 1.995 | Patta |
| Perurani | 223 | 1.200 | Patta |
| Perurani | 224/1 | 0.655 | Patta |
| Perurani | 224/2 | 1.295 | Patta |
| Perurani | 224/3 | 0.395 | Patta |
| Perurani | 224/4 | 0.795 | Patta |
| Perurani | 225/1 | 0.635 | Patta |
| Perurani | 225/2A | 0.340 | Patta |
| Perurani | 225/2B | 0.280 | Patta |
| Perurani | 225/3 | 0.675 | Patta |
| Perurani | 225/4A | 0.270 | Patta |
| Perurani | 225/4B | 0.270 | Patta |
| Perurani | 225/4C | 0.520 | Patta |
| Perurani | 225/5 | 0.905 | Patta |
| Perurani | 226/1 | 1.950 | Patta |
| Perurani | 226/2 | 0.800 | Patta |
| Perurani | 226/3A | 0.605 | Patta |
| Perurani | 226/3B | 0.595 | Patta |
| Perurani | 227/1 | 0.480 | Patta |
| Perurani | 227/2A | 0.620 | Patta |
| Perurani | 227/2B | 1.350 | Patta |
| Perurani | 227/2C | 0.700 | Patta |
| Perurani | 228/1 | 1.510 | Patta |
| Perurani | 228/2 | 0.215 | Patta |
| Perurani | 228/3 | 0.725 | Patta |
| Perurani | 228/4 | 0.465 | Patta |
| Perurani | 229 | 1.250 | Patta |
| Perurani | 230/1 | 2.025 | Patta |
| Perurani | 230/2 | 1.765 | Patta |
| Perurani | 230/3 | 0.710 | Patta |
| Perurani | 231/1 | 1.070 | Patta |
| Perurani | 231/2 | 0.715 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Perurani | 231/3 | 0.600 | Patta |
| Perurani | 231/4 | 0.575 | Patta |
| Perurani | 232/1 | 0.925 | Patta |
| Perurani | 232/2 | 1.480 | Patta |
| Perurani | 232/3 | 0.440 | Patta |
| Perurani | 232/4 | 0.390 | Patta |
| Perurani | 233/1 | 0.895 | Patta |
| Perurani | 233/2 | 0.580 | Patta |
| Perurani | 234 | 4.745 | Patta |
| Perurani | 235/1 | 1.200 | Patta |
| Perurani | 235/2 | 0.740 | Patta |
| Perurani | 235/3 | 0.725 | Patta |
| Perurani | 235/4 | 2.175 | Patta |
| Perurani | 238/1 | 0.685 | Patta |
| Perurani | 238/2 | 1.275 | Patta |
| Perurani | 238/3 | 1.395 | Patta |
| Perurani | 238/4 | 1.550 | Patta |
| Perurani | 239 | 4.335 | Patta |
| Perurani | 240/1 | 0.545 | Patta |
| Perurani | 240/2 | 2.615 | Patta |
| Perurani | 240/3 | 0.670 | Patta |
| Perurani | 241/1 | 0.965 | Patta |
| Perurani | 241/2 | 2.060 | Patta |
| Perurani | 242 | 4.700 | Patta |
| Perurani | 243/1 | 1.245 | Patta |
| Perurani | 243/2 | 1.030 | Patta |
| Perurani | 244/1 | 1.785 | Patta |
| Perurani | 244/2 | 1.385 | Patta |
| Perurani | 244/3 | 0.755 | Patta |
| Perurani | 245/1 | 0.405 | Patta |
| Perurani | 245/2 | 0.550 | Patta |
| Perurani | 245/3 | 0.345 | Patta |
| Perurani | 245/4 | 2.200 | Patta |
| Perurani | 246/1A | 0.275 | Patta |
| Perurani | 246/1B | 0.270 | Patta |
| Perurani | 246/2 | 0.680 | Patta |
| Perurani | 246/3 | 0.970 | Patta |
| Perurani | 247/1A | 1.200 | Patta |
| Perurani | 247/1B | 0.460 | Patta |
| Perurani | 247/2 | 0.500 | Patta |
| Perurani | 247/3 | 0.145 | Patta |
| Perurani | 247/4 | 0.095 | Patta |
| Perurani | 247/5 | 0.095 | Patta |
| Umarikottai | 168- | 1.610 | Patta |
| Umarikottai | 169/1 | 0.325 | Patta |
| Umarikottai | 169/2 | 0.655 | Patta |
| Umarikottai | 170/1 | 0.225 | Patta |
| Umarikottai | 170/2 | 0.470 | Patta |
| Umarikottai | 171/1 | 3.963 | Patta |
| Umarikottai | 171/2 | 0.737 | Patta |
| Umarikottai | 172/1 | 1.285 | Patta |
| Umarikottai | 172/2 | 1.605 | Patta |
| Umarikottai | 173 | 0.000 | Patta |
| Umarikottai | 174/1 | 5.740 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Umarikottai | 174/2 | 0.565 | Patta |
| Umarikottai | 175/1 | 0.745 | Patta |
| Umarikottai | 175/2 | 0.710 | Patta |
| Umarikottai | 176 | 0.755 | Patta |
| Umarikottai | 177/1 | 0.130 | Patta |
| Umarikottai | 177/2 | 1.365 | Patta |
| Umarikottai | 177/3 | 0.670 | Patta |
| Umarikottai | 177/4A | 0.370 | Patta |
| Umarikottai | 177/4B | 0.370 | Patta |
| Umarikottai | 178/1 | 0.550 | Patta |
| Umarikottai | 178/2 | 1.080 | Patta |
| Umarikottai | 179/1A | 0.710 | Patta |
| Umarikottai | 179/1B | 0.725 | Patta |
| Umarikottai | 179/2A | 0.910 | Patta |
| Umarikottai | 179/2B | 0.225 | Patta |
| Umarikottai | 179/2C | 0.220 | Patta |
| Umarikottai | 180/1 | 2.115 | Patta |
| Umarikottai | 180/2A | 0.840 | Patta |
| Umarikottai | 180/2B1 | 1.130 | Patta |
| Umarikottai | 180/2B2 | 0.705 | Patta |
| Umarikottai | 181/1 | 0.900 | Patta |
| Umarikottai | 181/2 | 0.900 | Patta |
| Umarikottai | 181/3 | 1.480 | Patta |
| Umarikottai | 182 | 1.795 | Patta |
| Umarikottai | 183 | 1.490 | Patta |
| Umarikottai | 184/1 | 0.760 | Patta |
| Umarikottai | 184/2 | 2.480 | Patta |
| Umarikottai | 185/1A | 0.590 | Patta |
| Umarikottai | 185/1B | 0.565 | Patta |
| Umarikottai | 185/2A | 0.455 | Patta |
| Umarikottai | 185/2B | 0.905 | Patta |
| Umarikottai | 186 | 0.745 | Patta |
| Umarikottai | 187 | 1.165 | Patta |
| Umarikottai | 188 | 0.460 | Patta |
| Umarikottai | 189 | 3.750 | Patta |
| Umarikottai | 190 | 1.360 | Patta |
| Umarikottai | 191/1 | 1.250 | Patta |
| Umarikottai | 191/2 | 0.650 | Patta |
| Umarikottai | 192 | 1.540 | Patta |
| Umarikottai | 193 | 1.370 | Patta |
| Umarikottai | 194 | 1.455 | Patta |
| Umarikottai | 195/1 | 2.200 | Patta |
| Umarikottai | 195/2 | 1.125 | Patta |
| Umarikottai | 196/1 | 3.740 | Patta |
| Umarikottai | 196/2 | 1.255 | Patta |
| Umarikottai | 197 | 1.935 | Patta |
| Umarikottai | 198 | 2.015 | Patta |
| Umarikottai | 199 | 2.795 | Patta |
| Umarikottai | 200 | 1.565 | Patta |
| Umarikottai | 201/1A | 0.700 | Patta |
| Umarikottai | 201/1B | 0.700 | Patta |
| Umarikottai | 201/2 | 1.245 | Patta |
| Umarikottai | 202/1A | 0.950 | Patta |
| Umarikottai | 202/1B | 1.440 | Patta |
| Umarikottai | 202/2 | 1.010 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Umarikottai | 202/3 | 0.865 | Patta |
| Umarikottai | 203 | 0.785 | Patta |
| Umarikottai | 204 | 0.855 | Patta |
| Umarikottai | 205 | 2.350 | Patta |
| Umarikottai | 206/1 | 1.310 | Patta |
| Umarikottai | 206/2 | 0.470 | Patta |
| Umarikottai | 206/3 | 0.525 | Patta |
| Umarikottai | 207/1 | 1.200 | Patta |
| Umarikottai | 207/2 | 0.115 | Patta |
| Umarikottai | 207/3 | 0.180 | Patta |
| Umarikottai | 208 | 2.815 | Patta |
| Umarikottai | 209 | 1.675 | Patta |
| Umarikottai | 211/3 | 1.775 | Patta |
| Umarikottai | 211/4 | 0.720 | Patta |
| Umarikottai | 212 | 0.840 | Patta |
| Umarikottai | 213/1 | 0.510 | Patta |
| Umarikottai | 213/2 | 0.430 | Patta |
| Umarikottai | 213/3 | 0.250 | Patta |
| Umarikottai | 213/4 | 0.510 | Patta |
| Umarikottai | 213/5 | 0.510 | Patta |
| Umarikottai | 213/6 | 0.330 | Patta |
| Umarikottai | 214/1 | 0.860 | Patta |
| Umarikottai | 214/10 | 0.685 | Patta |
| Umarikottai | 214/2 | 0.795 | Patta |
| Umarikottai | 214/3 | 0.330 | Patta |
| Umarikottai | 214/4 | 0.485 | Patta |
| Umarikottai | 214/5 | 0.020 | Patta |
| Umarikottai | 214/6 | 0.335 | Patta |
| Umarikottai | 214/7 | 0.130 | Patta |
| Umarikottai | 214/8 | 0.125 | Patta |
| Umarikottai | 214/9 | 0.270 | Patta |
| Umarikottai | 215 | 0.880 | Patta |
| Ramasamypuram | 81- | 1.010 | Patta |
| Ramasamypuram | 83 | 0.450 | Patta |
| Ramasamypuram | 84/1 | 0.130 | Patta |
| Ramasamypuram | 84/2 | 0.350 | Patta |
| Ramasamypuram | 84/3 | 0.615 | Patta |
| Ramasamypuram | 84/4 | 0.760 | Patta |
| Ramasamypuram | 84/5 | 0.625 | Patta |
| Ramasamypuram | 84/6A | 0.460 | Patta |
| Ramasamypuram | 84/6B | 0.160 | Patta |
| Ramasamypuram | 84/6C | 0.330 | Patta |
| Ramasamypuram | 84/6D | 0.470 | Patta |
| Ramasamypuram | 88/1 | 0.810 | Patta |
| Ramasamypuram | 88/2 | 0.930 | Patta |
| Ramasamypuram | 88/3 | 1.175 | Patta |
| Ramasamypuram | 88/4 | 1.955 | Patta |
| Ramasamypuram | 89/1 | 1.605 | Patta |
| Ramasamypuram | 89/2 | 0.610 | Patta |
| Ramasamypuram | 89/3 | 0.380 | Patta |
| Ramasamypuram | 89/4 | 1.045 | Patta |
| Ramasamypuram | 90/1 | 0.555 | Patta |
| Ramasamypuram | 90/2 | 0.620 | Patta |
| Ramasamypuram | 90/3 | 0.825 | Patta |
| Ramasamypuram | 91/1 | 0.575 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Ramasamypuram | 91/2 | 0.325 | Patta |
| Ramasamypuram | 91/3 | 0.815 | Patta |
| Ramasamypuram | 93/1 | 1.790 | Patta |
| Ramasamypuram | 93/2 | 0.740 | Patta |
| Ramasamypuram | 93/3 | 0.820 | Patta |
| Ramasamypuram | 93/4 | 0.700 | Patta |
| Ramasamypuram | 93/5 | 0.820 | Patta |
| Ramasamypuram | 94/1A | 0.000 | Patta |
| Ramasamypuram | 94/1B | 0.000 | Patta |
| Ramasamypuram | 94/2A | 0.000 | Patta |
| Ramasamypuram | 94/2B | 0.000 | Patta |
| Ramasamypuram | 94/3A | 0.000 | Patta |
| Ramasamypuram | 94/3B | 0.000 | Patta |
| Ramasamypuram | 94/4 | 0.000 | Patta |
| Ramasamypuram | 95/1 | 0.000 | Patta |
| Ramasamypuram | 95/2 | 0.000 | Patta |
| Ramasamypuram | 105/1 | 0.000 | Patta |
| Ramasamypuram | 105/2 | 0.000 | Patta |
| Ramasamypuram | 105/3 | 0.000 | Patta |
| Ramasamypuram | 105/4A | 0.000 | Patta |
| Ramasamypuram | 105/4B | 0.000 | Patta |
| Ramasamypuram | 106/3A | 0.000 | Patta |
| Ramasamypuram | 106/3B | 0.000 | Patta |
| Ramasamypuram | 106/4 | 0.000 | Patta |
| Ramasamypuram | 106/5 | 0.000 | Patta |
| Ramasamypuram | 107 | 0.000 | Patta |
| Ramasamypuram | 108/1A | 0.000 | Patta |
| Ramasamypuram | 108/1B | 0.000 | Patta |
| Ramasamypuram | 108/2A | 0.000 | Patta |
| Ramasamypuram | 108/2B | 0.000 | Patta |
| Ramasamypuram | 108/3 | 0.000 | Patta |
| Ramasamypuram | 108/4A | 0.000 | Patta |
| Ramasamypuram | 108/4B | 0.000 | Patta |
| Ramasamypuram | 108/5 | 0.000 | Patta |
| Ramasamypuram | 109/1 | 0.890 | Patta |
| Ramasamypuram | 109/2 | 0.540 | Patta |
| Ramasamypuram | 109/3 | 0.540 | Patta |
| Ramasamypuram | 109/4 | 0.420 | Patta |
| Ramasamypuram | 109/5A | 0.210 | Patta |
| Ramasamypuram | 109/5B | 0.205 | Patta |
| Ramasamypuram | 109/6 | 0.560 | Patta |
| Ramasamypuram | 110/1 | 0.380 | Patta |
| Ramasamypuram | 110/2 | 0.375 | Patta |
| Ramasamypuram | 110/3 | 0.390 | Patta |
| Ramasamypuram | 110/4 | 0.385 | Patta |
| Ramasamypuram | 110/5 | 1.485 | Patta |
| Ramasamypuram | 110/6 | 1.060 | Patta |
| Ramasamypuram | 110/7 | 0.775 | Patta |
| Ramasamypuram | 111/1A | 0.900 | Patta |
| Ramasamypuram | 111/1B | 0.490 | Patta |
| Ramasamypuram | 111/2 | 0.585 | Patta |
| Ramasamypuram | 111/3 | 0.330 | Patta |
| Ramasamypuram | 111/4 | 0.315 | Patta |
| Ramasamypuram | 112/1 | 1.010 | Patta |
| Ramasamypuram | 112/2 | 1.015 | Patta |

| Village | Survey No. | Land Extent (in ha) | Type |
|---|---|---|---|
| Ramasamypuram | 112/3 | 1.010 | Patta |
| Ramasamypuram | 112/4 | 0.715 | Patta |
| Ramasamypuram | 112/5 | 0.710 | Patta |
| Ramasamypuram | 112/6 | 0.710 | Patta |
| Ramasamypuram | 113/1 | 0.290 | Patta |
| Ramasamypuram | 113/3 | 0.260 | Patta |
| Ramasamypuram | 113/4 | 0.420 | Patta |
| Ramasamypuram | 113/5 | 0.975 | Patta |
| Ramasamypuram | 114/1 | 0.790 | Patta |
| Ramasamypuram | 114/2 | 0.595 | Patta |
| Ramasamypuram | 114/3 | 0.650 | Patta |
| Ramasamypuram | 114/4 | 0.175 | Patta |
| Ramasamypuram | 117/1 | 0.515 | Patta |
| Ramasamypuram | 117/2 | 0.540 | Patta |
| Ramasamypuram | 117/3 | 0.580 | Patta |
| Ramasamypuram | 117/5 | 0.235 | Patta |
| Ramasamypuram | 117/6 | 0.665 | Patta |
| Ramasamypuram | 117/7 | 0.540 | Patta |
| Ramasamypuram | 117/8 | 0.670 | Patta |
| Ramasamypuram | 120/1 | 0.265 | Patta |
| Ramasamypuram | 120/2 | 1.225 | Patta |
| Ramasamypuram | 120/3 | 1.365 | Patta |
| Ramasamypuram | 124/1 | 1.620 | Patta |
| Ramasamypuram | 124/2 | 2.970 | Patta |
| Ramasamypuram | 124/3 | 0.665 | Patta |
| Ramasamypuram | 125/1 | 0.625 | Patta |
| Ramasamypuram | 125/2 | 0.690 | Patta |
| Ramasamypuram | 125/3 | 0.560 | Patta |
| Ramasamypuram | 125/4 | 3.020 | Patta |
| Ramasamypuram | 126/1 | 1.125 | Patta |
| Ramasamypuram | 126/2 | 0.670 | Patta |
| Ramasamypuram | 126/3 | 0.615 | Patta |
| Ramasamypuram | 127/1 | 0.620 | Patta |
| Ramasamypuram | 127/2A | 0.550 | Patta |
| Ramasamypuram | 127/2B | 0.000 | Patta |
| Ramasamypuram | 128/1 | 0.710 | Patta |
| Ramasamypuram | 128/2 | 1.700 | Patta |
| Ramasamypuram | 129/1 | 0.000 | Patta |
| Ramasamypuram | 129/2 | 0.000 | Patta |
| Ramasamypuram | 129/3 | 0.000 | Patta |

# Annexure 2.1 - Signed_LPS_SIPCOT_Allikulam

**Details of lands identified for establishment of SIPCOT Industrial Park at Allikulam, South Silukanpatti, Keelathattaparai, Melathattaparai, Peroorani, Umarikottai, Ramasamypuram villages of Thoothukudi Taluk and district**

**ABSTRACT**

| | Land Extent (in ha) | | |
|---|---|---|---|
| **Village** | **Patta** | **Poramboke** | **Total** |
| Allikulam | 184.692 | 1.753 | 186.445 |
| Therkusillukkanpatti | 6.660 | 0.000 | 6.660 |
| Keelathattaparai | 189.640 | 3.505 | 193.145 |
| Melathattaparai | 97.445 | 1.950 | 99.395 |
| Perurani | 140.770 | 0.290 | 141.060 |
| Umarikottai | 104.180 | 0.000 | 104.180 |
| Ramasamypuram | 65.355 | 0.000 | 65.355 |
| **Total** | **788.742** | **7.498** | **796.240** |
| **Total (in acre)** | **1951.325** | **17.055** | **1966.713** |

| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Allikulam | 1-/1 | 0.605 | Patta | Patta |
| Allikulam | 1-/2 | 0.600 | Patta | Patta |
| Allikulam | 1/3A | 0.615 | Patta | Patta |
| Allikulam | 1/3B | 0.485 | Patta | Patta |
| Allikulam | 1/3C | 0.040 | Patta | Nilaviyal Odai |
| Allikulam | 1/3D | 0.140 | Patta | Patta |
| Allikulam | 1-/4 | 0.170 | Patta | Patta |
| Allikulam | 1/5A | 0.640 | Patta | Patta |
| Allikulam | 1/5B | 0.060 | Patta | Nilaviyal Odai |
| Allikulam | 1/5C | 0.605 | Patta | Patta |
| Allikulam | 1/6,8,10A | 1.502 | Patta | Patta |
| Allikulam | 1/7 | 0.453 | Poramboke | Odai |
| Allikulam | 1-/9 | 0.385 | Patta | Patta |
| Allikulam | 1/10B | 0.590 | Patta | Patta |
| Allikulam | 6-/1 | 0.350 | Patta | Patta |
| Allikulam | 6-/2 | 0.310 | Patta | Patta |
| Allikulam | 6-/3 | 2.315 | Patta | Patta |
| Allikulam | 6/4A | 0.810 | Patta | Patta |
| Allikulam | 6/4B1 | 0.800 | Patta | Patta |
| Allikulam | 6/4C | 0.405 | Patta | Patta |
| Allikulam | 6/4D | 0.425 | Patta | Patta |
| Allikulam | 6/4E | 0.400 | Patta | Patta |
| Allikulam | 6/4F | 0.400 | Patta | Patta |
| Allikulam | 6-/5 | 0.500 | Patta | Patta |
| Allikulam | 6/6A | 0.135 | Patta | Patta |
| Allikulam | 6/6B | 0.065 | Patta | Patta |
| Allikulam | 7 | 0.615 | Patta | Patta |
| Allikulam | 8/1,2,4A | 0.985 | Patta | Patta |
| Allikulam | 8/1,2,4B | 0.770 | Patta | Patta |
| Allikulam | 8-/10 | 0.165 | Patta | Patta |
| Allikulam | 8/-11 | 0.085 | Patta | Patta |
| Allikulam | 8-/3 | 0.320 | Patta | Nilaviyal Odai |
| Allikulam | 8-/5 | 0.055 | Poramboke | Vandipathai |
| Allikulam | 8/6,8 | 0.410 | Patta | Patta |

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| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Allikulam | 8-/7 | 0.215 | Patta | Patta |
| Allikulam | 8-/9 | 0.205 | Patta | Patta |
| Allikulam | 10-/1 | 0.745 | Patta | Patta |
| Allikulam | 10-/2 | 1.045 | Patta | Patta |
| Allikulam | 10-/3 | 0.055 | Poramboke | Vandipathai |
| Allikulam | 10-/4,16 | 1.915 | Patta | Patta |
| Allikulam | 10-/5 | 0.835 | Patta | Patta |
| Allikulam | 10/6A | 0.430 | Patta | Patta |
| Allikulam | 10/6B | 0.500 | Patta | Patta |
| Allikulam | 10/6C | 0.080 | Patta | Patta |
| Allikulam | 10/7A | 0.135 | Patta | Patta |
| Allikulam | 10/7B | 0.615 | Patta | Patta |
| Allikulam | 10/7C | 0.235 | Patta | Patta |
| Allikulam | 10-/8 | 0.540 | Patta | Patta |
| Allikulam | 10/9A | 0.590 | Patta | Patta |
| Allikulam | 10/9B | 1.035 | Patta | Patta |
| Allikulam | 10-/11,12 | 0.480 | Patta | Patta |
| Allikulam | 10-/13 | 0.140 | Patta | Patta |
| Allikulam | 10-/14 | 0.485 | Patta | Nilaviyal Odai |
| Allikulam | 11-/1A | 1.120 | Patta | Patta |
| Allikulam | 11/1B | 0.755 | Patta | Patta |
| Allikulam | 11-/2 | 0.990 | Patta | Patta |
| Allikulam | 11-/3 | 0.285 | Patta | Patta |
| Allikulam | 11-/4 | 0.325 | Patta | Patta |
| Allikulam | 11-/5 | 0.260 | Patta | Patta |
| Allikulam | 11-/6 | 0.415 | Patta | Patta |
| Allikulam | 11-/7 | 0.455 | Patta | Patta |
| Allikulam | 12/1A | 0.660 | Patta | Patta |
| Allikulam | 12/1B | 0.650 | Patta | Patta |
| Allikulam | 12/1C | 0.580 | Patta | Patta |
| Allikulam | 12/1D | 1.035 | Patta | Patta |
| Allikulam | 12/1E | 1.810 | Patta | Patta |
| Allikulam | 12/2A | 0.750 | Patta | Patta |
| Allikulam | 12/2B | 0.790 | Patta | Patta |
| Allikulam | 12-/3 | 0.080 | Poramboke | Vandipathai |
| Allikulam | 12-/4 | 0.495 | Patta | Patta |
| Allikulam | 12-/5 | 0.620 | Patta | Patta |
| Allikulam | 12-/6 | 0.130 | Patta | Patta |
| Allikulam | 12-/7 | 0.520 | Patta | Patta |
| Allikulam | 13/1A | 0.970 | Patta | Patta |
| Allikulam | 13/1B | 0.330 | Patta | Patta |
| Allikulam | 13/1C | 0.780 | Patta | Patta |
| Allikulam | 13/1D | 0.795 | Patta | Patta |
| Allikulam | 13/2A | 0.090 | Patta | Patta |
| Allikulam | 13/2B | 0.735 | Patta | Patta |
| Allikulam | 13-/3 | 0.915 | Patta | Patta |
| Allikulam | 13-/4 | 0.820 | Patta | Patta |
| Allikulam | 13-/5 | 0.070 | Patta | Patta |
| Allikulam | 14-/1 | 0.030 | Patta | Patta |
| Allikulam | 14-/10 | 0.340 | Patta | Patta |
| Allikulam | 14-/11 | 0.515 | Patta | Patta |
| Allikulam | 14-/12 | 0.355 | Patta | Patta |
| Allikulam | 14-/13 | 0.100 | Patta | Patta |
| Allikulam | 14-/14 | 0.685 | Patta | Patta |






| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Allikulam | 14-/15 | 0.495 | Patta | Patta |
| Allikulam | 14-/16 | 0.065 | Patta | Patta |
| Allikulam | 14-/17 | 0.100 | Patta | Patta |
| Allikulam | 14-/2 | 0.100 | Patta | Patta |
| Allikulam | 14-/3 | 0.535 | Patta | Patta |
| Allikulam | 14-/4 | 0.375 | Patta | Patta |
| Allikulam | 14-/5 | 0.730 | Patta | Patta |
| Allikulam | 14-/6 | 1.005 | Patta | Patta |
| Allikulam | 14-/7 | 0.470 | Patta | Patta |
| Allikulam | 14-/8 | 0.285 | Patta | Patta |
| Allikulam | 14-/9 | 0.100 | Patta | Patta |
| Allikulam | 15/1A | 0.500 | Patta | Patta |
| Allikulam | 15/1B | 2.060 | Patta | Patta |
| Allikulam | 15-/2 | 0.070 | Poramboke | Vandipathai |
| Allikulam | 15/3A | 0.540 | Patta | Patta |
| Allikulam | 15/3B | 0.490 | Patta | Patta |
| Allikulam | 15/3C | 0.540 | Patta | Patta |
| Allikulam | 15/3D | 0.200 | Patta | Patta |
| Allikulam | 15-/4 | 0.375 | Patta | Patta |
| Allikulam | 16-/1 | 0.330 | Patta | Patta |
| Allikulam | 16/2A | 0.370 | Patta | Patta |
| Allikulam | 16/2B | 0.930 | Patta | Patta |
| Allikulam | 16/3,4,5 | 1.435 | Patta | Patta |
| Allikulam | 16/6A | 1.015 | Patta | Patta |
| Allikulam | 16/6B | 0.590 | Patta | Patta |
| Allikulam | 17/1A | 0.060 | Patta | Patta |
| Allikulam | 17/1B | 0.580 | Patta | Patta |
| Allikulam | 17/1C | 0.920 | Patta | Patta |
| Allikulam | 17/1D | 0.090 | Patta | Nilaviyal Odai |
| Allikulam | 17-/2 | 0.020 | Poramboke | Vandipathai |
| Allikulam | 17-/3 | 0.045 | Patta | Patta |
| Allikulam | 18-/2 | 0.125 | Poramboke | Vandipathai |
| Allikulam | 18-/8 | 0.450 | Patta | Patta |
| Allikulam | 18-/9 | 0.260 | Patta | Patta |
| Allikulam | 18-/10 | 0.130 | Patta | Patta |
| Allikulam | 18/11A | 0.005 | Patta | Patta |
| Allikulam | 18/11B | 0.005 | Patta | Nilaviyal Odai |
| Allikulam | 18/11C | 0.170 | Patta | Patta |
| Allikulam | 18/12A | 0.060 | Patta | Patta |
| Allikulam | 18/12B | 0.055 | Patta | Patta |
| Allikulam | 18/12C | 0.130 | Patta | Patta |
| Allikulam | 18/13 | 0.850 | Patta | Patta |
| Allikulam | 18/14 | 0.460 | Patta | Patta |
| Allikulam | 18/15 | 0.605 | Patta | Patta |
| Allikulam | 18/16 | 0.685 | Patta | Patta |
| Allikulam | 18/17 | 0.860 | Patta | Patta |
| Allikulam | 18/18A | 0.345 | Patta | Patta |
| Allikulam | 18/18B | 0.365 | Patta | Patta |
| Allikulam | 18/19 | 0.305 | Patta | Patta |
| Allikulam | 18/1A | 0.325 | Patta | Patta |
| Allikulam | 18/1B | 0.400 | Patta | Patta |
| Allikulam | 18/1C | 0.110 | Patta | Patta |
| Allikulam | 18/1D | 0.080 | Patta | Patta |
| Allikulam | 18/1E | 0.030 | Patta | Patta |
| Allikulam | 18/1F | 0.210 | Patta | Patta |

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|---|---|---|---|---|
| Allikulam | 18/1G | 0.060 | Patta | Patta |
| Allikulam | 18/1H | 0.240 | Patta | Patta |
| Allikulam | 18/1I | 0.125 | Patta | Patta |
| Allikulam | 18/1J | 0.080 | Patta | Patta |
| Allikulam | 18/1K | 0.070 | Patta | Patta |
| Allikulam | 18/3A | 0.035 | Patta | Patta |
| Allikulam | 18/3B | 0.050 | Patta | Patta |
| Allikulam | 18/3C | 0.020 | Patta | Patta |
| Allikulam | 18/3D | 0.020 | Patta | Patta |
| Allikulam | 18/3E | 0.020 | Patta | Patta |
| Allikulam | 18/3F | 0.025 | Patta | Patta |
| Allikulam | 18/3G | 0.060 | Patta | Patta |
| Allikulam | 18/4A1 | 0.295 | Patta | Patta |
| Allikulam | 18/4A2 | 0.495 | Poramboke | Kuttai |
| Allikulam | 18/4B | 0.140 | Poramboke | Kuttai |
| Allikulam | 18/4C | 0.175 | Poramboke | Kuttai |
| Allikulam | 18/5A | 0.665 | Patta | Patta |
| Allikulam | 18/5B | 0.110 | Patta | Nilaviyal Odai |
| Allikulam | 18/5C | 0.190 | Patta | Patta |
| Allikulam | 18/6A | 0.580 | Patta | Patta |
| Allikulam | 18/6B | 0.055 | Patta | Nilaviyal Odai |
| Allikulam | 18/6C | 0.075 | Patta | Patta |
| Allikulam | 18/7A | 0.795 | Patta | Patta |
| Allikulam | 18/7B | 0.090 | Patta | Nilaviyal Odai |
| Allikulam | 18/7C | 0.020 | Patta | Patta |
| Allikulam | 19/1A | 1.050 | Patta | Patta |
| Allikulam | 19/1B | 0.800 | Patta | Patta |
| Allikulam | 19/1C | 0.340 | Patta | Patta |
| Allikulam | 19/1D | 0.150 | Patta | Patta |
| Allikulam | 19/1E | 0.290 | Patta | Patta |
| Allikulam | 19-/2 | 0.180 | Patta | Patta |
| Allikulam | 19-/3 | 0.340 | Patta | Patta |
| Allikulam | 19-/4 | 0.300 | Patta | Patta |
| Allikulam | 19/5,8A | 0.840 | Patta | Patta |
| Allikulam | 19/5,8B | 0.800 | Patta | Patta |
| Allikulam | 19/5,8C | 0.250 | Patta | Patta |
| Allikulam | 19-/6 | 0.085 | Patta | Patta |
| Allikulam | 19-/7 | 1.110 | Patta | Patta |
| Allikulam | 19-/9 | 0.590 | Patta | Patta |
| Allikulam | 20-/1 | 0.755 | Patta | Patta |
| Allikulam | 20-/2 | 0.220 | Patta | Patta |
| Allikulam | 20-/3 | 0.615 | Patta | Patta |
| Allikulam | 20-/4 | 0.085 | Poramboke | Vandipathai |
| Allikulam | 20-/5 | 0.195 | Patta | Patta |
| Allikulam | 20-/6 | 0.670 | Patta | Patta |
| Allikulam | 20/7A | 0.085 | Patta | Patta |
| Allikulam | 20/7B | 0.050 | Patta | Patta |
| Allikulam | 20/8A | 0.170 | Patta | Patta |
| Allikulam | 20/8B | 0.270 | Patta | Patta |
| Allikulam | 20/8C | 0.650 | Patta | Patta |
| Allikulam | 20/8D | 1.155 | Patta | Patta |
| Allikulam | 20/9A | 0.710 | Patta | Patta |
| Allikulam | 20/9B | 0.770 | Patta | Patta |
| Allikulam | 20/10 | 1.655 | Patta | Patta |
| Allikulam | 20/11 | 0.505 | Patta | Patta |

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|---|---|---|---|---|
| Allikulam | 20-/12 | 0.555 | Patta | Patta |
| Allikulam | 20/13 | 0.785 | Patta | Patta |
| Allikulam | 20/14 | 0.220 | Patta | Patta |
| Allikulam | 20/15A | 0.165 | Patta | Patta |
| Allikulam | 20/15B | 0.420 | Patta | Patta |
| Allikulam | 20/15C | 0.020 | Patta | Patta |
| Allikulam | 20/16A | 0.205 | Patta | Patta |
| Allikulam | 20/16B | 0.210 | Patta | Patta |
| Allikulam | 20/17 | 0.150 | Patta | Patta |
| Allikulam | 20/18 | 0.535 | Patta | Patta |
| Allikulam | 20/20 | 0.065 | Patta | Patta |
| Allikulam | 20/21 | 0.040 | Patta | Patta |
| Allikulam | 20/22 | 0.005 | Patta | Patta |
| Allikulam | 20/23 | 0.035 | Patta | Patta |
| Allikulam | 20/24 | 0.190 | Patta | Patta |
| Allikulam | 21 | 0.565 | Patta | Patta |
| Allikulam | 22-/1 | 0.455 | Patta | Patta |
| Allikulam | 22/2A | 0.735 | Patta | Patta |
| Allikulam | 22/2B | 0.445 | Patta | Patta |
| Allikulam | 22-/4 | 0.035 | Patta | Patta |
| Allikulam | 23-/1 | 0.910 | Patta | Patta |
| Allikulam | 23/2A1 | 0.035 | Patta | Patta |
| Allikulam | 23/2B | 0.145 | Patta | Patta |
| Allikulam | 23/3A | 0.240 | Patta | Patta |
| Allikulam | 23/3B | 0.295 | Patta | Patta |
| Allikulam | 23/4A | 0.160 | Patta | Patta |
| Allikulam | 23/4B | 0.150 | Patta | Patta |
| Allikulam | 23/4C | 0.300 | Patta | Patta |
| Allikulam | 23/4D | 0.120 | Patta | Patta |
| Allikulam | 24 | 0.605 | Patta | Patta |
| Allikulam | 25/1,3A | 0.390 | Patta | Patta |
| Allikulam | 25/1,3B | 0.230 | Patta | Patta |
| Allikulam | 25/1,3C | 0.010 | Patta | Patta |
| Allikulam | 25/1,3D | 0.065 | Patta | Nilaviyal Odai |
| Allikulam | 25/1,3E | 0.040 | Patta | Patta |
| Allikulam | 25/1,3F | 0.150 | Patta | Patta |
| Allikulam | 25/1,3G | 0.110 | Patta | Patta |
| Allikulam | 25/1,3H | 0.110 | Patta | Patta |
| Allikulam | 25/1,3I | 0.110 | Patta | Patta |
| Allikulam | 25/1,3J | 0.105 | Patta | Patta |
| Allikulam | 25/2A | 0.155 | Patta | Patta |
| Allikulam | 25/2B | 0.155 | Patta | Patta |
| Allikulam | 25/2C | 0.140 | Patta | Patta |
| Allikulam | 25/2D | 0.120 | Patta | Patta |
| Allikulam | 25/4A | 0.035 | Patta | Patta |
| Allikulam | 25/4B | 0.570 | Patta | Nilaviyal Odai |
| Allikulam | 25/4C | 0.460 | Patta | Patta |
| Allikulam | 25/4D | 0.140 | Patta | Patta |
| Allikulam | 25/4E | 0.250 | Patta | Patta |
| Allikulam | 25/4F | 0.080 | Patta | Patta |
| Allikulam | 25/4G | 0.210 | Patta | Patta |
| Allikulam | 25/4H | 0.850 | Patta | Patta |
| Allikulam | 25/4I | 1.080 | Patta | Patta |
| Allikulam | 25/5,7A | 0.770 | Patta | Patta |
| Allikulam | 25/5,7B | 0.700 | Patta | Patta |



| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Allikulam | 25-/6 | 0.870 | Patta | Patta |
| Allikulam | 25/8A,9A,10 | 0.790 | Patta | Patta |
| Allikulam | 25/8B,9B,10 B | 0.370 | Patta | Patta |
| Allikulam | 25/8B,9B,10 B | 0.735 | Patta | Patta |
| Allikulam | 25/8C,9C,10 C | 0.375 | Patta | Patta |
| Allikulam | 25/8C,9C,10 C | 0.360 | Patta | Patta |
| Allikulam | 25/8C,9C,10 C | 0.370 | Patta | Patta |
| Allikulam | 26/1A | 0.730 | Patta | Patta |
| Allikulam | 26/1B | 0.020 | Patta | Patta |
| Allikulam | 26/1C | 0.410 | Patta | Patta |
| Allikulam | 26/1D | 0.380 | Patta | Patta |
| Allikulam | 26/1E | 0.010 | Patta | Patta |
| Allikulam | 26/1F | 0.100 | Patta | Patta |
| Allikulam | 26/1G | 0.090 | Patta | Patta |
| Allikulam | 26-/2 | 0.405 | Patta | Patta |
| Allikulam | 27 | 0.495 | Patta | Patta |
| Allikulam | 28-/10 | 0.050 | Patta | Patta |
| Allikulam | 28/1A | 0.700 | Patta | Patta |
| Allikulam | 28/1B | 0.325 | Patta | Patta |
| Allikulam | 28/1C | 0.180 | Patta | Patta |
| Allikulam | 28/2A | 0.350 | Patta | Patta |
| Allikulam | 28/2B | 0.450 | Patta | Patta |
| Allikulam | 28/2C | 0.140 | Patta | Patta |
| Allikulam | 28/2D | 0.190 | Patta | Patta |
| Allikulam | 28/3A | 0.070 | Patta | Patta |
| Allikulam | 28/3B | 0.320 | Patta | Patta |
| Allikulam | 28/3C | 0.070 | Patta | Patta |
| Allikulam | 28/4A | 0.025 | Patta | Patta |
| Allikulam | 28/4B | 0.025 | Patta | Patta |
| Allikulam | 28/4C | 0.025 | Patta | Patta |
| Allikulam | 28/4D | 0.025 | Patta | Patta |
| Allikulam | 28-/5 | 0.085 | Patta | Patta |
| Allikulam | 28-/6 | 0.360 | Patta | Patta |
| Allikulam | 28-/7 | 0.330 | Patta | Patta |
| Allikulam | 28-/8 | 0.350 | Patta | Patta |
| Allikulam | 28/9A | 0.030 | Patta | Patta |
| Allikulam | 28/9B | 0.025 | Patta | Patta |
| Allikulam | 29-/10 | 0.630 | Patta | Patta |
| Allikulam | 29/1A | 0.050 | Patta | Patta |
| Allikulam | 29/1B | 0.120 | Patta | Nilaviyal Odai |
| Allikulam | 29/1C | 0.235 | Patta | Patta |
| Allikulam | 29-/2 | 0.845 | Patta | Patta |
| Allikulam | 29/3A | 0.700 | Patta | Patta |
| Allikulam | 29/3B | 0.635 | Patta | Patta |
| Allikulam | 29-/4 | 1.190 | Patta | Patta |
| Allikulam | 29-/5 | 0.615 | Patta | Patta |
| Allikulam | 29-/6 | 0.615 | Patta | Patta |
| Allikulam | 29-/7 | 1.300 | Patta | Patta |
| Allikulam | 29-/8 | 1.865 | Patta | Patta |
| Allikulam | 29-/9 | 0.455 | Patta | Patta |
| Allikulam | 30-/1 | 1.345 | Patta | Patta |
| Allikulam | 30-/2 | 1.220 | Patta | Patta |
| Allikulam | 30/3,4A | 1.630 | Patta | Patta |
| Allikulam | 30/3,4B | 0.060 | Patta | Nilaviyal Odai |
| Allikulam | 30/3,4C | 0.005 | Patta | Patta |



| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Allikulam | 30/5A | 0.060 | Patta | Patta |
| Allikulam | 30/5B | 0.310 | Patta | Nilaviyal Odai |
| Allikulam | 30/6A | 0.110 | Patta | Patta |
| Allikulam | 30/6B | 0.185 | Patta | Nilaviyal Odai |
| Allikulam | 30/6C | 1.180 | Patta | Patta |
| Allikulam | 30/7A | 0.010 | Patta | Patta |
| Allikulam | 31-/1 | 0.795 | Patta | Patta |
| Allikulam | 31-/2 | 0.890 | Patta | Patta |
| Allikulam | 31-/3 | 1.215 | Patta | Patta |
| Allikulam | 31-/4 | 0.615 | Patta | Patta |
| Allikulam | 31-/5 | 0.400 | Patta | Patta |
| Allikulam | 31-/6 | 0.160 | Patta | Patta |
| Allikulam | 32 | 0.665 | Patta | Patta |
| Allikulam | 33-/1 | 1.285 | Patta | Patta |
| Allikulam | 33/2A | 1.170 | Patta | Patta |
| Allikulam | 33/2B | 0.040 | Patta | Nilaviyal Odai |
| Allikulam | 33/2C | 0.005 | Patta | Patta |
| Allikulam | 34-/1 | 1.575 | Patta | Patta |
| Allikulam | 34-/2 | 0.385 | Patta | Patta |
| Allikulam | 35 | 0.225 | Patta | Patta |
| Allikulam | 36 | 0.370 | Patta | Patta |
| Allikulam | 37-/1 | 0.400 | Patta | Patta |
| Allikulam | 37-/2 | 0.290 | Patta | Nilaviyal Odai |
| Allikulam | 37-/3 | 0.070 | Patta | Patta |
| Allikulam | 38-/1 | 0.810 | Patta | Patta |
| Allikulam | 38-/2 | 0.810 | Patta | Patta |
| Allikulam | 38-/3 | 0.800 | Patta | Patta |
| Allikulam | 38-/4 | 0.185 | Patta | Patta |
| Allikulam | 39/1A | 0.100 | Patta | Patta |
| Allikulam | 39/1B | 0.280 | Patta | Nilaviyal Odai |
| Allikulam | 39/1C | 3.590 | Patta | Patta |
| Allikulam | 39-/2 | 0.295 | Patta | Patta |
| Allikulam | 40/1A | 0.015 | Patta | Patta |
| Allikulam | 40/1B | 0.425 | Patta | Patta |
| Allikulam | 40/1C | 0.010 | Patta | Patta |
| Allikulam | 40/1D | 0.410 | Patta | Patta |
| Allikulam | 40/2 | 0.260 | Patta | Patta |
| Allikulam | 40/3A | 0.150 | Patta | Nilaviyal Odai |
| Allikulam | 40/3B | 0.355 | Patta | Patta |
| Allikulam | 40/3C | 0.190 | Patta | Patta |
| Allikulam | 40/4A | 0.340 | Patta | Patta |
| Allikulam | 40/4B | 0.265 | Patta | Patta |
| Allikulam | 40/4C | 0.500 | Patta | Patta |
| Allikulam | 40/4D | 0.665 | Patta | Patta |
| Allikulam | 40/5 | 0.260 | Patta | Patta |
| Allikulam | 40/7 | 0.285 | Patta | Patta |
| Allikulam | 41/1A | 0.620 | Patta | Patta |
| Allikulam | 41/1B | 0.600 | Patta | Patta |
| Allikulam | 41/2 | 0.185 | Patta | Patta |
| Allikulam | 42/1A | 0.260 | Patta | Sadura Kinaru |
| Allikulam | 42/1B | 0.445 | Patta | Patta |
| Allikulam | 42/1C | 0.155 | Patta | Patta |
| Allikulam | 42/1D | 0.165 | Patta | Patta |
| Allikulam | 42/1E | 0.155 | Patta | Patta |
| Allikulam | 42/1F | 0.160 | Patta | Patta |



| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Allikulam | 42/1G | 0.135 | Patta | Patta |
| Allikulam | 42/1H | 0.120 | Patta | Patta |
| Allikulam | 42/1I | 0.215 | Patta | Patta |
| Allikulam | 42/2 | 0.125 | Patta | Patta |
| Allikulam | 42/3,4A1 | 0.340 | Patta | Patta |
| Allikulam | 42/3,4A2 | 0.420 | Patta | Patta |
| Allikulam | 42/3,4A3 | 0.395 | Patta | Patta |
| Allikulam | 42/3,4A4 | 0.390 | Patta | Patta |
| Allikulam | 42/4B | 0.160 | Patta | Patta |
| Allikulam | 42/4C | 0.260 | Patta | Patta |
| Allikulam | 42/5 | 0.120 | Patta | Patta |
| Allikulam | 43 | 0.510 | Patta | Sadura Kinaru |
| Allikulam | 45/1,2A | 1.400 | Patta | Sadura Kinaru |
| Allikulam | 45/1,2B | 1.435 | Patta | Sadura Kinaru |
| Allikulam | 47/1,2 | 0.480 | Patta | Patta |
| Allikulam | 47/3A | 0.715 | Patta | Patta |
| Allikulam | 47/3B | 0.695 | Patta | Patta |
| Allikulam | 47/3C | 0.630 | Patta | Patta |
| Allikulam | 47/3D | 0.575 | Patta | Patta |
| Allikulam | 48/1 | 0.145 | Patta | Patta |
| Allikulam | 48/2 | 0.330 | Patta | Patta |
| Allikulam | 49 | 0.615 | Patta | Patta |
| Allikulam | 50/1A | 0.085 | Patta | Patta |
| Allikulam | 50/1B | 0.075 | Patta | Nilaviyal Odai |
| Allikulam | 50/1C | 0.340 | Patta | Patta |
| Allikulam | 50/2A | 0.010 | Patta | Patta |
| Allikulam | 50/2B | 0.445 | Patta | Patta |
| Allikulam | 51/10 | 0.180 | Patta | Patta |
| Allikulam | 51/1A | 0.715 | Patta | Patta |
| Allikulam | 51/1B | 0.375 | Patta | Patta |
| Allikulam | 51/1C | 0.350 | Patta | Patta |
| Allikulam | 51/1D | 0.160 | Patta | Patta |
| Allikulam | 51/2A | 0.090 | Patta | Patta |
| Allikulam | 51/2B | 0.235 | Patta | Patta |
| Allikulam | 51/2C | 0.250 | Patta | Patta |
| Allikulam | 51/3 | 1.090 | Patta | Patta |
| Allikulam | 51/4A | 0.455 | Patta | Patta |
| Allikulam | 51/4B | 0.225 | Patta | Patta |
| Allikulam | 51/5 | 0.085 | Patta | Patta |
| Allikulam | 51/6 | 0.200 | Patta | Patta |
| Allikulam | 51/7 | 0.060 | Patta | Patta |
| Allikulam | 51/8 | 0.160 | Patta | Patta |
| Allikulam | 51/9 | 0.065 | Patta | Patta |
| Allikulam | 52/1 | 2.640 | Patta | Patta |
| Allikulam | 52/2 | 1.060 | Patta | Patta |
| Allikulam | 53/1 | 0.930 | Patta | Patta |
| Allikulam | 53/2 | 0.050 | Patta | Patta |
| Allikulam | 54/1 | 1.150 | Patta | Patta |
| Allikulam | 54/2 | 0.050 | Patta | Nilaviyal Odai |
| Allikulam | 55/1 | 1.395 | Patta | Patta |
| Allikulam | 55/2 | 0.655 | Patta | Patta |
| Allikulam | 55/3 | 1.295 | Patta | Patta |
| Allikulam | 55/4 | 4.310 | Patta | Patta |
| Allikulam | 56/1 | 0.100 | Patta | Patta |
| Allikulam | 56/2 | 0.405 | Patta | Nilaviyal Odai |

NOTARY
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| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Allikulam | 56/3 | 0.050 | Patta | Patta |
| Therkusillukkanpatti | 72/3 | 0.770 | Patta | Patta |
| Therkusillukkanpatti | 72/4 | 0.340 | Patta | Patta |
| Therkusillukkanpatti | 72/5 | 0.410 | Patta | Patta |
| Therkusillukkanpatti | 72/6 | 0.370 | Patta | Patta |
| Therkusillukkanpatti | 72/7A | 0.360 | Patta | Patta |
| Therkusillukkanpatti | 72/7B | 0.380 | Patta | Patta |
| Therkusillukkanpatti | 73/5 | 0.810 | Patta | Patta |
| Therkusillukkanpatti | 73/6 | 0.855 | Patta | Patta |
| Therkusillukkanpatti | 84/5 | 0.235 | Patta | Patta |
| Therkusillukkanpatti | 84/6 | 0.855 | Patta | Patta |
| Therkusillukkanpatti | 84/7 | 0.815 | Patta | Patta |
| Therkusillukkanpatti | 85/1 | 0.460 | Patta | Patta |
| Keelathattaparai | 335 | 1.545 | Patta | Patta |
| Keelathattaparai | 337 | 0.800 | Patta | Patta |
| Keelathattaparai | 338 | 0.495 | Patta | Patta |
| Keelathattaparai | 340 | 1.480 | Patta | Patta |
| Keelathattaparai | 342 | 1.920 | Patta | Patta |
| Keelathattaparai | 344 | 0.365 | Patta | Patta |
| Keelathattaparai | 345 | 1.155 | Patta | Patta |
| Keelathattaparai | 346 | 0.800 | Patta | Patta |
| Keelathattaparai | 347 | 0.410 | Patta | Patta |
| Keelathattaparai | 348 | 1.770 | Patta | Patta |
| Keelathattaparai | 349 | 0.790 | Patta | Patta |
| Keelathattaparai | 350 | 1.730 | Patta | Patta |
| Keelathattaparai | 351 | 1.190 | Patta | Patta |
| Keelathattaparai | 352 | 1.285 | Patta | Patta |
| Keelathattaparai | 353 | 2.815 | Patta | Patta |
| Keelathattaparai | 354 | 0.500 | Patta | Patta |
| Keelathattaparai | 355 | 1.060 | Patta | Patta |
| Keelathattaparai | 356 | 2.645 | Patta | Patta |
| Keelathattaparai | 358 | 1.700 | Patta | Patta |
| Keelathattaparai | 360 | 1.535 | Patta | Patta |
| Keelathattaparai | 362 | 1.185 | Patta | Patta |
| Keelathattaparai | 364 | 1.255 | Patta | Patta |
| Keelathattaparai | 372 | 3.345 | Patta | Patta |
| Keelathattaparai | 373 | 0.710 | Patta | Patta |
| Keelathattaparai | 375 | 1.715 | Patta | Patta |
| Keelathattaparai | 376 | 3.260 | Patta | Patta |
| Keelathattaparai | 381 | 1.620 | Patta | Patta |
| Keelathattaparai | 382 | 1.170 | Patta | Patta |
| Keelathattaparai | 383 | 0.730 | Patta | Patta |
| Keelathattaparai | 385 | 1.160 | Patta | Patta |
| Keelathattaparai | 386 | 1.265 | Patta | Patta |
| Keelathattaparai | 387 | 1.275 | Patta | Patta |
| Keelathattaparai | 388 | 1.390 | Patta | Patta |
| Keelathattaparai | 391 | 0.630 | Patta | Patta |
| Keelathattaparai | 395 | 0.070 | Patta | Patta |
| Keelathattaparai | 400 | 1.025 | Patta | Patta |
| Keelathattaparai | 401 | 0.450 | Patta | Patta |
| Keelathattaparai | 402 | 0.730 | Patta | Patta |
| Keelathattaparai | 403 | 1.015 | Patta | Patta |
| Keelathattaparai | 406 | 1.495 | Patta | Patta |
| Keelathattaparai | 434 | 3.110 | Patta | Patta |



| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Keelathattaparai | 435 | 0.600 | Poramboke | Tahrisu(Govt. Dry land) |
| Keelathattaparai | 438 | 0.650 | Patta | Patta |
| Keelathattaparai | 444 | 2.350 | Patta | Patta |
| Keelathattaparai | 445 | 0.820 | Patta | Patta |
| Keelathattaparai | 446 | 1.135 | Patta | Patta |
| Keelathattaparai | 447 | 0.715 | Patta | Nilaviyal Theru |
| Keelathattaparai | 448 | 1.150 | Patta | Patta |
| Keelathattaparai | 449 | 0.335 | Patta | Patta |
| Keelathattaparai | 450 | 3.640 | Patta | Patta |
| Keelathattaparai | 456 | 0.920 | Patta | Patta |
| Keelathattaparai | 459 | 0.450 | Patta | Patta |
| Keelathattaparai | 461 | 0.650 | Patta | Patta |
| Keelathattaparai | 462 | 1.560 | Patta | Patta |
| Keelathattaparai | 463 | 0.620 | Patta | Patta |
| Keelathattaparai | 464 | 2.155 | Patta | Patta |
| Keelathattaparai | 465 | 0.495 | Patta | Patta |
| Keelathattaparai | 466 | 0.260 | Patta | Patta |
| Keelathattaparai | 282/1 | 0.140 | Patta | Patta |
| Keelathattaparai | 282/2 | 0.550 | Patta | Patta |
| Keelathattaparai | 282/3 | 0.960 | Patta | Patta |
| Keelathattaparai | 282/4 | 0.990 | Patta | Patta |
| Keelathattaparai | 282/5 | 0.130 | Patta | Patta |
| Keelathattaparai | 283/1A | 0.780 | Patta | Patta |
| Keelathattaparai | 283/1B | 0.810 | Patta | Patta |
| Keelathattaparai | 283/1C | 0.400 | Patta | Patta |
| Keelathattaparai | 283/1D | 0.420 | Patta | Patta |
| Keelathattaparai | 283/1E | 0.740 | Patta | Patta |
| Keelathattaparai | 283/2 | 0.400 | Patta | Patta |
| Keelathattaparai | 283/3 | 0.400 | Patta | Patta |
| Keelathattaparai | 283/4 | 0.310 | Patta | Patta |
| Keelathattaparai | 283/5 | 0.370 | Patta | Patta |
| Keelathattaparai | 333/1A | 0.940 | Patta | Patta |
| Keelathattaparai | 333/1B | 0.930 | Patta | Patta |
| Keelathattaparai | 333/2A1 | 0.700 | Patta | Patta |
| Keelathattaparai | 333/2A2 | 0.490 | Patta | Patta |
| Keelathattaparai | 333/2B | 0.275 | Patta | Patta |
| Keelathattaparai | 336/1 | 0.395 | Patta | Patta |
| Keelathattaparai | 336/2 | 2.025 | Patta | Patta |
| Keelathattaparai | 339/1A | 0.290 | Patta | Patta |
| Keelathattaparai | 339/1B | 0.910 | Patta | Patta |
| Keelathattaparai | 339/2 | 0.985 | Patta | Patta |
| Keelathattaparai | 341/1A1B | 0.160 | Patta | Patta |
| Keelathattaparai | 341/1A1C | 0.190 | Patta | Patta |
| Keelathattaparai | 341/1A1D | 0.155 | Patta | Patta |
| Keelathattaparai | 341/1A1E | 0.290 | Patta | Patta |
| Keelathattaparai | 341/1A2 | 0.810 | Patta | Patta |
| Keelathattaparai | 341/1B | 0.370 | Patta | Patta |
| Keelathattaparai | 341/2 | 0.435 | Patta | Patta |
| Keelathattaparai | 343/1 | 0.860 | Patta | Patta |
| Keelathattaparai | 343/2 | 0.860 | Patta | Patta |
| Keelathattaparai | 343/3 | 0.820 | Patta | Patta |
| Keelathattaparai | 357/1 | 1.540 | Poramboke | Punjai as per alienation G.O |
| Keelathattaparai | 357/2 | 3.905 | Patta | Patta |
| Keelathattaparai | 359/1 | 1.100 | Patta | Patta |

NOTARY
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INDIA

| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Keelathattaparai | 359/2 | 1.155 | Patta | Patta |
| Keelathattaparai | 359/3 | 1.255 | Patta | Patta |
| Keelathattaparai | 359/4 | 1.490 | Patta | Patta |
| Keelathattaparai | 361/1 | 0.485 | Patta | Patta |
| Keelathattaparai | 361/2A | 1.270 | Patta | Patta |
| Keelathattaparai | 361/2B | 0.695 | Patta | Patta |
| Keelathattaparai | 361/2C | 0.690 | Patta | Patta |
| Keelathattaparai | 361/2D | 0.810 | Patta | Patta |
| Keelathattaparai | 363/1 | 0.465 | Patta | Patta |
| Keelathattaparai | 363/2 | 0.505 | Patta | Patta |
| Keelathattaparai | 363/3 | 0.295 | Patta | Patta |
| Keelathattaparai | 363/4 | 0.300 | Patta | Patta |
| Keelathattaparai | 365/1 | 0.260 | Patta | Patta |
| Keelathattaparai | 365/2 | 0.260 | Patta | Patta |
| Keelathattaparai | 366/1 | 0.070 | Patta | Patta |
| Keelathattaparai | 366/2 | 1.095 | Patta | Patta |
| Keelathattaparai | 366/3 | 0.145 | Patta | |
| Keelathattaparai | 366/4 | 0.010 | Poramboke | Vandipathai |
| Keelathattaparai | 366/5 | 0.045 | Poramboke | Vandipathai |
| Keelathattaparai | 367/1 | 0.995 | Patta | Patta |
| Keelathattaparai | 367/2 | 0.005 | Patta | Patta |
| Keelathattaparai | 367/3 | 0.010 | Poramboke | Vandipathai |
| Keelathattaparai | 368/1 | 0.280 | Patta | Patta |
| Keelathattaparai | 368/2 | 0.940 | Patta | Patta |
| Keelathattaparai | 369/1 | 1.290 | Patta | Patta |
| Keelathattaparai | 369/2 | 1.115 | Patta | Patta |
| Keelathattaparai | 370/1 | 3.935 | Patta | Patta |
| Keelathattaparai | 370/2 | 1.120 | Patta | Patta |
| Keelathattaparai | 370/3 | 0.010 | Patta | Patta |
| Keelathattaparai | 370/4 | 0.010 | Poramboke | Vandipathai |
| Keelathattaparai | 371/1 | 0.925 | Patta | Patta |
| Keelathattaparai | 371/2 | 0.090 | Patta | Patta |
| Keelathattaparai | 371/3 | 2.630 | Patta | Patta |
| Keelathattaparai | 371/4 | 0.700 | Patta | Patta |
| Keelathattaparai | 371/5 | 1.000 | Patta | Patta |
| Keelathattaparai | 371/6 | 0.090 | Poramboke | Vandipathai |
| Keelathattaparai | 374/1 | 1.215 | Patta | Patta |
| Keelathattaparai | 374/2 | 1.440 | Patta | Patta |
| Keelathattaparai | 374/3 | 2.025 | Patta | Patta |
| Keelathattaparai | 374/4 | 0.115 | Poramboke | Vandipathai |
| Keelathattaparai | 377/1 | 1.675 | Patta | Patta |
| Keelathattaparai | 377/2 | 1.610 | Patta | Patta |
| Keelathattaparai | 384/1 | 3.265 | Patta | Patta |
| Keelathattaparai | 384/2 | 0.875 | Patta | Patta |
| Keelathattaparai | 389/1 | 0.230 | Patta | Patta |
| Keelathattaparai | 390/1 | 0.055 | Patta | Patta |
| Keelathattaparai | 390/3 | 0.245 | Patta | Patta |
| Keelathattaparai | 392/1 | 0.790 | Patta | Patta |
| Keelathattaparai | 392/2 | 0.010 | Poramboke | Vandipathai |
| Keelathattaparai | 393/1 | 0.075 | Patta | Patta |
| Keelathattaparai | 393/2 | 0.015 | Patta | Patta |
| Keelathattaparai | 393/3 | 0.010 | Patta | Patta |
| Keelathattaparai | 393/4 | 0.725 | Patta | Patta |
| Keelathattaparai | 393/5 | 0.625 | Patta | Patta |

NOTARY
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| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Keelathattaparai | 393/6 | 0.980 | Patta | |
| Keelathattaparai | 393/7 | 0.025 | Poramboke | Vandipathai |
| Keelathattaparai | 394/1 | 0.805 | Patta | Patta |
| Keelathattaparai | 394/3 | 0.105 | Patta | Patta |
| Keelathattaparai | 394/4 | 0.050 | Patta | Patta |
| Keelathattaparai | 394/5 | 0.040 | Poramboke | Vandipathai |
| Keelathattaparai | 394/6 | 0.015 | Poramboke | Vandipathai |
| Keelathattaparai | 396/1 | 0.860 | Patta | Patta |
| Keelathattaparai | 396/3 | 0.155 | Patta | Patta |
| Keelathattaparai | 397/1 | 0.840 | Patta | Patta |
| Keelathattaparai | 398/1 | 0.925 | Patta | Patta |
| Keelathattaparai | 398/2 | 0.430 | Patta | Patta |
| Keelathattaparai | 398/3 | 0.415 | Patta | Patta |
| Keelathattaparai | 398/4 | 1.590 | Patta | Patta |
| Keelathattaparai | 399/1 | 0.705 | Patta | Patta |
| Keelathattaparai | 399/2 | 0.005 | Poramboke | Vandipathai |
| Keelathattaparai | 404/1 | 0.285 | Patta | Patta |
| Keelathattaparai | 404/2 | 0.615 | Patta | Patta |
| Keelathattaparai | 405/1 | 1.475 | Patta | Patta |
| Keelathattaparai | 405/2 | 1.380 | Patta | Patta |
| Keelathattaparai | 407/1 | 1.700 | Patta | Patta |
| Keelathattaparai | 407/2 | 1.095 | Patta | Patta |
| Keelathattaparai | 408/1 | 1.360 | Patta | Patta |
| Keelathattaparai | 408/2 | 0.015 | Patta | Patta |
| Keelathattaparai | 408/3 | 0.025 | Poramboke | Vandipathai |
| Keelathattaparai | 416/1 | 1.550 | Patta | Patta |
| Keelathattaparai | 416/2 | 0.245 | Patta | Patta |
| Keelathattaparai | 416/3 | 0.055 | Poramboke | Vandipathai |
| Keelathattaparai | 417/1 | 0.380 | Patta | Patta |
| Keelathattaparai | 417/2 | 0.695 | Patta | Patta |
| Keelathattaparai | 418/1 | 2.255 | Patta | Patta |
| Keelathattaparai | 418/2 | 0.050 | Poramboke | Vandipathai |
| Keelathattaparai | 419/1 | 0.590 | Poramboke | Tahrisu(Govt. Dry land) |
| Keelathattaparai | 419/2 | 0.265 | Patta | Patta |
| Keelathattaparai | 420/1 | 1.190 | Patta | Patta |
| Keelathattaparai | 420/2 | 4.280 | Patta | Patta |
| Keelathattaparai | 433/2 | 1.050 | Patta | Patta |
| Keelathattaparai | 436/1A | 0.710 | Patta | Patta |
| Keelathattaparai | 436/1B | 0.285 | Patta | Patta |
| Keelathattaparai | 436/1C | 0.415 | Patta | Patta |
| Keelathattaparai | 436/2 | 1.405 | Patta | Patta |
| Keelathattaparai | 437/2 | 0.275 | Patta | Patta |
| Keelathattaparai | 439/1 | 0.205 | Patta | Patta |
| Keelathattaparai | 439/2A | 0.065 | Patta | Patta |
| Keelathattaparai | 440/1B | 0.165 | Patta | Patta |
| Keelathattaparai | 440/2 | 0.985 | Patta | Patta |
| Keelathattaparai | 440/3 | 0.055 | Poramboke | Vandipathai |
| Keelathattaparai | 441/1 | 0.045 | Patta | Patta |
| Keelathattaparai | 441/3 | 0.970 | Patta | Patta |
| Keelathattaparai | 442/1 | 0.065 | Patta | Patta |
| Keelathattaparai | 442/3 | 0.380 | Patta | Patta |
| Keelathattaparai | 442/4 | 0.010 | Poramboke | Salai |
| Keelathattaparai | 443/1 | 0.450 | Patta | Patta |
| Keelathattaparai | 443/2 | 0.010 | Poramboke | Vandipathai |

NOTARY
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| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Keelathattaparai | 451/2 | 1.260 | Patta | Patta |
| Keelathattaparai | 452/1 | 3.090 | Patta | Patta |
| Keelathattaparai | 452/2 | 0.130 | Patta | Patta |
| Keelathattaparai | 452/3 | 0.010 | Poramboke | Vandipathai |
| Keelathattaparai | 452/5 | 0.820 | Patta | Patta |
| Keelathattaparai | 452/6 | 0.050 | Poramboke | Vandipathai |
| Keelathattaparai | 453/1 | 0.180 | Patta | Patta |
| Keelathattaparai | 453/2 | 0.950 | Patta | Patta |
| Keelathattaparai | 453/3 | 0.015 | Poramboke | Vandipathai |
| Keelathattaparai | 454/1 | 0.775 | Patta | Patta |
| Keelathattaparai | 454/2 | 0.805 | Patta | Patta |
| Keelathattaparai | 454/3 | 0.010 | Patta | Patta |
| Keelathattaparai | 454/4 | 0.015 | Poramboke | Vandipathai |
| Keelathattaparai | 460/1 | 0.215 | Patta | Patta |
| Keelathattaparai | 460/2 | 0.290 | Patta | Patta |
| Keelathattaparai | 460/3 | 0.045 | Poramboke | Vandipathai |
| Keelathattaparai | 467/2 | 5.360 | Patta | Patta |
| Keelathattaparai | 468/1 | 2.290 | Patta | Patta |
| Keelathattaparai | 468/2 | 0.400 | Patta | Patta |
| Keelathattaparai | 468/3 | 0.060 | Poramboke | Vandipathai |
| Melathattaparai | 151/2 | 1.020 | Patta | Patta |
| Melathattaparai | 152 | 0.000 | Patta | Patta |
| Melathattaparai | 154/1 | 0.000 | Patta | Patta |
| Melathattaparai | 154/2 | 0.000 | Patta | Patta |
| Melathattaparai | 155/1A | 0.000 | Patta | Patta |
| Melathattaparai | 155/1B | 0.000 | Patta | Patta |
| Melathattaparai | 155/2 | 0.265 | Patta | Patta |
| Melathattaparai | 156/1 | 0.000 | Patta | Patta |
| Melathattaparai | 156/2 | 0.000 | Patta | Patta |
| Melathattaparai | 157/1 | 0.500 | Patta | Patta |
| Melathattaparai | 157/2 | 0.520 | Patta | Patta |
| Melathattaparai | 158/1 | 0.790 | Patta | Patta |
| Melathattaparai | 158/2 | 0.765 | Patta | Patta |
| Melathattaparai | 159 | 0.000 | Patta | Patta |
| Melathattaparai | 160 | 0.000 | Patta | Patta |
| Melathattaparai | 161 | 0.000 | Patta | Patta |
| Melathattaparai | 162/1 | 0.250 | Patta | Patta |
| Melathattaparai | 163/1 | 1.155 | Patta | Patta |
| Melathattaparai | 163/2A | 0.000 | Patta | Patta |
| Melathattaparai | 163/2B | 0.000 | Patta | Patta |
| Melathattaparai | 164/1 | 0.210 | Patta | Patta |
| Melathattaparai | 164/2 | 0.210 | Patta | Patta |
| Melathattaparai | 165/1 | 0.735 | Patta | Patta |
| Melathattaparai | 165/2 | 1.480 | Patta | Patta |
| Melathattaparai | 166 | 0.000 | Patta | Patta |
| Melathattaparai | 167 | 0.000 | Patta | Patta |
| Melathattaparai | 168 | 0.000 | Patta | Patta |
| Melathattaparai | 169 | 0.000 | Patta | Patta |
| Melathattaparai | 170 | 0.000 | Patta | Patta |
| Melathattaparai | 171/1 | 0.000 | Patta | Patta |
| Melathattaparai | 171/2 | 0.000 | Patta | Patta |
| Melathattaparai | 172 | 0.000 | Patta | Patta |
| Melathattaparai | 173/1 | 0.000 | Patta | Patta |
| Melathattaparai | 173/2 | 0.000 | Patta | Patta |
| Melathattaparai | 174 | 0.000 | Patta | Patta |

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| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Melathattaparai | 175 | 0.965 | Patta | Patta |
| Melathattaparai | 176/1A | 0.665 | Patta | Patta |
| Melathattaparai | 176/1B | 0.295 | Patta | Patta |
| Melathattaparai | 176/3B | 0.185 | Patta | Patta |
| Melathattaparai | 177/1 | 0.000 | Patta | Patta |
| Melathattaparai | 177/2 | 0.000 | Patta | Patta |
| Melathattaparai | 177/3 | 0.325 | Patta | Patta |
| Melathattaparai | 177/4 | 0.970 | Patta | Patta |
| Melathattaparai | 178 | 0.000 | Patta | Patta |
| Melathattaparai | 179 | 0.000 | Patta | Patta |
| Melathattaparai | 180/1 | 0.000 | Patta | Patta |
| Melathattaparai | 180/2 | 0.000 | Patta | Patta |
| Melathattaparai | 181/1 | 0.000 | Patta | Patta |
| Melathattaparai | 181/2 | 0.000 | Poramboke | Odai |
| Melathattaparai | 182/1 | 0.000 | Patta | Patta |
| Melathattaparai | 182/2 | 0.000 | Patta | Patta |
| Melathattaparai | 183/1 | 0.000 | Patta | Patta |
| Melathattaparai | 183/2 | 0.000 | Patta | Patta |
| Melathattaparai | 184/1 | 0.000 | Patta | Patta |
| Melathattaparai | 184/2 | 0.000 | Patta | Patta |
| Melathattaparai | 185/1 | 0.000 | Patta | Patta |
| Melathattaparai | 185/2 | 0.000 | Patta | Patta |
| Melathattaparai | 186/1 | 0.000 | Patta | Patta |
| Melathattaparai | 186/2 | 0.000 | Patta | Patta |
| Melathattaparai | 187/1A | 0.000 | Patta | Patta |
| Melathattaparai | 187/1B | 0.000 | Patta | Patta |
| Melathattaparai | 187/2 | 0.000 | Patta | Patta |
| Melathattaparai | 188 | 0.000 | Patta | Patta |
| Melathattaparai | 189/1 | 0.000 | Patta | Patta |
| Melathattaparai | 189/2 | 0.000 | Patta | Patta |
| Melathattaparai | 190 | 0.000 | Patta | Patta |
| Melathattaparai | 191/1 | 0.000 | Patta | Patta |
| Melathattaparai | 191/2A | 0.000 | Patta | Patta |
| Melathattaparai | 191/2B | 0.000 | Patta | Patta |
| Melathattaparai | 191/2C | 0.000 | Patta | Patta |
| Melathattaparai | 192 | 0.000 | Patta | Patta |
| Melathattaparai | 193 | 0.000 | Patta | Patta |
| Melathattaparai | 194 | 0.000 | Patta | Patta |
| Melathattaparai | 195/1 | 0.000 | Patta | Patta |
| Melathattaparai | 195/2 | 0.000 | Patta | Patta |
| Melathattaparai | 195/3 | 0.000 | Patta | Patta |
| Melathattaparai | 196 | 0.000 | Patta | Patta |
| Melathattaparai | 197/1 | 0.000 | Patta | Patta |
| Melathattaparai | 197/2 | 0.000 | Patta | Patta |
| Melathattaparai | 197/3 | 0.000 | Patta | Patta |
| Melathattaparai | 198 | 0.000 | Patta | Patta |
| Melathattaparai | 199/1 | 0.000 | Patta | Patta |
| Melathattaparai | 199/2 | 1.060 | Patta | Patta |
| Melathattaparai | 199/3 | 0.820 | Patta | Patta |
| Melathattaparai | 200 | 0.000 | Patta | Patta |
| Melathattaparai | 201/1 | 0.000 | Patta | Patta |
| Melathattaparai | 201/2 | 0.000 | Patta | Patta |
| Melathattaparai | 202/1 | 0.000 | Patta | Patta |
| Melathattaparai | 202/2 | 0.000 | Patta | Patta |
| Melathattaparai | 203/1 | 0.000 | Patta | Patta |

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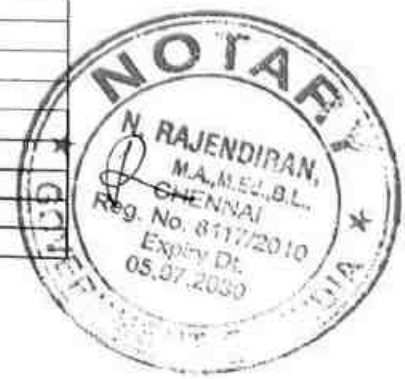
| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Melathattaparai | 203/2 | 0.000 | Patta | Patta |
| Melathattaparai | 204 | 0.000 | Patta | Patta |
| Melathattaparai | 205/1 | 0.000 | Patta | Patta |
| Melathattaparai | 205/2 | 0.000 | Patta | Patta |
| Melathattaparai | 206 | 5.520 | Patta | Patta |
| Melathattaparai | 207 | 2.300 | Patta | Patta |
| Melathattaparai | 208 | 1.950 | Poramboke | Tharisu |
| Melathattaparai | 209/1 | 0.000 | Patta | Patta |
| Melathattaparai | 209/2 | 0.000 | Patta | Patta |
| Melathattaparai | 210/1 | 0.660 | Patta | Patta |
| Melathattaparai | 210/2 | 0.435 | Patta | Patta |
| Melathattaparai | 211/1 | 0.890 | Patta | Patta |
| Melathattaparai | 211/2 | 0.125 | Patta | Patta |
| Melathattaparai | 212 | 1.020 | Patta | Patta |
| Melathattaparai | 213 | 0.965 | Patta | Patta |
| Melathattaparai | 214 | 2.175 | Patta | Patta |
| Melathattaparai | 215 | 1.680 | Patta | Patta |
| Melathattaparai | 216/2 | 0.915 | Patta | Patta |
| Melathattaparai | 217/1 | 0.785 | Patta | Patta |
| Melathattaparai | 217/2 | 0.320 | Patta | Patta |
| Melathattaparai | 218/2 | 0.130 | Patta | Patta |
| Melathattaparai | 219 | 0.350 | Patta | Patta |
| Melathattaparai | 221/2 | 1.210 | Patta | Patta |
| Melathattaparai | 222 | 0.320 | Patta | Patta |
| Melathattaparai | 223 | 0.520 | Patta | Patta |
| Melathattaparai | 224/1 | 0.535 | Patta | Patta |
| Melathattaparai | 224/2 | 1.205 | Patta | Patta |
| Melathattaparai | 225 | 0.750 | Patta | Patta |
| Melathattaparai | 226/1 | 1.290 | Patta | Patta |
| Melathattaparai | 226/2 | 0.415 | Patta | Patta |
| Melathattaparai | 227 | 0.860 | Patta | Patta |
| Melathattaparai | 228 | 0.730 | Patta | Patta |
| Melathattaparai | 229/1 | 0.675 | Patta | Patta |
| Melathattaparai | 229/2 | 0.850 | Patta | Patta |
| Melathattaparai | 230/1 | 0.655 | Patta | Patta |
| Melathattaparai | 230/2 | 0.625 | Patta | Patta |
| Melathattaparai | 231/1 | 1.535 | Patta | Patta |
| Melathattaparai | 231/2 | 1.500 | Patta | Patta |
| Melathattaparai | 232/1 | 0.895 | Patta | Patta |
| Melathattaparai | 232/2 | 0.835 | Patta | Patta |
| Melathattaparai | 233 | 2.010 | Patta | Patta |
| Melathattaparai | 234 | 2.195 | Patta | Patta |
| Melathattaparai | 235 | 1.285 | Patta | Patta |
| Melathattaparai | 236/1 | 0.285 | Patta | Patta |
| Melathattaparai | 236/2A | 1.190 | Patta | Patta |
| Melathattaparai | 236/2B | 1.190 | Patta | Patta |
| Melathattaparai | 237 | 0.700 | Patta | Patta |
| Melathattaparai | 238/1 | 0.735 | Patta | Patta |
| Melathattaparai | 238/2 | 0.730 | Patta | Patta |
| Melathattaparai | 238/3 | 1.220 | Patta | Patta |
| Melathattaparai | 239 | 0.730 | Patta | Patta |
| Melathattaparai | 240/1 | 0.415 | Patta | Patta |
| Melathattaparai | 240/2 | 0.405 | Patta | Patta |
| Melathattaparai | 241 | 1.155 | Patta | Patta |
| Melathattaparai | 242 | 1.335 | Patta | Patta |



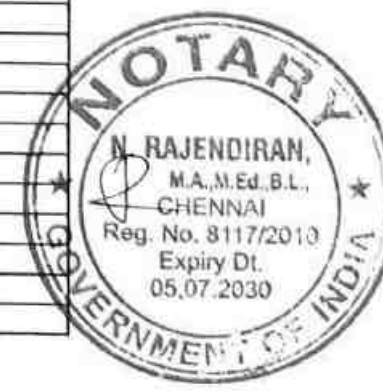
| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Melathattaparai | 243 | 0.775 | Patta | Patta |
| Melathattaparai | 244 | 1.070 | Patta | Patta |
| Melathattaparai | 245 | 1.210 | Patta | Patta |
| Melathattaparai | 246 | 0.900 | Patta | Patta |
| Melathattaparai | 247/1 | 0.680 | Patta | Patta |
| Melathattaparai | 247/2 | 0.305 | Patta | Patta |
| Melathattaparai | 248 | 1.245 | Patta | Patta |
| Melathattaparai | 249 | 2.095 | Patta | Patta |
| Melathattaparai | 250/1 | 0.480 | Patta | Patta |
| Melathattaparai | 250/2 | 0.555 | Patta | Patta |
| Melathattaparai | 250/3 | 1.220 | Patta | Patta |
| Melathattaparai | 251/1A | 0.560 | Patta | Patta |
| Melathattaparai | 251/1B | 1.075 | Patta | Patta |
| Melathattaparai | 251/2A | 0.580 | Patta | Patta |
| Melathattaparai | 251/2B | 0.060 | Patta | Patta |
| Melathattaparai | 252 | 1.810 | Patta | Patta |
| Melathattaparai | 253 | 0.345 | Patta | Patta |
| Melathattaparai | 254/1 | 0.505 | Patta | Patta |
| Melathattaparai | 254/2 | 0.605 | Patta | Patta |
| Melathattaparai | 254/3 | 2.455 | Patta | Patta |
| Melathattaparai | 254/4 | 1.050 | Patta | Patta |
| Melathattaparai | 255 | 0.710 | Patta | Patta |
| Melathattaparai | 256/1 | 2.020 | Patta | Patta |
| Melathattaparai | 256/2 | 0.395 | Patta | Patta |
| Melathattaparai | 257/2 | 1.230 | Patta | Patta |
| Melathattaparai | 258/1 | 0.175 | Patta | Patta |
| Melathattaparai | 258/2 | 0.595 | Patta | Patta |
| Melathattaparai | 259 | 1.525 | Patta | Patta |
| Melathattaparai | 260/1 | 0.670 | Patta | Patta |
| Melathattaparai | 260/2 | 0.955 | Patta | Patta |
| Melathattaparai | 260/3 | 0.225 | Patta | Patta |
| Melathattaparai | 261 | 1.405 | Patta | Patta |
| Melathattaparai | 262/1,2A | 1.515 | Patta | Patta |
| Melathattaparai | 262/2B | 1.570 | Patta | Patta |
| Melathattaparai | 263 | 1.200 | Patta | Patta |
| Melathattaparai | 264 | 1.735 | Patta | Patta |
| Perurani | 172/1 | 0.535 | Patta | Patta |
| Perurani | 172/2 | 0.195 | Patta | Patta |
| Perurani | 172/3 | 0.170 | Patta | Sadurakinaru |
| Perurani | 172/4 | 0.145 | Patta | Patta |
| Perurani | 172/5 | 0.105 | Patta | Patta |
| Perurani | 172/6 | 0.135 | Patta | Patta |
| Perurani | 172/8 | 0.580 | Patta | Patta |
| Perurani | 173/1 | 0.955 | Patta | Patta |
| Perurani | 173/2 | 0.860 | Patta | Patta |
| Perurani | 173/3 | 1.210 | Patta | Patta |
| Perurani | 174/1A | 0.850 | Patta | Patta |
| Perurani | 174/1B | 0.730 | Patta | Patta |
| Perurani | 174/2A | 0.270 | Patta | Patta |
| Perurani | 174/2B | 0.490 | Patta | Patta |
| Perurani | 174/3 | 1.020 | Patta | Patta |
| Perurani | 175/1 | 0.630 | Patta | Patta |
| Perurani | 175/2 | 1.280 | Patta | Patta |
| Perurani | 176/1 | 0.630 | Patta | Patta |
| Perurani | 176/2 | 0.330 | Patta | Patta |

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| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Perurani | 176/3 | 0.370 | Patta | Patta |
| Perurani | 176/4 | 0.735 | Patta | Patta |
| Perurani | 197/1 | 0.290 | Patta | Patta |
| Perurani | 197/2 | 0.730 | Patta | Patta |
| Perurani | 197/3 | 0.940 | Patta | Patta |
| Perurani | 197/4 | 0.965 | Patta | Patta |
| Perurani | 197/5 | 1.160 | Patta | Patta |
| Perurani | 197/6 | 0.735 | Patta | Patta |
| Perurani | 198/1 | 0.395 | Patta | Patta |
| Perurani | 198/2 | 0.405 | Patta | Patta |
| Perurani | 198/3 | 0.795 | Patta | Patta |
| Perurani | 199/1 | 0.430 | Patta | Patta |
| Perurani | 199/2 | 0.420 | Patta | Patta |
| Perurani | 199/3 | 0.415 | Patta | Patta |
| Perurani | 199/4A | 0.380 | Patta | Patta |
| Perurani | 199/4B | 0.390 | Patta | Patta |
| Perurani | 199/5 | 1.225 | Patta | Patta |
| Perurani | 200/1 | 0.825 | Patta | Patta |
| Perurani | 200/2 | 1.385 | Patta | Patta |
| Perurani | 201/1A | 0.465 | Patta | Patta |
| Perurani | 201/1B | 0.475 | Patta | Patta |
| Perurani | 201/1C | 0.475 | Patta | Patta |
| Perurani | 201/1D | 1.190 | Patta | Patta |
| Perurani | 201/2A | 0.660 | Patta | Patta |
| Perurani | 201/2B | 0.635 | Patta | Patta |
| Perurani | 202/1 | 0.695 | Patta | Patta |
| Perurani | 202/2 | 0.370 | Patta | Patta |
| Perurani | 202/3 | 0.430 | Patta | Patta |
| Perurani | 202/4 | 0.780 | Patta | Patta |
| Perurani | 203/1 | 0.485 | Patta | Patta |
| Perurani | 203/2 | 0.705 | Patta | Patta |
| Perurani | 203/3 | 1.110 | Patta | Patta |
| Perurani | 203/4 | 1.650 | Patta | Patta |
| Perurani | 204/1 | 1.685 | Patta | Patta |
| Perurani | 204/2 | 0.315 | Patta | Patta |
| Perurani | 204/3 | 0.390 | Patta | Patta |
| Perurani | 206/1 | 0.285 | Patta | Patta |
| Perurani | 206/2 | 0.300 | Patta | Patta |
| Perurani | 206/3 | 1.115 | Patta | Patta |
| Perurani | 206/4 | 1.340 | Patta | Patta |
| Perurani | 206/5 | 0.510 | Patta | Patta |
| Perurani | 206/6 | 0.730 | Patta | Patta |
| Perurani | 207/1 | 0.540 | Patta | Patta |
| Perurani | 207/2 | 1.520 | Patta | Patta |
| Perurani | 207/3 | 0.665 | Patta | Patta |
| Perurani | 207/4 | 0.810 | Patta | Patta |
| Perurani | 207/5 | 0.500 | Patta | Patta |
| Perurani | 207/6 | 0.370 | Patta | Patta |
| Perurani | 211/1 | 0.600 | Patta | Patta |
| Perurani | 211/2 | 0.290 | Poramboke | Vandipathai |
| Perurani | 211/3 | 0.585 | Patta | Patta |
| Perurani | 213 | 3.575 | Patta | Patta |
| Perurani | 214/1 | 0.390 | Patta | Patta |
| Perurani | 214/2 | 1.115 | Patta | Patta |
| Perurani | 214/3 | 0.520 | Patta | Patta |



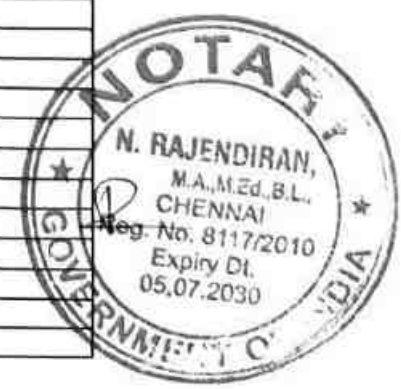
| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Perurani | 214/4 | 0.880 | Patta | Patta |
| Perurani | 214/5 | 0.505 | Patta | Patta |
| Perurani | 214/6 | 0.405 | Patta | Patta |
| Perurani | 214/7 | 0.485 | Patta | Patta |
| Perurani | 214/8 | 0.480 | Patta | Patta |
| Perurani | 214/9 | 0.220 | Patta | Patta |
| Perurani | 215/1 | 0.840 | Patta | Patta |
| Perurani | 215/2 | 0.525 | Patta | Patta |
| Perurani | 215/3 | 0.310 | Patta | Patta |
| Perurani | 215/4 | 0.940 | Patta | Patta |
| Perurani | 215/5A | 0.430 | Patta | Patta |
| Perurani | 215/5B | 0.775 | Patta | Patta |
| Perurani | 215/5C | 0.485 | Patta | Patta |
| Perurani | 215/5D | 0.500 | Patta | Patta |
| Perurani | 215/5E | 0.470 | Patta | Patta |
| Perurani | 218/1 | 0.300 | Patta | Patta |
| Perurani | 218/2 | 0.290 | Patta | Patta |
| Perurani | 218/3 | 0.155 | Patta | Patta |
| Perurani | 218/4 | 0.200 | Patta | Patta |
| Perurani | 218/5 | 0.270 | Patta | Patta |
| Perurani | 218/6 | 0.275 | Patta | Patta |
| Perurani | 219/1 | 0.350 | Patta | Patta |
| Perurani | 219/2 | 0.150 | Patta | Patta |
| Perurani | 222 | 1.995 | Patta | Patta |
| Perurani | 223 | 1.200 | Patta | Patta |
| Perurani | 224/1 | 0.655 | Patta | Patta |
| Perurani | 224/2 | 1.295 | Patta | Patta |
| Perurani | 224/3 | 0.395 | Patta | Patta |
| Perurani | 224/4 | 0.795 | Patta | Patta |
| Perurani | 225/1 | 0.635 | Patta | Patta |
| Perurani | 225/2A | 0.340 | Patta | Patta |
| Perurani | 225/2B | 0.280 | Patta | Patta |
| Perurani | 225/3 | 0.675 | Patta | Patta |
| Perurani | 225/4A | 0.270 | Patta | Patta |
| Perurani | 225/4B | 0.270 | Patta | Patta |
| Perurani | 225/4C | 0.520 | Patta | Patta |
| Perurani | 225/5 | 0.905 | Patta | Patta |
| Perurani | 226/1 | 1.950 | Patta | Patta |
| Perurani | 226/2 | 0.800 | Patta | Patta |
| Perurani | 226/3A | 0.605 | Patta | Patta |
| Perurani | 226/3B | 0.595 | Patta | Patta |
| Perurani | 227/1 | 0.480 | Patta | Patta |
| Perurani | 227/2A | 0.620 | Patta | Patta |
| Perurani | 227/2B | 1.350 | Patta | Patta |
| Perurani | 227/2C | 0.700 | Patta | Patta |
| Perurani | 228/1 | 1.510 | Patta | Patta |
| Perurani | 228/2 | 0.215 | Patta | Patta |
| Perurani | 228/3 | 0.725 | Patta | Patta |
| Perurani | 228/4 | 0.465 | Patta | Patta |
| Perurani | 229 | 1.250 | Patta | Patta |
| Perurani | 230/1 | 2.025 | Patta | Patta |
| Perurani | 230/2 | 1.765 | Patta | Patta |
| Perurani | 230/3 | 0.710 | Patta | Patta |
| Perurani | 231/1 | 1.070 | Patta | Patta |
| Perurani | 231/2 | 0.715 | Patta | Patta |



| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Perurani | 231/3 | 0.600 | Patta | Patta |
| Perurani | 231/4 | 0.575 | Patta | Patta |
| Perurani | 232/1 | 0.925 | Patta | Patta |
| Perurani | 232/2 | 1.480 | Patta | Patta |
| Perurani | 232/3 | 0.440 | Patta | Patta |
| Perurani | 232/4 | 0.390 | Patta | Patta |
| Perurani | 233/1 | 0.895 | Patta | Patta |
| Perurani | 233/2 | 0.580 | Patta | Patta |
| Perurani | 234 | 4.745 | Patta | Patta |
| Perurani | 235/1 | 1.200 | Patta | Patta |
| Perurani | 235/2 | 0.740 | Patta | Patta |
| Perurani | 235/3 | 0.725 | Patta | Patta |
| Perurani | 235/4 | 2.175 | Patta | Patta |
| Perurani | 238/1 | 0.685 | Patta | Patta |
| Perurani | 238/2 | 1.275 | Patta | Patta |
| Perurani | 238/3 | 1.395 | Patta | Patta |
| Perurani | 238/4 | 1.550 | Patta | Patta |
| Perurani | 239 | 4.335 | Patta | Patta |
| Perurani | 240/1 | 0.545 | Patta | Patta |
| Perurani | 240/2 | 2.615 | Patta | Patta |
| Perurani | 240/3 | 0.670 | Patta | Patta |
| Perurani | 241/1 | 0.965 | Patta | Patta |
| Perurani | 241/2 | 2.060 | Patta | Patta |
| Perurani | 242 | 4.700 | Patta | Patta |
| Perurani | 243/1 | 1.245 | Patta | Patta |
| Perurani | 243/2 | 1.030 | Patta | Patta |
| Perurani | 244/1 | 1.785 | Patta | Patta |
| Perurani | 244/2 | 1.385 | Patta | Patta |
| Perurani | 244/3 | 0.755 | Patta | Patta |
| Perurani | 245/1 | 0.405 | Patta | Patta |
| Perurani | 245/2 | 0.550 | Patta | Patta |
| Perurani | 245/3 | 0.345 | Patta | Patta |
| Perurani | 245/4 | 2.200 | Patta | Patta |
| Perurani | 246/1A | 0.275 | Patta | Patta |
| Perurani | 246/1B | 0.270 | Patta | Patta |
| Perurani | 246/2 | 0.680 | Patta | Patta |
| Perurani | 246/3 | 0.970 | Patta | Patta |
| Perurani | 247/1A | 1.200 | Patta | Patta |
| Perurani | 247/1B | 0.460 | Patta | Patta |
| Perurani | 247/2 | 0.500 | Patta | Patta |
| Perurani | 247/3 | 0.145 | Patta | Patta |
| Perurani | 247/4 | 0.095 | Patta | Patta |
| Perurani | 247/5 | 0.095 | Patta | Patta |
| Umarikottai | 168- | 1.610 | Patta | Patta |
| Umarikottai | 169/1 | 0.325 | Patta | Patta |
| Umarikottai | 169/2 | 0.655 | Patta | Patta |
| Umarikottai | 170/1 | 0.225 | Patta | Patta |
| Umarikottai | 170/2 | 0.470 | Patta | Patta |
| Umarikottai | 171/1 | 3.963 | Patta | Patta |
| Umarikottai | 171/2 | 0.737 | Patta | Patta |
| Umarikottai | 172/1 | 1.285 | Patta | Patta |
| Umarikottai | 172/2 | 1.605 | Patta | Patta |
| Umarikottai | 173 | 0.000 | Patta | Patta |
| Umarikottai | 174/1 | 5.740 | Patta | Patta |



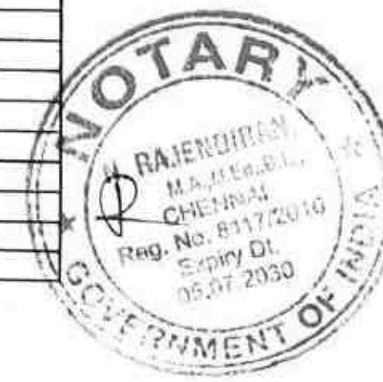
| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Umarikottai | 174/2 | 0.565 | Patta | Patta |
| Umarikottai | 175/1 | 0.745 | Patta | Patta |
| Umarikottai | 175/2 | 0.710 | Patta | Patta |
| Umarikottai | 176 | 0.755 | Patta | Patta |
| Umarikottai | 177/1 | 0.130 | Patta | Patta |
| Umarikottai | 177/2 | 1.365 | Patta | Patta |
| Umarikottai | 177/3 | 0.670 | Patta | Patta |
| Umarikottai | 177/4A | 0.370 | Patta | Patta |
| Umarikottai | 177/4B | 0.370 | Patta | Patta |
| Umarikottai | 178/1 | 0.550 | Patta | Patta |
| Umarikottai | 178/2 | 1.080 | Patta | Patta |
| Umarikottai | 179/1A | 0.710 | Patta | Patta |
| Umarikottai | 179/1B | 0.725 | Patta | Patta |
| Umarikottai | 179/2A | 0.910 | Patta | Patta |
| Umarikottai | 179/2B | 0.225 | Patta | Patta |
| Umarikottai | 179/2C | 0.220 | Patta | Patta |
| Umarikottai | 180/1 | 2.115 | Patta | Patta |
| Umarikottai | 180/2A | 0.840 | Patta | Patta |
| Umarikottai | 180/2B1 | 1.130 | Patta | Patta |
| Umarikottai | 180/2B2 | 0.705 | Patta | Patta |
| Umarikottai | 181/1 | 0.900 | Patta | Patta |
| Umarikottai | 181/2 | 0.900 | Patta | Patta |
| Umarikottai | 181/3 | 1.480 | Patta | Patta |
| Umarikottai | 182 | 1.795 | Patta | Patta |
| Umarikottai | 183 | 1.490 | Patta | Patta |
| Umarikottai | 184/1 | 0.760 | Patta | Patta |
| Umarikottai | 184/2 | 2.480 | Patta | Patta |
| Umarikottai | 185/1A | 0.590 | Patta | Patta |
| Umarikottai | 185/1B | 0.565 | Patta | Patta |
| Umarikottai | 185/2A | 0.455 | Patta | Patta |
| Umarikottai | 185/2B | 0.905 | Patta | Patta |
| Umarikottai | 186 | 0.745 | Patta | Patta |
| Umarikottai | 187 | 1.165 | Patta | Patta |
| Umarikottai | 188 | 0.460 | Patta | Patta |
| Umarikottai | 189 | 3.750 | Patta | Patta |
| Umarikottai | 190 | 1.360 | Patta | Patta |
| Umarikottai | 191/1 | 1.250 | Patta | Patta |
| Umarikottai | 191/2 | 0.650 | Patta | Patta |
| Umarikottai | 192 | 1.540 | Patta | Patta |
| Umarikottai | 193 | 1.370 | Patta | Patta |
| Umarikottai | 194 | 1.455 | Patta | Patta |
| Umarikottai | 195/1 | 2.200 | Patta | Patta |
| Umarikottai | 195/2 | 1.125 | Patta | Patta |
| Umarikottai | 196/1 | 3.740 | Patta | Patta |
| Umarikottai | 196/2 | 1.255 | Patta | Patta |
| Umarikottai | 197 | 1.935 | Patta | Patta |
| Umarikottai | 198 | 2.015 | Patta | Patta |
| Umarikottai | 199 | 2.795 | Patta | Patta |
| Umarikottai | 200 | 1.565 | Patta | Patta |
| Umarikottai | 201/1A | 0.700 | Patta | Patta |
| Umarikottai | 201/1B | 0.700 | Patta | Patta |
| Umarikottai | 201/2 | 1.245 | Patta | Patta |
| Umarikottai | 202/1A | 0.950 | Patta | Patta |
| Umarikottai | 202/1B | 1.440 | Patta | Patta |
| Umarikottai | 202/2 | 1.010 | Patta | Patta |



| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Umarikottai | 202/3 | 0.865 | Patta | Patta |
| Umarikottai | 203 | 0.785 | Patta | Patta |
| Umarikottai | 204 | 0.855 | Patta | Patta |
| Umarikottai | 205 | 2.350 | Patta | Patta |
| Umarikottai | 206/1 | 1.310 | Patta | Patta |
| Umarikottai | 206/2 | 0.470 | Patta | Patta |
| Umarikottai | 206/3 | 0.525 | Patta | Patta |
| Umarikottai | 207/1 | 1.200 | Patta | Patta |
| Umarikottai | 207/2 | 0.185 | Patta | Patta |
| Umarikottai | 207/3 | 0.180 | Patta | Patta |
| Umarikottai | 208 | 2.815 | Patta | Patta |
| Umarikottai | 209 | 1.675 | Patta | Patta |
| Umarikottai | 211/3 | 1.775 | Patta | Patta |
| Umarikottai | 211/4 | 0.720 | Patta | Patta |
| Umarikottai | 212 | 0.840 | Patta | Patta |
| Umarikottai | 213/1 | 0.510 | Patta | Patta |
| Umarikottai | 213/2 | 0.430 | Patta | Patta |
| Umarikottai | 213/3 | 0.250 | Patta | Patta |
| Umarikottai | 213/4 | 0.510 | Patta | Patta |
| Umarikottai | 213/5 | 0.500 | Patta | Patta |
| Umarikottai | 213/6 | 0.330 | Patta | Patta |
| Umarikottai | 214/1 | 0.860 | Patta | Patta |
| Umarikottai | 214/10 | 0.685 | Patta | Patta |
| Umarikottai | 214/2 | 0.795 | Patta | Patta |
| Umarikottai | 214/3 | 0.330 | Patta | Patta |
| Umarikottai | 214/4 | 0.485 | Patta | Patta |
| Umarikottai | 214/5 | 0.020 | Patta | Patta |
| Umarikottai | 214/6 | 0.335 | Patta | Patta |
| Umarikottai | 214/7 | 0.130 | Patta | Patta |
| Umarikottai | 214/8 | 0.125 | Patta | Patta |
| Umarikottai | 214/9 | 0.270 | Patta | Patta |
| Umarikottai | 215 | 0.880 | Patta | Patta |
| Ramasamypuram | 81- | 1.010 | Patta | Patta |
| Ramasamypuram | 83 | 0.450 | Patta | Patta |
| Ramasamypuram | 84/1 | 0.130 | Patta | Patta |
| Ramasamypuram | 84/2 | 0.350 | Patta | Patta |
| Ramasamypuram | 84/3 | 0.615 | Patta | Patta |
| Ramasamypuram | 84/4 | 0.760 | Patta | Patta |
| Ramasamypuram | 84/5 | 0.625 | Patta | Patta |
| Ramasamypuram | 84/6A | 0.460 | Patta | Patta |
| Ramasamypuram | 84/6B | 0.160 | Patta | Patta |
| Ramasamypuram | 84/6C | 0.330 | Patta | Patta |
| Ramasamypuram | 84/6D | 0.470 | Patta | Patta |
| Ramasamypuram | 88/1 | 0.810 | Patta | Patta |
| Ramasamypuram | 88/2 | 0.930 | Patta | Patta |
| Ramasamypuram | 88/3 | 1.175 | Patta | Patta |
| Ramasamypuram | 88/4 | 1.955 | Patta | Patta |
| Ramasamypuram | 89/1 | 1.605 | Patta | Patta |
| Ramasamypuram | 89/2 | 0.610 | Patta | Patta |
| Ramasamypuram | 89/3 | 0.380 | Patta | Patta |
| Ramasamypuram | 89/4 | 1.045 | Patta | Patta |
| Ramasamypuram | 90/1 | 0.555 | Patta | Patta |
| Ramasamypuram | 90/2 | 0.620 | Patta | Patta |
| Ramasamypuram | 90/3 | 0.825 | Patta | Patta |
| Ramasamypuram | 91/1 | 0.575 | Patta | Patta |



| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Ramasamypuram | 91/2 | 0.325 | Patta | Patta |
| Ramasamypuram | 91/3 | 0.815 | Patta | Patta |
| Ramasamypuram | 93/1 | 1.790 | Patta | Patta |
| Ramasamypuram | 93/2 | 0.740 | Patta | Patta |
| Ramasamypuram | 93/3 | 0.820 | Patta | Patta |
| Ramasamypuram | 93/4 | 0.700 | Patta | Patta |
| Ramasamypuram | 93/5 | 0.820 | Patta | Patta |
| Ramasamypuram | 94/1A | 0.000 | Patta | Patta |
| Ramasamypuram | 94/1B | 0.000 | Patta | Patta |
| Ramasamypuram | 94/2A | 0.000 | Patta | Patta |
| Ramasamypuram | 94/2B | 0.000 | Patta | Patta |
| Ramasamypuram | 94/3A | 0.000 | Patta | Patta |
| Ramasamypuram | 94/3B | 0.000 | Patta | Patta |
| Ramasamypuram | 94/4 | 0.000 | Patta | Patta |
| Ramasamypuram | 95/1 | 0.000 | Patta | Patta |
| Ramasamypuram | 95/2 | 0.000 | Patta | Patta |
| Ramasamypuram | 105/1 | 0.000 | Patta | Patta |
| Ramasamypuram | 105/2 | 0.000 | Patta | Patta |
| Ramasamypuram | 105/3 | 0.000 | Patta | Patta |
| Ramasamypuram | 105/4A | 0.000 | Patta | Patta |
| Ramasamypuram | 105/4B | 0.000 | Patta | Patta |
| Ramasamypuram | 106/3A | 0.000 | Patta | Patta |
| Ramasamypuram | 106/3B | 0.000 | Patta | Patta |
| Ramasamypuram | 106/4 | 0.000 | Patta | Patta |
| Ramasamypuram | 106/5 | 0.000 | Patta | Patta |
| Ramasamypuram | 107 | 0.000 | Patta | Patta |
| Ramasamypuram | 108/1A | 0.000 | Patta | Patta |
| Ramasamypuram | 108/1B | 0.000 | Patta | Patta |
| Ramasamypuram | 108/2A | 0.000 | Patta | Patta |
| Ramasamypuram | 108/2B | 0.000 | Patta | Patta |
| Ramasamypuram | 108/3 | 0.000 | Patta | Patta |
| Ramasamypuram | 108/4A | 0.000 | Patta | Patta |
| Ramasamypuram | 108/4B | 0.000 | Patta | Patta |
| Ramasamypuram | 108/5 | 0.000 | Patta | Patta |
| Ramasamypuram | 109/1 | 0.890 | Patta | Patta |
| Ramasamypuram | 109/2 | 0.540 | Patta | Patta |
| Ramasamypuram | 109/3 | 0.540 | Patta | Patta |
| Ramasamypuram | 109/4 | 0.420 | Patta | Patta |
| Ramasamypuram | 109/5A | 0.210 | Patta | Patta |
| Ramasamypuram | 109/5B | 0.205 | Patta | Patta |
| Ramasamypuram | 109/6 | 0.560 | Patta | Patta |
| Ramasamypuram | 110/1 | 0.380 | Patta | Patta |
| Ramasamypuram | 110/2 | 0.375 | Patta | Patta |
| Ramasamypuram | 110/3 | 0.390 | Patta | Patta |
| Ramasamypuram | 110/4 | 0.385 | Patta | Patta |
| Ramasamypuram | 110/5 | 1.485 | Patta | Patta |
| Ramasamypuram | 110/6 | 1.060 | Patta | Patta |
| Ramasamypuram | 110/7 | 0.775 | Patta | Patta |
| Ramasamypuram | 111/1A | 0.900 | Patta | Patta |
| Ramasamypuram | 111/1B | 0.490 | Patta | Patta |
| Ramasamypuram | 111/2 | 0.585 | Patta | Patta |
| Ramasamypuram | 111/3 | 0.330 | Patta | Patta |
| Ramasamypuram | 111/4 | 0.315 | Patta | Patta |
| Ramasamypuram | 112/1 | 1.010 | Patta | Patta |
| Ramasamypuram | 112/2 | 1.015 | Patta | Patta |



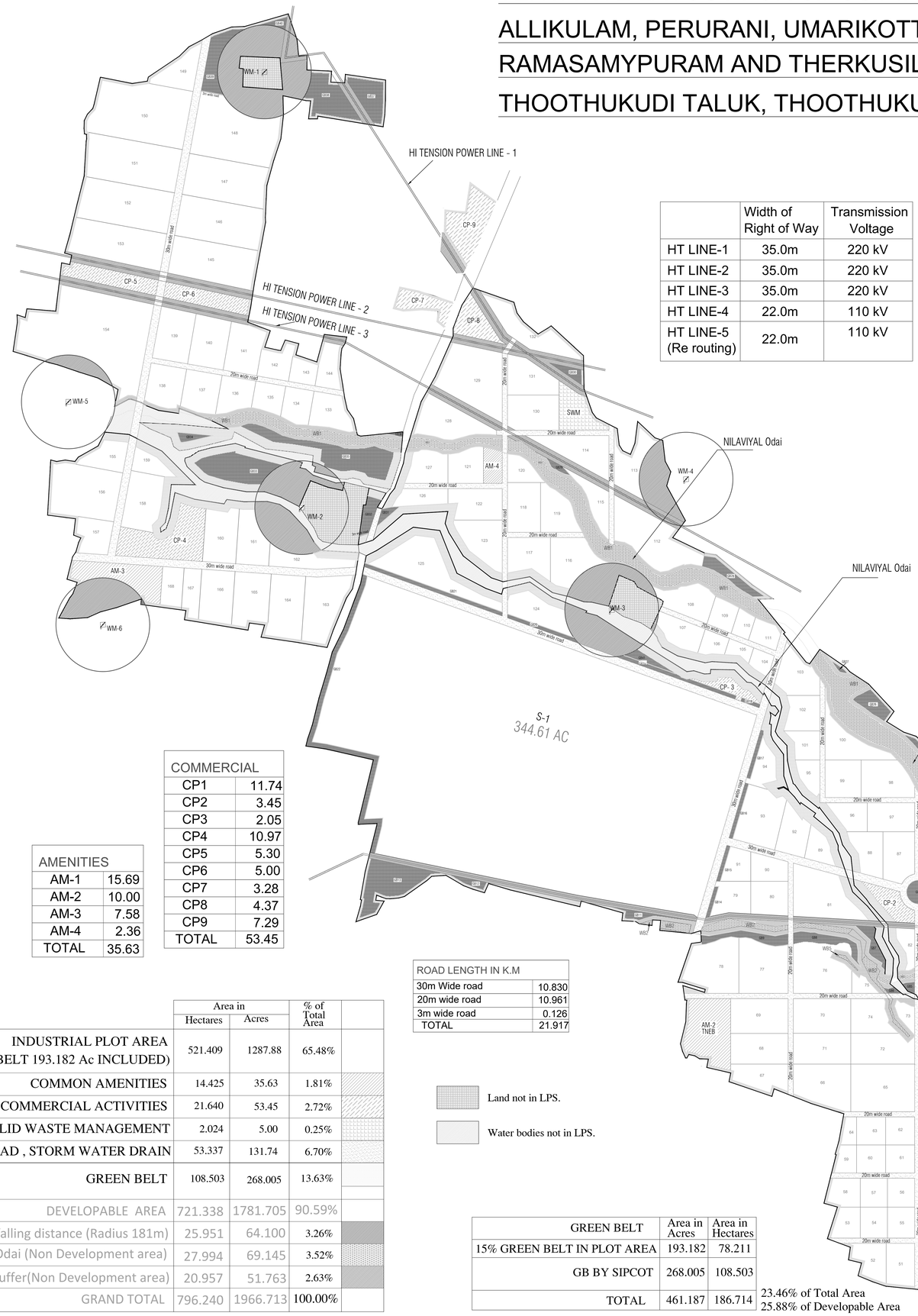
| Village | Survey No. | Land Extent (in ha) | Type | Classification |
|---|---|---|---|---|
| Ramasamypuram | 112/3 | 1.010 | Patta | Patta |
| Ramasamypuram | 112/4 | 0.715 | Patta | Patta |
| Ramasamypuram | 112/5 | 0.710 | Patta | Patta |
| Ramasamypuram | 112/6 | 0.710 | Patta | |
| Ramasamypuram | 113/1 | 0.290 | Patta | Patta |
| Ramasamypuram | 113/3 | 0.260 | Patta | Patta |
| Ramasamypuram | 113/4 | 0.420 | Patta | Patta |
| Ramasamypuram | 113/5 | 0.975 | Patta | Patta |
| Ramasamypuram | 114/1 | 0.790 | Patta | Patta |
| Ramasamypuram | 114/2 | 0.595 | Patta | Patta |
| Ramasamypuram | 114/3 | 0.650 | Patta | Patta |
| Ramasamypuram | 114/4 | 0.175 | Patta | Patta |
| Ramasamypuram | 117/1 | 0.515 | Patta | Patta |
| Ramasamypuram | 117/2 | 0.540 | Patta | Patta |
| Ramasamypuram | 117/3 | 0.580 | Patta | Patta |
| Ramasamypuram | 117/5 | 0.235 | Patta | Patta |
| Ramasamypuram | 117/6 | 0.665 | Patta | Patta |
| Ramasamypuram | 117/7 | 0.540 | Patta | Patta |
| Ramasamypuram | 117/8 | 0.670 | Patta | Patta |
| Ramasamypuram | 120/1 | 0.265 | Patta | Patta |
| Ramasamypuram | 120/2 | 1.225 | Patta | Patta |
| Ramasamypuram | 120/3 | 1.365 | Patta | Patta |
| Ramasamypuram | 124/1 | 1.620 | Patta | Patta |
| Ramasamypuram | 124/2 | 2.970 | Patta | Patta |
| Ramasamypuram | 124/3 | 0.665 | Patta | Patta |
| Ramasamypuram | 125/1 | 0.625 | Patta | Patta |
| Ramasamypuram | 125/2 | 0.690 | Patta | Patta |
| Ramasamypuram | 125/3 | 0.560 | Patta | Patta |
| Ramasamypuram | 125/4 | 3.020 | Patta | Patta |
| Ramasamypuram | 126/1 | 1.125 | Patta | Patta |
| Ramasamypuram | 126/2 | 0.670 | Patta | Patta |
| Ramasamypuram | 126/3 | 0.615 | Patta | Patta |
| Ramasamypuram | 127/1 | 0.620 | Patta | Patta |
| Ramasamypuram | 127/2A | 0.550 | Patta | Patta |
| Ramasamypuram | 127/2B | 0.000 | Patta | Patta |
| Ramasamypuram | 128/1 | 0.710 | Patta | Patta |
| Ramasamypuram | 128/2 | 1.700 | Patta | Patta |
| Ramasamypuram | 129/1 | 0.000 | Patta | Patta |
| Ramasamypuram | 129/2 | 0.000 | Patta | Patta |
| Ramasamypuram | 129/3 | 0.000 | Patta | Patta |

NOTARY
N. RAJENDIRAN, M.A., M.Ed., B.L.,
CHENNAI
Reg. No. 9117/2010
Expiry Dt. 05.07.2030
GOVERNMENT OF INDIA

N. RAJENDIRAN, M.A., M.Ed., B.L.,
MS No: 1293/1991
ADVOCATE & NOTARY PUBLIC
GOVERNMENT OF INDIA
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West Mambalam, Chennai - 600 033.
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# Annexure 3 - Tentative layout for Industrial Park

# TENTATIVE LAYOUT FOR SIPCOT INDUSTRIAL PARK AT KEELATHATTAPARAI, ALLIKULAM, PERURANI, UMARIKOTTAI, MELATHATTAPARAI, RAMASAMYPURAM AND THERKUSILLUKKANPATTI VILLAGES THOOTHUKUDI TALUK, THOOTHUKUDI DISTRICT.




| | Width of Right of Way | Transmission Voltage |
|---|---|---|
| HT LINE-1 | 35.0m | 220 kV |
| HT LINE-2 | 35.0m | 220 kV |
| HT LINE-3 | 35.0m | 220 kV |
| HT LINE-4 | 22.0m | 110 kV |
| HT LINE-5 (Re routing) | 22.0m | 110 kV |

PLOT AREA

| PLOT NO. | AREA IN ACRE. | PLOT NO. | AREA IN ACRE. | PLOT NO. | AREA IN ACRE. |
|---|---|---|---|---|---|
| S1 | 344.61 | 56 | 3.00 | 112 | 12.14 |
| 1 | 2.47 | 57 | 3.00 | 113 | 5.15 |
| 2 | 2.50 | 58 | 3.10 | 114 | 7.11 |
| 3 | 2.66 | 59 | 1.98 | 115 | 3.70 |
| 4 | 12.55 | 60 | 3.00 | 116 | 6.87 |
| 5 | 7.84 | 61 | 3.00 | 117 | 5.58 |
| 6 | 6.17 | 62 | 3.00 | 118 | 6.08 |
| 7 | 6.34 | 63 | 3.00 | 119 | 5.19 |
| 8 | 5.76 | 64 | 1.37 | 120 | 2.70 |
| 9 | 6.29 | 65 | 11.20 | 121 | 4.36 |
| 10 | 7.36 | 66 | 8.42 | 122 | 5.81 |
| 11 | 6.10 | 67 | 4.76 | 123 | 6.30 |
| 12 | 3.72 | 68 | 6.50 | 124 | 5.60 |
| 13 | 4.82 | 69 | 7.37 | 125 | 11.31 |
| 14 | 8.76 | 70 | 7.33 | 126 | 3.09 |
| 15 | 14.35 | 71 | 6.53 | 127 | 4.51 |
| 16 | 4.14 | 72 | 6.96 | 128 | 7.47 |
| 17 | 5.37 | 73 | 1.47 | 129 | 13.11 |
| 18 | 5.36 | 74 | 4.82 | 130 | 6.64 |
| 19 | 5.20 | 75 | 1.34 | 131 | 5.82 |
| 20 | 5.37 | 76 | 9.97 | 132 | 6.46 |
| 21 | 5.37 | 77 | 9.23 | 133 | 4.64 |
| 22 | 2.16 | 78 | 9.16 | 134 | 3.63 |
| 23 | 4.73 | 79 | 4.30 | 135 | 3.15 |
| 24 | 7.78 | 80 | 4.63 | 136 | 4.21 |
| 25 | 6.42 | 81 | 10.03 | 137 | 5.38 |
| 26 | 2.42 | 82 | 2.24 | 138 | 5.45 |
| 27 | 3.89 | 83 | 4.35 | 139 | 6.80 |
| 28 | 2.43 | 84 | 9.06 | 140 | 6.67 |
| 29 | 7.07 | 85 | 3.94 | 141 | 6.13 |
| 30 | 3.00 | 86 | 11.60 | 142 | 3.54 |
| 31 | 2.35 | 87 | 5.62 | 143 | 2.29 |
| 32 | 2.84 | 88 | 4.47 | 144 | 3.27 |
| 33 | 3.00 | 89 | 2.65 | 145 | 12.22 |
| 34 | 3.00 | 90 | 3.38 | 146 | 12.96 |
| 35 | 3.00 | 91 | 3.06 | 147 | 12.31 |
| 36 | 3.00 | 92 | 4.59 | 148 | 16.53 |
| 37 | 3.00 | 93 | 8.53 | 149 | 4.44 |
| 38 | 1.44 | 94 | 3.11 | 150 | 19.67 |
| 39 | 3.05 | 95 | 2.39 | 151 | 14.89 |
| 40 | 2.47 | 96 | 3.27 | 152 | 13.95 |
| 41 | 3.00 | 97 | 5.05 | 153 | 12.55 |
| 42 | 3.00 | 98 | 6.68 | 154 | 31.89 |
| 43 | 3.00 | 99 | 5.00 | 155 | 3.83 |
| 44 | 3.00 | 100 | 5.96 | 156 | 12.54 |
| 45 | 3.00 | 101 | 2.92 | 157 | 4.06 |
| 46 | 3.00 | 102 | 4.26 | 158 | 7.24 |
| 47 | 3.57 | 103 | 5.44 | 159 | 2.58 |
| 48 | 8.42 | 104 | 1.67 | 160 | 6.48 |
| 49 | 5.41 | 105 | 1.39 | 161 | 5.38 |
| 50 | 3.74 | 106 | 2.05 | 162 | 4.11 |
| 51 | 4.38 | 107 | 4.24 | 163 | 8.76 |
| 52 | 3.75 | 108 | 5.53 | 164 | 8.06 |
| 53 | 2.86 | 109 | 2.69 | 165 | 6.78 |
| 54 | 3.00 | 110 | 1.73 | 166 | 6.35 |
| 55 | 3.00 | 111 | 2.45 | 167 | 2.99 |
| | | | | 168 | 3.07 |
| | | | | TOTAL | 1287.88 |

| GREEN BELT | |
|---|---|
| GB-1 | 49.150 |
| GB-2 | 47.325 |
| GB-3 | 93.15 |
| GB-4 | 0.15 |
| GB-5 | 0.37 |
| GB-6 | 0.26 |
| GB-7 | 1.52 |
| GB-8 | 2.36 |
| GB-9 | 2.59 |
| GB-10 | 1.57 |
| GB-11 | 0.89 |
| GB-12 | 0.67 |
| GB-13 | 7.10 |
| GB-14 | 0.45 |
| GB-15 | 0.53 |
| GB-16 | 0.82 |
| GB-17 | 0.71 |
| GB-18 | 0.28 |
| GB-19 | 1.71 |
| GB-20 | 1.04 |
| GB-21 | 2.09 |
| GB-22 | 6.95 |
| GB-23 | 3.50 |
| GB-24 | 2.36 |
| GB-25 | 2.70 |
| GB-26 | 1.94 |
| GB-27 | 0.21 |
| GB-28 | 2.26 |
| GB-29 | 0.45 |
| GB-30 | 0.87 |
| GB-31 | 0.59 |
| GB-32 | 1.63 |
| GB-33 | 6.41 |
| GB-34 | 0.71 |
| GB-35 | 8.55 |
| GB-36 | 0.18 |
| GB-37 | 3.61 |
| GB-38 | 5.28 |
| GB-39 | 3.57 |
| GB-40 | 0.53 |
| GB-41 | 0.97 |
| Total | 268.005 |

| | |
|---|---|
| WM-1 | |
| NOT IN LPS | 4.520 |
| NON DEVELOPABLE AREA | 17.841 |

| | |
|---|---|
| WM-2 | |
| NOT IN LPS | 7.610 |
| NON DEVELOPABLE AREA | 14.288 |
| WATER BODY NOT IN LPS | 3.528 |

| | |
|---|---|
| WM-3 | |
| NOT IN LPS | 5.720 |
| NON DEVELOPABLE AREA | 14.990 |
| WATER BODY NOT IN LPS | 4.280 |

| | |
|---|---|
| WM-4 | |
| NON DEVELOPABLE AREA | 6.580 |

| | |
|---|---|
| WM-5 | |
| NON DEVELOPABLE AREA | 2.753 |

| | |
|---|---|
| WM-6 | |
| NON DEVELOPABLE AREA | 7.648 |

| COMMERCIAL | |
|---|---|
| CP1 | 11.74 |
| CP2 | 3.45 |
| CP3 | 2.05 |
| CP4 | 10.97 |
| CP5 | 5.30 |
| CP6 | 5.00 |
| CP7 | 3.28 |
| CP8 | 4.37 |
| CP9 | 7.29 |
| TOTAL | 53.45 |

| AMENITIES | |
|---|---|
| AM-1 | 15.69 |
| AM-2 | 10.00 |
| AM-3 | 7.58 |
| AM-4 | 2.36 |
| TOTAL | 35.63 |

| ROAD LENGTH IN K.M | |
|---|---|
| 30m Wide road | 10.830 |
| 20m wide road | 10.961 |
| 3m wide road | 0.126 |
| TOTAL | 21.917 |

| | Area in Hectares | Area in Acres | % of Total Area | |
|---|---|---|---|---|
| INDUSTRIAL PLOT AREA (15% GREEN BELT 193.182 Ac INCLUDED) | 521.409 | 1287.88 | 65.48% | |
| COMMON AMENITIES | 14.425 | 35.63 | 1.81% | |
| COMMERCIAL ACTIVITIES | 21.640 | 53.45 | 2.72% | |
| SOLID WASTE MANAGEMENT | 2.024 | 5.00 | 0.25% | |
| ROAD , STORM WATER DRAIN | 53.337 | 131.74 | 6.70% | |
| GREEN BELT | 108.503 | 268.005 | 13.63% | |
| DEVELOPABLE AREA | 721.338 | 1781.705 | 90.59% | |
| Area of wind mill falling distance (Radius 181m) | 25.951 | 64.100 | 3.26% | |
| Existing Nilaviyal Odai (Non Development area) | 27.994 | 69.145 | 3.52% | |
| RoW HT line buffer(Non Development area) | 20.957 | 51.763 | 2.63% | |
| GRAND TOTAL | 796.240 | 1966.713 | 100.00% | |

Land not in LPS.

Water bodies not in LPS.

| GREEN BELT | Area in Acres | Area in Hectares |
|---|---|---|
| 15% GREEN BELT IN PLOT AREA | 193.182 | 78.211 |
| GB BY SIPCOT | 268.005 | 108.503 |
| TOTAL | 461.187 | 186.714 |

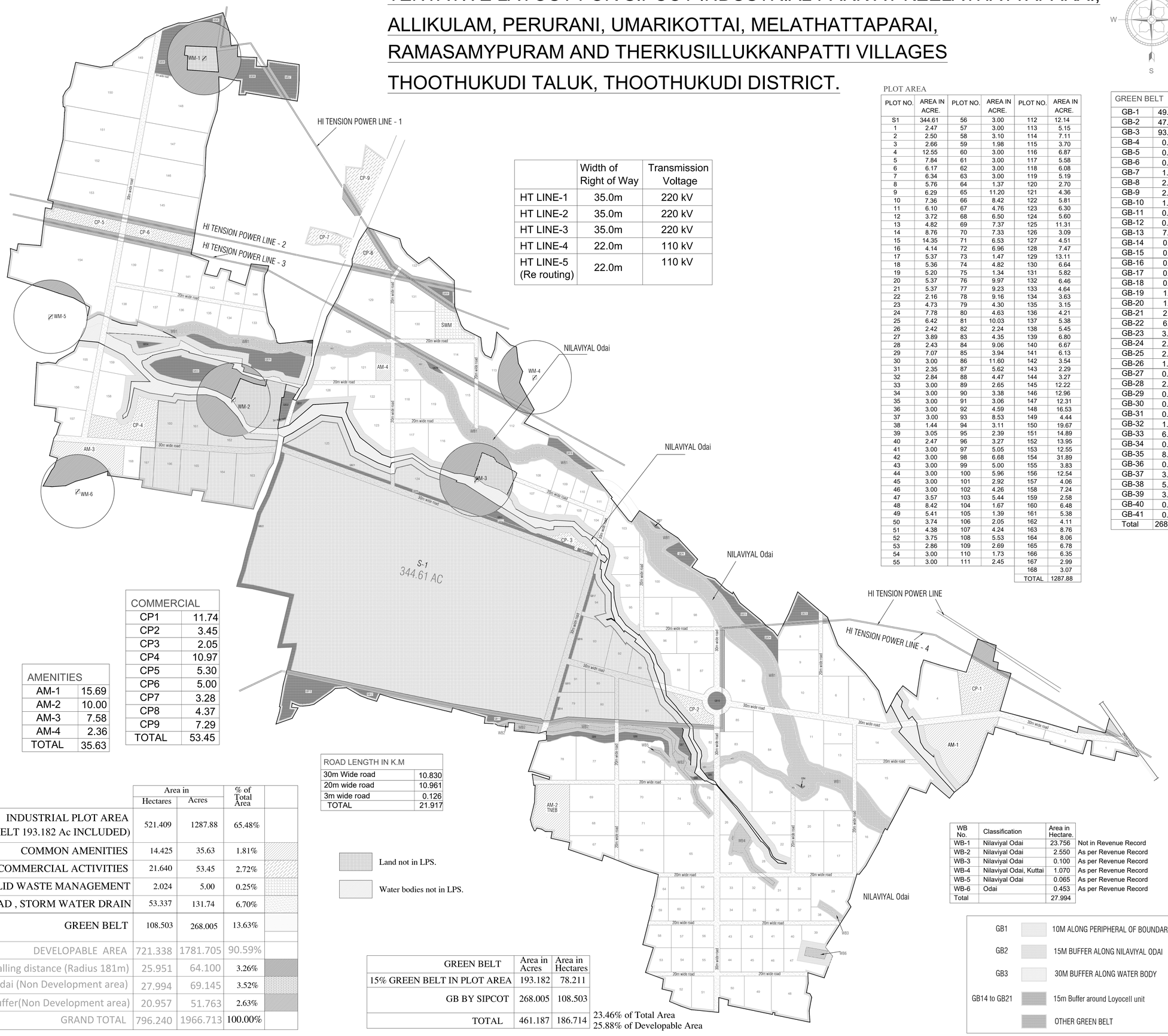
23.46% of Total Area
25.88% of Developable Area

| WB No. | Classification | Area in Hectare. | |
|---|---|---|---|
| WB-1 | Nilaviyal Odai | 23.756 | Not in Revenue Record |
| WB-2 | Nilaviyal Odai | 2.550 | As per Revenue Record |
| WB-3 | Nilaviyal Odai | 0.100 | As per Revenue Record |
| WB-4 | Nilaviyal Odai, Kuttai | 1.070 | As per Revenue Record |
| WB-5 | Nilaviyal Odai | 0.065 | As per Revenue Record |
| WB-6 | Odai | 0.453 | As per Revenue Record |
| Total | | 27.994 | |

| | |
|---|---|
| GB1 | 10M ALONG PERIPHERAL OF BOUNDARY |
| GB2 | 15M BUFFER ALONG NILAVIYAL ODAI |
| GB3 | 30M BUFFER ALONG WATER BODY |
| GB14 to GB21 | 15m Buffer around Loyocell unit |
| | OTHER GREEN BELT |

# Annexure – 3A Tentative Zonation layout for Proposed SIPCOT Industrial Park

# TENTATIVE LAYOUT FOR SIPCOT INDUSTRIAL PARK AT KEELATHATTAPARAI, ALLIKULAM, PERURANI, UMARIKOTTAI, MELATHATTAPARAI, RAMASAMYPURAM AND THERKUSILLUKKANPATTI VILLAGES THOOTHUKUDI TALUK, THOOTHUKUDI DISTRICT.




| | Width of Right of Way | Transmission Voltage |
|---|---|---|
| HT LINE-1 | 35.0m | 220 kV |
| HT LINE-2 | 35.0m | 220 kV |
| HT LINE-3 | 35.0m | 220 kV |
| HT LINE-4 | 22.0m | 110 kV |
| HT LINE-5 (Re routing) | 22.0m | 110 kV |

PLOT AREA

| PLOT NO. | AREA IN ACRE. | PLOT NO. | AREA IN ACRE. | PLOT NO. | AREA IN ACRE. |
|---|---|---|---|---|---|
| S1 | 344.61 | 56 | 3.00 | 112 | 12.14 |
| 1 | 2.47 | 57 | 3.00 | 113 | 5.15 |
| 2 | 2.50 | 58 | 3.10 | 114 | 7.11 |
| 3 | 2.66 | 59 | 1.98 | 115 | 3.70 |
| 4 | 12.55 | 60 | 3.00 | 116 | 6.87 |
| 5 | 7.84 | 61 | 3.00 | 117 | 5.58 |
| 6 | 6.17 | 62 | 3.00 | 118 | 6.08 |
| 7 | 6.34 | 63 | 3.00 | 119 | 5.19 |
| 8 | 5.76 | 64 | 1.37 | 120 | 2.70 |
| 9 | 6.29 | 65 | 11.20 | 121 | 4.36 |
| 10 | 7.36 | 66 | 8.42 | 122 | 5.81 |
| 11 | 6.10 | 67 | 4.76 | 123 | 6.30 |
| 12 | 3.72 | 68 | 6.50 | 124 | 5.60 |
| 13 | 4.82 | 69 | 7.37 | 125 | 11.31 |
| 14 | 8.76 | 70 | 7.33 | 126 | 3.09 |
| 15 | 14.35 | 71 | 6.53 | 127 | 4.51 |
| 16 | 4.14 | 72 | 6.96 | 128 | 7.47 |
| 17 | 5.37 | 73 | 1.47 | 129 | 13.11 |
| 18 | 5.36 | 74 | 4.82 | 130 | 6.64 |
| 19 | 5.20 | 75 | 1.34 | 131 | 5.82 |
| 20 | 5.37 | 76 | 9.97 | 132 | 6.46 |
| 21 | 5.37 | 77 | 9.23 | 133 | 4.64 |
| 22 | 2.16 | 78 | 9.16 | 134 | 3.63 |
| 23 | 4.73 | 79 | 4.30 | 135 | 3.15 |
| 24 | 7.78 | 80 | 4.63 | 136 | 4.21 |
| 25 | 6.42 | 81 | 10.03 | 137 | 5.38 |
| 26 | 2.42 | 82 | 2.24 | 138 | 5.45 |
| 27 | 3.89 | 83 | 4.35 | 139 | 6.80 |
| 28 | 2.43 | 84 | 9.06 | 140 | 6.67 |
| 29 | 7.07 | 85 | 3.94 | 141 | 6.13 |
| 30 | 3.00 | 86 | 11.60 | 142 | 3.54 |
| 31 | 2.35 | 87 | 5.62 | 143 | 2.29 |
| 32 | 2.84 | 88 | 4.47 | 144 | 3.27 |
| 33 | 3.00 | 89 | 2.65 | 145 | 12.22 |
| 34 | 3.00 | 90 | 3.38 | 146 | 12.96 |
| 35 | 3.00 | 91 | 3.06 | 147 | 12.31 |
| 36 | 3.00 | 92 | 4.59 | 148 | 16.53 |
| 37 | 3.00 | 93 | 8.53 | 149 | 4.44 |
| 38 | 1.44 | 94 | 3.11 | 150 | 19.67 |
| 39 | 3.05 | 95 | 2.39 | 151 | 14.89 |
| 40 | 2.47 | 96 | 3.27 | 152 | 13.95 |
| 41 | 3.00 | 97 | 5.05 | 153 | 12.55 |
| 42 | 3.00 | 98 | 6.68 | 154 | 31.89 |
| 43 | 3.00 | 99 | 5.00 | 155 | 3.83 |
| 44 | 3.00 | 100 | 5.96 | 156 | 12.54 |
| 45 | 3.00 | 101 | 2.92 | 157 | 4.06 |
| 46 | 3.00 | 102 | 4.26 | 158 | 7.24 |
| 47 | 3.57 | 103 | 5.44 | 159 | 2.58 |
| 48 | 8.42 | 104 | 1.67 | 160 | 6.48 |
| 49 | 5.41 | 105 | 1.39 | 161 | 5.38 |
| 50 | 3.74 | 106 | 2.05 | 162 | 4.11 |
| 51 | 4.38 | 107 | 4.24 | 163 | 8.76 |
| 52 | 3.75 | 108 | 5.53 | 164 | 8.06 |
| 53 | 2.86 | 109 | 2.69 | 165 | 6.78 |
| 54 | 3.00 | 110 | 1.73 | 166 | 6.35 |
| 55 | 3.00 | 111 | 2.45 | 167 | 2.99 |
| | | | | 168 | 3.07 |
| | | | | TOTAL | 1287.88 |

| GREEN BELT | |
|---|---|
| GB-1 | 49.150 |
| GB-2 | 47.325 |
| GB-3 | 93.15 |
| GB-4 | 0.15 |
| GB-5 | 0.37 |
| GB-6 | 0.26 |
| GB-7 | 1.52 |
| GB-8 | 2.36 |
| GB-9 | 2.59 |
| GB-10 | 1.57 |
| GB-11 | 0.89 |
| GB-12 | 0.67 |
| GB-13 | 7.10 |
| GB-14 | 0.45 |
| GB-15 | 0.53 |
| GB-16 | 0.82 |
| GB-17 | 0.71 |
| GB-18 | 0.28 |
| GB-19 | 1.71 |
| GB-20 | 1.04 |
| GB-21 | 2.09 |
| GB-22 | 6.95 |
| GB-23 | 3.50 |
| GB-24 | 2.36 |
| GB-25 | 2.70 |
| GB-26 | 1.94 |
| GB-27 | 0.21 |
| GB-28 | 2.26 |
| GB-29 | 0.45 |
| GB-30 | 0.87 |
| GB-31 | 0.59 |
| GB-32 | 1.63 |
| GB-33 | 6.41 |
| GB-34 | 0.71 |
| GB-35 | 8.55 |
| GB-36 | 0.18 |
| GB-37 | 3.61 |
| GB-38 | 5.28 |
| GB-39 | 3.57 |
| GB-40 | 0.53 |
| GB-41 | 0.97 |
| Total | 268.005 |

| | |
|---|---|
| WM-1 | |
| NOT IN LPS | 4.520 |
| NON DEVELOPABLE AREA | 17.841 |

| | |
|---|---|
| WM-2 | |
| NOT IN LPS | 7.610 |
| NON DEVELOPABLE AREA | 14.288 |
| WATER BODY NOT IN LPS | 3.528 |

| | |
|---|---|
| WM-3 | |
| NOT IN LPS | 5.720 |
| NON DEVELOPABLE AREA | 14.990 |
| WATER BODY NOT IN LPS | 4.280 |

| | |
|---|---|
| WM-4 | |
| NON DEVELOPABLE AREA | 6.580 |

| | |
|---|---|
| WM-5 | |
| NON DEVELOPABLE AREA | 2.753 |

| | |
|---|---|
| WM-6 | |
| NON DEVELOPABLE AREA | 7.648 |

| COMMERCIAL | |
|---|---|
| CP1 | 11.74 |
| CP2 | 3.45 |
| CP3 | 2.05 |
| CP4 | 10.97 |
| CP5 | 5.30 |
| CP6 | 5.00 |
| CP7 | 3.28 |
| CP8 | 4.37 |
| CP9 | 7.29 |
| TOTAL | 53.45 |

| AMENITIES | |
|---|---|
| AM-1 | 15.69 |
| AM-2 | 10.00 |
| AM-3 | 7.58 |
| AM-4 | 2.36 |
| TOTAL | 35.63 |

| ROAD LENGTH IN K.M | |
|---|---|
| 30m Wide road | 10.830 |
| 20m wide road | 10.961 |
| 3m wide road | 0.126 |
| TOTAL | 21.917 |

| | Area in Hectares | Area in Acres | % of Total Area | |
|---|---|---|---|---|
| INDUSTRIAL PLOT AREA (15% GREEN BELT 193.182 Ac INCLUDED) | 521.409 | 1287.88 | 65.48% | |
| COMMON AMENITIES | 14.425 | 35.63 | 1.81% | |
| COMMERCIAL ACTIVITIES | 21.640 | 53.45 | 2.72% | |
| SOLID WASTE MANAGEMENT | 2.024 | 5.00 | 0.25% | |
| ROAD , STORM WATER DRAIN | 53.337 | 131.74 | 6.70% | |
| GREEN BELT | 108.503 | 268.005 | 13.63% | |
| DEVELOPABLE AREA | 721.338 | 1781.705 | 90.59% | |
| Area of wind mill falling distance (Radius 181m) | 25.951 | 64.100 | 3.26% | |
| Existing Nilaviyal Odai (Non Development area) | 27.994 | 69.145 | 3.52% | |
| RoW HT line buffer(Non Development area) | 20.957 | 51.763 | 2.63% | |
| GRAND TOTAL | 796.240 | 1966.713 | 100.00% | |

Land not in LPS.

Water bodies not in LPS.

| GREEN BELT | Area in Acres | Area in Hectares |
|---|---|---|
| 15% GREEN BELT IN PLOT AREA | 193.182 | 78.211 |
| GB BY SIPCOT | 268.005 | 108.503 |
| TOTAL | 461.187 | 186.714 |

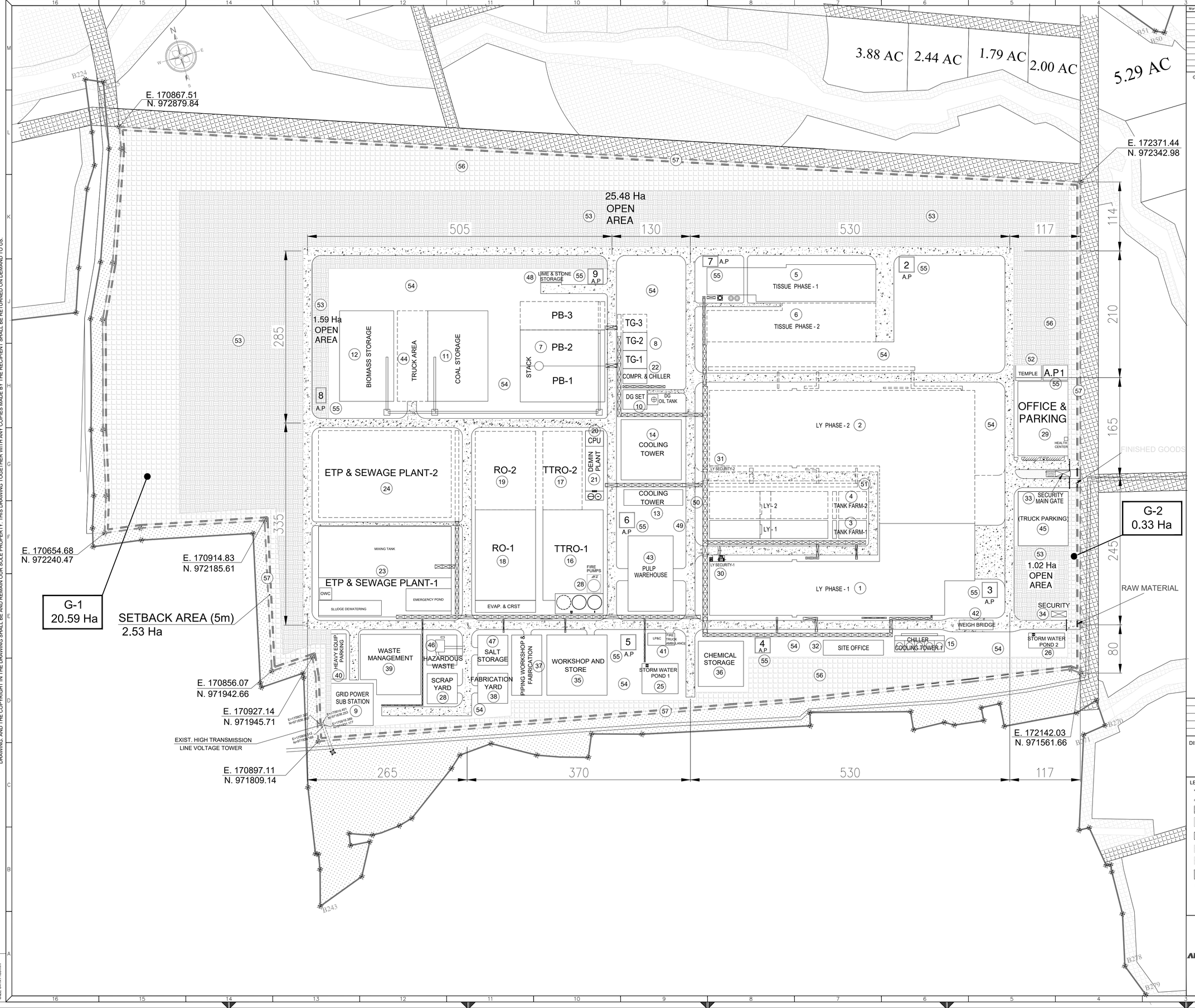
23.46% of Total Area
25.88% of Developable Area

| WB No. | Classification | Area in Hectare. | |
|---|---|---|---|
| WB-1 | Nilaviyal Odai | 23.756 | Not in Revenue Record |
| WB-2 | Nilaviyal Odai | 2.550 | As per Revenue Record |
| WB-3 | Nilaviyal Odai | 0.100 | As per Revenue Record |
| WB-4 | Nilaviyal Odai, Kuttai | 1.070 | As per Revenue Record |
| WB-5 | Nilaviyal Odai | 0.065 | As per Revenue Record |
| WB-6 | Odai | 0.453 | As per Revenue Record |
| Total | | 27.994 | |

| | |
|---|---|
| GB1 | 10M ALONG PERIPHERAL OF BOUNDARY |
| GB2 | 15M BUFFER ALONG NILAVIYAL ODAI |
| GB3 | 30M BUFFER ALONG WATER BODY |
| GB14 to GB21 | 15m Buffer around Loyocell unit |
| | OTHER GREEN BELT |

# Annexure 4 - Tentative layout for Lyocell

THIS DRAWING MUST NOT WITHOUT OUR CONSENT BE SHOWN TO ANY PERSON OUTSIDE THE RECIPIENT EMPLOY OR BE COPIED OR USED FOR THE PURPOSE OF MANUFACTURING ANY ARTICLE SHOWN IN THE DRAWING. AND THE COPYRIGHT IN THE DRAWING SHALL BE AND REMAIN OUR SOLE PROPERTY. THIS DRAWING TOGETHER WITH ANY COPIES MADE BY THE RECIPIENT SHALL BE RETURNED ON DEMAND TO US.




| Mark | Date | Drawn | Checked | Engineer | Approved | Revision Description |
|---|---|---|---|---|---|---|
| | | | | | | |

GENERAL NOTES :

| Sr No | Description | Area ha | % |
|---|---|---|---|
| **A** | **Main Plant** | **14,61** | **10%** |
| 1 | Ly Phase - 1 | 3,96 | |
| 2 | Ly Phase - 2 | 5,50 | |
| 3 | Tank Farm 1 | 0,78 | |
| 4 | Tank Farm 2 | 1,17 | |
| 5 | Tissue Phase 1 | 1,60 | |
| 6 | Tissue Phase 2 | 1,60 | |
| **B** | **Power Plant** | **7,96** | **6%** |
| 7 | PB 1, 2, 3 | 2,32 | |
| 8 | TG 1, 2, 3 | 0,45 | |
| 9 | Grid Power Sub Station | 0,49 | |
| 10 | DG SET & Oil tank | 0,19 | |
| 11 | Coal Storage | 1,50 | |
| 12 | Biomass storage | 1,50 | |
| 13 | Cooling tower | 0,25 | |
| 14 | Cooling tower - BOP | 1,00 | |
| 15 | Chiller cooling Tower | 0,25 | |
| **C** | **Utility** | **13,23** | **9%** |
| 16 | TTRO 1 | 1,50 | |
| 17 | TTRO 2 | 0,85 | |
| 18 | RO + Evap 1 | 1,70 | |
| 19 | RO 2 | 1,30 | |
| 20 | CPU | 0,08 | |
| 21 | Demin plant | 0,27 | |
| 22 | Compressor & Chiller | 0,18 | |
| 23 | ETP & Sewage plant -1 + OWC | 3,30 | |
| 24 | ETP & Sewage plant -2 | 3,30 | |
| 25 | Storm water pond 1 | 0,30 | |
| 26 | Storm water pond 2 | 0,15 | |
| 27 | Scrap yard | 0,25 | |
| 28 | Fire pump | 0,07 | |
| **D** | **Facility** | **5,21** | **4%** |
| 29 | Office, health center & parking | 1,17 | |
| 30 | LY Security-1 | 0,03 | |
| 31 | LY Security-2 | 0,03 | |
| 32 | Site office | 0,25 | |
| 33 | Security main gate & emergency control center | 0,04 | |
| 34 | Security post | 0,03 | |
| 35 | Workshop & Store | 1,00 | |
| 36 | Chemical storage | 0,56 | |
| 37 | Piping workshop & fabrication | 0,50 | |
| 38 | Fabrication Yard | 0,25 | |
| 39 | Waste management | 1,00 | |
| 40 | Heavy equipment parking | 0,19 | |
| 41 | LP&C, Fire Truck & Ambulance | 0,09 | |
| 42 | Weigh bridge | 0,08 | |
| **E** | **Storage** | **3,01** | **2%** |
| 43 | Pulp warehouse | 0,94 | |
| 44 | Truck area - coal & biomass | 0,75 | |
| 45 | Truck parking - main plant | 0,77 | |
| 46 | Hazardous Waste | 0,25 | |
| 47 | Salt Storage | 0,25 | |
| 48 | Lime & Stone Storage | 0,06 | |
| **F** | **Others** | **71,98** | **52%** |
| 49 | Road & Drain | 12,53 | |
| 50 | Piperack Ph-1 | 1,79 | |
| 51 | Piperack Ph-2 | 0,68 | |
| 52 | Temple | 0,11 | |
| 53 | Open Area | 28,09 | |
| 54 | Area Building and Road | 28,23 | |
| 55 | Assembly Point 1-9 | 0,56 | |
| **G** | **Green Belt** | **20,92** | **15%** |
| 56 | Green Area 15% | 20,92 | |
| **H** | **Setback Area** | **2,53** | **2%** |
| 57 | Setback Area | 2,53 | |
| | **Total** | **139,46** | |

| DWG NO. | REFERENCE DWG : |
|---|---|
| | |

DISTR :

LEGEND :

- SIPCOT BOUNDARY
- RGE PLANT BOUNDARY
- ROAD WITH DRAIN ON BOTH SIDE
- FIRE FIGHTING
- PIPE RACK (PIPE AND CABLES)
- OPEN AREA
- GREEN BELT AREA
- A.P - ASSEMBLY POINT

A.P

FOR INFORMATION

APRIL FIBER RESOURCE

| | |
|---|---|
| PROJECT: | TAMARIND |
| 1000: | PSG01 |
| AREA | 1111–GENERAL |
| TYPE | OVERALL PLANT LAYOUT |
| DETAIL | REFERENCE DOCUMENT FOR ENVIRONMENTAL CLEARENCE |
| DETAIL | OPTION–2E,G1,EC,0.1 |

| | DATE | INITIALS | SIGN. | SCALE | ORIG.SIZE | TOTAL PAGES |
|---|---|---|---|---|---|---|
| DRAWN | 01.12.2025 | LBH | | 1: 2000 | A0 | 1 |
| CHECKED | | | | DWG NO : | PAGE | REV. |
| ENGINEER | | | | AFRT–1111–M–0003 | 1/1 | 0.1 |
| APPROVED | | | | | | |

ORIGINAL FRAME SIZE 841x1189mm

# Annexure 5 - EB Report

# ECOLOGY & BIODIVERSITY REPORT

**For**

**"Development of an Industrial Park"**

**Schedule: 1d (5d) (7c) (8b) , Category: A**

**by M/s State Industries Promotion Corporation of Tamilnadu Limited (SIPCOT)**

**at**

Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu

**Environmental Consultant:**


**M/s. Perfact Enviro Solutions Private Limited.**

**(NABET Registered List of Accredited Consultant Organisations/NABET/EIA/25 - 28/ RA 0467 Valid Upto 26/11/2028)**

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# 1. Introduction on Ecology and Biodiversity

The ecological environment within and around the proposed Industrial Park development by M/s. State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT) encompasses a complex interplay of biotic and abiotic components—comprising native vegetation, faunal assemblages, soil and microbial communities, and supporting environmental factors—that collectively maintain ecological functions and ecosystem services in the region. The project site spans multiple villages including Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram, and Therkusillukkanpatti in Thoothukudi Taluk, Thoothukudi District, Tamil Nadu, an area characterized by undulating terrain with a mix of agricultural lands, scrub forests, grasslands, and water bodies. The proposal involves the development of an industrial park over a significant land area, falling under **Schedule 1(d), 5(d), 7(c), and 8(b)**, Category **'A'** as per the EIA Notification, 2006 and subsequent amendments, thereby necessitating a comprehensive assessment of potential ecological and environmental impacts.

The site lies within the tropical dry and semi-arid climatic zone of Tamil Nadu, with seasonal rainfall, high temperatures, and soils ranging from red sandy loams to clayey alluvial deposits, supporting predominantly dry deciduous vegetation and agricultural activities. Ecologically, the landscape represents a heterogeneous mosaic of cultivated lands, patches of natural vegetation, small water courses, and human settlements, sustaining local biodiversity including flora, birds, small mammals, reptiles, amphibians, and invertebrates. These features play a crucial role in maintaining habitat connectivity, groundwater recharge, and ecosystem resilience. However, the ecological integrity of the area remains susceptible to anthropogenic pressures arising from large-scale land conversion, soil compaction, stormwater runoff, air and noise pollution, and associated infrastructural development. Without effective mitigation measures, these activities have the potential to fragment habitats, alter hydrological regimes, and impact local biodiversity and ecosystem services.

https://www.icar-crida.res.in/CP/Tamilnadu/TNAU,%20Coimbattore/TN13-Thoothukudi3.2.2011.pdf

# 2. Project Location and Environmental Sensitivity

## Project Profile:

M/s. State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT) proposes to develop an Industrial Park at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram, and Therkusillukkanpatti villages in Thoothukudi District, Tamil Nadu. The project aims to establish integrated industrial infrastructure with facilities such as roads, drainage, power, water supply, and environmental management systems over a large area. Falling under Schedule 1(d), 5(d), 7(c), and 8(b) of the EIA Notification, 2006, and classified as Category 'A', the proposal requires central-level appraisal. The park will accommodate various industrial sectors, promote regional economic development, create employment opportunities, and incorporate environmental safeguards for sustainable operations.

## Environmental Sensitivity:

Within a 10 km radius of the proposed Industrial Park project site at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram, and Therkusillukkanpatti villages in Thoothukudi District, no ecologically sensitive areas such as National Parks, Wildlife Sanctuaries, Biosphere Reserves, or Reserved Forests are located. The surrounding landscape is predominantly characterized by agricultural lands, open scrub, and scattered settlements interspersed with minor irrigation tanks and surface water bodies that play a vital role in groundwater recharge and local hydrological balance. A detailed inventory of these environmental features within the 10 km buffer zone has been prepared to evaluate potential project-induced impacts and to formulate suitable conservation and mitigation measures. This approach ensures that the proposed industrial development progresses in an environmentally responsible and sustainable manner, maintaining the ecological integrity of the region.

*Table 1. List of Eco-Sensitivity Landscapes within a 10 km Radius of the Proposed Project Area*

| Sl. No. | Eco-sensitivity Identity | Distance | Direction |
|---|---|---|---|
| **WATERBODIES** | | | |
| 1. | Odai Within Project Area | Odai Within Project Area | Odai Within Project Area |
| 2. | Nilaviyal Within Project Area | Nilaviyal Within Project Area | Nilaviyal Within Project Area |
| 3. | Pond near Project Area | 0.21 Km | NE |
| 4. | Pond near Project Area | 0.31 Km | NW |
| 5. | Pond near Project Area | 0.39 Km | SSW |
| 6. | Allikulam Pond | 0.43 Km | S |
| 7. | Pond near Perurani | 0.80 Km | S |
| 8. | Pond near Allikulam | 0.80 Km | SSE |
| 9. | Swimming Pond near Perurani | 1.01 Km | S |
| 10. | Neeravi Pond Perurani | 1.13 Km | SW |
| 11. | Pond near Perurani | 1.25 Km | WSW |
| 12. | Perurani Pond | 1.28 Km | SW |
| 13. | Kadamba Kulam ( Fishing Pond ) | 1.53 Km | SSE |
| 14. | Pond near Perurani | 1.56 Km | SW |

| Sl. No. | Eco-sensitivity Identity | Distance | Direction |
|---|---|---|---|
| 15. | Pond near Mel Kuttudankadu | 1.90 Km | S |
| 16. | Lake Elim (Kanchan Kulam) | 2.07 Km | SSE |
| 17. | Vepan Lake | 2.11 Km | SW |
| 18. | Pond near Umari kkottai | 2.39 Km | NW |
| 19. | Pond near Putupatti | 3.04 Km | SSW |
| 20. | Koram Pullam Tank | 3.52 Km | SE |
| 21. | Pond near Varthagareddypatti | 3.52 Km | SW |
| 22. | Pond near Varthagareddypatti | 3.60 Km | SW |
| 23. | periya Kulam water body | 3.80 Km | SW |
| 24. | Pond Bethesda | 3.85 Km | SSE |
| 25. | Senkulam River (River Port) | 4.49 Km | ENE |
| 26. | Pond near Korampallam | 5.06 Km | E |
| 27. | Pond near Korampallam Check Dam | 5.38 Km | SE |
| 28. | North Channal | 6.31 Km | SSE |
| 29. | Pond near Jambulinga Puram | 6.84 Km | NNE |
| 30. | Canal near Tiruvai Puram | 7.18 Km | SSE |
| 31. | Pond near Melmatan | 7.68 Km | NNE |
| 32. | Pond near Sakkammal Puram | 7.73 Km | SSE |
| 33. | Canal near Peykulam | 7.75 Km | SSE |
| 34. | Canal near Brahmapuram | 8.10 Km | SSE |
| 35. | Canal near Manakkudu | 8.50 Km | SSE |
| 36. | Sivathaiya Puram Pond | 8.57 Km | SSE |

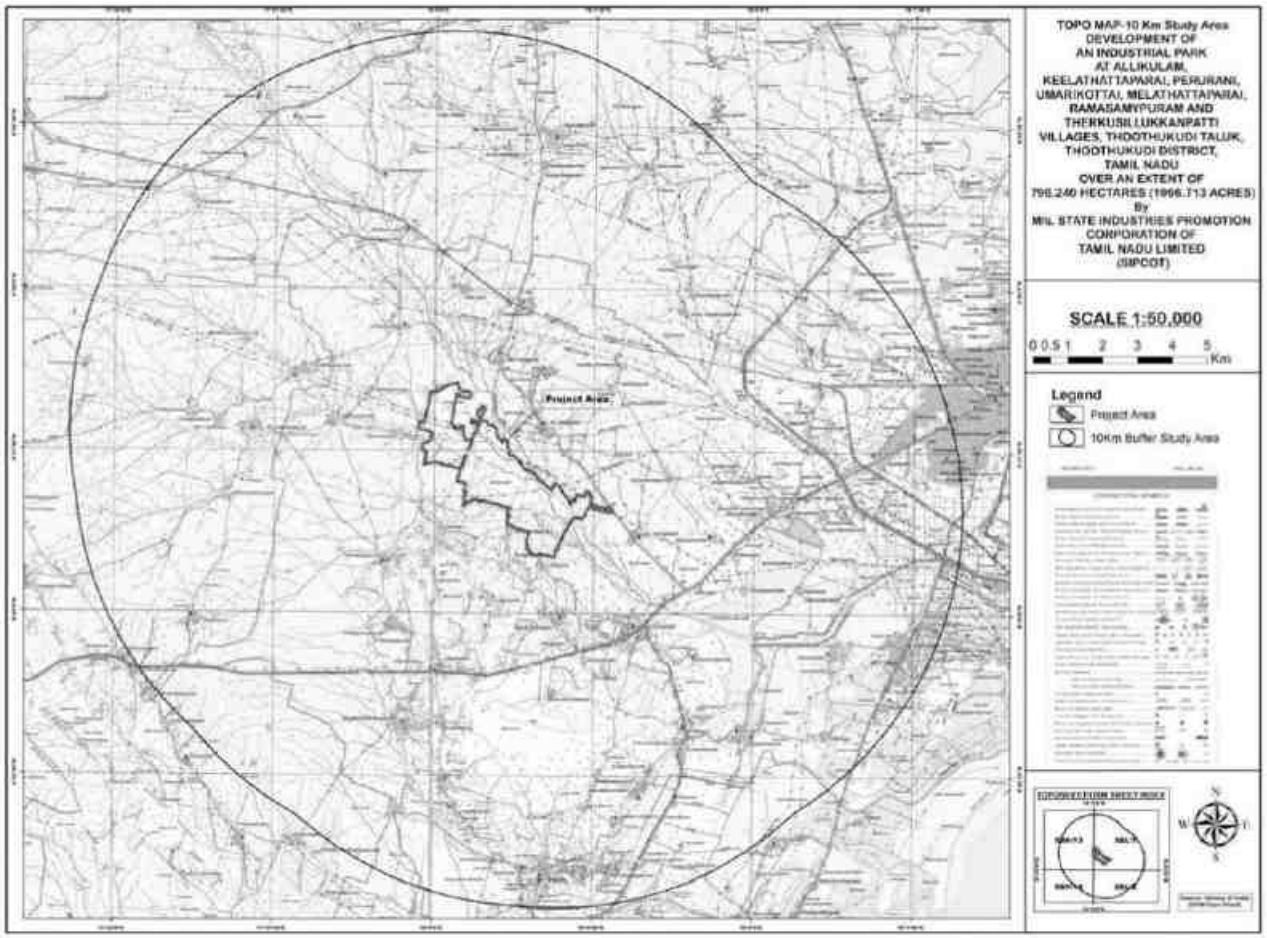



*Figure 2: Topographical Map of the study area*

# 3. Objective

The objective of this study is in accordance with the Terms of Reference (ToR), primarily concentrating on a detailed inventory of the species (flora and fauna) identified in the mining lease expanse and in the vicinity encompassing a 10 km radius. As such, the key objectives involve assessing the ecological health of the existing flora and fauna and their habitats, creating foundational data, and evaluating potential project induced impacts on the biological environment.

## o Terrestrial and Arboreal Ecology and Biodiversity

- Scrutinization the key characteristics of the vegetation, with an emphasis on the various types of natural forests, the most frequently encountered and dominant floral species, associated families, the occurrence of man-made plantations, Exotic plant species, and any indications of habitat deterioration in the area of interest.
- One of the objectives against the current study entails recognizing the prevailing habitat and land cover categories within the study region, such as forests, wetlands, agricultural areas, and urban development *etc*.

- Evaluation of the crop-diversity of the study area, along with an assessment allied to the native plant species with commercial and ethnomedicinal values.
- Identification of the susceptible plant and animal species in respect to their long-term survivability on the basis of IUCN Red Data List.
- Identification of the Schedule I species (as per WLPA, 1972 and the amendments thereafter).

# 4. Survey Methodology

## o Baseline survey Period

March, 2025 to May, 2025

## o Expanse of Study Area

314.16 square kilometers ($\pi r^2 = \pi.10^2 \approx 314.16$).

## o Survey Approach

The primary and secondary survey that included the core zone—the area allocated for mining leases—as well as a buffer zone that extended 10 km surrounding the core zone was used to assess the biological variety of the area. Primary and secondary surveys were the main focus of the survey methodology. The adjacent land and water regions were taken into account for the assessments associated with natural vegetation. The process used for establishing a thorough inventory of the study area's floral variety and habitat categories using original observations and secondary data. Furthermore, the local population's traditional ecological knowledge supported these findings.

Investigations toward fauna species were carried out in day time (considering both direct and Indirect survey) usually by visual encounters and tracking animal calls, footprints, excreta evidence, scents of particular animals, etc., in order to gather ground truthing. A comprehensive listing of the study area's animal species was created by gathering primary and secondary records. Understanding the existing faunal life in the study region is additionally significantly helped by the insights offered by the locals. To improve and streamline the process of identifying different species, the surveys included photographic evidence. Consequently, the following is a summary of the environmental indicators associated with biological factors for the current course of action:

- Species composition of flora and fauna.
- Flora: Species diversity, predominant floral species, economic significance, and commercial values.
- Fauna: Species diversity, Composition, related families, Conservation status, *etc*.

- **Primary Survey:**

A conscious effort was made to clearly note the variety of plant species, including aquatic flora, during the field study, with a focus on the most common species and their habitats. Through visual observations, the existence of animal species, including birds, reptiles, and mammals, was carefully assessed. The information that locals in the study region supplied was essential for guiding current projects. Understanding the distinctive characteristics of animals in a particular area requires a significant investment of time and effort. In addition to collecting direct observations of species, ecological studies often documented indirect evidence of their presence, such as animal odors, footprints, droppings, and vocalizations. Furthermore, the confirmation of the existence of wildlife was made easier by talking to locals, who shared insightful information and mentioned how frequently animals interacted in the survey region.

The early morning hours of 7:00 to 9:00 am and the late afternoon hours of 3:30 to 5:00 pm were set aside for the avifauna survey. During the day, surveys of animals, amphibians, reptiles, and vegetation were carried out, along with from 9:00 am to 4:00 pm, butterflies were observed. A comprehensive survey of the bird species was carefully documented at each sample location, resulting in the creation of an extensive list. Binoculars and reputable field guides made it easier to identify different kinds of birds, guaranteeing precise species identification.

**Secondary Survey:**

Many secondary sources, including books, research projects, and research papers, have provided support for the data and conclusions drawn from the primary survey. Additionally, the Divisional Forest Officer's verified list of plants and animals for the present project serves as a valuable additional source of information.

- **Species Inventorization:**

After merging primary data with information from desktop analysis, the biological diversity record of the study region for the current project was finally acquired and completed.

# 5. Survey Limitation

- **Insufficient Vegetation Density:** The limited density of vegetation has restricted the variety of sampling sites, thereby hindering the observation of species and the collection of relevant data.
- **Fragmentation of Natural Environments:** Agricultural practices and human activities have led to the fragmentation of natural environments, posing challenges for a thorough assessment of ecological patterns.

- **Seasonal Limitations:** The timing of the survey may not have aligned with the peak seasons for biodiversity, potentially resulting in the absence of migratory species or seasonal plant growth.
- **Limitation in Survey Stretch:** The surveys were exclusively conducted in daylight, thereby confining the observed bird activities to the hours of daylight. No surveys were performed at night.
- **Shorter Timeframe:** The rapid surveys were executed over a limited timeframe, resulting in the report's omission of any analysis regarding seasonal variability in the data.

# 6. Cropping Pattern

During the baseline environmental monitoring period from **March, 2025 to May, 2025** in Thoothukudi District, Tamil Nadu, the prevailing agricultural activity reflected the district's dryland farming system adapted to semi-arid climatic conditions. The principal crops cultivated during this summer (pre-monsoon) season included pearl millet (cumbu), black gram, and green gram, which are well-suited to limited rainfall and residual soil moisture. Sowing generally commenced in April, with harvesting occurring in June–July depending on local irrigation availability. Groundnut was also grown as a major oilseed crop, particularly in irrigated tracts, with sowing undertaken in late April and harvesting by June–July. In areas supported by well or tank irrigation, sunflower, sesame (gingelly), and maize were cultivated on a smaller scale for both commercial and fodder purposes. Perennial crops such as cashew, banana, and coconut formed part of the agricultural landscape, contributing to farm income but not adhering to the short seasonal cycle. Vegetables like brinjal, lady's finger, and chilli were cultivated in select irrigated pockets to meet local market demand. This diverse cropping pattern was primarily governed by soil type, availability of irrigation sources, and prevailing temperature and rainfall conditions during the April–June period, ensuring livelihood sustenance under semi-arid environmental conditions.
https://agritech.tnau.ac.in/agriculture/agri_agrometeorology_croppingpattern_southernzone.html

# 7. Forest Type and Dominant Flora and Fauna Species

Thoothukudi District, located in the southeastern part of Tamil Nadu, lies within the dry and arid zone of the Deccan Plateau and is characterized by sparse vegetation and limited forest cover. The district's forest types are primarily tropical dry deciduous and thorn forests, influenced by the region's low rainfall and high temperature. These forests are mostly found in the western and northwestern parts of the district, particularly in areas with undulating terrain and shallow soils. The vegetation is dominated by hardy and drought-resistant species.

In some coastal and inland areas, scrub jungles and grasslands occur, providing habitat for small mammals, reptiles, and birds adapted to dry conditions. The coastal belt of Thoothukudi, extending along the Gulf of Mannar, supports mangrove forests and littoral vegetation, particularly in estuarine and lagoon ecosystems.

## 7.1 Flora of the study area

*Table 2. List of floral species in the study area*

| S. no | Botanical name | Common Indian Name | Family | Habit |
|---|---|---|---|---|
| 1 | *Abrus precatorius* | Gunja | Fabaceae | Liana |
| 2 | *Acacia auriculiformis* | Earleaf Acacia | Fabaceae | Tree |
| 3 | *Acacia chundra* | Lal Khair | Fabaceae | Tree |
| 4 | *Acacia horrida* | Prickly Acacia | Fabaceae | Tree |
| 5 | *Acacia holosericea* | Silky Wattle | Fabaceae | Tree |
| 6 | *Acacia nilotica* | Babul | Fabaceae | Tree |
| 7 | *Acacia planifrons* | Umbrella Thorn | Fabaceae | Tree |
| 8 | *Acacia senegal* | Gum Arabic Tree | Fabaceae | Tree |
| 9 | *Acacia melanoxylon* | Australian Blackwood | Fabaceae | Tree |
| 10 | *Aegle marmelos* | Bael | Rutaceae | Tree |
| 11 | *Ailanthus excelsa* | Tree of Heaven | Simaroubaceae | Tree |
| 12 | *Albizia amara* | Kattumurai | Fabaceae | Tree |
| 13 | *Albizia lebbeck* | Siris | Fabaceae | Tree |
| 14 | *Anacardium occidentale* | Cashew | Anacardiaceae | Tree |
| 15 | *Annona squamosa* | Custard Apple | Annonaceae | Tree |
| 16 | *Anogeissus latifolia* | Dhaura | Combretaceae | Tree |
| 17 | *Azadirachta indica* | Neem | Meliaceae | Tree |
| 18 | *Barringtonia acutangula* | Freshwater Mangrove | Lecythidaceae | Tree |
| 19 | *Bauhinia malabarica* | Malabar Bauhinia | Fabaceae | Tree |
| 20 | *Bauhinia racemosa* | Bidi Leaf Tree | Fabaceae | Tree |
| 21 | *Borassus flabellifer* | Palmyra Palm | Arecaceae | Tree |
| 22 | *Caesalpinia pulcherrima* | Peacock Flower | Fabaceae | Tree |
| 23 | *Canthium coromandelicum* | Coromandel Ebony | Rubiaceae | Shrub |
| 24 | *Carica papaya* | Papaya | Caricaceae | Shrub |
| 25 | *Cassia fistula* | Amaltas | Fabaceae | Tree |
| 26 | *Casuarina equisetifolia* | Casuarina | Casuarinaceae | Tree |
| 27 | *Catunaregam spinosa* | Mountain Pomegranate | Rubiaceae | Shrub |
| 28 | *Ceiba pentandra* | Silk Cotton Tree | Malvaceae | Tree |
| 29 | *Cissus quadrangularis* | Hadjod | Vitaceae | Liana |
| 30 | *Cissus vitiginea* | Woodbine | Vitaceae | Liana |
| 31 | *Cissus heyneana* | Climbing Grape | Vitaceae | Liana |
| 32 | *Citrus aurantiifolia* | Lime | Rutaceae | Shrub |
| 33 | *Citrus limon* | Lemon | Rutaceae | Shrub |
| 34 | *Cocos nucifera* | Coconut | Arecaceae | Tree |
| 35 | *Coccinia grandis* | Ivy Gourd | Cucurbitaceae | Liana |
| 36 | *Cocculus hirsutus* | Broom Creeper | Minispermaceae | Liana |
| 37 | *Commiphora berryi* | Indian Myrrh | Burseraceae | Shrub |
| 38 | *Cordia sebestena* | Scarlet Cordia | Boraginaceae | Shrub |
| 39 | *Ctenolepis garcini* | Garcin’s Vine | Cucurbitaceae | Liana |
| 40 | *Crateva religiosa* | Sacred Garlic Pear | Capparaceae | Tree |

| S. no | Botanical name | Common Indian Name | Family | Habit |
|---|---|---|---|---|
| 41 | *Dalbergia spinosa* | Thorny Rosewood | Fabaceae | Shrub |
| 42 | *Dalbergia sissoo* | Shisham | Fabaceae | Tree |
| 43 | *Delonix elata* | White Gulmohar | Fabaceae | Tree |
| 44 | *Delonix regia* | Gulmohar | Fabaceae | Tree |
| 45 | *Dichrostachys cinerea* | Sickle Bush | Fabaceae | Tree |
| 46 | *Dichrostachys santapaui* | Santapau's Sickle Bush | Fabaceae | Tree |
| 47 | *Erythrina variegata* | Indian Coral Tree | Fabaceae | Tree |
| 48 | *Eucalyptus tereticornis* | Eucalyptus | Myrtaceae | Tree |
| 49 | *Ficus benghalensis* | Banyan | Moraceae | Tree |
| 50 | *Ficus mollis* | Hairy Fig | Moraceae | Tree |
| 51 | *Ficus religiosa* | Peepal | Moraceae | Tree |
| 52 | *Flacourtia indica* | Governor's Plum | Salicaceae | Shrub |
| 53 | *Flueggea virosa* | White Berry Bush | Phyllanthaceae | Shrub |
| 54 | *Gliricidia sepium* | Gliricidia | Fabaceae | Tree |
| 55 | *Gmelina arborea* | Gmelina | Lamiaceae | Tree |
| 56 | *Guettarda speciosa* | Sea Gardenia | Rubiaceae | Tree |
| 57 | *Hardwickia binata* | Anjan | Fabaceae | Tree |
| 58 | *Holoptelea grandis* | Indian Elm | Ulmaceae | Tree |
| 59 | *Lannea coromandelica* | Indian Ash Tree | Anacardiaceae | Tree |
| 60 | *Lawsonia inermis* | Henna | Lythraceae | Shrub |
| 61 | *Lysiloma latisiliquum* | Wild Tamarind | Fabaceae | Tree |
| 62 | *Leucaena leucocephala* | Subabul | Fabaceae | Tree |
| 63 | *Madhuca longifolia* | Mahua | Sapotaceae | Tree |
| 64 | *Mangifera indica* | Mango | Anacaridiaceae | Tree |
| 65 | *Manilkara zapota* | Chikoo | Sapotaceae | Tree |
| 66 | *Melia azedarach* | Chinaberry | Meliaceae | Tree |
| 67 | *Millingtonia hortensis* L | Indian Cork Tree | Bigononiaceae | Tree |
| 68 | *Morinda coreia* | Indian Mulberry | Rubiaceae | Tree |
| 69 | *Moringa oleifera* | Drumstick Tree | Moringaceae | Tree |
| 70 | *Muntingia calabura* | Singapore Cherry | Muntingiaceae | Tree |
| 71 | *Nyctanthes arbor-tristis* | Parijat | Oleaceae | Tree |
| 72 | *Pandanus odorifer* | Screw Pine | Pandanaceae | Shrub |
| 73 | *Parkinsonia aculeata* | Jerusalem Thorn | Fabaceae | Tree |
| 74 | *Pergularia daemia* | Trellis Vine | Apocynaceae | Liana |
| 75 | *Peltophorum pterocarpum* | Copperpod | Fabaceae | Tree |
| 76 | *Pongamia pinnata* | Karanja | Fabaceae | Tree |
| 77 | *Pterocarpus santalinus* | Red Sandalwood | Fabaceae | Tree |
| 78 | *Phyllanthus acidus* | Star Gooseberry | Phyllanthaceae | Shrub |
| 79 | *Phyllanthus emblica* | Amla | Phyllanthaceae | Tree |
| 80 | *Pisonia grandis* | Lettuce Tree | Nyctaginaceae | Shrub |
| 81 | P*ithecellobium dulce* | Manila Tamarind | Fabaceae | Tree |
| 82 | *Plumeria rubra* | Frangipani | Apocynaceae | Shrub |
| 83 | *Polyalthia longifolia* | Ashoka Tree | Annonaceae | Tree |
| 84 | *Prosopis chilensis* | Chile Prosopis | Fabaceae | Tree |

| S. no | Botanical name | Common Indian Name | Family | Habit |
|---|---|---|---|---|
| 85 | *Prosopis juliflora* | Mesquite | Fabaceae | Tree |
| 86 | *Psidium guajava* | Guava | Myrtaceae | Tree |
| 87 | *Rivea hypocrateriformis* | Morning Glory Creeper | Convolvulaceae | Liana |
| 88 | *Sapindus emarginatus* | Soapnut Tree | Sapindaceae | Tree |
| 89 | *Sapindus trifoliatus* | Soapberry | Sapindaceae | Tree |
| 90 | *Spathodea campanulata* | African Tulip Tree | Bignoniaceae | Tree |
| 91 | *Saraca asoca* | Ashoka Tree | Fabaceae | Tree |
| 92 | *Senna siamea* | Siamese Cassia | Fabaceae | Tree |
| 94 | *Syzygium cumini* | Jamun | Myrtaceae | Tree |
| 95 | *Tabebuia rosea* | Pink Trumpet Tree | Bigononiaceae | Tree |
| 96 | *Tamarindus indica* | Tamarind | Fabaceae | Tree |
| 97 | *Tecomella undulata* | Rohida | Bigononiaceae | Tree |
| 98 | *Tectona grandis* | Teak | Lamiaceae | Tree |
| 99 | *Terminalia arjuna* | Arjun | Combretaceae | Tree |
| 100 | *Terminalia catappa* | Indian Almond | Combretaceae | Tree |
| 101 | *Thespesia populnea* | Portia Tree | Malvaceae | Tree |
| 102 | *Thespesia populneoides* | Seaside Mahoe | Malvaceae | Tree |
| 103 | *Tinospora sinensis* | Guduchi | Menispermaceae | Liana |
| 104 | *Ziziphus jujuba* | Ber | Rhamanaceae | Shrub |
| 105 | *Ziziphus xylopyrus* | Wild Jujube | Rhamanaceae | Shrub |

## 7.2 Fauna of the Study area :

A comprehensive study of the local fauna within the study area was conducted through both primary and secondary surveys, with a focus on birds, mammals, and herpetofauna. Given that the study was limited to a single season and data was extensive, secondary sources were also utilized to enhance our ecological biodiversity assessment. This included an extensive review of existing literature, such as research papers, recent articles, dissertations, topographical maps, and textbooks, to identify critical corridors and the presence of any endangered species near the project area.

### A. Mammals

*Table 3. List of Mammals in the study area*

| S. No. | Common Name | Scientific Name | Family | IUCN Status | WLPA Schedule 2022 |
|---|---|---|---|---|---|
| 1 | Asian Palm Civet | *Paradoxurus hermaphroditus* | Viverridae | LC | I |
| 2 | Rusty-spotted Cat | *Prionailurus rubiginosus* | Felidae | NT | I |
| 3 | Bonnet macaque | *Macaca radiata* | Cercopithecidae | V | I |

| | | | | | |
|---|---|---|---|---|---|
| 4 | Indian Brown Mongoose | *Urva fusca* | Herpestidae | LC | I |
| 5 | Ruddy Mongoose | *Urva smithii* | Herpestidae | LC | I |
| 6 | Small Indian Civet | *Viverricula indica* | Viverridae | LC | I |
| 7 | Common Palm Civet | *Paradoxurus musangus* | Viverridae | LC | – |
| 8 | Wild Boar | *Sus scrofa* | Suidae | LC | II |
| 9 | Black-naped Hare / Indian Hare | *Lepus nigricollis* | Leporidae | LC | II |
| 10 | Indian Porcupine | *Hystrix indica* | Hystricidae | LC | I |

## B. Reptiles

*Table 4. List of Reptiles in the study area*

| Sr. No. | Scientific Name | Common Name | Family | WPA Schedule (Amendment), 2022 |
|---|---|---|---|---|
| 1 | *Cnemaspis indica* | Indian day gecko | Gekkonidae | - |
| 2 | *Cnemaspis ornatus* | Ornate day gecko | Gekkonidae | - |
| 3 | *Calotes calotes* | Common greenfield forest | Agamidae | - |
| 4 | *Calotes ellioti* | Elliot's forest lizard | Agamidae | - |
| 5 | *Calotes nemoricola* | Nilgiri forest lizard | Agamidae | - |
| 6 | *Mabuya macularicus* | Bronze grass skink | Scincidae | - |
| 7 | *Varanus bengalensis* | Indian monitor lizard | Varanidae | Sch I |
| 8 | *Chamaeleo zeylanicus* | Indian Chameleon | Chamaeleonidae | Sch I |
| 9 | *Xenochropis piscator* | Checkered Keelback | Colubridae | Sch I |
| 10 | *Lycodon aulicus* | Indian wolf snake | Colubridae | Sch II |
| 11 | *Trimeresurus gramineus* | Bamboo Pit Viper | Viperidae | Sch II |
| 12 | *Trimeresurus malabaricus* | Malabar Pit Viper | Viperidae | Sch II |

## C. Birds

*Table 5. List of Birds in the study area*

| Sr. No. | Scientific Name | Common Name | Family | WPA Schedule (Amendment), 2022 |
|---|---|---|---|---|
| 1. | *Phalacrocorax niger* | Little Cormorant | Phalacrocoracidae | Sch II |
| 2. | *Arodeola grayii* | Pond Heron | Ardeidae | Sch II |
| 3. | *Bubulcus ibis* | Cattle Egret | Ardeidae | Sch II |
| 4 | *Milvus migrans* | Pariah kite | Accipitridae | Sch II |
| 5 | *Haliastur indus* | Brahminy Kite | Accipitridae | Sch I |
| 6 | *Accipiter bad ius* | Shikra | Accipitridae | Sch I |
| 7 | *Falco tinnunculus* | Kestrel | Falconidae | Sch II |
| 8 | *Gallus sodneratii* | Grey Junglefowl | Phasianidae | Sch I |
| 9 | *Vanellus indicus* | Red wattled Lapwing | Charadriidae | Sch II |
| 10 | *Trerod pompadora* | Grey fronted Green Pigeon | Columbioab | Sch II |
| 11 | *Trerod phoenicoptera* | Green Pigeon | Columbidae | Sch II |
| 12 | *Streptopelia chinensis* | Spotted Dove | Columbidae | Sch II |
| 13 | *Psittacula krameri* | Rose ringed Parakeet | Psittacidae | Sch II |
| 14 | *Eudynamys scolopacea* | Koel | Cuculidae | Sch II |
| 15 | *Centropus sinensis* | Coucal | Cuculidae | Sch II |
| 16 | *Caprimulgus asiaticus Latham* | Indian Little Night jar | Caprimulgidae | Sch II |

| | | | | |
|---|---|---|---|---|
| 17 | *Ceryle rudis* | Pied Kingfisher | Alcedlnidae | Sch II |
| 18 | *Halcyon smyrnensis* | Whitebreasted Kingfisher | Alcedinidae | Sch II |
| 19 | *Merops lescbenaulti* | Chestnutheaded Bee-Eater | Meropidae | Sch II |
| 20 | *Coracias bengbalensis* | Indian Roller | Coraciidae | Sch II |
| 21 | *Upupa epops* | Hoopoe | Upupidae | Sch II |
| 22 | *Megalaima viridis* | Small Green Barbet | Capitonidae | Sch II |
| 23 | *Dinopium benghalense* | Golden backed Woodpecker | Picidae | Sch II |
| 24 | *Pitta brachyura* | Indian Pitta | Pittidae | Sch II |
| 25 | *Oriolus oriolus* | Golden Oriole | Oriolidae | Sch II |
| 26 | *Dicrurus adsimilis* | Black Drongo | Dicruridae | Sch II |
| 27 | *Acridotheres tristis* | Indian Myna | Sturnidae | Sch II |
| 28 | *Dendrocitta vagabunda* | Indian Treepie | Corvidae | Sch II |
| 29 | *Corvus splendens* | Indian House Crow | Corvidae | - |
| 30 | *Tephrodornis pondicerianus* | Indian Wood Shrike | Vangidae | Sch II |
| 31 | *Pycnonotus cafer* | Red vented Bulbul | Pycnonotidae | Sch II |
| 32 | *Muscicapa albicaudata* | Nilgiri Verditer Flycatcher | Muscicapidae | Sch II |
| 33 | *Orthotomus sutorius* | Tailor Bird | Cisticolidae | Sch II |
| 34 | *Copsychus saularis* | Magpie-Robin | Muscicapidae | Sch II |
| 35 | *Myiophonus horsfieldi* | Malabar Whistling Thrush | Muscicapidae | Sch II |
| 36 | *Parus xanthogenys* | Yellow cheeked Tit | Paridae | Sch II |

| | | | | |
|---|---|---|---|---|
| 37 | *Motacilla maderaspatensis* | Large Pied Wagtail | Motacillidae | Sch II |
| 38 | *Nectarinia asiatica* | Purple Sunbird | Nectariniidae | Sch II |
| 39 | *Zosterops paJpebrosa* | White Eye | Zosteropidae | Sch II |
| 40 | *Passer domesticus* | House Sparrow | Passeridae | Sch II |
| 41 | *Elanus caeruleus* | Black winged Kite | Accipitridae | Sch II |
| 42 | *Ictinaetus malayensis* | Black Eagle | Accipitridae | Sch II |
| 43 | *Ocyceros griseus* | Malabar Grey Hornbill | Accipitridae | Sch I |
| 44 | *Acridotberes fuscus* | Jungle Myna | Accipitridae | Sch II |
| 45 | *Pericrocotus cionamomeus* | Small Minivet | Accipitridae | Sch I |

## Amphibians

Table 6. List of Amphibians in the study area

| SL. NO. | ZOOLOGICAL NAME | COMMON NAME | FAMILY | IUCN STATUS |
|---|---|---|---|---|
| 1. | *Duttaphrynus stomaticus* | Common Indian Toad | Bufonidae | LC |
| 2. | *Holobatrachus tigerinus* | Indian Bull Frog | Bufonidae | LC |

# 8. Schedule I species:

Based on both our primary and secondary surveys, as well as the compiled table above, we have identified a total of **15** species listed under Schedule I of the Wildlife Protection Act, indicating their endangered status and necessitating conservation efforts (https://www.iucnredlist.org.) Accordingly a detailed conservation plan for these scheduled species will be submitted separately.

*Table 7. List of schedule I species*

| S. No. | Scientific Name | Common Name | WLPA Schedule 2022 |
|---|---|---|---|
| 1 | *Paradoxurus hermaphroditus* | Asian Palm Civet | I |
| 2 | *Prionailurus rubiginosus* | Rusty-spotted Cat | I |
| 3 | *Macaca radiata* | Bonnet macaque | I |
| 4 | *Urva fusca* | Indian Brown Mongoose | I |
| 5 | *Urva smithii* | Ruddy Mongoose | I |
| 6 | *Viverricula indica* | Small Indian Civet | I |
| 7 | *Hystrix indica* | Indian Porcupine | I |
| 8 | *Varanus griseus* | Desert Monitor | I |
| 9 | *Chamaeleo zeylanicus* | Indian Chameleon | I |
| 10 | *Fowlea piscator* | Checkered Keelback | I |
| 11 | *Haliastur indus* | Brahminy Kite | I |
| 12 | *Accipiter badius* | Shikra | I |
| 13 | *Gallus sonneratii* | Grey Junglefowl | I |
| 14 | *Ocyceros griseus* | Malabar Grey Hornbill | I |
| 15 | *Pericrocotus cinnamomeus* | Small Minivet | I |

# Annexure 6 - SE Report

# SOCIO ECONOMIC REPORT

**Development of an Industrial Park**

**at**

**Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu over an extent of 796.240 ha.**

**(1966.713 acre)**



## M/s State Industries Promotion Corporation of Tamilnadu Limited (SIPCOT)

**BY**


**M/s. Perfact Enviro Solutions Private Limited.**

**(NABET Registered List of Accredited Consultant Organisations/NABET/EIA/25 - 28/ RA 0467 Valid Upto 26/11/2028)**

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## 1.0 INTRODUCTION

State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT) proposes "Development of An Industrial Park at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram And Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu in an area of 796.240 hectare (1966.713 acres). The total project cost will be INR 666.11 Cr. The land is owned by M/s State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT) vide G.O.(Ms).No.100 dated 26.02.2021.

The proposed Industrial Park features comprehensive zoning for Industrial Plots for Industries attracting EIA Notification (Technical Textile and other Textile units) and for those not attracting as well, plots for amenities, commercial and other activities such as SWH, Internal roads and Stormwater drains and Greenbelt development. Total plotted development will be carried out in 721.338 ha while Non-development area (Nilaviyal odai & RoW for HT Line Buffer) will be 48.951 ha, and no development buffer are left for the windmills falling distance is 25.951 ha.

Proposed Industrial Park will house one pre-defined Lyocell Manufacturing Unit (attracting Environmental Clearance - Category B, Schedule Activity 5(d) of the EIA Notification, 2006 and its subsequent amendments. Since Total plot area exceeds 500 hectares and proposed industrial park includes a predefined Category 'B' industry, Man-Made Fibre Manufacturing Unit Schedule 5(d), the entire project attracts the provisions of Category 'A' , Schedule 7(c) (Industrial Estates/Parks/Complexes/Areas) attracting specific conditions and applicability to public hearing.

### 1.1 ToR Points Related to preparation of SE report

| SL No. | ToR Point | Compliance | Citation in FAE Report |
|---|---|---|---|
| **ToR No.TO25A3102TN5260559NNFile No.10/19/2025-IA.III(I) Dated 21/09/2025** | | | |
| **Specific Terms of Reference for (Townships/ Area Development Projects / Rehabilitation Centres)** | | | |
| **1.0**<br>**1.29** | **Specific Conditions**<br>Carry out a study with a reputed University/Social Institute like TISS on measuring the impact of the Project on the Health of Human beings and measures to monitor and mitigate the same. | The present proposal is for area development of Industrial ready plots with all common services like Road , Fresh Water supply, development, development of Greenbelt & Stormwater drain etc A detailed impact study has been conducted by NABET accredited Environmental consultant on the aspects of Social Impacts and welfare & mitigative measures . | - |
| **Standard Terms of Reference for (Townships/ Area Development Projects / Rehabilitation Centres)** | | | |
| **3.0**<br>**3.1** | **Land Acquisition And R&R**<br>Submit details of environmentally sensitive places, land acquisition status, rehabilitation of communities/villages and present status of such activities. | The total extent of 796.240 ha was approved under **G.O. (Ms) No. 100 dated 26.02.2021**. The land is government-owned; hence no private acquisition or resettlement is involved. No eco-sensitive zones, forests, or wildlife sanctuaries are within 10 km radius. | **Chapter 2 – Land Details (Sec 2.3 & Table 5) G.O is attached in the Annexure 1** |

| SL No. | ToR Point | Compliance | Citation in FAE Report |
|---|---|---|---|
| **4.0**<br><br>**4.2** | **Environmental Monitoring And Management**<br>Environmental data to be considered in relation to the project development would be (a) land, (b) groundwater, (c) surface water, (d) air, (e) bio-diversity, (f) noise and vibrations, **(g) socio economic and health.** | **Land:** The project area mainly comprises barren/scrub and agricultural land with flat topography. Land use conforms to SIPCOT zoning norms, and 23.46% of the total area is will be developed with greenbelt. This complies with the recently published OM 29.10.2025.<br>**Groundwater:** Quality at all eight monitoring locations meets IS 10500:2012 standards. The area is classified as "Safe" (16.06% development) by CGWB. No groundwater extraction is proposed; SIPCOT desalinated and treated municipal water will be used.<br>**Surface Water:** Quality at eight locations meets CPCB Class "C" criteria, suitable for drinking after conventional treatment. Zero Liquid Discharge (ZLD) will be maintained through complete reuse of treated effluent and sewage.<br>**Air:** Ambient air quality parameters ($PM_{10}$, $PM_{2.5}$, $SO_2$, $NO_2$) are within NAAQS limits, and AQI is rated "Good." Adequate stack height, APCS, and dust suppression systems are provided.<br>**Biodiversity:** No forest or eco-sensitive zone lies within 10 km. Fifteen Schedule-I species recorded; a separate Wildlife Conservation Plan will be implemented.<br>**Noise & Vibration:** Noise levels are within CPCB limits for industrial and | **Chapter 3 – Baseline Environment (Sec 3.4–3.12)** |

| | | | |
|---|---|---|---|
| | | residential areas. DG sets are acoustically enclosed, and PPEs are provided to workers.<br>**Socio-Economic & Health:** The area has good literacy, infrastructure, and healthcare access. The project will generate employment, improve local economy, and implement periodic occupational health surveillance. | |

## 1.2 Project Description

The total extent of the proposed Industrial Park is 796.240 hectares (1966.713 acres). Of this, the developable area is 721.338 hectares, while the non-developable area accounts for 74.902 hectares, comprising natural drainage features, statutory buffers, and windmill safety zones.

The land use within the developable area is proposed as follows: Industrial plots, including mandatory internal greenbelt provisions as applicable, will occupy 521.409 hectares; commercial plots will cover 21.640 hectares; amenity plots will extend over 14.425 hectares; and solid waste management facilities will be developed in 2.024 hectares. Internal roads and the stormwater drainage network will occupy 53.337 hectares. In addition, SIPCOT-developed greenbelt areas, including buffers along water bodies, peripheral greenbelt, and ecological buffers, will cover 108.503 hectares.

The Industrial Park will be developed by SIPCOT with dedicated land allocations for:

- A Technical Textile manufacturing cluster, including a single large plot earmarked for a Lyocell Manufacturing Unit;
- Technical and other textile manufacturing industries, including units falling under Category ‘A’ or ‘B’ as per the EIA Notification, 2006;
- Engineering and manufacturing industries that do not attract the provisions of the EIA Notification, 2006;
- Commercial establishments and amenity facilities; and
- Common infrastructure and services, including internal roads, street lighting, power distribution infrastructure, freshwater storage and distribution for domestic use, stormwater management systems, solid waste management facilities, and greenbelt development along the periphery and alongside existing water bodies within the Industrial Park.

The non-developable area of 74.902 hectares includes:

- Windmill safety buffer (falling distance radius of 181 m) covering 25.951 hectares, retained as a no-development zone;
- Existing Nilaviyal Odai, covering 27.994 hectares, retained in its natural state; and
- Right-of-Way buffer for existing HT transmission lines, covering 20.957 hectares.

SIPCOT proposes the development of the Industrial Park primarily to promote textile, technical textile, and allied industries in Thoothukudi District, Tamil Nadu, with a total project cost of ₹666.11 Crores. Employment opportunities are expected to be generated during both the construction and operational phases of the project, with approximately 525 persons during the

construction phase and about 17,200 persons during the operational phase, to be provided by individual industries and other units established within the Industrial Park.

Land will be allocated by SIPCOT for TANGEDCO to establish a substation to cater to the power requirements of member industries and commercial units. SIPCOT will also develop the project office, common amenities, and infrastructure required for estate management and security services. No common Sewage Treatment Plant (STP) or Common Effluent Treatment Plant (CETP) is proposed by SIPCOT, and individual industries shall make their own arrangements in accordance with statutory requirements.

## 2.0 DESCRIPTION OF SOCIO ECONOMIC ENVIRONMENT

### 2.1 Objectives of conducting SE study

Interalia, the points raised in ToR, the objective of socio-economic study will be below:

**To evaluate the Socio Economic condition of the area.**

- To assess the demographic feature To assess the work participation rate. To assess the various amenities
- To evaluate the Quality of life Index.
- To assess the impact of Application for grant of Development of an Industrial Park on the SE condition of the area.
- Negative and Positive Impact of development assessed Mitigation proposed of development assessed

**To assess various gaps need to be filled for Environmental conditions in surrounding villages**

- Gaps in availability for Training and skill development canters.
- Gaps in Sanitation facility Gaps in Drinking Water
- Gaps in Solid waste management Gaps in Health facilities
- Gaps in Education system available Gaps in Infrastructure/Road condition
- Gaps in Electrification including Solar lights

### 2.2 Study Area

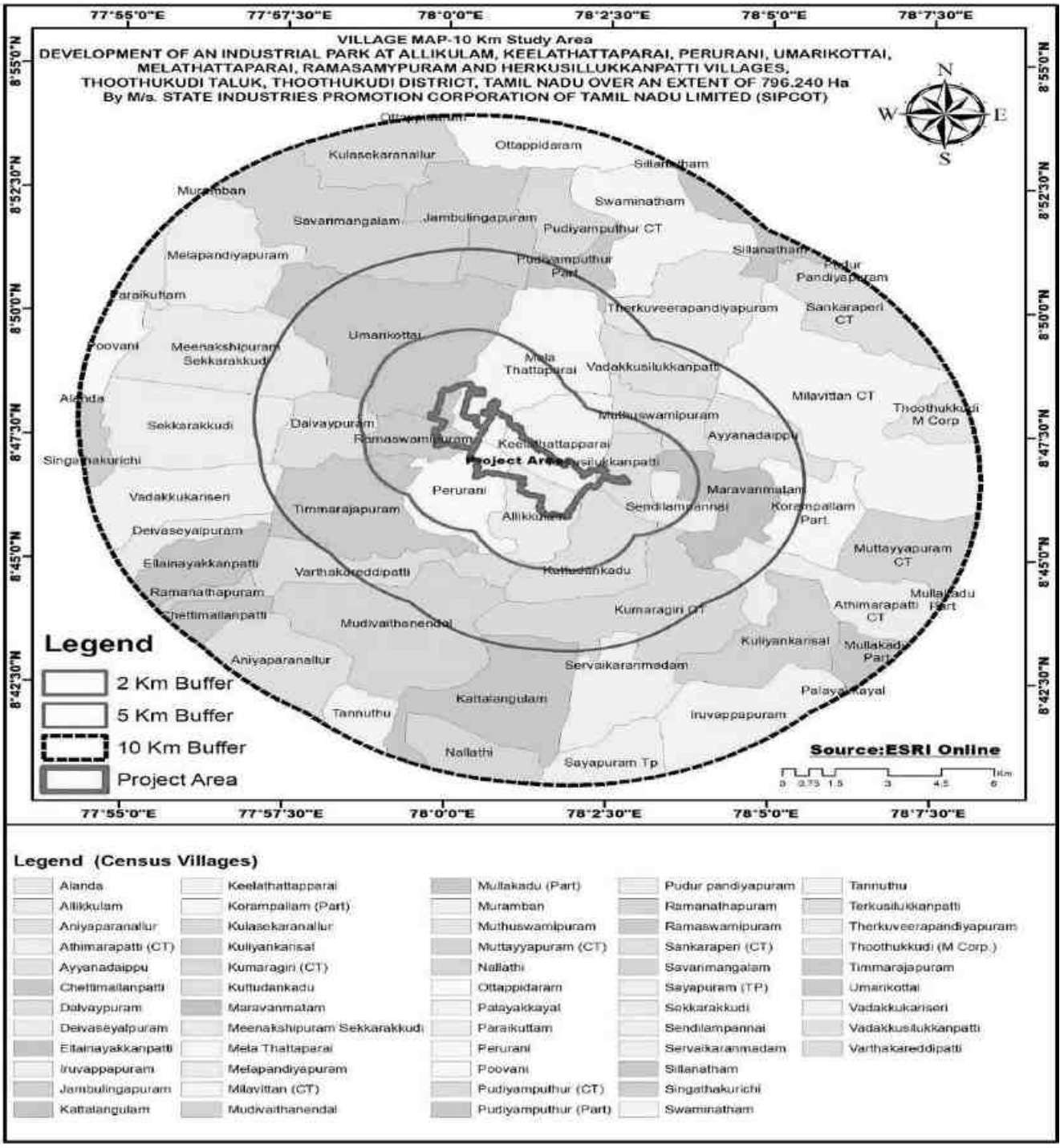
The study area for the project has been considered a 10 km peripheral area from the project site. Depending upon their proximity, The Study area was divided into three zones viz **Zone-I** (0-2 Km), **Zone-II** (02 Km to 05Km) & **Zone-III** (5Km to 10Km).This includes:

**Study Area Zone-I:** Includes village settlements & Urban area located within the 2 Km radius from the project site. (No. of village: 8, No. Urban area: Nil)

**Study Area Zone-II:** Includes village settlements & Urban area located within the 2 to 5 Km radius from the project site. (No. of villages: 10, No. Urban area: 1)

**Study Area Zone-III:** Includes village settlements & Urban area located within the 5 to 10 Km radius from the project site. (No. of villages: 31, No. Urban area: 7)

The Village/Urban map with the Study area Zone is shown below in **Map-1.**




## 2.3 Methodology

Socio-economic survey is based on proportionate, stratified and random sampling methods. Secondary data from census records, statistical hard books, topo sheets, health records and relevant official records available with Govt. agencies. Primary data collection through questionnaire

**Collection of secondary Data**

- Identifying villages in 10Km radius from the project boundary as per PCA (Primary Census Abstract) Census 2011.
- On the basis of available census data, 2011 identifying different aspects of socio-economic conditions.
- Analysis of the secondary data.

**ii) Collection of Primary Data**

- 60% villages (5 out of 8 villages) up to 2 km from the project site are selected,
- 10% villages (1 out of 10 villages) from 2 to 5 km, and one village from 5 to10 km distance from the project site are also selected to study the primary survey. These villages justify the overall socio-economic scenario of the study area.
- Preparation of list of villages and questionnaire for survey.
- Carrying out site visits.
- Physical survey for sanitation, drinking water facilities, availability of banks, primary health centers, roads, education facilities and source of income of the villagers.
- Focus Group Discussion (FGD).
- Collection of the relevant Photographs.

**iii) Collation of Secondary & Primary Data**

- Developing socio economic significance and influence to the local community.

## 2.4 Habitation in the Study Area

### 2.4.1 District Thoothukkudi

The project area lies in Thoothukkudi District of Tamil Nadu, located along the southeastern coast of India. The district is bounded by Tirunelveli in the west, Virudhunagar in the northwest, and the Gulf of Mannar in the east. Thoothukkudi city is the district headquarters and serves as a major centre for administration, trade, industry, and port activities.

Administratively, the district is divided into 8 talukas—Thoothukkudi, Tiruchendur, Srivaikuntam, Sathankulam, Vilathikulam, Ettayapuram, Ottapidaram, and Kovilpatti.

Economically, Thoothukkudi is known for its port-based industries, salt production, fishing, and power generation, along with agriculture and small-scale industries. Geographically, the district has coastal plains and semi-arid inland areas.

As per Census 2011, key demographic details are as follows:

- Total Population: 1,750,176
- Population Growth (2001–2011): 11.32%
- Population Density: 369 persons/km²
- Urban Population: 50.10%
- Rural Population: 49.90%
- Sex Ratio: 1,023 females/1000 males
- Child Population (0–6 years): 10.50%
- Child Sex Ratio: 963 females/1000 boys
- Literacy Rate: 86.16% (Male: 91.14%, Female: 81.33%)
- Social Composition: SC – 19.88%, ST – 0.28%, Others – 79.84%

### 2.4.2 Total habitats in the Study Area (10 Km radius)

The villages/Urban within the study area are further classified into three categories, depending upon their proximity to the project site as per **Table 2.4.2- List of Village/Urban within Study Area:**

| Sr.No | Village/Urban Name | Sr.No | Village/Urban Name |
|---|---|---|---|
| **Within 2 km (8 Village, 0 Urban)** | | | |
| 1 | Umarikottai | 5 | Perurani |
| 2 | Mela Thattaparai | 6 | Allikkulam |
| 3 | Keelathattapparai | 7 | Terkusilukkanpatti |
| 4 | Ramaswamipuram | 8 | Kuttudankadu |
| **More than 2 km and less than equal to 5 km (10 Villages, 1 Urban)** | | | |
| 9 | Jambulingapuram | 14 | Dalvaypuram |
| 10 | Pudiyamputhur (Part) | 15 | Timmarajapuram |
| 11 | Vadakkusilukkanpatti | 16 | Maravanmatam |
| 12 | Ayyanadaippu | 17 | Varthakareddipatti |
| 13 | Muthuswamipuram | 18 | Mudivaithanendal |
| **URBAN** | | | |
| 1 | Kumaragiri (CT) | | |
| **More than 5 km and less than equal to 10 km (31Villages, 7 Urban)** | | | |
| 19 | Ottappidaram | 35 | Mullakadu (Part) |
| 20 | Kulasekaranallur | 36 | Alanda |
| 21 | Muramban | 37 | Poovani |
| 22 | Paraikuttam | 38 | Meenakshipuram Sekkarakkudi |
| 23 | Melapandiyapuram | 39 | Sekkarakkudi |
| 24 | Savarimangalam | 40 | Vadakkukariseri |
| 25 | Swaminatham | 41 | Singathakurichi |
| 26 | Therkuveerapandiyapuram | 42 | Deivaseyalpuram |
| 27 | Sillanatham | 43 | Ellainayakkanpatti |

| | | | |
|---|---|---|---|
| 28 | Pudur pandiyapuram | 44 | Chettimallanpatti |
| 29 | Korampallam (Part) | 45 | Aniyaparanallur |
| 30 | Sendilampannai | 46 | Tannuthu |
| 31 | Ramanathapuram | 47 | Nallathi |
| 32 | Kattalangulam | 48 | Iruvappapuram |
| 33 | Servaikaranmadam | 49 | Palayakkayal |
| 34 | Kuliyankarisal | | |
| **URBAN** | | | |
| 2 | Pudiyamputhur (CT) | 6 | Athimarapatti (CT) |
| 3 | Sankaraperi (CT) | 7 | Thoothukkudi (M Corp.) |
| 4 | Milavittan (CT) | 8 | Sayapuram (TP) |
| 5 | Muttayyapuram (CT) | | |

**Source: PCA Census 2011, District: Thoothukkudi State- Tamil Nadu.**

### 2.4.3 Villages Selected for Socio Study Using Primary Survey

Depending upon their proximity to the project site, the village level information has been compiled for the villages which were selected as per Methodology. The main objective of the socio-economic study is to collect social and economic information about the area and to identify the expected impacts due to the project activities and to provide the appropriate mitigation measures.

Based on Methodology prepared and followed by team SE, few questionnaires were filled for 7 villages (as per Table 2.4.3) to identify and record the demography, Source of Income & Working Pattern, Infrastructure Facilities, Cropping Pattern, Farmer Category, Disease Prevalence and Need based gaps is prepared as per Annexure 1

**Table 2.4.3: List of Villages (Primary Survey)**

| Sr No | Name of Village | Direction | Study Area Zone |
|---|---|---|---|
| 1 | Umarikottai | NE | Zone-I (0-2 Km) |
| 2 | Mela Thattaparai | NNW | Zone-I (0-2 Km) |
| 3 | Keelathattapparai | N | Zone-I (0-2 Km) |
| 4 | Allikkulam | SSW | Zone-I (0-2 Km) |
| 5 | Terkusilukkanpatti | SE | Zone-I (0-2 Km) |
| 6 | Vadakkusilukkanpatti | NE | Zone-II (2-5Km) |
| 7 | Therkuveerapandiyapuram | NE | Zone-III (5-10Km) |

Source: Physical survey Team SE

## 2.5 Demographic Structure of Study Area

As per details extracted from**,** PCA Census 2011 the Demographic details such as household, total population, sex ratio, %age of SC and %age of ST population, literacy rate

and employment pattern are summarized and annexed as **Annexure-II.** Demographic details presented in **Table 2.5 Demographic Structure of Study Area**

| Study area | | Total Household | Population | | | 0-6 Child Population | Sex Ratio | SC % | ST % | Others % |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Total | Male | Female | | | | | |
| Zone-I | Rural | 3923 | 14586 | 7249 | 7337 | 1747 | 1012 | 37.8 | 0.1 | 62.1 |
| | Urban | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Zone-II | Rural | 5989 | 21851 | 10922 | 10929 | 2489 | 1001 | 31.4 | 0.1 | 68.5 |
| | Urban | 3428 | 13344 | 6735 | 6609 | 1595 | 981 | 10.8 | 0.1 | 89.1 |
| Zone-III | Rural | 19405 | 72982 | 36456 | 36526 | 7946 | 1002 | 36 | 0.1 | 63.9 |
| | Urban | 96801 | 379053 | 189804 | 189249 | 40898 | 997 | 12.2 | 0.2 | 87.6 |
| Overall Rural | | 29317 | 109419 | 54627 | 54792 | 12182 | 1003 | 35.3 | 0.1 | 64.6 |
| Overall Urban | | 100229 | 392397 | 196539 | 195858 | 42493 | 997 | 12.2 | 0.2 | 87.6 |
| Overall Study Area | | 129546 | 501816 | 251166 | 250650 | 54675 | 998 | 17.2 | 0.1 | 82.7 |

**Source: PCA Census 2011, District: Thoothukkudi State- Tamil Nadu.**

### 2.5.1 Demographic Structure of Villages Selected for Primary survey:

Demographic detail of the villages PCA Census 2011 are compared with data extracted from surveyed by primary survey team of Perfact and Tabulated below:

**Table below 2.5.1 Demographic Structure of Surveyed Village**

| Sr No. | Particulars | As per PCA Census 2011 | Surveyed in 2025 by Team Perfact |
|---|---|---|---|
| 1 | Total HouseHold | 2578 | 3231 |
| 2 | Total Population | 9563 | 10174 |
| 3 | Average Household Size | 3.7 | 3.1 |
| 4 | Total Male | 49.7% | 49.8% |
| 5 | Total Female | 50.3% | 50.2% |
| 6 | Sex Ratio | 1012 | 1008 |
| 7 | Total SC population | 41.7% | 42% |
| 8 | Total ST population | 0% | 0% |
| 9 | Total others population | 58.3% | 58% |

**Demographic Report (2011–2025)**

- **Total Households:** 2,578 → 3,231
- **Total Population:** 9,563 → 10,174
- **Average Household Size:** 3.7 → 3.1
- **Male Population:** 49.7% → 49.8%
- **Female Population:** 50.3% → 50.2%
- **Sex Ratio (females per 1000 males):** 1,012 → 1,008

- **SC Population:** 41.7% → 42%
- **ST Population:** 0% → 0%
- **Other Population:** 58.3% → 58%

**Summary:** The area saw an **increase in households and population**, a **slight decrease in household size**, a **stable gender ratio**, and **slight growth in SC population**.

### 2.6 Literacy Details of Study area

Data extracted from PCA Census 2011, Literacy Detail of villages in study area are compared with details of Villages surveyed by primary survey team of Perfact is prepared and annexed as Annexure-II. Summarized details are tabulated in **Table 2.6 Literacy Details of study area**

**Table 2.6 Literacy Details of study area**

| Study Area | | Population above 0-6 Years | | | Literate | | | |
|---|---|---|---|---|---|---|---|---|
| | | Total | Male | Female | Total | Overall % | Male (%) | Female (%) |
| Zone-I | Rural | 12839 | 6343 | 6496 | 10821 | 84.3 | 90.9 | 77.8 |
| | Urban | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Zone-II | Rural | 19362 | 9628 | 9734 | 16972 | 87.7 | 92.9 | 82.5 |
| | Urban | 11749 | 5940 | 5809 | 10815 | 92.1 | 95 | 89 |
| Zone-III | Rural | 65036 | 32423 | 32613 | 54962 | 84.5 | 90.7 | 78.4 |
| | Urban | 338155 | 168964 | 169191 | 310678 | 91.9 | 94.7 | 89.1 |
| Overall Rural | | 97237 | 48394 | 48843 | 82755 | 85.1 | 91.2 | 79.1 |
| Overall Urban | | 349904 | 174904 | 175000 | 321493 | 91.9 | 94.7 | 89.1 |
| Overall Study Area | | 447141 | 223298 | 223843 | 404248 | 90.4 | 93.9 | 86.9 |

**Source: PCA Census 2011, District: Thoothukkudi State- Tamil Nadu.**

#### 2.6.1 Literacy Details of Surveyed Villages

Demographic detail of the villages PCA Census 2011 are compared with data extracted from surveyed by primary survey team of Perfact and Tabulated below

**Table 2.6.1 Literacy Details of Surveyed villages**

| Sr No. | Particulars | As per PCA Census 2011 | Surveyed in 2024 by Team Perfact |
|---|---|---|---|
| 1 | **Overall** Literacy (%) | 80.2% | 87% |
| 2 | **Male** Literacy (**%)** | 88.6% | 93% |
| 3 | **Female** Literacy (**%)** | 72.9% | 82% |

**Source: PCA Census 2011 and Primary Survey by Team Perfact**

Overall Literacy in the surveyed villages is 87% as compared to PCA Census 2011 was 80.2%

## 2.7 Work Force/Employment Pattern of study area

The workforce/employment in the study area as per Census 2011 is prepared and annexed as **Annexure-III.** Summarized details is tabulated in **Table 2.7 Workforce/Employment Pattern of Study area**

**Table 2.7 Workforce/Employment Pattern of Study area**

| Study area | | Total Population | Total Working Population | % Total Working Population | % Non-working Population | % Main-working Population | % Marginal working Population |
|---|---|---|---|---|---|---|---|
| Zone-I | Rural | 14586 | 6538 | 44.8 | 55.2 | 72.9 | 27.1 |
| | Urban | 0 | 0 | 0 | 0 | 0 | 0 |
| Zone-II | Rural | 21851 | 9280 | 42.5 | 57.5 | 80.6 | 19.4 |
| | Urban | 13344 | 4835 | 36.2 | 63.8 | 84.7 | 15.3 |
| Zone-III | Rural | 72982 | 34102 | 46.7 | 53.3 | 82.6 | 17.4 |
| | Urban | 379053 | 138169 | 36.5 | 63.5 | 93.5 | 6.5 |
| Overall Rural | | 109419 | 49920 | 45.6 | 54.4 | 81 | 19 |
| Overall Urban | | 392397 | 143004 | 36.4 | 63.6 | 93.2 | 6.8 |
| **Overall Study Area** | | 501816 | 192924 | 38.4 | 61.6 | 90 | 10 |

**Source: PCA Census 2011, District: Thoothukkudi State- Tamil Nadu.**

## 2.8 Main Workforce Employment Pattern for study area

The main workers employment pattern in the study area as per Census 2011 is prepared and annexed as Annexure-IV. Summarized details is tabulated in **Table 2.8 Main Workers Employment Pattern for study area**

**Table 2.8. Main Workforce Employment Pattern for study area**

| Study area | | Total no of Main Workforce | Cultivators % | Agricultural Labour % | Household Industries % | *Others % |
|---|---|---|---|---|---|---|
| Zone-I | Rural | 4763 | 11.7 | 28.8 | 3.8 | 55.7 |
| | Urban | 0 | 0 | 0 | 0 | 0 |
| Zone-II | Rural | 7481 | 3.5 | 18.4 | 3 | 75.1 |
| | Urban | 4094 | 2.2 | 6.8 | 1.1 | 89.9 |
| Zone-III | Rural | 28167 | 9.8 | 36.8 | 2 | 51.4 |
| | Urban | 129150 | 0.5 | 2.7 | 1.7 | 95.1 |
| Overall Rural | | 40411 | 8.9 | 32.4 | 2.4 | 56.3 |
| Overall Urban | | 133244 | 0.6 | 2.8 | 1.7 | 94.9 |
| Overall Study Area | | 173655 | 2.5 | 9.7 | 1.9 | 85.9 |

**Source: PCA Census 2011, District: Thoothukkudi State- Tamil Nadu.**

*Includes, Non Agricultural Labour, Govt. Job, Private service, Self Employed, etc

### 2.8.1 Source of Income & Workforce Pattern in Surveyed Villages:

The main sources of income in the surveyed area are agriculture and agricultural labour, private and government jobs, daily wage labour, self-employment, shops, businesses, and animal husbandry etc.

### 2.8.2 Crop Pattern for surveyed villages

The main crop from District Census Handbook 2011 of villages in study area are compared with details of Villages surveyed by the primary survey team of Perfact as summarized below.

**Table 2.8.2 Crop Pattern for surveyed villages**

| Sr No. | Village Name | As per District Census Handbook 2011 | Surveyed in 2025 by Team Perfact |
|---|---|---|---|
| 1 | Umarikottai | Maize, Bajra, Black Gram | Maize, Bajra, Black Gram |
| 2 | Mela Thattaparai | Whole green germ, Black Gram, Sesame seeds | Whole green germ, Black Gram, Sesame seeds |
| 3 | Keelathattapparai | Whole green germ, Black Gram, Sesame seeds | Whole green germ, Black Gram, Sesame seeds |
| 4 | Allikkulam | Flowers, Paddy | Flowers, Paddy |
| 5 | Terkusilukkanpatti | Pulses, Black Gram | Pulses, Black Gram |
| 6 | Vadakkusilukkanpatti | Whole green germ, Black Gram, Sesame seeds | Whole green germ, Black Gram, Sesame seeds |
| 7 | Therkuveerapandiyapuram | Bulrush,Whole green germ, Black Gram | Bulrush,Whole green germ, Black Gram |

**Source: District Census Handbook 2011 and Primary Survey by Team Perfact**

The main crops in the surveyed villages are Maize, Bajra, Black Gram, Whole Green Gram, Sesame seeds, Jasmine, Paddy, Pulses, Flowers and Bulrush. These are grown across all villages in different combinations.

### 2.8.3 Diseases in Surveyed Villages:

**Disease prevalence**: No major diseases reported; only **minor seasonal ailments (1–5%)**.

### 2.9 Population Growth & Projected Population of Study Area

Census data from 2001 and 2011 were analyzed to understand the population growth trend in the study area of Thoothukkudi District. The analysis shows that the decadal growth rate is 17.92% in Zone I, 20.06% in Zone II, and 14.26% in Zone III. In comparison, Thoothukkudi District recorded an overall decadal growth rate of 11.32%. The details are presented in Table 2.9.1: Population Growth & Projected Population of Study Area

**Table 2.9.1: Population Growth & Projected Population of Study Area**

| Particulars | Total Population as on 2001 | Total Population as on 2011 | Decadal Growth Rate % | Yearly Growth Rate % | Projected Population (As on 2025) | | |
|---|---|---|---|---|---|---|---|
| | | | 2001-2011 | | Total | Male | Female |
| 0-2 Km Zone-I | 12369 | 14586 | 17.92 | 1.79 | 18696 | 9291 | 9405 |
| 2-5Km Zone-II | 29315 | 35195 | 20.06 | 2.01 | 46469 | 23313 | 23156 |
| 5-10 Km Zone-III | 395625 | 452035 | 14.26 | 1.43 | 551121 | 275856 | 275265 |
| Study Area | 437309 | 501816 | 14.75 | | 616286 | 308460 | 307826 |
| Kachchh district | 1,572,273 | 1,750,176 | 11.32 | | | | |

**Source: Census Data 2001 & 2011**

## 2.10 Infrastructure Available

### 2.10.1 Infrastructure Available in Study Area

The result of infrastructure resources based on the District Census Handbook 2011 is attached as summarized below.

**Education:** As per 2011 records, the study area (10 km radius) of Thoothukkudi District comprises 49 villages and 8 urban areas across Zones I, II, and III, with 44 villages having government primary schools. In rural areas, there are 77 government and 37 private primary schools, along with 28 government and 15 private middle schools, 7 government and 6 private secondary schools, and 4 government and 5 private senior secondary schools. Urban areas have 31 government and 87 private primary schools, 21 government and 68 private middle schools, 4 government and 40 private secondary schools, and 4 government and 38 private senior secondary schools. Overall, while primary education is widely available in both rural and urban areas, secondary and senior secondary schools are more concentrated in urban locations.

| Education (No. of School) | | Primary School | | Middle School | | Secondary School | | Senior Secondary School | |
|---|---|---|---|---|---|---|---|---|---|
| | | Govt | Private | Govt | Private | Govt | Private | Govt | Private |
| 0-2 Km Zone-I | Rural | 14 | 4 | 4 | 1 | 0 | 0 | 0 | 0 |
| | Urban | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2-5Km Zone-II | Rural | 17 | 7 | 7 | 2 | 2 | 1 | 1 | 1 |
| | Urban | 5 | 0 | 6 | 4 | 1 | 4 | 1 | 4 |
| 5-10 Km Zone-III | Rural | 46 | 26 | 17 | 12 | 5 | 5 | 3 | 4 |
| | Urban | 26 | 87 | 15 | 64 | 3 | 36 | 3 | 34 |
| **Study Area** | **Rural** | **77** | **37** | **28** | **15** | **7** | **6** | **4** | **5** |
| | **Urban** | **31** | **87** | **21** | **68** | **4** | **40** | **4** | **38** |

**Source: District Census Handbook 2011 District: Thoothukkudi State- Tamil Nadu.**

**Medical/Primary Health Care:** There are 5 Primary Health Centres, 27 Primary Sub Centres, 19 Maternity and Child Welfare Centers, 7 TB Clinic, 2 Hospital Allopathi, 10 Dispensary, 7 Family Welfare Centre present in the study area providing health care facilities.

| Health Care (Number) | | Primary Health Centre | Primary Health Sub Centre | Maternity and Child Welfare Centre | TB Clinic | Hospital Allopathic | Dispensary | Family Welfare Centre |
|---|---|---|---|---|---|---|---|---|
| 0-2 Km Zone-I | Rural | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| | Urban | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2-5Km Zone-II | Rural | 1 | 5 | 3 | 1 | 0 | 1 | 1 |
| | Urban | - | - | 1 | 0 | 0 | 1 | 0 |
| 5-10 Km Zone-III | Rural | 4 | 20 | 9 | 4 | 0 | 4 | 4 |
| | Urban | - | - | 6 | 2 | 2 | 4 | 2 |
| Study Area | | **5** | **27** | **19** | **7** | **2** | **10** | **7** |

**Source: District Census Handbook 2011 District: Thoothukkudi State- Tamil Nadu.**

**Drinking Water:** The study area has various sources of drinking water. There are 46 treated and 42 untreated tap water points, 13 covered and 10 uncovered wells, 13 hand pumps, 18 tube wells/boreholes, 3 springs, and 1 river/canal. Zone III has the highest number of sources, while traditional sources like wells and hand pumps are still important in rural areas.

| Drinking Water | Tap Water-Treated | Tap Water Untreated | Covered Well | Uncovered Well | Hand Pump | Tube Wells/ Borehole | Spring | River/ Canal |
|---|---|---|---|---|---|---|---|---|
| Zone-I | 7 | 8 | 2 | 1 | 2 | 3 | 1 | 0 |
| Zone-II | 9 | 9 | 4 | 4 | 4 | 4 | 1 | 0 |
| Zone-III | 30 | 25 | 7 | 5 | 7 | 11 | 1 | 1 |
| Study Area | 46 | 42 | 13 | 10 | 13 | 18 | 3 | 1 |

**Source: District Census Handbook 2011 District: Thoothukkudi State- Tamil Nadu.**

**Drainage and Sanitation Facilities:** The study area has 42 open drains, 4 places with no drainage, 2 pucca drains covered with tiles, 29 uncovered pucca drains, and 28 open kuccha drains. Sanitation facilities include 13 areas under the Total Sanitation Campaign and 7 community toilet complexes. Zone III has the most facilities, but there is a need to improve covered drainage and sanitation coverage.

| Drainage & sanitation | Open Drainage | No Drainage | Pucca Drainage Covered with Tiles Slabs | Pucca Drainage Uncovered | Open Kuccha Drainage | Total Sanitation Campaign | Community Toilet Complex (excluding Bath) |
|---|---|---|---|---|---|---|---|
| Zone-I | 8 | 0 | 0 | 5 | 6 | 3 | 1 |
| Zone-II | 9 | 1 | 1 | 6 | 5 | 5 | 2 |
| Zone-III | 25 | 3 | 1 | 18 | 17 | 5 | 4 |
| Study Area | 42 | 4 | 2 | 29 | 28 | 13 | 7 |

**Source: District Census Handbook 2011 District: Thoothukkudi State- Tamil Nadu.**

**Communication:** Communication facility is present in the form of the post office, sub-post office, landline, etc.

| Communication | Post Office | Sub Post Office | Telephone | Public Call Office | Mobile Phone Coverage | Common Service Centre |
|---|---|---|---|---|---|---|
| Zone-I | 1 | 5 | 8 | 6 | 8 | 1 |
| Zone-II | 2 | 5 | 10 | 7 | 10 | 2 |
| Zone-III | 3 | 25 | 28 | 22 | 31 | 3 |
| Study Area | 6 | 35 | 46 | 35 | 49 | 6 |

**Source: District Census Handbook 2011 District: Thoothukkudi State- Tamil Nadu.**

**Transportation:** A public bus facility is available in all villages of the study area. Other facilities in the form of autos, taxis, vans, etc are also available in the study area.

| Transportation | Public Bus Service | Railway Station | Auto/Modified Autos | Taxi | Vans |
|---|---|---|---|---|---|
| Zone-I | 8 | 1 | 4 | 3 | 4 |
| Zone-II | 10 | 0 | 3 | 2 | 2 |
| Zone-III | 31 | 2 | 12 | 10 | 12 |
| Study Area | 49 | 3 | 19 | 15 | 18 |

**Source: District Census Handbook 2011 District: Thoothukkudi State- Tamil Nadu.**

**Road Approach:** All villages in the study area have blacktop roads. In addition, 43 villages have gravel roads, 25 have water-bound macadam roads, and all villages have weather roads and footpaths.

| Road | Black Topped Road | Gravel Roads | Water Bound Macadam | All Weather Road | Footpath |
|---|---|---|---|---|---|
| Zone-I | 8 | 7 | 2 | 8 | 8 |
| Zone-II | 10 | 9 | 4 | 10 | 10 |
| Zone-III | 31 | 27 | 19 | 31 | 31 |
| Study Area | 49 | 43 | 25 | 49 | 49 |

**Source: District Census Handbook 2011 District: Thoothukkudi State- Tamil Nadu.**

**Bank Facilities:** Out of 49 villages, 3 villages have commercial banks & 8 Agricultural Credit Societies & 49 Self - Help Groups are available. There are 9 Cooperative banks within the study area.

| Bank | Commercial Bank | Cooperative Bank | Agricultural Credit Societies | Self - Help Group |
|---|---|---|---|---|
| Zone-I | 0 | 1 | 1 | 8 |
| Zone-II | 1 | 1 | 1 | 10 |
| Zone-III | 2 | 7 | 6 | 31 |
| Study Area | 3 | 9 | 8 | 49 |

**Source: District Census Handbook 2011 District: Thoothukkudi State- Tamil Nadu.**

**Power Supply:** The study area has good electricity coverage. Power is available for domestic use in all villages, for agriculture in 38, for commercial use in 33, and for all users in 38 villages. Zone III has the most coverage, while Zones I and II have fewerelectrified areas.

| Electricity | Power Supply for Domestic Use | Power Supply for Agriculture Use | Power Supply for Commercial Use | Power Supply for All Users |
|---|---|---|---|---|
| Zone-I | 8 | 5 | 6 | 5 |
| Zone-II | 10 | 7 | 5 | 8 |
| Zone-III | 31 | 26 | 22 | 25 |
| Study Area | 49 | 38 | 33 | 38 |

**Source: District Census Handbook 2011 District: Thoothukkudi State- Tamil Nadu.**

### 2.10.2 Infrastructure Available in Surveyed Villages

The infrastructure details from PCA Census 2011 of villages in the study area are compared with details of Villages surveyed by the primary survey team of Perfact as summarized below.

**Table 3.6.4 Infrastructure Facilities**

| Educational Facilities | Anganwadi (available in No. of villages) | Govt. Primary School (available in No. of villages) | Govt. Middle School (available in No. of villages) | Govt. Secondary School (available in No. of villages) | Govt. Senior Secondary School (available in No. of villages) |
|---|---|---|---|---|---|
| By Primary Survey (7 villages) | 12 | 12 | 6 | 0 | 0 |
| Census 2011(7 villages) | 7 | 12 | 5 | 0 | 0 |

| Health Care facilities | Asha Workers (available in No. of villages) | Private Clinic (available in No. of villages) | Dispensary (available in No. of villages) | Primary Health center (available in No. of villages) | Sub-cente (available in No. of villages)r |
|---|---|---|---|---|---|
| By Primary Survey (7 villages) | 7 | 7 | 0 | 1 | 1 |
| Census 2011(7 villages) | 7 | - | 0 | 0 | 2 |

| Drinking water Facilities | Hand Pump (available in No. of villages) | PWS Individual (Govt) Pipe Line (available in No. of villages) | Uncovered Well | Tube Wells/ Borehole (available in No. of villages) | Tank/ Pond / Lake/ River (available in No. of villages) |
|---|---|---|---|---|---|
| By Primary Survey (7 villages) | 0 | 7 | 1 | 7 | 1 |
| Census 2011(7 villages) | 2 | - | 1 | 1 | 1 |

| Transportation Facilities | Public Bus (available in No. of villages) | Car/Auto (available in No. of villages) | Vans/Taxi (available in No. of villages) | Railway Station(available in No. of villages) |
|---|---|---|---|---|
| By Primary Survey (7 villages) | 7 | 7 | 7 | 1 |
| Census 2011(7 villages) | 7 | 2 | 1 | 1 |

| Communication Facilities | Panchayat Office | Phone Recharge Office | Mobile Phone Coverage (available in No. of villages) |
|---|---|---|---|
| By Primary Survey (7 villages) | 7 | 7 | 7 |
| Census 2011(7 villages) | - | - | - |

| Road Facilities | Black Topped (Pacca Road) (available in No. of villages) | Gravel (Kutcha) Road (available in No. of villages) | Water Bound Macadam (available in No. of villages) | Foot path (available in No. of villages) |
|---|---|---|---|---|
| By Primary Survey (7 villages) | 7 | No | No | 7 |

| | | | | |
|---|---|---|---|---|
| Census 2011(7 villages) | 7 | 7 | 2 | 7 |

| Bank Facilities | ATM (available in No. of villages) | Commercial Bank (available in No. of villages) | Co-operative Bank (available in No. of villages) |
|---|---|---|---|
| By Primary Survey (7 villages) | 1 | 1 | 0 |

| Power Facilities | Whether Electrifie ? (available in No. of villages) | No of individual connections (available in No. of villages) | Whether street lights are present? (available in No. of villages) | Electricity available for Agricultural Purpose ? (available in No. of villages) | Solar lighting (available in No. of villages) |
|---|---|---|---|---|---|
| By Primary Survey (7 villages) | 7 | 7 | 7 | No | No |

| Sanitation Facilities | Open Drainage (available in No. of villages) | Public Toilets (available in No. of villages) | Individual Toilets (available in No. of villages) |
|---|---|---|---|
| By Primary Survey (7 villages) | 7 | No | 7 |

### 2.11 Major Industries in the Study Area:

**Major Industries in Thoothukudi District:** Thoothukudi hosts key industries like JJJ Industries, Ramamoorthy Industries, and BLUE Industries within 10 km of the study area, producing construction, manufacturing, and agro-industrial goods. The district is a hub for chemical, machinery, and fertilizer exports.

**List of Industries-Study Area:** The project area is located in Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram, and Therkusillukkanpatti in Thoothukudi Taluk, Thoothukudi District, Tamil Nadu. The major industries within about 10 km of the project area include

**Table list of Industries-Study Area**

| S. No. | Name of Industry | Distance & Direction |
|---|---|---|
| 1 | JJJ Industries - Real Estate Builders & Construction Company | 3.0Km SE |

| | | |
|---|---|---|
| | Thoothukudi - Tirunelveli Hwy Pudukottai, Tamil Nadu 628103 | |
| 2 | Ramamoorthy Industries - Manufacturer D.P.No.6 of SIDCO INDUSTRIAL ESTATE, SIPCOT 628008 | 6.3Km E |
| 3 | BLUE INDUSTRIES - Manufacturer NO.5C/103 RAJA PANDI NAGAR East Coast Rd Thoothukudi, Tamil Nadu 628001 | 9.9Km E |

**2.12 Sensitive areas in 5 km radius of project site (Monuments, Eco-sensitive areas etc.)**

| Environmental Feature / Sensitive Receptor | Approximate Distance (km) | Direction (from Project Site) |
|---|---|---|
| **Water Bodies** | | |
| Nilviyal odai Within Project Area | Odai Within Project Area | Passing through the site |
| Odai within Project Area | Odai Within Project Area | Passing through the site |
| Pond near Project Area | 0.21 | NE |
| Pond near Project Area | 0.31 | NW |
| Pond near Project Area | 0.39 | SSW |
| Allikulam Pond | 0.43 | S |
| Pond near Perurani | 0.80 | S |
| Pond near Allikulam | 0.80 | SSE |
| Swimming Pond near Perurani | 1.01 | S |
| Neeravi Pond Perurani | 1.13 | SW |
| Pond near Perurani | 1.25 | WSW |
| Perurani Pond | 1.28 | SW |
| Kadamba Kulam ( Fishing Pond ) | 1.53 | SSE |
| Pond near Perurani | 1.56 | SW |
| Pond near Mel Kuttudankadu | 1.90 | S |
| Pond Elim (Kanchan Kulam) | 2.07 | SSE |
| Vepan Pond | 2.11 | SW |
| Pond near Umari kkottai | 2.39 | NW |
| Pond near Putupatti | 3.04 | SSW |
| Koram Pallam Tank | 3.52 | SE |
| Pond near Varthagareddypatti | 3.52 | SW |
| Pond near Varthagareddypatti | 3.60 | SW |
| periya Kulam water body | 3.80 | SW |
| Pond Bethesda | 3.85 | SSE |
| Senkulam River (River Port) | 4.49 | ENE |
| **Hospitals** | | |
| Jacob Hospital, Pudukottai | 3.03 | SE |
| Sree Aicort Maharaja Clinic, Sekkarakkudi | 4.43 | W |
| **Post Offices** | | |
| Branch Post Office, Mela Thattaparai | 1.34 | NE |
| Post Office, Melakuttudakadu | 2.05 | S |
| Post Office, Pudukottai | 2.93 | SE |
| Senthil Postal Service Centre, Pudukottai | 2.96 | SE |
| Kumaragiri Panchayat Office (Post Office), Pudukottai | 3.36 | SE |
| Post Office, Sekkarakkudi | 4.93 | W |
| **Places of Worship** | | |
| Sri Sappani Madan Temple, Allikulam | 0.21 | SSE |
| Sri Muthu Mariamman Temple, Allikulam | 0.31 | S |
| Sri Alagiya Thiruveattai Ayyanar Temple, | 0.31 | SSW |

| Environmental Feature / Sensitive Receptor | Approximate Distance (km) | Direction (from Project Site) |
|---|---|---|
| Allikulam | | |
| Sri Perumal Temple, Allikulam | 0.33 | S |
| Sri Vinayagar Temple, Allikulam | 0.37 | S |
| Sri Parvathi Parameswari Amman Temple, Allikulam | 0.37 | S |
| Sri Muthumari Amman Temple, Allikulam | 0.41 | SW |
| Sri Thadikaraswami Temple, Thoothukudi | 0.42 | S |
| Mullai Marathu Sudalaimadan Swamy Temple, Thoothukudi | 0.50 | S |
| Kaliamman Temple, Melathattaparai | 0.90 | NE |
| Nallamadasamy Temple, Melathattaparai | 1.14 | NE |
| Shri Angala Parameshwari Temple, Melathattaparai | 1.15 | NE |
| Sri Uchinimakali Amman Temple, Melathattaparai | 1.23 | NE |
| Ellammal Temple, Melathattaparai | 1.25 | NE |
| Shri Nagamma Temple, Melathattaparai | 1.33 | NE |
| Sri Sappandimadasamy Temple, Melathattaparai | 1.42 | NE |
| Church of God, Melathattaparai | 2.31 | NE |
| **Schools** | | |
| Annai Subasri Vidhyalaya Nursery & Primary School, Melathattaparai | 0.95 | NNE |
| TDTA School, Melathattaparai | 1.25 | NE |
| Anganwadi Centre (Elementary School), Melathattaparai | 1.34 | NNE |
| Govt School, Melathattaparai | 2.84 | NNE |
| Soosaipandiapuram Primary School, Kuttudankadu | 3.02 | SSE |
| TDTA PSP Hr Sec School, Pudukottai | 3.34 | SE |
| Aananthi Pappa Home, Pudukottai | 3.36 | SE |
| TNDTA St. Augustine Primary School, Pudukottai | 3.37 | SE |

### 2.13 Quality of Life Assessment

Quality of life (QoL) indicates the overall status of socio-economic aspects in each area. Quality of life (QoL) is defined as a function between "objective conditions" and "subjective attitudes" involving a defined "area" of concern.

The "objective conditions" are numerically measurable artifacts of a physical, sociological event or economic event. Objective conditions may be defined as any number, which stands for a given quantity of a variable of interest if it is independent of subjective opinion.

Infrastructure related and Services related 15 social demographic indicators were selected to ascertain the Quality-of-life index. Every present QOL indicator has 10 points and for the absence zero points are given. Allocation of the weightage to the Economic variables is made owing to the significance of social demographic data. Infrastructure related variables were assigned 70% weightage. Services related variables were assigned 30% weightage.

Following social demographic indicators were selected:

**Infrastructure:**

Anganwadi Centre, Govt. Primary School, Govt. Vocational Training Centre ITI, Govt.

PHC/SC,Tap Water Untreated, River & Canal, Total Sanitation Campaign, Metal Road, Community Centre, Commercial Bank, Agricultural Credit Society.

**Services:**

Self Help Group; Electric Power (Domestic); Telephone/mobile; Mode of transportation.

The summarized calculation of above indicators is annexed as **Annexure VI.** The outcome of the study is given below:

The maximum score obtained by a village is 8.3 and the minimum score is 1,7 the average score in the study area is 5,9 Based on the results the following criteria is defined:

| Average Score Group | Performance Group | Freq of Villages | Percentage |
|---|---|---|---|
| 1,7-3.4 | Poor | 2 | 4% |
| 3.5-5.0 | Fair | 6 | 12% |
| 5.1-6.6 | Good | 28 | 57% |
| 6.7& above | Excellent | 13 | 27% |

Thus, as per above index about 27% villages stand Excellent, 57% villages are Good and 12% villages in the study area are in the Fair group. 2 Villages (4%) in the study area are in the Poor performance group.

**INFERENCE:**

The project is located in Allikulam, Keelathattaparai, Perurani, Umarkottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages (Zone I), which has a good ofshows good & Excellent performance with a score of 5.2 to 7.0 while two villages in Zone III have poor performance (Annexure-VI)

| Name of Village | Score obtained | Study Area Zone | Name of Village | Score obtained | Study Area Zone |
|---|---|---|---|---|---|
| Sendilampannai | 1.7 | Zone-III | Tannuthu | 3.0 | Zone-III |

## 2.14 Key Findings and Summary of Primary Data Collection

### 1. Demographics and Literacy

**Households and Population:**

- The number of households varies from **198 to 684** across villages.
- Total population ranges from **700 to 2,010**, with males slightly outnumbering females in most villages.

**Gender Distribution:**

- Male population is consistently higher than the female population in all surveyed villages.

**Literacy Rates:**

- Overall literacy ranges from **60% to 97%**, with **male literacy higher (80–98%)** than female literacy (60–95%), showing a notable gender gap.

**Caste Distribution:**

- SC households range from **12% to 73%**, ST households are absent, and Other categories vary between **27% to88%**.

**Roads:**

- Black-topped roads are available in all villages.

- All-weather roads and footpaths are present in some villages, while Kuchha and water-bound macadam roads are absent.

**Toilet Availability:**

- 100% of households have **individual toilets**; **no public toilets** or open defecation reported.

**Electrification:**

- All villages are fully electrified with individual connections.
- Power supply is consistent for domestic and commercial use, though **agricultural power supply is absent**.
- Streetlights exist, but **solar lighting is not implemented**.

**Water Sources:**

- Primary drinking sources include **supply water** and **tube wells/bore wells**, ensuring reliable availability.

**Transportation:**

- All villages have access to **public buses, autos, vans, taxis, cycles/bikes, and cars**.
- **Railway stations are** present only in one village.

**Educational Facilities**

- **Anganwadi centers**: Present in all villages (1–3 per village).
- **Primary schools**: Present in all villages.
- **Middle and high schools**: Largely absent, except a few middle schools.
- **Colleges**: None in any village.

### 2.15 Critical Gaps Identified Across All Villages

The identified gaps in the villages, as analyzed in the document, are:

- **Education & Skill Development:**

  Middle schools exist in some villages; **no High Schools or Colleges**.
- Need: **Libraries and Skill Development Centres**.

**Sanitation & Waste Management:**

- **Household toilets available**, but **no public toilets**.
- Drainage is **open kuccha**, solid waste disposal basic.
- Need: **Drainage, public toilets, formal Solid Waste Management**

**Health Facilities:**

- PHCs are **mostly absent**; private clinics/ASHA present.
- Need: **PHC expansion, ambulance, medicine supply**.

**Electrification & Lighting:**

- Fully electrified; streetlights exist, **no solar lighting**.

- Need: **LED streetlights, solar lighting, agricultural power**.

**Connectivity & Transport:**

- Roads mostly black-topped; footpaths and all-weather roads missing in some villages.
- Need: **Improve all-weather roads, footpaths, transport links**.

**Public Utilities:**

- Mobile coverage is good; banks largely absent; community halls exist only in some villages.
- Need: **Banks and community halls**.

**Livelihood & Agriculture:**

- Agriculture dominant; diverse crops including **Bajra, Black Gram, Maize, Whole Green Gram, Sesame seeds**.
- Need: **Agriculture support programs, training, irrigation, market access**.

### 2.16 Cultural & Aesthetic Attributes – Thoothukkudi District

**Cultural Practices:** Thoothukkudi is known for its rich Tamil culture and coastal traditions. Major festivals celebrated are Pongal, Deepavali, Navaratri, and Easter, along with temple festivals like the Ther Thiruvizha at Tiruchendur Murugan Temple. Folk arts such as *Karagattam*, *Oyilattam*, and *Villu Pattu* are popular. The Our Lady of Snows Basilica is a major pilgrimage centre.

**Historical Context:** Thoothukkudi has been an important port and trade centre since ancient times. It played a vital role in the freedom movement, being the birthplace of V.O. Chidambaranar. The district's old churches, temples, and lighthouses reflect colonial and Tamil architecture.

**Modern Integration:** The district has developed into an industrial and port hub, hosting major industries like SPIC and Sterlite Copper. Despite this growth, Thoothukkudi retains its traditional festivals, crafts, and coastal culture.

#### 2.16.1 Aesthetic Attributes

**Traditional:** Includes Tiruchendur Murugan Temple, ancient churches, colonial buildings, and beaches. Local crafts include palm-leaf products, shell works, and pearl jewellery.

**Modern:** Modern structures blend traditional Tamil designs with modern architecture. Murals and art inspired by the sea and local culture are used in buildings.

**Cultural Aesthetics:** Festivals like Ther Thiruvizha and the Our Lady of Snows Festival highlight Thoothukkudi's vibrant mix of music, dance, art, and devotion.

## 3.0 IMPACTS & MITIGATION

### 3.1 Anticipated Impact and Mitigation in vicinity

The impact assessment for the proposed Synthetic Organic Chemicals industry has been conducted through the following steps:

1. **Identification of Interactions** – Understanding the interactions between project activities and environmental receptors.
2. **Identification of Significant Impacts** – Evaluating potential environmental impacts based on these interactions.

The key environmental components of the project which will be affected by the project and its mitigation proposed :

### 3.2 Anticipated Impact and Mitigation on Socio-Economic Environment

| Sl. No. | Activity | Anticipated Impact | Proposed Mitigation Measures |
|---|---|---|---|
| 1 | Construction | Positive impact by giving employment to the local people.<br>Increase in local economic activity.<br>Increased noise and dust emission might cause irritation to workers and nearby people.<br>Accidents during installation might lead to loss of life to workers | Equipment like PPEs and nose masks will be provided to workers.<br>Safety equipment will be provided to workers. |
| 2 | Installation of Machineries and Utilities | Increased noise and dust emission might cause irritation to workers and nearby people.<br>The noise level generation will be 80-85 dB (A) during installation. | Equipment like PPEs like earmuffs/ear plugs and nose masks will be provided to workers.<br>Green belt area of 142.804 (17.93% of plot area) will be developed at the project site which will act as a barrier and help in reducing noise levels at the project site as a result of attenuation of noise generated due to plant operations<br>and transportation. |

| Sl. No. | Activity | Anticipated Impact | Proposed Mitigation Measures |
|---|---|---|---|
| 3 | Operation of Construction machinery (Concrete mixing machinery, DG sets, JCB, etc.) | Noise due to operation of DG Set and machinery.<br>Impact due to sudden slip/breakage of machinery can cause injury to workers. | DG Sets will be enclosed in an acoustic enclosure & will be used during the emergency.<br>Provision of Ear Plugs to workers can reduce the impact of noise on Ears of Workers can reduce the impacts.<br>Green belt will be developed. |
| 4 | Transportation (Raw Material, Labour) | Due to the construction of the project there will be an increase in usage of vehicles which will have a direct impact on traffic load on the existing roads in the area. Due to which there will be a traffic jam, chaos, discomfort, safety issues on the roads.<br>Indirect employment generation due to transportation will be there, hence, the economic condition of their families will improve. The purchasing power of people will increase. Hence, there will be overall development of the area. | Existing road width is sufficient to handle the load of increased traffic.<br>Adequate parking is provided for trucks, cars within the factory premises.<br>There will be a positive impact due to increase in employment and other indirect requirements. |
| 5 | Working & Daily Activity of Construction Labor | Improper disposal of Solid waste & wastewater from labors may cause nuisance due to smell if not properly managed & treated. | The generated organic waste will be collected and disposed of by an approved vendor. |

### 3.3 Anticipated Impact and mitigation on Cultural attributes

| Sl No. | Activity | Environmental Component | Impact | Mitigation |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 1 | Community Dynamics | Economic condition | The project will influence local traditions and lifestyles, especially in tribal areas. It may bring economic opportunities but could also disrupt their traditional practices. | They will be given training to develop their skills.<br>Education facilities will be provided.<br>Care shall be taken so that there is no impact on traditional practices. |
| 2 | Cultural Preservation | Social condition | The project might lead to the erosion of local cultural heritage if not managed properly. | Initiatives like cultural awareness programs and community engagement can mitigate the impact. |
| 3 | Migration and Diversity | Social condition | The influx of workers from different regions could lead to cultural exchange but might also create social tensions. | Care shall be taken to prevent this condition. |

## 4. Rehabilitation and Resettlement Plan

The Government of Tamil Nadu has already sanctioned the acquisition of land for the project under G.O. No. 100, Industries (SIPCOT-1) Department, dated 26.02.2021, for a total extent of 904.40 hectares. Out of this, 796.240 hectares are being developed as the Industrial Park area.

The acquired land comprises approximately 788.742 hectares of patta land and 7.498 hectares of poramboke land. The acquisition was carried out through the Tamil Nadu Industrial Development procedures following due legal and administrative processes. No habitations, residential structures, or settlements are located within the project area; hence, no physical displacement or loss of livelihood has occurred due to the project.

No Resettlement and Rehabilitation (R&R) activities are required for the proposed SIPCOT Industrial Park at Allikulam, ThoothukudiDistrict.

## 5.0 ENTERPRISE SOCIAL RESPONSIBILITY

The project will provide training skills to local employable youth and will give preference to them to give employment in the project.

For the benefit of the community around the site, an assessment of the needs of surrounding villages regarding development activities that are needed, focus group discussions with various sections of people living in the villages was carried out.

The following activities shall be undertaken by the unit in consultation with district administration and local body is given below:

| S. No | Details |
|---|---|
| 1 | Drinking water supply, pipelines, RO units |
| 2 | Healthcare facilities, medical camps, equipment |
| 3 | Education support — classrooms, digital learning |
| 4 | Skill development & livelihood training |
| 5 | Sanitation, community toilets, waste management |
| 6 | Greenbelt / community plantation drives |
| 7 | Community infrastructure (streetlights, small civic works) |

| S. No | Activity | Action plan | Year Wise Budget in INR Lakhs | | | Total in INR Lakhs |
|---|---|---|---|---|---|---|
| | | | 1st Year | 2nd Year | 3rd Year | |
| 6 | Electrification | Install LED and solar-powered streetlights | | | | |
| 7 | Livelihood & Agriculture | Support farming through training programs and irrigation facilities | | | | |

**SUMMARY OF SE PRIMARY SURVEY-VILLAGE LEVEL** **Annexure-I**

| Gram Panchayat/ Village | | Umarikottai | Mela Thattaparai | Keelathattapparai | Allikkulam | Terkusilukkanpatti | Vadakkusilukkanpatti | Therkuveerapandiyapuram |
|---|---|---|---|---|---|---|---|---|
| Households (Nos) | Number of Total Households | 545 | 684 | 498 | 491 | 198 | 325 | 490 |
| Total Population of the village | Total Population | 2010 | 1384 | 1412 | 1465 | 700 | 1448 | 1755 |
| | No. of Males | 1000 | 684 | 700 | 735 | 340 | 728 | 880 |
| | No. of Females | 1010 | 700 | 712 | 730 | 360 | 720 | 875 |
| Overall Literacy (Males/Females) | Overall Literacy | 83% | 91% | 70% | 97% | 90% | 92% | 90% |
| | Males | 85% | 96% | 80% | 98% | 95% | 98% | 97% |
| | Females | 80% | 85% | 60% | 95% | 85% | 85% | 83% |
| Caste (% of HH) | SC (No. HHs) % | 36% | 45% | 67% | 73% | 50% | 12% | 41% |
| | ST (No. HHs) % | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Other (No. HHs) % | 64% | 55% | 33% | 27% | 50% | 88% | 59% |
| Connectivity Yes/No | Kuchha Road | No | No | No | No | No | No | No |
| | Black Topped | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Water Bound Macadam | No | No | No | No | No | No | No |
| | All Weather Road | Yes | Yes | Yes | No | No | No | Yes |
| | Footpath | Yes | Yes | Yes | No | No | No | Yes |
| Toilet Availability ( of HH) | Individual toilets | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | Public Toilets | No | No | No | No | No | No | No |
| | Open Defecation | No | No | No | No | No | No | No |
| Institutions/ Educational Facilities (Yes/No) | Anganwadi | 3 Yes | 2 Yes | 1 Yes | 2 Yes | 1 Yes | 1 Yes | 2 Yes |
| | Primary School | 3 Yes | 3 Yes | 1 Yes | 1 Yes | 1 Yes | 1 Yes | 2 Yes |
| | Middle School | 1 Yes | 2 Yes | No | 1 Yes | No | 1 Yes | 1 Yes |
| | High School | No | No | No | No | No | No | No |
| | College | No | No | No | No | No | No | No |
| Medical Facilities (Yes/No) | Sub-Centre | No | No | No | No | No | No | No |
| | Primary Health Centre | No | Yes | No | No | No | No | Yes |
| | Dispensary | No | No | No | No | No | No | No |
| | Private Clinic | Yes | Yes | Yes | No | No | No | Yes |
| | Asha Workers | Yes | Yes | Yes | No | No | No | Yes |
| Occupation in the village (Yes/No) | Agriculture - Farmers | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Agriculture Labors/Other Labors | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Private Jobs,Govt. Job | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Others Self Employed, Animals Husbandry | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Drinking Water Source | Supply Water | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Tube Well/ Bore well | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Transportation Facilities | Public Bus | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Auto | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Vans | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Taxi | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Cycle/Bike | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Car | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Railway Station | No | Yes | No | No | No | No | No |
| Public Utilities (Yes/No) | Commercial Bank | No | No | No | No | No | No | No |
| | Cooperative Bank | No | Yes | No | No | No | No | No |
| | Phone Recharge office Airtel, Vodafone, Jio etc. | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Mobile Phone coverage. | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Public Toilets | No | No | No | No | No | No | No |
| | Community Hall | No | Yes | Yes | No | No | Yes | No |
| | Dharamshala | No | No | No | No | No | No | No |
| | Panchayat Office | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Electrification Facilities | Whether Electrified | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | individual connections | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Power Supply For Domestic Use | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Power Supply For Agriculture Use | No | No | No | No | No | No | No |
| | Power Supply For Commercial Use | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Solar Lighting | No | No | No | No | No | No | No |
| | streetlights | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Sanitation Facilities (Yes/No) | Proper Drainage | No | No | No | | | | No |
| | Open Kuccha Drainage | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Solid waste Disposal (Yes/No) | On-Land disposal | No | No | No | No | No | No | No |
| | Public Dustbin | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Composting | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Key Crops of the Area Yes/No) | Maize | Yes | No | No | No | No | No | No |
| | Bajra | Yes | No | No | No | No | No | No |
| | Black Gram | Yes | Yes | Yes | No | Yes | Yes | Yes |
| | Flowers | No | No | No | Yes | No | No | No |
| | Whole Green Gram | No | Yes | Yes | No | No | Yes | Yes |
| | Sesame seeds | No | Yes | Yes | No | No | Yes | No |
| | Jasmine | No | No | No | No | No | No | No |
| | Paddy | No | No | No | Yes | No | No | No |
| | Pulses | No | No | No | No | Yes | No | No |
| | Bulrush | No | No | No | No | No | No | Yes |
| Disease Prevalence %) | Diarrhea | No | No | No | No | No | No | No |
| | Dysentery | No | No | No | No | No | No | No |
| | Jaundice | No | No | No | No | No | No | No |
| | Gastroenteritis | No | No | No | No | No | No | No |
| | Typhoid | No | No | No | No | No | No | No |
| | Tuberculosis | No | No | No | No | No | No | No |
| | Bronchitis | No | No | No | No | No | No | No |
| | Asthma | No | No | No | No | No | No | No |
| | Pneumonia | No | No | No | No | No | No | No |
| | Others-Specify | Seasonal 2-5% | Seasonal 2-3% | Seasonal 1-2 % | Seasonal 2-5% | Seasonal 2-3% | Seasonal 1-2 % | Seasonal 1-2 % |
| Availability of Skills in the Village Yes/No | Mason | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Carpenter | No | No | No | No | No | No | No |
| | Blacksmith | No | No | No | No | No | No | No |
| | Mechanic | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Electrician | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

**DEMOGRAPHIC PROFILE OF THE AREA** **Annexure-II**

| Village Name | Total Household | Population | | | Sex Ratio | 0-6 Child Population | SC % | ST % | Others |
|---|---|---|---|---|---|---|---|---|---|
| | | Total | Male | Female | | | | | |
| Umarikottai | 506 | 1838 | 904 | 934 | 1033 | 195 | 33 | 0 | 67 |
| Mela Thattaparai | 617 | 2154 | 1066 | 1088 | 1021 | 263 | 22.9 | 0 | 77.1 |
| Keelathattapparai | 368 | 1382 | 688 | 694 | 1009 | 193 | 66.4 | 0 | 33.6 |
| Ramaswamipuram | 71 | 234 | 112 | 122 | 1089 | 16 | 1.7 | 0 | 98.3 |
| Perurani | 469 | 1764 | 887 | 877 | 989 | 222 | 28.3 | 0 | 71.7 |
| Allikkulam | 371 | 1468 | 737 | 731 | 992 | 169 | 73.3 | 0 | 26.7 |
| Terkusilukkanpatti | 187 | 681 | 327 | 354 | 1083 | 88 | 58.3 | 0 | 41.7 |
| Kuttudankadu | 1334 | 5065 | 2528 | 2537 | 1004 | 601 | 29.9 | 0.3 | 69.8 |
| Jambulingapuram | 589 | 2036 | 1007 | 1029 | 1022 | 214 | 39.3 | 0 | 60.7 |
| Pudiyamputhur (Part) | 223 | 825 | 419 | 406 | 969 | 92 | 4.7 | 0 | 95.3 |
| Vadakkusilukkanpatti | 123 | 473 | 247 | 226 | 915 | 71 | 29.6 | 0 | 70.4 |
| Ayyanadaippu | 1168 | 4693 | 2380 | 2313 | 972 | 634 | 56.7 | 0.4 | 42.9 |
| Muthuswamipuram | 244 | 886 | 421 | 465 | 1105 | 103 | 42.6 | 0 | 57.4 |
| Dalvaypuram | 370 | 1287 | 665 | 622 | 935 | 118 | 39.9 | 0 | 60.1 |
| Timmarajapuram | 282 | 1070 | 536 | 534 | 996 | 125 | 48.6 | 0 | 51.4 |
| Maravanmatam | 661 | 2664 | 1312 | 1352 | 1030 | 340 | 5.1 | 0 | 94.9 |
| Varthakareddipatti | 567 | 1990 | 967 | 1023 | 1058 | 197 | 17.3 | 0 | 82.7 |
| Mudivaithanendal | 1762 | 5927 | 2968 | 2959 | 997 | 595 | 22.5 | 0 | 77.5 |
| Kumaragiri (CT) | 3428 | 13344 | 6735 | 6609 | 981 | 1595 | 10.8 | 0.1 | 89.1 |
| Ottappidaram | 2099 | 7963 | 4000 | 3963 | 991 | 864 | 54.4 | 0.7 | 44.9 |
| Kulasekaranallur | 831 | 3187 | 1582 | 1605 | 1015 | 381 | 78.1 | 0 | 21.9 |
| Muramban | 210 | 696 | 338 | 358 | 1059 | 72 | 67.5 | 0 | 32.5 |
| Paraikuttam | 65 | 203 | 96 | 107 | 1115 | 19 | 3.4 | 0 | 96.6 |
| Melapandiyapuram | 194 | 766 | 386 | 380 | 984 | 44 | 37.1 | 0 | 62.9 |
| Savarimangalam | 660 | 2201 | 1104 | 1097 | 994 | 159 | 26 | 0 | 74 |
| Swaminatham | 651 | 2598 | 1349 | 1249 | 926 | 323 | 46 | 0 | 54 |
| Therkuveerapandiyapuram | 406 | 1567 | 785 | 782 | 996 | 182 | 23 | 0 | 77 |
| Sillanatham | 424 | 1594 | 795 | 799 | 1005 | 161 | 7.3 | 0 | 92.7 |
| Pudur pandiyapuram | 431 | 1764 | 900 | 864 | 960 | 218 | 90.2 | 0 | 9.8 |
| Korampallam (Part) | 1276 | 4912 | 2486 | 2426 | 976 | 621 | 32.8 | 0 | 67.2 |
| Sendilampannai | 30 | 103 | 53 | 50 | 943 | 9 | 11.7 | 0 | 88.3 |
| Ramanathapuram | 147 | 500 | 261 | 239 | 916 | 44 | 78.2 | 0 | 21.8 |
| Kattalangulam | 748 | 2835 | 1403 | 1432 | 1021 | 306 | 19.1 | 0 | 80.9 |
| Servaikaranmadam | 1148 | 4473 | 2221 | 2252 | 1014 | 437 | 6.5 | 0 | 93.5 |
| Kuliyankarisal | 982 | 3951 | 1984 | 1967 | 991 | 345 | 14.2 | 0.1 | 85.7 |
| Mullakadu (Part) | 550 | 2191 | 1086 | 1105 | 1017 | 226 | 18 | 0 | 82 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Alanda | 680 | 2513 | 1245 | 1268 | 1018 | 290 | 88.5 | 0 | 11.5 |
| Poovani | 797 | 2914 | 1432 | 1482 | 1035 | 231 | 64 | 0 | 36 |
| Meenakshipuram Sekkarakkudi | 391 | 1186 | 539 | 647 | 1200 | 152 | 0.4 | 0 | 99.6 |
| Sekkarakkudi | 1446 | 5166 | 2600 | 2566 | 987 | 623 | 13.2 | 0 | 86.8 |
| Vadakkukariseri | 341 | 1189 | 576 | 613 | 1064 | 126 | 56 | 0 | 44 |
| Singathakurichi | 742 | 2624 | 1288 | 1336 | 1037 | 290 | 45.4 | 0 | 54.6 |
| Deivaseyalpuram | 231 | 819 | 422 | 397 | 941 | 88 | 13.8 | 0.4 | 85.8 |
| Ellainayakkanpatti | 534 | 1682 | 817 | 865 | 1059 | 140 | 9.6 | 0 | 90.4 |
| Chettimallanpatti | 94 | 336 | 155 | 181 | 1168 | 44 | 27.7 | 0 | 72.3 |
| Aniyaparanallur | 741 | 2843 | 1442 | 1401 | 972 | 390 | 31.3 | 0 | 68.7 |
| Tannuthu | 145 | 555 | 284 | 271 | 954 | 67 | 98.4 | 0 | 1.6 |
| Nallathi | 744 | 2874 | 1445 | 1429 | 989 | 354 | 22.8 | 0 | 77.2 |
| Iruvappapuram | 453 | 1753 | 863 | 890 | 1031 | 180 | 15.7 | 0 | 84.3 |
| Palayakkayal | 1214 | 5024 | 2519 | 2505 | 994 | 560 | 34.3 | 0 | 65.7 |
| Pudiyamputhur (CT) | 2043 | 8012 | 4117 | 3895 | 946 | 976 | 13.2 | 0.3 | 86.5 |
| Sankaraperi (CT) | 5057 | 19844 | 10001 | 9843 | 984 | 2259 | 15.6 | 0.3 | 84.1 |
| Milavittan (CT) | 11811 | 45863 | 23167 | 22696 | 980 | 5273 | 22.8 | 0.2 | 77 |
| Muttayyapuram (CT) | 8338 | 32494 | 16823 | 15671 | 932 | 3547 | 21.9 | 0.5 | 77.6 |
| Athimarapatti (CT) | 5613 | 22218 | 11081 | 11137 | 1005 | 2599 | 23.4 | 0.2 | 76.4 |
| Thoothukkudi (M Corp.) | 60714 | 237830 | 118298 | 119532 | 1010 | 24959 | 7.4 | 0.1 | 92.5 |
| Sayapuram (TP) | 3225 | 12792 | 6317 | 6475 | 1025 | 1285 | 13.8 | 0.1 | 86.1 |
| **Zone- I Rural** | **3923** | **14586** | **7249** | **7337** | **1012** | **1747** | **37.8** | **0.1** | **62.1** |
| **Zone-I Urban** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |
| **Zone- II Rural** | **5989** | **21851** | **10922** | **10929** | **1001** | **2489** | **31.4** | **0.1** | **68.5** |
| **Zone-II Urban** | **3428** | **13344** | **6735** | **6609** | **981** | **1595** | **10.8** | **0.1** | **89.1** |
| **Zone- III Rural** | **19405** | **72982** | **36456** | **36526** | **1002** | **7946** | **36** | **0.1** | **63.9** |
| **Zone-III Urban** | **96801** | **379053** | **189804** | **189249** | **997** | **40898** | **12.2** | **0.2** | **87.6** |
| **Total Rural** | **29317** | **109419** | **54627** | **54792** | **1003** | **12182** | **35.3** | **0.1** | **64.6** |
| **Total Urban** | **100229** | **392397** | **196539** | **195858** | **997** | **42493** | **12.2** | **0.2** | **87.6** |
| **Overall** | **129546** | **501816** | **251166** | **250650** | **998** | **54675** | **17.2** | **0.1** | **82.7** |

**LITERACY DETAIL** **Annexure-III**

| Study Area / Name of Village | Population above 0-6 Years | | | Literate | | | |
|---|---|---|---|---|---|---|---|
| | Total | Male | Female | Total (No) | Overall % | Male (%) | Female (%) |
| Umarikottai | 1643 | 801 | 842 | 1279 | 77.8 | 87.4 | 68.8 |
| Mela Thattaparai | 1891 | 938 | 953 | 1595 | 84.3 | 91.5 | 77.3 |
| Keelathattapparai | 1189 | 578 | 611 | 744 | 62.6 | 73.4 | 52.4 |
| Ramaswamipuram | 218 | 102 | 116 | 212 | 97.2 | 100 | 94.8 |
| Perurani | 1542 | 772 | 770 | 1418 | 92 | 96.2 | 87.7 |
| Allikkulam | 1299 | 643 | 656 | 1154 | 88.8 | 93.2 | 84.6 |
| Terkusilukkanpatti | 593 | 286 | 307 | 489 | 82.5 | 88.1 | 77.2 |
| Kuttudankadu | 4464 | 2223 | 2241 | 3930 | 88 | 93.9 | 82.2 |
| Jambulingapuram | 1822 | 895 | 927 | 1498 | 82.2 | 90.3 | 74.4 |
| Pudiyamputhur (Part) | 733 | 375 | 358 | 697 | 95.1 | 96.5 | 93.6 |
| Vadakkusilukkanpatti | 402 | 207 | 195 | 341 | 84.8 | 94.7 | 74.4 |
| Ayyanadaippu | 4059 | 2048 | 2011 | 3416 | 84.2 | 88.9 | 79.4 |
| Muthuswamipuram | 783 | 370 | 413 | 615 | 78.5 | 87.8 | 70.2 |
| Dalvaypuram | 1169 | 605 | 564 | 1047 | 89.6 | 97 | 81.6 |
| Timmarajapuram | 945 | 473 | 472 | 728 | 77 | 83.7 | 70.3 |
| Maravanmatam | 2324 | 1142 | 1182 | 1985 | 85.4 | 89.4 | 81.6 |
| Varthakareddipatti | 1793 | 866 | 927 | 1575 | 87.8 | 97.2 | 79.1 |
| Mudivaithanendal | 5332 | 2647 | 2685 | 5070 | 95.1 | 97.7 | 92.6 |
| Kumaragiri (CT) | 11749 | 5940 | 5809 | 10815 | 92.1 | 95 | 89 |
| Ottappidaram | 7099 | 3556 | 3543 | 6013 | 84.7 | 90.3 | 79.1 |
| Kulasekaranallur | 2806 | 1395 | 1411 | 2166 | 77.2 | 85.8 | 68.7 |
| Muramban | 624 | 300 | 324 | 614 | 98.4 | 98 | 98.8 |
| Paraikuttam | 184 | 85 | 99 | 105 | 57.1 | 67.1 | 48.5 |
| Melapandiyapuram | 722 | 361 | 361 | 600 | 83.1 | 90.3 | 75.9 |
| Savarimangalam | 2042 | 1027 | 1015 | 1779 | 87.1 | 93.3 | 80.9 |
| Swaminatham | 2275 | 1173 | 1102 | 1901 | 83.6 | 91.4 | 75.2 |
| Therkuveerapandiyapuram | 1385 | 698 | 687 | 1176 | 84.9 | 92.8 | 76.9 |
| Sillanatham | 1433 | 718 | 715 | 1180 | 82.3 | 90.4 | 74.3 |
| Pudur pandiyapuram | 1546 | 791 | 755 | 1168 | 75.5 | 83.3 | 67.4 |
| Korampallam (Part) | 4291 | 2168 | 2123 | 3773 | 87.9 | 91.2 | 84.6 |
| Sendilampannai | 94 | 46 | 48 | 81 | 86.2 | 97.8 | 75 |
| Ramanathapuram | 456 | 241 | 215 | 417 | 91.4 | 95.4 | 87 |
| Kattalangulam | 2529 | 1246 | 1283 | 2353 | 93 | 95.7 | 90.5 |
| Servaikaranmadam | 4036 | 2003 | 2033 | 3763 | 93.2 | 95.3 | 91.2 |
| Kuliyankarisal | 3606 | 1809 | 1797 | 3320 | 92.1 | 94.6 | 89.5 |
| Mullakadu (Part) | 1965 | 967 | 998 | 1733 | 88.2 | 93.8 | 82.8 |
| Alanda | 2223 | 1097 | 1126 | 1690 | 76 | 84.2 | 68 |

| Study Area<br>Name of Village | Population above 0-6 Years | | | Literate | | | |
|---|---|---|---|---|---|---|---|
| | Total | Male | Female | Total (No) | Overall % | Male (%) | Female (%) |
| Poovani | 2683 | 1316 | 1367 | 2058 | 76.7 | 84.5 | 69.2 |
| Meenakshipuram Sekkarakkudi | 1034 | 467 | 567 | 947 | 91.6 | 97.9 | 86.4 |
| Sekkarakkudi | 4543 | 2277 | 2266 | 3488 | 76.8 | 90.7 | 62.8 |
| Vadakkukariseri | 1063 | 521 | 542 | 840 | 79 | 86.2 | 72.1 |
| Singathakurichi | 2334 | 1150 | 1184 | 1872 | 80.2 | 87.5 | 73.1 |
| Deivaseyalpuram | 731 | 370 | 361 | 653 | 89.3 | 95.4 | 83.1 |
| Ellainayakkanpatti | 1542 | 749 | 793 | 1277 | 82.8 | 95.7 | 70.6 |
| Chettimallanpatti | 292 | 137 | 155 | 244 | 83.6 | 92.7 | 75.5 |
| Aniyaparanallur | 2453 | 1245 | 1208 | 1971 | 80.4 | 86.3 | 74.2 |
| Tannuthu | 488 | 242 | 246 | 357 | 73.2 | 76.9 | 69.5 |
| Nallathi | 2520 | 1257 | 1263 | 2168 | 86 | 90.5 | 81.6 |
| Iruvappapuram | 1573 | 771 | 802 | 1345 | 85.5 | 89.6 | 81.5 |
| Palayakkayal | 4464 | 2240 | 2224 | 3910 | 87.6 | 92 | 83.1 |
| Pudiyamputhur (CT) | 7036 | 3596 | 3440 | 6067 | 86.2 | 90.9 | 81.3 |
| Sankaraperi (CT) | 17585 | 8896 | 8689 | 16194 | 92.1 | 95.6 | 88.5 |
| Milavittan (CT) | 40590 | 20476 | 20114 | 36165 | 89.1 | 92.9 | 85.2 |
| Muttayyapuram (CT) | 28947 | 14944 | 14003 | 25210 | 87.1 | 92.1 | 81.8 |
| Athimarapatti (CT) | 19619 | 9774 | 9845 | 16943 | 86.4 | 90.8 | 82 |
| Thoothukkudi (M Corp.) | 212871 | 105614 | 107257 | 199432 | 93.7 | 95.8 | 91.6 |
| Sayapuram (TP) | 11507 | 5664 | 5843 | 10667 | 92.7 | 95.2 | 90.2 |
| **Zone- I Rural** | **12839** | **6343** | **6496** | **10821** | **84.3** | **90.9** | **77.8** |
| **Zone-I Urban** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |
| **Zone- II Rural** | **19362** | **9628** | **9734** | **16972** | **87.7** | **92.9** | **82.5** |
| **Zone-II Urban** | **11749** | **5940** | **5809** | **10815** | **92.1** | **95** | **89** |
| **Zone- III Rural** | **65036** | **32423** | **32613** | **54962** | **84.5** | **90.7** | **78.4** |
| **Zone-III Urban** | **338155** | **168964** | **169191** | **310678** | **91.9** | **94.7** | **89.1** |
| **Total Rural** | **97237** | **48394** | **48843** | **82755** | **85.1** | **91.2** | **79.1** |
| **Total Urban** | **349904** | **174904** | **175000** | **321493** | **91.9** | **94.7** | **89.1** |
| **Overall** | **447141** | **223298** | **223843** | **404248** | **90.4** | **93.9** | **86.9** |

**WORKING PATTERN** **Annexure-IV**

| Study area | Total Population | Total Working Population | % Total Working Population | % Non-working Population | % Main-working Population | % Marginal working Population |
|---|---|---|---|---|---|---|
| Umarikottai | 1838 | 1025 | 55.8 | 44.2 | 88 | 12 |
| Mela Thattaparai | 2154 | 1068 | 49.6 | 50.4 | 15.5 | 84.5 |
| Keelathattapparai | 1382 | 689 | 49.9 | 50.1 | 99.7 | 0.3 |
| Ramaswamipuram | 234 | 74 | 31.6 | 68.4 | 94.6 | 5.4 |
| Perurani | 1764 | 938 | 53.2 | 46.8 | 82.2 | 17.8 |
| Allikkulam | 1468 | 639 | 43.5 | 56.5 | 58.8 | 41.2 |
| Terkusilukkanpatti | 681 | 304 | 44.6 | 55.4 | 94.1 | 5.9 |
| Kuttudankadu | 5065 | 1801 | 35.6 | 64.4 | 83.6 | 16.4 |
| Jambulingapuram | 2036 | 1144 | 56.2 | 43.8 | 82.2 | 17.8 |
| Pudiyamputhur (Part) | 825 | 276 | 33.5 | 66.5 | 97.1 | 2.9 |
| Vadakkusilukkanpatti | 473 | 211 | 44.6 | 55.4 | 35.1 | 64.9 |
| Ayyanadaippu | 4693 | 1752 | 37.3 | 62.7 | 80.8 | 19.2 |
| Muthuswamipuram | 886 | 408 | 46 | 54 | 84.8 | 15.2 |
| Dalvaypuram | 1287 | 562 | 43.7 | 56.3 | 32.9 | 67.1 |
| Timmarajapuram | 1070 | 492 | 46 | 54 | 98.4 | 1.6 |
| Maravanmatam | 2664 | 1133 | 42.5 | 57.5 | 96.3 | 3.7 |
| Varthakareddipatti | 1990 | 887 | 44.6 | 55.4 | 87 | 13 |
| Mudivaithanendal | 5927 | 2415 | 40.7 | 59.3 | 78.9 | 21.1 |
| Kumaragiri (CT) | 13344 | 4835 | 36.2 | 63.8 | 84.7 | 15.3 |
| Ottappidaram | 7963 | 3777 | 47.4 | 52.6 | 68.7 | 31.3 |
| Kulasekaranallur | 3187 | 1796 | 56.4 | 43.6 | 87.2 | 12.8 |
| Muramban | 696 | 494 | 71 | 29 | 99.8 | 0.2 |
| Paraikuttam | 203 | 120 | 59.1 | 40.9 | 83.3 | 16.7 |
| Melapandiyapuram | 766 | 430 | 56.1 | 43.9 | 87.7 | 12.3 |
| Savarimangalam | 2201 | 1223 | 55.6 | 44.4 | 86.5 | 13.5 |
| Swaminatham | 2598 | 1274 | 49 | 51 | 42.5 | 57.5 |
| Therkuveerapandiyapuram | 1567 | 635 | 40.5 | 59.5 | 84.3 | 15.7 |
| Sillanatham | 1594 | 847 | 53.1 | 46.9 | 99.6 | 0.4 |
| Pudur pandiyapuram | 1764 | 911 | 51.6 | 48.4 | 97.8 | 2.2 |
| Korampallam (Part) | 4912 | 1895 | 38.6 | 61.4 | 98.2 | 1.8 |
| Sendilampannai | 103 | 50 | 48.5 | 51.5 | 86 | 14 |
| Ramanathapuram | 500 | 237 | 47.4 | 52.6 | 100 | 0 |
| Kattalangulam | 2835 | 1049 | 37 | 63 | 65.9 | 34.1 |
| Servaikaranmadam | 4473 | 2062 | 46.1 | 53.9 | 77.5 | 22.5 |
| Kuliyankarisal | 3951 | 1569 | 39.7 | 60.3 | 71.6 | 28.4 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mullakadu (Part) | 2191 | 882 | 40.3 | 59.7 | 93.2 | 6.8 |
| Alanda | 2513 | 1445 | 57.5 | 42.5 | 92 | 8 |
| Poovani | 2914 | 1482 | 50.9 | 49.1 | 79.8 | 20.2 |
| Meenakshipuram Sekkarakkudi | 1186 | 495 | 41.7 | 58.3 | 43 | 57 |
| Sekkarakkudi | 5166 | 2529 | 49 | 51 | 80.7 | 19.3 |
| Vadakkukariseri | 1189 | 500 | 42.1 | 57.9 | 96.8 | 3.2 |
| Singathakurichi | 2624 | 1408 | 53.7 | 46.3 | 66.5 | 33.5 |
| Deivaseyalpuram | 819 | 381 | 46.5 | 53.5 | 87.4 | 12.6 |
| Ellainayakkanpatti | 1682 | 766 | 45.5 | 54.5 | 87.3 | 12.7 |
| Chettimallanpatti | 336 | 190 | 56.5 | 43.5 | 94.2 | 5.8 |
| Aniyaparanallur | 2843 | 1316 | 46.3 | 53.7 | 94.1 | 5.9 |
| Tannuthu | 555 | 305 | 55 | 45 | 99.3 | 0.7 |
| Nallathi | 2874 | 1193 | 41.5 | 58.5 | 98.3 | 1.7 |
| Iruvappapuram | 1753 | 766 | 43.7 | 56.3 | 97.3 | 2.7 |
| Palayakkayal | 5024 | 2075 | 41.3 | 58.7 | 94.6 | 5.4 |
| Pudiyamputhur (CT) | 8012 | 3514 | 43.9 | 56.1 | 92.8 | 7.2 |
| Sankaraperi (CT) | 19844 | 7282 | 36.7 | 63.3 | 92.1 | 7.9 |
| Milavittan (CT) | 45863 | 17172 | 37.4 | 62.6 | 91.8 | 8.2 |
| Muttayyapuram (CT) | 32494 | 12904 | 39.7 | 60.3 | 88.8 | 11.2 |
| Athimarapatti (CT) | 22218 | 8600 | 38.7 | 61.3 | 92.6 | 7.4 |
| Thoothukkudi (M Corp.) | 237830 | 83669 | 35.2 | 64.8 | 94.6 | 5.4 |
| Sayapuram (TP) | 12792 | 5028 | 39.3 | 60.7 | 95.6 | 4.4 |
| **Zone- I Rural** | **14586** | **6538** | **44.8** | **55.2** | **72.9** | **27.1** |
| **Zone-I Urban** | **0** | **0** | **0** | **0** | **0** | **0** |
| **Zone- II Rural** | **21851** | **9280** | **42.5** | **57.5** | **80.6** | **19.4** |
| **Zone-II Urban** | **13344** | **4835** | **36.2** | **63.8** | **84.7** | **15.3** |
| **Zone- III Rural** | **72982** | **34102** | **46.7** | **53.3** | **82.6** | **17.4** |
| **Zone-III Urban** | **379053** | **138169** | **36.5** | **63.5** | **93.5** | **6.5** |
| **Total Rural** | **109419** | **49920** | **45.6** | **54.4** | **81** | **19** |
| **Total Urban** | **392397** | **143004** | **36.4** | **63.6** | **93.2** | **6.8** |
| **Overall** | **501816** | **192924** | **38.4** | **61.6** | **90** | **10** |

**MAIN WORKERS EMPLOYMENT PATTERN** **Annexure-V**

| Study area | Total Main Workers | Cultivators % | Agricultural Labour % | Household Industries % | Other Workers % |
|---|---|---|---|---|---|
| Umarikottai | 902 | 23.6 | 49.9 | 0.6 | 25.9 |
| Mela Thattaparai | 166 | 3.6 | 12.7 | 0 | 83.7 |
| Keelathattapparai | 687 | 10.6 | 14.4 | 0.9 | 74.1 |
| Ramaswamipuram | 70 | 0 | 98.6 | 0 | 1.4 |
| Perurani | 771 | 23.1 | 31.1 | 19.5 | 26.3 |
| Allikkulam | 376 | 13 | 58 | 0.8 | 28.2 |
| Terkusilukkanpatti | 286 | 1.7 | 2.4 | 0.7 | 95.2 |
| Kuttudankadu | 1505 | 2.3 | 17.9 | 1 | 78.8 |
| Jambulingapuram | 940 | 7 | 32 | 6.4 | 54.6 |
| Pudiyamputhur (Part) | 268 | 4.9 | 22.4 | 0.4 | 72.3 |
| Vadakkusilukkanpatti | 74 | 9.5 | 8.1 | 1.4 | 81 |
| Ayyanadaippu | 1416 | 0.6 | 0.2 | 1.1 | 98.1 |
| Muthuswamipuram | 346 | 10.1 | 12.1 | 2 | 75.8 |
| Dalvaypuram | 185 | 2.2 | 76.2 | 0 | 21.6 |
| Timmarajapuram | 484 | 5 | 34.5 | 5.2 | 55.3 |
| Maravanmatam | 1091 | 0.5 | 0.6 | 1.6 | 97.3 |
| Varthakareddipatti | 772 | 4.3 | 8.8 | 0.8 | 86.1 |
| Mudivaithanendal | 1905 | 3.4 | 30.6 | 4.9 | 61.1 |
| Kumaragiri (CT) | 4094 | 2.2 | 6.8 | 1.1 | 89.9 |
| Ottappidaram | 2596 | 9.4 | 22.6 | 2 | 66 |
| Kulasekaranallur | 1567 | 8.4 | 62.4 | 0.4 | 28.8 |
| Muramban | 493 | 1.8 | 90.7 | 0.4 | 7.1 |
| Paraikuttam | 100 | 0 | 79 | 0 | 21 |
| Melapandiyapuram | 377 | 1.1 | 97.9 | 0 | 1 |
| Savarimangalam | 1058 | 3.3 | 58.6 | 2.2 | 35.9 |
| Swaminatham | 542 | 3.5 | 1.5 | 5.2 | 89.8 |
| Therkuveerapandiyapuram | 535 | 7.3 | 3.2 | 0.9 | 88.6 |
| Sillanatham | 844 | 1.9 | 67.8 | 0.6 | 29.7 |
| Pudur pandiyapuram | 891 | 8.1 | 45 | 3 | 43.9 |
| Korampallam (Part) | 1860 | 2.9 | 23.2 | 2.4 | 71.5 |
| Sendilampannai | 43 | 2.3 | 4.7 | 4.7 | 88.3 |
| Ramanathapuram | 237 | 95.4 | 0 | 0 | 4.6 |
| Kattalangulam | 691 | 4.9 | 7.7 | 7.1 | 80.3 |
| Servaikaranmadam | 1598 | 7.7 | 28.5 | 5.2 | 58.6 |
| Kuliyankarisal | 1124 | 17.3 | 26.8 | 1.5 | 54.4 |
| Mullakadu (Part) | 822 | 8.5 | 4.1 | 1.6 | 85.8 |
| Alanda | 1330 | 7.3 | 77.2 | 1.1 | 14.4 |

| | | | | | |
|---|---|---|---|---|---|
| Poovani | 1182 | 11.8 | 74 | 1.2 | 13 |
| Meenakshipuram Sekkarakkudi | 213 | 3.3 | 5.6 | 6.1 | 85 |
| Sekkarakkudi | 2040 | 6.8 | 48.8 | 1.2 | 43.2 |
| Vadakkukariseri | 484 | 8.5 | 64.5 | 1.4 | 25.6 |
| Singathakurichi | 937 | 55.6 | 10.4 | 3.5 | 30.5 |
| Deivaseyalpuram | 333 | 15.6 | 53.8 | 2.1 | 28.5 |
| Ellainayakkanpatti | 669 | 17.6 | 35.7 | 0.4 | 46.3 |
| Chettimallanpatti | 179 | 22.9 | 67 | 0 | 10.1 |
| Aniyaparanallur | 1238 | 7.6 | 48.1 | 2.3 | 42 |
| Tannuthu | 303 | 18.5 | 67.3 | 0.3 | 13.9 |
| Nallathi | 1173 | 1.8 | 20.1 | 1.7 | 76.4 |
| Iruvappapuram | 745 | 17.6 | 9.5 | 1.1 | 71.8 |
| Palayakkayal | 1963 | 1.8 | 1.9 | 1.1 | 95.2 |
| Pudiyamputhur (CT) | 3262 | 0.7 | 23.7 | 1.5 | 74.1 |
| Sankaraperi (CT) | 6705 | 0.3 | 0.6 | 1.6 | 97.5 |
| Milavittan (CT) | 15766 | 0.2 | 1.3 | 1.5 | 97 |
| Muttayyapuram (CT) | 11459 | 0.2 | 2 | 1 | 96.8 |
| Athimarapatti (CT) | 7967 | 1.4 | 6.4 | 1.3 | 90.9 |
| Thoothukkudi (M Corp.) | 79186 | 0.1 | 0.2 | 1.9 | 97.8 |
| Sayapuram (TP) | 4805 | 7.4 | 33.4 | 2.3 | 56.9 |
| **Zone- I Rural** | **4763** | **11.7** | **28.8** | **3.8** | **55.7** |
| **Zone-I Urban** | **0** | **0** | **0** | **0** | **0** |
| **Zone- II Rural** | **7481** | **3.5** | **18.4** | **3** | **75.1** |
| **Zone-II Urban** | **4094** | **2.2** | **6.8** | **1.1** | **89.9** |
| **Zone- III Rural** | **28167** | **9.8** | **36.8** | **2** | **51.4** |
| **Zone-III Urban** | **129150** | **0.5** | **2.7** | **1.7** | **95.1** |
| **Total Rural** | **40411** | **8.9** | **32.4** | **2.4** | **56.3** |
| **Total Urban** | **133244** | **0.6** | **2.8** | **1.7** | **94.9** |
| **Overall** | **173655** | **2.5** | **9.7** | **1.9** | **85.9** |

**Quality of Life Assessment**

**Annexure-VI**

The summary of Total score and Average Weighted score for each village falling within study area is given below:

| Name of Village | Total Score of Infrastructure out of 80 | Total Score in % | Average Score of Infrastructure out of 80 | Total Score for Services out of 70 | Total Score in % | Average Score for Services out of 70 | Average Weighted Score point Infra + Services |
|---|---|---|---|---|---|---|---|
| Umarikottai | 40 | 50 | 5.0 | 40 | 57.1 | 5.7 | 5.2 |
| Mela Thattaparai | 50 | 62.5 | 6.3 | 60 | 85.7 | 8.6 | 6.9 |
| Keelathattapparai | 40 | 50 | 5.0 | 50 | 71.4 | 7.1 | 5.6 |
| Ramaswamipuram | 50 | 62.5 | 6.3 | 40 | 57.1 | 5.7 | 6.1 |
| Perurani | 50 | 62.5 | 6.3 | 50 | 71.4 | 7.1 | 6.5 |
| Allikkulam | 40 | 50 | 5.0 | 40 | 57.1 | 5.7 | 5.2 |
| Terkusilukkanpatti | 40 | 50 | 5.0 | 40 | 57.1 | 5.7 | 5.2 |
| Kuttudankadu | 60 | 75 | 7.5 | 40 | 57.1 | 5.7 | 7.0 |
| Jambulingapuram | 40 | 50 | 5.0 | 40 | 57.1 | 5.7 | 5.2 |
| Pudiyamputhur (Part) | 50 | 62.5 | 6.3 | 40 | 57.1 | 5.7 | 6.1 |
| Vadakkusilukkanpatti | 40 | 50 | 5.0 | 50 | 71.4 | 7.1 | 5.6 |
| Ayyanadaippu | 60 | 75 | 7.5 | 50 | 71.4 | 7.1 | 7.4 |
| Muthuswamipuram | 60 | 75 | 7.5 | 40 | 57.1 | 5.7 | 7.0 |
| Dalvaypuram | 50 | 62.5 | 6.3 | 40 | 57.1 | 5.7 | 6.1 |
| Timmarajapuram | 50 | 62.5 | 6.3 | 40 | 57.1 | 5.7 | 6.1 |
| Maravanmatam | 40 | 50 | 5.0 | 40 | 57.1 | 5.7 | 5.2 |
| Varthakareddipatti | 50 | 62.5 | 6.3 | 50 | 71.4 | 7.1 | 6.5 |
| Mudivaithanendal | 50 | 62.5 | 6.3 | 60 | 85.7 | 8.6 | 6.9 |
| Ottappidaram | 50 | 62.5 | 6.3 | 70 | 100.0 | 10.0 | 7.4 |
| Kulasekaranallur | 50 | 62.5 | 6.3 | 50 | 71.4 | 7.1 | 6.5 |
| Muramban | 30 | 37.5 | 3.8 | 50 | 71.4 | 7.1 | 4.8 |
| Paraikuttam | 30 | 37.5 | 3.8 | 40 | 57.1 | 5.7 | 4.3 |
| Melapandiyapuram | 30 | 37.5 | 3.8 | 40 | 57.1 | 5.7 | 4.3 |
| Savarimangalam | 40 | 50 | 5.0 | 40 | 57.1 | 5.7 | 5.2 |
| Swaminatham | 40 | 50 | 5.0 | 60 | 85.7 | 8.6 | 6.1 |
| Therkuveerapandiyapuram | 60 | 75 | 7.5 | 40 | 57.1 | 5.7 | 7.0 |
| Sillanatham | 50 | 62.5 | 6.3 | 60 | 85.7 | 8.6 | 6.9 |
| Pudur pandiyapuram | 40 | 50 | 5.0 | 50 | 71.4 | 7.1 | 5.6 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Korampallam (Part) | 70 | 87.5 | 8.8 | 50 | 71.4 | 7.1 | 8.3 |
| Sendilampannai | 0 | 0 | 0.0 | 40 | 57.1 | 5.7 | 1.7 |
| Ramanathapuram | 30 | 37.5 | 3.8 | 50 | 71.4 | 7.1 | 4.8 |
| Kattalangulam | 40 | 50 | 5.0 | 50 | 71.4 | 7.1 | 5.6 |
| Servaikaranmadam | 40 | 50 | 5.0 | 50 | 71.4 | 7.1 | 5.6 |
| Kuliyankarisal | 50 | 62.5 | 6.3 | 40 | 57.1 | 5.7 | 6.1 |
| Mullakadu (Part) | 60 | 75 | 7.5 | 50 | 71.4 | 7.1 | 7.4 |
| Alanda | 40 | 50 | 5.0 | 40 | 57.1 | 5.7 | 5.2 |
| Poovani | 50 | 62.5 | 6.3 | 60 | 85.7 | 8.6 | 6.9 |
| Meenakshipuram Sekkarakkudi | 40 | 50 | 5.0 | 50 | 71.4 | 7.1 | 5.6 |
| Sekkarakkudi | 40 | 50 | 5.0 | 60 | 85.7 | 8.6 | 6.1 |
| Vadakkukariseri | 30 | 37.5 | 3.8 | 40 | 57.1 | 5.7 | 4.3 |
| Singathakurichi | 50 | 62.5 | 6.3 | 50 | 71.4 | 7.1 | 6.5 |
| Deivaseyalpuram | 50 | 62.5 | 6.3 | 40 | 57.1 | 5.7 | 6.1 |
| Ellainayakkanpatti | 50 | 62.5 | 6.3 | 50 | 71.4 | 7.1 | 6.5 |
| Chettimallanpatti | 30 | 37.5 | 3.8 | 50 | 71.4 | 7.1 | 4.8 |
| Aniyaparanallur | 40 | 50 | 5.0 | 50 | 71.4 | 7.1 | 5.6 |
| Tannuthu | 10 | 12.5 | 1.3 | 50 | 71.4 | 7.1 | 3.0 |
| Nallathi | 60 | 75 | 7.5 | 50 | 71.4 | 7.1 | 7.4 |
| Iruvappapuram | 50 | 62.5 | 6.3 | 50 | 71.4 | 7.1 | 6.5 |
| Palayakkayal | 60 | 75 | 7.5 | 60 | 85.7 | 8.6 | 7.8 |

# Annexure 7 - Conservation plan

# WILDLIFE CONSERVATION PLAN

**For**

## "Development of an Industrial Park"

**Schedule: 1d (5d) (7c) (8b) , Category: A**

## by M/s State Industries Promotion Corporation of Tamilnadu Limited (SIPCOT)

## at

Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu

**Environmental Consultant:**


**M/s. Perfact Enviro Solutions Private Limited.**

**(NABET Registered List of Accredited Consultant Organisations/NABET/EIA/25 - 28/ RA 0467 Valid Upto 26/11/2028)**

**Registered Address:- Perfact House, A 14, Shubham Enclave (Outer Ring Road), Paschim Vihar, New Delhi 110063**

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# CHAPTER 1. GENERAL INTRODUCTION

## 1.1 Background

M/s. State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT) proposes the development of an Industrial Park at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram, and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu. The project falls under Schedule 1(d), 5(d), 7(c), and 8(b) of the EIA Notification, 2006, and is categorized as Category A, thereby requiring prior Environmental Clearance (EC) from the Ministry of Environment, Forest and Climate Change (MoEF&CC). The proposed Industrial Park is envisioned to promote balanced regional industrial growth, attract investments, and generate sustainable employment opportunities in southern Tamil Nadu. By providing integrated infrastructure facilities such as roads, power supply, water distribution, common effluent treatment systems, and solid waste management units, the project aims to create an environmentally responsible and economically vibrant industrial ecosystem.

The Industrial Park will accommodate a mix of industries—primarily non-polluting and medium-scale manufacturing units—supported by a well-planned layout ensuring efficient land use, greenbelt development, Power Supply and Water assurance. Emphasis will be placed on sustainable resource management, including the reuse and recycling of treated wastewater, rainwater harvesting, and renewable energy integration within the park. The project also commits to maintaining compliance with CPCB and Tamil Nadu Pollution Control Board (TNPCB) norms and implementing real-time environmental monitoring systems to ensure operational transparency.

Given the ecological sensitivities of the region, the project incorporates extensive environmental safeguard measures, such as biodiversity-friendly landscaping, dust and noise control mechanisms, and development of a comprehensive Environmental Management Plan (EMP). Beyond its industrial objectives, the project aligns with India's Make in India initiative and contributes to the nation's Sustainable Development Goals (SDGs) by fostering clean, green, and inclusive industrialization. The SIPCOT Industrial Park at Thoothukudi thus represents a strategic initiative to strengthen Tamil Nadu's industrial base while upholding high standards of environmental stewardship and social responsibility.

## 1.2. Wildlife Conservation Plan (WLCP)

This document addresses the Wildlife Conservation Plan (WLCP) for schedule I species. The EIA and WLCP report identify the environmental impacts in the earlier stages of project preparation to be incorporated, considering necessary mitigation measures required to minimize those impacts as well as to enhance the positive impacts of the project. The environmental management/ mitigation costs envisaged, including environmental monitoring and other mitigation measures has been provided in the EIA report.

This document assists the associated officials in mitigating or minimizing the impacts on wildlife during the construction and operation of the project, and enhances the positive impact of this project. WLCP's purpose is to present an evaluation of potential impacts due to the proposed development. The document includes the impacts, mitigation measures for the proposed project. The Institutional strengthening for environmental management is also an essential part of this document for implementing Contract provisions and other environmental mitigation and enhancement provisions.

## 1.3 Objectives of Wildlife Conservation Plan

The vision of the project is to develop an eco-friendly project development with the participation of the Community, Farmers, NGOs, the Private sector, Institutions, Government agencies, and the Forest Department for economic growth and sustainable development. In recognition of this, it ensures that the balance between development and environmental conservation is maintained, and the environmental management plan is accordingly prepared. The objectives of the Wildlife Conservation Plan are to:

I. Define environmental management principles and guidelines to support sustainable industrial practices during and after the expansion of the PVC production facility.

II. Describe the mitigation measures that will be implemented to prevent or mitigate any negative environmental impacts and to enhance the positive issues.

III. To develop a comprehensive management plan with a specific focus on Schedule 1 species.

IV. Establish the roles and responsibilities of all parties involved in the implementation of environmental controls and;

V. Establish a monitoring and reporting system for facilitating the appropriate implementation of Wildlife Conservation Plan.

## 1.4 Regulatory Procedure for WLCP

The legal framework of India consists of several acts, notifications, rules, and regulations to protect the environment and wildlife.

The MOEF&CC Environmental Impact Assessment (EIA) notification, 2006 (and its amendment), Forest (Conservation) Act, 1980 and Wildlife (Protection) Act, 1972 (and its amendment) are the most relevant act in context of road development and a cornerstone of its support for ensuring optimal use of natural resources for sustainable development. The overall objective of it is to prevent and mitigate undue harm to Habitat, Wildlife, People, and the Environment in the development process. It provides guidelines for the identification, preparation, and implementation of programs and projects.

As per the WPA 1972, for any activity including the Road & Highway development projects that are proposed within a protected area of National Park &Wildlife Sanctuary, consultation with the National Board for Wildlife (NBWL)/ State Board of Wildlife is required before the State

The government accords any approval. The SC (Standing Committee) of the NBWL performs this task for the NBWL. As per orders of the Supreme Court of India, all cases within Sanctuaries are also required to be referred to SC-NBWL, as the Act provides for consultation with SBWL. However, no National Park, Wildlife Sanctuary, Biosphere Reserve, Protected Forest (PF) and wildlife corridors fall within a 10 km radius of the plant site.

# CHAPTER 2. PROJECT PROFILE

The proposed project titled “Development of an Industrial Park” by M/s. State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT) is planned at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram, and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu. The project falls under Schedule 1(d), 5(d), 7(c), and 8(b) of the EIA Notification, 2006, and is classified as Category A, requiring prior Environmental Clearance from the Ministry of Environment, Forest and Climate Change (MoEF&CC). The proposed development aims to establish a well-planned, sustainable industrial hub to promote regional economic growth, attract investments, and generate employment opportunities in southern Tamil Nadu. The Industrial Park will include essential infrastructure such as internal roads, power supply, water distribution and stormwater drainage provisions.

The project is designed with a focus on environmental sustainability through efficient resource management, reuse of treated wastewater, and development of extensive greenbelts to act as natural buffers. Strict adherence to CPCB and TNPCB standards will be ensured through installation of pollution control measures and real-time environmental monitoring systems. Furthermore, biodiversity-friendly landscaping, noise and dust suppression systems, and a comprehensive Environmental Management Plan (EMP) will be implemented to minimize potential impacts on the local environment. Overall, the proposed Industrial Park aligns with the objectives of Make in India and supports India's Sustainable Development Goals (SDGs) by fostering clean, inclusive, and environmentally responsible industrialization.

## 2.1. Identification of the Project

*Table 1. Identification of project*

| S. No. | Particulars | Details |
|---|---|---|
| 1 | **Nature of Project** | Greenfield Project - Development of an Industrial Park |
| 2 | **Activity & Category of the Project** | 1d (5d) (7c) (8b) , Category 'A' |
| 3 | **Proposed site/land details (Ha)** | **Total Area -**796.240 Ha. |
| 4 | **Greenbelt details (Ha)** | 301.686 Ha (40.52 %) |

## 2.2. Project Location

The proposed Industrial Park by M/s. State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT) is located at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram, and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu. The site is strategically situated with excellent connectivity to major highways and nearby industrial centers, ensuring smooth transportation of raw materials and finished goods. Its proximity to Thoothukudi Port provides a significant logistical advantage for export-oriented industries, while the availability of regional infrastructure such as power supply, water sources, and workforce enhances the project's operational feasibility. The location within an identified industrial growth corridor supports planned development, efficient resource utilization, and reduced transportation-related environmental impacts.

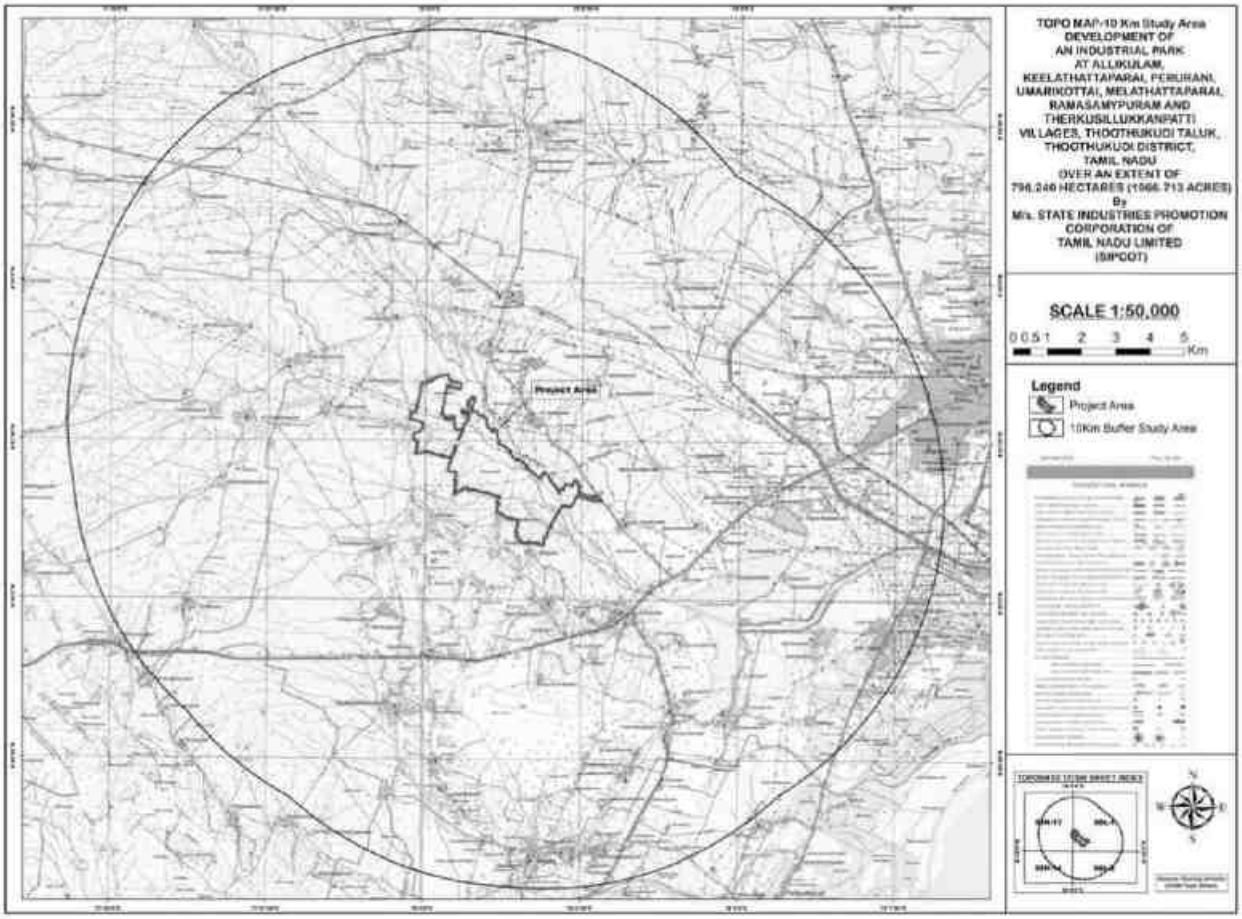



*Figure 1: Topographical Map of the study area*

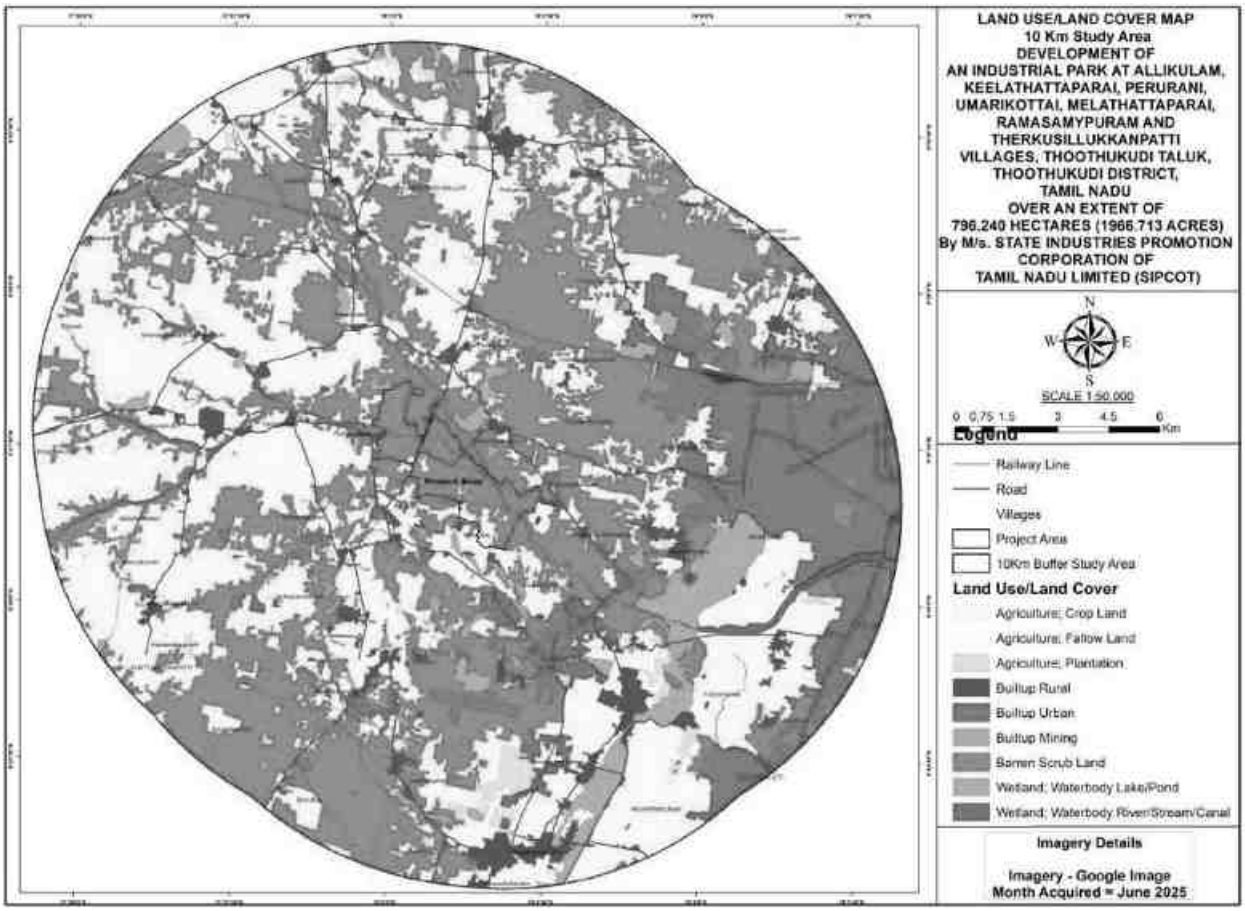
## 2.3 Land Use and Land Cover

The land use/ land cover map has been generated on 1:50,000 scale using digital classification of Imagery. Based on the methodology developed for the present land use/ land cover, categories have been grouped under the following major land use/land cover categories. The data analysis process involves examining the data using various image processing techniques by a digital computer. Its application in the field of environmental management is of great prominence.

*Table 2. Major land use/land cover categories of study area (10 Km Radius Buffer zone)*

| S. No. | Category | | Area in Sq. km | Area In Ha | Percentage |
|---|---|---|---|---|---|
| | Lable-I | Label-II | | | |
| 1 | Agriculture Land (41.95%) | Agriculture; Crop Land | 192.8966 | 19289.7 | 39.89% |
| | | Agriculture; Fallow Land | 3.413125 | 341.3 | 0.71% |

| S. No. | Category | | Area in Sq. km | Area In Ha | Percentage |
|---|---|---|---|---|---|
| | Lable-I | Label-II | | | |
| | | Agriculture; Plantation | 6.560105 | 656.0 | 1.36% |
| 2 | Builtup Land (16.32%) | Builtup Rural | 15.72118 | 1572.1 | 3.25% |
| | | Builtup Urban | 59.58659 | 5958.7 | 12.32% |
| | | Builtup Mining/Industrial | 3.609647 | 361.0 | 0.75% |
| 3 | Barren Land (37.09%) | Barren; Scrub Land | 179.3701 | 17937.0 | 37.09% |
| 4 | Wet Land (4.64%) | Wetland; Waterbody Lake/Pond | 17.39774 | 1739.8 | 3.60% |
| | | Wetland; Waterbody River/Stream/Canal | 5.045859 | 504.6 | 1.04% |
| | **Total** | | **483.6009** | **48360.1** | **100.00%** |




## 2.4 Environmental Sensitivity of the Study Area

Identifying and documenting Eco-Sensitive Zones (ESZs) surrounding the project area is of utmost importance, as these zones—regardless of their size—harbor distinctive biological resources that require focused conservation measures. This process integrates conservation efforts with sustainable development goals, ensuring the protection of the

interests of local and tribal communities. Preserving the biodiversity within ESZs is essential for maintaining ecological balance throughout the project's execution. Therefore, ecologically sensitive areas play a key role in influencing and regulating the ecological characteristics and biological diversity of the project zone.

*Table 3. List of Eco-Sensitivity Landscapes within a 10 km Radius of the Proposed Project Area*

| Sl. No. | Eco-sensitivity Identity | Distance | Direction |
|---|---|---|---|
| **WATERBODIES** | | | |
| 1. | Odai Within Project Area | Odai Within Project Area | Odai Within Project Area |
| 2. | Nilaviyal Within Project Area | Nilaviyal Within Project Area | Nilaviyal Within Project Area |
| 3. | Pond near Project Area | 0.21 Km | NE |
| 4. | Pond near Project Area | 0.31 Km | NW |
| 5. | Pond near Project Area | 0.39 Km | SSW |
| 6. | Allikulam Pond | 0.43 Km | S |
| 7. | Pond near Perurani | 0.80 Km | S |
| 8. | Pond near Allikulam | 0.80 Km | SSE |
| 9. | Swimming Pond near Perurani | 1.01 Km | S |
| 10. | Neeravi Pond Perurani | 1.13 Km | SW |
| 11. | Pond near Perurani | 1.25 Km | WSW |
| 12. | Perurani Pond | 1.28 Km | SW |
| 13. | Kadamba Kulam ( Fishing Pond ) | 1.53 Km | SSE |
| 14. | Pond near Perurani | 1.56 Km | SW |
| 15. | Pond near Mel Kuttudankadu | 1.90 Km | S |
| 16. | Lake Elim (Kanchan Kulam) | 2.07 Km | SSE |
| 17. | Vepan Lake | 2.11 Km | SW |
| 18. | Pond near Umari kkottai | 2.39 Km | NW |
| 19. | Pond near Putupatti | 3.04 Km | SSW |
| 20. | Koram Pullam Tank | 3.52 Km | SE |
| 21. | Pond near Varthagareddypatti | 3.52 Km | SW |
| 22. | Pond near Varthagareddypatti | 3.60 Km | SW |
| 23. | periya Kulam water body | 3.80 Km | SW |
| 24. | Pond Bethesda | 3.85 Km | SSE |
| 25. | Senkulam River (River Port) | 4.49 Km | ENE |
| 26. | Pond near Korampallam | 5.06 Km | E |
| 27. | Pond near Korampallam Check Dam | 5.38 Km | SE |
| 28. | North Channal | 6.31 Km | SSE |
| 29. | Pond near Jambulinga Puram | 6.84 Km | NNE |
| 30. | Canal near Tiruvai Puram | 7.18 Km | SSE |
| 31. | Pond near Melmatan | 7.68 Km | NNE |
| 32. | Pond near Sakkammal Puram | 7.73 Km | SSE |
| 33. | Canal near Peykulam | 7.75 Km | SSE |

| Sl. No. | Eco-sensitivity Identity | Distance | Direction |
|---|---|---|---|
| 34. | Canal near Brahmapuram | 8.10 Km | SSE |
| 35. | Canal near Manakkudu | 8.50 Km | SSE |
| 36. | Sivathaiya Puram Pond | 8.57 Km | SSE |

## 2.6 Forest Type of Study Area

The study area for the proposed SIPCOT Industrial Park at Thoothukudi District, Tamil Nadu is characterized by a mix of degraded dry deciduous forests, scrublands, and patches of plantation along village and roadside areas. According to the Forest Survey of India (FSI, 2019), the natural vegetation in this region falls under the Tropical Dry Deciduous Forest type (Champion & Seth, 1968), with predominant species including *Azadirachta indica*, *Cassia fistula*, *Dalbergia sissoo*, *Albizia lebbeck*, *Pongamia pinnata*, *and Ficus religiosa*. These forests are adapted to semi-arid to dry tropical conditions, with low to moderate rainfall, and provide important ecological services such as soil stabilization, microclimate regulation, and habitat for local fauna.

## 2.7 Geographical Features of the Study Area

The terrain of the study area is generally flat to gently undulating, forming part of the Thoothukudi coastal plain, with occasional rocky outcrops and seasonal water bodies. The region experiences a tropical climate with hot summers, moderate to high humidity due to proximity to the coast, and a monsoon season primarily between October and December. Local watercourses and ponds support agriculture and groundwater recharge, while scattered vegetation and tree cover contribute to ecological balance. The area supports a variety of flora and fauna, including small mammals, reptiles, and resident bird species. Although largely rural, the region is undergoing industrial development, and the proposed SIPCOT Industrial Park has been planned with environmental safeguards to minimize impacts on existing vegetation, water resources, and biodiversity.

# 2.8. Objectives for the Proposed WLCP

The most significant rationale behind the proposed study of the biological environment is one of the most important aspects for Environmental Impact Assessment, in view of the need for conservation of environmental quality and biodiversity. Ecological systems show complex inter-relationships between biotic and abiotic components including dependence, competition and mutualism. Biotic components comprise of both plant and

animal communities which interact not only within and between themselves but also with the abiotic components viz. Physical and chemical components of the environment.

The key objectives of the proposed wildlife conservation plan are as below:

- To assess the biodiversity of the study area, including (Schedule-I species).
- To assess the impact caused by the project activities on biodiversity.
- To provide the suitable conservation plan to the long-term conservation of concerned flora and fauna.

## 2.9. Regulatory and Statutory Requirements

The provision of 'Environmental Clearance' is outlined in the EIA notification of 2006, which mandates the development of a 'Wildlife Conservation Plan (WLCP)'. This plan is a decisive component of the EIA process, aimed at safeguarding the ecological habitats and the diversity of species identified during the assessment and owing the existence of Schedule I animal species as defined by the Wildlife Protection Act of 1972 and its subsequent amendments, within a 10 km radius of the Impact Area adjacent to the lease area highlights the necessity for the preparation of a comprehensive WLCP. Therefore, the proposed wildlife conservation plan was designed based on various national regulatory requirements along with statutory practices applied across various wildlife conservation reserves. In absence of any national conservation regulations, international and MoEFCC recommendations were incorporated for the similar related projects.

The scope of the survey study is designed to establish the prevailing situation in relation to the environment, human beings and the flora and fauna in the study area. So, an area of 10 km radius around the project side has been considered as the study area. Biodiversity baseline survey was carried out in three months' duration which includes survey of flora and fauna as per the guidelines of MoEFCC. The species of the flora has been listed while faunal species have been identified as per Wildlife Protection Act, 1972 and as amended subsequently and listed in conservation categories.

Baseline information on the biodiversity of a specific region is collected prior to the commencement of any interventions or development projects The process of gathering baseline data for ecological and biodiversity studies involves collecting initial datasets that act as a reference for the Environmental Impact Assessment (EIA). This collection process includes acquiring comprehensive information about the current ecological condition of an area, which encompasses its species, habitats, and ecosystem functions, prior to the commencement of any development activities. Such data provides a basis for

monitoring changes over time and informs conservation efforts, particularly emphasizing the inventory of species and habitats.

The Baseline study was scheduled for the **Post-monsoon**, specifically from **March, 2025 to May, 2025** as specified earlier. Data were being gathered and were synthesized from both primary and secondary sources. Primary environmental data obtained through field studies conducted within the impact area, which encompasses both the Core Zone and Buffer Zone, focusing on various environmental components, including ecological and biological diversity with an enormous assistance of concerned state forest officials and local people. For the current project the details on the plant and animal biodiversity are furnished accordingly. The IUCN Red List employs nine categories to evaluate the extinction risk of various species. In the current report, the abbreviations for Critically Endangered, Endangered, Vulnerable, Near Threatened, Least Concern, Data Deficient, and Not Evaluated are CR, EN, VU, NT, LC, DD, and NE, respectively. These categories are utilized to determine the global conservation status of the concerned species (*https://www.iucnredlist.org/*).

# CHAPTER 3. METHODOLOGY

**Baseline Survey Period**

March, 2025 to May, 2025

**Expanse of Study Area**

314.16 square kilometers ($\pi r2 = \pi.102 \approx 314.16$).

## 3.1. Survey Approach

The biological diversity of the region was evaluated through an initial primary and secondary survey that encompassed the project area and an immediate Impact Zone extending 10 km around the proposed expansion of the project area. The survey approach fundamentally concentrated on primary surveys and the secondary survey. For the assessments concerning natural vegetation the nearby terrestrial areas and water bodies were taken into consideration. The methodology employed to create a comprehensive inventory of the floral diversity and habitat types of the study area on the basis of primary observations and secondary records. Additionally, these findings were corroborated with the traditional ecological knowledge of the local population. Investigations into fauna species were conducted at various times of a day, typically through visual encounters along with tracing the animal calls, their pug marks, evidence of excreta, scents of specific

animals etc. The insights provided by the local residents also play a crucial role in understanding the current faunal distribution in the study area. The surveys included photographic documentation to enhance and facilitate the process of identifying various species. The biological parameters for the present course of action are outlined as follows:

- Flora: composition, Height, Girth, Canopy Cover, predominant floral species,
- Fauna: Species composition, feeding and migratory habits of avifauna species, *etc.*

## 3.2. Primary Survey Method

### 3.2.1 Mammals

Mammal sampling in the study area was carried out using the direct and indirect sign survey along the line transect in a random selected grid. Transects of various lengths were laid in the selected grids (Buckland et al., 1993). Animal presence data was recorded based on the sightings of animals and indirect signs such as scratch marks on the ground and trees, animal droppings, and foot marks, etc.

### 3.2.2 Birds

Point count was used with a single observer in each sampling point (Metcalfe, 2007). The point count method was preferred over line transects as the undulating terrain and steep slope make it difficult to traverse a straight line while observing birds (Buckland et al., 1993). The point-count method, in which an observer records all birds detected within a fixed or visible distance from a point during a specified period (Ferry & Frochot, 1970), is the most widely used counting method in bird population studies (Ralph et al., 1995; Rosenstock et al., 2002). The observation points were selected along the transect line at 200 m intervals. At every point, the bird count was started after a few minutes to let the bird activities resume to normal. Observations were recorded for 10 minutes at a point. Bird species were identified based on sightings and calls.

The avifauna survey was scheduled for the early morning from 7:00 to 9:00 am and in the late afternoon from 3:30 to 5:00 pm. Surveys for reptiles, amphibians, mammals, and plant life were conducted during daylight hours, while butterfly observations took place between 9:00 am and 4:00 pm. At each sampling site, a comprehensive count of species of birds was meticulously recorded, leading to the compilation of an extensive list. The identification of bird species was facilitated by the use of binoculars and recognized field guides, ensuring accurate species recognition.

### 3.2.3 Butterfly

Butterfly sampling, the most common method used for assessing butterfly abundance in monitoring programs (Newman et al., 2003), was done along the transect line. This method is cost-effective and easy to implement. The drawback of this method is that it does not account for individual detection probability and temporal fragmentation of butterfly populations.

### 3.2.4 Herpetofauna

A Visual Encounter Survey (VES) was done for the survey of the amphibians and reptiles along the transect line in randomly selected grids in the study area. In this method, field personnel walk through an area or habitat for a given period, systematically searching for animals. This method is the most widely used and best suited to document the Herpetofauna and for monitoring studies. During the systematic search, leaf litter, fallen logs, trees (bark, buttress, root, and holes), shrubs, boulders, rocks, and rock crevices were examined. The identification of Herpetofauna was done with the help of Boulenger (1890), Daniel (2002), Daniels (2005), Das (2003), and Whitaker & Captain (2004).

### 3.2.5 Vegetation Sampling

For habitat assessment in terms of plant density, the quadrat method was used. Quadrats were laid randomly in the selected plots, and vegetation parameters like height, GBH, canopy cover etc were recorded from each of them. A smaller plot, 5 m x 5 m, was laid in each 10 m X 10 m quadrant for estimating the Shrubs and 1 m x 1 m plot for herbs.

## 3.3. Secondary Survey Method

The information and insights derived from the primary survey have been supported by numerous secondary sources, such as scholarly articles, books, Forest department sources (Management Plan, Action Plan), Previous EIA Reports, and research studies. Furthermore, the authenticated list of flora and fauna from the Divisional Forest Officer for the current project act as a significant source of secondary information.

Secondary data collection on biodiversity through community surveys involves sourcing existing information and traditional ecological knowledge from local populations who maintain a close relationship with their natural surroundings. This method enables the documentation of species diversity, seasonal trends, habitat transformations, and local conservation practices that are often absent from formal scientific records. The deep, place-based knowledge held by community members—passed down through generations—plays a vital role in understanding and contextualizing local biodiversity patterns. Such information, both qualitative and quantitative, not only complements primary research but also helps identify data gaps and supports the development of more inclusive and locally grounded conservation strategies. As part of the study, interactions

were conducted with local residents to gather information on biodiversity in the surrounding area.

### 3.4. Survey Limitation

- **Insufficient Vegetation cover:** The limited vegetation cover has restricted the inclusion of variable sampling sites and also replication of sampling grids, thereby hindering the observation of species and the collection of relevant data.
- **Fragmentation of Natural Environments:** Agricultural practices and human activities have led to the fragmentation of natural environments, posing challenges for a thorough assessment of ecological patterns.
- **Seasonal Limitations:** The timing of the survey may not have aligned with the peak seasons for biodiversity, potentially resulting in the absence of migratory species or seasonal plant growth.
- **Limitation in Survey Stretch:** The surveys were exclusively conducted in daylight, thereby confining the observed bird activities to the hours of daylight. No surveys were performed at night.

# CHAPTER 4. STATUS OF FLORA AND FAUNA IN THE STUDY AREA

Conceptually, the baseline data in biodiversity conservation refers to the initial information gathered about the biodiversity of a specific region before any interventions or development projects commence. The process of gathering baseline data for ecological and biodiversity studies involves collecting initial datasets that act as a reference for the Environmental Impact Assessment (EIA). This collection process includes acquiring comprehensive information about the current ecological condition of an area, which encompasses its species, habitats, and ecosystem functions, prior to the commencement of any development activities. Such data provides a basis for monitoring changes over time and informs conservation efforts, particularly emphasizing the inventory of species and habitats.

The Baseline study was scheduled for the **Summer** Period , specifically from **March to May, 2025** as specified earlier. Data were being gathered and were synthesized from both primary and secondary sources. Primary environmental data obtained through field studies conducted within the impact area, focusing on various environmental components, including ecological and biological diversity with an enormous assistance of concerned state forest officials and local people. For the current project the details on the plant and animal biodiversity are furnished accordingly. The IUCN Red List employs nine

categories to evaluate the extinction risk of various species. In the current report, the abbreviations for Critically Endangered, Endangered, Vulnerable, Near Threatened, Least Concern, Data Deficient, and Not Evaluated are CR, EN, VU, NT, LC, DD, and NE, respectively. These categories are utilized to determine the global conservation status of the concerned species (https://www.iucnredlist.org/).

## 4.1. Flora

*Table 4. List of floral species in the study area*

| S. No. | Botanical name | Common Indian Name | Family | Habit |
|---|---|---|---|---|
| 1 | *Abrus precatorius* | Gunja | Fabaceae | Liana |
| 2 | *Acacia auriculiformis* | Earleaf Acacia | Fabaceae | Tree |
| 3 | *Acacia chundra* | Lal Khair | Fabaceae | Tree |
| 4 | *Acacia horrida* | Prickly Acacia | Fabaceae | Tree |
| 5 | *Acacia holosericea* | Silky Wattle | Fabaceae | Tree |
| 6 | *Acacia nilotica* | Babul | Fabaceae | Tree |
| 7 | *Acacia planifrons* | Umbrella Thorn | Fabaceae | Tree |
| 8 | *Acacia senegal* | Gum Arabic Tree | Fabaceae | Tree |
| 9 | *Acacia melanoxylon* | Australian Blackwood | Fabaceae | Tree |
| 10 | *Aegle marmelos* | Bael | Rutaceae | Tree |
| 11 | *Ailanthus excelsa* | Tree of Heaven | Simaroubaceae | Tree |
| 12 | *Albizia amara* | Kattumurai | Fabaceae | Tree |
| 13 | *Albizia lebbeck* | Siris | Fabaceae | Tree |
| 14 | *Anacardium occidentale* | Cashew | Anacardiaceae | Tree |
| 15 | *Annona squamosa* | Custard Apple | Annonaceae | Tree |
| 16 | *Anogeissus latifolia* | Dhaura | Combretaceae | Tree |
| 17 | *Azadirachta indica* | Neem | Meliaceae | Tree |
| 18 | *Barringtonia acutangula* | Freshwater Mangrove | Lecythidaceae | Tree |
| 19 | *Bauhinia malabarica* | Malabar Bauhinia | Fabaceae | Tree |
| 20 | *Bauhinia racemosa* | Bidi Leaf Tree | Fabaceae | Tree |
| 21 | *Borassus flabellifer* | Palmyra Palm | Arecaceae | Tree |
| 22 | *Caesalpinia pulcherrima* | Peacock Flower | Fabaceae | Tree |
| 23 | *Canthium coromandelicum* | Coromandel Ebony | Rubiaceae | Shrub |
| 24 | *Carica papaya* | Papaya | Caricaceae | Shrub |
| 25 | *Cassia fistula* | Amaltas | Fabaceae | Tree |
| 26 | *Casuarina equisetifolia* | Casuarina | Casuarinaceae | Tree |
| 27 | *Catunaregam spinosa* | Mountain Pomegranate | Rubiaceae | Shrub |
| 28 | *Ceiba pentandra* | Silk Cotton Tree | Malvaceae | Tree |
| 29 | *Cissus quadrangularis* | Hadjod | Vitaceae | Liana |
| 30 | *Cissus vitiginea* | Woodbine | Vitaceae | Liana |
| 31 | *Cissus heyneana* | Climbing Grape | Vitaceae | Liana |
| 32 | *Citrus aurantiifolia* | Lime | Rutaceae | Shrub |
| 33 | *Citrus limon* | Lemon | Rutaceae | Shrub |

| S. No. | Botanical name | Common Indian Name | Family | Habit |
|---|---|---|---|---|
| 34 | *Cocos nucifera* | Coconut | Arecaceae | Tree |
| 35 | *Coccinia grandis* | Ivy Gourd | Cucurbitaceae | Liana |
| 36 | *Cocculus hirsutus* | Broom Creeper | Minispermaceae | Liana |
| 37 | *Commiphora berryi* | Indian Myrrh | Burseraceae | Shrub |
| 38 | *Cordia sebestena* | Scarlet Cordia | Boraginaceae | Shrub |
| 39 | *Ctenolepis garcini* | Garcin's Vine | Cucurbitaceae | Liana |
| 40 | *Crateva religiosa* | Sacred Garlic Pear | Capparaceae | Tree |
| 41 | *Dalbergia spinosa* | Thorny Rosewood | Fabaceae | Shrub |
| 42 | *Dalbergia sissoo* | Shisham | Fabaceae | Tree |
| 43 | *Delonix elata* | White Gulmohar | Fabaceae | Tree |
| 44 | *Delonix regia* | Gulmohar | Fabaceae | Tree |
| 45 | *Dichrostachys cinerea* | Sickle Bush | Fabaceae | Tree |
| 46 | *Dichrostachys santapaui* | Santapau's Sickle Bush | Fabaceae | Tree |
| 47 | *Erythrina variegata* | Indian Coral Tree | Fabaceae | Tree |
| 48 | *Eucalyptus tereticornis* | Eucalyptus | Myrtaceae | Tree |
| 49 | *Ficus benghalensis* | Banyan | Moraceae | Tree |
| 50 | *Ficus mollis* | Hairy Fig | Moraceae | Tree |
| 51 | *Ficus religiosa* | Peepal | Moraceae | Tree |
| 52 | *Flacourtia indica* | Governor's Plum | Salicaceae | Shrub |
| 53 | *Flueggea virosa* | White Berry Bush | Phyllanthaceae | Shrub |
| 54 | *Gliricidia sepium* | Gliricidia | Fabaceae | Tree |
| 55 | *Gmelina arborea* | Gmelina | Lamiaceae | Tree |
| 56 | *Guettarda speciosa* | Sea Gardenia | Rubiaceae | Tree |
| 57 | *Hardwickia binata* | Anjan | Fabaceae | Tree |
| 58 | *Holoptelea grandis* | Indian Elm | Ulmaceae | Tree |
| 59 | *Lannea coromandelica* | Indian Ash Tree | Anacardiaceae | Tree |
| 60 | *Lawsonia inermis* | Henna | Lythraceae | Shrub |
| 61 | *Lysiloma latisiliquum* | Wild Tamarind | Fabaceae | Tree |
| 62 | *Leucaena leucocephala* | Subabul | Fabaceae | Tree |
| 63 | *Madhuca longifolia* | Mahua | Sapotaceae | Tree |
| 64 | *Mangifera indica* | Mango | Anacaridiaceae | Tree |
| 65 | *Manilkara zapota* | Chikoo | Sapotaceae | Tree |
| 66 | *Melia azedarach* | Chinaberry | Meliaceae | Tree |
| 67 | *Millingtonia hortensis* L | Indian Cork Tree | Bigononiaceae | Tree |
| 68 | *Morinda coreia* | Indian Mulberry | Rubiaceae | Tree |
| 69 | *Moringa oleifera* | Drumstick Tree | Moringaceae | Tree |
| 70 | *Muntingia calabura* | Singapore Cherry | Muntingiaceae | Tree |
| 71 | *Nyctanthes arbor-tristis* | Parijat | Oleaceae | Tree |
| 72 | *Pandanus odorifer* | Screw Pine | Pandanaceae | Shrub |
| 73 | *Parkinsonia aculeata* | Jerusalem Thorn | Fabaceae | Tree |
| 74 | *Pergularia daemia* | Trellis Vine | Apocynaceae | Liana |
| 75 | *Peltophorum pterocarpum* | Copperpod | Fabaceae | Tree |
| 76 | *Pongamia pinnata* | Karanja | Fabaceae | Tree |

| S. No. | Botanical name | Common Indian Name | Family | Habit |
|---|---|---|---|---|
| 77 | *Phyllanthus acidus* | Star Gooseberry | Phyllanthaceae | Shrub |
| 78 | *Phyllanthus emblica* | Amla | Phyllanthaceae | Tree |
| 79 | *Pisonia grandis* | Lettuce Tree | Nyctaginaceae | Shrub |
| 80 | P*ithecellobium dulce* | Manila Tamarind | Fabaceae | Tree |
| 81 | *Plumeria rubra* | Frangipani | Apocynaceae | Shrub |
| 82 | *Polyalthia longifolia* | Ashoka Tree | Annonaceae | Tree |
| 83 | *Prosopis chilensis* | Chile Prosopis | Fabaceae | Tree |
| 84 | *Prosopis juliflora* | Mesquite | Fabaceae | Tree |
| 85 | *Psidium guajava* | Guava | Myrtaceae | Tree |
| 86 | *Rivea hypocrateriformis* | Morning Glory Creeper | Convolvulaceae | Liana |
| 87 | *Sapindus emarginatus* | Soapnut Tree | Sapindaceae | Tree |
| 88 | *Sapindus trifoliatus* | Soapberry | Sapindaceae | Tree |
| 89 | *Spathodea campanulata* | African Tulip Tree | Bignoniaceae | Tree |
| 90 | *Saraca asoca* | Ashoka Tree | Fabaceae | Tree |
| 91 | *Senna siamea* | Siamese Cassia | Fabaceae | Tree |
| 92 | *Syzygium cumini* | Jamun | Myrtaceae | Tree |
| 94 | *Tabebuia rosea* | Pink Trumpet Tree | Bigononiaceae | Tree |
| 95 | *Tamarindus indica* | Tamarind | Fabaceae | Tree |
| 96 | *Tecomella undulata* | Rohida | Bigononiaceae | Tree |
| 97 | *Tectona grandis* | Teak | Lamiaceae | Tree |
| 98 | *Terminalia arjuna* | Arjun | Combretaceae | Tree |
| 99 | *Terminalia catappa* | Indian Almond | Combretaceae | Tree |
| 100 | *Thespesia populnea* | Portia Tree | Malvaceae | Tree |
| 101 | *Thespesia populneoides* | Seaside Mahoe | Malvaceae | Tree |
| 102 | *Tinospora sinensis* | Guduchi | Menispermaceae | Liana |
| 103 | *Ziziphus jujuba* | Ber | Rhamanaceae | Shrub |
| 104 | *Ziziphus xylopyrus* | Wild Jujube | Rhamanaceae | Shrub |

## 4.2 Fauna of the Study area :

A comprehensive study of the local fauna within the study area was conducted through both primary and secondary surveys, with a focus on birds, mammals, and herpetofauna. Given that the study was limited to a single season and data was extensive, secondary sources were also utilized to enhance our ecological biodiversity assessment. This included an extensive review of existing literature, such as research papers, recent articles, dissertations, topographical maps, and textbooks, to identify critical corridors and the presence of any endangered species near the project area.

## A. Mammals

*Table 5. List of Mammals in the study area*

| S. No. | Common Name | Scientific Name | Family | IUCN status | WLPA Schedule 2022 |
|---|---|---|---|---|---|
| 1 | Asian Palm Civet | *Paradoxurus hermaphroditus* | Viverridae | LC | I |
| 2 | Rusty-spotted Cat | *Prionailurus rubiginosus* | Felidae | NT | I |
| 3 | Bonnet macaque | *Macaca radiata* | Cercopithecidae | **V** | **I** |
| 4 | Indian Brown Mongoose | *Urva fusca* | Herpestidae | LC | I |
| 5 | Ruddy Mongoose | *Urva smithii* | Herpestidae | LC | I |
| 6 | Small Indian Civet | *Viverricula indica* | Viverridae | LC | I |
| 7 | Common Palm Civet | *Paradoxurus musangus* | Viverridae | LC | - |
| 8 | Wild Boar | *Sus scrofa* | Suidae | LC | II |
| 9 | Black-naped Hare/ Indian Hare | *Lepus nigricollis* | Leporidae | LC | II |
| 10 | Indian Porcupine | *Hystrix indica* | Hystricidae | LC | I |

## B. Reptiles

*Table 6. List of Reptiles in the study area*

| S. No. | Scientific Name | Common Name | Family | IUCN status | WPA Schedule (Amendment), 2022 |
|---|---|---|---|---|---|
| 1 | *Cnemaspis indica* | Indian day gecko | Gekkonidae | LC | - |
| 2 | *Cnemaspis ornata* | Ornate day gecko | Gekkonidae | LC | - |
| 3 | *Calotes calotes* | Common greenfield forest | Agamidae | LC | - |
| 4 | *Calotes ellioti* | Elliot's forest lizard | Agamidae | LC | - |
| 5 | *Calotes nemoricola* | Nilgiri forest lizard | Agamidae | NT | - |
| 6 | *Mabuya macularicus* | Bronze grass skink | Scincidae | LC | - |
| 7 | *Varanus griseus* | Desert Monitor | Varanidae | LC | I |
| 8 | *Chamaeleo zeylanicus* | Indian Chameleon | Chamaeleonidae | LC | I |
| 9 | *Fowlea piscator* | Checkered Keelback | Colubridae | LC | I |
| 10 | *Lycodon aulicus* | Indian wolf snake | Colubridae | LC | - |
| 11 | *Trimeresurus gramineus* | Bamboo Pit Viper | Viperidae | LC | - |
| 12 | *Trimeresurus malabaricus* | Malabar Pit Viper | Viperidae | LC | - |

## C. Birds

*Table 7. List of Birds in the study area*

| S. No. | Scientific Name | Common Name | Family | WPA Schedule (Amendment), 2022 |
|---|---|---|---|---|
| 1. | *Microcarbo niger* | Little Cormorant | Phalacrocoracidae | II |

| S. No. | Scientific Name | Common Name | Family | WPA Schedule (Amendment), 2022 |
|---|---|---|---|---|
| 2. | *Ardeola grayii* | Pond Heron | Ardeidae | II |
| 3. | *Bubulcus ibis* | Cattle Egret | Ardeidae | II |
| 4 | *Milvus migrans* | Pariah kite | Accipitridae | II |
| 5 | *Haliastur indus* | Brahminy Kite | Accipitridae | I |
| 6 | *Accipiter badius* | Shikra | Accipitridae | I |
| 7 | *Falco tinnunculus* | Kestrel | Falconidae | II |
| 8 | *Gallus sonneratii* | Grey Junglefowl | Phasianidae | I |
| 9 | *Vanellus indicus* | Red wattled Lapwing | Charadriidae | II |
| 10 | *Treron pompadora* | Grey fronted Green Pigeon | Columbia | - |
| 11 | *Treron phoenicopterus* | Yellow-footed Green Pigeon | Columbidae | II |
| 12 | *Spilopelia chinensis* | Spotted Dove | Columbidae | - |
| 13 | *Psittacula krameri* | Rose ringed Parakeet | Psittacidae | II |
| 14 | *Eudynamys scolopaceus* | Koel | Cuculidae | II |
| 15 | *Centropus sinensis* | Coucal | Cuculidae | II |
| 16 | *Caprimulgus asiaticus* | Indian Little Night jar | Caprimulgidae | II |
| 17 | *Ceryle rudis* | Pied Kingfisher | Alcedlnidae | II |
| 18 | *Halcyon smymensis* | White-breasted Kingfisher | Alcedinidae | II |
| 19 | *Merops leschenaulti* | Chestnut-headed Bee-Eater | Meropidae | II |
| 20 | *Coracias benghalensis* | Indian Roller | Coraciidae | II |
| 21 | *Upupa epops* | Hoopoe | Upupidae | II |
| 22 | *Megalaima viridis* | Small Green Barbet | Capitonidae | - |
| 23 | *Dinopium benghalense* | Black-rumped Flameback | Picidae | II |
| 24 | *Pitta brachyura* | Indian Pitta | Pittidae | II |
| 25 | *Oriolus oriolus* | Golden Oriole | Oriolidae | II |
| 26 | *Dicrurus macrocercus* | Black Drongo | Dicruridae | II |
| 27 | *Acridotheres tristis* | Indian Myna | Sturnidae | II |
| 28 | *Dendrocitta vagabunda* | Indian Treepie | Corvidae | II |
| 29 | *Corvus splendens* | Indian House Crow | Corvidae | - |
| 30 | *Tephrodornis pondicerianus* | Indian Wood Shrike | Vangidae | II |
| 31 | *Pycnonotus cafer* | Red-vented Bulbul | Pycnonotidae | II |
| 32 | *Sholicola albiventris* | White-tailed Flycatcher | Muscicapidae | II |
| 33 | *Orthotomus sutorius* | Tailor Bird | Cisticolidae | II |
| 34 | *Copsychus saularis* | Magpie-Robin | Muscicapidae | II |
| 35 | *Myophonus horsfieldii* | White-browed Blue Flycatcher | Muscicapidae | II |
| 36 | *Machlolophus spilonotus* | Yellow cheeked Tit | Paridae | II |

| S. No. | Scientific Name | Common Name | Family | WPA Schedule (Amendment), 2022 |
|---|---|---|---|---|
| 37 | *Motacilla maderaspatensis* | White-browed Wagtail | Motacillidae | II |
| 38 | *Cinnyris asiaticus* | Purple Sunbird | Nectariniidae | II |
| 39 | *Zosterops palpebrosus* | White Eye | Zosteropidae | II |
| 40 | *Passer domesticus* | House Sparrow | Passeridae | II |
| 41 | *Elanus caeruleus* | Black winged Kite | Accipitridae | II |
| 42 | *Ictinaetus malayensis* | Black Eagle | Accipitridae | II |
| 43 | *Ocyceros griseus* | Malabar Grey Hornbill | Accipitridae | I |
| 44 | *Acridotheres fuscus* | Jungle Myna | Accipitridae | II |
| 45 | *Pericrocotus cinnamomeus* | Small Minivet | Accipitridae | I |

## D. Amphibians

*Table 8. List of Amphibians in the study area*

| S. No. | Zoological Name | Common Name | Family | IUCN Status |
|---|---|---|---|---|
| 1. | *Duttaphrynus stomaticus* | Common Indian Toad | Bufonidae | LC |
| 2. | *Hoplobatrachus tigerinus* | Indian Bull Frog | Bufonidae | LC |

## 4.3 Schedule I species:

Based on both our primary and secondary surveys, as well as the compiled table above, we have identified a total of **15** species listed under Schedule I of the Wildlife Protection Act, indicating their endangered status and necessitating conservation efforts (https://www.iucnredlist.org.) Accordingly a detailed conservation plan for these scheduled species will be submitted separately.

*Table 9. List of schedule I species*

| S. No. | Scientific Name | Common Name | WLPA Schedule 2022 |
|---|---|---|---|
| 1 | *Paradoxurus hermaphroditus* | Asian Palm Civet | I |
| 2 | *Prionailurus rubiginosus* | Rusty-spotted Cat | I |
| 3 | *Macaca radiata* | Bonnet macaque | **I** |
| 4 | *Urva fusca* | Indian Brown Mongoose | I |
| 5 | *Urva smithii* | Ruddy Mongoose | I |

| S. No. | Scientific Name | Common Name | WLPA Schedule 2022 |
|---|---|---|---|
| 6 | *Viverricula indica* | Small Indian Civet | I |
| 7 | *Hystrix indica* | Indian Porcupine | I |
| 8 | Desert Monitor | *Varanus griseus* | I |
| 9 | Indian Chameleon | *Chamaeleo zeylanicus* | I |
| 10 | Checkered Keelback | *Fowlea piscator* | I |
| 11 | Brahminy Kite | *Haliastur indus* | I |
| 12 | Shikra | *Accipiter badius* | I |
| 13 | Grey Junglefowl | *Gallus sonneratii* | I |
| 14 | Malabar Grey Hornbill | *Ocyceros griseus* | I |
| 15 | Small Minivet | *Pericrocotus cinnamomeus* | I |

# CHAPTER 5. IMPACT ASSESSMENT

The Zone of Influence (ZoI) for the proposed SIPCOT Industrial Park at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram, and Therkusillukkanpatti Villages, Thoothukudi District, Tamil Nadu, extends across air, water, soil, terrestrial habitats, and surrounding human settlements. The project site is located in a rural-industrial transition zone, in proximity to degraded dry deciduous forests, scrublands, agricultural lands, and seasonal water bodies, which support small mammals, reptiles, and resident and migratory birds. Key project activities—including land development, construction of industrial units, internal roads, water supply and effluent management systems, and vehicular movement—may influence ambient air quality, noise levels, surface and groundwater quality, and soil characteristics, with indirect pressures on local biodiversity.

To address these potential impacts, the project proponent has proposed robust mitigation measures including greenbelt development over ≥33% of the site using native species, stormwater management and erosion control, Zero Liquid Discharge (ZLD) through a Common Effluent Treatment Plant (CETP), solid waste management, and dust and noise suppression measures. Continuous environmental monitoring of air, water, and soil quality will be undertaken in coordination with accredited agencies. These measures ensure compliance with CPCB and TNPCB guidelines while safeguarding local flora and fauna, maintaining ecological balance, and supporting environmentally sustainable industrial development in the region.

*Table 10. Impact & Mitigation Measures*

| Sl. No. | Activity | Potential Impact | Mitigation Measures |
|---|---|---|---|
| **Phase 1: Site Preparation and Infrastructure Expansion** | | | |
| (i) | Site clearing, earthwork, road construction, and utility installation | Temporary dust emissions, noise, soil erosion, and possible disturbance to existing flora and fauna | Water sprinkling for dust suppression; covering of trucks; restricted daytime work; noise barriers; preservation of existing trees where feasible; erosion control measures. |
| (ii) | Storage of construction materials, fuels, and chemicals | Risk of accidental spills, soil and water contamination, fire hazards | Designated storage areas with impervious flooring; spill containment measures; firefighting systems; trained personnel; compliance with MSIHC and local regulations. |
| **Phase 2: Operational Phase (Post-Commissioning)** | | | |
| (i) | Operation of industrial units and internal infrastructure | Air emissions from machinery and increased vehicular movement, noise affecting local fauna | Use of pollution control equipment where applicable; regular maintenance; noise barriers; plantation as buffer; adherence to TNPCB standards. |
| (ii) | Effluent generation from industrial operations, domestic sewage, and runoff | Water pollution, soil contamination, and impact on local water bodies | Common Effluent Treatment Plant (CETP) with Zero Liquid Discharge (ZLD); reuse of treated water for landscaping and utilities; regular monitoring of effluent quality. |
| (iii) | Solid waste generation from construction and industrial operations | Soil and water contamination, littering | Segregation, collection, storage, and disposal of solid waste as per local rules; use of biodegradable or recyclable materials; periodic housekeeping. |
| (iv) | Noise and vibration from machinery, generators, and vehicular traffic | Disturbance to local fauna, domestic animals, and nearby residents | Acoustic enclosures for machinery; plantation as noise buffer; restricted night-time operations; regular maintenance of vehicles. |
| **Phase 3: Miscellaneous / Indirect Activities** | | | |
| (i) | Greenbelt development (≥33% of total park area) | Opportunity for ecological enhancement, dust and noise attenuation | Plantation of native and pollution-tolerant species; multilayer greenbelt along park boundaries; monitoring survival rate; maintenance program. |

| | | | |
|---|---|---|---|
| (ii) | Human presence, illumination, and industrial operations | Disturbance to local birds, reptiles, and small mammals | Use of downward-facing, shielded lighting; preference for daytime operations; awareness and biodiversity training programs for personnel. |

# CHAPTER 6. LONG TERM MANAGEMENT STRATEGIES

## 6.1. Management Philosophy

The conservation and management of forest ecosystems calls for a comprehensive strategy, ranging from legal framework and policy support to inventory, institutional mechanisms, capacity building, and community participation. There is a range of international, national, and local-level policy commitments that need to be kept in mind while developing a management plan. The National Environmental Policy (NEP), 2006, suggests developing conservation and wise use strategies for notified protected areas with the participation of local communities and other relevant stakeholders. It further suggests integration of forest conservation into the Sectoral development plan for poverty alleviation and livelihood improvement. In India, several legislations have been enacted which are relevant to forest conservation. These include the Indian Forest Act, 1927, the Forest (Conservation) Act, 1980, the Wildlife (Protection) Act, 1972, and the umbrella provision of the Environment (Protection) Act, 1986. Most recently, the Government of India amended the Wildlife Protection Act and Forest Conservation Act, which include better provisions for biodiversity conservation.

## 6.2. Degree of Intervention

In general, a policy of minimal intervention in natural ecosystem-level processes has been followed in this management plan, considering the frugality of the forest ecosystem. The chain of interdependence, however, is too complex to be understood in totality. Tampering with this natural ecosystem with limited understanding may create a chain of events that we may not understand and can have long-term undesirable effects. Management prescriptions, therefore, are mostly directed towards reducing excessive activities and developments that may create undesirable impacts on flora and fauna, and at the same time promoting sustainable use of forest resources to ensure human well-being.

In situations where the cause-and-effect relationship is well understood, it may be justifiable to carry out interventions that help mitigate an altered natural feature of

the ecosystem or to achieve specific management objectives. This implies a good understanding of the ecology of the forest ecosystem at the habitat level, species level, and other related disciplines.

### 6.3. Statutes, rules, and guidelines followed

The management strategies suggested in this plan follow the extant statutes, rules, directives, and guidelines prevalent in India. The primary ones in this regard are the National Environmental Policy, 2006, Wildlife (Protection) Act, 1972 and Wildlife (Protection) Act, 2022, Environmental (Protection) Act, 1986, and Indian Forest Act, 1927. In addition, suggestions from officials and local communities having wide experience in sanctuary management have also been considered while framing the strategies for the management of the protected area.

## MANAGEMENT INTERVENTION FOR FLORA AND FAUNA

### A. Cover Management

Cover or shelter is an important requirement for the welfare of the species. The cover may be natural or artificial. Caves or holes are required for their resting and breeding period for carnivores and reptiles. Lack of such natural caves or holes is a limiting factor for animals. These animals will never stay in an area that is devoid of the above type of shelter.

In case of herbivores, sufficient cover of either grass, wood, brushwood, etc., is required for shelter, protection, and breeding. Woods are used as cover for small animals as well as big animals during hot summer days. It also acts as a shelter for birds. Small bushes provide breeding, resting, and protective shelters for bird species. Shrubs provide protective shelters for herbivores and other prey animals from predators.

On the whole, it can be said that different kinds of covers like winter cover, summer cover, refuse cover, breeding cover, fawning cover, resting cover, ambush cover, and nesting cover are required for different animals for different purposes. It can be ensured by strict protection of habitat, which includes dens, caves, rocks, nalas, ravines, vegetal cover, etc., and further, by improvement of habitat by planting in blanks with suitable plant species. The occurrence of fire incidents greatly hampers the availability of nesting and reproductive cover for birds. So the incidence of fire will be checked efficiently.

The program will be implemented in collaboration with the Forest Department, who have forestry offices and nurseries in its jurisdiction. Recommended types of trees will

be determined by the Forest Department. The program shall be community-based and accompanied by awareness and sensitization of the people.

**B. Weed Management**

Weed infestation has become a menace in some parts of the degraded forest areas. In the interest of the wildlife, therefore, it has to be cleared by uprooting as far as possible. People may be allowed and encouraged to collect it from the forest for fuel or fencing purposes.

The eradication of weeds will be based on scientific knowledge, i.e. root cutback method.

**C. Wildlife Health**

Efforts will be made to immunize the domestic animals in and around the proposed area against contagious diseases like Foot & Mouth disease, Rinderpest, etc. To avoid the spread of disease the stall feeding will be encouraged by supporting grassland development on community or private farmland. The villagers will be given incentives to change crop patterns and simultaneously motivated to reduce the number of cattle and rear a hybrid breed of cattle.

**D. Apathy/unawareness of wildlife**

The common people are unaware of the importance of wildlife in day-to-day life, so it remains unconcerned about its importance. There is a need to establish a link with wildlife through a conservation awareness programme.

**F. Research and Monitoring**

The research component used to be given less priority in forestry. There has never been an attempt to conduct or promote research by any project to generate information about ecology, biology, etc. of various species which are involved in conflict with humans. As a result of this, information on many aspects is highly inadequate to make suitable plans and strategies for different species. Lack of priority and funding for this purpose has been the main cause behind this.

To overcome this deficiency, information on many aspects, which do not involve any technical expertise, like animals sighted, number, age/sex distribution, location, habitat description, general activity, plant phenology, fire outbreaks, extent of burnt area, observations about dens, caves etc. will be initiated by the department on its own or through support by project authorities.

On the other hand, for those aspects which need considerable skill and technical expertise like ecology and biology of important wild animals. e.g. reptiles, amphibians, fishes, Birds, invertebrates and aquatic flora and fauna etc., causes of decline in wildlife populations, making detailed inventories of flora and fauna, Contractual engagements or consultancies with experienced NGOs working in the field of Wildlife & Environment or a University will be made. The detailed inventory of invertebrates, lower plants, medicinal plants, amphibians, reptiles, birds, lesser-known animals, etc., for researching to elicit information on the habitat and habitat of different species, their distribution, population trends, densities, etc.

In addition, a rainfall gauge and best best-quality scientific digital thermometer will be placed at different locations within the project area, and regular data will be noted down beginning from the first year of the plan. The forest staff deployed can be trained to take observations and the report will be sent monthly to the concerned Forest Division. The data will be used for preparation of the next five-year plan.

**6.5 Habitat Improvement**

The Habitat Improvement Plan aims to enhance and maintain ecological integrity in the project's surrounding environment. While the core project area is not a designated wildlife zone, but has many protected areas in proximity and hence the plan emphasizes ecological continuity, safe faunal movement, and improved habitat quality in adjoining green and buffer zones.

- Gap plantation is anticipated to offer significant advantages in areas where ecological restoration is necessary. The most suitable plant species for this endeavor, particularly for the overall habitat conservation for the Sixteen schedule I species in respect to the current project, the plant species proposed for the establishment of the green belt are expected to exhibit significant effectiveness in gap plantation and restoration purposes. The floral species mainly include *Albizia sp.*, *Dalbergia sissoo*, *Cassia fistula*, *Albizia lebbeck*, *Pongamia pinnata*, *Ficus religiosa*, and *Azadirachta indica*. and groves of large trees about villages and cultivation. Within this framework, a few notable examples serve as robust significance.
- Such habitats not only support the targeted species for conservation, but also will be good homes for their prey species.
- Moderate grasslands will be maintained through consistent cutting, controlled burns, and grazing practices.

- Carrying out a detailed study on spatial and temporal food availability in the habitat will be considered effectively.
- Maintenance of already existing natural waterbodies in the vicinity will be taken into consideration.
- Regular maintenance and supply of clean drinking water during dry seasons will be obligatorily conducted.
- Implementation of a system for fire management during extended droughts will be done.
- Ongoing monitoring of habitat characteristics is substantial and the same will be conducted with a serious note.
- Regular assessments of current wetland habitats and allied terrestrial expanses will be carried out.

### 6.6. Greenbelt and Shelterbelt Development

- Establish a multi-layered greenbelt around the project site using native tree, shrub, and grass species to simulate natural habitat conditions.
- Plant species that offer fruit, nectar, cover, and nesting options for fauna (e.g., dense shrubs for ground-dwelling animals and canopy trees for roosting birds).
- Ensure seasonal variation in flowering/fruiting to support year-round ecological activity.
- Creation of Habitat Micro-Niches
- Rock piles and logs provide shelter for small mammals and reptiles.
- Bushy corners and thickets to support ground-nesting birds and concealment for shy animals.
- Leaf litter and mulch zones for foraging.
- Introduce microhabitat features like hollow logs or vegetated mounds to improve species-specific shelter opportunities.

*Table 11. List of Potential Plant Species for Green Belt Development*

| S no | Botanical Name | English Name | Family | Broad Leaved | Sensitive / Tolerant | Growth Rate |
|---|---|---|---|---|---|---|
| 1. | *Albizia lebbeck* | East Indian Walnut | Fabaceae | Twice Compound | Tolerant | Fast growing |
| 2. | *Azadirachta Indica* | Indian Lilac | Meliaceae | Broad Compound Leaved. | Tolerant | Fast growing after 1st season |

| S no | Botanical Name | English Name | Family | Broad Leaved | Sensitive / Tolerant | Growth Rate |
|---|---|---|---|---|---|---|
| 3. | *Cassia fistula* | Golden Shower Tree | Fabaceae | Small Compound | Tolerant | Fast growing |
| 4. | *Dalbergia sissoo* | North Indian Rosewood | Fabaceae | Broad | Moderately sensitive | Moderate during 1st year and rapid afterwards |
| 5. | *Polyalthia longifolia* | Ashoka Tree | Annonaceae | Broad-leaved | Tolerant | Moderate to Fast-growing |
| 6. | *Pongamia pinnata* | Indian Beech | Fabaceae | Broad | Tolerant | Fast growing |
| 7. | *Ficus religiosa* | Sacred Fig | Moraceae | Broad | Tolerant | Fast growing |
| 8. | *Mangifera indica* | Mango | Anacardiaceae | Broad | Tolerant | Fast growing after 1st year |
| 9. | *Syzygium cumini* | Black Plum | Myrtaceae | Broad | Tolerant | Fast growing |

# CHAPTER 7. MONITORING AND EVALUATION

Monitoring and evaluation of wildlife mitigation measures are critical processes that ensure the effectiveness and adaptability of strategies aimed at reducing human-wildlife conflict and conserving biodiversity. These processes involve systematically collecting data on implemented measures, such as wildlife corridors, fencing, warning signage, or underpasses, and assessing their performance in real-world conditions. Monitoring provides insights into wildlife behavior, movement patterns, and interaction with mitigation structures, while evaluation helps determine whether the measures are meeting their intended goals. Through regular assessments, ineffective approaches can be modified or replaced, and successful practices can be scaled or replicated elsewhere. Ultimately, robust monitoring and evaluation foster accountability, promote evidence-based decision-making, and contribute to the long-term success of wildlife conservation efforts.

The monitoring approach in the future will be contingent upon the executing agency. If funds are deposited with the forest department and the execution of work falls under their purview, the forest department will assume responsibility for monitoring and reporting results. The Forest Department will provide the proponent with a utilization certificate, outlining all the wildlife conservation mitigation measures implemented during the preceding financial year.

*Table 12. Monitoring Plan of the study area*

| Activity | Monitoring Frequency | Responsibility |
|---|---|---|
| Water Availability:<br>- Regular Maintenance Initiative.<br>- Community Involvement Program. | Six monthly | Forest Department |

| Activity | Monitoring Frequency | Responsibility |
|---|---|---|
| Food Availability and Habitat Improvement<br>- Diversification of Tree Species | Six monthly | Forest Department |
| Awareness Programs<br>-Structured Educational Initiatives.<br>-Impact Monitoring and Training | yearly | Forest Department |
| Community Engagement<br>-Encouraging Active Participation | Six monthly | Forest Department |
| Administrative Costs for Processing Inspection | One time | Forest Department |
| Tree Plantation near Urban Areas | Three months | Forest Department |

# CHAPTER 8. FINANCIAL SUMMARY

The allocation of budgetary resources for wildlife conservation initiatives is essential for project advocates in India, as it guarantees adherence to environmental regulations. This compliance is vital for obtaining necessary environmental clearances and preventing possible delays or fines associated with project execution. Such financial provisions are instrumental in supporting strategies aimed at alleviating adverse effects on wildlife and their ecosystems, which are frequently required during the environmental impact assessment and clearance procedures.

The Proponent has proposed a sum of Rs. 62.7 lakhs only for the conservation of species under the following heads with a time frame of **5 years**. The total financial plan is presented below.

*Table 13. Financial budget allocation*

| | Year-Wise Financial Targets (INR, in Lakhs) | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl No. | Name of the Activity | 1st Year | 2nd Year | 3rd Year | 4th Year | 5th Year | Total |
| A | Habitat Management | | | | | | |
| I. | Habitat Enrichment | | | | | | |
| | Habitat enrichment in and around degraded areas within IIZ by plantation of fodder/fruit-bearing trees (but no exotic/foreign species) to improve habitat and food base for wild animals and birds | | | | | | |
| 1. | Plantation | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 7.0 |
| 2. | Fire Protection | 1.0 | 1.0 | 1.0 | 0.5 | 0.5 | 4.0 |
| 3. | Corridor connectivity and micro-niche development | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 5.0 |
| II. | Management of Soil Water and Moisture | | | | | | |
| 4. | Creation and maintenance of new waterholes, check dams, gullies in impact areas/villages in and around IIZ | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 10.0 |
| B. | Research and Wildlife Monitoring | | | | | | |
| 5. | Wildlife Monitoring | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 5.0 |
| 6. | Human – Wildlife Conflict Management | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 5.0 |
| 7. | Provision of First aid kits to the Forest Department | 0.5 | 0.5 | 0.0 | 0.0 | 0.0 | 1.0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| C. | Community based Conservation / Capacity Building | | | | | | |
| 8. | Entry point work in project-impact villages in and around IIZ as per identified requirements/infrastructure gaps (e.g., drinking water facilities, chabutra, community road repairing, etc.) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 5.0 |
| 9. | Provision for alternate Livelihood options (eg., Poultry, duckrey etc.) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 10.0 |
| 10. | Development of a training for staff and villagers focused on wildlife conservation | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 5.0 |
| | SUBTOTAL | 12.5 | 12.5 | 11.0 | 10.5 | 10.5 | 57.0 |
| | Cost Escalation (10% of sub-total) | | | | | | 5.7 |
| | Grand Total | | | | | | 62.7 |

# Annexure 8 - Carbon Footprint Report

# Life Cycle Assessment & Carbon Sequestration Study of Development of an Industrial Park at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu over an extent of 796.240 hectares (1966.713 acres)

**Activity:** 7(c), **Category:** A

## Project Proponent:

**STATE INDUSTRIES PROMOTION CORPORATION OF TAMIL NADU LIMITED (SIPCOT)**

## Prepared by

Environmental Consultant
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# 1 Introduction

## 1.1 What is Life cycle Assessment?

Life Cycle Assessment is a process to evaluate the environmental burdens associated with a product, process, or activity by identifying and quantifying energy and materials used and wastes released to the environment; to assess the impact of those energy and materials used and releases to the environment; and to identify and evaluate opportunities to affect environmental improvements.

A carbon footprint corresponds to the whole amount of greenhouse gases (GHG) produced to, directly and indirectly, support a person's lifestyle and activities. Carbon footprints are usually measured in equivalent tons of $CO_2$, during the period of a year, and they can be associated with an individual, an organisation, a product or an event, among others.

The assessment includes the entire life cycle of the product, process or activity, encompassing, extracting and processing raw materials; manufacturing, transportation and distribution; use, re-use, maintenance; recycling, and final disposal.

Life-cycle assessment has emerged as a valuable decision-support tool for both policy makers and industry in assessing the cradle-to-grave impacts of a product or process. Three forces are driving this evolution.

First, government regulations are moving in the direction of "life-cycle accountability;" the notion that a manufacturer is responsible not only for direct production impacts, but also for impacts associated with product inputs, use, transport, and disposal.

Second, business is participating in voluntary initiatives which contain LCA and product stewardship components. These include, for example, ISO 14000 and the Chemical Manufacturer Association's Responsible Care Program, both of which seek to foster continuous improvement through better environmental management systems.

Third, environmental "preferability" has emerged as a criterion in both consumer markets and government procurement guidelines. Together these developments have placed LCA in a central role as a tool for identifying cradle-to-grave impacts both of products and the materials from which they are made.

# 1.2 A Standardised, Transparent, Verifiable and Internationally Recognized Approach

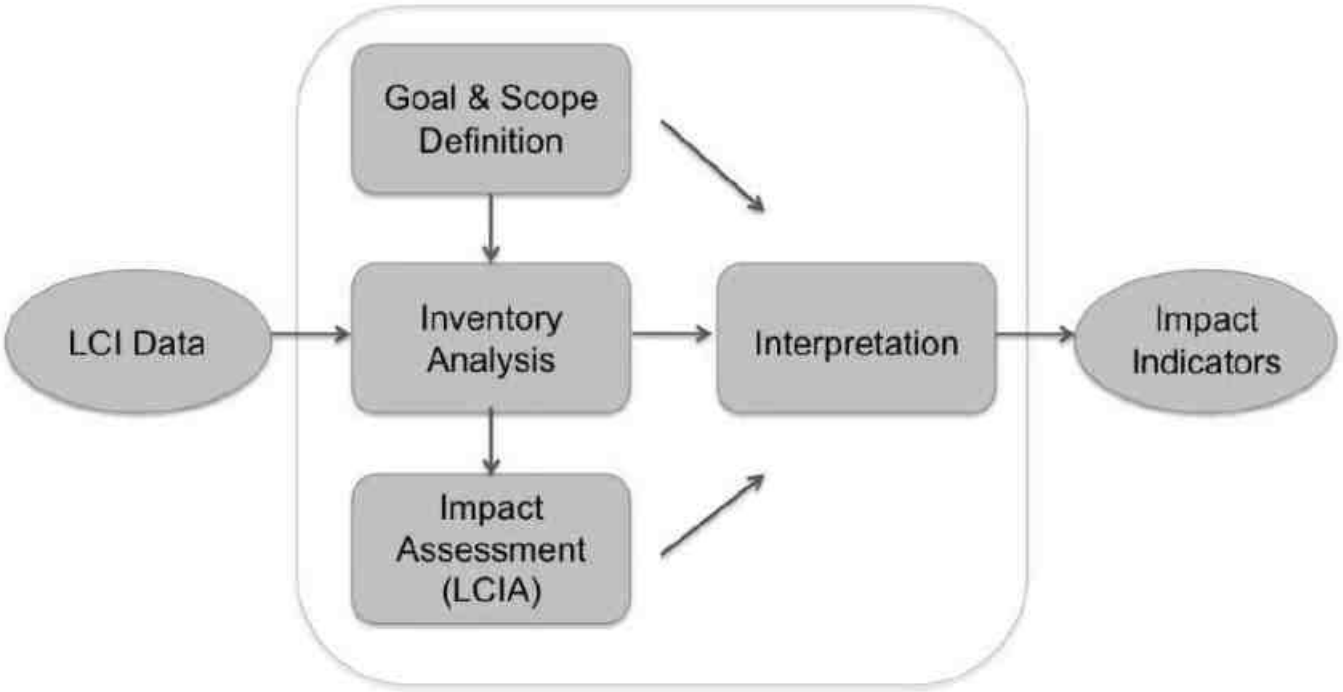
ISO has developed standards for LCA under the ISO 14040 family of international standards, notably ISO 14040:2006: Principles and framework of LCA and ISO 14044:2006: Requirements and guidelines for LCA standards.

These define the methods for developing and verifying LCAs. It is recommended that any LCA be performed according to ISO 14040 standards.

LCAs follow four fundamental steps. These steps, which are expanded later in this document, are:

1. Goal and Scope definition;
2. Inventory Analysis;
3. Impact Assessment; and
4. Interpretation.

These steps are linked in the LCA methodology diagram from the U.S. Life Cycle Inventory Database.




Source: http://www.nrel.gov/lci/assessments.html

There are also specific requirements for data quality and transparency, and requirements to ensure that the assessment is robust, for example:

- Sensitivity analysis, to understand how sensitive the results are to the methods and data; and
- Uncertainty analysis, to quantify the uncertainty introduced into the results due to the cumulative effects of model assumptions, input uncertainty and data variability.

The ISO Standards require third-party review by an independent expert panel (the “peer review” process) prior to any public communication of results.

Because of the scientific rigour required, conducting an LCA is technically challenging and time-consuming. If it is well planned, its benefits can outweigh the costs.

# 1.3 What Are the Main Reasons for Carrying Out an LCA?

## 1.3.1 Driving Performance Improvements

LCA can enable companies to prioritise environmental investments. Companies can target investments more effectively, since LCA provides a detailed breakdown of the main contributors (materials, energy sources, step of the life cycle, etc.) to key environmental impacts. With data on which choice will lead to better environmental performance, companies can choose projects with superior improvement-to-cost ratios.

LCA supports companies by looking at processes and supply chains comprehensively, which in turn can spark significant overall performance improvements. It can be a major catalyst of innovation within a company because it brings people together from different functional departments and from different points in the supply chain, many of whom may never have collaborated before, to find new ways of managing the life cycle of products. In addition, adopting an LCA approach provides a unique opportunity to rethink relationships with suppliers, notably by developing concepts of mutual progress and through improved information exchange and transparency.

LCA can contribute to cost savings through more efficient use of resources or energy, or by identifying alternative processes that lower overall production costs.

LCA can also be used to identify improvements to products, processes and services. The basis for analysis in an LCA is the functional unit, which is a description of what the product does (e.g. a paper towel cleans up a spill). The analysis is set up to avoid “false savings,” such as using fewer resources for a product that requires more units to perform the same task (e.g. a smaller paper towel may not have a lighter environmental impact if two smaller paper towels are needed for the job compared to one larger one).

Software tools have been developed based on LCA in order to support life cycle based decisions. For example the Athena Institute’s EcoCalculator for building assemblies and Impact Estimator for Buildings help designers choose building materials based on life cycle information.

LCA can be used to define key performance indicators (KPIs) to monitor progress and communicate relevant information to stakeholders, especially if the design/production process is linked to a company-wide Environmental Management System. This may also serve as the basis for new strategic positioning of products based on the integration of LCA in daily business practices, notably through eco-design, new markets or customer targets, marketing claims, etc

## 1.3.2 Effective Marketing Communications

Customers and consumers are increasingly aspiring towards healthier and more environmentally friendly consumption and greener procurement practices, and they want quality information to assist them in making choices.

Marketing claims regarding the environmental aspects of products or services are most effective when the claims are substantiated by data. Because of a growing number of unsubstantiated environmental and green claims, customers and consumers have more confidence in claims that have been verified by an independent party.

LCAs that follow an internationally recognized methodology and are verified by a panel of independent experts can provide credible information on which to base marketing communications.

LCAs provide the bases for developing Environmental Product Declarations(EPDs), which are used to communicate LCA results and other product and environmental performance information.

A key strength of LCA is the ability to communicate the multiple benefits of different initiatives a company has underway. Some companies may want to communicate only one or two elements, e.g. carbon footprint, water consumption or energy consumption. Others, however, may want to

provide a more comprehensive picture and LCA can serve as a tool to support a broad range of communications.

## 1.3.3 Meeting Stakeholders' Expectations

Innovative and proactive companies, policy-makers and NGOs are also promoting life cycle thinking since it provides a holistic view of the environmental performance of products. For example, many governments around the world are factoring in environmental requirements and performance indicators when developing procurement criteria. Investors are increasingly looking for environmental performance indicators to support their valuations and to assess company risk.

Companies' industrial customers need to address their own customers' and stakeholders' expectations and will need data from upstream in their supply chain to do so. If they are carrying out LCAs, it is likely that they will need to work with their suppliers to obtain accurate and recent data.

This raises such questions as: will the availability of an LCA carried out by a supplier be a decisive point in their choice of suppliers? Or, will the results of an LCA, and the demonstration of improvement over time, become a competitive advantage?

Retailers are beginning to launch initiatives themselves, and are pushing the need for information upstream.

For example Walmart is effectively making carbon footprinting and emissions reduction actions a requirement for its suppliers for certain product categories.

Tesco, a major retailer in the UK, introduced carbon labelling in stores in 2008 and is continually adding to the number of products labelled, which implies increasing cooperation with their suppliers

## 1.3.4 Complying With and Anticipating Legislative Requirements

To date, using life cycle approaches has been voluntary, and used mainly by companies interested in improving and disclosing the environmental performance of their products.

However, there is a trend towards increasing legislation based on environmental accounting. For example, the first Canadian mandatory requirements for greenhouse gas (GHG) reporting/accounting and emissions caps and penalties for large emitters were introduced in

2007 in the province of Alberta. Many other provinces (e.g. British Columbia, Ontario and Quebec) have implemented reporting and verification requirements for the purpose of calculating baseline emission levels in 2010.

In Europe, several legislative requirements are directly based on LCA, such as the Energy-Using Products Eco-design Directive. Many countries around the world are beginning to explore mandatory national, environmental labelling schemes. For example in France, under the Grenelle Law, the mass-market retail industry has had to display environmental information based on national LCA guidelines since 2011.

Currently Environmental labelling regulations are not considered to be technical barriers to trade under the World Trade Organization (WTO) rules. This means that companies wishing to sell products in France and other countries that have implemented similar initiatives will have to perform LCA studies and produce the required environmental information.

The cost of doing so may be very high unless companies are prepared and have already started down the LCA path. In India, it is not known whether similar legislation will be enacted.

## 1.4. Understanding the Limitations of LCA

LCA provides many benefits, however it is important to understand its limitations if it is to be used effectively. Knowing these limitations is key to determining whether it is the most appropriate tool for a given situation.

The results of an LCA are relevant for the geographic area where the data is collected. For example, an LCA conducted on an energy-intensive product in a region where electricity is mainly from hydroelectricity cannot be applied to the same product produced in another region where the electricity is mainly from fossil fuels, unless the LCA calculations are adjusted accordingly.

Inventories of the inputs and outputs are collected based on where they occur, and then are translated into environmental impacts on a global or regional scale. The results from an LCA identify potential impacts on the environment and are not a calculation of actual impacts.

Therefore LCA cannot replace local studies such as ecosystem-based studies of forest dynamics and biodiversity.

LCA is a steady-state approach. It is a snapshot at a point in time and does not capture changes over time. However, LCA practitioners are actively studying ways to address this issue.

LCA is quantitative and generates many numbers, all of which need to be interpreted. It does not provide a pass or fail result.

LCA is a risk management tool that supports the identification of the largest impacts and can provide a basis of comparison over time. Improvements will result from the quality of the subsequent decisions.

LCA is an environmental accounting tool with an inherent level of uncertainty and it should not be seen as having the same level of precision as financial accounting. LCA requires a very large amount of data, particularly to calculate all the inputs and outputs for every step. Databases are often used since it is impractical to collect all the necessary data from original sources (e.g. cannot get data from all the specific power plants from which electricity was sourced).

Databases are improving, but practitioners need to understand all the assumptions, the age of the data, etc., and this may not be possible for every data point. There are numerous assumptions made during the assessment.

For example, practitioners have to make assumptions about how to allocate electricity used in a plant which produces multiple products on the same equipment. Additionally, turning the inputs and outputs into their impacts on the environment is not an exact science and there are several credible methodologies that are used for impact assessment.

The results of two LCAs on the same subject may differ according to the objectives, processes, quality of the data, assumptions and the impact assessment methods used. This makes transparency in LCA reporting a crucial element for communication and is the reason why ISO standards require it.

Conducting an LCA is very resource-intensive, requiring personnel with the necessary expertise, access to data and databases as well as specialised software.

LCA typically does not address the economic or social aspects of a product, however the life cycle approach and methodologies described in the ISO standards could be applied to these aspects.

Understanding LCA's limitations upfront during the planning phase will help to ensure that the goals of the assessment are achieved or determine whether other life cycle approaches would be more appropriate.

Understanding LCA's limitations along with its benefits will also improve understanding of LCAs presented by others.

# 2 Project Details

| S. No. | Details | Description |
|---|---|---|
| 1 | Name | Development of an Industrial Park at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu over an extent of 796.240 hectares (1966.713 acres) |
| 2 | Area / Size | 796.24 ha |
| | Production capacity | 300,000 TPA for Lyocell & 100,000 for Tissue |
| 3 | Project Location (Address) | The plant is located at Allikulam, Keelathattaparai, Perurani, Umarikottai, Melathattaparai, Ramasamypuram and Therkusillukkanpatti Villages, Thoothukudi Taluk, Thoothukudi District, Tamil Nadu |

# 3 Methodology

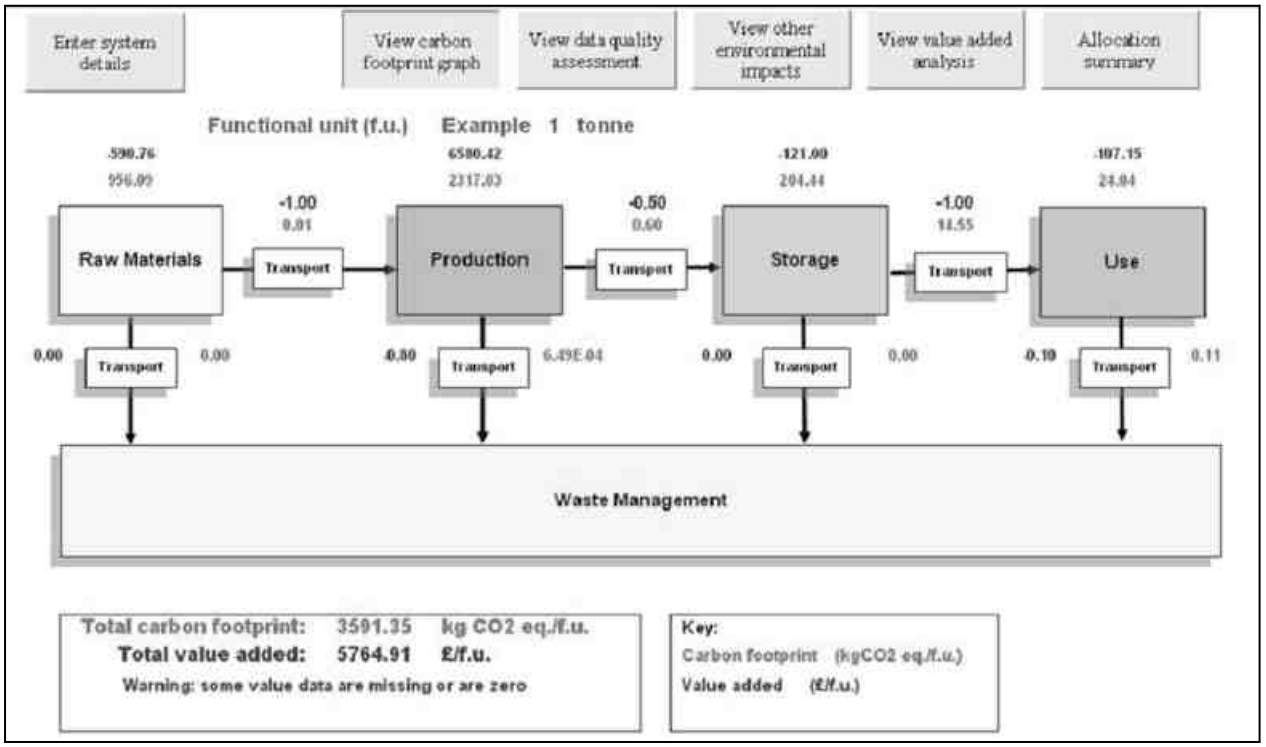
## 3.1 Life Cycle Assessment

The methodology used for the evaluation of impacts associated with the project in question was derived from a paper by Gonzalez et al. which explored the idea of a gate to gate approach to LCA.

The methodology therefore calculates the impacts of a project as a result of its direct processes only and does not take into account the indirect emissions and impacts, this is done by using a modified calculation method developed by Perfact using CCalc2.

CCalc2 is a tool developed by Prof. Adisa Azapagic of the University of Manchester, UK to evaluate the carbon footprint of industrial activities in an easy, approachable manner. It is a

simple but powerful software that can help reduce the carbon footprint by making it easy to observe the carbon “hot spots”.



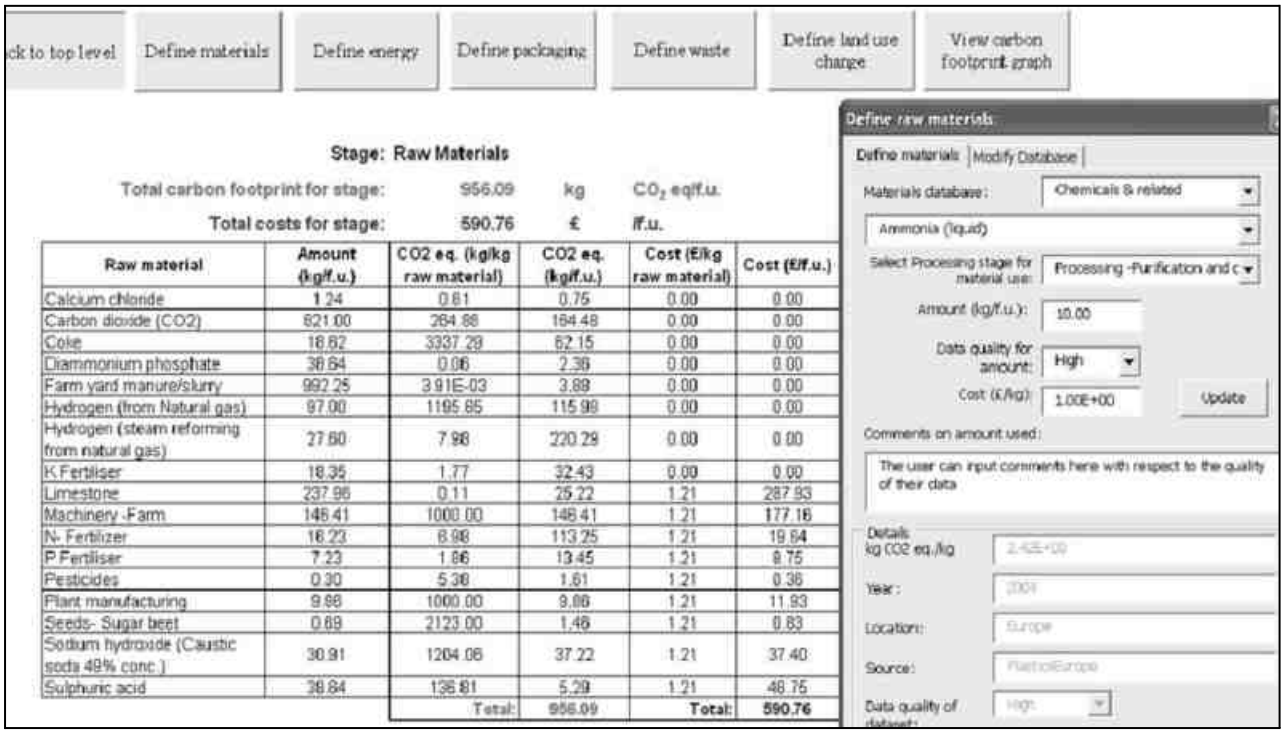




*Figure 1. CCalc2 Modelling Illustration*

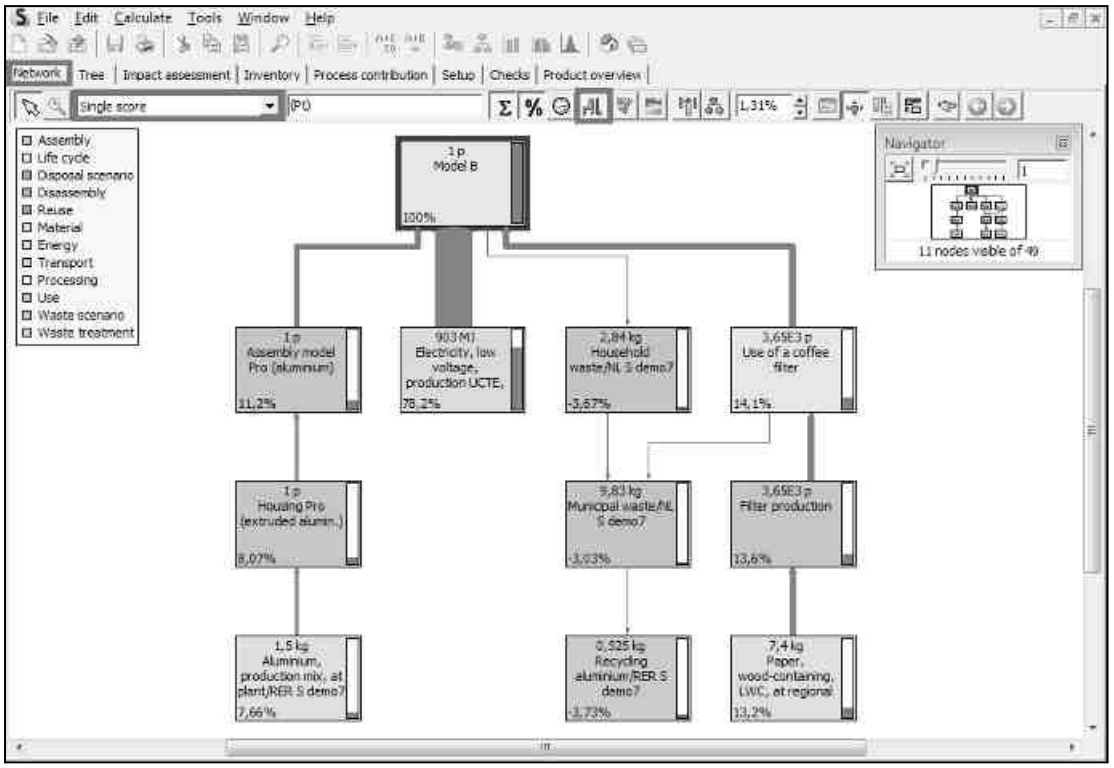
SimaPro helps you effectively apply your sustainability expertise to empower informed decision-making, change product life cycles for the better, and increase your company’s positive

impact. The software empowers you to gain insights into the environmental performance of products and services and become an informed change-maker that truly drives sustainable change.

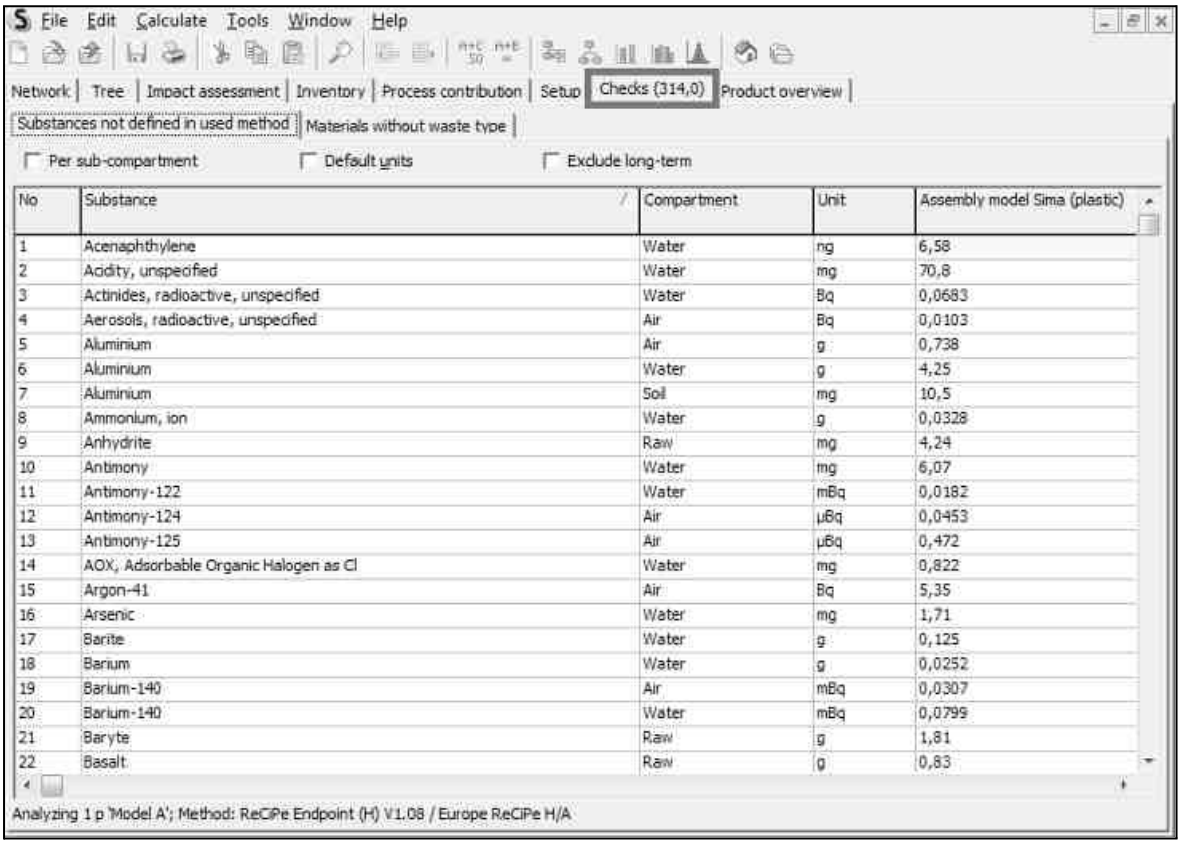
SimaPro has been among the leading LCA software solutions for over 30 years – used by companies, consultancies and universities in more than 80 countries. Developed by PRé Sustainability, SimaPro was designed to be a source of science-based information, providing full transparency and avoiding black-box processes. It is the solution to collect, analyse and monitor the sustainability performance data of products and services. The software can be used for various applications: sustainability reporting, carbon and water footprinting, product design, generating environmental product declarations and determining key performance indicators.

With SimaPro, you can:

- Easily model and analyse complex life cycles in a systematic and transparent way.
- Measure the environmental impact of your products and services across all life cycle stages.
- Identify the hotspots in every link of your supply chain, from extraction of raw materials to manufacturing, distribution, use, and disposal.



This model is then further fed into Sima Pro v8.4 for quantification of impacts and comparing the results of the model with the values from literature to get a better understanding of carbon hotspots in the system and the final Life cycle Impacts associated with the scope.




| No | Substance | Compartment | Unit | Assembly model Sima (plastic) |
|---|---|---|---|---|
| 1 | Acenaphthylene | Water | ng | 6,58 |
| 2 | Acidity, unspecified | Water | mg | 70,8 |
| 3 | Actinides, radioactive, unspecified | Water | Bq | 0,0683 |
| 4 | Aerosols, radioactive, unspecified | Air | Bq | 0,0103 |
| 5 | Aluminium | Air | g | 0,738 |
| 6 | Aluminium | Water | g | 4,25 |
| 7 | Aluminium | Soil | mg | 10,5 |
| 8 | Ammonium, ion | Water | g | 0,0328 |
| 9 | Anhydrite | Raw | mg | 4,24 |
| 10 | Antimony | Water | mg | 6,07 |
| 11 | Antimony-122 | Water | mBq | 0,0182 |
| 12 | Antimony-124 | Air | µBq | 0,0453 |
| 13 | Antimony-125 | Air | µBq | 0,472 |
| 14 | AOX, Adsorbable Organic Halogen as Cl | Water | mg | 0,822 |
| 15 | Argon-41 | Air | Bq | 5,35 |
| 16 | Arsenic | Water | mg | 1,71 |
| 17 | Barite | Water | g | 0,125 |
| 18 | Barium | Water | g | 0,0252 |
| 19 | Barium-140 | Air | mBq | 0,0307 |
| 20 | Barium-140 | Water | mBq | 0,0799 |
| 21 | Baryte | Raw | g | 1,81 |
| 22 | Basalt | Raw | g | 0,83 |

*Figure 2. Sima Pro v8.4 Modelling Illustration*

By using a modified version of the CCalc Software along with the corrected values for the Indian context, and with the use of Sima Pro v8.4 as calculation software, calculation is done for the evaluation of Carbon Footprint using data already available to industry.

# 3.2 Scope of LCA

The Scope of the LCA for the aforementioned project was defined as given in the figure below where the blue box represents our scope.

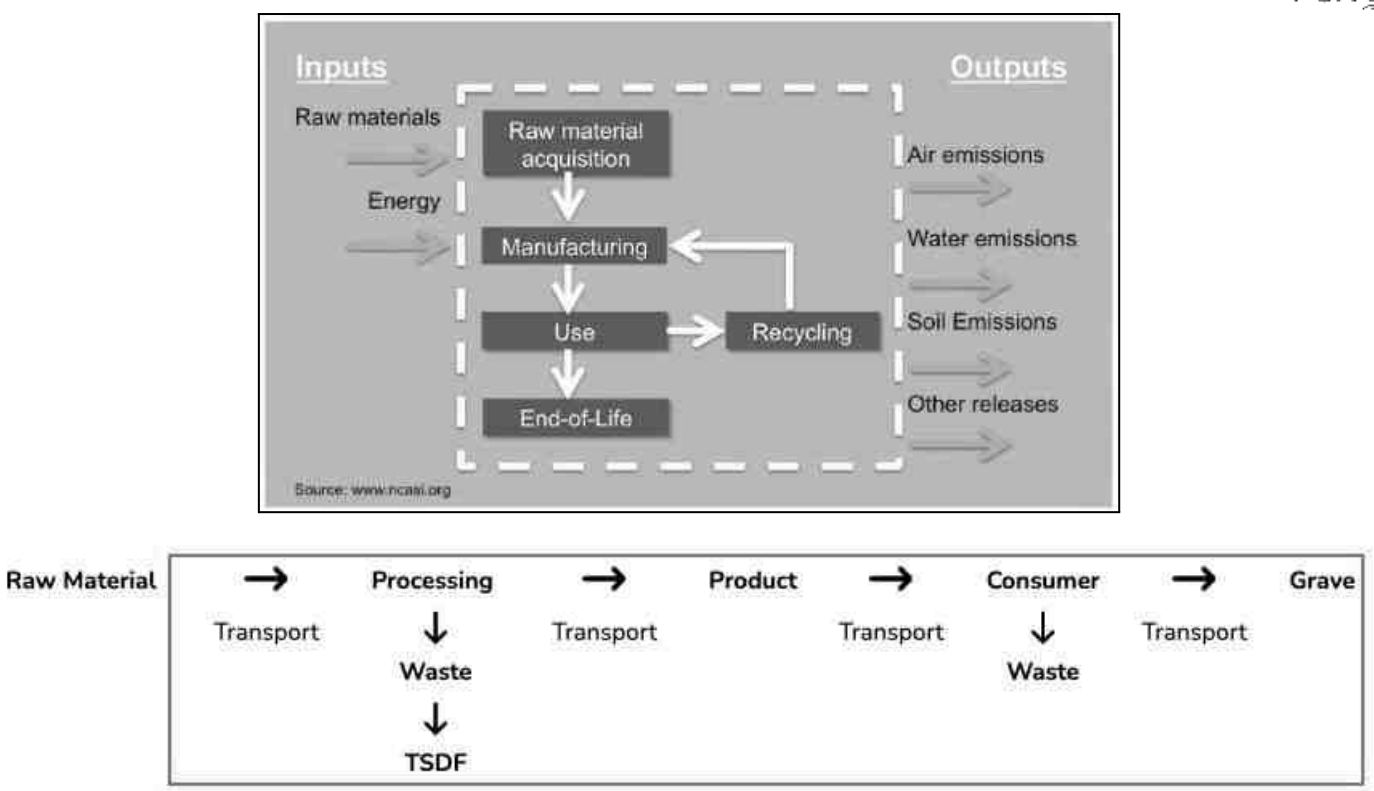



*Figure 3. Scope of LCA*

The scope for this LCA was taken to be a “Gate to Grave” wherein by using Functional Unit as 1 year of Plant Operation at peak load under usual business conditions, the carbon impact was evaluated.

The Scope is defined as taking into account the: Processing of Raw Material, Waste and Effluent from Process, Transport of Raw Material to Plant, Products and Byproducts to Consumer and Transport of waste to the TSDF.

The notable exclusions being the sourcing of RM and embodied carbon in the materials used.

# 3.3 Functional Unit of LCA

The Functional unit chosen by the approach is for one year of operation of the plant at 100% Capacity with 313 working days and 24 hours of operation.

The limitations of the calculation methodology devised are that the emission factors for many parameters are evaluated based on the UK and Canadian data available and that the correction factors applied based on the uncertainty of the factors as given in literature may lead to errors.

The formula used by the software for the calculation of the carbon footprint is:

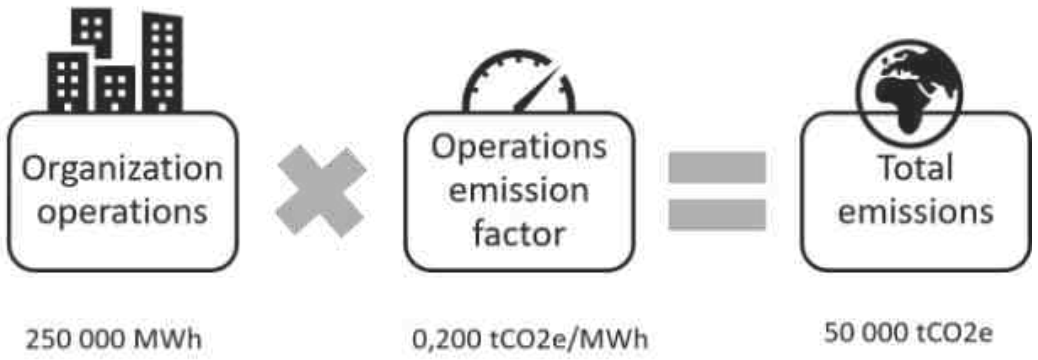



*Figure 4. Calculation of Carbon Footprint*

# 3.4 Carbon Sequestration

Carbon sequestration is the process of capturing produced carbon dioxide and subsequently storing it safely, away from the atmosphere. It is a method that reduces the amount of carbon dioxide in the atmosphere, aiming at reducing global warming and climate change. It also aims at stabilising the amounts of the greenhouse gas concentration in the atmosphere, and reducing the human 'carbon footprint'. It is a natural occurrence but could also occur as a result of anthropogenic activities, which also sees carbon being stored from becoming carbon dioxide gas.

For the calculation of carbon dioxide sequestration due to the activities described in the report, the major carbon sinks are the trees and therefore the carbon sequestration due to the trees needs to be calculated using an easy and traceable method.

The rate of carbon sequestration depends on the growth characteristics of the tree species, the conditions for growth where the tree is planted, and the density of the tree's wood.

It is greatest in the younger stages of tree growth, between 20 to 50 years. Further complicating the issue is the fact that far less research has been done on tropical tree species as compared to temperate tree species.

Nevertheless, we can roughly estimate the amount of $CO_2$ sequestered in a given tree, and if we divide by the tree's age, get a yearly sequestration rate.

Therefore the methodology consists of the following steps,

1. Determine the total (green) weight of the tree.
2. Determine the dry weight of the tree.
3. Determine the weight of carbon in the tree.
4. Determine the weight of carbon dioxide sequestered in the tree
5. Determine the weight of CO2 sequestered in the tree per year

## 3.4.1 Determine the total (green) weight of the tree

The algorithm to calculate the weight of a tree is:

For trees with D < 11:

$W = 0.25*D^2*H$

For trees with D >= 11:

$W = 0.15*D^2*H$

Where,

W = Above-ground weight of the tree in pounds

D = Diameter of the trunk in inches

H = Height of the tree in feet

Depending on the species, the coefficient (e.g. 0.25) could change, and the variables D2 and H could be raised to exponents just above or below 1.

However, these two equations could be seen as an “average” of all the species’ equations.

The root system weighs about 20% as much as the above-ground weight of the tree. Therefore, to determine the total green weight of the tree, multiply the above-ground weight of the tree by 120%.

## 3.4.2 Determine the dry weight of the tree

This is based on an extension publication from the University of Nebraska. This publication has a table with average weights for one cord of wood for different temperate tree species. Taking all species in the table into account, the average tree is 72.5% dry matter and 27.5% moisture.

Therefore, to determine the dry weight of the tree, multiply the weight of the tree by 72.5%.

## 3.4.3 Determine the weight of carbon in the tree

The average carbon content is generally 50% of the tree’s total volume.

Therefore, to determine the weight of carbon in the tree, multiply the dry weight of the tree by 50%.

## 3.4.4 Determine the weight of carbon dioxide sequestered in the tree

$CO_2$ is composed of one molecule of Carbon and 2 molecules of Oxygen.

The atomic weight of Carbon is 12.001115.

The atomic weight of Oxygen is 15.9994.

The weight of $CO_2$ is C+2*O = 43.999915.

The ratio of $CO_2$ to C is 43.999915/12.001115 = 3.6663.

Therefore, to determine the weight of carbon dioxide sequestered in the tree, multiply the weight of carbon in the tree by 3.6663.6

## 3.4.5 Determine the weight of $CO_2$ sequestered in the tree per year

Simply, Divide the weight of carbon dioxide sequestered in the tree by the age of the tree.

## 3.4.6 Illustrative Example

Estimated growth rates and sizes of agroforestry trees were taken from the World Agroforestry Centre's "Agroforestree Database"7:

Let's see how much a *Calliandra calothyrsus* might sequester in a year.

A 10-year-old Calliandra would probably grow about 15 feet tall with a trunk about 8 inches in diameter. Therefore:

$W = 0.25*D^2*H = (0.25)(8^2)(15) = 240$ lbs. green weight above ground.

240 lbs. * 120% = 288 lbs. green weight (roots included)

288 lbs. * 72.5% = 208.8 lbs. dry weight

208.8 lbs. * 50% = 104.4 lbs. carbon

104.4 lbs * 3.6663 = 382.8 lbs. $CO_2$ sequestered

382.8 lbs / 10 years = 38.3 lbs. $CO_2$ sequestered per year

# 4 Life Cycle Analysis

## 4.1 Life Cycle Inventory

During the scope definition phase, the LCA was limited to the following products as given below:

*Table 1. List of products*

| S. No | Product | Total Production Capacity |
|---|---|---|
| 1 | Lyocell | 300,000 TPA |
| 2 | Tissue | 100,000 TPA |

These products were then evaluated on their emissions, effluent generated, transportation, electrical load ,and waste treatment at TSDF.

## 4.2 Calculation of Potentials

The calculation of carbon footprint associated with the functional unit is illustrated below:

$$Emissions_{SO2}\,(g/s) = Emissions_{SO2}\,(kg/year\ of\ operation)$$

$$Emissions_{SO2}(kg/year\ of\ operation) * Emission\ Factor\ (kg\ CO2\ Eq./kg) = Carbon\ Footprint_{SO2}\,(kg\ CO2\ Eq.)$$

*Table 2. Cumulative emission load- Air*

| **Emission Load Cumulative** | | | | |
|---|---|---|---|---|
| **Source** | **PM (kg/year)** | **$SO_2$ (kg/year)** | **$NO_2$ (kg/year)** | **$CO_2$ (kg/year)** |
| **Utility** | 35426.6 | 152253.2 | 98707.7 | 0.0 |
| **Process** | 30315.4 | 5462.7 | 8112.96 | 124669.1 |

*Table 3. Cumulative emission load- Water*

| **Effluent Load Cumulative** | | |
|---|---|---|
| **Effluent Stream** | **COD in kg removed per year** | **BOD in kg removed per year** |

| | | |
|---|---|---|
| **LCOD/LTDS** | 3647389.0 | 3877694.4 |

*Table 4. Cumulative emission load- Transport*

| **Transport Load Cumulative** | | |
|---|---|---|
| | **Type of Transport** | **Total km per year** |
| **Raw Material** | Truck | 8404050.00 |
| **Product to Consumer** | Truck | 98404050.0 |
| **Waste to TSDF** | Truck | 18.8 |

*Table 5. Cumulative emission load-Electricity*

| **Electricity Load Cumulative per Year** | | |
|---|---|---|
| | **Source** | **Total kWh per year** |
| **Electricity for production** | TANGEDCO | 411056640 |
| **Electricity for Other Uses** | Renewable Energy | 21634560 |

*Table 6. Green Area Carbon Sequestration*

| **Carbon Sequestered by Trees per Year** | | | | |
|---|---|---|---|---|
| **S. No** | **Species** | **Common name** | **No. of Trees** | **CO2 sequestered in Kg /yr** |
| 01 | *Pongamia pinnata* | Pungam | 60,000 | 2,921.26 |
| 02 | *Albizia lebbeck* | Vaagai | 55,000 | 2,699.60 |
| 03 | *Syzygium cumini* | Naval | 42,000 | 1,115.87 |
| 04 | *Terminalia arjuna* | Maruthu | 35,600 | 955.71 |
| 05 | *Cassia fistula* | Sarakondrai | 30,300 | 1,447.60 |
| 06 | *Butea monosperma* | Murukkamaram | 25,050 | 1,236.97 |
| 07 | *Lagerstroemia speciosa* | Poo Marudhu | 20,500 | 591.71 |
| 08 | *Ficus amplissima* | Kallthi | 19,500 | 570.07 |
| 09 | *Bauhinia purpurea* | Mantharai | 19,500 | 561.23 |

| | | | | |
|---|---|---|---|---|
| 10 | *Madhuca longifolia* | Illuppai | 18,000 | 518.05 |
| 11 | *Albizia amara* | Usil | 18,000 | 880.20 |
| 12 | *Calophyllum inophyllum* | Punnai | 17,000 | 490.68 |
| 13 | *Terminalia bellirica* | Thandri | 17,000 | 490.68 |
| 14 | *Terminalia chebula* | Kadukkai | 16,500 | 809.88 |
| 15 | *Pterocarpus marsupium* | Vengai | 16,500 | 814.77 |
| 16 | *Hardwickia binata* | Aacha | 16,500 | 806.85 |
| 17 | *Diospyros ebenum* | Karungali | 16,500 | 471.45 |
| 18 | *Prosopis cineraria* | Vanni maram | 16,010 | 462.11 |
| 19 | *Aegle marmelos* | Vilvam | 16,000 | 449.68 |
| 20 | *Saraca asoca* | Asoca | 15,000 | 428.59 |
| 21 | *Chloroxylon swietenia* | Purasa maram | 15,000 | 431.71 |
| 22 | *Cassia roxburghii* | Sengondrai | 15,000 | 431.71 |
| 23 | *Limonia acidissima* | Vila maram | 15,000 | 740.70 |
| 24 | *Wrightia tinctoria* | Veppalai | 12,000 | 589.00 |
| 25 | *Wrightia tomentosa* | Valsurai | 12,000 | 577.54 |
| 26 | *Bauhinia racemosa* | Aathi | 12,000 | 571.29 |
| 27 | *Dillenia pentagyna* | Uva | 12,000 | 571.29 |
| 28 | *Dillenia indica* | Siru Uva | 11,000 | 316.59 |
| 29 | *Manilkara hexandra* | Ulakkai Paalai | 10,000 | 285.73 |
| 30 | *Mimusops elengi* | Magizhmaram | 10,000 | 287.81 |
| 31 | *Ficus religiosa* | Arasa maram (added) | 10,000 | 494.25 |
| 32 | *Morinda pubescens* | Nuna | 9,005 | 440.34 |
| 33 | *Morinda citrifolia* | Vellai Nuna | 9,000 | 441.75 |
| 34 | *Premna serratifolia* | Narummunai | 9,000 | 447.91 |
| 35 | *Premna mollissima* | Munnai | 9,000 | 444.42 |
| 36 | *Lannea coromandelica* | Odhiyam | 8,500 | 417.21 |
| 37 | *Litsea glutinosa* | Pisinpattai | 8,251 | 401.72 |

| | | | | |
|---|---|---|---|---|
| 38 | *Creteva adansonii* | Mavalingum | 7,301 | 206.61 |
| 39 | *Cordia dichotoma* | Mookuchalimaram | 7,105 | 204.49 |
| 40 | *Adenanthera pavonina* | Manjadi | 7,100 | 214.91 |
| 41 | *Hibiscus tiliaceus* | Aathupoovarsau | 6,002 | 288.87 |
| 42 | *Holoptelea integrifolia* | Aayili | 5,510 | 272.08 |
| 43 | *Phoenix sylvestris* | Eachai | 5,000 | 246.90 |
| 44 | *Pterospermum xylocarpum* | Polavu | 5,000 | 244.50 |
| 45 | *Pterospermum acescens* | Vennangu | 3,350 | 161.23 |
| 46 | *Bobax ceiba* | Ilavu | 3,330 | 163.45 |
| 47 | *Buchanania axillaris* | Kattuma | 3,000 | 147.25 |
| 48 | *Cochlospermum religiosum* | Kongu | 3,002 | 147.35 |
| 49 | *Puthranjiva roxburghii* | Puthranjivi | 2,551 | 73.95 |
| 50 | *Salvadora persica* | Ugaa Maram | 2,000 | 57.15 |
| 51 | *Sapindus emarginatus* | Soapkudai | 2,000 | 56.60 |
| 52 | *Streblus asper* | Pirayamaram | 2,000 | 81.06 |
| 53 | *Strychnos nux-vomica* | Yetti | 2,000 | 81.06 |
| 54 | *Strychnos potatorum* | Therthang Kottai | 2,000 | 81.06 |
| 55 | *Mitragyna parvifolia* | Kadambu | 1,950 | 79.03 |
| 56 | *Trewia ciliata* | Sandhanavembu | 1,501 | 60.83 |
| 57 | *Borassus flabellifer* | Panai | 1,495 | 60.59 |
| 58 | *Diospyros chloroxylon* | Vaganai | 1,302 | 63.91 |
| 59 | *Lepisanthus tetraphylla* | Neikottaimaram | 1,300 | 38.00 |
| 60 | *Bauhinia tomentosa* | Iruvathi | 1,200 | 35.17 |

# 5 Results

The results of the analysis done are given below:

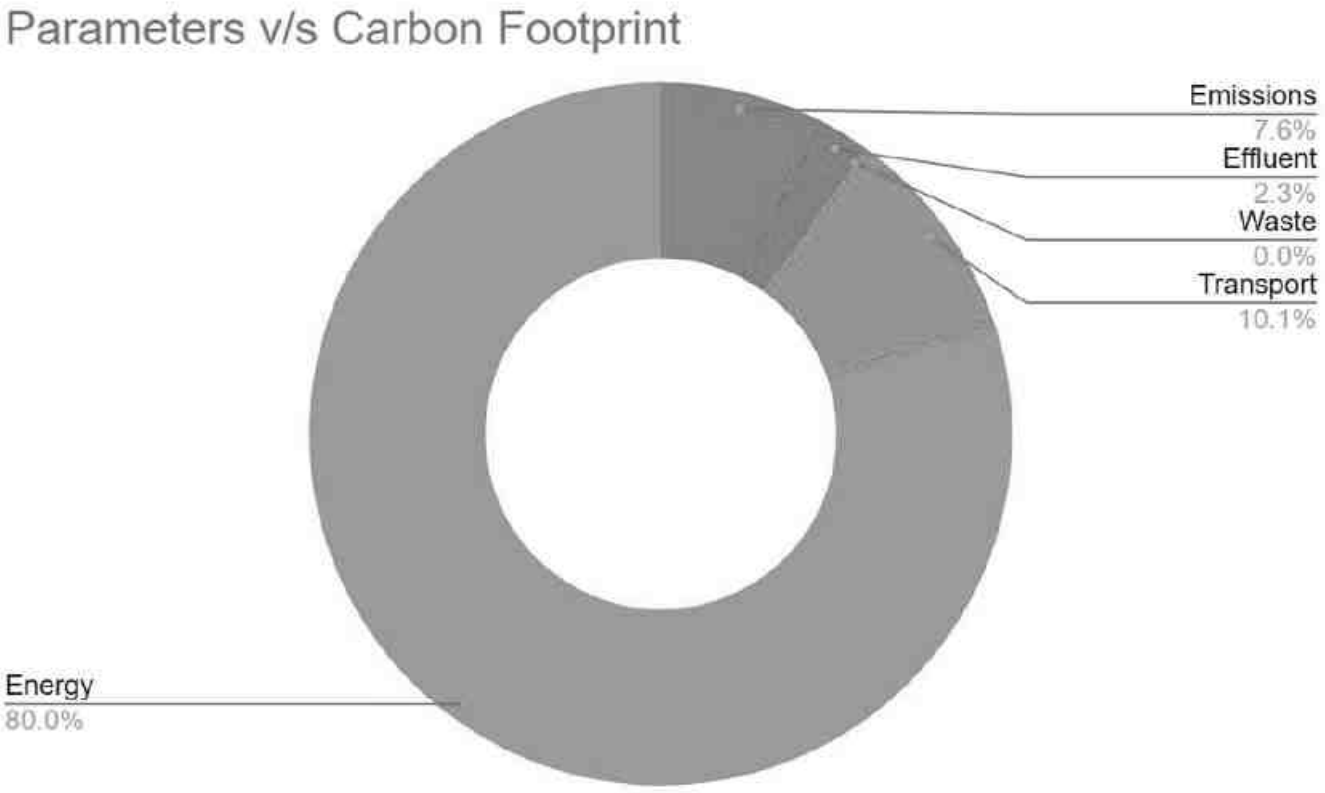



*Figure 1. Parameters v/s Kg CO2 Eq.*

*Table 7. Carbon Footprint*

| Carbon Footprint | |
|---|---|
| **Parameters** | **Tonnes CO2-eq.** |
| Emissions | 31,932.37 |
| Effluent | 9,643.04 |
| Waste | 0.01 |
| Transport | 42,723.24 |
| Energy | 337,066.44 |
| Carbon Sequestered through Plantation | 94,679.40 |
| Carbon Avoided through Renewable Energy | 1,532.16 |
| **Total w/o Offset** | 421365.1 |
| **Total Residual Emissions** | 325,153.54 |

*Table 8. Calculated Life Cycle Impact Potentials*

| Life Cycle Impact Potential | | |
|---|---|---|
| **Acidification Potential** | 223,858.08 | kg SO2-eq |
| **Eutrophication Potential** | 815,735.50 | kg PO4-eq. |
| **Climate Change Potential** | 325,153,541.36 | kg CO2-eq. |
| **Photochemical Smog Potential** | 253,549.44 | kg C2H4-eq. |
| **Human Toxicity** | 436,052.16 | kg 1,4 C6H4CL2-eq |

# 6 Conclusions

The projected annual CO2 emissions during peak operations are substantial, at 421365.1 metric tonnes, translating to 0.82 tonnes of CO2 equivalent per tonne of production. However, the establishment of a green belt covering an area of 301.686 Ha of the total land, which will be 40.52% of total land area with a total 7,54,215 number of trees shall be planted as per CPCB norms (considering 2500 trees per hectare). The company aims to offset 94,679.40 metric tonnes of CO2 equivalent annually, which is 22.47 % of the total emissions, by cultivating this green space within the plant's premises each year of operation. Consequently, the net residual CO2 emissions at full capacity are expected to be 325,153.54 metric tonnes of CO2 equivalent per annum, or approximately 0.63 tonnes of CO2 equivalent per tonne of production.

Further, the acidification potential is estimated at approximately 223.85 tonnes of $SO_2$-equivalent per year, indicating the release of emissions that can lead to acid rain and soil degradation. The Eutrophication Potential stands at around 815.73 tonnes of $PO_4$-equivalent annually, reflecting nutrient enrichment in water bodies that can cause harmful algal blooms and aquatic ecosystem imbalance. The Climate Change Potential is the most significant, with approximately 325,153.5 tonnes of $CO_2$-equivalent emissions per year, representing the system's contribution to global warming through greenhouse gas emissions. The Photochemical Smog Potential is about 253.54 tonnes of $C_2H_4$-equivalent per year,

highlighting the formation of ground-level ozone and urban smog from reactive emissions. Lastly, the Human Toxicity Potential amounts to roughly 436.05 tonnes of 1,4-dichlorobenzene-equivalent per year, indicating the potential human health risks due to toxic chemical exposure throughout the product's life cycle. Together, these indicators provide a comprehensive picture of the environmental and human health burdens associated with the system or process under study.

The pie chart analysis indicates that the primary contributor to the project's carbon footprint is energy consumption. To mitigate this, it is recommended to investigate alternative energy sources such as solar power. Adopting energy-saving practices, including the deployment of LED lighting, automated electricity shut-offs, and more efficient pump systems, should be considered. The installation of a heat recovery system could capitalize on the hot water produced in processing and utility areas. Additionally, shifting load times to off-peak periods and implementing a demand controller to manage peak demand can lead to significant power cost savings and further energy conservation over time.

# 7 References


1. AECOM, C. (2022). Retrieved 10 April 2022, from https://www.winnipeg.ca/finance/findata/matmgt/documents/2012/682-2012/682-2012_Appendix_H-WSTP_South_End_Plant_Process_Selection_Report/Appendix%207.pdf

2. Azapagic, A. (2022). CCaLC • Carbon Calculations over the Life Cycle of Industrial Activities. Retrieved 10 April 2022, from http://www.ccalc.org.uk/

3. Chai, C., Zhang, D., Yu, Y., Feng, Y., & Wong, M. (2015). Carbon Footprint Analyses of Mainstream Wastewater Treatment Technologies under Different Sludge Treatment Scenarios in China. *Water*, *7*(12), 918-938. doi: 10.3390/w7030918

4. Haas, D., Foley, J., & Barr, K. (2008). GREENHOUSE GAS INVENTORIES FROM WWTPs – THE TRADE-OFF WITH NUTRIENT REMOVAL. *Proceedings Of The Water Environment Federation*, *2008*(6), 264-285. doi: 10.2175/193864708788808456

5. Jiménez-González, C., Kim, S., & Overcash, M. (2000). Methodology for developing gate-to-gate Life cycle inventory information. *The International Journal Of Life Cycle Assessment*, *5*(3), 153-159. doi: 10.1007/bf02978615

6. Jo, G., Kalantarifard, A., Jang, J., Byeon, E., Jang, y., & Yang, G. (2022). The effects of malodorous substances from Municipal Solid Waste (MSW) to Climate-Change as Greenhouse-Gas:

Calculating GWP of Hydrogen Sulfide. Retrieved 10 April 2022, from https://www.jstage.jst.go.jp/article/jsmcwm/26/0/26_547/_article/-char/en

# Annexure 9- Test Report

# PERFACT RESEARCHERS PVT LTD

TC-8993

## TEST REPORT



ULR NO. : TC699325000065354F
Test Report No. : PRPL/AS/250415-001
Date of Issue : 15.04.2025
Reference No. : TRF

**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**

**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

## SAMPLE PARTICULARS

Name of the Sample : Ambient Air
a)Details of Sampling
b)Sampling Protocol : IS : 5182 Part-14
c)Equipment Used : RDS, FDS
d)Sampling Done By : Mr. Dharmendra & Mr. Pushpendra
e)Duration of Sampling : 24 Hrs.
f)Sampling Location : Onsite West

Physical Observation
(a) Sampling Flow Rate for Gases : 0.5 LPM
(b) Sampling Flow Rate For RSPM/: 0.95m3/min
PM-10 (Ave.)

## TEST RESULTS

| Parameters: - | | | | | | | Particulate Matter ($PM_{10}$) | Particulate Matter ($PM_{2.5}$) |
|---|---|---|---|---|---|---|---|---|
| Units: - | | | | | | | µg/m³ | µg/m³ |
| Test Method: - | | | | | | | IS : 5182 P-23, 2006 | IS : 5182 P-24, 2019 |
| Requirements/Specification (As per CPCB Vol -II): - | | | | | | | 100 (24 Hrs) | 60 (24 Hrs) |
| Sample Receiving Date | Sampling Date | | Ambient Condition (Physical Observation) | | | Sample ID PRPL/AS/ | Results | |
| | Start | End | Weather Condition | Wind Direction | Temperature, °C (max./min.) | | | |
| 06.03.2025 | 28.02.2025 | 01.03.2025 | Haze | ENE | 34 °C/26 °C | 250225-001 | 27.37 | 17.57 |
| 06.03.2025 | 03.03.2025 | 04.03.2025 | Fair | ESE | 37 °C/25 °C | 250225-002 | 32.48 | 20.46 |
| 13.03.2025 | 07.03.2025 | 08.03.2025 | Mist | ENE | 38 °C/24 °C | 250225-003 | 28.75 | 18.36 |
| 13.03.2025 | 10.03.2025 | 11.03.2025 | Partly Cloudy | NNE | 30 °C/24 °C | 250225-004 | 27.8 | 17.6 |
| 20.03.2025 | 14.03.2025 | 15.03.2025 | Partly Cloudy | E | 36 °C/26 °C | 250225-005 | 31.79 | 20.43 |
| 20.03.2025 | 17.03.2025 | 18.03.2025 | Partly Cloudy | ENE | 37 °C/28 °C | 250225-006 | 30.15 | 19.35 |
| 27.03.2025 | 21.03.2025 | 22.03.2025 | Partly Cloudy | ESE | 38 °C/27 °C | 250225-007 | 35.69 | 21.28 |
| 27.03.2025 | 24.03.2025 | 25.03.2025 | Fair | ESE | 37 °C/26 °C | 250225-008 | 30.25 | 19.91 |
| 07.04.2025 | 31.03.2025 | 01.04.2025 | Haze | ENE | 37 °C/28 °C | 250225-009 | 25.75 | 16.44 |
| 07.04.2025 | 03.04.2025 | 04.04.2025 | Partly Cloudy | ESE | 37 °C/27 °C | 250225-010 | 24.99 | 15.99 |
| 12.04.2025 | 07.04.2025 | 08.04.2025 | Fair | E | 37 °C/28 °C | 250225-011 | 26.31 | 17.45 |
| 12.04.2025 | 10.04.2025 | 11.04.2025 | Mostly Cloudy | SW | 39 °C/32°C | 250225-012 | 25.61 | 17.58 |

Pushpendra Singh
Manager
Reviewed By

Perfact Researchers Pvt. Ltd. DELHI

Rachna Dogra
Sr. Vice President
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  (in case of non-perishable products only)
  Document No.: PRPL/AA/7.8 F-07

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**
**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

ULR NO. : TC699325000065354F
Test Report No. : PRPL/AS/250415-001
Date of Issue : 15.04.2025
Reference No. : TRF

## TEST RESULTS

| Parameters: - | | Nitrogen Dioxide ($NO_2$) | Sulphur Dioxide ($SO_2$) | CO |
|---|---|---|---|---|
| Units: - | | µg/m³ | µg/m³ | mg/m³ |
| Test Method: - | | IS : 5182 P-6, 2006 | IS : 5182 P-2, Sec-1, 2023 | IS : 5182 P-10, 1999 |
| Requirements/Specification (As per CPCB Vol-II): - | | 80 (24 Hrs) | 80 (24 Hrs) | 2 (8 Hrs) |
| Analysis | | Results | | |
| Start Date | End Date | | | |
| 06.03.2025 | 10.03.2025 | 20.10 | 6.50 | 0.60 |
| 06.03.2025 | 10.03.2025 | 18.03 | 6.96 | 0.54 |
| 13.03.2025 | 17.03.2025 | 20.85 | 7.58 | 0.63 |
| 13.03.2025 | 17.03.2025 | 20.0 | 7.4 | 0.60 |
| 20.03.2025 | 24.03.2025 | 22.35 | 8.14 | 0.67 |
| 20.03.2025 | 24.03.2025 | 20.43 | 8.20 | 0.61 |
| 27.03.2025 | 31.03.2025 | 22.94 | 8.19 | 0.69 |
| 27.03.2025 | 31.03.2025 | 16.51 | 9.53 | 0.50 |
| 07.04.2025 | 11.04.2025 | 17.22 | 6.51 | 0.52 |
| 07.04.2025 | 11.04.2025 | 18.35 | 6.50 | 0.55 |
| 12.04.2025 | 15.04.2025 | 18.96 | 7.47 | 0.57 |
| 12.04.2025 | 15.04.2025 | 14.00 | 5.83 | 0.42 |

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**Pushpendra Singh**
**Manager**
**Reviewed By**

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Document No.: PRPL/AA/7.8 F-07

# TEST REPORT



Test Report No. : PRPL/AS/250605-001
Date of Issue : 05.06.2025
Reference No. : TRF

**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**
**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

## SAMPLE PARTICULARS

Name of the Sample : Ambient Air
a)Details of Sampling
b)Sampling Protocol : IS : 5182 Part-14
c)Equipment Used : RDS, FDS
d)Sampling Done By : Mr. Dharmendra & Mr. Pushpendra
e)Duration of Sampling : 24 Hrs.
f)Sampling Location : Onsite West

Physical Observation
(a) Sampling Flow Rate for Gases : 0.5 LPM
(b) Sampling Flow Rate For RSPM/: 0.85m3/min
PM-10 (Ave.)

## TEST RESULTS

| Parameters: - | | | | | | | Particulate Matter ($PM_{10}$) | Particulate Matter ($PM_{2.5}$) |
|---|---|---|---|---|---|---|---|---|
| Units: - | | | | | | | µg/m³ | µg/m³ |
| Test Method: - | | | | | | | IS : 5182 P-23, 2006 | IS : 5182 P-24, 2019 |
| Requirements/Specification (As per CPCB Vol -II): - | | | | | | | 100 (24 Hrs) | 60 (24 Hrs) |
| Sample Receiving Date | Sampling Date | | Ambient Condition (Physical Observation) | | | Sample ID PRPL/AS/ | Results | |
| | Start | End | Weather Condition | Wind Direction | Temperature, °C (max./min.) | | | |
| 20.04.2025 | 14.04.2025 | 15.04.2025 | Mist | SE | 38 °C/27 °C | 250225-013 | 26.37 | 15.67 |
| 20.04.2025 | 17.04.2025 | 18.04.2025 | Fair | ESE | 40 °C/28 °C | 250225-014 | 29.15 | 18.60 |
| 27.04.2025 | 21.04.2025 | 22.04.2025 | Haze | SE | 39 °C/29 °C | 250225-015 | 27.86 | 17.71 |
| 27.04.2025 | 24.04.2025 | 25.04.2025 | Partly Cloudy | ESE | 40 °C/29 °C | 250225-016 | 25.17 | 14.38 |
| 07.05.2025 | 01.05.2025 | 02.05.2025 | Haze | SSE | 39°C/30 °C | 250225-017 | 23.43 | 13.54 |
| 07.05.2025 | 04.05.2025 | 05.05.2025 | Mist | SSE | 37 °C/25 °C | 250225-018 | 22.12 | 13.72 |
| 14.05.2025 | 08.05.2025 | 09.05.2025 | Partly Cloudy | WNW | 40 °C/28 °C | 250225-019 | 25.14 | 16.29 |
| 14.05.2025 | 11.05.2025 | 12.05.2025 | Fair | VAR | 40 °C/30 °C | 250225-020 | 23.92 | 15.68 |
| 21.05.2025 | 15.05.2025 | 16.05.2025 | Haze | WSW | 38 °C/28 °C | 250225-021 | 23.69 | 15.56 |
| 21.05.2025 | 18.05.2025 | 19.05.2025 | Mist | VAR | 32 °C/25 °C | 250225-022 | 23.32 | 14.80 |
| 28.05.2025 | 22.05.2025 | 23.05.2025 | Partly Cloudy | SSW | 35°C/27 °C | 250225-023 | 23.28 | 15.68 |
| 28.05.2025 | 25.05.2025 | 26.05.2025 | Light Drizzle | WSW | 38 °C/29 °C | 250225-024 | 23.51 | 15.66 |

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# TEST REPORT



**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**

**"Address:-"Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

## TEST RESULTS

**Test Report No.** : **PRPL/AS/250605-001**
**Date of Issue** : 05.06.2025
**Reference No.** : **TRF**

| **Parameters: -** | | **Nitrogen Dioxide ($NO_2$)** | **Sulphur Dioxide ($SO_2$)** | **CO** |
|---|---|---|---|---|
| **Units: -** | | **µg/m3** | **µg/m3** | **mg/m3** |
| **Test Method: -** | | **IS : 5182 P-6, 2006** | **IS : 5182 P-2, Sec-1, 2023** | **IS : 5182 P-10, 1999** |
| **Requirements/Specification (As per CPCB Vol-II): -** | | **80** (24 Hrs) | **80** (24 Hrs) | **2** (8 Hrs) |
| **Analysis** | | **Results** | | |
| **Start Date** | **End Date** | | | |
| **20.04.2025** | **24.04.2025** | 15.70 | 4.93 | 0.47 |
| **20.04.2025** | **24.04.2025** | 15.33 | 5.79 | 0.46 |
| **27.04.2025** | **01.05.2025** | 17.15 | 6.77 | 0.51 |
| **27.04.2025** | **01.05.2025** | 17.72 | 6.46 | 0.53 |
| **07.05.2025** | **11.05.2025** | 23.61 | 7.33 | 0.71 |
| **07.05.2025** | **11.05.2025** | 21.54 | 7.47 | 0.65 |
| **14.05.2025** | **18.05.2025** | 20.16 | 8.31 | 0.60 |
| **14.05.2025** | **18.05.2025** | 16.03 | 6.37 | 0.48 |
| **21.05.2025** | **25.05.2025** | 18.47 | 7.29 | 0.55 |
| **21.05.2025** | **25.05.2025** | 20.24 | 7.93 | 0.61 |
| **28.05.2025** | **02.06.2025** | 19.87 | 7.47 | 0.60 |
| **28.05.2025** | **02.06.2025** | 15.80 | 6.46 | 0.47 |

**Remark: NA**
**Opinion/interpretation**

*****End of Report*****

Perfact Researchers Pvt. Ltd. DELHI

**Pushpendra Singh**
**Manager**
**Reviewed By**

**Rachna Dogra**
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**AUTHORISED SIGNATORY**

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# PERFACT RESEARCHERS PVT LTD



## TEST REPORT

Issued to: M/s State Industries Promotion Corporation of TN Ltd..

"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.

ULR NO. : TC699325000065355F
Test Report No. : PRPL/AS/250415-002
Date of Issue : 15.04.2025
Reference No. : TRF

## SAMPLE PARTICULARS

Name of the Sample : Ambient Air
a)Details of Sampling
b)Sampling Protocol : IS : 5182 Part-14
c)Equipment Used : RDS, FDS
d)Sampling Done By : Mr. Dharmendra & Mr. Pushpendra
e)Duration of Sampling : 24 Hrs.
f)Sampling Location :Onsite East

Physical Observation
(a) Sampling Flow Rate for Gases : 0.5 LPM
(b) Sampling Flow Rate For RSPM/: 0.65m3/min
PM-10 (Ave.)

## TEST RESULTS

| Parameters: - | | | | | | | Particulate Matter ($PM_{10}$) | Particulate Matter ($PM_{2.5}$) |
|---|---|---|---|---|---|---|---|---|
| Units: - | | | | | | | µg/m³ | µg/m³ |
| Test Method: - | | | | | | | IS : 5182 P-23, 2006 | IS : 5182 P-24, 2019 |
| Requirements/Specification (As per CPCB Vol -II): - | | | | | | | 100 (24 Hrs) | 60 (24 Hrs) |
| Sample Receiving Date | Sampling Date | | Ambient Condition (Physical Observation) | | | Sample ID PRPL/AS/ | Results | |
| | Start | End | Weather Condition | Wind Direction | Temperature, °C (max./min.) | | | |
| 06.03.2025 | 28.02.2025 | 01.03.2025 | Haze | ENE | 34 °C/26 °C | 250225-025 | 32.52 | 20.88 |
| 06.03.2025 | 03.03.2025 | 04.03.2025 | Fair | ESE | 37 °C/25 °C | 250225-026 | 38.59 | 24.31 |
| 13.03.2025 | 07.03.2025 | 08.03.2025 | Mist | ENE | 38 °C/24 °C | 250225-027 | 34.16 | 21.81 |
| 13.03.2025 | 10.03.2025 | 11.03.2025 | Partly Cloudy | NNE | 30 °C/24 °C | 250225-028 | 33.1 | 20.9 |
| 20.03.2025 | 14.03.2025 | 15.03.2025 | Partly Cloudy | E | 36 °C/26 °C | 250225-029 | 37.77 | 24.27 |
| 20.03.2025 | 17.03.2025 | 18.03.2025 | Partly Cloudy | ENE | 37 °C/28 °C | 250225-030 | 35.82 | 22.99 |
| 27.03.2025 | 21.03.2025 | 22.03.2025 | Partly Cloudy | ESE | 38 °C/27 °C | 250225-031 | 42.41 | 25.28 |
| 27.03.2025 | 24.03.2025 | 25.03.2025 | Fair | ESE | 37 °C/26 °C | 250225-032 | 35.94 | 23.65 |
| 07.04.2025 | 31.03.2025 | 01.04.2025 | Haze | ENE | 37 °C/28 °C | 250225-033 | 30.59 | 19.54 |
| 07.04.2025 | 03.04.2025 | 04.04.2025 | Partly Cloudy | ESE | 37 °C/27 °C | 250225-034 | 29.69 | 18.99 |
| 14.04.2025 | 07.04.2025 | 08.04.2025 | Fair | E | 37 °C/28 °C | 250225-035 | 31.26 | 20.73 |
| 14.04.2025 | 10.04.2025 | 11.04.2025 | Mostly Cloudy | SW | 39 °C/32°C | 250225-036 | 30.42 | 20.88 |

Pushpendra Singh
Manager
Reviewed By

Perfect Researchers Pvt. Ltd. DELHI

Rachna Dogra
Sr. Vice President
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Document No.: PRPL/AA/7.8 F-07

# TEST REPORT

**Issued to: M/s State Industries Promotion Corporation of TN Ltd..**

**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**TEST RESULTS**

**ULR NO.** : TC699325000065355F
**Test Report No.** : PRPL/AS/250415-002
**Date of Issue** : 15.04.2025
**Reference No.** : TRF

| Parameters: - | | Nitrogen Dioxide ($NO_2$) | Sulphur Dioxide ($SO_2$) | CO |
|---|---|---|---|---|
| Units: - | | µg/m3 | µg/m3 | mg/m3 |
| Test Method: - | | IS : 5182 P-6, 2006 | IS : 5182 P-2, Sec-1, 2023 | IS : 5182 P-10, 1999 |
| Requirements/Specification (As per CPCB Vol-II): - | | 80 (24 Hrs) | 80 (24 Hrs) | 2 (8 Hrs) |
| Analysis | | Results | | |
| Start Date | End Date | | | |
| 06.03.2025 | 10.03.2025 | 23.88 | 7.72 | 0.72 |
| 06.03.2025 | 10.03.2025 | 21.42 | 8.27 | 0.64 |
| 13.03.2025 | 17.03.2025 | 24.78 | 9.00 | 0.74 |
| 13.03.2025 | 17.03.2025 | 23.7 | 8.8 | 0.71 |
| 20.03.2025 | 24.03.2025 | 26.56 | 9.67 | 0.80 |
| 20.03.2025 | 24.03.2025 | 24.27 | 9.74 | 0.73 |
| 27.03.2025 | 31.03.2025 | 27.26 | 9.73 | 0.82 |
| 27.03.2025 | 31.03.2025 | 19.61 | 11.32 | 0.59 |
| 07.04.2025 | 11.04.2025 | 20.46 | 7.73 | 0.61 |
| 07.04.2025 | 11.04.2025 | 21.80 | 7.72 | 0.65 |
| 12.04.2025 | 15.04.2025 | 22.53 | 8.88 | 0.68 |
| 12.04.2025 | 15.04.2025 | 16.63 | 6.93 | 0.50 |

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Pushpendra Singh
Manager
Reviewed By

Rachna Dogra
Sr. Vice President
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Document No.: PRPL/AA/7.8 F-07

## TEST REPORT



**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**
**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**Test Report No.** : **PRPL/AS/250605-002**
**Date of Issue** : 05.06.2025
**Reference No.** : **TRF**

## SAMPLE PARTICULARS

**Name of the Sample** : **Ambient Air**
**a)Details of Sampling** — **Physical Observation**
**b)Sampling Protocol** : **IS : 5182 Part-14** — **(a) Sampling Flow Rate for Gases : 0.5 LPM**
**c) Equipment Used** : **RDS, FDS** — **(b) Sampling Flow Rate For RSPM/: 0.85m3/min**
**d) Sampling Done By** : **Mr. Dharmendra & Mr. Pushpendra** — **PM-10 (Ave.)**
**e) Duration of Sampling** : **24 Hrs.**
**f) Sampling Location** : **Onsite East**

## TEST RESULTS

| Parameters: - | | | | | | | Particulate Matter ($PM_{10}$) | Particulate Matter ($PM_{2.5}$) |
|---|---|---|---|---|---|---|---|---|
| Units: - | | | | | | | µg/m³ | µg/m³ |
| Test Method: - | | | | | | | IS : 5182 P-23, 2006 | IS : 5182 P-24, 2019 |
| Requirements/Specification (As per CPCB Vol -II): - | | | | | | | 100 (24 Hrs) | 60 (24 Hrs) |
| Sample Receiving Date | Sampling Date | | Ambient Condition (Physical Observation) | | | Sample ID PRPL/AS/ | Results | |
| | Start | End | Weather Condition | Wind Direction | Temperature, °C (max./min.) | | | |
| 20.04.2025 | 14.04.2025 | 15.04.2025 | Mist | SE | 38 °C/27 °C | 250225-037 | 31.33 | 18.61 |
| 20.04.2025 | 17.04.2025 | 18.04.2025 | Fair | ESE | 40 °C/28 °C | 250225-038 | 34.63 | 22.10 |
| 27.04.2025 | 21.04.2025 | 22.04.2025 | Haze | SE | 39 °C/29 °C | 250225-039 | 33.10 | 21.04 |
| 27.04.2025 | 24.04.2025 | 25.04.2025 | Partly Cloudy | ESE | 40 °C/29 °C | 250225-040 | 29.91 | 17.08 |
| 07.05.2025 | 01.05.2025 | 02.05.2025 | Haze | SSE | 39°C/30 °C | 250225-041 | 27.83 | 16.09 |
| 07.05.2025 | 04.05.2025 | 05.05.2025 | Mist | SSE | 37 °C/25 °C | 250225-042 | 26.28 | 16.30 |
| 14.05.2025 | 08.05.2025 | 09.05.2025 | Partly Cloudy | WNW | 40 °C/28 °C | 250225-043 | 29.87 | 19.36 |
| 14.05.2025 | 11.05.2025 | 12.05.2025 | Fair | VAR | 40 °C/30 °C | 250225-044 | 28.41 | 18.63 |
| 21.05.2025 | 15.05.2025 | 16.05.2025 | Haze | WSW | 38 °C/28 °C | 250225-045 | 28.14 | 18.49 |
| 21.05.2025 | 18.05.2025 | 19.05.2025 | Mist | VAR | 32 °C/25 °C | 250225-046 | 27.70 | 17.58 |
| 28.05.2025 | 22.05.2025 | 23.05.2025 | Partly Cloudy | SSW | 35°C/27 °C | 250225-047 | 27.66 | 18.63 |
| 28.05.2025 | 25.05.2025 | 26.05.2025 | Light Drizzle | WSW | 38 °C/29 °C | 250225-048 | 27.93 | 18.60 |

Pushpendra Singh
Manager
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Rachna Dogra
Sr. Vice President
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# TEST REPORT



**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**

**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**Test Report No.** : **PRPL/AS/250605-002**
**Date of Issue** : 05.06.2025
**Reference No.** : **TRF**

## TEST RESULTS

| Parameters: - | | Nitrogen Dioxide ($NO_2$) | Sulphur Dioxide ($SO_2$) | CO |
|---|---|---|---|---|
| Units: - | | µg/m3 | µg/m3 | mg/m3 |
| Test Method: - | | IS : 5182 P-6, 2006 | IS : 5182 P-2, Sec-1, 2023 | IS : 5182 P-10, 1999 |
| Requirements/Specification (As per CPCB Vol-II): - | | 80 (24 Hrs) | 80 (24 Hrs) | 2 (8 Hrs) |
| Analysis | | Results | | |
| Start Date | End Date | | | |
| 20.04.2025 | 24.04.2025 | 18.65 | 5.86 | 0.56 |
| 20.04.2025 | 24.04.2025 | 18.21 | 6.88 | 0.55 |
| 27.04.2025 | 01.05.2025 | 20.37 | 8.04 | 0.61 |
| 27.04.2025 | 01.05.2025 | 21.05 | 7.67 | 0.63 |
| 07.05.2025 | 11.05.2025 | 28.05 | 8.71 | 0.84 |
| 07.05.2025 | 11.05.2025 | 25.59 | 8.88 | 0.77 |
| 14.05.2025 | 18.05.2025 | 23.96 | 9.88 | 0.72 |
| 14.05.2025 | 18.05.2025 | 19.04 | 7.56 | 0.57 |
| 21.05.2025 | 25.05.2025 | 21.95 | 8.66 | 0.66 |
| 21.05.2025 | 25.05.2025 | 24.05 | 9.42 | 0.72 |
| 28.05.2025 | 02.06.2025 | 23.61 | 8.87 | 0.71 |
| 28.05.2025 | 02.06.2025 | 18.77 | 7.67 | 0.56 |

**Remark: NA**
**Opinion/interpretation**

***End of Report***

Perfact Researchers Pvt. Ltd. DELHI

**Pushpendra Singh**
**Manager**
**Reviewed By**

**Rachna Dogra**
**Sr. Vice President**
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**Document No.: PRPL/AA/7.8 F-07**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**

**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR NO.** : TC699325000065356F
**Test Report No.** : PRPL/AS/250415-003
**Date of Issue** : 15.04.2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**Name of the Sample** : Ambient Air
**a)Details of Sampling**
**b)Sampling Protocol** : IS : 5182 Part-14
**c)Equipment Used** : RDS, FDS
**d)Sampling Done By** : Mr. Dharmendra & Mr. Pushpendra
**e)Duration of Sampling** : 24 Hrs.
**f)Sampling Location** : Onsite North

**Physical Observation**
**(a) Sampling Flow Rate for Gases : 0.5 LPM**
**(b) Sampling Flow Rate For RSPM/: 0.45m3/min PM-10 (Ave.)**

## TEST RESULTS

| Parameters: - | | | | | | | Particulate Matter ($PM_{10}$) | Particulate Matter ($PM_{2.5}$) |
|---|---|---|---|---|---|---|---|---|
| Units: - | | | | | | | µg/m³ | µg/m³ |
| Test Method: - | | | | | | | IS : 5182 P-23, 2006 | IS : 5182 P-24, 2019 |
| Requirements/Specification (As per CPCB Vol -II): - | | | | | | | 100 (24 Hrs) | 60 (24 Hrs) |
| Sample Receiving Date | Sampling Date | | Ambient Condition (Physical Observation) | | | Sample ID PRPL/AS/ | Results | |
| | Start | End | Weather Condition | Wind Direction | Temperature, °C (max./min.) | | | |
| 06.03.2025 | 28.02.2025 | 01.03.2025 | Haze | ENE | 34 °C/26 °C | 250225-049 | 34.46 | 21.71 |
| 06.03.2025 | 03.03.2025 | 04.03.2025 | Fair | ESE | 37 °C/25 °C | 250225-050 | 30.50 | 19.47 |
| 13.03.2025 | 07.03.2025 | 08.03.2025 | Mist | ENE | 38 °C/24 °C | 250225-051 | 29.5 | 18.6 |
| 13.03.2025 | 10.03.2025 | 11.03.2025 | Partly Cloudy | NNE | 30 °C/24 °C | 250225-052 | 33.72 | 21.67 |
| 20.03.2025 | 14.03.2025 | 15.03.2025 | Partly Cloudy | E | 36 °C/26 °C | 250225-053 | 31.99 | 20.53 |
| 20.03.2025 | 17.03.2025 | 18.03.2025 | Partly Cloudy | ENE | 37 °C/28 °C | 250225-054 | 37.87 | 22.58 |
| 27.03.2025 | 21.03.2025 | 22.03.2025 | Partly Cloudy | ESE | 38 °C/27 °C | 250225-055 | 32.09 | 21.12 |
| 27.03.2025 | 24.03.2025 | 25.03.2025 | Fair | ESE | 37 °C/26 °C | 250225-056 | 27.32 | 17.44 |
| 07.04.2025 | 31.03.2025 | 01.04.2025 | Haze | ENE | 37 °C/28 °C | 250225-057 | 26.51 | 16.96 |
| 07.04.2025 | 03.04.2025 | 04.04.2025 | Partly Cloudy | ESE | 37 °C/27 °C | 250225-058 | 27.92 | 18.51 |
| 14.04.2025 | 07.04.2025 | 08.04.2025 | Fair | E | 37 °C/28 °C | 250225-059 | 27.17 | 18.65 |
| 14.04.2025 | 10.04.2025 | 11.04.2025 | Mostly Cloudy | SW | 39 °C/32°C | 250225-060 | 27.98 | 16.62 |

**Pushpendra Singh**
**Manager**
**Reviewed By**

Perfact Researchers Pvt. Ltd. DELHI

**Rachna Dogra**
**Sr. Vice President**
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**Document No.: PRPL/AA/7.8 F-07**

TC-8993

## TEST REPORT



**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**

**"Address:-"Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR NO.** : TC699325000065356F
**Test Report No.** : PRPL/AS/250415-003
**Date of Issue** : 15.04.2025
**Reference No.** : TRF

## TEST RESULTS

| Parameters: - | | Nitrogen Dioxide ($NO_2$) | Sulphur Dioxide ($SO_2$) | CO |
|---|---|---|---|---|
| Units: - | | µg/m3 | µg/m3 | mg/m3 |
| Test Method: - | | IS : 5182 P-6, 2006 | IS : 5182 P-2, Sec-1, 2023 | IS : 5182 P-10, 1999 |
| Requirements/Specification (As per CPCB Vol-II): - | | 80 (24 Hrs) | 80 (24 Hrs) | 2 (8 Hrs) |
| Analysis | | Results | | |
| Start Date | End Date | | | |
| 06.03.2025 | 10.03.2025 | 19.12 | 7.39 | 0.57 |
| 06.03.2025 | 10.03.2025 | 22.12 | 8.04 | 0.66 |
| 13.03.2025 | 17.03.2025 | 21.2 | 7.9 | 0.64 |
| 13.03.2025 | 17.03.2025 | 23.72 | 8.63 | 0.71 |
| 20.03.2025 | 24.03.2025 | 21.68 | 8.70 | 0.65 |
| 20.03.2025 | 24.03.2025 | 24.34 | 8.69 | 0.73 |
| 27.03.2025 | 31.03.2025 | 17.51 | 10.11 | 0.53 |
| 27.03.2025 | 31.03.2025 | 18.27 | 6.90 | 0.55 |
| 07.04.2025 | 11.04.2025 | 19.46 | 6.89 | 0.58 |
| 07.04.2025 | 11.04.2025 | 20.12 | 7.93 | 0.60 |
| 12.04.2025 | 15.04.2025 | 14.85 | 6.19 | 0.45 |
| 12.04.2025 | 15.04.2025 | 16.66 | 5.23 | 0.50 |

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  **Document No.: PRPL/AA/7.8 F-07**

# TEST REPORT



Test Report No. : PRPL/AS/250605-003
Date of Issue : 05.06.2025
Reference No. : TRF

**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**
**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

## SAMPLE PARTICULARS

**Name of the Sample** : Ambient Air
**a)Details of Sampling** — **Physical Observation**
**b)Sampling Protocol** : IS : 5182 Part-14 — **(a) Sampling Flow Rate for Gases : 0.5 LPM**
**c)Equipment Used** : RDS, FDS — **(b) Sampling Flow Rate For RSPM/: 0.85m3/min**
**d)Sampling Done By** : Mr. Dharmendra & Mr. Pushpendra — **PM-10 (Ave.)**
**e)Duration of Sampling** : 24 Hrs.
**f)Sampling Location** : Onsite North

## TEST RESULTS

| Parameters: - | | | | | | | Particulate Matter ($PM_{10}$) | Particulate Matter ($PM_{2.5}$) |
|---|---|---|---|---|---|---|---|---|
| Units: - | | | | | | | µg/m³ | µg/m³ |
| Test Method: - | | | | | | | IS : 5182 P-23, 2006 | IS : 5182 P-24, 2019 |
| Requirements/Specification (As per CPCB Vol -II): - | | | | | | | 100 (24 Hrs) | 60 (24 Hrs) |
| Sample Receiving Date | Sampling Date | | Ambient Condition (Physical Observation) | | | Sample ID PRPL/AS/ | Results | |
| | Start | End | Weather Condition | Wind Direction | Temperature, °C (max./min.) | | | |
| 20.04.2025 | 14.04.2025 | 15.04.2025 | Mist | SE | 39 °C/32°C | 250225-061 | 30.92 | 19.74 |
| 20.04.2025 | 17.04.2025 | 18.04.2025 | Fair | ESE | 38 °C/27 °C | 250225-062 | 29.55 | 18.79 |
| 27.04.2025 | 21.04.2025 | 22.04.2025 | Haze | SE | 40 °C/28 °C | 250225-063 | 26.71 | 15.25 |
| 27.04.2025 | 24.04.2025 | 25.04.2025 | Partly Cloudy | ESE | 39 °C/29 °C | 250225-064 | 24.85 | 14.37 |
| 07.05.2025 | 01.05.2025 | 02.05.2025 | Haze | SSE | 40 °C/29 °C | 250225-065 | 23.46 | 14.55 |
| 07.05.2025 | 04.05.2025 | 05.05.2025 | Mist | SSE | 39°C/30 °C | 250225-066 | 26.68 | 17.29 |
| 14.05.2025 | 08.05.2025 | 09.05.2025 | Partly Cloudy | WNW | 37 °C/25 °C | 250225-067 | 25.37 | 16.64 |
| 14.05.2025 | 11.05.2025 | 12.05.2025 | Fair | VAR | 40 °C/28 °C | 250225-068 | 25.13 | 16.51 |
| 21.05.2025 | 15.05.2025 | 16.05.2025 | Haze | WSW | 40 °C/30 °C | 250225-069 | 24.74 | 15.70 |
| 21.05.2025 | 18.05.2025 | 19.05.2025 | Mist | VAR | 38 °C/28 °C | 250225-070 | 24.70 | 16.64 |
| 28.05.2025 | 22.05.2025 | 23.05.2025 | Partly Cloudy | SSW | 32 °C/25 °C | 250225-071 | 24.94 | 16.61 |
| 28.05.2025 | 25.05.2025 | 26.05.2025 | Light Drizzle | WSW | 35°C/27 °C | 250225-072 | 30.92 | 19.74 |

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# TEST REPORT



Test Report No. : PRPL/AS/250605-003
Date of Issue : 05.06.2025
Reference No. : TRF

**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**
**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

## TEST RESULTS

| Parameters: - | | Nitrogen Dioxide ($NO_2$) | Sulphur Dioxide ($SO_2$) | CO |
|---|---|---|---|---|
| Units: - | | µg/m3 | µg/m3 | mg/m3 |
| Test Method: - | | IS : 5182 P-6, 2006 | IS : 5182 P-2, Sec-1, 2023 | IS : 5182 P-10, 1999 |
| Requirements/Specification (As per CPCB Vol-II): - | | 80 (24 Hrs) | 80 (24 Hrs) | 2 (8 Hrs) |
| Analysis | | Results | | |
| Start Date | End Date | | | |
| 20.04.2025 | 24.04.2025 | 16.26 | 6.15 | 0.49 |
| 20.04.2025 | 24.04.2025 | 18.19 | 7.18 | 0.55 |
| 27.04.2025 | 01.05.2025 | 18.80 | 6.85 | 0.56 |
| 27.04.2025 | 01.05.2025 | 25.04 | 7.78 | 0.75 |
| 07.05.2025 | 11.05.2025 | 22.85 | 7.93 | 0.69 |
| 07.05.2025 | 11.05.2025 | 21.39 | 8.82 | 0.64 |
| 14.05.2025 | 18.05.2025 | 17.00 | 6.75 | 0.51 |
| 14.05.2025 | 18.05.2025 | 19.60 | 7.73 | 0.59 |
| 21.05.2025 | 25.05.2025 | 21.48 | 8.41 | 0.64 |
| 21.05.2025 | 25.05.2025 | 21.08 | 7.92 | 0.63 |
| 28.05.2025 | 02.06.2025 | 16.76 | 6.85 | 0.50 |
| 28.05.2025 | 02.06.2025 | 16.26 | 6.15 | 0.49 |

**Remark: NA**
**Opinion/interpretation**

***End of Report***

Perfact Researchers Pvt. Ltd. DELHI

**Pushpendra Singh**
**Manager**
**Reviewed By**

**Rachna Dogra**
**Sr. Vice President**
**AUTHORISED SIGNATORY**

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  (in case of non-perishable products only)
  **Document No.: PRPL/AA/7.8 F-07**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**

ULR NO. : TC699325000065357F
Test Report No. : PRPL/AS/250415-004
Date of Issue : 15.04.2025
Reference No. : TRF

**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

## SAMPLE PARTICULARS

Name of the Sample : Ambient Air
a)Details of Sampling
b)Sampling Protocol : IS : 5182 Part-14
c)Equipment Used : RDS, FDS
d)Sampling Done By : Mr. Dharmendra & Mr. Pushpendra
e)Duration of Sampling : 24 Hrs.
f)Sampling Location : Onsite South

Physical Observation
(a) Sampling Flow Rate for Gases : 0.5 LPM
(b) Sampling Flow Rate For RSPM/: 0.95m3/min
PM-10 (Ave.)

## TEST RESULTS

| Parameters: - | | | | | | | Particulate Matter ($PM_{10}$) | Particulate Matter ($PM_{2.5}$) |
|---|---|---|---|---|---|---|---|---|
| Units: - | | | | | | | µg/m³ | µg/m³ |
| Test Method: - | | | | | | | IS : 5182 P-23, 2006 | IS : 5182 P-24, 2019 |
| Requirements/Specification (As per CPCB Vol -II): - | | | | | | | 100 (24 Hrs) | 60 (24 Hrs) |
| Sample Receiving Date | Sampling Date | | Ambient Condition (Physical Observation) | | | Sample ID PRPL/AS/ | Results | |
| | Start | End | Weather Condition | Wind Direction | Temperature, °C (max./min.) | | | |
| 07.03.2025 | 01.03.2025 | 02.03.2025 | Mist | ENE | 38°C/26 °C | 250225-073 | 30.75 | 19.74 |
| 07.03.2025 | 04.03.2025 | 05.03.2025 | Haze | ESE | 38°C/24 °C | 250225-074 | 36.50 | 22.99 |
| 15.03.2025 | 08.03.2025 | 09.03.2025 | Fair | E | 35°C/23 °C | 250225-075 | 32.30 | 20.63 |
| 15.03.2025 | 11.03.2025 | 12.03.2025 | Mostly Cloudy | NNE | 27°C/24 °C | 250225-076 | 31.3 | 19.7 |
| 21.03.2025 | 15.03.2025 | 16.03.2025 | Fair | ESE | 35 °C/25 °C | 250225-077 | 35.72 | 22.95 |
| 21.03.2025 | 18.03.2025 | 19.03.2025 | Haze | ESE | 36 °C/26 °C | 250225-078 | 33.88 | 21.74 |
| 25.03.2025 | 22.03.2025 | 20.03.2025 | Haze | E | 37 °C/26 °C | 250225-079 | 40.11 | 23.91 |
| 25.03.2025 | 25.03.2025 | 26.03.2025 | Fair | ENE | 38 °C/24 °C | 250225-080 | 33.99 | 22.37 |
| 07.04.2025 | 01.04.2025 | 02.04.2025 | Mostly Cloudy | ESE | 30 °C/26 °C | 250225-081 | 28.93 | 18.47 |
| 07.04.2025 | 04.04.2025 | 05.04.2025 | Partly Cloudy | ESE | 38 °C/26 °C | 250225-082 | 28.08 | 17.96 |
| 13.04.2025 | 08.04.2025 | 09.04.2025 | Partly Cloudy | ESE | 38 °C/27 °C | 250225-083 | 29.57 | 19.61 |
| 13.04.2025 | 11.04.2025 | 12.04.2025 | Haze | WNW | 38 °C/25 °C | 250225-084 | 28.77 | 19.75 |

Pushpendra Singh
Manager
Reviewed By

Perfact Researchers Pvt. Ltd. DELHI

Rachna Dogra
Sr. Vice President
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**Document No.: PRPL/AA/7.8 F-07**

TC-6993

## TEST REPORT



**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**

**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR NO.** : TC699325000065357F
**Test Report No.** : PRPL/AS/250415-004
**Date of Issue** : 15.04.2025
**Reference No.** : TRF

## TEST RESULTS

| Parameters: - | | Nitrogen Dioxide ($NO_2$) | Sulphur Dioxide ($SO_2$) | CO |
|---|---|---|---|---|
| Units: - | | µg/m3 | µg/m3 | mg/m3 |
| Test Method: - | | IS : 5182 P-6, 2006 | IS : 5182 P-2, Sec-1, 2023 | IS : 5182 P-10, 1999 |
| Requirements/Specification (As per CPCB Vol-II): - | | 80 (24 Hrs) | 80 (24 Hrs) | 2 (8 Hrs) |
| Analysis | | Results | | |
| Start Date | End Date | | | |
| 07.03.2025 | 11.03.2025 | 22.58 | 7.30 | 0.68 |
| 07.03.2025 | 11.03.2025 | 20.25 | 7.82 | 0.61 |
| 15.03.2025 | 19.03.2025 | 23.43 | 8.52 | 0.70 |
| 15.03.2025 | 19.03.2025 | 22.4 | 8.4 | 0.67 |
| 21.03.2025 | 25.03.2025 | 25.12 | 9.14 | 0.75 |
| 21.03.2025 | 25.03.2025 | 22.96 | 9.22 | 0.69 |
| 25.03.2025 | 29.03.2025 | 25.78 | 9.20 | 0.77 |
| 25.03.2025 | 29.03.2025 | 18.55 | 10.71 | 0.56 |
| 07.04.2025 | 11.04.2025 | 19.35 | 7.31 | 0.58 |
| 07.04.2025 | 11.04.2025 | 20.61 | 7.30 | 0.62 |
| 13.04.2025 | 15.04.2025 | 21.31 | 8.40 | 0.64 |
| 13.04.2025 | 15.04.2025 | 15.73 | 6.55 | 0.47 |

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**Pushpendra Singh**
**Manager**
**Reviewed By**

**Rachna Dogra**
**Sr. Vice President**
**AUTHORISED SIGNATORY**

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Document No.: PRPL/AA/7.8 F-07

# TEST REPORT



Issued to: M/s State Industries Promotion Corporation of TN Ltd.

Test Report No. : PRPL/AS/250605-004
Date of Issue : 05.06.2025
Reference No. : TRF

"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.

## SAMPLE PARTICULARS

Name of the Sample : Ambient Air
a)Details of Sampling
b)Sampling Protocol : IS : 5182 Part-14
c)Equipment Used : RDS, FDS
d)Sampling Done By : Mr. Dharmendra & Mr. Pushpendra
e)Duration of Sampling : 24 Hrs.
f)Sampling Location : Onsite South

Physical Observation
(a) Sampling Flow Rate for Gases : 0.5 LPM
(b) Sampling Flow Rate For RSPM/: 0.95m3/min PM-10 (Ave.)

## TEST RESULTS

| Parameters: - | | | | | | | Particulate Matter ($PM_{10}$) | Particulate Matter ($PM_{2.5}$) |
|---|---|---|---|---|---|---|---|---|
| Units: - | | | | | | | µg/m³ | µg/m³ |
| Test Method: - | | | | | | | IS : 5182 P-23, 2006 | IS : 5182 P-24, 2019 |
| Requirements/Specification (As per CPCB Vol -II): - | | | | | | | 100 (24 Hrs) | 60 (24 Hrs) |
| Sample Receiving Date | Sampling Date | | Ambient Condition (Physical Observation) | | | Sample ID PRPL/AS/ | Results | |
| | Start | End | Weather Condition | Wind Direction | Temperature, °C (max./min.) | | | |
| 21.04.2025 | 15.04.2025 | 16.04.2025 | Partly Cloudy | NW | 39 °C/28 °C | 250225-085 | 29.63 | 17.60 |
| 21.04.2025 | 18.04.2025 | 19.04.2025 | Partly Cloudy | SW | 39 °C/28 °C | 250225-086 | 32.75 | 20.90 |
| 28.04.2025 | 22.04.2025 | 23.04.2025 | Fair | VAR | 40 °C/28 °C | 250225-087 | 31.30 | 19.90 |
| 28.04.2025 | 25.04.2025 | 26.04.2025 | Fair | SSE | 39 °C/29 °C | 250225-088 | 28.29 | 16.16 |
| 08.05.2025 | 02.05.2025 | 03.05.2025 | Fair | WNW | 40 °C/28 °C | 250225-089 | 26.32 | 15.22 |
| 08.05.2025 | 05.05.2025 | 06.05.2025 | Light Drizzle | SSW | 39 °C/28 °C | 250225-090 | 24.85 | 15.41 |
| 15.05.2025 | 09.05.2025 | 10.05.2025 | Partly Cloudy | NE | 38 °C/27 °C | 250225-091 | 28.25 | 18.31 |
| 15.05.2025 | 12.05.2025 | 13.05.2025 | Haze | NW | 40 °C/28 °C | 250225-092 | 26.87 | 17.62 |
| 22.05.2025 | 16.05.2025 | 17.05.2025 | Haze | WSW | 34 °C/27 °C | 250225-093 | 26.61 | 17.48 |
| 22.05.2025 | 19.05.2025 | 20.05.2025 | Haze | W | 35 °C/27 °C | 250225-094 | 26.20 | 16.63 |
| 29.05.2025 | 23.05.2025 | 24.05.2025 | Haze | WSW | 34 °C/28 °C | 250225-095 | 26.16 | 17.62 |
| 29.05.2025 | 26.05.2025 | 27.05.2025 | Haze | W | 35 °C/26 °C | 250225-096 | 26.41 | 17.59 |

Pushpendra Singh
Manager
Reviewed By

Perfact Researchers Pvt. Ltd. DELHI

Rachna Dogra
Sr. Vice President
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Document No.: PRPL/AA/7.8 F-07

# TEST REPORT



**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**

**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**Test Report No.** : **PRPL/AS/250605-004**
**Date of Issue** : 05.06.2025
**Reference No.** : **TRF**

## TEST RESULTS

| Parameters: - | | Nitrogen Dioxide ($NO_2$) | Sulphur Dioxide ($SO_2$) | CO |
|---|---|---|---|---|
| Units: - | | µg/m3 | µg/m3 | mg/m3 |
| Test Method: - | | IS : 5182 P-6, 2006 | IS : 5182 P-2, Sec-1, 2023 | IS : 5182 P-10, 1999 |
| Requirements/Specification (As per CPCB Vol-II): - | | 80 (24 Hrs) | 80 (24 Hrs) | 2 (8 Hrs) |
| Analysis | | Results | | |
| Start Date | End Date | | | |
| 21.04.2025 | 25.04.2025 | 17.64 | 5.54 | 0.53 |
| 21.04.2025 | 25.04.2025 | 17.22 | 6.51 | 0.52 |
| 28.04.2025 | 02.05.2025 | 19.27 | 7.61 | 0.58 |
| 28.04.2025 | 02.05.2025 | 19.91 | 7.25 | 0.60 |
| 08.05.2025 | 12.05.2025 | 26.52 | 8.24 | 0.80 |
| 08.05.2025 | 12.05.2025 | 24.20 | 8.39 | 0.73 |
| 15.05.2025 | 18.05.2025 | 22.66 | 9.34 | 0.68 |
| 15.05.2025 | 18.05.2025 | 18.01 | 7.15 | 0.54 |
| 22.05.2025 | 26.05.2025 | 20.75 | 8.19 | 0.62 |
| 22.05.2025 | 26.05.2025 | 22.74 | 8.91 | 0.68 |
| 29.05.2025 | 02.06.2025 | 22.33 | 8.39 | 0.67 |
| 29.05.2025 | 02.06.2025 | 17.75 | 7.25 | 0.53 |

**Remark: NA**
**Opinion/interpretation**

*****End of Report*****

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**Pushpendra Singh**
**Manager**
**Reviewed By**

**Rachna Dogra**
**Sr. Vice President**
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**Document No.: PRPL/AA/7.8 F-07**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**

**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR NO.** : TC699325000065358F
**Test Report No.** : PRPL/AS/250415-005
**Date of Issue** : 15.04.2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**Name of the Sample** : Ambient Air
**a)Details of Sampling**
**b)Sampling Protocol** : IS : 5182 Part-14
**c)Equipment Used** : RDS, FDS
**d)Sampling Done By** : Mr. Dharmendra & Mr. Pushpendra
**e)Duration of Sampling** : 24 Hrs.
**f)Sampling Location** : Thiruvanthapuram

**Physical Observation**
(a) Sampling Flow Rate for Gases : 0.5 LPM
(b) Sampling Flow Rate For RSPM/: 0.95m3/min
PM-10 (Ave.)

## TEST RESULTS

| Parameters: - | | | | | | | Particulate Matter ($PM_{10}$) | Particulate Matter ($PM_{2.5}$) |
|---|---|---|---|---|---|---|---|---|
| Units: - | | | | | | | µg/m³ | µg/m³ |
| Test Method: - | | | | | | | IS : 5182 P-23, 2006 | IS : 5182 P-24, 2019 |
| Requirements/Specification (As per CPCB Vol -II): - | | | | | | | 100 (24 Hrs) | 60 (24 Hrs) |
| Sample Receiving Date | Sampling Date | | Ambient Condition (Physical Observation) | | | Sample ID PRPL/AS/ | Results | |
| | Start | End | Weather Condition | Wind Direction | Temperature, °C (max./min.) | | | |
| 07.03.2025 | 01.03.2025 | 02.03.2025 | Mist | ENE | 38°C/26 °C | 250225-097 | 33.12 | 21.26 |
| 07.03.2025 | 04.03.2025 | 05.03.2025 | Haze | ESE | 38°C/24 °C | 250225-098 | 39.30 | 24.76 |
| 15.03.2025 | 08.03.2025 | 09.03.2025 | Fair | E | 35°C/23 °C | 250225-099 | 34.79 | 22.21 |
| 15.03.2025 | 11.03.2025 | 12.03.2025 | Mostly Cloudy | NNE | 27°C/24 °C | 250225-100 | 33.7 | 21.2 |
| 21.03.2025 | 15.03.2025 | 16.03.2025 | Fair | ESE | 35 °C/25 °C | 250225-101 | 38.46 | 24.72 |
| 21.03.2025 | 18.03.2025 | 19.03.2025 | Haze | ESE | 36 °C/26 °C | 250225-102 | 36.48 | 23.41 |
| 25.03.2025 | 22.03.2025 | 20.03.2025 | Haze | E | 37 °C/26 °C | 250225-103 | 43.19 | 25.75 |
| 25.03.2025 | 25.03.2025 | 26.03.2025 | Fair | ENE | 38 °C/24 °C | 250225-104 | 36.60 | 24.09 |
| 07.04.2025 | 01.04.2025 | 02.04.2025 | Mostly Cloudy | ESE | 30 °C/26 °C | 250225-105 | 31.16 | 19.90 |
| 07.04.2025 | 04.04.2025 | 05.04.2025 | Partly Cloudy | ESE | 38 °C/26 °C | 250225-106 | 30.24 | 19.35 |
| 14.04.2025 | 08.04.2025 | 09.04.2025 | Partly Cloudy | ESE | 38 °C/27 °C | 250225-107 | 31.84 | 21.11 |
| 14.04.2025 | 11.04.2025 | 12.04.2025 | Haze | WNW | 38 °C/25 °C | 250225-108 | 30.98 | 21.27 |

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**Document No.: PRPL/AA/7.8 F-07**

# TEST REPORT

**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**

**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR NO.** : TC699325000065358F
**Test Report No.** : PRPL/AS/250415-005
**Date of Issue** : 15.04.2025
**Reference No.** : TRF

## TEST RESULTS

| Parameters: - | | Nitrogen Dioxide ($NO_2$) | Sulphur Dioxide ($SO_2$) | CO |
|---|---|---|---|---|
| Units: - | | µg/m3 | µg/m3 | mg/m3 |
| Test Method: - | | IS : 5182 P-6, 2006 | IS : 5182 P-2, Sec-1, 2023 | IS : 5182 P-10, 1999 |
| Requirements/Specification (As per CPCB Vol-II): - | | 80 (24 Hrs) | 80 (24 Hrs) | 2 (8 Hrs) |
| Analysis | | Results | | |
| Start Date | End Date | | | |
| 07.03.2025 | 11.03.2025 | 24.32 | 7.87 | 0.73 |
| 07.03.2025 | 11.03.2025 | 21.81 | 8.42 | 0.65 |
| 15.03.2025 | 19.03.2025 | 25.23 | 9.17 | 0.76 |
| 15.03.2025 | 19.03.2025 | 24.2 | 9.0 | 0.72 |
| 21.03.2025 | 25.03.2025 | 27.05 | 9.85 | 0.81 |
| 21.03.2025 | 25.03.2025 | 24.72 | 9.92 | 0.74 |
| 25.03.2025 | 29.03.2025 | 27.76 | 9.91 | 0.83 |
| 25.03.2025 | 29.03.2025 | 19.97 | 11.53 | 0.60 |
| 07.04.2025 | 11.04.2025 | 20.83 | 7.87 | 0.62 |
| 07.04.2025 | 11.04.2025 | 22.20 | 7.86 | 0.67 |
| 13.04.2025 | 15.04.2025 | 22.95 | 9.04 | 0.69 |
| 13.04.2025 | 15.04.2025 | 16.94 | 7.06 | 0.51 |

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Pushpendra Singh
Manager
Reviewed By

Rachna Dogra
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Document No.: PRPL/AA/7.8 F-07

# TEST REPORT



Issued to: M/s State Industries Promotion Corporation of TN Ltd.

"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.

Test Report No. : PRPL/AS/250605-005
Date of Issue : 05.06.2025
Reference No. : TRF

## SAMPLE PARTICULARS

Name of the Sample : Ambient Air
a)Details of Sampling
b)Sampling Protocol : IS : 5182 Part-14
c)Equipment Used : RDS, FDS
d)Sampling Done By : Mr. Dharmendra & Mr. Pushpendra
e)Duration of Sampling : 24 Hrs.
f)Sampling Location : Thiruvanthapuram

Physical Observation
(a) Sampling Flow Rate for Gases : 0.5 LPM
(b) Sampling Flow Rate For RSPM/: 0.95m3/min
PM-10 (Ave.)

## TEST RESULTS

| Parameters: - | | | | | | | Particulate Matter ($PM_{10}$) | Particulate Matter ($PM_{2.5}$) |
|---|---|---|---|---|---|---|---|---|
| Units: - | | | | | | | µg/m³ | µg/m³ |
| Test Method: - | | | | | | | IS : 5182 P-23, 2006 | IS : 5182 P-24, 2019 |
| Requirements/Specification (As per CPCB Vol -II): - | | | | | | | 100 (24 Hrs) | 60 (24 Hrs) |
| Sample Receiving Date | Sampling Date | | Ambient Condition (Physical Observation) | | | Sample ID PRPL/AS/ | Results | |
| | Start | End | Weather Condition | Wind Direction | Temperature, °C (max./min.) | | | |
| 21.04.2025 | 15.04.2025 | 16.04.2025 | Partly Cloudy | NW | 39 °C/28 °C | 250225-109 | 31.91 | 18.96 |
| 21.04.2025 | 18.04.2025 | 19.04.2025 | Partly Cloudy | SW | 39 °C/28 °C | 250225-110 | 35.27 | 22.51 |
| 28.04.2025 | 22.04.2025 | 23.04.2025 | Fair | VAR | 40 °C/28 °C | 250225-111 | 33.71 | 21.43 |
| 28.04.2025 | 25.04.2025 | 26.04.2025 | Fair | SSE | 39 °C/29 °C | 250225-112 | 30.46 | 17.40 |
| 08.05.2025 | 02.05.2025 | 03.05.2025 | Fair | WNW | 40 °C/28 °C | 250225-113 | 28.34 | 16.39 |
| 08.05.2025 | 05.05.2025 | 06.05.2025 | Light Drizzle | SSW | 39 °C/28 °C | 250225-114 | 26.76 | 16.60 |
| 15.05.2025 | 09.05.2025 | 10.05.2025 | Partly Cloudy | NE | 38 °C/27 °C | 250225-115 | 30.42 | 19.72 |
| 15.05.2025 | 12.05.2025 | 13.05.2025 | Haze | NW | 40 °C/28 °C | 250225-116 | 28.94 | 18.97 |
| 22.05.2025 | 16.05.2025 | 17.05.2025 | Haze | WSW | 34 °C/27 °C | 250225-117 | 28.66 | 18.83 |
| 22.05.2025 | 19.05.2025 | 20.05.2025 | Haze | W | 35 °C/27 °C | 250225-118 | 28.21 | 17.91 |
| 29.05.2025 | 23.05.2025 | 24.05.2025 | Haze | WSW | 34 °C/28 °C | 250225-119 | 28.17 | 18.97 |
| 29.05.2025 | 26.05.2025 | 27.05.2025 | Haze | W | 35 °C/26 °C | 250225-120 | 28.44 | 18.95 |

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Document No.: PRPL/AA/7.8 F-07

# TEST REPORT



**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**

**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**Test Report No.** : **PRPL/AS/250605-005**
**Date of Issue** : 05.06.2025
**Reference No.** : **TRF**

## TEST RESULTS

| Parameters: - | | Nitrogen Dioxide ($NO_2$) | Sulphur Dioxide ($SO_2$) | CO |
|---|---|---|---|---|
| Units: - | | µg/m3 | µg/m3 | mg/m3 |
| Test Method: - | | IS : 5182 P-6, 2006 | IS : 5182 P-2, Sec-1, 2023 | IS : 5182 P-10, 1999 |
| Requirements/Specification (As per CPCB Vol-II): - | | 80 (24 Hrs) | 80 (24 Hrs) | 2 (8 Hrs) |
| Analysis | | Results | | |
| Start Date | End Date | | | |
| 21.04.2025 | 25.04.2025 | 19.00 | 5.97 | 0.57 |
| 21.04.2025 | 25.04.2025 | 18.55 | 7.01 | 0.56 |
| 28.04.2025 | 02.05.2025 | 20.75 | 8.19 | 0.62 |
| 28.04.2025 | 02.05.2025 | 21.44 | 7.81 | 0.64 |
| 08.05.2025 | 12.05.2025 | 28.56 | 8.87 | 0.86 |
| 08.05.2025 | 12.05.2025 | 26.07 | 9.04 | 0.78 |
| 15.05.2025 | 18.05.2025 | 24.40 | 10.06 | 0.73 |
| 15.05.2025 | 18.05.2025 | 19.39 | 7.70 | 0.58 |
| 22.05.2025 | 26.05.2025 | 22.35 | 8.82 | 0.67 |
| 22.05.2025 | 26.05.2025 | 24.49 | 9.59 | 0.73 |
| 29.05.2025 | 02.06.2025 | 24.05 | 9.04 | 0.72 |
| 29.05.2025 | 02.06.2025 | 19.12 | 7.81 | 0.57 |

**Remark: NA**
**Opinion/interpretation**

***End of Report***

Perfact Researchers Pvt. Ltd. DELHI

**Pushpendra Singh**
**Manager**
**Reviewed By**

**Rachna Dogra**
**Sr. Vice President**
**AUTHORISED SIGNATORY**

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  **Document No.: PRPL/AA/7.8 F-07**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



Issued to: M/s State Industries Promotion Corporation of TN Ltd.

"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.

ULR NO. : TC699325000065359F
Test Report No. : PRPL/AS/250415-006
Date of Issue : 15.04.2025
Reference No. : TRF

## SAMPLE PARTICULARS

Name of the Sample : Ambient Air
a)Details of Sampling
b)Sampling Protocol : IS : 5182 Part-14
c)Equipment Used : RDS, FDS
d)Sampling Done By : Mr. Dharmendra & Mr. Pushpendra
e)Duration of Sampling : 24 Hrs.
f)Sampling Location : Therku Silukkanpatti

Physical Observation
(a) Sampling Flow Rate for Gases : 0.5 LPM
(b) Sampling Flow Rate For RSPM/: 0.95m3/min PM-10 (Ave.)

## TEST RESULTS

| Parameters: - | | | | | | | Particulate Matter ($PM_{10}$) | Particulate Matter ($PM_{2.5}$) |
|---|---|---|---|---|---|---|---|---|
| Units: - | | | | | | | µg/m³ | µg/m³ |
| Test Method: - | | | | | | | IS : 5182 P-23, 2006 | IS : 5182 P-24, 2019 |
| Requirements/Specification (As per CPCB Vol -II): - | | | | | | | 100 (24 Hrs) | 60 (24 Hrs) |
| Sample Receiving Date | Sampling Date | | Ambient Condition (Physical Observation) | | | Sample ID PRPL/AS/ | Results | |
| | Start | End | Weather Condition | Wind Direction | Temperature, °C (max./min.) | | | |
| 07.03.2025 | 01.03.2025 | 02.03.2025 | Mist | ENE | 38°C/26 °C | 250225-121 | 36.20 | 23.24 |
| 07.03.2025 | 04.03.2025 | 05.03.2025 | Haze | ESE | 38°C/24 °C | 250225-122 | 42.96 | 27.06 |
| 15.03.2025 | 08.03.2025 | 09.03.2025 | Fair | E | 35°C/23 °C | 250225-123 | 38.02 | 24.28 |
| 15.03.2025 | 11.03.2025 | 12.03.2025 | Mostly Cloudy | NNE | 27°C/24 °C | 250225-124 | 36.8 | 23.2 |
| 21.03.2025 | 15.03.2025 | 16.03.2025 | Fair | ESE | 35 °C/25 °C | 250225-125 | 42.04 | 27.02 |
| 21.03.2025 | 18.03.2025 | 19.03.2025 | Haze | ESE | 36 °C/26 °C | 250225-126 | 39.88 | 25.59 |
| 25.03.2025 | 22.03.2025 | 20.03.2025 | Haze | E | 37 °C/26 °C | 250225-127 | 47.21 | 28.14 |
| 25.03.2025 | 25.03.2025 | 26.03.2025 | Fair | ENE | 38 °C/24 °C | 250225-128 | 40.01 | 26.33 |
| 07.04.2025 | 01.04.2025 | 02.04.2025 | Mostly Cloudy | ESE | 30 °C/26 °C | 250225-129 | 34.05 | 21.75 |
| 07.04.2025 | 04.04.2025 | 05.04.2025 | Partly Cloudy | ESE | 38 °C/26 °C | 250225-130 | 33.05 | 21.14 |
| 14.04.2025 | 08.04.2025 | 09.04.2025 | Partly Cloudy | ESE | 38 °C/27 °C | 250225-131 | 34.80 | 23.08 |
| 14.04.2025 | 11.04.2025 | 12.04.2025 | Haze | WNW | 38 °C/25 °C | 250225-132 | 33.87 | 23.24 |

Pushpendra Singh
Manager
Reviewed By

Perfact Researchers Pvt. Ltd. DELHI

Rachna Dogra
Sr. Vice President
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Document No.: PRPL/AA/7.8 F-07

TC-6993

## TEST REPORT



**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**

**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR NO.** : TC699325000065359F
**Test Report No.** : PRPL/AS/250415-006
**Date of Issue** : 15.04.2025
**Reference No.** : TRF

## TEST RESULTS

| Parameters: - | | Nitrogen Dioxide ($NO_2$) | Sulphur Dioxide ($SO_2$) | CO |
|---|---|---|---|---|
| Units: - | | µg/m3 | µg/m3 | mg/m3 |
| Test Method: - | | IS : 5182 P-6, 2006 | IS : 5182 P-2, Sec-1, 2023 | IS : 5182 P-10, 1999 |
| Requirements/Specification (As per CPCB Vol-II): - | | 80 (24 Hrs) | 80 (24 Hrs) | 2 (8 Hrs) |
| Analysis | | Results | | |
| Start Date | End Date | | | |
| 07.03.2025 | 11.03.2025 | 26.58 | 8.60 | 0.80 |
| 07.03.2025 | 11.03.2025 | 23.84 | 9.21 | 0.72 |
| 15.03.2025 | 19.03.2025 | 27.58 | 10.02 | 0.83 |
| 15.03.2025 | 19.03.2025 | 26.4 | 9.8 | 0.79 |
| 21.03.2025 | 25.03.2025 | 29.56 | 10.76 | 0.89 |
| 21.03.2025 | 25.03.2025 | 27.02 | 10.85 | 0.81 |
| 25.03.2025 | 29.03.2025 | 30.34 | 10.83 | 0.91 |
| 25.03.2025 | 29.03.2025 | 21.83 | 12.60 | 0.65 |
| 07.04.2025 | 11.04.2025 | 22.77 | 8.61 | 0.68 |
| 07.04.2025 | 11.04.2025 | 24.26 | 8.59 | 0.73 |
| 13.04.2025 | 15.04.2025 | 25.08 | 9.88 | 0.75 |
| 13.04.2025 | 15.04.2025 | 18.51 | 7.71 | 0.56 |

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**Pushpendra Singh**
**Manager**
**Reviewed By**

**Rachna Dogra**
**Sr. Vice President**
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Document No.: PRPL/AA/7.8 F-07

# TEST REPORT



Issued to: M/s State Industries Promotion Corporation of TN Ltd.

"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu

Test Report No. : PRPL/AS/250605-006
Date of Issue : 05.06.2025
Reference No. : TRF

## SAMPLE PARTICULARS

Name of the Sample : Ambient Air
a)Details of Sampling
b)Sampling Protocol : IS : 5182 Part-14
c)Equipment Used : RDS, FDS
d)Sampling Done By : Mr. Dharmendra & Mr. Pushpendra
e)Duration of Sampling : 24 Hrs.
f)Sampling Location : Therku Silukkanpatti

Physical Observation
(a) Sampling Flow Rate for Gases : 0.5 LPM
(b) Sampling Flow Rate For RSPM/: 0.95m3/min
PM-10 (Ave.)

## TEST RESULTS

| Parameters: - | | | | | | | Particulate Matter ($PM_{10}$) | Particulate Matter ($PM_{2.5}$) |
|---|---|---|---|---|---|---|---|---|
| Units: - | | | | | | | µg/m³ | µg/m³ |
| Test Method: - | | | | | | | IS : 5182 P-23, 2006 | IS : 5182 P-24, 2019 |
| Requirements/Specification (As per CPCB Vol -II): - | | | | | | | 100 (24 Hrs) | 60 (24 Hrs) |
| Sample Receiving Date | Sampling Date | | Ambient Condition (Physical Observation) | | | Sample ID PRPL/AS/ | Results | |
| | Start | End | Weather Condition | Wind Direction | Temperature, °C (max./min.) | | | |
| 21.04.2025 | 15.04.2025 | 16.04.2025 | Partly Cloudy | NW | 39 °C/28 °C | 250225-133 | 34.87 | 20.72 |
| 21.04.2025 | 18.04.2025 | 19.04.2025 | Partly Cloudy | SW | 39 °C/28 °C | 250225-134 | 38.55 | 24.60 |
| 28.04.2025 | 22.04.2025 | 23.04.2025 | Fair | VAR | 40 °C/28 °C | 250225-135 | 36.84 | 23.42 |
| 28.04.2025 | 25.04.2025 | 26.04.2025 | Fair | SSE | 39 °C/29 °C | 250225-136 | 33.29 | 19.01 |
| 08.05.2025 | 02.05.2025 | 03.05.2025 | Fair | WNW | 40 °C/28 °C | 250225-137 | 30.98 | 17.91 |
| 08.05.2025 | 05.05.2025 | 06.05.2025 | Light Drizzle | SSW | 39 °C/28 °C | 250225-138 | 29.25 | 18.14 |
| 15.05.2025 | 09.05.2025 | 10.05.2025 | Partly Cloudy | NE | 38 °C/27 °C | 250225-139 | 33.25 | 21.55 |
| 15.05.2025 | 12.05.2025 | 13.05.2025 | Haze | NW | 40 °C/28 °C | 250225-140 | 31.63 | 20.74 |
| 22.05.2025 | 16.05.2025 | 17.05.2025 | Haze | WSW | 34 °C/27 °C | 250225-141 | 31.32 | 20.58 |
| 22.05.2025 | 19.05.2025 | 20.05.2025 | Haze | W | 35 °C/27 °C | 250225-142 | 30.84 | 19.57 |
| 29.05.2025 | 23.05.2025 | 24.05.2025 | Haze | WSW | 34 °C/28 °C | 250225-143 | 30.79 | 20.74 |
| 29.05.2025 | 26.05.2025 | 27.05.2025 | Haze | W | 35 °C/26 °C | 250225-144 | 31.09 | 20.71 |

Pushpendra Singh
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Document No.: PRPL/AA/7.8 F-07

## TEST REPORT



**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**

**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**Test Report No.** : PRPL/AS/250605-006
**Date of Issue** : 05.06.2025
**Reference No.** : TRF

## TEST RESULTS

| Parameters: - | | Nitrogen Dioxide ($NO_2$) | Sulphur Dioxide ($SO_2$) | CO |
|---|---|---|---|---|
| Units: - | | µg/m3 | µg/m3 | mg/m3 |
| Test Method: - | | IS : 5182 P-6, 2006 | IS : 5182 P-2, Sec-1, 2023 | IS : 5182 P-10, 1999 |
| Requirements/Specification (As per CPCB Vol-II): - | | 80 (24 Hrs) | 80 (24 Hrs) | 2 (8 Hrs) |
| Analysis | | Results | | |
| Start Date | End Date | | | |
| 21.04.2025 | 25.04.2025 | 20.76 | 6.52 | 0.62 |
| 21.04.2025 | 25.04.2025 | 20.27 | 7.66 | 0.61 |
| 28.04.2025 | 02.05.2025 | 22.68 | 8.95 | 0.68 |
| 28.04.2025 | 02.05.2025 | 23.43 | 8.54 | 0.70 |
| 08.05.2025 | 12.05.2025 | 31.22 | 9.70 | 0.94 |
| 08.05.2025 | 12.05.2025 | 28.49 | 9.88 | 0.85 |
| 15.05.2025 | 18.05.2025 | 26.67 | 11.00 | 0.80 |
| 15.05.2025 | 18.05.2025 | 21.19 | 8.42 | 0.64 |
| 22.05.2025 | 26.05.2025 | 24.43 | 9.64 | 0.73 |
| 22.05.2025 | 26.05.2025 | 26.77 | 10.48 | 0.80 |
| 29.05.2025 | 02.06.2025 | 26.28 | 9.88 | 0.79 |
| 29.05.2025 | 02.06.2025 | 20.90 | 8.54 | 0.63 |

**Remark: NA**
**Opinion/interpretation**

*****End of Report*****

**Pushpendra Singh**
**Manager**
**Reviewed By**

Perfact Researchers Pvt. Ltd. DELHI

**Rachna Dogra**
**Sr. Vice President**
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  **Document No.: PRPL/AA/7.8 F-07**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**

**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR NO.** : TC699325000065360F
**Test Report No.** : PRPL/AS/250415-007
**Date of Issue** : 15.04.2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**Name of the Sample** : Ambient Air
**a)Details of Sampling** — **Physical Observation**
**b)Sampling Protocol** : IS : 5182 Part-14 — **(a) Sampling Flow Rate for Gases : 0.5 LPM**
**c)Equipment Used** : RDS, FDS — **(b) Sampling Flow Rate For RSPM/: 0.95m3/min**
**d)Sampling Done By** : Mr. Dharmendra & Mr. Pushpendra — **PM-10 (Ave.)**
**e)Duration of Sampling** : 24 Hrs.
**f)Sampling Location** : Keela Thatapparai

## TEST RESULTS

| Parameters: - | | | | | | | Particulate Matter ($PM_{10}$) | Particulate Matter ($PM_{2.5}$) |
|---|---|---|---|---|---|---|---|---|
| Units: - | | | | | | | µg/m³ | µg/m³ |
| Test Method: - | | | | | | | IS : 5182 P-23, 2006 | IS : 5182 P-24, 2019 |
| Requirements/Specification (As per CPCB Vol -II): - | | | | | | | 100 (24 Hrs) | 60 (24 Hrs) |
| Sample Receiving Date | Sampling Date | | Ambient Condition (Physical Observation) | | | Sample ID PRPL/AS/ | Results | |
| | Start | End | Weather Condition | Wind Direction | Temperature, °C (max./min.) | | | |
| 08.03.2025 | 02.03.2025 | 03.03.2025 | Haze | ESE | 33 °C/26 °C | 250225-145 | 34.95 | 22.44 |
| 08.03.2025 | 05.03.2025 | 06.03.2025 | Fair | ENE | 40°C/ 23 °C | 250225-146 | 41.47 | 26.13 |
| 15.03.2025 | 09.03.2025 | 10.03.2025 | Partly Cloudy | ENE | 33 °C/23 °C | 250225-147 | 36.71 | 23.44 |
| 15.03.2025 | 12.03.2025 | 13.03.2025 | Haze | ESE | 35 °C/23 °C | 250225-148 | 35.5 | 22.4 |
| 22.03.2025 | 16.03.2025 | 17.03.2025 | Partly Cloudy | E | 39 °C/26 °C | 250225-149 | 40.59 | 26.08 |
| 22.03.2025 | 19.03.2025 | 20.03.2025 | Fair | E | 37 °C/26 °C | 250225-150 | 38.50 | 24.71 |
| 28.03.2025 | 20.03.2025 | 21.03.2025 | Haze | E | 34 °C/26 °C | 250225-151 | 45.58 | 27.17 |
| 28.03.2025 | 26.03.2025 | 27.03.2025 | Haze | ESE | 38 °C/25 °C | 250225-152 | 38.63 | 25.42 |
| 08.04.2025 | 02.04.2025 | 03.04.2025 | Mostly Cloudy | ENE | 39 °C/28 °C | 250225-153 | 32.88 | 21.00 |
| 08.04.2025 | 05.04.2025 | 06.04.2025 | Mist | W | 36 °C/27 °C | 250225-154 | 31.91 | 20.41 |
| 15.04.2025 | 09.04.2025 | 10.04.2025 | Partly Cloudy | WSW | 39 °C/28 °C | 250225-155 | 33.60 | 22.28 |
| 15.04.2025 | 12.04.2025 | 13.04.2025 | Mostly Cloudy | NNE | 36 °C/28 °C | 250225-156 | 32.70 | 22.44 |

Pushpendra Singh
Manager
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Perfact Researchers Pvt. Ltd. DELHI

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Sr. Vice President
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**Document No.: PRPL/AA/7.8 F-07**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**

**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR NO.** : TC699325000065360F
**Test Report No.** : PRPL/AS/250415-007
**Date of Issue** : 15.04.2025
**Reference No.** : TRF

## TEST RESULTS

| Parameters: - | | Nitrogen Dioxide ($NO_2$) | Sulphur Dioxide ($SO_2$) | CO |
|---|---|---|---|---|
| Units: - | | µg/m3 | µg/m3 | mg/m3 |
| Test Method: - | | IS : 5182 P-6, 2006 | IS : 5182 P-2, Sec-1, 2023 | IS : 5182 P-10, 1999 |
| Requirements/Specification (As per CPCB Vol-II): - | | 80 (24 Hrs) | 80 (24 Hrs) | 2 (8 Hrs) |
| Analysis | | Results | | |
| Start Date | End Date | | | |
| 08.03.2025 | 12.03.2025 | 25.66 | 8.30 | 0.77 |
| 08.03.2025 | 12.03.2025 | 23.02 | 8.89 | 0.69 |
| 15.03.2025 | 18.03.2025 | 26.63 | 9.68 | 0.80 |
| 15.03.2025 | 18.03.2025 | 25.5 | 9.5 | 0.77 |
| 22.03.2025 | 25.03.2025 | 28.54 | 10.39 | 0.86 |
| 22.03.2025 | 25.03.2025 | 26.09 | 10.47 | 0.78 |
| 28.03.2025 | 31.03.2025 | 29.30 | 10.46 | 0.88 |
| 28.03.2025 | 31.03.2025 | 21.08 | 12.17 | 0.63 |
| 08.04.2025 | 11.04.2025 | 21.98 | 8.31 | 0.66 |
| 08.04.2025 | 11.04.2025 | 23.43 | 8.30 | 0.70 |
| 15.04.2025 | 15.04.2025 | 24.22 | 9.54 | 0.73 |
| 15.04.2025 | 15.04.2025 | 17.87 | 7.45 | 0.54 |

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Document No.: PRPL/AA/7.8 F-07

# TEST REPORT



Issued to: M/s State Industries Promotion Corporation of TN Ltd.

"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.

Test Report No. : PRPL/AS/250605-007
Date of Issue : 05.06.2025
Reference No. : TRF

## SAMPLE PARTICULARS

Name of the Sample : Ambient Air
a)Details of Sampling
b)Sampling Protocol : IS : 5182 Part-14
c)Equipment Used : RDS, FDS
d)Sampling Done By : Mr. Dharmendra & Mr. Pushpendra
e)Duration of Sampling : 24 Hrs.
f)Sampling Location : Keela Thatapparai

Physical Observation
(a) Sampling Flow Rate for Gases : 0.5 LPM
(b) Sampling Flow Rate For RSPM/: 0.95m3/min
PM-10 (Ave.)

## TEST RESULTS

| Parameters: - | | | | | | | Particulate Matter ($PM_{10}$) | Particulate Matter ($PM_{2.5}$) |
|---|---|---|---|---|---|---|---|---|
| Units: - | | | | | | | µg/m³ | µg/m³ |
| Test Method: - | | | | | | | IS : 5182 P-23, 2006 | IS : 5182 P-24, 2019 |
| Requirements/Specification (As per CPCB Vol -II): - | | | | | | | 100 (24 Hrs) | 60 (24 Hrs) |
| Sample Receiving Date | Sampling Date | | Ambient Condition (Physical Observation) | | | Sample ID PRPL/AS/ | Results | |
| | Start | End | Weather Condition | Wind Direction | Temperature, °C (max./min.) | | | |
| 22.04.2025 | 16.04.2025 | 17.04.2025 | Mist | SE | 36 °C/28 °C | 250225-157 | 33.67 | 20.00 |
| 22.04.2025 | 19.04.2025 | 20.04.2025 | Partly Cloudy | SE | 40 °C/28 °C | 250225-158 | 37.22 | 23.75 |
| 29.04.2025 | 23.04.2025 | 24.04.2025 | Mist | SW | 38 °C/29 °C | 250225-159 | 35.57 | 22.62 |
| 29.04.2025 | 26.04.2025 | 27.04.2025 | Partly Cloudy | ESE | 36 °C/28 °C | 250225-160 | 32.15 | 18.36 |
| 09.05.2025 | 03.05.2025 | 04.05.2025 | Haze / Windy | SSE | 40 °C/30 °C | 250225-161 | 29.91 | 17.29 |
| 09.05.2025 | 06.05.2025 | 07.05.2025 | Partly Cloudy | ESE | 39 °C/25 °C | 250225-162 | 28.24 | 17.52 |
| 16.05.2025 | 10.05.2025 | 11.05.2025 | Fair | SE | 37 °C/28 °C | 250225-163 | 32.11 | 20.81 |
| 16.05.2025 | 13.05.2025 | 14.05.2025 | Mist | W | 41 °C/29 °C | 250225-164 | 30.54 | 20.02 |
| 23.05.2025 | 17.05.2025 | 18.05.2025 | Haze | WNW | 36 °C/25 °C | 250225-165 | 30.24 | 19.87 |
| 23.05.2025 | 20.05.2025 | 21.05.2025 | Fair | WNW | 37 °C/27 °C | 250225-166 | 29.77 | 18.90 |
| 30.05.2025 | 24.05.2025 | 25.05.2025 | Haze | WSW | 33 °C/28 °C | 250225-167 | 29.73 | 20.02 |
| 30.05.2025 | 27.05.2025 | 28.05.2025 | Mist | W | 39 °C/29 °C | 250225-168 | 30.02 | 19.99 |

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Document No.: PRPL/AA/7.8 F-07

## TEST REPORT



**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**

**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**Test Report No.** : **PRPL/AS/250605-007**
**Date of Issue** : 05.06.2025
**Reference No.** : **TRF**

## TEST RESULTS

| Parameters: - | | Nitrogen Dioxide ($NO_2$) | Sulphur Dioxide ($SO_2$) | CO |
|---|---|---|---|---|
| Units: - | | µg/m3 | µg/m3 | mg/m3 |
| Test Method: - | | IS : 5182 P-6, 2006 | IS : 5182 P-2, Sec-1, 2023 | IS : 5182 P-10, 1999 |
| Requirements/Specification (As per CPCB Vol-II): - | | 80 (24 Hrs) | 80 (24 Hrs) | 2 (8 Hrs) |
| Analysis | | Results | | |
| Start Date | End Date | | | |
| 22.04.2025 | 25.04.2025 | 20.05 | 6.30 | 0.60 |
| 22.04.2025 | 25.04.2025 | 19.57 | 7.40 | 0.59 |
| 29.04.2025 | 03.04.2025 | 21.90 | 8.64 | 0.66 |
| 29.04.2025 | 03.04.2025 | 22.62 | 8.24 | 0.68 |
| 09.05.2025 | 12.05.2025 | 30.14 | 9.36 | 0.90 |
| 09.05.2025 | 12.05.2025 | 27.51 | 9.54 | 0.83 |
| 16.05.2025 | 19.05.2025 | 25.75 | 10.62 | 0.77 |
| 16.05.2025 | 19.05.2025 | 20.46 | 8.13 | 0.61 |
| 23.05.2025 | 26.05.2025 | 23.59 | 9.31 | 0.71 |
| 23.05.2025 | 26.05.2025 | 25.85 | 10.12 | 0.78 |
| 30.05.2025 | 03.06.2025 | 25.38 | 9.54 | 0.76 |
| 30.05.2025 | 03.06.2025 | 20.18 | 8.24 | 0.61 |

**Remark: NA**
**Opinion/interpretation**

*****End of Report*****

Perfact Researchers Pvt. Ltd. DELHI

**Pushpendra Singh**
**Manager**
**Reviewed By**

**Rachna Dogra**
**Sr. Vice President**
**AUTHORISED SIGNATORY**

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**Document No.: PRPL/AA/7.8 F-07**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**

**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR NO.** : TC699325000065361F
**Test Report No.** : PRPL/AS/250415-008
**Date of Issue** : 15.04.2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**Name of the Sample** : Ambient Air
**a)Details of Sampling**
**b)Sampling Protocol** : IS : 5182 Part-14
**c)Equipment Used** : RDS, FDS
**d)Sampling Done By** : Mr. Dharmendra & Mr. Pushpendra
**e)Duration of Sampling** : 24 Hrs.
**f)Sampling Location** : Kuttudankadu

**Physical Observation**
**(a) Sampling Flow Rate for Gases : 0.5 LPM**
**(b) Sampling Flow Rate For RSPM/: 0.95m3/min**
**PM-10 (Ave.)**

## TEST RESULTS

| Parameters: - | | | | | | | Particulate Matter ($PM_{10}$) | Particulate Matter ($PM_{2.5}$) |
|---|---|---|---|---|---|---|---|---|
| Units: - | | | | | | | µg/m³ | µg/m³ |
| Test Method: - | | | | | | | IS : 5182 P-23, 2006 | IS : 5182 P-24, 2019 |
| Requirements/Specification (As per CPCB Vol -II): - | | | | | | | 100 (24 Hrs) | 60 (24 Hrs) |
| Sample Receiving Date | Sampling Date | | Ambient Condition (Physical Observation) | | | Sample ID PRPL/AS/ | Results | |
| | Start | End | Weather Condition | Wind Direction | Temperature, °C (max./min.) | | | |
| 08.03.2025 | 02.03.2025 | 03.03.2025 | Haze | ESE | 33 °C/26 °C | 250225-169 | 38.76 | 24.88 |
| 08.03.2025 | 05.03.2025 | 06.03.2025 | Fair | ENE | 40°C/ 23 °C | 250225-170 | 46.00 | 28.98 |
| 15.03.2025 | 09.03.2025 | 10.03.2025 | Partly Cloudy | ENE | 33 °C/23 °C | 250225-171 | 40.71 | 25.99 |
| 15.03.2025 | 12.03.2025 | 13.03.2025 | Haze | ESE | 35 °C/23 °C | 250225-172 | 39.4 | 24.9 |
| 22.03.2025 | 16.03.2025 | 17.03.2025 | Partly Cloudy | E | 39 °C/26 °C | 250225-173 | 45.02 | 28.93 |
| 22.03.2025 | 19.03.2025 | 20.03.2025 | Fair | E | 37 °C/26 °C | 250225-174 | 42.70 | 27.40 |
| 28.03.2025 | 20.03.2025 | 21.03.2025 | Haze | E | 34 °C/26 °C | 250225-175 | 50.55 | 30.13 |
| 28.03.2025 | 26.03.2025 | 27.03.2025 | Haze | ESE | 38 °C/25 °C | 250225-176 | 42.84 | 28.19 |
| 08.04.2025 | 02.04.2025 | 03.04.2025 | Mostly Cloudy | ENE | 39 °C/28 °C | 250225-177 | 36.46 | 23.28 |
| 08.04.2025 | 05.04.2025 | 06.04.2025 | Mist | W | 36 °C/27 °C | 250225-178 | 35.39 | 22.64 |
| 15.04.2025 | 09.04.2025 | 10.04.2025 | Partly Cloudy | WSW | 39 °C/28 °C | 250225-179 | 37.26 | 24.71 |
| 15.04.2025 | 12.04.2025 | 13.04.2025 | Mostly Cloudy | NNE | 36 °C/28 °C | 250225-180 | 36.26 | 24.89 |

Pushpendra Singh
Manager
Reviewed By

Perfact Researchers Pvt Ltd DELHI

Rachna Dogra
Sr. Vice President
AUTHORISED SIGNATORY

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Document No.: PRPL/AA/7.8 F-07

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**

"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.

ULR NO. : TC699325000065361F
Test Report No. : PRPL/AS/250415-008
Date of Issue : 15.04.2025
Reference No. : TRF

## TEST RESULTS

| Parameters: - | | Nitrogen Dioxide ($NO_2$) | Sulphur Dioxide ($SO_2$) | CO |
|---|---|---|---|---|
| Units: - | | µg/m3 | µg/m3 | mg/m3 |
| Test Method: - | | IS : 5182 P-6, 2006 | IS : 5182 P-2, Sec-1, 2023 | IS : 5182 P-10, 1999 |
| Requirements/Specification (As per CPCB Vol-II): - | | 80 (24 Hrs) | 80 (24 Hrs) | 2 (8 Hrs) |
| Analysis | | Results | | |
| Start Date | End Date | | | |
| 08.03.2025 | 12.03.2025 | 28.46 | 9.21 | 0.85 |
| 08.03.2025 | 12.03.2025 | 25.53 | 9.86 | 0.77 |
| 15.03.2025 | 18.03.2025 | 29.53 | 10.73 | 0.89 |
| 15.03.2025 | 18.03.2025 | 28.3 | 10.5 | 0.85 |
| 22.03.2025 | 25.03.2025 | 31.66 | 11.52 | 0.95 |
| 22.03.2025 | 25.03.2025 | 28.93 | 11.61 | 0.87 |
| 28.03.2025 | 31.03.2025 | 32.49 | 11.59 | 0.97 |
| 28.03.2025 | 31.03.2025 | 23.38 | 13.50 | 0.70 |
| 08.04.2025 | 11.04.2025 | 24.38 | 9.22 | 0.73 |
| 08.04.2025 | 11.04.2025 | 25.98 | 9.20 | 0.78 |
| 15.04.2025 | 15.04.2025 | 26.86 | 10.58 | 0.81 |
| 15.04.2025 | 15.04.2025 | 19.82 | 8.26 | 0.59 |

Pushpendra Singh
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Document No.: PRPL/AA/7.8 F-07

# TEST REPORT



Issued to: M/s State Industries Promotion Corporation of TN Ltd.

"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.

Test Report No. : PRPL/AS/250605-008
Date of Issue : 05.06.2025
Reference No. : TRF

## SAMPLE PARTICULARS

Name of the Sample : Ambient Air
a)Details of Sampling
b)Sampling Protocol : IS : 5182 Part-14
c)Equipment Used : RDS, FDS
d)Sampling Done By : Mr. Dharmendra & Mr. Pushpendra
e)Duration of Sampling : 24 IIrs.
f)Sampling Location : Kuttudankadu

Physical Observation
(a) Sampling Flow Rate for Gases : 0.5 LPM
(b) Sampling Flow Rate For RSPM/: 0.95m3/min PM-10 (Ave.)

## TEST RESULTS

| Parameters: - | | | | | | | Particulate Matter ($PM_{10}$) | Particulate Matter ($PM_{2.5}$) |
|---|---|---|---|---|---|---|---|---|
| Units: - | | | | | | | µg/m³ | µg/m³ |
| Test Method: - | | | | | | | IS : 5182 P-23, 2006 | IS : 5182 P-24, 2019 |
| Requirements/Specification (As per CPCB Vol -II): - | | | | | | | 100 (24 Hrs) | 60 (24 Hrs) |
| Sample Receiving Date | Sampling Date | | Ambient Condition (Physical Observation) | | | Sample ID PRPL/AS/ | Results | |
| | Start | End | Weather Condition | Wind Direction | Temperature, °C (max./min.) | | | |
| 22.04.2025 | 16.04.2025 | 17.04.2025 | Mist | SE | 36 °C/28 °C | 250225-181 | 37.34 | 22.19 |
| 22.04.2025 | 19.04.2025 | 20.04.2025 | Partly Cloudy | SE | 40 °C/28 °C | 250225-182 | 41.27 | 26.34 |
| 29.04.2025 | 23.04.2025 | 24.04.2025 | Mist | SW | 38 °C/29 °C | 250225-183 | 39.45 | 25.08 |
| 29.04.2025 | 26.04.2025 | 27.04.2025 | Partly Cloudy | ESE | 36 °C/28 °C | 250225-184 | 35.65 | 20.36 |
| 09.05.2025 | 03.05.2025 | 04.05.2025 | Haze / Windy | SSE | 40 °C/30 °C | 250225-185 | 33.17 | 19.18 |
| 09.05.2025 | 06.05.2025 | 07.05.2025 | Partly Cloudy | ESE | 39 °C/25 °C | 250225-186 | 31.32 | 19.43 |
| 16.05.2025 | 10.05.2025 | 11.05.2025 | Fair | SE | 37 °C/28 °C | 250225-187 | 35.61 | 23.07 |
| 16.05.2025 | 13.05.2025 | 14.05.2025 | Mist | W | 41 °C/29 °C | 250225-188 | 33.87 | 22.21 |
| 23.05.2025 | 17.05.2025 | 18.05.2025 | Haze | WNW | 36 °C/25 °C | 250225-189 | 33.54 | 22.04 |
| 23.05.2025 | 20.05.2025 | 21.05.2025 | Fair | WNW | 37 °C/27 °C | 250225-190 | 33.02 | 20.96 |
| 30.05.2025 | 24.05.2025 | 25.05.2025 | Haze | WSW | 33 °C/28 °C | 250225-191 | 32.97 | 22.21 |
| 30.05.2025 | 27.05.2025 | 28.05.2025 | Mist | W | 39 °C/29 °C | 250225-192 | 33.29 | 22.17 |

Pushpendra Singh
Manager
Reviewed By

Perfact Researchers Pvt. Ltd. DELHI

Rachna Dogra
Sr. Vice President
AUTHORISED SIGNATORY

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Document No.: PRPL/AA/7.8 F-07

# TEST REPORT



**Issued to: M/s State Industries Promotion Corporation of TN Ltd.**

**"Address:- "Development of an Industrial Park over an extent of 796.240 ha" by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**Test Report No.** : **PRPL/AS/250605-008**
**Date of Issue** : 05.06.2025
**Reference No.** : **TRF**

## TEST RESULTS

| **Parameters: -** | | **Nitrogen Dioxide ($NO_2$)** | **Sulphur Dioxide ($SO_2$)** | **CO** |
|---|---|---|---|---|
| **Units: -** | | **µg/m3** | **µg/m3** | **mg/m3** |
| **Test Method: -** | | **IS : 5182 P-6, 2006** | **IS : 5182 P-2, Sec-1, 2023** | **IS : 5182 P-10, 1999** |
| **Requirements/Specification (As per CPCB Vol-II): -** | | 80 (24 Hrs) | 80 (24 Hrs) | 2 (8 Hrs) |
| **Analysis** | | **Results** | | |
| **Start Date** | **End Date** | | | |
| **22.04.2025** | **25.04.2025** | 22.23 | 6.98 | 0.67 |
| **22.04.2025** | **25.04.2025** | 21.71 | 8.21 | 0.65 |
| **29.04.2025** | **03.04.2025** | 24.28 | 9.59 | 0.73 |
| **29.04.2025** | **03.04.2025** | 25.09 | 9.14 | 0.75 |
| **09.05.2025** | **12.05.2025** | 33.43 | 10.39 | 1.00 |
| **09.05.2025** | **12.05.2025** | 30.51 | 10.58 | 0.92 |
| **16.05.2025** | **19.05.2025** | 28.56 | 11.77 | 0.86 |
| **16.05.2025** | **19.05.2025** | 22.69 | 9.01 | 0.68 |
| **23.05.2025** | **26.05.2025** | 26.16 | 10.32 | 0.78 |
| **23.05.2025** | **26.05.2025** | 28.67 | 11.22 | 0.86 |
| **30.05.2025** | **03.06.2025** | 28.14 | 10.58 | 0.84 |
| **30.05.2025** | **03.06.2025** | 22.38 | 9.14 | 0.67 |

**Remark: NA**
**Opinion/interpretation**

*****End of Report*****

Perfact Researchers Pvt Ltd DELHI

**Pushpendra Singh**
**Manager**
**Reviewed By**

**Rachna Dogra**
**Sr. Vice Rresident**
**AUTHORISED SIGNATORY**

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**Document No.: PRPL/AA/7.8 F-07**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065362F
**Test Report No.** : PRPL/WS/250327-004
**Sample I.D.** : PRPL/WS/270325-004
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Ground Water
(b) Sample description : Borewell
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 9:30 AM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Nearby Site

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | pH at 25°C | -- | 6.64 | 6.5-8.5 | No Relaxation | 4500H+ B |
| 2 | Odour | -- | Agreeable | Agreeable | Agreeable | 2150 B |
| 3 | Conductivity at 25°C | µS/cm | 4453 | Not Specified | Not Specified | 2510 B |
| 4 | Colour | Hazen | <1 | 5 | 15 | 2120 B |
| 5 | Turbidity | NTU | BDL (DL-1) | 1 | 5 | 2130 B |
| 6 | Total Dissolved Solids | mg/l | 1901.50 | 500 | 2000 | 2540 C |
| 7 | Calcium (as Ca) | mg/l | 401 | 75 | 200 | 3500Ca-B |
| 8 | Boron (as B) | mg/l | BDL (DL-0.1) | 0.5 | 2.4 | 4500B-C |
| 9 | Aluminium (as Al) | mg/l | BLQ (LOQ-0.02) | 0.03 | 0.2 | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065362F
**Test Report No.** : PRPL/WS/250327-004
**Sample I.D.** : PRPL/WS/270325-004
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 10 | Chloride (as Cl) | mg/l | 519.0 | 250 | 1000 | 4500Cl-B |
| 11 | Copper (as Cu) | mg/l | BLQ (LOQ-0.02) | 0.05 | 1.5 | 3120 B |
| 12 | Fluoride (as F) | mg/l | 0.5 | 1 | 1.5 | 4500F-D |
| 13 | Iron (as Fe) | mg/l | BLQ (LOQ-0.05) | 1.0 | No Relaxation | 3120 B |
| 14 | Maganesium (as Mg) | mg/l | 117.6 | 30 | 100 | 3500Mg-B |
| 15 | Nitrate (as NO3) | mg/l | 47.70 | 45 | No Relaxation | 4500NO3-B |
| 16 | Manganese (as Mn) | mg/l | BLQ (LOQ-0.05) | 0.1 | 0.3 | 3120 B |
| 17 | Sulphate (as SO4) | mg/l | 645.50 | 200 | 400 | 4500SO4-E |
| 18 | Total Alkalinity as CaCO3 | mg/l | 260 | 200 | 600 | 2320 B |
| 19 | Total Hardness (as CaCO3) | mg/l | 1484 | 200 | 600 | 2340 C |
| 20 | Zinc (as Zn) | mg/l | BLQ (LOQ-0.05) | 5 | 15 | 3120 B |
| 21 | Cadmium (as Cd) | mg/l | BLQ (LOQ-0.001) | 0.003 | No Relaxation | 3120 B |
| 22 | Lead (as Pb) | mg/l | BLQ (LOQ-0.01) | 0.01 | No Relaxation | 3120 B |
| 23 | Nickel (as Ni) | mg/l | BLQ | 0.02 | No Relaxation | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

## TEST REPORT

**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065362F
**Test Report No.** : PRPL/WS/250327-004
**Sample I.D.** : PRPL/WS/270325-004
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 23 | | | (LOQ-0.02) | | | |
| 24 | Total Chromium (as Cr) | mg/l | BLQ (LOQ-0.02) | 0.05 | No Relaxation | 3120 B |
| 25 | Phosphate | mg/l | BDL (DL-0.1) | Not Specified | Not Specified | 4500P-D |
| 26 | Potassium | mg/l | 16.10 | Not Specified | Not Specified | 3120 B |
| 27 | Total Suspended Solids | mg/l | BDL (DL-1) | Not Specified | Not Specified | 2540 D |
| 28 | Lithium (as Li) | mg/l | BLQ (LOQ-0.01) | Not Specified | Not Specified | 3120 B |
| 29 | Sodium (as Na) | mg/l | 46.30 | Not Specified | Not Specified | 3120 B |
| 30 | Temperature | °C | 24.1 | Not Specified | Not Specified | 2550 B |

*BDL=Below Detection Limit,DL=Detection Limit, BLQ=Below Limit of Quantification,LOQ=Limit of Quantification.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065363F
**Test Report No.** : PRPL/WS/250327-005
**Sample I.D.** : PRPL/WS/270325-005
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Ground Water
(b) Sample description : Borewell (90ft)
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 10:05 AM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Thiruvanthapuram

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | pH at 25°C | -- | 7.08 | 6.5-8.5 | No Relaxation | 4500H+ B |
| 2 | Odour | -- | Agreeable | Agreeable | Agreeable | 2150 B |
| 3 | Conductivity at 25°C | µS/cm | 771 | Not Specified | Not Specified | 2510 B |
| 4 | Colour | Hazen | <1 | 5 | 15 | 2120 B |
| 5 | Turbidity | NTU | BDL (DL-1) | 1 | 5 | 2130 B |
| 6 | Total Dissolved Solids | mg/l | 542.88 | 500 | 2000 | 2540 C |
| 7 | Calcium (as Ca) | mg/l | 56 | 75 | 200 | 3500Ca-B |
| 8 | Boron (as B) | mg/l | BDL (DL-0.1) | 0.5 | 2.4 | 4500B-C |
| 9 | Aluminium (as Al) | mg/l | BLQ (LOQ-0.02) | 0.03 | 0.2 | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

**Note :**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065363F
**Test Report No.** : PRPL/WS/250327-005
**Sample I.D.** : PRPL/WS/270325-005
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 10 | Chloride (as Cl) | mg/l | 262.0 | 250 | 1000 | 4500Cl-B |
| 11 | Copper (as Cu) | mg/l | BLQ (LOQ-0.02) | 0.05 | 1.5 | 3120 B |
| 12 | Fluoride (as F) | mg/l | 0.1 | 1 | 1.5 | 4500F-D |
| 13 | Iron (as Fe) | mg/l | BLQ (LOQ-0.05) | 1.0 | No Relaxation | 3120 B |
| 14 | Maganesium (as Mg) | mg/l | 72.0 | 30 | 100 | 3500Mg-B |
| 15 | Nitrate (as NO3) | mg/l | 62.10 | 45 | No Relaxation | 4500NO3-B |
| 16 | Manganese (as Mn) | mg/l | BLQ (LOQ-0.05) | 0.1 | 0.3 | 3120 B |
| 17 | Sulphate (as SO4) | mg/l | 40.58 | 200 | 400 | 4500SO4-E |
| 18 | Total Alkalinity as CaCO3 | mg/l | 128 | 200 | 600 | 2320 B |
| 19 | Total Hardness (as CaCO3) | mg/l | 212 | 200 | 600 | 2340 C |
| 20 | Zinc (as Zn) | mg/l | BLQ (LOQ-0.05) | 5 | 15 | 3120 B |
| 21 | Cadmium (as Cd) | mg/l | BLQ (LOQ-0.001) | 0.003 | No Relaxation | 3120 B |
| 22 | Lead (as Pb) | mg/l | BLQ (LOQ-0.01) | 0.01 | No Relaxation | 3120 B |
| 23 | Nickel (as Ni) | mg/l | BLQ | 0.02 | No Relaxation | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

## TEST REPORT

**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065363F
**Test Report No.** : PRPL/WS/250327-005
**Sample I.D.** : PRPL/WS/270325-005
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 23 | | | (LOQ-0.02) | | | |
| 24 | Total Chromium (as Cr) | mg/l | BLQ (LOQ-0.02) | 0.05 | No Relaxation | 3120 B |
| 25 | Phosphate | mg/l | 0.13 | Not Specified | Not Specified | 4500P-D |
| 26 | Potassium | mg/l | 8.30 | Not Specified | Not Specified | 3120 B |
| 27 | Total Suspended Solids | mg/l | BDL (DL-1) | Not Specified | Not Specified | 2540 D |
| 28 | Lithium (as Li) | mg/l | BLQ (LOQ-0.01) | Not Specified | Not Specified | 3120 B |
| 29 | Sodium (as Na) | mg/l | 27.20 | Not Specified | Not Specified | 3120 B |
| 30 | Temperature | °C | 24.2 | Not Specified | Not Specified | 2550 B |

*BDL=Below Detection Limit,DL=Detection Limit, BLQ=Below Limit of Quantification,LOQ=Limit of Quantification.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065364F
**Test Report No.** : PRPL/WS/250327-006
**Sample I.D.** : PRPL/WS/270325-006
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Ground Water
(b) Sample description : Borewell (140ft)
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 10:30 AM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Therku Silukkanpatti

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | pH at 25°C | -- | 6.95 | 6.5-8.5 | No Relaxation | 4500H+ B |
| 2 | Odour | -- | Agreeable | Agreeable | Agreeable | 2150 B |
| 3 | Conductivity at 25°C | µS/cm | 1965 | Not Specified | Not Specified | 2510 B |
| 4 | Colour | Hazen | <1 | 5 | 15 | 2120 B |
| 5 | Turbidity | NTU | BDL (DL-1) | 1 | 5 | 2130 B |
| 6 | Total Dissolved Solids | mg/l | 784.85 | 500 | 2000 | 2540 C |
| 7 | Calcium (as Ca) | mg/l | 160 | 75 | 200 | 3500Ca-B |
| 8 | Boron (as B) | mg/l | BDL (DL-0.1) | 0.5 | 2.4 | 4500B-C |
| 9 | Aluminium (as Al) | mg/l | BLQ (LOQ-0.02) | 0.03 | 0.2 | 3120 B |

Anshul
Assistant Manager
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**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065364F
**Test Report No.** : PRPL/WS/250327-006
**Sample I.D.** : PRPL/WS/270325-006
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 10 | Chloride (as Cl) | mg/l | 339.0 | 250 | 1000 | 4500Cl-B |
| 11 | Copper (as Cu) | mg/l | BLQ (LOQ-0.02) | 0.05 | 1.5 | 3120 B |
| 12 | Fluoride (as F) | mg/l | BDL (DL-0.1) | 1 | 1.5 | 4500F-D |
| 13 | Iron (as Fe) | mg/l | BLQ (LOQ-0.05) | 1.0 | No Relaxation | 3120 B |
| 14 | Maganesium (as Mg) | mg/l | 48.6 | 30 | 100 | 3500Mg-B |
| 15 | Nitrate (as NO3) | mg/l | 114.40 | 45 | No Relaxation | 4500NO3-B |
| 16 | Manganese (as Mn) | mg/l | BLQ (LOQ-0.05) | 0.1 | 0.3 | 3120 B |
| 17 | Sulphate (as SO4) | mg/l | 92.75 | 200 | 400 | 4500SO4-E |
| 18 | Total Alkalinity as CaCO3 | mg/l | 160 | 200 | 600 | 2320 B |
| 19 | Total Hardness (as CaCO3) | mg/l | 600 | 200 | 600 | 2340 C |
| 20 | Zinc (as Zn) | mg/l | BLQ (LOQ-0.05) | 5 | 15 | 3120 B |
| 21 | Cadmium (as Cd) | mg/l | BLQ (LOQ-0.001) | 0.003 | No Relaxation | 3120 B |
| 22 | Lead (as Pb) | mg/l | BLQ (LOQ-0.01) | 0.01 | No Relaxation | 3120 B |
| 23 | Nickel (as Ni) | mg/l | BLQ | 0.02 | No Relaxation | 3120 B |

Anshul
Assistant Manager
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**ULR No.** : TC699325000065364F
**Test Report No.** : PRPL/WS/250327-006
**Sample I.D.** : PRPL/WS/270325-006
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 23 | | | (LOQ-0.02) | | | |
| 24 | Total Chromium (as Cr) | mg/l | BLQ (LOQ-0.02) | 0.05 | No Relaxation | 3120 B |
| 25 | Phosphate | mg/l | 0.12 | Not Specified | Not Specified | 4500P-D |
| 26 | Potassium | mg/l | 10.10 | Not Specified | Not Specified | 3120 B |
| 27 | Total Suspended Solids | mg/l | BDL (DL-1) | Not Specified | Not Specified | 2540 D |
| 28 | Lithium (as Li) | mg/l | BLQ (LOQ-0.01) | Not Specified | Not Specified | 3120 B |
| 29 | Sodium (as Na) | mg/l | 38.40 | Not Specified | Not Specified | 3120 B |
| 30 | Temperature | °C | 24.0 | Not Specified | Not Specified | 2550 B |

*BDL=Below Detection Limit,DL=Detection Limit, BLQ=Below Limit of Quantification,LOQ=Limit of Quantification.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065365F
**Test Report No.** : PRPL/WS/250327-007
**Sample I.D.** : PRPL/WS/270325-007
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Ground Water
(b) Sample description : Borewell (50ft)
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 10:46 AM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Keela Thatapparai

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | pH at 25°C | -- | 6.97 | 6.5-8.5 | No Relaxation | 4500H+ B |
| 2 | Odour | -- | Agreeable | Agreeable | Agreeable | 2150 B |
| 3 | Conductivity at 25°C | µS/cm | 1612 | Not Specified | Not Specified | 2510 B |
| 4 | Colour | Hazen | <1 | 5 | 15 | 2120 B |
| 5 | Turbidity | NTU | BDL (DL-1) | 1 | 5 | 2130 B |
| 6 | Total Dissolved Solids | mg/l | 1201.90 | 500 | 2000 | 2540 C |
| 7 | Calcium (as Ca) | mg/l | 144 | 75 | 200 | 3500Ca-B |
| 8 | Boron (as B) | mg/l | BDL (DL-0.1) | 0.5 | 2.4 | 4500B-C |
| 9 | Aluminium (as Al) | mg/l | BLQ (LOQ-0.02) | 0.03 | 0.2 | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

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Sr. Vice President
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**Test Report No.** : PRPL/WS/250327-007
**Sample I.D.** : PRPL/WS/270325-007
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 10 | Chloride (as Cl) | mg/l | 81.0 | 250 | 1000 | 4500Cl-B |
| 11 | Copper (as Cu) | mg/l | BLQ (LOQ-0.02) | 0.05 | 1.5 | 3120 B |
| 12 | Fluoride (as F) | mg/l | BDL (DL-0.1) | 1 | 1.5 | 4500F-D |
| 13 | Iron (as Fe) | mg/l | BLQ (LOQ-0.05) | 1.0 | No Relaxation | 3120 B |
| 14 | Maganesium (as Mg) | mg/l | 103.0 | 30 | 100 | 3500Mg-B |
| 15 | Nitrate (as NO3) | mg/l | 97.20 | 45 | No Relaxation | 4500NO3-B |
| 16 | Manganese (as Mn) | mg/l | BLQ (LOQ-0.05) | 0.1 | 0.3 | 3120 B |
| 17 | Sulphate (as SO4) | mg/l | 595.50 | 200 | 400 | 4500SO4-E |
| 18 | Total Alkalinity as CaCO3 | mg/l | 300 | 200 | 600 | 2320 B |
| 19 | Total Hardness (as CaCO3) | mg/l | 784 | 200 | 600 | 2340 C |
| 20 | Zinc (as Zn) | mg/l | BLQ (LOQ-0.05) | 5 | 15 | 3120 B |
| 21 | Cadmium (as Cd) | mg/l | BLQ (LOQ-0.001) | 0.003 | No Relaxation | 3120 B |
| 22 | Lead (as Pb) | mg/l | BLQ (LOQ-0.01) | 0.01 | No Relaxation | 3120 B |
| 23 | Nickel (as Ni) | mg/l | BLQ | 0.02 | No Relaxation | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

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Sr. Vice President
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**ULR No.** : TC699325000065365F
**Test Report No.** : PRPL/WS/250327-007
**Sample I.D.** : PRPL/WS/270325-007
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 23 | | | (LOQ-0.02) | | | |
| 24 | Total Chromium (as Cr) | mg/l | BLQ (LOQ-0.02) | 0.05 | No Relaxation | 3120 B |
| 25 | Phosphate | mg/l | BDL (DL-0.1) | Not Specified | Not Specified | 4500P-D |
| 26 | Potassium | mg/l | 13.00 | Not Specified | Not Specified | 3120 B |
| 27 | Total Suspended Solids | mg/l | BDL (DL-1) | Not Specified | Not Specified | 2540 D |
| 28 | Lithium (as Li) | mg/l | BLQ (LOQ-0.01) | Not Specified | Not Specified | 3120 B |
| 29 | Sodium (as Na) | mg/l | 41.40 | Not Specified | Not Specified | 3120 B |
| 30 | Temperature | °C | 25.1 | Not Specified | Not Specified | 2550 B |

*BDL=Below Detection Limit,DL=Detection Limit, BLQ=Below Limit of Quantification,LOQ=Limit of Quantification

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



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**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065366F
**Test Report No.** : PRPL/WS/250327-008
**Sample I.D.** : PRPL/WS/270325-008
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Ground Water
(b) Sample description : Borewell (90ft)
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 11:03 AM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Kuttudankadu

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | pH at 25°C | -- | 6.95 | 6.5-8.5 | No Relaxation | 4500H+ B |
| 2 | Odour | -- | Agreeable | Agreeable | Agreeable | 2150 B |
| 3 | Conductivity at 25°C | µS/cm | 1029 | Not Specified | Not Specified | 2510 B |
| 4 | Colour | Hazen | <1 | 5 | 15 | 2120 B |
| 5 | Turbidity | NTU | BDL (DL-1) | 1 | 5 | 2130 B |
| 6 | Total Dissolved Solids | mg/l | 495.76 | 500 | 2000 | 2540 C |
| 7 | Calcium (as Ca) | mg/l | 72 | 75 | 200 | 3500Ca-B |
| 8 | Boron (as B) | mg/l | BDL (DL-0.1) | 0.5 | 2.4 | 4500B-C |
| 9 | Aluminium (as Al) | mg/l | BLQ (LOQ-0.02) | 0.03 | 0.2 | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
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## TEST REPORT



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**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065366F
**Test Report No.** : PRPL/WS/250327-008
**Sample I.D.** : PRPL/WS/270325-008
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 10 | Chloride (as Cl) | mg/l | 117.0 | 250 | 1000 | 4500Cl-B |
| 11 | Copper (as Cu) | mg/l | BLQ (LOQ-0.02) | 0.05 | 1.5 | 3120 B |
| 12 | Fluoride (as F) | mg/l | BDL (DL-0.1) | 1 | 1.5 | 4500F-D |
| 13 | Iron (as Fe) | mg/l | BLQ (LOQ-0.05) | 1.0 | No Relaxation | 3120 B |
| 14 | Maganesium (as Mg) | mg/l | 37.9 | 30 | 100 | 3500Mg-B |
| 15 | Nitrate (as NO3) | mg/l | 9.46 | 45 | No Relaxation | 4500NO3-B |
| 16 | Manganese (as Mn) | mg/l | BLQ (LOQ-0.05) | 0.1 | 0.3 | 3120 B |
| 17 | Sulphate (as SO4) | mg/l | 34.12 | 200 | 400 | 4500SO4-E |
| 18 | Total Alkalinity as CaCO3 | mg/l | 272 | 200 | 600 | 2320 B |
| 19 | Total Hardness (as CaCO3) | mg/l | 336 | 200 | 600 | 2340 C |
| 20 | Zinc (as Zn) | mg/l | BLQ (LOQ-0.05) | 5 | 15 | 3120 B |
| 21 | Cadmium (as Cd) | mg/l | BLQ (LOQ-0.001) | 0.003 | No Relaxation | 3120 B |
| 22 | Lead (as Pb) | mg/l | BLQ (LOQ-0.01) | 0.01 | No Relaxation | 3120 B |
| 23 | Nickel (as Ni) | mg/l | BLQ | 0.02 | No Relaxation | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

**Note :**

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**Document No.: PRPL/DW/7.8 F-04**

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065366F
**Test Report No.** : PRPL/WS/250327-008
**Sample I.D.** : PRPL/WS/270325-008
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 23 | | | (LOQ-0.02) | | | |
| 24 | Total Chromium (as Cr) | mg/l | BLQ (LOQ-0.02) | 0.05 | No Relaxation | 3120 B |
| 25 | Phosphate | mg/l | 0.93 | Not Specified | Not Specified | 4500P-D |
| 26 | Potassium | mg/l | 0.94 | Not Specified | Not Specified | 3120 B |
| 27 | Total Suspended Solids | mg/l | BDL (DL-1) | Not Specified | Not Specified | 2540 D |
| 28 | Lithium (as Li) | mg/l | BLQ (LOQ-0.01) | Not Specified | Not Specified | 3120 B |
| 29 | Sodium (as Na) | mg/l | 9.70 | Not Specified | Not Specified | 3120 B |
| 30 | Temperature | °C | 24.6 | Not Specified | Not Specified | 2550 B |

*BDL=Below Detection Limit,DL=Detection Limit, BLQ=Below Limit of Quantification,LOQ=Limit of Quantification.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065367F
**Test Report No.** : PRPL/WS/250327-009
**Sample I.D.** : PRPL/WS/270325-009
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Ground Water
(b) Sample description : Borewell (100ft)
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 11:20 AM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Perurani

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | pH at 25°C | -- | 7.35 | 6.5-8.5 | No Relaxation | 4500H+ B |
| 2 | Odour | -- | Agreeable | Agreeable | Agreeable | 2150 B |
| 3 | Conductivity at 25°C | µS/cm | 254 | Not Specified | Not Specified | 2510 B |
| 4 | Colour | Hazen | <1 | 5 | 15 | 2120 B |
| 5 | Turbidity | NTU | BDL (DL-1) | 1 | 5 | 2130 B |
| 6 | Total Dissolved Solids | mg/l | 140.80 | 500 | 2000 | 2540 C |
| 7 | Calcium (as Ca) | mg/l | 21 | 75 | 200 | 3500Ca-B |
| 8 | Boron (as B) | mg/l | BDL (DL-0.1) | 0.5 | 2.4 | 4500B-C |
| 9 | Aluminium (as Al) | mg/l | BLQ (LOQ-0.02) | 0.03 | 0.2 | 3120 B |

Anshul
Assistant Manager
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**Document No.: PRPL/DW/7.8 F-04**

## TEST REPORT

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**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065367F
**Test Report No.** : PRPL/WS/250327-009
**Sample I.D.** : PRPL/WS/270325-009
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 10 | Chloride (as Cl) | mg/l | 34.0 | 250 | 1000 | 4500Cl-B |
| 11 | Copper (as Cu) | mg/l | BLQ (LOQ-0.02) | 0.05 | 1.5 | 3120 B |
| 12 | Fluoride (as F) | mg/l | 0.3 | 1 | 1.5 | 4500F-D |
| 13 | Iron (as Fe) | mg/l | BLQ (LOQ-0.05) | 1.0 | No Relaxation | 3120 B |
| 14 | Maganesium (as Mg) | mg/l | 8.7 | 30 | 100 | 3500Mg-B |
| 15 | Nitrate (as NO3) | mg/l | 20.80 | 45 | No Relaxation | 4500NO3-B |
| 16 | Manganese (as Mn) | mg/l | BLQ (LOQ-0.05) | 0.1 | 0.3 | 3120 B |
| 17 | Sulphate (as SO4) | mg/l | 8.92 | 200 | 400 | 4500SO4-E |
| 18 | Total Alkalinity as CaCO3 | mg/l | 92 | 200 | 600 | 2320 B |
| 19 | Total Hardness (as CaCO3) | mg/l | 88 | 200 | 600 | 2340 C |
| 20 | Zinc (as Zn) | mg/l | BLQ (LOQ-0.05) | 5 | 15 | 3120 B |
| 21 | Cadmium (as Cd) | mg/l | BLQ (LOQ-0.001) | 0.003 | No Relaxation | 3120 B |
| 22 | Lead (as Pb) | mg/l | BLQ (LOQ-0.01) | 0.01 | No Relaxation | 3120 B |
| 23 | Nickel (as Ni) | mg/l | BLQ | 0.02 | No Relaxation | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

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**Document No.: PRPL/DW/7.8 F-04**

## TEST REPORT



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**ULR No.** : TC699325000065367F
**Test Report No.** : PRPL/WS/250327-009
**Sample I.D.** : PRPL/WS/270325-009
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 23 | | | (LOQ-0.02) | | | |
| 24 | Total Chromium (as Cr) | mg/l | BLQ (LOQ-0.02) | 0.05 | No Relaxation | 3120 B |
| 25 | Phosphate | mg/l | 0.29 | Not Specified | Not Specified | 4500P-D |
| 26 | Potassium | mg/l | 0.64 | Not Specified | Not Specified | 3120 B |
| 27 | Total Suspended Solids | mg/l | BDL (DL-1) | Not Specified | Not Specified | 2540 D |
| 28 | Lithium (as Li) | mg/l | BLQ (LOQ-0.01) | Not Specified | Not Specified | 3120 B |
| 29 | Sodium (as Na) | mg/l | 8.37 | Not Specified | Not Specified | 3120 B |
| 30 | Temperature | °C | 24.4 | Not Specified | Not Specified | 2550 B |

*BDL=Below Detection Limit,DL=Detection Limit, BLQ=Below Limit of Quantification,LOQ=Limit of Quantification.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065368F
**Test Report No.** : PRPL/WS/250327-010
**Sample I.D.** : PRPL/WS/270325-010
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Ground Water
(b) Sample description : Borewell (120ft)
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 11:40 AM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Melathattaparai

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | pH at 25°C | -- | 7.1 | 6.5-8.5 | No Relaxation | 4500H+ B |
| 2 | Odour | -- | Agreeable | Agreeable | Agreeable | 2150 B |
| 3 | Conductivity at 25°C | µS/cm | 463 | Not Specified | Not Specified | 2510 B |
| 4 | Colour | Hazen | <1 | 5 | 15 | 2120 B |
| 5 | Turbidity | NTU | BDL (DL-1) | 1 | 5 | 2130 B |
| 6 | Total Dissolved Solids | mg/l | 313.10 | 500 | 2000 | 2540 C |
| 7 | Calcium (as Ca) | mg/l | 64 | 75 | 200 | 3500Ca-B |
| 8 | Boron (as B) | mg/l | BDL (DL-0.1) | 0.5 | 2.4 | 4500B-C |
| 9 | Aluminium (as Al) | mg/l | BLQ (LOQ-0.02) | 0.03 | 0.2 | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



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**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065368F
**Test Report No.** : PRPL/WS/250327-010
**Sample I.D.** : PRPL/WS/270325-010
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 10 | Chloride (as Cl) | mg/l | 43.0 | 250 | 1000 | 4500Cl-B |
| 11 | Copper (as Cu) | mg/l | BLQ (LOQ-0.02) | 0.05 | 1.5 | 3120 B |
| 12 | Fluoride (as F) | mg/l | BDL (DL-0.1) | 1 | 1.5 | 4500F-D |
| 13 | Iron (as Fe) | mg/l | BLQ (LOQ-0.05) | 1.0 | No Relaxation | 3120 B |
| 14 | Maganesium (as Mg) | mg/l | 10.7 | 30 | 100 | 3500Mg-B |
| 15 | Nitrate (as NO3) | mg/l | 8.60 | 45 | No Relaxation | 4500NO3-B |
| 16 | Manganese (as Mn) | mg/l | BLQ (LOQ-0.05) | 0.1 | 0.3 | 3120 B |
| 17 | Sulphate (as SO4) | mg/l | 19.32 | 200 | 400 | 4500SO4-E |
| 18 | Total Alkalinity as CaCO3 | mg/l | 264.00 | 200 | 600 | 2320 B |
| 19 | Total Hardness (as CaCO3) | mg/l | 204 | 200 | 600 | 2340 C |
| 20 | Zinc (as Zn) | mg/l | BLQ (LOQ-0.05) | 5 | 15 | 3120 B |
| 21 | Cadmium (as Cd) | mg/l | BLQ (LOQ-0.001) | 0.003 | No Relaxation | 3120 B |
| 22 | Lead (as Pb) | mg/l | BLQ (LOQ-0.01) | 0.01 | No Relaxation | 3120 B |
| 23 | Nickel (as Ni) | mg/l | BLQ | 0.02 | No Relaxation | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**ULR No.** : TC699325000065368F
**Test Report No.** : PRPL/WS/250327-010
**Sample I.D.** : PRPL/WS/270325-010
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 23 | | | (LOQ-0.02) | | | |
| 24 | Total Chromium (as Cr) | mg/l | BLQ (LOQ-0.02) | 0.05 | No Relaxation | 3120 B |
| 25 | Phosphate | mg/l | BDL (DL-0.1) | Not Specified | Not Specified | 4500P-D |
| 26 | Potassium | mg/l | 1.56 | Not Specified | Not Specified | 3120 B |
| 27 | Total Suspended Solids | mg/l | BDL (DL-1) | Not Specified | Not Specified | 2540 D |
| 28 | Lithium (as Li) | mg/l | BLQ (LOQ-0.01) | Not Specified | Not Specified | 3120 B |
| 29 | Sodium (as Na) | mg/l | 11.09 | Not Specified | Not Specified | 3120 B |
| 30 | Temperature | °C | 24.3 | Not Specified | Not Specified | 2550 B |

*BDL=Below Detection Limit,DL=Detection Limit, BLQ=Below Limit of Quantification,LOQ=Limit of Quantification.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065369F
**Test Report No.** : PRPL/WS/250327-011
**Sample I.D.** : PRPL/WS/270325-011
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Ground Water
(b) Sample description : Borewell (180ft)
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 11:57 AM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Allikulam

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | pH at 25°C | -- | 6.93 | 6.5-8.5 | No Relaxation | 4500H+ B |
| 2 | Odour | -- | Agreeable | Agreeable | Agreeable | 2150 B |
| 3 | Conductivity at 25°C | µS/cm | 1554 | Not Specified | Not Specified | 2510 B |
| 4 | Colour | Hazen | <1 | 5 | 15 | 2120 B |
| 5 | Turbidity | NTU | BDL (DL-1) | 1 | 5 | 2130 B |
| 6 | Total Dissolved Solids | mg/l | 726.88 | 500 | 2000 | 2540 C |
| 7 | Calcium (as Ca) | mg/l | 149 | 75 | 200 | 3500Ca-B |
| 8 | Boron (as B) | mg/l | BDL (DL-0.1) | 0.5 | 2.4 | 4500B-C |
| 9 | Aluminium (as Al) | mg/l | BLQ (LOQ-0.02) | 0.03 | 0.2 | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

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**Test Report No.** : PRPL/WS/250327-011
**Sample I.D.** : PRPL/WS/270325-011
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 10 | Chloride (as Cl) | mg/l | 237.0 | 250 | 1000 | 4500Cl-B |
| 11 | Copper (as Cu) | mg/l | BLQ (LOQ-0.02) | 0.05 | 1.5 | 3120 B |
| 12 | Fluoride (as F) | mg/l | BDL (DL-0.1) | 1 | 1.5 | 4500F-D |
| 13 | Iron (as Fe) | mg/l | BLQ (LOQ-0.05) | 1.0 | No Relaxation | 3120 B |
| 14 | Maganesium (as Mg) | mg/l | 45.7 | 30 | 100 | 3500Mg-B |
| 15 | Nitrate (as NO3) | mg/l | 70.20 | 45 | No Relaxation | 4500NO3-B |
| 16 | Manganese (as Mn) | mg/l | BLQ (LOQ-0.05) | 0.1 | 0.3 | 3120 B |
| 17 | Sulphate (as SO4) | mg/l | 116.00 | 200 | 400 | 4500SO4-E |
| 18 | Total Alkalinity as CaCO3 | mg/l | 216 | 200 | 600 | 2320 B |
| 19 | Total Hardness (as CaCO3) | mg/l | 560 | 200 | 600 | 2340 C |
| 20 | Zinc (as Zn) | mg/l | BLQ (LOQ-0.05) | 5 | 15 | 3120 B |
| 21 | Cadmium (as Cd) | mg/l | BLQ (LOQ-0.001) | 0.003 | No Relaxation | 3120 B |
| 22 | Lead (as Pb) | mg/l | BLQ (LOQ-0.01) | 0.01 | No Relaxation | 3120 B |
| 23 | Nickel (as Ni) | mg/l | BLQ | 0.02 | No Relaxation | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
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## TEST REPORT



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**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065369F
**Test Report No.** : PRPL/WS/250327-011
**Sample I.D.** : PRPL/WS/270325-011
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 23 | | | (LOQ-0.02) | | | |
| 24 | Total Chromium (as Cr) | mg/l | BLQ (LOQ-0.02) | 0.05 | No Relaxation | 3120 B |
| 25 | Phosphate | mg/l | BDL (DL-0.1) | Not Specified | Not Specified | 4500P-D |
| 26 | Potassium | mg/l | 0.93 | Not Specified | Not Specified | 3120 B |
| 27 | Total Suspended Solids | mg/l | BDL (DL-1) | Not Specified | Not Specified | 2540 D |
| 28 | Lithium (as Li) | mg/l | BLQ (LOQ-0.01) | Not Specified | Not Specified | 3120 B |
| 29 | Sodium (as Na) | mg/l | 7.75 | Not Specified | Not Specified | 3120 B |
| 30 | Temperature | °C | 24.8 | Not Specified | Not Specified | 2550 B |

*BDL=Below Detection Limit,DL=Detection Limit, BLQ=Below Limit of Quantification,LOQ=Limit of Quantification.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065370F
**Test Report No.** : PRPL/WS/250327-012
**Sample I.D.** : PRPL/WS/270325-012
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Surface Water
(b) Sample description : Surface Water
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 12:50 PM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Madagiri Odai Upstream

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | pH at 25°C | -- | 6.94 | 6.5-8.5 | No Relaxation | 4500H+ B |
| 2 | Odour | -- | Agreeable | Agreeable | Agreeable | 2150 B |
| 3 | Conductivity at 25°C | µS/cm | 6100 | Not Specified | Not Specified | 2510 B |
| 4 | Colour | Hazen | <1 | 5 | 15 | 2120 B |
| 5 | Turbidity | NTU | BDL (DL-1) | 1 | 5 | 2130 B |
| 6 | Total Dissolved Solids | mg/l | 2387.57 | 500 | 2000 | 2540 C |
| 7 | Calcium (as Ca) | mg/l | 417 | 75 | 200 | 3500Ca-B |
| 8 | Boron (as B) | mg/l | BDL (DL-0.1) | 0.5 | 2.4 | 4500B-C |
| 9 | Aluminium (as Al) | mg/l | BLQ (LOQ-0.02) | 0.03 | 0.2 | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065370F
**Test Report No.** : PRPL/WS/250327-012
**Sample I.D.** : PRPL/WS/270325-012
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 10 | Chloride (as Cl) | mg/l | 1178.0 | 250 | 1000 | 4500Cl-B |
| 11 | Copper (as Cu) | mg/l | BLQ (LOQ-0.02) | 0.05 | 1.5 | 3120 B |
| 12 | Fluoride (as F) | mg/l | BDL (DL-0.1) | 1 | 1.5 | 4500F-D |
| 13 | Iron (as Fe) | mg/l | BLQ (LOQ-0.05) | 1.0 | No Relaxation | 3120 B |
| 14 | Maganesium (as Mg) | mg/l | 184.7 | 30 | 100 | 3500Mg-B |
| 15 | Nitrate (as NO3) | mg/l | 0.83 | 45 | No Relaxation | 4500NO3-B |
| 16 | Manganese (as Mn) | mg/l | BLQ (LOQ-0.05) | 0.1 | 0.3 | 3120 B |
| 17 | Sulphate (as SO4) | mg/l | 0.20 | 200 | 400 | 4500SO4-E |
| 18 | Total Alkalinity as CaCO3 | mg/l | 300 | 200 | 600 | 2320 B |
| 19 | Total Hardness (as CaCO3) | mg/l | 1800 | 200 | 600 | 2340 C |
| 20 | Zinc (as Zn) | mg/l | BLQ (LOQ-0.05) | 5 | 15 | 3120 B |
| 21 | Cadmium (as Cd) | mg/l | BLQ (LOQ-0.001) | 0.003 | No Relaxation | 3120 B |
| 22 | Lead (as Pb) | mg/l | BLQ (LOQ-0.01) | 0.01 | No Relaxation | 3120 B |
| 23 | Nickel (as Ni) | mg/l | BLQ | 0.02 | No Relaxation | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065370F
**Test Report No.** : PRPL/WS/250327-012
**Sample I.D.** : PRPL/WS/270325-012
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 23 | | | (LOQ-0.02) | | | |
| 24 | Total Chromium (as Cr) | mg/l | BLQ (LOQ-0.02) | 0.05 | No Relaxation | 3120 B |
| 25 | Dissolved Oxygen | mg/l | 6.0 | Not Specified | Not Specified | 4500O-C |
| 26 | Phosphate | mg/l | BDL (DL-0.1) | Not Specified | Not Specified | 4500P-D |
| 27 | Potassium | mg/l | 1.97 | Not Specified | Not Specified | 3120 B |
| 28 | Biochemical Oxygen Demant at 20°C for 5days | mg/l | 3.2 | Not Specified | Not Specified | 5210 B |
| 29 | Chemical Oxygen Demand | mg/l | 10 | Not Specified | Not Specified | 5220 B & C |
| 30 | Total Suspended Solids | mg/l | 14.00 | Not Specified | Not Specified | 2540 D |
| 31 | Ammonical Nitrogen (as NH3-N) | mg/l | 0.2 | Not Specified | Not Specified | 4500NH3-B |
| 32 | Lithium (as Li) | mg/l | BLQ (LOQ-0.01) | Not Specified | Not Specified | 3120 B |
| 33 | Nitrite (as NO2) | mg/l | 0.21 | Not Specified | Not Specified | 4500NO2-B |
| 34 | Sodium (as Na) | mg/l | 14.20 | Not Specified | Not Specified | 3120 B |
| 35 | Temperature | °C | 24.9 | Not Specified | Not Specified | 2550 B |

*BDL=Below Detection Limit,DL=Detection Limit, BLQ=Below Limit of Quantification,LOQ=Limit of Quantification.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**Test Report No.** : PRPL/WS/250327-012/N
**Sample I.D.** : PRPL/WS/270325-012
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Surface Water
(b) Sample description : Surface Water
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 12:50 PM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Madagiri Odai Upstream

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | Total Coliform | MPN/100ML | 109.0 | Shall not be detectable in any 100ml sample | -- | IS : 1622, 1981 |

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Anshul
Assistant Manager
**Reviewed By**

Perfact Researchers Pvt. Ltd. DELHI

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065371F
**Test Report No.** : PRPL/WS/250327-013
**Sample I.D.** : PRPL/WS/270325-013
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Surface Water
(b) Sample description : Surface Water
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 12:30 PM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Drain Onsite

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | pH at 25°C | – | 7.41 | 6.5-8.5 | No Relaxation | 4500H+ B |
| 2 | Odour | – | Agreeable | Agreeable | Agreeable | 2150 B |
| 3 | Conductivity at 25°C | µS/cm | 65 | Not Specified | Not Specified | 2510 B |
| 4 | Colour | Hazen | <1 | 5 | 15 | 2120 B |
| 5 | Turbidity | NTU | BDL (DL-1) | 1 | 5 | 2130 B |
| 6 | Total Dissolved Solids | mg/l | 89.20 | 500 | 2000 | 2540 C |
| 7 | Calcium (as Ca) | mg/l | 10 | 75 | 200 | 3500Ca-B |
| 8 | Boron (as B) | mg/l | BDL (DL-0.1) | 0.5 | 2.4 | 4500B-C |
| 9 | Aluminium (as Al) | mg/l | BLQ (LOQ-0.02) | 0.03 | 0.2 | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



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**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065371F
**Test Report No.** : PRPL/WS/250327-013
**Sample I.D.** : PRPL/WS/270325-013
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 10 | Chloride (as Cl) | mg/l | 36.0 | 250 | 1000 | 4500Cl-B |
| 11 | Copper (as Cu) | mg/l | BLQ (LOQ-0.02) | 0.05 | 1.5 | 3120 B |
| 12 | Fluoride (as F) | mg/l | 0.4 | 1 | 1.5 | 4500F-D |
| 13 | Iron (as Fe) | mg/l | BLQ (LOQ-0.05) | 1.0 | No Relaxation | 3120 B |
| 14 | Maganesium (as Mg) | mg/l | 2.9 | 30 | 100 | 3500Mg-B |
| 15 | Nitrate (as NO3) | mg/l | 0.28 | 45 | No Relaxation | 4500NO3-B |
| 16 | Manganese (as Mn) | mg/l | BLQ (LOQ-0.05) | 0.1 | 0.3 | 3120 B |
| 17 | Sulphate (as SO4) | mg/l | 0.40 | 200 | 400 | 4500SO4-E |
| 18 | Total Alkalinity as CaCO3 | mg/l | 35 | 200 | 600 | 2320 B |
| 19 | Total Hardness (as CaCO3) | mg/l | 36 | 200 | 600 | 2340 C |
| 20 | Zinc (as Zn) | mg/l | BLQ (LOQ-0.05) | 5 | 15 | 3120 B |
| 21 | Cadmium (as Cd) | mg/l | BLQ (LOQ-0.001) | 0.003 | No Relaxation | 3120 B |
| 22 | Lead (as Pb) | mg/l | BLQ (LOQ-0.01) | 0.01 | No Relaxation | 3120 B |
| 23 | Nickel (as Ni) | mg/l | BLQ | 0.02 | No Relaxation | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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TC-6993

## TEST REPORT



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**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065371F
**Test Report No.** : PRPL/WS/250327-013
**Sample I.D.** : PRPL/WS/270325-013
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 23 | | | (LOQ-0.02) | | | |
| 24 | Total Chromium (as Cr) | mg/l | BLQ (LOQ-0.02) | 0.05 | No Relaxation | 3120 B |
| 25 | Dissolved Oxygen | mg/l | 6.5 | Not Specified | Not Specified | 4500O-C |
| 26 | Phosphate | mg/l | BDL (DL-0.01) | Not Specified | Not Specified | 4500P-D |
| 27 | Potassium | mg/l | 2.07 | Not Specified | Not Specified | 3120 B |
| 28 | Biochemical Oxygen Demant at 20°C for 5days | mg/l | 8.2 | Not Specified | Not Specified | 5210 B |
| 29 | Chemical Oxygen Demand | mg/l | 20 | Not Specified | Not Specified | 5220 B & C |
| 30 | Total Suspended Solids | mg/l | 31.00 | Not Specified | Not Specified | 2540 D |
| 31 | Ammonical Nitrogen (as NH3-N) | mg/l | BDL (DL-0.1) | Not Specified | Not Specified | 4500NH3-B |
| 32 | Lithium (as Li) | mg/l | BLQ (LOQ-0.01) | Not Specified | Not Specified | 3120 B |
| 33 | Nitrite (as NO2) | mg/l | BDL (DL-0.02) | Not Specified | Not Specified | 4500NO2-B |
| 34 | Sodium (as Na) | mg/l | 16.85 | Not Specified | Not Specified | 3120 B |
| 35 | Temperature | °C | 25.1 | Not Specified | Not Specified | 2550 B |

*BDL=Below Detection Limit,DL=Detection Limit, BLQ=Below Limit of Quantification,LOQ=Limit of Quantification.

**Remarks :** N.A>
**Opinion/Interpretation**

***End of Report***

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**Test Report No.** : PRPL/WS/250327-013/N
**Sample I.D.** : PRPL/WS/270325-013
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Surface Water
(b) Sample description : Surface Water
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 12:30 PM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Drain Onsite

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | Total Coliform. | MPN/100ML | 141.0 | Shall not be detectable in any 100ml sample | -- | IS : 1622, 1981 |

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Perfact Researchers Pvt. Ltd. DELHI

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065372F
**Test Report No.** : PRPL/WS/250327-014
**Sample I.D.** : PRPL/WS/270325-014
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Surface Water
(b) Sample description : Surface Water
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 1:10 PM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Odai Onsite

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | pH at 25°C | – | 7.5 | 6.5-8.5 | No Relaxation | 4500H+ B |
| 2 | Odour | – | Agreeable | Agreeable | Agreeable | 2150 B |
| 3 | Conductivity at 25°C | µS/cm | 79 | Not Specified | Not Specified | 2510 B |
| 4 | Colour | Hazen | <1 | 5 | 15 | 2120 B |
| 5 | Turbidity | NTU | BDL (DL-1) | 1 | 5 | 2130 B |
| 6 | Total Dissolved Solids | mg/l | 67.00 | 500 | 2000 | 2540 C |
| 7 | Calcium (as Ca) | mg/l | 11 | 75 | 200 | 3500Ca-B |
| 8 | Boron (as B) | mg/l | BDL (DL-0.1) | 0.5 | 2.4 | 4500B-C |
| 9 | Aluminium (as Al) | mg/l | BLQ (LOQ-0.02) | 0.03 | 0.2 | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

## TEST REPORT

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**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065372F
**Test Report No.** : PRPL/WS/250327-014
**Sample I.D.** : PRPL/WS/270325-014
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 10 | Chloride (as Cl) | mg/l | 20.0 | 250 | 1000 | 4500Cl-B |
| 11 | Copper (as Cu) | mg/l | BLQ (LOQ-0.02) | 0.05 | 1.5 | 3120 B |
| 12 | Fluoride (as F) | mg/l | 0.3 | 1 | 1.5 | 4500F-D |
| 13 | Iron (as Fe) | mg/l | BLQ (LOQ-0.05) | 1.0 | No Relaxation | 3120 B |
| 14 | Maganesium (as Mg) | mg/l | 2.9 | 30 | 100 | 3500Mg-B |
| 15 | Nitrate (as NO3) | mg/l | 1.53 | 45 | No Relaxation | 4500NO3-B |
| 16 | Manganese (as Mn) | mg/l | BLQ (LOQ-0.05) | 0.1 | 0.3 | 3120 B |
| 17 | Sulphate (as SO4) | mg/l | 0.30 | 200 | 400 | 4500SO4-E |
| 18 | Total Alkalinity as CaCO3 | mg/l | 35.00 | 200 | 600 | 2320 B |
| 19 | Total Hardness (as CaCO3) | mg/l | 40 | 200 | 600 | 2340 C |
| 20 | Zinc (as Zn) | mg/l | BLQ (LOQ-0.05) | 5 | 15 | 3120 B |
| 21 | Cadmium (as Cd) | mg/l | BLQ (LOQ-0.001) | 0.003 | No Relaxation | 3120 B |
| 22 | Lead (as Pb) | mg/l | BLQ (LOQ-0.01) | 0.01 | No Relaxation | 3120 B |
| 23 | Nickel (as Ni) | mg/l | BLQ | 0.02 | No Relaxation | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

**Note :**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065372F
**Test Report No.** : PRPL/WS/250327-014
**Sample I.D.** : PRPL/WS/270325-014
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 23 | | | (LOQ-0.02) | | | |
| 24 | Total Chromium (as Cr) | mg/l | BLQ (LOQ-0.02) | 0.05 | No Relaxation | 3120 B |
| 25 | Dissolved Oxygen | mg/l | 3.9 | Not Specified | Not Specified | 4500O-C |
| 26 | Phosphate | mg/l | BDL (DL-0.01) | Not Specified | Not Specified | 4500P-D |
| 27 | Potassium | mg/l | 1.76 | Not Specified | Not Specified | 3120 B |
| 28 | Biochemical Oxygen Demant at 20°C for 5days | mg/l | 28.0 | Not Specified | Not Specified | 5210 B |
| 29 | Chemical Oxygen Demand | mg/l | 84 | Not Specified | Not Specified | 5220 B & C |
| 30 | Total Suspended Solids | mg/l | 33.00 | Not Specified | Not Specified | 2540 D |
| 31 | Ammonical Nitrogen (as NH3-N) | mg/l | BDL (DL-0.1) | Not Specified | Not Specified | 4500NH3-B |
| 32 | Lithium (as Li) | mg/l | BLQ (LOQ-0.01) | Not Specified | Not Specified | 3120 B |
| 33 | Nitrite (as NO2) | mg/l | BDL (DL-0.02) | Not Specified | Not Specified | 4500NO2-B |
| 34 | Sodium (as Na) | mg/l | 3.24 | Not Specified | Not Specified | 3120 B |
| 35 | Temperature | °C | 25.3 | Not Specified | Not Specified | 2550 B |

*BDL=Below Detection Limit,DL=Detection Limit, BLQ=Below Limit of Quantification,LOQ=Limit of Quantification.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**Test Report No.** : PRPL/WS/250327-014/N
**Sample I.D.** : PRPL/WS/270325-014
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Surface Water
(b) Sample description : Surface Water
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 1:10 PM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Odai Onsite

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | Total Coliform. | MPN/100ML | 278.0 | Shall not be detectable in any 100ml sample | -- | IS : 1622, 1981 |

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Perfact Researchers Pvt. Ltd. DELHI

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065373F
**Test Report No.** : PRPL/WS/250327-015
**Sample I.D.** : PRPL/WS/270325-015
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Surface Water
(b) Sample description : Surface Water
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 1:30 PM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Thiruvanthapuram lake

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | pH at 25°C | -- | 7.2 | 6.5-8.5 | No Relaxation | 4500H+ B |
| 2 | Odour | -- | Agreeable | Agreeable | Agreeable | 2150 B |
| 3 | Conductivity at 25°C | µS/cm | 323 | Not Specified | Not Specified | 2510 B |
| 4 | Colour | Hazen | <1 | 5 | 15 | 2120 B |
| 5 | Turbidity | NTU | BDL (DL-1) | 1 | 5 | 2130 B |
| 6 | Total Dissolved Solids | mg/l | 194 00 | 500 | 2000 | 2540 C |
| 7 | Calcium (as Ca) | mg/l | 32 | 75 | 200 | 3500Ca-B |
| 8 | Boron (as B) | mg/l | BDL (DL-0.1) | 0.5 | 2.4 | 4500B-C |
| 9 | Aluminium (as Al) | mg/l | BLQ (LOQ-0.02) | 0.03 | 0.2 | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

## TEST REPORT

**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065373F
**Test Report No.** : PRPL/WS/250327-015
**Sample I.D.** : PRPL/WS/270325-015
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 10 | Chloride (as Cl) | mg/l | 48.0 | 250 | 1000 | 4500Cl-B |
| 11 | Copper (as Cu) | mg/l | BLQ (LOQ-0.02) | 0.05 | 1.5 | 3120 B |
| 12 | Fluoride (as F) | mg/l | 0.1 | 1 | 1.5 | 4500F-D |
| 13 | Iron (as Fe) | mg/l | BLQ (LOQ-0.05) | 1.0 | No Relaxation | 3120 B |
| 14 | Maganesium (as Mg) | mg/l | 9.7 | 30 | 100 | 3500Mg-B |
| 15 | Nitrate (as NO3) | mg/l | 7.58 | 45 | No Relaxation | 4500NO3-B |
| 16 | Manganese (as Mn) | mg/l | BLQ (LOQ-0.05) | 0.1 | 0.3 | 3120 B |
| 17 | Sulphate (as SO4) | mg/l | 25.46 | 200 | 400 | 4500SO4-E |
| 18 | Total Alkalinity as CaCO3 | mg/l | 100.00 | 200 | 600 | 2320 B |
| 19 | Total Hardness (as CaCO3) | mg/l | 120 | 200 | 600 | 2340 C |
| 20 | Zinc (as Zn) | mg/l | BLQ (LOQ-0.05) | 5 | 15 | 3120 B |
| 21 | Cadmium (as Cd) | mg/l | BLQ (LOQ-0.001) | 0.003 | No Relaxation | 3120 B |
| 22 | Lead (as Pb) | mg/l | BLQ (LOQ-0.01) | 0.01 | No Relaxation | 3120 B |
| 23 | Nickel (as Ni) | mg/l | BLQ | 0.02 | No Relaxation | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065373F
**Test Report No.** : PRPL/WS/250327-015
**Sample I.D.** : PRPL/WS/270325-015
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 23 | | | (LOQ-0.02) | | | |
| 24 | Total Chromium (as Cr) | mg/l | BLQ (LOQ-0.02) | 0.05 | No Relaxation | 3120 B |
| 25 | Dissolved Oxygen | mg/l | 4.7 | Not Specified | Not Specified | 4500O-C |
| 26 | Phosphate | mg/l | BDL (DL-0.1) | Not Specified | Not Specified | 4500P-D |
| 27 | Potassium | mg/l | 2.96 | Not Specified | Not Specified | 3120 B |
| 28 | Biochemical Oxygen Demant at 20°C for 5days | mg/l | 14.0 | Not Specified | Not Specified | 5210 B |
| 29 | Chemical Oxygen Demand | mg/l | 40 | Not Specified | Not Specified | 5220 B & C |
| 30 | Total Suspended Solids | mg/l | 66.0 | Not Specified | Not Specified | 2540 D |
| 31 | Ammonical Nitrogen (as NH3-N) | mg/l | 0.2 | Not Specified | Not Specified | 4500NH3-B |
| 32 | Lithium (as Li) | mg/l | BLQ (LOQ-0.01) | Not Specified | Not Specified | 3120 B |
| 33 | Nitrite (as NO2) | mg/l | BDL (DL-0.02) | Not Specified | Not Specified | 4500NO2-B |
| 34 | Sodium (as Na) | mg/l | 14.53 | Not Specified | Not Specified | 3120 B |
| 35 | Temperature | °C | 24.1 | Not Specified | Not Specified | 2550 B |

*BDL=Below Detection Limit,DL=Detection Limit, BLQ=Below Limit of Quantification,LOQ=Limit of Quantification.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**Test Report No.** : PRPL/WS/250327-015/N
**Sample I.D.** : PRPL/WS/270325-015
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Surface Water
(b) Sample description : Surface Water
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 1:30 PM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Thiruvanthapuram lake

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | Total Coliform | MPN/100ML | 141.0 | Shall not be detectable in any 100ml sample | -- | IS : 1622, 1981 |

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Perfact Researchers Pvt. Ltd. DELHI

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065374F
**Test Report No.** : PRPL/WS/250327-016
**Sample I.D.** : PRPL/WS/270325-016
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Surface Water
(b) Sample description : Surface Water
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 1:50 PM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Pond Near Keela Thatapparai

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | pH at 25°C | -- | 7.4 | 6.5-8.5 | No Relaxation | 4500H+ B |
| 2 | Odour | -- | Agreeable | Agreeable | Agreeable | 2150 B |
| 3 | Conductivity at 25°C | µS/cm | 601 | Not Specified | Not Specified | 2510 B |
| 4 | Colour | Hazen | <1 | 5 | 15 | 2120 B |
| 5 | Turbidity | NTU | BDL (DL-1) | 1 | 5 | 2130 B |
| 6 | Total Dissolved Solids | mg/l | 484.89 | 500 | 2000 | 2540 C |
| 7 | Calcium (as Ca) | mg/l | 45 | 75 | 200 | 3500Ca-B |
| 8 | Boron (as B) | mg/l | BDL (DL-0.1) | 0.5 | 2.4 | 4500B-C |
| 9 | Aluminium (as Al) | mg/l | BLQ (LOQ-0.02) | 0.03 | 0.2 | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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## TEST REPORT



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**ULR No.** : TC699325000065374F
**Test Report No.** : PRPL/WS/250327-016
**Sample I.D.** : PRPL/WS/270325-016
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 10 | Chloride (as Cl) | mg/l | 54.0 | 250 | 1000 | 4500Cl-B |
| 11 | Copper (as Cu) | mg/l | BLQ (LOQ-0.02) | 0.05 | 1.5 | 3120 B |
| 12 | Fluoride (as F) | mg/l | 0.2 | 1 | 1.5 | 4500F-D |
| 13 | Iron (as Fe) | mg/l | BLQ (LOQ-0.05) | 1.0 | No Relaxation | 3120 B |
| 14 | Maganesium (as Mg) | mg/l | 18.5 | 30 | 100 | 3500Mg-B |
| 15 | Nitrate (as NO3) | mg/l | 6.02 | 45 | No Relaxation | 4500NO3-B |
| 16 | Manganese (as Mn) | mg/l | BLQ (LOQ-0.05) | 0.1 | 0.3 | 3120 B |
| 17 | Sulphate (as SO4) | mg/l | 83.00 | 200 | 400 | 4500SO4-E |
| 18 | Total Alkalinity as CaCO3 | mg/l | 105.00 | 200 | 600 | 2320 B |
| 19 | Total Hardness (as CaCO3) | mg/l | 188 | 200 | 600 | 2340 C |
| 20 | Zinc (as Zn) | mg/l | BLQ (LOQ-0.05) | 5 | 15 | 3120 B |
| 21 | Cadmium (as Cd) | mg/l | BLQ (LOQ-0.001) | 0.003 | No Relaxation | 3120 B |
| 22 | Lead (as Pb) | mg/l | BLQ (LOQ-0.01) | 0.01 | No Relaxation | 3120 B |
| 23 | Nickel (as Ni) | mg/l | BLQ | 0.02 | No Relaxation | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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## TEST REPORT

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**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065374F
**Test Report No.** : PRPL/WS/250327-016
**Sample I.D.** : PRPL/WS/270325-016
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 23 | | | (LOQ-0.02) | | | |
| 24 | Total Chromium (as Cr) | mg/l | BLQ (LOQ-0.02) | 0.05 | No Relaxation | 3120 B |
| 25 | Dissolved Oxygen | mg/l | 4.8 | Not Specified | Not Specified | 4500O-C |
| 26 | Phosphate | mg/l | BDL (DL-0.1) | Not Specified | Not Specified | 4500P-D |
| 27 | Potassium | mg/l | 3.05 | Not Specified | Not Specified | 3120 B |
| 28 | Biochemical Oxygen Demant at 20°C for 5days | mg/l | 20.0 | Not Specified | Not Specified | 5210 B |
| 29 | Chemical Oxygen Demand | mg/l | 60 | Not Specified | Not Specified | 5220 B & C |
| 30 | Total Suspended Solids | mg/l | 24.0 | Not Specified | Not Specified | 2540 D |
| 31 | Ammonical Nitrogen (as NH3-N) | mg/l | 0.3 | Not Specified | Not Specified | 4500NH3-B |
| 32 | Lithium (as Li) | mg/l | BLQ (LOQ-0.01) | Not Specified | Not Specified | 3120 B |
| 33 | Nitrite (as NO2) | mg/l | 0.02 | Not Specified | Not Specified | 4500NO2-B |
| 34 | Sodium (as Na) | mg/l | 11.64 | Not Specified | Not Specified | 3120 B |
| 35 | Temperature | °C | 25.0 | Not Specified | Not Specified | 2550 B |

*BDL=Below Detection Limit,DL=Detection Limit, BLQ=Below Limit of Quantification,LOQ=Limit of Quantification.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**Test Report No.** : PRPL/WS/250327-016/N
**Sample I.D.** : PRPL/WS/270325-016
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Surface Water
(b) Sample description : Surface Water
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 1:50 PM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Pond Near Keela Thatapparai

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | Total Coliform | MPN/100ML | 94.0 | Shall not be detectable in any 100ml sample | -- | IS : 1622, 1981 |

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Perfact Researchers Pvt. Ltd. DELHI

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

**Note :**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065375F
**Test Report No.** : PRPL/WS/250327-017
**Sample I.D.** : PRPL/WS/270325-017
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Surface Water
(b) Sample description : Surface Water
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 2:15 PM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Allikulam lake

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | pH at 25°C | -- | 7.2 | 6.5-8.5 | No Relaxation | 4500H+ B |
| 2 | Odour | -- | Agreeable | Agreeable | Agreeable | 2150 B |
| 3 | Conductivity at 25°C | µS/cm | 290 | Not Specified | Not Specified | 2510 B |
| 4 | Colour | Hazen | <1 | 5 | 15 | 2120 B |
| 5 | Turbidity | NTU | 98.0 | 1 | 5 | 2130 B |
| 6 | Total Dissolved Solids | mg/l | 186.20 | 500 | 2000 | 2540 C |
| 7 | Calcium (as Ca) | mg/l | 22 | 75 | 200 | 3500Ca-B |
| 8 | Boron (as B) | mg/l | BDL (DL-0.1) | 0.5 | 2.4 | 4500B-C |
| 9 | Aluminium (as Al) | mg/l | BLQ (LOQ-0.02) | 0.03 | 0.2 | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

## TEST REPORT



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**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065375F
**Test Report No.** : PRPL/WS/250327-017
**Sample I.D.** : PRPL/WS/270325-017
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 10 | Chloride (as Cl) | mg/l | 58.0 | 250 | 1000 | 4500Cl-B |
| 11 | Copper (as Cu) | mg/l | BLQ (LOQ-0.02) | 0.05 | 1.5 | 3120 B |
| 12 | Fluoride (as F) | mg/l | BDL (DL-0.1) | 1 | 1.5 | 4500F-D |
| 13 | Iron (as Fe) | mg/l | BLQ (LOQ-0.05) | 1.0 | No Relaxation | 3120 B |
| 14 | Maganesium (as Mg) | mg/l | 4.0 | 30 | 100 | 3500Mg-B |
| 15 | Nitrate (as NO3) | mg/l | 36.20 | 45 | No Relaxation | 4500NO3-B |
| 16 | Manganese (as Mn) | mg/l | BLQ (LOQ-0.05) | 0.1 | 0.3 | 3120 B |
| 17 | Sulphate (as SO4) | mg/l | 31.07 | 200 | 400 | 4500SO4-E |
| 18 | Total Alkalinity as CaCO3 | mg/l | 60.00 | 200 | 600 | 2320 B |
| 19 | Total Hardness (as CaCO3) | mg/l | 60 | 200 | 600 | 2340 C |
| 20 | Zinc (as Zn) | mg/l | BLQ (LOQ-0.05) | 5 | 15 | 3120 B |
| 21 | Cadmium (as Cd) | mg/l | BLQ (LOQ-0.001) | 0.003 | No Relaxation | 3120 B |
| 22 | Lead (as Pb) | mg/l | BLQ (LOQ-0.01) | 0.01 | No Relaxation | 3120 B |
| 23 | Nickel (as Ni) | mg/l | BLQ | 0.02 | No Relaxation | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065375F
**Test Report No.** : PRPL/WS/250327-017
**Sample I.D.** : PRPL/WS/270325-017
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 23 | | | (LOQ-0.02) | | | |
| 24 | Total Chromium (as Cr) | mg/l | BLQ (LOQ-0.02) | 0.05 | No Relaxation | 3120 B |
| 25 | Dissolved Oxygen | mg/l | 4.4 | Not Specified | Not Specified | 4500O-C |
| 26 | Phosphate | mg/l | 0.67 | Not Specified | Not Specified | 4500P-D |
| 27 | Potassium | mg/l | 1.84 | Not Specified | Not Specified | 3120 B |
| 28 | Biochemical Oxygen Demant at 20°C for 5days | mg/l | 28.0 | Not Specified | Not Specified | 5210 B |
| 29 | Chemical Oxygen Demand | mg/l | 70.0 | Not Specified | Not Specified | 5220 B & C |
| 30 | Total Suspended Solids | mg/l | 138.0 | Not Specified | Not Specified | 2540 D |
| 31 | Ammonical Nitrogen (as NH3-N) | mg/l | 0.3 | Not Specified | Not Specified | 4500NH3-B |
| 32 | Lithium (as Li) | mg/l | BLQ (LOQ-0.01) | Not Specified | Not Specified | 3120 B |
| 33 | Nitrite (as NO2) | mg/l | 0.2 | Not Specified | Not Specified | 4500NO2-B |
| 34 | Sodium (as Na) | mg/l | 32.54 | Not Specified | Not Specified | 3120 B |
| 35 | Temperature | °C | 25.2 | Not Specified | Not Specified | 2550 B |

*BDL=Below Detection Limit,DL=Detection Limit, BLQ=Below Limit of Quantification,LOQ=Limit of Quantification.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**Test Report No.** : PRPL/WS/250327-017/N
**Sample I.D.** : PRPL/WS/270325-017
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Surface Water
(b) Sample description : Surface Water
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 2:15 PM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Allikulam lake

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | Total Coliform | MPN/100ML | 54.0 | Shall not be detectable in any 100ml sample | -- | IS : 1622, 1981 |

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Perfact Researchers Pvt. Ltd. DELHI

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065376F
**Test Report No.** : PRPL/WS/250327-018
**Sample I.D.** : PRPL/WS/270325-018
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Surface Water
(b) Sample description : Surface Water
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 2:35 PM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Perurani lake

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | pH at 25°C | -- | 7.1 | 6.5-8.5 | No Relaxation | 4500H+ B |
| 2 | Odour | -- | Agreeable | Agreeable | Agreeable | 2150 B |
| 3 | Conductivity at 25°C | µS/cm | 340 | Not Specified | Not Specified | 2510 B |
| 4 | Colour | Hazen | <1 | 5 | 15 | 2120 B |
| 5 | Turbidity | NTU | 83.2 | 1 | 5 | 2130 B |
| 6 | Total Dissolved Solids | mg/l | 226.00 | 500 | 2000 | 2540 C |
| 7 | Calcium (as Ca) | mg/l | 32 | 75 | 200 | 3500Ca-B |
| 8 | Boron (as B) | mg/l | BDL (DL-0.1) | 0.5 | 2.4 | 4500B-C |
| 9 | Aluminium (as Al) | mg/l | BLQ (LOQ-0.02) | 0.03 | 0.2 | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

## TEST REPORT



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**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065376F
**Test Report No.** : PRPL/WS/250327-018
**Sample I.D.** : PRPL/WS/270325-018
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 10 | Chloride (as Cl) | mg/l | 56.0 | 250 | 1000 | 4500Cl-B |
| 11 | Copper (as Cu) | mg/l | BLQ (LOQ-0.02) | 0.05 | 1.5 | 3120 B |
| 12 | Fluoride (as F) | mg/l | 0.9 | 1 | 1.5 | 4500F-D |
| 13 | Iron (as Fe) | mg/l | BLQ (LOQ-0.05) | 1.0 | No Relaxation | 3120 B |
| 14 | Maganesium (as Mg) | mg/l | 11.7 | 30 | 100 | 3500Mg-B |
| 15 | Nitrate (as NO3) | mg/l | 11.20 | 45 | No Relaxation | 4500NO3-B |
| 16 | Manganese (as Mn) | mg/l | BLQ (LOQ-0.05) | 0.1 | 0.3 | 3120 B |
| 17 | Sulphate (as SO4) | mg/l | 34.14 | 200 | 400 | 4500SO4-E |
| 18 | Total Alkalinity as CaCO3 | mg/l | 104.00 | 200 | 600 | 2320 B |
| 19 | Total Hardness (as CaCO3) | mg/l | 128 | 200 | 600 | 2340 C |
| 20 | Zinc (as Zn) | mg/l | BLQ (LOQ-0.05) | 5 | 15 | 3120 B |
| 21 | Cadmium (as Cd) | mg/l | BLQ (LOQ-0.001) | 0.003 | No Relaxation | 3120 B |
| 22 | Lead (as Pb) | mg/l | BLQ (LOQ-0.01) | 0.01 | No Relaxation | 3120 B |
| 23 | Nickel (as Ni) | mg/l | BLQ | 0.02 | No Relaxation | 3120 B |

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**ULR No.** : TC699325000065376F
**Test Report No.** : PRPL/WS/250327-018
**Sample I.D.** : PRPL/WS/270325-018
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method (APHA 24th Edition 2023) |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 23 | | | (LOQ-0.02) | | | |
| 24 | Total Chromium (as Cr) | mg/l | BLQ (LOQ-0.02) | 0.05 | No Relaxation | 3120 B |
| 25 | Dissolved Oxygen | mg/l | 5.4 | Not Specified | Not Specified | 4500O-C |
| 26 | Phosphate | mg/l | 0.39 | Not Specified | Not Specified | 4500P-D |
| 27 | Potassium | mg/l | 2.96 | Not Specified | Not Specified | 3120 B |
| 28 | Biochemical Oxygen Demant at 20°C for 5days | mg/l | 4.0 | Not Specified | Not Specified | 5210 B |
| 29 | Chemical Oxygen Demand | mg/l | 10.0 | Not Specified | Not Specified | 5220 B & C |
| 30 | Total Suspended Solids | mg/l | 100.0 | Not Specified | Not Specified | 2540 D |
| 31 | Ammonical Nitrogen (as NH3-N) | mg/l | 0.4 | Not Specified | Not Specified | 4500NH3-B |
| 32 | Lithium (as Li) | mg/l | BLQ (LOQ-0.01) | Not Specified | Not Specified | 3120 B |
| 33 | Nitrite (as NO2) | mg/l | 0.20 | Not Specified | Not Specified | 4500NO2-B |
| 34 | Sodium (as Na) | mg/l | 22.86 | Not Specified | Not Specified | 3120 B |
| 35 | Temperature | °C | 24.7 | Not Specified | Not Specified | 2550 B |

*BDL=Below Detection Limit,DL=Detection Limit, BLQ=Below Limit of Quantification,LOQ=Limit of Quantification.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**Test Report No.** : PRPL/WS/250327-018/N
**Sample I.D.** : PRPL/WS/270325-018
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Surface Water
(b) Sample description : Surface Water
(c) Sample Quantity : 5 Lt.
(d) Sample Pkg. Condition : P.P. Bottle

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 2:35 PM
(c) Sampling Protocol : IS : 17614 Part-3
(d) Equipment Used : N.A.
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Perurani lake

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Requirements/Specifications (As per IS : 10500, 2012) | | Test Method |
|---|---|---|---|---|---|---|
| | | | | Acceptable Limit | Permissible Limit | |
| 1 | Total Coliform | MPN/100ML | 84.0 | Shall not be detectable in any 100ml sample | -- | IS : 1622, 1981 |

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Perfact Researchers Pvt Ltd. DELHI

Anshul
Assistant Manager
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/DW/7.8 F-04**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065339F
**Test Report No.** : PRPL/SS/250327-005
**Sample I.D.** : PRPL/SS/270325-005
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Soil
(b) Sample description : Grass Land uses soil
(c) Sample Quantity : 1 Kg
(d) Sample Pkg. Condition : Poly Bag

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 11:07 AM
(c) Sampling Protocol : IS : 2720 Part-1
(d) Equipment Used : Khurpi
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Onsite West

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Test Method |
|---|---|---|---|---|
| 1 | pH at 25°C | – | 7.83 | IS : 2720 P-26,2021 |
| 2 | Conductivity at 25°C | µS/cm | 417.5 | IS : 14767, 2021 |
| 3 | Available Chloride | mg/kg | 124.25 | LAB SOP No.010, Issue No. 02, Issue Date: 01.06.2024 |
| 4 | Bicarbonate Alkalinity (as CaCO3) | mg/kg | 134.20 | LAB SOP No.008 , Issue No. 02, Issue Date: 01.06.2024 |
| 5 | Colour | | 4/3 Brown | Munsell Chart, 1930 |
| 6 | Nitrate (as NO3) | mg/kg | 64.8 | Lab SOP No. 15 , Issue No. 02, Issue Date: 01.06.2024 |
| 7 | Organic Matter | % | 0.68 | IS : 2720 P-22,2022 |
| 8 | Phosphorus (Available) | mg/kg | 7.72 | ISO : 11263,1994 |
| 9 | Bulk Density | gm/cc | 1.39 | ISO : 11272, 2017 |
| 10 | Calcium (as Ca) | mg/kg | 92.3 | ISO : 11260, 2018 |

Meenakshi
Anayst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/SS/7.8 F-06**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



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**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065339F
**Test Report No.** : PRPL/SS/250327-005
**Sample I.D.** : PRPL/SS/270325-005
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Test Method |
|---|---|---|---|---|
| 11 | Texture | Visually | Clay | IS : 2720 P-4, 2020 |
| 12 | Sand | % | 33.2 | IS : 2720 P-4, 2020 |
| 13 | Silt | % | 18.8 | IS : 2720 P-4, 2020 |
| 14 | Clay | % | 48.0 | IS : 2720 P-4, 2020 |
| 15 | Magnesium (as Mg) | mg/kg | 57.3 | ISO : 11260, 2018 |
| 16 | Moisture | % | 1.1 | IS : 2720 P-2, 2020 |
| 17 | Porosity | % | 28.7 | USDA M40, Ed. by LA Richards, 1954 |
| 18 | Potassium (as K) | mg/kg | 52.80 | ISO : 11260, 2018 |
| 19 | Sodium Absorption Ratio | | 5.6 | IS : 11624, 2023 |
| 20 | Sodium (as Na) | mg/kg | 104.50 | ISO : 11260, 2018 |
| 21 | Water Holding Capacity | % | 52 | Lab SOP No. 25, Issue No. 02, Issue Date: 01.06.2024. |
| 22 | Available Nitrogen | mg/kg | 64.2 | IS : 14684, 2019 |
| 23 | Cation Exchange Capacity (CEC) | meq/100gm | 18.30 | ISO : 11260, 2018 |
| 24 | Sulphur | mg/kg | 1.53 | Lab SOP No. 012, Issue No. 02, Issue Date: 01.06.2024. |

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Meenakshi
Anayst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

**Note :**

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**Document No.: PRPL/SS/7.8 F-06**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065340F
**Test Report No.** : PRPL/SS/250327-006
**Sample I.D.** : PRPL/SS/270325-006
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Soil
(b) Sample description : Grass Land uses soil
(c) Sample Quantity : 1 Kg
(d) Sample Pkg. Condition : Poly Bag

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 11:37 AM
(c) Sampling Protocol : IS : 2720 Part-1
(d) Equipment Used : Khurpi
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Onsite East

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Test Method |
|---|---|---|---|---|
| 1 | pH at 25°C | -- | 7.82 | IS : 2720 P-26,2021 |
| 2 | Conductivity at 25°C | µS/cm | 123.7 | IS : 14767, 2021 |
| 3 | Available Chloride | mg/kg | 35.50 | LAB SOP No.010, Issue No. 02, Issue Date: 01.06.2024 |
| 4 | Bicarbonate Alkalinity (as CaCO3) | mg/kg | 122.00 | LAB SOP No.008 , Issue No. 02, Issue Date: 01.06.2024 |
| 5 | Colour | | 4/3 Brown | Munsell Chart, 1930 |
| 6 | Nitrate (as NO3) | mg/kg | 30.4 | Lab SOP No. 15 , Issue No. 02, Issue Date: 01.06.2024 |
| 7 | Organic Matter | % | 0.41 | IS : 2720 P-22,2022 |
| 8 | Phosphorus (Available) | mg/kg | 6.40 | ISO : 11263,1994 |
| 9 | Bulk Density | gm/cc | 1.42 | ISO : 11272, 2017 |
| 10 | Calcium (as Ca) | mg/kg | 52.3 | ISO : 11260, 2018 |

Meenakshi
Anayst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/SS/7.8 F-06**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065340F
**Test Report No.** : PRPL/SS/250327-006
**Sample I.D.** : PRPL/SS/270325-006
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Test Method |
|---|---|---|---|---|
| 11 | Texture | Visually | Clay | IS : 2720 P-4, 2020 |
| 12 | Sand | % | 22.8 | IS : 2720 P-4, 2020 |
| 13 | Silt | % | 13.8 | IS : 2720 P-4, 2020 |
| 14 | Clay | % | 63.3 | IS : 2720 P-4, 2020 |
| 15 | Magnesium (as Mg) | mg/kg | 46.1 | ISO : 11260, 2018 |
| 16 | Moisture | % | 2.7 | IS : 2720 P-2, 2020 |
| 17 | Porosity | % | 33.4 | USDA M40, Ed. by LA Richards, 1954 |
| 18 | Potassium (as K) | mg/kg | 42.90 | ISO : 11260, 2018 |
| 19 | Sodium Absorption Ratio | | 5.9 | IS : 11624, 2023 |
| 20 | Sodium (as Na) | mg/kg | 62.80 | ISO : 11260, 2018 |
| 21 | Water Holding Capacity | % | 60 | Lab SOP No. 25, Issue No. 02, Issue Date: 01.06.2024 |
| 22 | Available Nitrogen | mg/kg | 54.4 | IS : 14684, 2019 |
| 23 | Cation Exchange Capacity (CEC) | meq/100gm | 20.70 | ISO : 11260, 2018 |
| 24 | Sulphur | mg/kg | 1.95 | Lab SOP No. 012, Issue No. 02, Issue Date: 01.06.2024. |

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Meenakshi
Anayst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/SS/7.8 F-06**

# PERFACT RESEARCHERS PVT LTD

TC-16695

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065341F
**Test Report No.** : PRPL/SS/250327-007
**Sample I.D.** : PRPL/SS/270325-007
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Soil
(b) Sample description : Grass Land uses soil
(c) Sample Quantity : 1 Kg
(d) Sample Pkg. Condition : Poly Bag

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 12:07 PM
(c) Sampling Protocol : IS : 2720 Part-1
(d) Equipment Used : Khurpi
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Onsite North

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Test Method |
|---|---|---|---|---|
| 1 | pH at 25°C | -- | 7.76 | IS : 2720 P-26,2021 |
| 2 | Conductivity at 25°C | µS/cm | 512.1 | IS : 14767, 2021 |
| 3 | Available Chloride | mg/kg | 142.00 | LAB SOP No.010, Issue No. 02, Issue Date: 01.06.2024. |
| 4 | Bicarbonate Alkalinity (as CaCO3) | mg/kg | 122.00 | LAB SOP No.008 , Issue No. 02, Issue Date: 01.06.2024. |
| 5 | Colour | | 4/3 Brown | Munsell Chart, 1930 |
| 6 | Nitrate (as NO3) | mg/kg | 40.8 | Lab SOP No. 15 , Issue No. 02, Issue Date: 01.06.2024. |
| 7 | Organic Matter | % | 0.75 | IS : 2720 P-22,2022 |
| 8 | Phosphorus (Available) | mg/kg | 7.74 | ISO : 11263,1994 |
| 9 | Bulk Density | gm/cc | 1.21 | ISO : 11272, 2017 |
| 10 | Calcium (as Ca) | mg/kg | 105.3 | ISO : 11260, 2018 |

Meenakshi
Anayst
**Reviewed By**

Perfact Researchers Pvt. Ltd. DELHI

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/SS/7.8 F-06**

# PERFACT RESEARCHERS PVT LTD

TC-16695

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065341F
**Test Report No.** : PRPL/SS/250327-007
**Sample I.D.** : PRPL/SS/270325-007
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Test Method |
|---|---|---|---|---|
| 11 | Texture | Visually | Clay Loam | IS : 2720 P-4, 2020 |
| 12 | Sand | % | 31.8 | IS : 2720 P-4, 2020 |
| 13 | Silt | % | 28.5 | IS : 2720 P-4, 2020 |
| 14 | Clay | % | 39.6 | IS : 2720 P-4, 2020 |
| 15 | Magnesium (as Mg) | mg/kg | 65.5 | ISO : 11260, 2018 |
| 16 | Moisture | % | 1.6 | IS : 2720 P-2, 2020 |
| 17 | Porosity | % | 27.4 | USDA M40, Ed. by LA Richards, 1954 |
| 18 | Potassium (as K) | mg/kg | 56.10 | ISO : 11260, 2018 |
| 19 | Sodium Absorption Ratio | | 5.8 | IS : 11624, 2023 |
| 20 | Sodium (as Na) | mg/kg | 115.30 | ISO : 11260, 2018 |
| 21 | Water Holding Capacity | % | 50 | Lab SOP No. 25, Issue No. 02, Issue Date: 01.06.2024. |
| 22 | Available Nitrogen | mg/kg | 72.6 | IS : 14684, 2019 |
| 23 | Cation Exchange Capacity (CEC) | meq/100gm | 17.50 | ISO : 11260, 2018 |
| 24 | Sulphur | mg/kg | 1.38 | Lab SOP No. 012, Issue No. 02, Issue Date: 01.06.2024 |

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Meenakshi
Anayst
**Reviewed By**

Perfact Researchers Pvt. Ltd. DELHI

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/SS/7.8 F-06**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065342F
**Test Report No.** : PRPL/SS/250327-008
**Sample I.D.** : PRPL/SS/270325-008
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Soil
(b) Sample description : Grass Land uses soil
(c) Sample Quantity : 1 Kg
(d) Sample Pkg. Condition : Poly Bag

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 12:33 PM
(c) Sampling Protocol : IS : 2720 Part-1
(d) Equipment Used : Khurpi
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Onsite South

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Test Method |
|---|---|---|---|---|
| 1 | pH at 25°C | -- | 7.49 | IS : 2720 P-26,2021 |
| 2 | Conductivity at 25°C | µS/cm | 129.2 | IS : 14767, 2021 |
| 3 | Available Chloride | mg/kg | 17.75 | LAB SOP No.010, Issue No. 02, Issue Date: 01.06.2024. |
| 4 | Bicarbonate Alkalinity (as CaCO3) | mg/kg | 85.40 | LAB SOP No.008 , Issue No. 02, Issue Date: 01.06.2024. |
| 5 | Colour | | 4/3 Brown | Munsell Chart, 1930 |
| 6 | Nitrate (as NO3) | mg/kg | 56.4 | Lab SOP No. 15 , Issue No. 02, Issue Date: 01.06.2024 |
| 7 | Organic Matter | % | 1.02 | IS : 2720 P-22,2022 |
| 8 | Phosphorus (Available) | mg/kg | 9.75 | ISO : 11263,1994 |
| 9 | Bulk Density | gm/cc | 1.18 | ISO : 11272, 2017 |
| 10 | Calcium (as Ca) | mg/kg | 57.6 | ISO : 11260, 2018 |

Meenakshi
Anayst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/SS/7.8 F-06**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065342F
**Test Report No.** : PRPL/SS/250327-008
**Sample I.D.** : PRPL/SS/270325-008
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Test Method |
|---|---|---|---|---|
| 11 | Texture | Visually | Clay | IS : 2720 P-4, 2020 |
| 12 | Sand | % | 29.1 | IS : 2720 P-4, 2020 |
| 13 | Silt | % | 20.0 | IS : 2720 P-4, 2020 |
| 14 | Clay | % | 50.8 | IS : 2720 P-4, 2020 |
| 15 | Magnesium (as Mg) | mg/kg | 36.4 | ISO : 11260, 2018 |
| 16 | Moisture | % | 1.3 | IS : 2720 P-2, 2020 |
| 17 | Porosity | % | 31.9 | USDA M40, Ed. by LA Richards, 1954 |
| 18 | Potassium (as K) | mg/kg | 32.90 | ISO : 11260, 2018 |
| 19 | Sodium Absorption Ratio | | 6.7 | IS : 11624, 2023 |
| 20 | Sodium (as Na) | mg/kg | 67.90 | ISO : 11260, 2018 |
| 21 | Water Holding Capacity | % | 52 | Lab SOP No. 25, Issue No. 02, Issue Date: 01.06.2024 |
| 22 | Available Nitrogen | mg/kg | 98.8 | IS : 14684, 2019 |
| 23 | Cation Exchange Capacity (CEC) | meq/100gm | 18.80 | ISO : 11260, 2018 |
| 24 | Sulphur | mg/kg | 2.58 | Lab SOP No. 012, Issue No. 02, Issue Date: 01.06.2024. |

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Meenakshi
Anayst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/SS/7.8 F-06**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065343F
**Test Report No.** : PRPL/SS/250327-009
**Sample I.D.** : PRPL/SS/270325-009
**Date of Issue** : 03/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Soil
(b) Sample description : Grass Land uses soil
(c) Sample Quantity : 1 Kg
(d) Sample Pkg. Condition : Poly Bag

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 12:57 PM
(c) Sampling Protocol : IS : 2720 Part-1
(d) Equipment Used : Khurpi
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Thiruvantha Puram

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Test Method |
|---|---|---|---|---|
| 1 | pH at 25°C | -- | 7.95 | IS : 2720 P-26,2021 |
| 2 | Conductivity at 25°C | µS/cm | 125.9 | IS : 14767, 2021 |
| 3 | Available Chloride | mg/kg | 62.13 | LAB SOP No.010, Issue No. 02, Issue Date: 01.06.2024. |
| 4 | Bicarbonate Alkalinity (as CaCO3) | mg/kg | 146.40 | LAB SOP No.008 , Issue No. 02, Issue Date: 01.06.2024. |
| 5 | Colour | | 6/3 Dull Brown | Munsell Chart, 1930 |
| 6 | Nitrate (as NO3) | mg/kg | 36.2 | Lab SOP No. 15 , Issue No. 02, Issue Date: 01.06.2024 |
| 7 | Organic Matter | % | 0.58 | IS : 2720 P-22,2022 |
| 8 | Phosphorus (Available) | mg/kg | 2.29 | ISO : 11263,1994 |
| 9 | Bulk Density | gm/cc | 1.29 | ISO : 11272, 2017 |
| 10 | Calcium (as Ca) | mg/kg | 58.8 | ISO : 11260, 2018 |

Meenakshi
Anayst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/SS/7.8 F-06**

# PERFACT RESEARCHERS PVT LTD

TC-6995

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065343F
**Test Report No.** : PRPL/SS/250327-009
**Sample I.D.** : PRPL/SS/270325-009
**Date of Issue** : 03/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Test Method |
|---|---|---|---|---|
| 11 | Texture | Visually | Clay | IS : 2720 P-4, 2020 |
| 12 | Sand | % | 31.1 | IS : 2720 P-4, 2020 |
| 13 | Silt | % | 18.1 | IS : 2720 P-4, 2020 |
| 14 | Clay | % | 50.6 | IS : 2720 P-4, 2020 |
| 15 | Magnesium (as Mg) | mg/kg | 36.1 | ISO : 11260, 2018 |
| 16 | Moisture | % | 2.5 | IS : 2720 P-2, 2020 |
| 17 | Porosity | % | 33.3 | USDA M40, Ed. by LA Richards, 1954 |
| 18 | Potassium (as K) | mg/kg | 28.70 | ISO : 11260, 2018 |
| 19 | Sodium Absorption Ratio | | 6.1 | IS : 11624, 2023 |
| 20 | Sodium (as Na) | mg/kg | 58.40 | ISO : 11260, 2018 |
| 21 | Water Holding Capacity | % | 52 | Lab SOP No. 25, Issue No. 02, Issue Date: 01.06.2024 |
| 22 | Available Nitrogen | mg/kg | 66.4 | IS : 14684, 2019 |
| 23 | Cation Exchange Capacity (CEC) | meq/100gm | 20.10 | ISO : 11260, 2018 |
| 24 | Sulphur | mg/kg | 1.59 | Lab SOP No. 012, Issue No. 02, Issue Date: 01.06.2024 |

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Meenakshi
Anayst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/SS/7.8 F-06**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065344F
**Test Report No.** : PRPL/SS/250327-010
**Sample I.D.** : PRPL/SS/270325-010
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Soil
(b) Sample description : Grass Land uses soil
(c) Sample Quantity : 1 Kg
(d) Sample Pkg. Condition : Poly Bag

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 1:17 PM
(c) Sampling Protocol : IS : 2720 Part-1
(d) Equipment Used : Khurpi
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Thenku Silukanpatti

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Test Method |
|---|---|---|---|---|
| 1 | pH at 25°C | -- | 7.63 | IS : 2720 P-26,2021 |
| 2 | Conductivity at 25°C | µS/cm | 194.6 | IS : 14767, 2021 |
| 3 | Available Chloride | mg/kg | 44.38 | LAB SOP No.010, Issue No. 02, Issue Date: 01.06.2024 |
| 4 | Bicarbonate Alkalinity (as CaCO3) | mg/kg | 109.80 | LAB SOP No.008 , Issue No. 02, Issue Date: 01.06.2024 |
| 5 | Colour | | 4/3 Brown | Munsell Chart, 1930 |
| 6 | Nitrate (as NO3) | mg/kg | 34.8 | Lab SOP No. 15 , Issue No. 02, Issue Date: 01.06.2024 |
| 7 | Organic Matter | % | 0.58 | IS : 2720 P-22,2022 |
| 8 | Phosphorus (Available) | mg/kg | 3.71 | ISO : 11263,1994 |
| 9 | Bulk Density | gm/cc | 1.32 | ISO : 11272, 2017 |
| 10 | Calcium (as Ca) | mg/kg | 62.3 | ISO : 11260, 2018 |

Meenakshi
Anayst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

**Note :**

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# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065344F
**Test Report No.** : PRPL/SS/250327-010
**Sample I.D.** : PRPL/SS/270325-010
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Test Method |
|---|---|---|---|---|
| 11 | Texture | Visually | Clay | IS : 2720 P-4, 2020 |
| 12 | Sand | % | 27.9 | IS : 2720 P-4, 2020 |
| 13 | Silt | % | 26.9 | IS : 2720 P-4, 2020 |
| 14 | Clay | % | 45.1 | IS : 2720 P-4, 2020 |
| 15 | Magnesium (as Mg) | mg/kg | 38.4 | ISO : 11260, 2018 |
| 16 | Moisture | % | 2.3 | IS : 2720 P-2, 2020 |
| 17 | Porosity | % | 32.5 | USDA M40, Ed. by LA Richards, 1954 |
| 18 | Potassium (as K) | mg/kg | 31.30 | ISO : 11260, 2018 |
| 19 | Sodium Absorption Ratio | | 5.7 | IS : 11624, 2023 |
| 20 | Sodium (as Na) | mg/kg | 67.90 | ISO : 11260, 2018 |
| 21 | Water Holding Capacity | % | 56 | Lab SOP No. 25, Issue No. 02, Issue Date: 01.06.2024 |
| 22 | Available Nitrogen | mg/kg | 62.6 | IS : 14684, 2019 |
| 23 | Cation Exchange Capacity (CEC) | meq/100gm | 18.80 | ISO : 11260, 2018 |
| 24 | Sulphur | mg/kg | 2.18 | Lab SOP No. 012, Issue No. 02, Issue Date: 01.06.2024 |

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Meenakshi
Anayst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/SS/7.8 F-06**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065377F
**Test Report No.** : PRPL/SS/250327-011
**Sample I.D.** : PRPL/SS/270325-011
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Soil
(b) Sample description : Grass Land uses soil
(c) Sample Quantity : 1 Kg
(d) Sample Pkg. Condition : Poly Bag

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 1:17 PM
(c) Sampling Protocol : IS : 2720 Part-1
(d) Equipment Used : Khurpi
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Keelathatta parai

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Test Method |
|---|---|---|---|---|
| 1 | pH at 25°C | -- | 7.30 | IS : 2720 P-26,2021 |
| 2 | Conductivity at 25°C | µS/cm | 301.8 | IS : 14767, 2021 |
| 3 | Available Chloride | mg/kg | 53.25 | LAB SOP No.010, Issue No. 02, Issue Date: 01.06.2024. |
| 4 | Bicarbonate Alkalinity (as CaCO3) | mg/kg | 122.00 | LAB SOP No.008 , Issue No. 02, Issue Date: 01.06.2024. |
| 5 | Colour | | 4/3 Brown | Munsell Chart, 1930 |
| 6 | Nitrate (as NO3) | mg/kg | 38.6 | Lab SOP No. 15 , Issue No. 02, Issue Date: 01.06.2024 |
| 7 | Organic Matter | % | 0.71 | IS : 2720 P-22,2022 |
| 8 | Phosphorus (Available) | mg/kg | 7.16 | ISO : 11263,1994 |
| 9 | Bulk Density | gm/cc | 1.43 | ISO : 11272, 2017 |
| 10 | Calcium (as Ca) | mg/kg | 74.5 | ISO : 11260, 2018 |

Meenakshi
Anayst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/SS/7.8 F-06**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**

**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065377F
**Test Report No.** : PRPL/SS/250327-011
**Sample I.D.** : PRPL/SS/270325-011
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Test Method |
|---|---|---|---|---|
| 11 | Texture | Visually | Clay | IS : 2720 P-4, 2020 |
| 12 | Sand | % | 28.4 | IS : 2720 P-4, 2020 |
| 13 | Silt | % | 15.9 | IS : 2720 P-4, 2020 |
| 14 | Clay | % | 55.6 | IS : 2720 P-4, 2020 |
| 15 | Magnesium (as Mg) | mg/kg | 42.9 | ISO : 11260, 2018 |
| 16 | Moisture | % | 1.8 | IS : 2720 P-2, 2020 |
| 17 | Porosity | % | 36.1 | USDA M40, Ed. by LA Richards, 1954 |
| 18 | Potassium (as K) | mg/kg | 34.50 | ISO : 11260, 2018 |
| 19 | Sodium Absorption Ratio | | 5.6 | IS : 11624, 2023 |
| 20 | Sodium (as Na) | mg/kg | 76.50 | ISO : 11260, 2018 |
| 21 | Water Holding Capacity | % | 54 | Lab SOP No. 25, Issue No. 02, Issue Date: 01.06.2024 |
| 22 | Available Nitrogen | mg/kg | 70.8 | IS : 14684, 2019 |
| 23 | Cation Exchange Capacity (CEC) | meq/100gm | 20.30 | ISO : 11260, 2018 |
| 24 | Sulphur | mg/kg | 3.44 | Lab SOP No. 012, Issue No. 02, Issue Date: 01.06.2024. |

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Meenakshi
Anayst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/SS/7.8 F-06**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065345F
**Test Report No.** : PRPL/SS/250327-012
**Sample I.D.** : PRPL/SS/270325-012
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

**SAMPLE PARTICULERS**

(a) Sample Type : Soil
(b) Sample description : Grass Land uses soil
(c) Sample Quantity : 1 Kg
(d) Sample Pkg. Condition : Poly Bag

**Details of sampling**

(a) Date of Sampling : 26/03/2025
(b) Time of sampling : 2:02 PM
(c) Sampling Protocol : IS : 2720 Part-1
(d) Equipment Used : Khurpi
(e) Sampling Done By : Mr. Dharmendra
(f) Sampling Location : Kuttadankadu

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Test Method |
|---|---|---|---|---|
| 1 | pH at 25°C | -- | 7.45 | IS : 2720 P-26,2021 |
| 2 | Conductivity at 25°C | µS/cm | 323.7 | IS : 14767, 2021 |
| 3 | Available Chloride | mg/kg | 79.88 | LAB SOP No.010, Issue No. 02, Issue Date: 01.06.2024 |
| 4 | Bicarbonate Alkalinity (as CaCO3) | mg/kg | 109.80 | LAB SOP No.008 , Issue No. 02, Issue Date: 01.06.2024. |
| 5 | Colour | | 5/6 Bright Brown | Munsell Chart, 1930 |
| 6 | Nitrate (as NO3) | mg/kg | 40.4 | Lab SOP No. 15 , Issue No. 02, Issue Date: 01.06.2024 |
| 7 | Organic Matter | % | 0.75 | IS : 2720 P-22,2022 |
| 8 | Phosphorus (Available) | mg/kg | 15.03 | ISO : 11263,1994 |
| 9 | Bulk Density | gm/cc | 1.29 | ISO : 11272, 2017 |
| 10 | Calcium (as Ca) | mg/kg | 80.1 | ISO : 11260, 2018 |

Meenakshi
Anayst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065345F
**Test Report No.** : PRPL/SS/250327-012
**Sample I.D.** : PRPL/SS/270325-012
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 03/04/2025

| S.No. | Parameters | Units | Results | Test Method |
|---|---|---|---|---|
| 11 | Texture | Visually | Clay | IS : 2720 P-4, 2020 |
| 12 | Sand | % | 31.0 | IS : 2720 P-4, 2020 |
| 13 | Silt | % | 19.6 | IS : 2720 P-4, 2020 |
| 14 | Clay | % | 49.3 | IS : 2720 P-4, 2020 |
| 15 | Magnesium (as Mg) | mg/kg | 55.3 | ISO : 11260, 2018 |
| 16 | Moisture | % | 1.9 | IS : 2720 P-2, 2020 |
| 17 | Porosity | % | 29.6 | USDA M40, Ed. by LA Richards, 1954 |
| 18 | Potassium (as K) | mg/kg | 45.30 | ISO : 11260, 2018 |
| 19 | Sodium Absorption Ratio | | 5.6 | IS : 11624, 2023 |
| 20 | Sodium (as Na) | mg/kg | 88.70 | ISO : 11260, 2018 |
| 21 | Water Holding Capacity | % | 50 | Lab SOP No. 25, Issue No. 02, Issue Date: 01.06.2024 |
| 22 | Available Nitrogen | mg/kg | 74.6 | IS : 14684, 2019 |
| 23 | Cation Exchange Capacity (CEC) | meq/100gm | 18.90 | ISO : 11260, 2018 |
| 24 | Sulphur | mg/kg | 3.69 | Lab SOP No. 012, Issue No. 02, Issue Date: 01.06.2024. |

**Remarks :** N.A.
Opinion/Interpretation

***End of Report***

Meenakshi
Anayst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/SS/7.8 F-06**

# PERFACT RESEARCHERS PVT LTD

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## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065347F
**Test Report No.** : PRPL/NS/250327-005
**Sample I.D.** : PRPL/NS/270325-005
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

Name of the Sample : Ambient Noise

**Details of sampling**

(a) Date & Time of Sampling : 01/03/2025 to 02/03/2025
(b) Sampling Protocol : IS : 9989
(c) Equipment Used : Sound Level Meter
(d) Sampling Done By : Mr. Dharmendra & Mr. Pushpendra
(e) Duration of Sampling : 24 Hr
(f) Sampling Location : Onsite West

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 28/03/2025

| S.No. | Parameters | Units | Results | Requirement/Specification (Industrial Area,As per CPCB) | Test Method |
|---|---|---|---|---|---|
| 1 | Leq Value (Day Time) | dB(A) | 41.6 | 75 | IS : 9989, 1981 |
| 2 | Leq Value (Night Time) | dB(A) | 38.6 | 70 | IS : 9989, 1981 |

Day time shall mean from 10:00 AM to 06:00 PM.
Night time shall mean from 06:00 PM to 10:00 AM.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Sonu Singh
Analyst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/AN/7.8 F-03**

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## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065348F
**Test Report No.** : PRPL/NS/250327-006
**Sample I.D.** : PRPL/NS/270325-006
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

Name of the Sample : Ambient Noise

**Details of sampling**

(a) Date & Time of Sampling : 03/03/2025 to 04/03/2025
(b) Sampling Protocol : IS : 9989
(c) Equipment Used : Sound Level Meter
(d) Sampling Done By : Mr. Dharmendra & Mr. Pushpendra
(e) Duration of Sampling : 24 Hr
(f) Sampling Location : Onsite West

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 28/03/2025

| S.No. | Parameters | Units | Results | Requirement/Specification (Industrial Area,As per CPCB) | Test Method |
|---|---|---|---|---|---|
| 1 | Leq Value (Day Time) | dB(A) | 48.4 | 75 | IS : 9989, 1981 |
| 2 | Leq Value (Night Time) | dB(A) | 43.2 | 70 | IS : 9989, 1981 |

Day time shall mean from 10:00 AM to 06:00 PM.
Night time shall mean from 06:00 PM to 10:00 AM.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Sonu Singh
Analyst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065352F
**Test Report No.** : PRPL/NS/250327-007
**Sample I.D.** : PRPL/NS/270325-007
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

Name of the Sample : Ambient Noise

**Details of sampling**

(a) Date & Time of Sampling : 07/03/2025 to 08/03/2025
(b) Sampling Protocol : IS : 9989
(c) Equipment Used : Sound Level Meter
(d) Sampling Done By : Mr. Dharmendra & Mr. Pushpendra
(e) Duration of Sampling : 24 Hr
(f) Sampling Location : Onsite West

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 28/03/2025

| S.No. | Parameters | Units | Results | Requirement/Specification (Industrial Area,As per CPCB) | Test Method |
|---|---|---|---|---|---|
| 1 | Leq Value (Day Time) | dB(A) | 40.6 | 75 | IS : 9989, 1981 |
| 2 | Leq Value (Night Time) | dB(A) | 36.4 | 70 | IS : 9989, 1981 |

Day time shall mean from 10:00 AM to 06:00 PM.
Night time shall mean from 06:00 PM to 10:00 AM.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Sonu Singh
Analyst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/AN/7.8 F-03**

# PERFACT RESEARCHERS PVT LTD

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## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065378F
**Test Report No.** : PRPL/NS/250327-008
**Sample I.D.** : PRPL/NS/270325-008
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

Name of the Sample : Ambient Noise

**Details of sampling**

(a) Date & Time of Sampling : 10/03/2025 to 11/03/2025
(b) Sampling Protocol : IS : 9989
(c) Equipment Used : Sound Level Meter
(d) Sampling Done By : Mr. Dharmendra & Mr. Pushpendra
(e) Duration of Sampling : 24 Hr
(f) Sampling Location : Onsite West

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 28/03/2025

| S.No. | Parameters | Units | Results | Requirement/Specification (Industrial Area,As per CPCB) | Test Method |
|---|---|---|---|---|---|
| 1 | Leq Value (Day Time) | dB(A) | 46.9 | 75 | IS : 9989, 1981 |
| 2 | Leq Value (Night Time) | dB(A) | 39.5 | 70 | IS : 9989, 1981 |

Day time shall mean from 10:00 AM to 06:00 PM.
Night time shall mean from 06:00 PM to 10:00 AM.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Sonu Singh
Analyst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/AN/7.8 F-03**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065349F
**Test Report No.** : PRPL/NS/250327-009
**Sample I.D.** : PRPL/NS/270325-009
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

Name of the Sample : Ambient Noise

**Details of sampling**

(a) Date & Time of Sampling : 14/03/2025 to 15/03/2025
(b) Sampling Protocol : IS : 9989
(c) Equipment Used : Sound Level Meter
(d) Sampling Done By : Mr. Dharmendra & Mr. Pushpendra
(e) Duration of Sampling : 24 Hr
(f) Sampling Location : Thiruvanthapuram

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 28/03/2025

| S.No. | Parameters | Units | Results | Requirement/Specification (Residential Area,As per CPCB) | Test Method |
|---|---|---|---|---|---|
| 1 | Leq Value (Day Time) | dB(A) | 54.3 | 55 | IS : 9989, 1981 |
| 2 | Leq Value (Night Time) | dB(A) | 41.9 | 45 | IS : 9989, 1981 |

Day time shall mean from 10:00 AM to 06:00 PM.
Night time shall mean from 06:00 PM to 10:00 AM.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Sonu Singh
Analyst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/AN/7.8 F-03**

# PERFACT RESEARCHERS PVT LTD

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## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065350F
**Test Report No.** : PRPL/NS/250327-010
**Sample I.D.** : PRPL/NS/270325-010
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

Name of the Sample : Ambient Noise

**Details of sampling**

(a) Date & Time of Sampling : 17/03/2025 to 18/03/2025
(b) Sampling Protocol : IS : 9989
(c) Equipment Used : Sound Level Meter
(d) Sampling Done By : Mr. Dharmendra & Mr. Pushpendra
(e) Duration of Sampling : 24 Hr
(f) Sampling Location : Thiruvanthapuram

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 28/03/2025

| S.No. | Parameters | Units | Results | Requirement/Specification (Residential Area,As per CPCB) | Test Method |
|---|---|---|---|---|---|
| 1 | Leq Value (Day Time) | dB(A) | 53.7 | 55 | IS : 9989, 1981 |
| 2 | Leq Value (Night Time) | dB(A) | 42.6 | 45 | IS : 9989, 1981 |

Day time shall mean from 10:00 AM to 06:00 PM.
Night time shall mean from 06:00 PM to 10:00 AM.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Sonu Singh
Analyst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

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# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065353F
**Test Report No.** : PRPL/NS/250327-011
**Sample I.D.** : PRPL/NS/270325-011
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

Name of the Sample : Ambient Noise

**Details of sampling**

(a) Date & Time of Sampling : 21/03/2025 to 22/03/2025
(b) Sampling Protocol : IS : 9989
(c) Equipment Used : Sound Level Meter
(d) Sampling Done By : Mr. Dharmendra & Mr. Pushpendra
(e) Duration of Sampling : 24 Hr
(f) Sampling Location : Thiruvanthapuram

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 28/03/2025

| S.No. | Parameters | Units | Results | Requirement/Specification (Residential Area,As per CPCB) | Test Method |
|---|---|---|---|---|---|
| 1 | Leq Value (Day Time) | dB(A) | 52.6 | 55 | IS : 9989, 1981 |
| 2 | Leq Value (Night Time) | dB(A) | 41.8 | 45 | IS : 9989, 1981 |

Day time shall mean from 10:00 AM to 06:00 PM.
Night time shall mean from 06:00 PM to 10:00 AM.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Sonu Singh
Analyst
**Reviewed By**

Radhna Dogra
Sr. Vice President
**Authorized Signatory**

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**Document No.: PRPL/AN/7.8 F-03**

# PERFACT RESEARCHERS PVT LTD

TC-6993

## TEST REPORT



**Issued to : M/s State Industries Promotion Corporation of TN Ltd.**
**"Development of an Industrial Park over an extent of 796.240 by M/s SIPCOT at Thoothukudi District, Tamil Nadu.**

**ULR No.** : TC699325000065351F
**Test Report No.** : PRPL/NS/250327-012
**Sample I.D.** : PRPL/NS/270325-012
**Date of Issue** : 14/04/2025
**Reference No.** : TRF

## SAMPLE PARTICULARS

Name of the Sample : Ambient Noise

**Details of sampling**

(a) Date & Time of Sampling : 24/03/2025 to 25/03/2025
(b) Sampling Protocol : IS : 9989
(c) Equipment Used : Sound Level Meter
(d) Sampling Done By : Mr. Dharmendra & Mr. Pushpendra
(e) Duration of Sampling : 24 Hr
(f) Sampling Location : Thiruvanthapuram

## TEST RESULTS

Test Started on : 28/03/2025 Test Completed on : 28/03/2025

| S.No. | Parameters | Units | Results | Requirement/Specification (Residential Area,As per CPCB) | Test Method |
|---|---|---|---|---|---|
| 1 | Leq Value (Day Time) | dB(A) | 55.2 | 55 | IS : 9989, 1981 |
| 2 | Leq Value (Night Time) | dB(A) | 44.6 | 45 | IS : 9989, 1981 |

Day time shall mean from 10:00 AM to 06:00 PM.
Night time shall mean from 06:00 PM to 10:00 AM.

**Remarks :** N.A.
**Opinion/Interpretation**

***End of Report***

Sonu Singh
Analyst
**Reviewed By**

Rachna Dogra
Sr. Vice President
**Authorized Signatory**

**Note :**

* The results listed refer only to the tested sample and applicable parameter.
* This report, fully or in part, shall not be used for advertising or as evidence in any court of law.
* This report cannot be reproduced, except when in full, without the written permission of the Director.
* The sample will be destroyed after three weeks from the date of issue of the test report. ( in case of non-perishable products only)

**Document No.: PRPL/AN/7.8 F-03**

# Annexure 10- Cumulative Air Quality Report

# CUMULATIVE IMPACT ASSESSMENT REPORT

**For**

**DEVELOPMENT OF AN INDUSTRIAL PARK AT ALLIKULAM, KEELATHATTAPARAI, PERURANI, UMARIKOTTAI, MELATHATTAPARAI, RAMASAMYPURAM AND THERKUSILLUKKANPATTI VILLAGES, THOOTHUKUDI TALUK, THOOTHUKUDI DISTRICT, TAMIL NADU OVER AN EXTENT OF 796.240 HECTARES (1966.713 ACRES)**

## PROJECT PROPONENT

**M/s. STATE INDUSTRIES PROMOTION CORPORATION OF TAMILNADU LIMITED (SIPCOT)**

**Address :** 19-A, Rukmani Lakshmipathy Road Egmore, Chennai - 600008.

## ENVIRONMENTAL CONSULTANT

**M/s. PERFACT ENVIROSOLUTIONS PVT. LTD**

(NABET Registered List of Accredited Consultant Organisations/NABET/EIA/25 - 28/ RA 0467 Valid Upto 26/11/2028)

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# 1. INTRODUCTION

A Cumulative Impact Assessment has been undertaken, considering the baseline environmental settings, impacts by existing polluting industries within study area, wind direction and meteorological conditions and the proposed Development of Industrial Park . The ambient air quality Ground Level Concentration (GLC) of the area near the project will be impacted due to air pollution sources. The air pollution sources are of two types:

- Point Sources – Chimneys/ Stacks/ ducts/ Vents of Process and Utilities
- Non-Point Sources – Vehicles, machinery, blasting, drilling etc.

The emissions from these sources spread or disperse in the air and cause an increase in the pollution level in ambient air. This causes an increase in Ground Level Concentration (GLC). This increase in GLC can be predicted using Air Dispersion Modelling studies. In this study, AERMOD developed by Lakes Environmental Inc. is used to calculate incremental Ground Level concentrations (GLC) for the proposed sources of air pollution in the current expansion, for Particulate emissions, Gaseous emissions ($NO_2$ & $SO_2$).

# 2. METHODOLOGY

## 2.1. Modeling procedure

The American Meteorological Society (AMS)/Environmental Protection Agency (EPA) Regulatory Model Improvement Committee (AERMIC) was formed to introduce state-of-the-art modeling concepts into the EPA's air quality models. Through AERMIC, a modeling system, AERMOD, was introduced that incorporated air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain.(Epa and OAR 2016)

There are two input data processors that are regulatory components of the AERMOD modeling system: AERMET, a meteorological data preprocessor that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, and AERMAP, a terrain data preprocessor that incorporates complex terrain using USGS Digital Elevation Data.

The pollutants released into the atmosphere will disperse in the downwind direction and finally reach the ground at a farther distance from the source. The concentration of ground

level concentrations mainly depends upon the strength of the emission source and micrometeorology of the study area.

The AERMOD is actually a modeling system with three separate components: AERMOD (AERMIC Dispersion Model), AERMAP (AERMOD Terrain Preprocessor), and AERMET (AERMOD Meteorological Preprocessor). Special features of AERMOD include its ability to treat the vertical in homogeneity of the planetary boundary layer special treatment of surface releases, irregularly-shaped area sources, a plume model for the convective boundary layer, limitation of vertical mixing in the stable boundary layer, and fixing the reflecting surface at the stack base.

The AERMET is the meteorological preprocessor for the AERMOD. Input data can come from hourly cloud cover observations, surface meteorological observations and twice-a-day upper air soundings. Output includes surface meteorological observations and parameters and vertical profiles of several atmospheric parameters.

The AERMAP is a terrain pre-processor designed to simplify and standardize the input of terrain data for the AERMOD. Input data include receptor terrain elevation data. Output includes, for each receptor, location and height scale, which are elevations used for the computation of airflow around hills. The input file for the AERMOD model makes use of a keyword/parameter approach to specifying the options and input data for running the model.

For Air Dispersion Modelling following methodology shall be used:

AERMOD uses Gaussian plume dispersion modelling parameters, the generalised equation is given below:

$$c = \frac{Q}{2\pi u \sigma_y \sigma_z} exp\left(-\frac{y^2}{2\sigma_y^2}\right)\left\{exp\left[-\frac{1}{2}\frac{(z-h)}{\sigma_z^2}\right] + exp\left[-\frac{1}{2}\frac{(z+h)}{\sigma_z^2}\right]\right\}$$

Where

$c$ = concentration at a given point (g/m$^3$)

$Q$ = emission rate (g/s)

$u$ = wind speed (m/s)

$\sigma_y$ = dispersion parameter in the horizontal (lateral) direction (m)

$\sigma_z$ = dispersion parameter in the vertical direction (m)

$x$ = direction of the wind ($x = 0$ at the source; $x > 0$ downwind).

$y$ = horizontal direction perpendicular to the wind ($y = 0$ at the center of the plume; positive on your left when you look downwind).

$z$ = vertical direction ($z = 0$ at the surface and positive above the surface).

As well as the effective source height $h$. They all have meters as units.

**Plume Rise**

Plume rise Δh has been determined according to Brigg's formula (CPCB guideline)

$$\Delta h = 21.425 \frac{F^{3/4}}{U_s} \quad \text{for } F<55$$

and

$$\Delta h = 38.71 \frac{F^{3/5}}{U_s} \quad \text{for } F>55$$

$$F = g V_s D^2 (T_s - T_a)/4T_s$$

Where

$U_s$ = wind speed at stack level (m/s)

$V_s$ = stack gas velocity (m/s)

$T_s$ = stack gas temperature (K)

$T_a$ = ambient temperature (K)

F = Buoyancy flux parameter ($m^4/s^3$)

Δh = Plume rise (m)

D = Diameter of the stack (m)

g = acceleration due to gravity, 9.807 ($m/s^2$)

## 2.2. EXTRAPOLATION OF WIND SPEED

Wind speed at stack level is calculated by power law as given below.

$$U_{stack} = U_{10}(\text{Stack height}/10)^p$$

Where $U_{10}$ is the wind speed at 10 meter level and p is the power law coefficient (0.07, 0.07, 0.10, 0.15, 0.35 and 0.55 for stability classes A,B,C,D,E and F respectively) as per Irwin for rural areas (USEPA, 1987).

### 2.2.1. Stability Classification

Hourly stability is determined by wind direction fluctuation method as suggested by Slade (1965) and recommended by CPCB (PROBES/70/1997-1998).

$\sigma_\theta = W_{dr}/6$

$\sigma_\theta$, is standard deviation of wind direction fluctuation, $W_{dr}$ is the overall wind direction fluctuation or width of the wind direction in degrees. The table for stability classes is given as under.

Table 1. Stability Class

| Stability Class | $\sigma_\theta$ (degree) |
|---|---|
| A | > 22.5 |
| B | 22.4 – 17.5 |
| C | 17.4 – 12.5 |
| D | 12.4 – 7.5 |
| E | 7.4 – 3.5 |
| F | < 3.5 |

### 2.2.2. Dispersion Parameters

Dispersion parameters $\sigma_y$ and $\sigma_z$ for open country conditions (Briggs, 1974) are used as the project is located on a flat terrain in a rural area. Atmospheric dispersion coefficients vary with downwind distance (x) from emission sources for different atmospheric stability conditions. (CPCB – PROBES/70/1997-98).

### 2.2.3. Rural Conditions

Table 2. Stability classification

| Stability Class | $\sigma_y$ | $\sigma_z$ |
|---|---|---|
| A | $0.22x(1+0.0001x)^{-.5}$ | 0.20x |
| B | $0.16x(1+0.0001x)^{-.5}$ | 0.12x |
| C | $0.11x(1+0.0001x)^{-.5}$ | $0.08x(1+0.0002x)^{.5}$ |
| D | $0.08x(1+0.0001x)^{-.5}$ | $0.06(1+0.0015x)^{.5}$ |
| E | $0.06x(1+0.0001x)^{-.5}$ | $0.03x(1+0.0003x)^{-1}$ |
| F | $0.04x(1+0.0001x)^{-.5}$ | $0.16x(1+0.0003x)^{-1}$ |

## 2.3. INPUT DATA

### 2.3.1. About the project and emission details

Proposed Industrial Park development includes a pre-defined manmade fibre manufacturing (Lyocell) unit along with 135 MW coal & biomass based CPP and other Technical Textile units (Category A or B) and non EC-category industrial units of Red/Orange/Green/White categories. A single plot S-1 is allotted for the proposed Lyocell unit and 19 Nos. other plots are identified for Technical Textile units and about 149 Nos. of plots are identified for setting up different Non-EC categories of Industries. There will be commercial units set up in 11 number of plots to meet the requirement of occupying industrial needs.

Existing operational Industrial units with valid Environmental clearances and or consent orders ( Red, Orange ,Green or White) as applicable to the industry within study area are taken into consideration for predicting cumulative impacts if existing industries operate together with their full capacity . The incremental emission loads are mapped over baseline results obtained and plotted at each point of observations.

Prediction of Emission based on the tentative Project Planning considering polluting industries in 10 km radius.

### 2.3.2. Location of the project

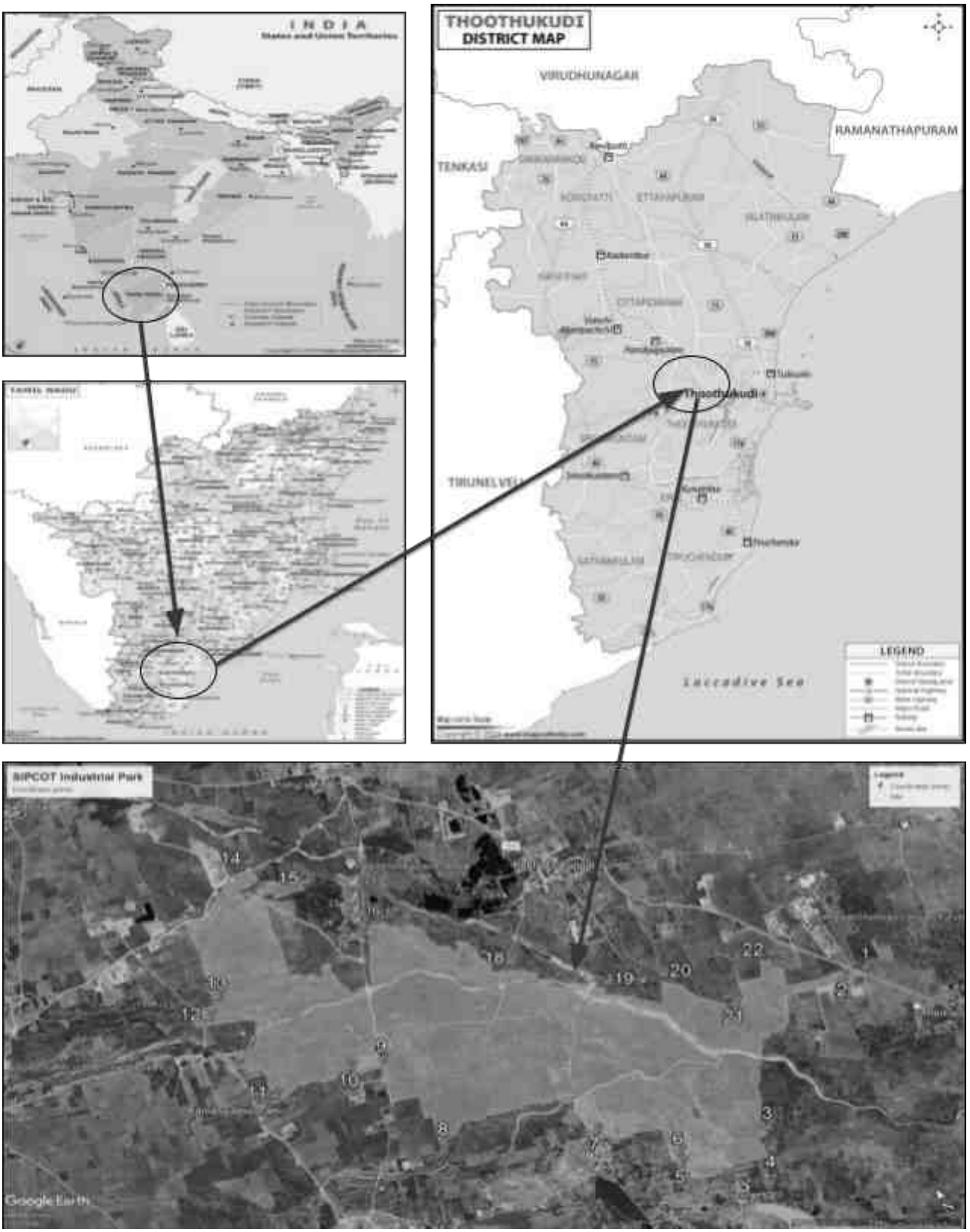



Figure 1.Project Location

## 2.3.2.1 Sensitive receptors (Within 10 km project site)

Table 3. Environment Sensitivity

| Environmental Feature / Sensitive Receptor | Approximate Distance (km) | Direction (from Project Site) |
|---|---|---|
| **Water Bodies** | | |
| Nilviyal odai Within Project Area | Odai Within Project Area | Passing through the site |
| Odai within Project Area | Odai Within Project Area | Passing through the site |
| Pond near Project Area | 0.21 | NE |
| Pond near Project Area | 0.31 | NW |
| Pond near Project Area | 0.39 | SSW |
| Allikulam Pond | 0.43 | S |
| Pond near Perurani | 0.80 | S |
| Pond near Allikulam | 0.80 | SSE |
| Swimming Pond near Perurani | 1.01 | S |
| Neeravi Pond Perurani | 1.13 | SW |
| Pond near Perurani | 1.25 | WSW |
| Perurani Pond | 1.28 | SW |
| Kadamba Kulam ( Fishing Pond ) | 1.53 | SSE |
| Pond near Perurani | 1.56 | SW |
| Pond near Mel Kuttudankadu | 1.90 | S |
| Pond Elim (Kanchan Kulam) | 2.07 | SSE |
| Vepan Pond | 2.11 | SW |
| Pond near Umari kkottai | 2.39 | NW |
| Pond near Putupatti | 3.04 | SSW |
| Koram Pallam Tank | 3.52 | SE |
| Pond near Varthagareddypatti | 3.52 | SW |
| Pond near Varthagareddypatti | 3.60 | SW |
| periya Kulam water body | 3.80 | SW |
| Pond Bethesda | 3.85 | SSE |
| Senkulam River (River Port) | 4.49 | ENE |
| Pond near Korampallam | 5.06 | E |
| Pond near Korampallam Check Dam | 5.38 | SE |
| North Channal | 6.31 | SSE |
| Pond near Jambulinga Puram | 6.84 | NNE |
| Canal near Tiruvai Puram | 7.18 | SSE |
| Pond near Melmatan | 7.68 | NNE |
| Pond near Sakkammal Puram | 7.73 | SSE |
| Canal near Peykulam | 7.75 | SSE |
| Canal near Brahmapuram | 8.10 | SSE |
| Canal near Manakkudu | 8.50 | SSE |
| Sivathaiya Puram Pond | 8.57 | SSE |
| **Nearby Area** | | |
| Allikulam Village | 0.16 | S |
| **Densely Populated Area** | | |
| Thoothukudi Corporation Area | 2.0 | SE |
| **Inland, Coastal, Marine Waters** | | |
| Gulf of Mannar | 14.63 | ENE |

| Environmental Feature / Sensitive Receptor | Approximate Distance (km) | Direction (from Project Site) |
|---|---|---|
| **State/National Boundaries** | | |
| International Boundary towards Bay of Bengal | 14.63 | ENE |
| **ASI Monuments** | | |
| Sirupadu (Iron age burial site) | 4.75 | E |
| The Panchalankurichi Fort | 14.06 | N |
| Sivagalai | 14.75 | S |
| Korkai | 14.80 | SEE |
| **Reserve Forest & Wildlife Sanctuary** | | |
| Vallanadu RF & Blackbuck Sanctuary | 13.71 | SW |
| **Eco-Sensitive Zone** | | |
| Vallanadu Blackbuck Sanctuary ESZ | 13.27 | SW |
| **Inter State Boundary** | | |
| No Inter State Boundary within 15 km Radius | | |
| **Protected Flora/Fauna Habitats (breeding, nesting, foraging, resting, overwintering, migration)** | | |
| Gulf of Mannar – 14.63 (ENE) | | |
| **Defence Installation** | | |
| No Defence Installation within 15 km Radius | | |
| **Areas Already Subjected to Pollution or Environmental Damage** | | |
| SIPCOT Industrial Complex, Thoothukudi | 5.07 | N |
| SIPCOT Furniture Park | 7.48 | NE |
| **Hospitals** | | |
| Jacob Hospital, Pudukottai | 3.03 | SE |
| Sree Aicort Maharaja Clinic, Sekkarakkudi | 4.43 | W |
| Primary Health Centre, Sekkarakkudi | 5.01 | W |
| Government Hospital, Sekkarakkudi | 5.02 | W |
| Rapha Hospital and Pharmacy, Ayyanadaippu | 5.34 | ENE |
| Nallathambi Hospital, Periyanayagapuram | 5.93 | ENE |
| Selvaa Hospital, Sawyerpuram | 8.93 | S |
| **Post Offices** | | |
| Branch Post Office, Mela Thattaparai | 1.34 | NE |
| Post Office, Melakuttudakadu | 2.05 | S |
| Post Office, Pudukottai | 2.93 | SE |
| Senthil Postal Service Centre, Pudukottai | 2.96 | SE |
| Kumaragiri Panchayat Office (Post Office), Pudukottai | 3.36 | SE |
| Post Office, Sekkarakkudi | 4.93 | W |

| Environmental Feature / Sensitive Receptor | Approximate Distance (km) | Direction (from Project Site) |
|---|---|---|
| Post Office, Mudivaithanendal | 6.02 | SW |
| Post Office, Kulayankarisal | 7.57 | SE |
| Post Office, Sawyerpuram | 9.29 | S |
| **Places of Worship** | | |
| Sri Sappani Madan Temple, Allikulam | 0.21 | SSE |
| Sri Muthu Mariamman Temple, Allikulam | 0.31 | S |
| Sri Alagiya Thiruveattai Ayyanar Temple, Allikulam | 0.31 | SSW |
| Sri Perumal Temple, Allikulam | 0.33 | S |
| Sri Vinayagar Temple, Allikulam | 0.37 | S |
| Sri Parvathi Parameswari Amman Temple, Allikulam | 0.37 | S |
| Sri Muthumari Amman Temple, Allikulam | 0.41 | SW |
| Sri Thadikaraswami Temple, Thoothukudi | 0.42 | S |
| Mullai Marathu Sudalaimadan Swamy Temple, Thoothukudi | 0.50 | S |
| Kaliamman Temple, Melathattaparai | 0.90 | NE |
| Nallamadasamy Temple, Melathattaparai | 1.14 | NE |
| Shri Angala Parameshwari Temple, Melathattaparai | 1.15 | NE |
| Sri Uchinimakali Amman Temple, Melathattaparai | 1.23 | NE |
| Ellammal Temple, Melathattaparai | 1.25 | NE |
| Shri Nagamma Temple, Melathattaparai | 1.33 | NE |
| Sri Sappandimadasamy Temple, Melathattaparai | 1.42 | NE |
| Church of God, Melathattaparai | 2.31 | NE |
| **Schools** | | |
| Annai Subasri Vidhyalaya Nursery & Primary School, Melathattaparai | 0.95 | NNE |
| TDTA School, Melathattaparai | 1.25 | NE |
| Anganwadi Centre (Elementary School), Melathattaparai | 1.34 | NNE |
| Govt School, Melathattaparai | 2.84 | NNE |
| Soosaipandiapuram Primary School, Kuttudankadu | 3.02 | SSE |
| TDTA PSP Hr Sec School, Pudukottai | 3.34 | SE |

| Environmental Feature / Sensitive Receptor | Approximate Distance (km) | Direction (from Project Site) |
|---|---|---|
| Aananthi Pappa Home, Pudukottai | 3.36 | SE |
| TNDTA St. Augustine Primary School, Pudukottai | 3.37 | SE |
| **Banks** | | |
| Indian Overseas Bank ATM, Pudukottai | 3.05 | SE |
| Tamilnad Mercantile Bank, Pudukottai | 3.12 | SE |
| Indian Overseas Bank ATM, Pudukottai | 3.18 | SE |
| ICICI Bank, Pudukottai | 3.19 | SE |
| Axis Bank ATM, Thattaparai | 7.48 | NNE |
| Indian Overseas Bank ATM, Pudiyamputhur | 7.61 | NNE |

## 2.3.3. Sources

A Table showing the sources of Air Pollution (Incremental i.e. predicted due to the proposed SIPCOT Park at Allikulam, due to existing operating Industries , will be due to coming up Industries in near future) are listed below in Tables 4,5& 6. Cumulative impact prediction is made over baseline concentrations (Onsite and Buffer zone) along with maximum possible incremental loads after appropriate Air Pollution Control systems. The detail of stacks are listed below :

Table 4. List of stacks from units within the proposed Industrial Park

| S. No. | Stack attached to | Capacity | Standard Emission Limit |
|---|---|---|---|
| **1** | **Project Developer -SIPCOT** | | |
| **Point source emissions :** NIL.<br>(No DG sets / boilers / stacks envisaged **)** | | | |
| 2 | **Plot S-1 : Proposed Stacks Details for Lyocell and Tissue Manufacturing Unit** | | |
| 2.1 | DG Sets<br>(4 Nos.) | 2500 kVA | As per CPCB Emission Standard for DG:<br>PM: 75 mg/Nm$^3$<br>CO: 150 mg/Nm$^3$<br>NOx: 360 mg/Nm$^3$<br>$SO_2$- 2 mg/Nm$^3$<br>1. **Diesel consumption for 2500 kVA DG set is considered** approx. 400 LPH.<br>2. **Density of diesel** - 0.845 Kg/Litres.<br>3. **Sulphur content (BS VI) - 0.001%** = 10 ppm = 0.00001 Kg S/Kg diesel. |
| 2.2 | Boilers<br>(3 Nos.) | 280 TPH | Notification S.O. 3305(E) dated 7 December 2015<br>SO2: 100 mg/Nm3 |

| S. No. | Stack attached to | Capacity | Standard Emission Limit |
|---|---|---|---|
| | | | NOx: 100 mg/Nm3<br>PM: 30 mg/Nm3<br>Fuel: Coal +15% biomass |
| 3 | **Technical Textile and other Textile Units -19 Nos.** | | |
| 3.1 | DG Sets (19 Nos.) | 1010 kVA each | CPCB DG emission standards applicable to HSD<br>Stack height as per CPCB norms. |
| 3.2 | Boilers (19 Nos.) | 2 TPH each | Emissions as per CPCB norms applicable to Coal fired<br>Stack height as per CPCB guidelines. |
| 4 | **Other Industrial Units (149 Nos. of Plots)** | | |
| 4.1 | DG Sets (64 Nos.) | 62.5 kVA each | CPCB DG emission standards applicable to HSD<br>Stack height as per CPCB norms. |
| 4.2 | DG Sets (46 Nos.) | 125 kVA each | CPCB DG emission standards applicable to HSD<br>Stack height as per CPCB norms. |
| 4.3 | DG Sets (26 Nos.) | 500 kVA each | CPCB DG emission standards applicable to HSD<br>Stack height as per CPCB norms. |
| 4.4 | DG Sets (12 Nos.) | 625 kVA each | CPCB DG emission standards applicable to HSD<br>Stack height as per CPCB norms. |
| 4.5 | Boilers (21 Nos.) | 2.0 TPH each | Emissions as per CPCB / MoEF&CC norms for Coal<br>Stack height as per CPCB guidelines. |
| 4.6 | Boilers (16 Nos.) | 3.0 TPH each | Emissions as per CPCB / MoEF&CC norms for Coal<br>Stack height as per CPCB guidelines. |
| 4.7 | Boilers (13 Nos.) | 4.0 TPH each | Emissions as per CPCB / MoEF&CC norms for Coal<br>Stack height as per CPCB guidelines. |
| 5 | **Commercial Units (9 Nos. of Plots)** | | |
| 5.1 | DG Sets (9 Nos.) | 125 kVA each | Emissions as per CPCB / MoEF&CC norms for HSD<br>Stack height as per CPCB guidelines. |
| 6 | **SWM Plots (1 No. of Plots)** | | |
| 6.1 | DG Sets (1 No.) | 62.5 kVA each | No process boilers or stacks. CPCB DG emission for HSD.<br>Stack height as per CPCB norms. |

*For Industrial Plots , it is considered 1 each DG set based on the plot area , and one Boiler each for 33% of Industrial units .

## 2.3.4. Emission characteristics of point sources

Air Dispersion modeling using AERMOD View with maximum Ground Level Concentration (mGLC) for criteria and specific pollutants with village wise impact are included in this study.

Table 5. Stack details from units within the proposed Industrial Park

| S. No. | Stack attached to | Capacity | Stack height (m) | Stack dia. m | Stack velocity m/s | APCM Detail | Emission load in kg/hr of all utilities | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | $PM_{10}$ | $PM_{2.5}$ | NOx | SOx | CO |
| 1 | DG Sets (4 Nos.) | 2500 kVA | 30 | 0.6 | 20 | Adequate stack height | 0.80 | 0.64 | 7.18 | 0.03 | 1.59 |
| 2 | Power Boiler-3 | 280 TPH | 60 | 1.2 | 18 | ESP | 0.22 | 0.17 | 10.91 | 2.18 | 4.37 |
| 3 | DG Sets (19 Nos.) | 1010 kVA | 30 | 0.45 | 14 | Acoustic enclosure with stack | 0.30 | 0.24 | 2.80 | 0.03 | 0.90 |
| 4 | Boilers (19 Nos.) | 2 TPH | 33 | 1.00 | 15 | Dust collectors with stack | 0.35 | 0.26 | 1.80 | 0.10 | 0.60 |
| 5 | DG Sets (64 Nos.) | 62.5 kVA each | 22 | 0.30 | 10 | Acoustic enclosure with stack | 0.04 | 0.03 | 0.30 | 0.004 | 0.10 |
| 6 | DG Sets (46 Nos.) | 125 kVA each | 30 | 0.30 | 12 | Acoustic enclosure with stack | 0.07 | 0.05 | 0.60 | 0.006 | 0.20 |
| 7 | DG Sets (26 Nos.) | 500 kVA each | 30 | 0.45 | 14 | Acoustic enclosure with stack | 0.18 | 0.14 | 1.40 | 0.015 | 0.45 |
| 8 | DG Sets (12 Nos.) | 625 kVA each | 30 | 0.45 | 14 | Acoustic enclosure with stack | 0.22 | 0.17 | 1.80 | 0.020 | 0.60 |
| 9 | Boilers (21 Nos.) | 2.0 TPH each | 12 | 1.20 | 18 | Common stack | 0.20 | 0.15 | 0.90 | 0.06 | 0.30 |
| 10 | Boilers (16 Nos.) | 3.0 TPH each | 18 | 1.20 | 18 | Cyclone separator with stack | 0.28 | 0.21 | 1.30 | 0.08 | 0.45 |
| 11 | Boilers (13 Nos.) | 4.0 TPH each | 30.5 | 1.00 | 15 | Acoustic enclosure with stack | 0.60 | 0.45 | 3.20 | 0.18 | 1.10 |
| 12 | DG Sets (9 Nos.) | 125 kVA each | 30 | 0.30 | 12 | Acoustic enclosure with stack | 0.05 | 0.04 | 0.45 | 0.005 | 0.15 |
| 13 | DG Sets (5 Nos.) | 62.5 kVA each | 22 | 0.30 | 10 | Acoustic enclosure with stack | 0.03 | 0.02 | 0.25 | 0.003 | 0.08 |

*Table 6. Stack details of nearby industries*

| S. No. | Point Emission Source | Air Pollution Control Measures | Stack Height (m) FGL | Stack dia. (m) | Stack velocity (m/s) |
|---|---|---|---|---|---|
| **EXISTING INDUSTRIES** | | | | | |
| **M/s. V.V. TITANIUM PIGMENTS PRIVATE LIMITED** | | | | | |
| 1. | Boiler – 12 T/hr | Stack with cyclone separator | 30 | 1.20 | 18 |
| 2. | Boiler – 3 TPH & 8 TPH | Stack | 30 | 1.20 | 18 |
| 3. | DG Set – 380 KVA | Stack | 12 | 0.45 | 14 |
| 4. | DG Set – 380 KVA | Stack | 12 | 0.45 | 14 |
| 5. | DG Set – 750 KVA | Stack | 12 | 0.45 | 14 |
| 6. | DG Set – 750 KVA | Stack | 12 | 0.45 | 14 |
| 7. | DG Set – 1500 KVA | Stack | 28 | 0.45 | 14 |
| 8. | DG Set – 1500 KVA | Stack | 28 | 0.45 | 14 |
| **M/S. VINFAST AUTO INDIA PRIVATE LIMITED** | | | | | |
| 9. | 1010 kVA DG | Acoustic enclosures with twin stack | 30 | 0.90 | 15 |
| 10. | 2000 kVA DG | Acoustic enclosures with twin stack | 30 | 1.20 | 15 |
| 11. | Hot Water Boiler (2.8 MW of Rated Thermal Power) | Stack | 20 | 0.60 | 12 |
| 12. | ETP Mechanical evaporator | Stack | 12.6 | 0.45 | 10 |

| S. No. | Point Emission Source | Air Pollution Control Measures | Stack Height (m) FGL | Stack dia. (m) | Stack velocity (m/s) |
|---|---|---|---|---|---|
| 13. | Dip Treatment and Electro | Stack | 20 | 0.45 | 8 |
| 14. | Dip Treatment and Electro | Stack | 20 | 0.45 | 8 |
| 15. | Electro Coat Deposition Oven Cooling | Stack | 20 | 0.60 | 10 |
| 16. | Electro Coat Deposition Oven | Stack | 20 | 0.60 | 10 |
| 17. | Electro Coat Deposition Oven | Stack | 20 | 0.60 | 10 |
| 18. | Top Coat Oven | Stack | 20 | 0.75 | 12 |
| 19. | Top Coat Cooling | Stack | 20 | 0.60 | 10 |
| 20. | Top Coat Oven | Stack | 20 | 0.75 | 12 |
| 21. | Paint booth | Stack | 20 | 0.60 | 10 |
| 22. | Paint booth | Stack | 20 | 0.60 | 10 |
| 23. | Electro Coat Deposition Sanding | Stack | 20 | 0.45 | 8 |
| 24. | Electro Coat Deposition Heavy Sanding | Stack | 20 | 0.45 | 8 |
| 25. | Under Body sealing and Under body coating | Stack | 20 | 0.45 | 8 |
| 26. | Liquid Applied Sound Damping Sealer | Stack | 20 | 0.45 | 8 |

| S. No. | Point Emission Source | Air Pollution Control Measures | Stack Height (m) FGL | Stack dia. (m) | Stack velocity (m/s) |
|---|---|---|---|---|---|
| 27. | Hemming Sealer | Stack | 20 | 0.45 | 8 |
| 28. | Inspect and refine stage of painting stage | Stack | 20 | 0.45 | 8 |
| 29. | Polishing and finishing stage of Painting | Stack | 20 | 0.45 | 8 |
| 30. | Heavy repair stage | Stack | 20 | 0.45 | 8 |
| 31. | Electro Coat Deposition Bath – 1 Nos | Common dry scrubber with stack | 20 | 0.90 | 12 |
| 32. | Electro Coat Deposition Oven – 1 Nos | Common dry scrubber with stack | 20 | 0.90 | 12 |
| 33. | Spray Booth – 4 Nos | Common dry scrubber with stack | 20 | 0.90 | 12 |
| 34. | Top Coat Oven – 1 Nos | Common dry scrubber with stack | 20 | 0.90 | 12 |
| 35. | Paint Mixing Room – 1 Nos | Common dry scrubber with stack | 2 | 0.30 | 6 |
| 36. | Spot Repair – 1 Nos | Common dry scrubber with stack | 20 | 0.45 | 8 |
| 37. | Heavy Repair – 1 Nos | Common dry scrubber with stack | 20 | 0.45 | 8 |
| **M/s. FAUNA INTERNATIONAL** | | | | | |
| 38. | Boiler – 1.0 TPH (Working & Standby) | Common stack | 12 | 1.20 | 18 |
| 39. | DG Set – 62.5 KVA | Acoustic enclosure with stack | 24 | 0.45 | 14 |
| **M/s. EASTERNBULK LIME PRODUCTS PRIVATE LIMITED** | | | | | |

| S. No. | Point Emission Source | Air Pollution Control Measures | Stack Height (m) FGL | Stack dia. (m) | Stack velocity (m/s) |
|---|---|---|---|---|---|
| 40. | DG Set – 625 KVA – I | Acoustic enclosure with stack | 8 | 0.45 | 14 |
| 41. | DG Set – 625 KVA – II | Acoustic enclosure with stack | 8 | 0.45 | 14 |
| 42. | Vertical Shaft Lime Kiln -1 | Bagfilter with three stacks (One main stack and two standby stacks) | 37 | 1.20 | 18 |
| 43. | Vertical Shaft Lime Kiln -1 | Bagfilter with three stacks (One main stack and two standby stacks) | 37 | 1.20 | 18 |
| **M/s. AMULYA SEA FOODS** | | | | | |
| 44. | Boiler – 0.4 T/hr | Stack | 20 | 1.20 | 18 |
| 45. | DG Set – 500 KVA | Stack | 9 | 0.45 | 14 |
| 46. | DG Set – 310 KVA | Stack | 6 | 0.45 | 14 |
| **M/s. BABY MARINE EASTERN EXPORTS PVT. LTD.** | | | | | |
| 47. | DG Set – 500 KVA | Acoustic enclosure with stack | 4.2 | 0.45 | 14 |
| **M/s. COCO TUFTTERS PRIVATE LIMITED** | | | | | |
| 48. | Thermic Fluid Heater | Stack | 30.50 | 1.00 | 18 |
| 49. | Boiler – 4 T/hr | Stack | 30.50 | 0.90 | 18 |
| 50. | Stenciling Booth 1 | Duct arrangement with exhaust | 7 | 0.40 | 10 |
| 51. | Stenciling Booth 2 | Duct arrangement with exhaust | 7 | 0.40 | 10 |
| 52. | Air Drier | Stack | 8 | 0.45 | 10 |

| S. No. | Point Emission Source | Air Pollution Control Measures | Stack Height (m) FGL | Stack dia. (m) | Stack velocity (m/s) |
|---|---|---|---|---|---|
| 53. | Diesel Generator – 400 kVA | Acoustic enclosures with stack | 3 | 0.40 | 10 |
| **M/s. ANITHA INDUSTRIES (BOTTLING UNIT)** | | | | | |
| 54. | DG Set – 125 KVA | Acoustic enclosure with stack | 4.2 | 0.45 | 14 |
| **M/s. ANITHA INDUSTRIES (BOILING UNIT)** | | | | | |
| 55. | DG Set – 125 KVA | Acoustic enclosure with stack | 4.2 | 0.45 | 14 |
| **M/s. BALAMURUGAN ENTERPRISES / INDUSTRIES** | | | | | |
| 56. | Calcination Unit | Stack | 10.8 | 1.20 | 18 |
| **M/s. CLASSIC PLASTERS** | | | | | |
| 57. | Calcinator | Stack | 10.8 | 1.20 | 18 |
| **M/s. ECOGREEN CLEANTECH PRIVATE LIMITED** | | | | | |
| 58. | Rotary Kiln – I | Stack | 22 | 1.20 | 18 |
| 59. | Rotary Kiln – II | Stack | 22 | 1.20 | 18 |
| 60. | Waste Heat Recovery Boiler | Wet scrubber with stack | 18 | 1.00 | 15 |
| 61. | Boiler – 1.5 TPH | Cyclone separator with stack | 18 | 1.00 | 15 |
| 62. | DG Set – 125 KVA – I | Stack | 10 | 0.30 | 12 |
| 63. | DG Set – 125 KVA – II | Stack | 10 | 0.30 | 12 |
| **M/s. N.C. JOHN & SONS LTD.** | | | | | |

| S. No. | Point Emission Source | Air Pollution Control Measures | Stack Height (m) FGL | Stack dia. (m) | Stack velocity (m/s) |
|---|---|---|---|---|---|
| 64. | DG Set – 63 KVA | Exhaust pipe | 2.5 | 0.30 | 10 |
| **M/s. M.G.M. EDIBLE OILS PVT. LTD.** | | | | | |
| 65. | Boiler – 1 TPH | Stack | 5 | 1.00 | 15 |
| 66. | Boiler – 12 TPH | MDC + Bag filter with stack | 33 | 1.50 | 20 |
| 67. | Thermic Fluid Heater | MDC with stack | 33 | 1.00 | 15 |
| 68. | DG Set – 910 KVA | Acoustic enclosure with stack | 6 | 0.45 | 14 |
| **M/s. MAHESWARI SALT TRADING COMPANY** | | | | | |
| 69. | Hot Air Generator | Stack | 21 | 0.60 | 12 |
| 70. | DG Set – 200 KVA | Acoustic enclosure with stack | 4.2 | 0.30 | 12 |
| **M/s. RAMESH FLOWERS** | | | | | |
| 71. | DG Set – 62.5 KVA | Acoustic enclosure with stack | 4.0 | 0.30 | 10 |
| **M/s. NINANS LTD.** | | | | | |
| 72. | DG Set – 125 KVA | Acoustic enclosure with stack | 4.5 | 0.30 | 12 |
| **M/s. RADIUM INDUSTRIES** | | | | | |
| 73. | DG Set – 50 KVA | Acoustic enclosure with stack | 4.5 | 0.30 | 10 |
| **M/s. YENTOP MANICKAVEL SONS EDIBLE OILS (P) LTD.** | | | | | |
| 74. | Boiler – 4 TPH (2 Nos.) | Common stack | 30 | 1.00 | 15 |

| S. No. | Point Emission Source | Air Pollution Control Measures | Stack Height (m) FGL | Stack dia. (m) | Stack velocity (m/s) |
|---|---|---|---|---|---|
| 75. | Thermic Fluid Heater – 15 Lakh kcal (2 Nos.) | Common stack | 30 | 1.00 | 15 |
| **M/s. PHILLIPS FOODS INDIA PVT. LTD.** | | | | | |
| 76. | Boiler – 0.6 TPH | Stack | 18 | 0.60 | 10 |
| 77. | DG Set – 400 KVA | Stack | 5 | 0.30 | 12 |
| **M/s. K.T.V. HEALTH FOOD PRIVATE LIMITED** | | | | | |
| 78. | Boiler / TFH (Mixed Units) | Dust collectors with stack | 20–28 | 1.00 | 15 |
| 79. | DG Sets (125–1010 KVA) | Acoustic enclosure with stack | 7–9 | 0.45 | 14 |
| **M/s. VAINI FLY ASH BRICK & BLOCK MANUFACTURERS** | | | | | |
| 80. | Raw Material Silo | Cyclone separator with stack | 5 | 0.60 | 10 |
| 81. | DG Set – 140 KVA | Acoustic enclosure with stack | 5 | 0.30 | 12 |
| **M/s.GEE GEE KAY PRIVATE LIMITED (GRANULATION DIVISION)** | | | | | |
| 82. | Hot Air Generator | Stack | 12 | 0.60 | 12 |
| 83. | DG Set – 125 KVA | Acoustic enclosure with stack | 4.5 | 0.30 | 12 |
| **M/s. HANDY – WATERBASE INDIA PRIVATE LIMITED** | | | | | |
| 84. | D.G. Set – 125 KVA (2 Nos.) | Acoustic enclosures with stack | 5 | 0.30 | 10 |
| 85. | D.G. Set – 82.5 KVA | Acoustic enclosures with stack | 5 | 0.30 | 10 |
| 86. | Boiler – 0.6 T/hr (2 Nos.) | Common stack | 6 | 0.60 | 10 |

| S. No. | Point Emission Source | Air Pollution Control Measures | Stack Height (m) FGL | Stack dia. (m) | Stack velocity (m/s) |
|---|---|---|---|---|---|
| **M/s. INDIAN OIL CORPORATION LIMITED (CITY GATE STATION)** | | | | | |
| 87. | D.G. Set – 25 KVA | Acoustic enclosures with stack | 4 | 0.30 | 10 |
| 88. | Natural Gas Driven Compressor | Acoustic enclosures with stack | 6 | 0.45 | 14 |
| **M/s. KADER EXPORTS PRIVATE LIMITED – UNIT 04** | | | | | |
| 89. | D.G. Set – 500 KVA | Acoustic enclosures with stack | 7.2 | 0.45 | 14 |
| 90. | D.G. Set – 600 KVA | Acoustic enclosures with stack | 7.2 | 0.45 | 14 |
| 91. | D.G. Set – 250 KVA | Acoustic enclosures with stack | 7.2 | 0.30 | 10 |
| 92. | D.G. Set – 1010 KVA | Acoustic enclosures with stack | 18.5 | 0.45 | 14 |
| 93. | Baby Boiler | Stack | 12 | 0.60 | 10 |
| 94. | D.G. Sets (Noise) | Acoustic enclosures | 3 | 0.30 | 8 |
| **M/s. P.S.S. KRISHNAMURTHI EXPORTS (P) LTD.** | | | | | |
| 95. | D.G. Set – 50 KVA | Stack | 4 | 0.30 | 10 |
| 96. | Grinding Machine (Fugitive) | Dust collector with bag filter | 3 | 0.30 | 8 |
| **M/s. AMMAN BLUE METALS** | | | | | |
| 97. | D.G. Set – 350 KVA | Acoustic enclosures with stack | 4.2 | 0.30 | 10 |
| 98. | Jaw Crusher – 2 Nos. (Fugitive) | Water sprinkler system | 3 | 0.30 | 8 |
| 99. | VSI Crusher (Fugitive) | Water sprinkler system | 3 | 0.30 | 8 |

| S. No. | Point Emission Source | Air Pollution Control Measures | Stack Height (m) FGL | Stack dia. (m) | Stack velocity (m/s) |
|---|---|---|---|---|---|
| 100. | Vibrating Screen (Fugitive) | Water sprinkler system | 3 | 0.30 | 8 |
| 101. | Conveyors (Fugitive) | Tin sheet cover with water sprinkler | 3 | 0.30 | 8 |
| **M/s. EPPOTHUM VENDRAN RMC PRIVATE LIMITED** | | | | | |
| 102. | D.G. Set – 210 KVA | Acoustic enclosures with stack | 4 | 0.30 | 10 |
| 103. | Raw Material Silo (3 Nos.) | Inbuilt dust collector | 10 | 0.60 | 10 |
| 104. | Aggregate Loading / Mixing / Conveyors (Fugitive) | GI sheet enclosures & water sprinklers | 3 | 0.30 | 8 |
| **M/s. TIDEL NEO LIMITED – MELAVITTAN PART-2** | | | | | |
| 105. | Diesel Generator – 380 KVA (2 Nos.) | Acoustic enclosures with stack | 10 | 0.45 | 14 |
| 106. | DG Sets (Noise) | Acoustic enclosures | 3 | 0.30 | 8 |
| **M/s. XYLOSUISSE PRIVATE LIMITED** | | | | | |
| 107. | D.G. Set – 600 KVA | Acoustic enclosures with stack | 13 | 0.45 | 14 |
| 108. | Energy Plant | ESP with stack | 30 | 1.20 | 18 |
| 109. | Chipper Machine | Cyclone separator with stack | 5 | 0.60 | 10 |
| 110. | Dryer Outlet | Cyclone separator with stack | 58.5 | 1.20 | 18 |
| 111. | Thermic Fluid Heater | Stack | 20 | 1.00 | 15 |
| 112. | D.G. Set (Noise) | Acoustic enclosure | 3 | 0.30 | 8 |

| S. No. | Point Emission Source | Air Pollution Control Measures | Stack Height (m) FGL | Stack dia. (m) | Stack velocity (m/s) |
|---|---|---|---|---|---|
| **M/s. JAAS INC** | | | | | |
| 113. | Hot Air Oven | Stack | 6 | 0.60 | 10 |
| 114. | D.G. Set – 30 KVA | Acoustic enclosures with stack | 3 | 0.30 | 10 |
| 115. | Shaker Machine (Fugitive) | Enclosed shed | 3 | 0.30 | 8 |
| **M/S. MARIS ASSOCIATES PVT LTD.,** | | | | | |
| 116. | D.G. Set 625 kVA (03 Nos) | Acoustic enclosures with stack | 4.5 | 0.45 | 12 |
| 117. | D.G. Set 82.5 kVA | Acoustic enclosures with stack | 3.6 | 0.30 | 10 |
| 118. | D.G. Set 725 kVA | Acoustic enclosures with stack | 5.3 | 0.50 | 12 |
| 119. | D.G. Set 200 kVA | Acoustic enclosures with stack | 5.3 | 0.35 | 10 |
| 120. | D.G. Set 380 kVA | Acoustic enclosures with stack | 3.3 | 0.40 | 10 |
| **M/s.SRIRAM CHEMICALS PRIVATE LIMITED** | | | | | |
| 121. | D.G. Set – 100 kVA | Acoustic enclosures with stack | 6 | 0.30 | 10 |
| 122. | Shaft Kiln | Stack | 10 | 0.60 | 12 |
| 123. | Shaft Kiln | Stack | 10 | 0.60 | 12 |
| 124. | Reactor Vessel | Wet scrubber with stack | 8.0 | 0.45 | 10 |
| 125. | Heating Furnace | Stack | 13 | 0.75 | 15 |
| **M/s . JENEFA INDIA** | | | | | |

| S. No. | Point Emission Source | Air Pollution Control Measures | Stack Height (m) FGL | Stack dia. (m) | Stack velocity (m/s) |
|---|---|---|---|---|---|
| 126. | Boiler – 12 T/hr | Mechanical dust collector with stack | 15 | 1.20 | 18 |
| 127. | Boiler – 12 T/hr | Mechanical dust collector with stack | 15 | 1.20 | 18 |
| 128. | DG Set – 750 kVA | Acoustic enclosures with stack | 6 | 0.50 | 12 |
| **M/s . VENUS HOME APPLIANCES PRIVATE LIMITED** | | | | | |
| 129. | Phosphating Section | Wet scrubber with stack | 6.0 | 0.45 | 10 |
| 130. | Shot Blasting | Dust collectors with stack | 8.66 | 0.60 | 12 |
| 131. | Furnace (LPG Fired) | Stack | 9.0 | 0.75 | 15 |
| 132. | DG Set – 200 kVA | Stack | 8.5 | 0.35 | 10 |
| 133. | DG Set – 725 kVA | Stack | 9.0 | 0.50 | 12 |
| 134. | Chromating | Wet scrubber with stack | 6.0 | 0.45 | 10 |
| 135. | Curing Oven (Fan) | Stack | 4.72 | 0.40 | 8 |
| **M/s . TVS VEHICLE MOBILITY SOLUTION PRIVATE LIMITED** | | | | | |
| 136. | DG Set – 70 kVA | Acoustic enclosures with stack | 5.7 | 0.45 | 10 |
| **M/s . HOLISTA TRANZWORLD PVT LTD** | | | | | |
| 137. | Boiler | Stack | 25 | 1.20 | 18 |
| 138. | DG Set – 500 kVA | Acoustic enclosures with stack | 5 | 0.45 | 12 |
| **M/s.BHARAT PETROLEUM CORPORATION LIMITED, TUTICORIN LPG PLANT,** | | | | | |

| S. No. | Point Emission Source | Air Pollution Control Measures | Stack Height (m) FGL | Stack dia. (m) | Stack velocity (m/s) |
|---|---|---|---|---|---|
| 139. | LPG Filling Area | Stack | 7.5 | 0.40 | 10 |
| 140. | Tank Lorry Gantry | Stack | 6.5 | 0.40 | 10 |
| 141. | DG 125 & 140 kVA | Stack | 3.14 | 0.30 | 8 |
| 142. | DG Set 62.5 kVA | Stack | 3.14 | 0.25 | 8 |
| 143. | DG of 450 kVA | Stack | 6 | 0.45 | 12 |
| **FUTURE INDUSTRIES** | | | | | |
| **M/s . SOUTHERN PETROCHEMICAL INDUSTRIES CORPORATION LIMITED** | | | | | |
| 144. | Auxiliary Boiler I & II (90 TPH each) | Stack | 50 | 1.5 | 18 |
| 145. | Reformer Flue Gas | Stack | 36.6 | 1.4 | 18 |
| 146. | Raw Naphtha Vapouriser | Stack | 36.6 | 0.4 | 14 |
| 147. | Sweet Naphtha Vapouriser | Stack | 36.6 | 0.6 | 15 |
| 148. | Air Preheater | Stack | 36.6 | 1.2 | 16 |
| 149. | Offsite Boiler Flue Gas (85 TPH x 2) | Stack | 50 | 1.5 | 18 |
| 150. | Urea Plant Prilling Tower | Dry cyclone + cyclone + dust chamber + water spray system | 82 | 3.6 | 11 |
| 151. | Flare in Ammonia | Stack | 36 | 0.6 | 30 |

| S. No. | Point Emission Source | Air Pollution Control Measures | Stack Height (m) FGL | Stack dia. (m) | Stack velocity (m/s) |
|---|---|---|---|---|---|
| 152. | 1100 kVA DG Set | Stack | 10 | 0.25 | 15 |
| 153. | 830 kVA DG Set | Stack | 8 | 0.20 | 15 |
| 154. | 500 kVA DG Set | Stack | 8 | 0.15 | 15 |
| 155. | NG Preheater | Stack | 36.6 | 0.6 | 15 |
| 156. | GT/HRSG Main | Stack | 50 | 1.4 | 19 |
| 157. | GT/HRSG Bypass | Stack | 50 | 1.4 | 19 |
| 158. | 830 kVA DG Set | Stack | 8 | 0.20 | 15 |
| **M/s. P.R. SEEDS & GRAINS PRIVATE LIMITED** | | | | | |
| 159. | Boiler – 2 TPH | Dust collectors with stack | 33 | 1.00 | 15 |
| 160. | DG Set – 750 KVA | Acoustic enclosure with stack | 10 | 0.45 | 14 |
| **M/s . GROVJOINT INDIA PIPE FITTINGS PRIVATE LIMITED** | | | | | |
| 161. | DG Set 500 kVA | Acoustic enclosure with stack | 6.0 | 0.15 | 15 |
| 162. | Electrical Induction Furnace – 2 Nos | Wet scrubber with stack | 30.0 | 1.0 | 16 |
| **M/S. VINFAST AUTO INDIA PRIVATE LIMITED** | | | | | |
| 163. | 1010 kVA DG | Acoustic enclosures with twin stack | 30 | 0.90 | 15 |
| 164. | 2000 kVA DG | Acoustic enclosures with twin stack | 30 | 1.20 | 15 |

| S. No. | Point Emission Source | Air Pollution Control Measures | Stack Height (m) FGL | Stack dia. (m) | Stack velocity (m/s) |
|---|---|---|---|---|---|
| 165. | Hot Water Boiler (2.8 MW of Rated Thermal Power) | Stack | 20 | 0.60 | 12 |
| 166. | ETP Mechanical evaporator | Stack | 12.6 | 0.45 | 10 |
| 167. | Dip Treatment and Electro | Stack | 20 | 0.45 | 8 |
| 168. | Dip Treatment and Electro | Stack | 20 | 0.45 | 8 |
| 169. | Electro Coat Deposition Oven Cooling | Stack | 20 | 0.60 | 10 |
| 170. | Electro Coat Deposition Oven | Stack | 20 | 0.60 | 10 |
| 171. | Electro Coat Deposition Oven | Stack | 20 | 0.60 | 10 |
| 172. | Top Coat Oven | Stack | 20 | 0.75 | 12 |
| 173. | Top Coat Cooling | Stack | 20 | 0.60 | 10 |
| 174. | Top Coat Oven | Stack | 20 | 0.75 | 12 |
| 175. | Paint booth | Stack | 20 | 0.60 | 10 |
| 176. | Paint booth | Stack | 20 | 0.60 | 10 |
| 177. | Electro Coat Deposition Sanding | Stack | 20 | 0.45 | 8 |
| 178. | Electro Coat Deposition Heavy Sanding | Stack | 20 | 0.45 | 8 |

| S. No. | Point Emission Source | Air Pollution Control Measures | Stack Height (m) FGL | Stack dia. (m) | Stack velocity (m/s) |
|---|---|---|---|---|---|
| 179. | Under Body sealing and Under body coating | Stack | 20 | 0.45 | 8 |
| 180. | Liquid Applied Sound Damping Sealer | Stack | 20 | 0.45 | 8 |
| 181. | Hemming Sealer | Stack | 20 | 0.45 | 8 |
| 182. | Inspect and refine stage of painting stage | Stack | 20 | 0.45 | 8 |
| 183. | Polishing and finishing stage of Painting | Stack | 20 | 0.45 | 8 |
| 184. | Heavy repair stage | Stack | 20 | 0.45 | 8 |
| 185. | Electro Coat Deposition Bath – 1 Nos | Common dry scrubber with stack | 20 | 0.90 | 12 |
| 186. | Electro Coat Deposition Oven – 1 Nos | Common dry scrubber with stack | 20 | 0.90 | 12 |
| 187. | Spray Booth – 4 Nos | Common dry scrubber with stack | 20 | 0.90 | 12 |
| 188. | Top Coat Oven – 1 Nos | Common dry scrubber with stack | 20 | 0.90 | 12 |
| 189. | Paint Mixing Room – 1 Nos | Common dry scrubber with stack | 2 | 0.30 | 6 |
| 190. | Spot Repair – 1 Nos | Common dry scrubber with stack | 20 | 0.45 | 8 |
| 191. | Heavy Repair – 1 Nos | Common dry scrubber with stack | 20 | 0.45 | 8 |

**Note a:**

For Existing Industries, sources of air emission (DG set , boiler and others) are considered based on Consent orders.

**Note b :**

For Future upcomming industries values are assumed based on available sources.

For Future upcoming Industries , Sources of Air emission are considered based on Consent orders. for the Expansion industry ( VINFAST) air emission is assumed to be from the same sources and capacities of existing consent order .

### 2.3.5 Mixing height and Inversion level

Mixing height is the vertical extent of the atmosphere from the earth's surface up to the level through which pollutants can be dispersed by atmospheric turbulence. It represents the layer of the atmosphere where active vertical mixing occurs due to solar heating, wind shear, and surface friction. The higher the mixing height, the greater the volume available for the dispersion and dilution of air pollutants, thereby reducing their concentration at ground level.

Mixing height is a critical meteorological parameter that directly influences the dispersion potential of pollutants. During daytime, especially in summer, solar radiation increases the surface temperature, which enhances convective mixing and results in higher mixing heights often exceeding 1000 meters. Conversely, during nighttime or in winter months, reduced solar heating and atmospheric stability lead to lower mixing heights (sometimes below 200 meters), restricting vertical dispersion and causing pollutants to remain concentrated near the surface.

Inversion level refers to the altitude in the atmosphere at which a temperature inversion occurs, a condition where temperature increases with height rather than decreasing, which is the normal atmospheric pattern. This phenomenon creates a stable layer that acts as a lid, trapping pollutants below it and significantly limiting vertical mixing and dispersion of emissions. Under inversion conditions, especially common during winter nights or early mornings, the atmosphere becomes stratified, and the mixing height is severely reduced. As a result, pollutants emitted from surface or low-level sources accumulate near the ground, leading to high concentrations and deteriorated air quality.

| Baseline season | Maximum Surface temperature (Ts) °C (Source: Micrometerological data) | Dew point temperature (Td) °C (Source: Power NASA) | Dry adiabatic lapse rate (γ) °C/km | Mixing height m | Interpretation |
|---|---|---|---|---|---|
| **March to May 2025** | 35.5 | 25.2 | 9.8 | 1.05 | The calculated mixing height is approximately 1.05 km i.e. indicating the vertical extent of the atmospheric boundary layer in which turbulent mixing occurs. If the mixing height is at or above 1 km, it indicates the unstable conditions and this stability class encourages vertical mixing of air, leading to effective dispersion of pollutants. In unstable atmospheric conditions, the inversion level will typically sits just above the mixing height, 1owing for active vertical mixing i.e. ranging from 50 to 200 meters higher. |

### 2.3.6 Micro-Meteorological Data (March-May 2025)

A weather station was installed near the project site to record hourly meteorological parameters, including temperature, humidity, wind speed and wind direction, for the period of March to May 2025. The average data collected during this period is summarized below:

*Table 7. Summary of Micro-Meteorological Data March to May 2025*

| Month | Temperature (°C) | | | Wind Speed (m/s) | | | Relative Humidity (%) | | | Precipitation (mm/h) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Max | Min | Mean | Max | Min | Mean | Max | Min | Mean | Max | Min | Mean |
| March | 33.8 | 25.3 | 28.8 | 8.4 | 0.19 | 3.5 | 93.3 | 40.6 | 73.3 | 65.9 | 0 | 3.1 |
| April | 34.9 | 27.2 | 30.0 | 6.6 | 0.3 | 3.5 | 89.9 | 47.5 | 73.5 | 179.1 | 0 | 2.7 |
| May | 35.5 | 27.3 | 30.5 | 12.1 | 0.3 | 5.9 | 92.9 | 44.8 | 72.7 | 28.0 | 0 | 2.1 |

### 2.3.6.1 Windrose Diagram

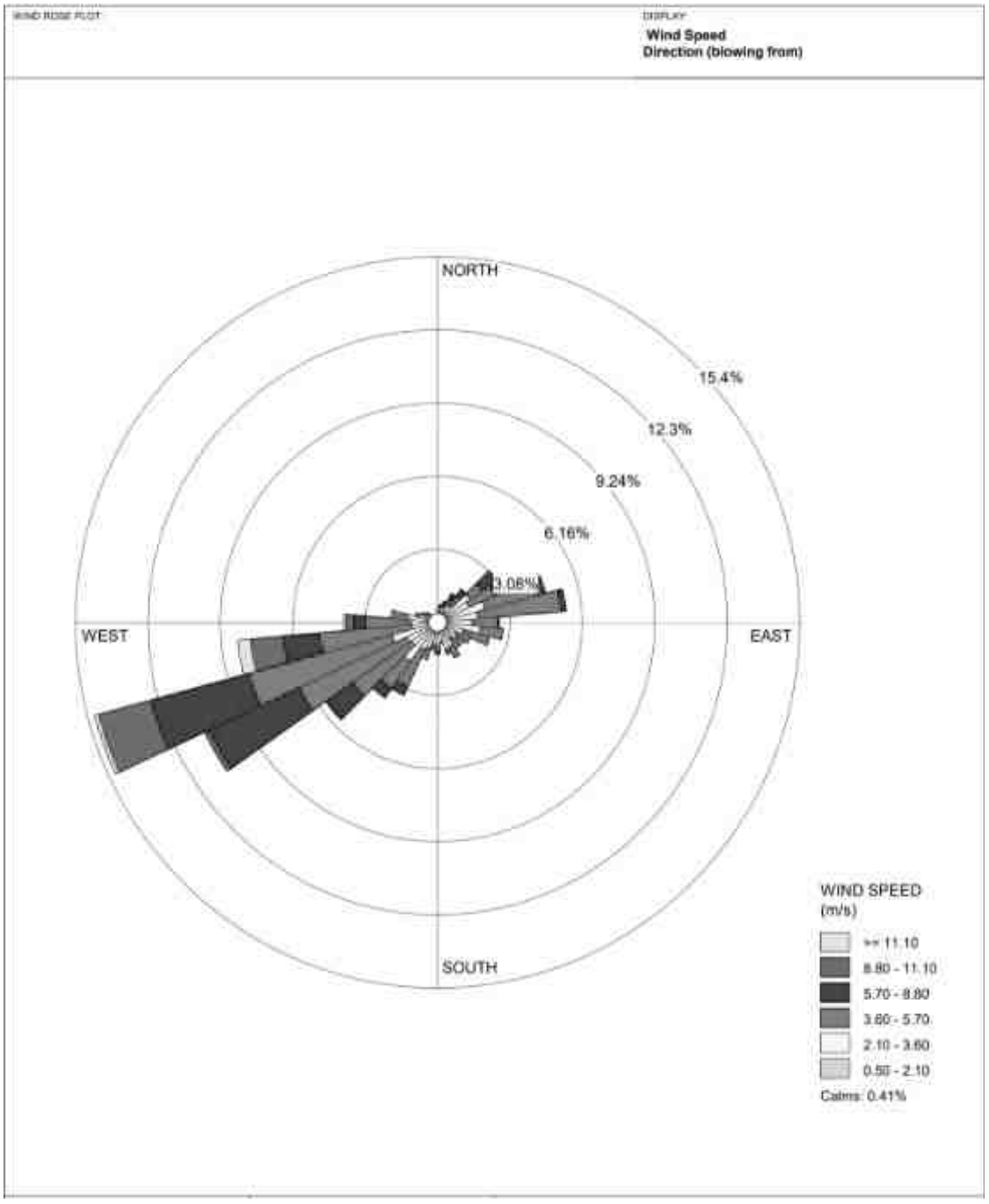



*Figure 2. Annual Windrose Diagram*
*(The predominant wind direction is from SW direction)*

## 2.3.7. Ambient Air Quality Standards and Background Concentrations

Ambient air quality standards promulgated by Central Pollution Control Board (CPCB) for different areas are as follows:

*Table 8. Ambient Air Quality Standards(as per CPCB)*

| S. No | Pollutant µg/m³ | Time Weighted Average | Concentration in Ambient Air | |
|---|---|---|---|---|
| | | | Industrial, Residential, Rural and Other Area | Ecologically Sensitive Area(Notified by Central Government) |
| 1. | Sulphur Dioxide($SO_2$), | Annual* | 50 | 20 |
| | | 24 hours** | 80 | 80 |
| 2. | Nitrogen Dioxide($NO_2$), | Annual* | 40 | 30 |
| | | 24 hours** | 80 | 80 |
| 3. | Particulate Matter (size less than 10µm) or $PM_{10}$ | Annual* | 60 | 60 |
| | | 24 hours** | 100 | 100 |
| 4. | Particulate Matter (size less than 2.5µm) or $PM_{2.5}$ | Annual* | 40 | 40 |
| | | 24 hours** | 60 | 60 |
| 5. | Carbon Monoxide (CO)-mg/m3 | 8 Hours | 02 | 02 |
| | | 1 Hour | 04 | 04 |

*Annual arithmetic mean of minimum 104 measurements in a year at particular site taken twice a week 24 hourly at uniform intervals**24 hours monitored values, shall be compiled with 98% of the time in a year, 2% of the time, they may exceed the limits but not on two consecutive days of the morning. The above standards are for a sampling period of 24 hours.

**Ambient air quality sampling locations:**

*Table 9. Details of Sampling Locations for Ambient Air Quality.*

| Location no. | Latitude & Longitude | Distance & Direction from Project Boundary | Wind Direction | Environmental Significance | Zone |
|---|---|---|---|---|---|
| A1 | 8°47'15.51"N, 78° 0'24.98"E | Within site | Upwind | Industrial Area | Core Zone |
| A2 | 8°46'39.47"N, 78° 2'20.02"E | Within site | Cross-wind | Industrial Area | Core Zone |
| A3 | 8°47'7.09"N, 78° 1'25.23"E | Within site | Cross-wind | Industrial Area | Core Zone |
| A4 | 8°46'15.61"N, 78° 1'29.11"E | Within site | Cross-wind | Industrial Area | Core Zone |
| A5 | 8°46'16.71"N, 78° 1'11.45"E | 1.05 km WSW | Upwind | Residential Area | Buffer Zone |

| Location no. | Latitude & Longitude | Distance & Direction from Project Boundary | Wind Direction | Environmental Significance | Zone |
|---|---|---|---|---|---|
| A6 | 8°46'7.73"N, 78° 2'59.27"E | 1.41 km SE | Downwind | Residential Area | Buffer Zone |
| A7 | 8°47'51.23"N, 78° 1'43.19"E | 1.69 km N | Cross-wind | Residential Area | Buffer Zone |
| A8 | 8°44'57.91"N, 78° 1'55.52"E | 2.47 km S | Cross-wind | Residential Area | Buffer Zone |
| A9 | 8°47'5.33"N, 78° 5'34.49"E | 5.15, E | Cross-wind | Residential area | Buffer Zone |
| A10 | °49'38.35"N, 78° 3'56.17"E | 5.81 km , NE | Downwind | Residential area | Buffer Zone |

## 2.3.8. Ambient Air Sampling Locations

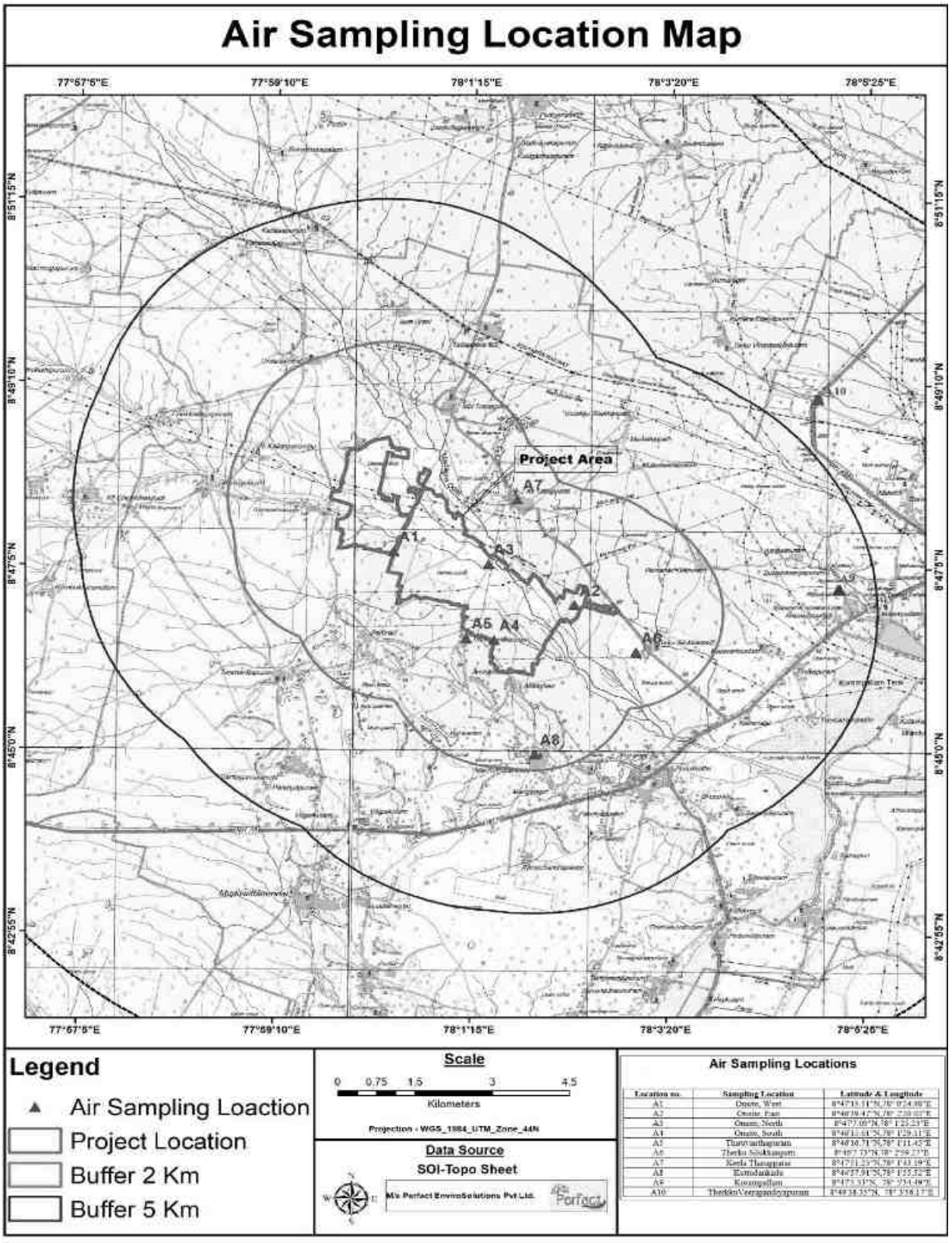



*Figure 3. Ambient Air Quality Sampling Locations*

## 2.3.8.1 Ambient Air Quality Results

Ambient Air Quality result for 8 locations is given below:

*Table 10. Ambient Air Quality Results for PM10 and PM2.5*

| Location | Min | Max | Mean | 98th Percentile | Min | Max | Mean | 98th Percentile |
|---|---|---|---|---|---|---|---|---|
| | PM2.5 (Standard – 60 µg/m3) | | | | PM10 (Standard – 100 µg/m3) | | | |
| A1 | 13.54 | 21.28 | 17.07 | 20.46 | 22.12 | 35.69 | 26.83 | 32.48 |
| A2 | 16.09 | 25.28 | 20.28 | 24.31 | 26.28 | 42.41 | 31.88 | 38.59 |
| A3 | 14.37 | 22.58 | 18.11 | 21.71 | 23.46 | 37.87 | 28.46 | 34.46 |
| A4 | 15.22 | 23.91 | 19.18 | 22.99 | 24.85 | 40.11 | 30.15 | 36.5 |
| A5 | 16.39 | 25.75 | 20.65 | 24.76 | 26.76 | 43.19 | 32.46 | 39.3 |
| A6 | 17.91 | 28.14 | 22.57 | 27.06 | 29.25 | 47.21 | 35.48 | 42.96 |
| A7 | 17.29 | 27.17 | 21.79 | 26.13 | 28.24 | 45.58 | 34.26 | 41.47 |
| A8 | 19.18 | 30.13 | 24.17 | 28.98 | 31.32 | 50.55 | 37.99 | 46 |
| A9 | 18.54 | 29.13 | 23.37 | 27.95 | 30.27 | 48.86 | 36.73 | 44.55 |
| A10 | 10.97 | 17.24 | 13.83 | 16.55 | 17.91 | 28.91 | 21.73 | 26.35 |

*Table 11. Ambient Air Quality Results for SO2 and NO2*

| Location | Min | Max | Mean | 98th Percentile | Min | Max | Mean | 98th Percentile |
|---|---|---|---|---|---|---|---|---|
| | $NO_2$ (Standard – 80 µg/$m^3$) | | | | $SO_2$ (Standard – 80 µg/$m^3$) | | | |
| A1 | 14.00 | 23.61 | 18.81 | 22.94 | 4.93 | 9.53 | 7.14 | 8.31 |
| A2 | 16.63 | 28.05 | 22.34 | 27.26 | 5.86 | 11.32 | 8.48 | 9.88 |
| A3 | 14.85 | 25.04 | 19.95 | 24.34 | 5.23 | 10.11 | 7.58 | 8.82 |
| A4 | 15.73 | 26.52 | 21.13 | 25.78 | 5.54 | 10.71 | 8.03 | 9.34 |
| A5 | 16.94 | 28.56 | 22.76 | 27.76 | 5.97 | 11.53 | 8.64 | 10.06 |
| A6 | 18.51 | 31.22 | 24.87 | 30.34 | 6.52 | 12.60 | 9.44 | 11.0 |

| Location | Min | Max | Mean | 98th Percentile | Min | Max | Mean | 98th Percentile |
|---|---|---|---|---|---|---|---|---|
| | $NO_2$ (Standard – 80 µg/m$^3$) | | | | $SO_2$ (Standard – 80 µg/m$^3$) | | | |
| A7 | 17.87 | 30.14 | 24.01 | 29.3 | 6.30 | 12.17 | 9.12 | 10.62 |
| A8 | 19.82 | 33.43 | 26.63 | 32.49 | 6.98 | 13.50 | 10.11 | 11.77 |
| A9 | 19.16 | 32.32 | 25.74 | 31.40 | 6.75 | 13.05 | 9.78 | 12.0 |
| A10 | 11.34 | 19.12 | 15.23 | 18.55 | 3.99 | 7.72 | 5.78 | 7.10 |

*Table 12. Ambient Air Quality Results for CO*

| Location | Min | Max | Mean | 98th Percentile |
|---|---|---|---|---|
| | CO (Standard-2 mg/m$^3$) | | | |
| A1 | 0.42 | 0.71 | 0.56 | 0.69 |
| A2 | 0.50 | 0.84 | 0.67 | 0.82 |
| A3 | 0.45 | 0.75 | 0.60 | 0.73 |
| A4 | 0.47 | 0.80 | 0.63 | 0.77 |
| A5 | 0.51 | 0.86 | 0.68 | 0.83 |
| A6 | 0.56 | 0.94 | 0.75 | 0.91 |
| A7 | 0.54 | 0.90 | 0.72 | 0.88 |
| A8 | 0.59 | 1.00 | 0.80 | 0.97 |
| A9 | 0.57 | 0.97 | 0.77 | 0.95 |
| A10 | 0.34 | 0.57 | 0.46 | 0.55 |

## 2.4. PLAN AND FRAMEWORK OF COMPUTATIONS

### 2.4.1. Selection of Locations

The locations have been selected around the project site covering an area of 10 km radius from the centre of the project site, and nearer to existing SIPCOT Industrial Parks . The entire area has been put on a 1 km x 1 km grid network and grid spacing has been taken as 5-10 m.

## 2.4.2. Plan of Computation

The emission rate, dispersion coefficients and other input data being now available; it was planned to compute the following:

1 The 24-hourly averaged incremental concentration with hourly data.

1 The identification of grid point having peak concentration for the incremental values.

1 Preparation of isopleths for various pollutants.

## 2.4.3. Input parameters for air quality modeling:

*Table 13. The input parameters for air quality modeling (AERMOD)*

| **Input** | | **Description** |
|---|---|---|
| **Modelling Software Used** | | AERMOD View-Version 11.2.0 |
| **Control Pathway** | | |
| Terrain | | Elevated |
| Dispersion Coefficient | | Rural |
| **Meteorology Pathway** | | |
| 1 | Met Input Data | AERMET Meteorological data for the year 2025 |
| 2 | Latitude: | Plant Location as shown earlier |
| 3 | Longitude: | |
| 4 | Datum | WGS 84 |
| 5 | Base Elevation : | 35 mSL |
| **Receptor** | | Uniform Cartesian Grid 2 with 5-10 m receptor spacing |

## 2.5. MODEL OUTPUT FILES

**The maximum ground level concentration for SIPCOT Industrial Park at Allikulam is mentioned below.**

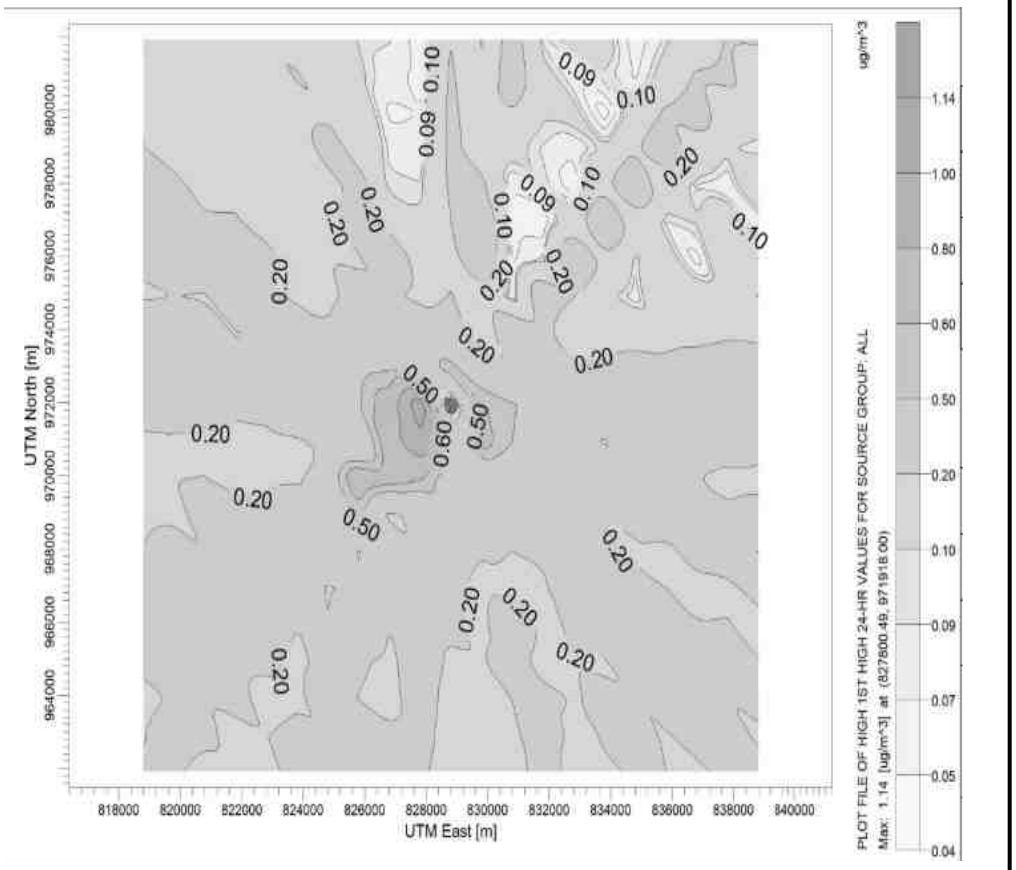
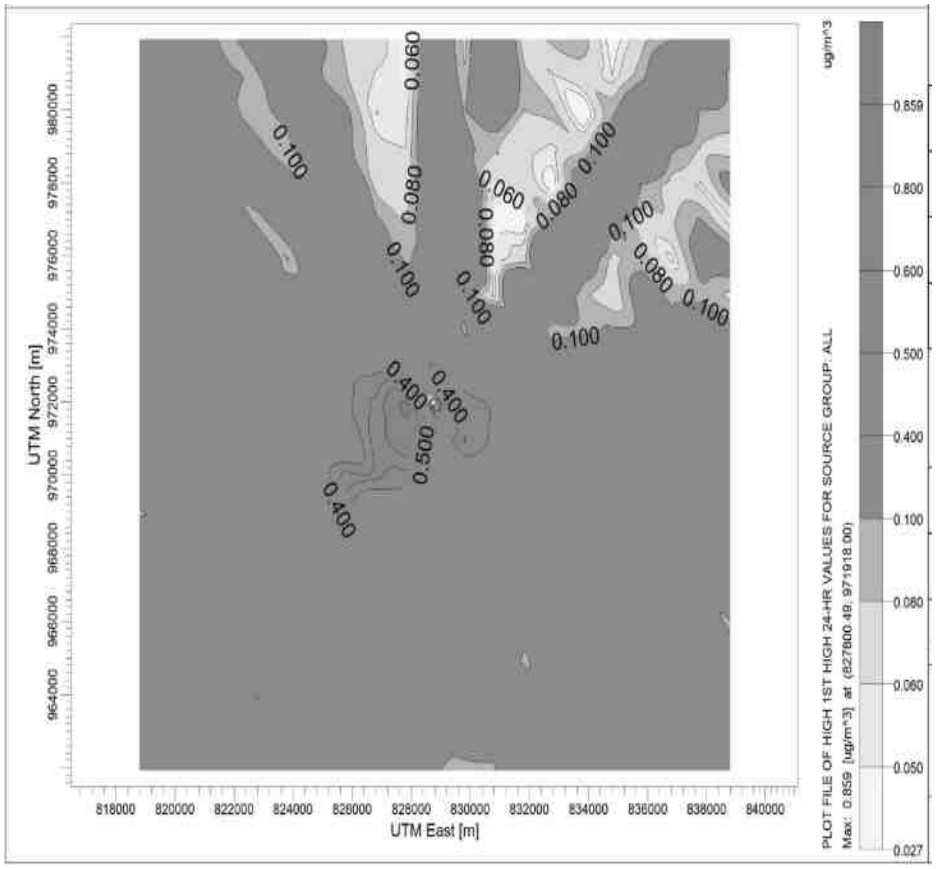
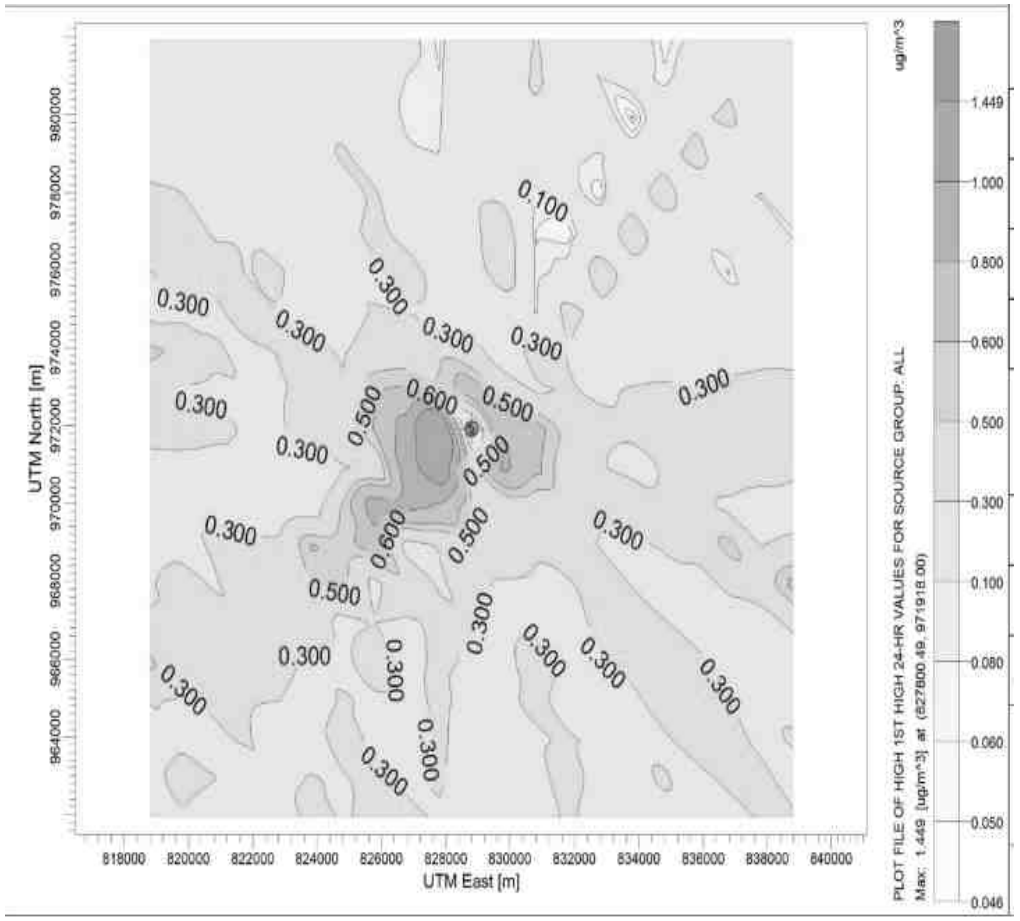
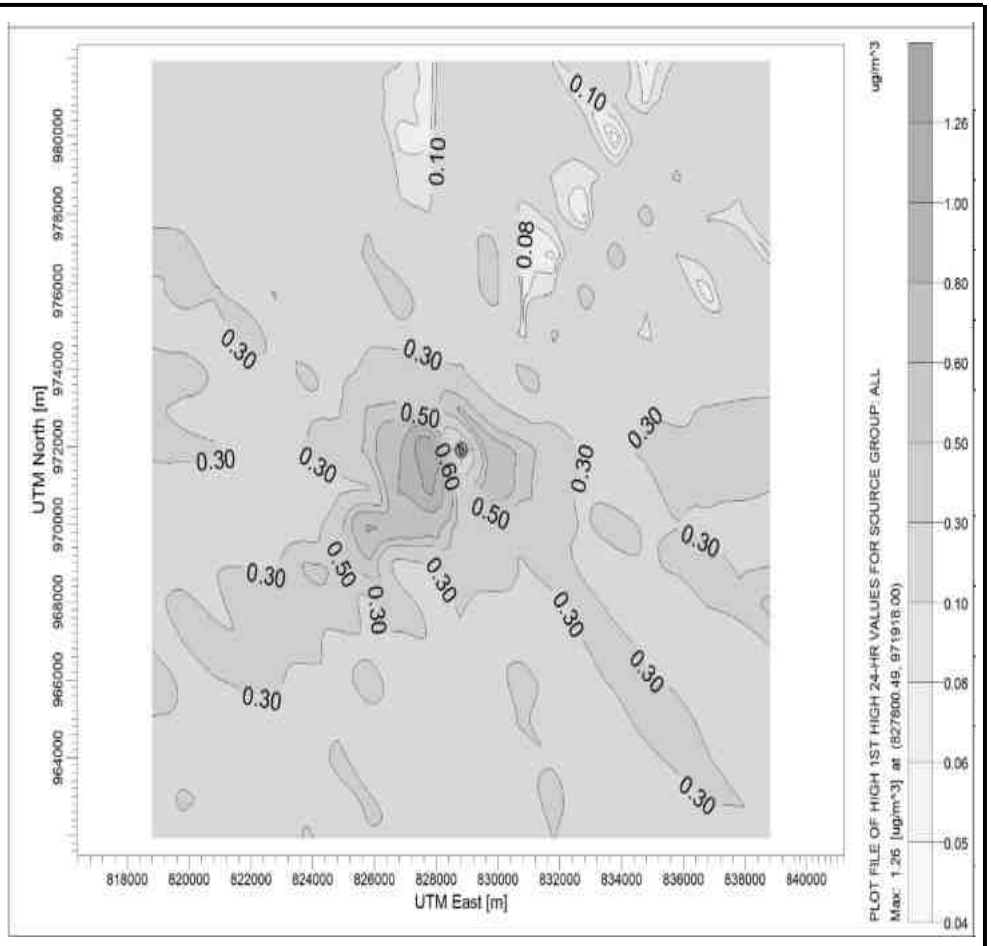
| | |
|---|---|
|  |  |
| **$PM_{10}$ - Maximum GLC is 1.14 µg/m$^3$** | **$PM_{2.5}$- Maximum GLC is 0.859 µg/m$^3$** |

*Table 14. Output file showing PM10, & PM2.5*

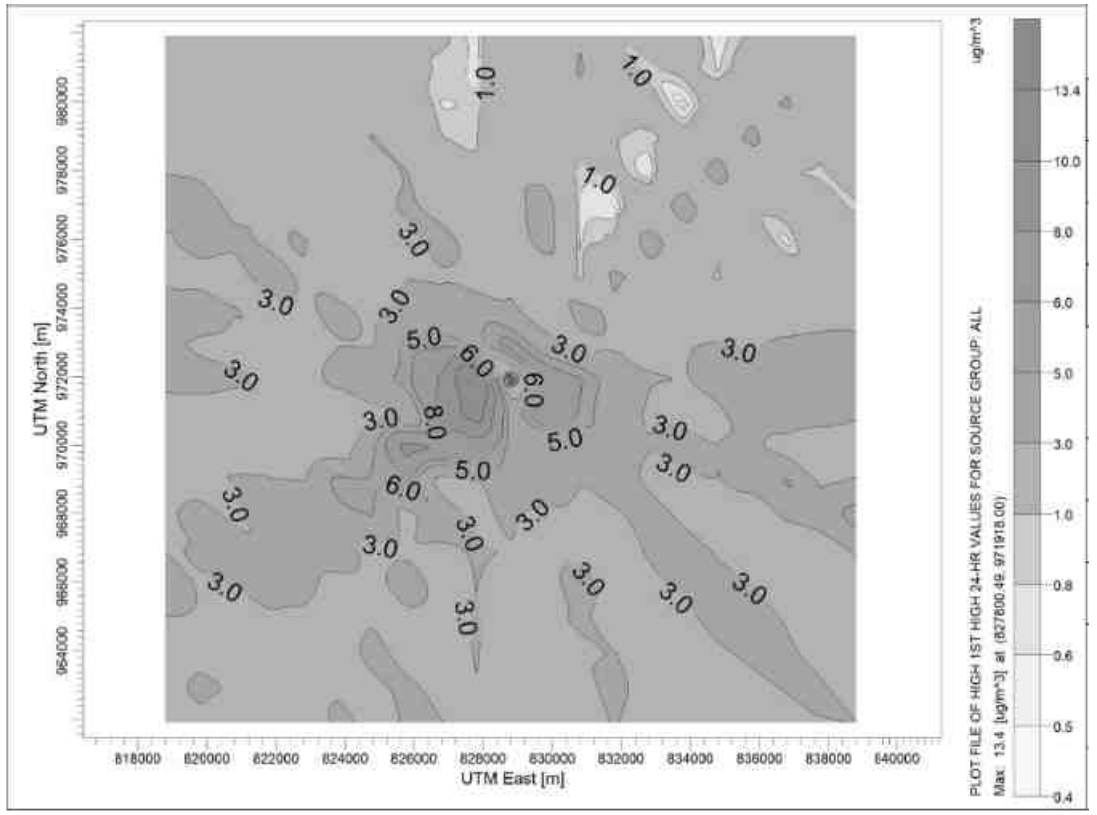
*Table 15. Output file showing NOx & SO2*




**$NO_2$- Maximum GLC is 1.449 µg/m³**




**$SO_2$- Maximum GLC is 1.26 µg/m³**




**CO- Maximum GLC is 0.013 mg/m³**

*Table 16. Output file showing CO*

**The maximum ground level concentration for other nearby industries are mentioned below.**

*Table 17. Output file showing PM10 & PM2.5*

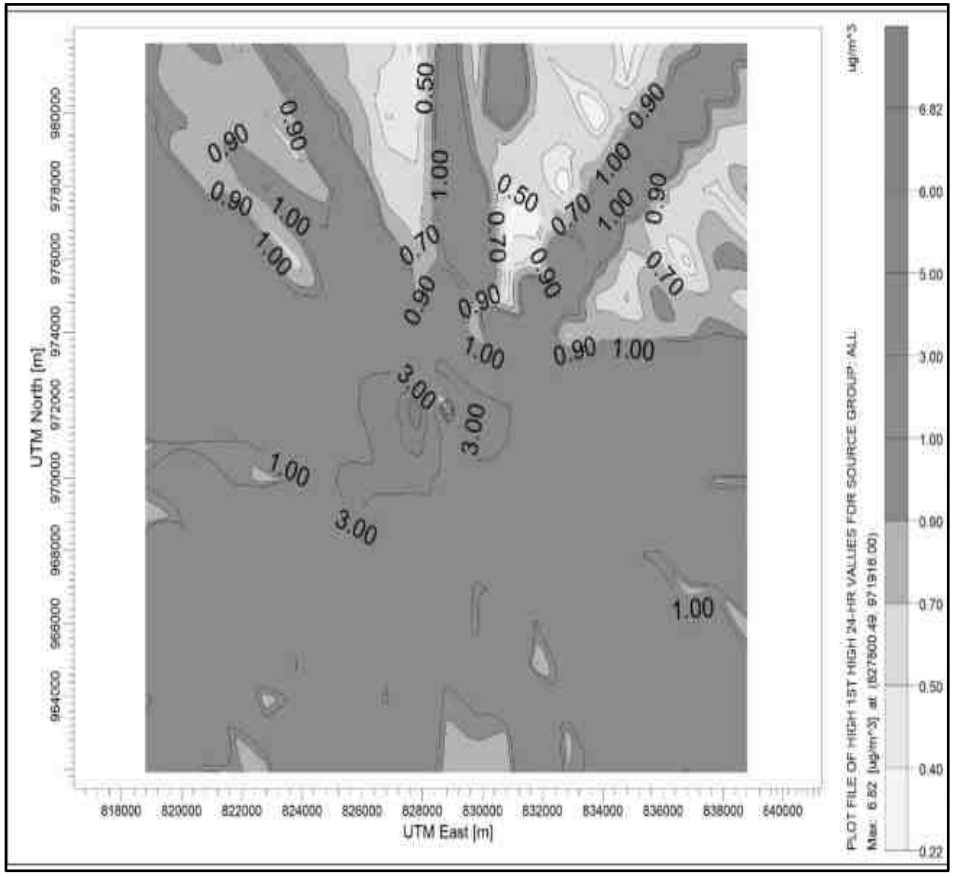
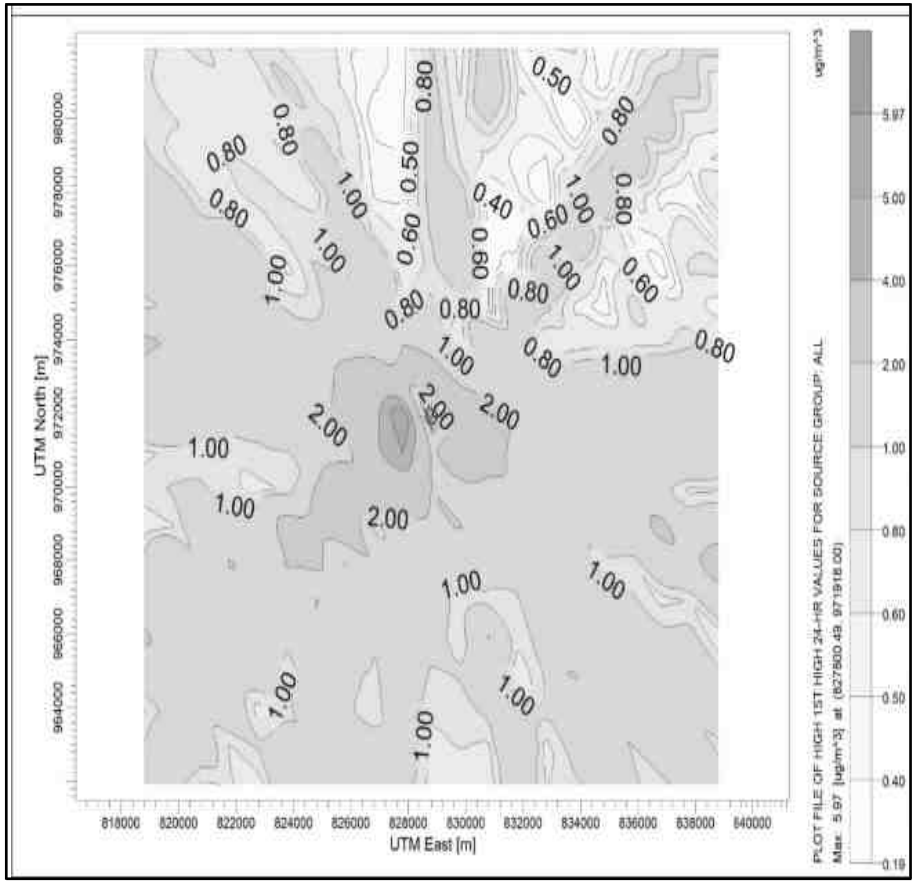
| | |
|---|---|
|  |  |
| **$PM_{10}$ - Maximum GLC is 6.82 µg/m³** | **$PM_{2.5}$- Maximum GLC is 5.97 µg/m³** |

*Table 18. Output file showing SO2 & NO2*

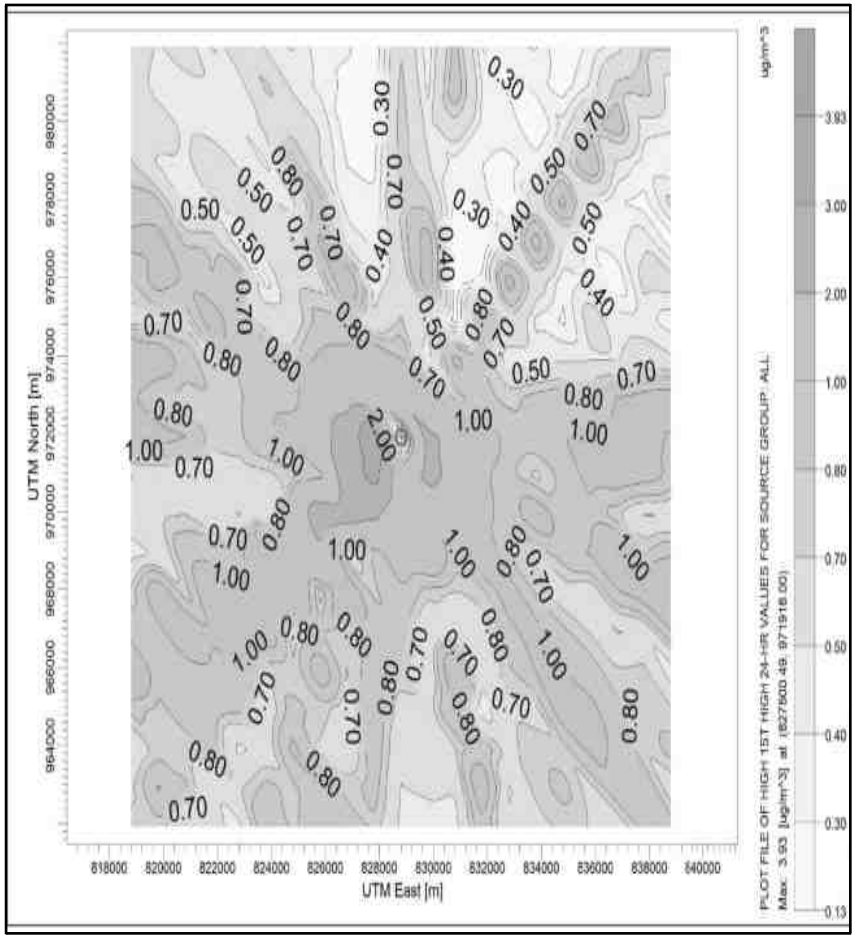
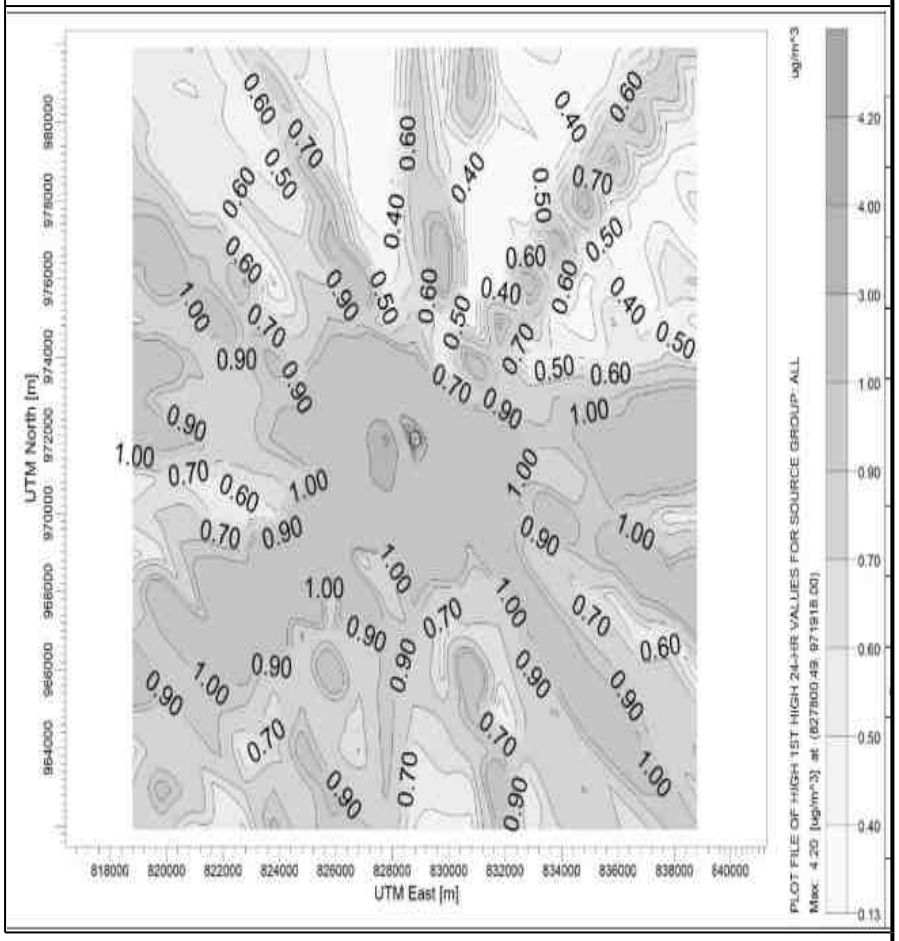
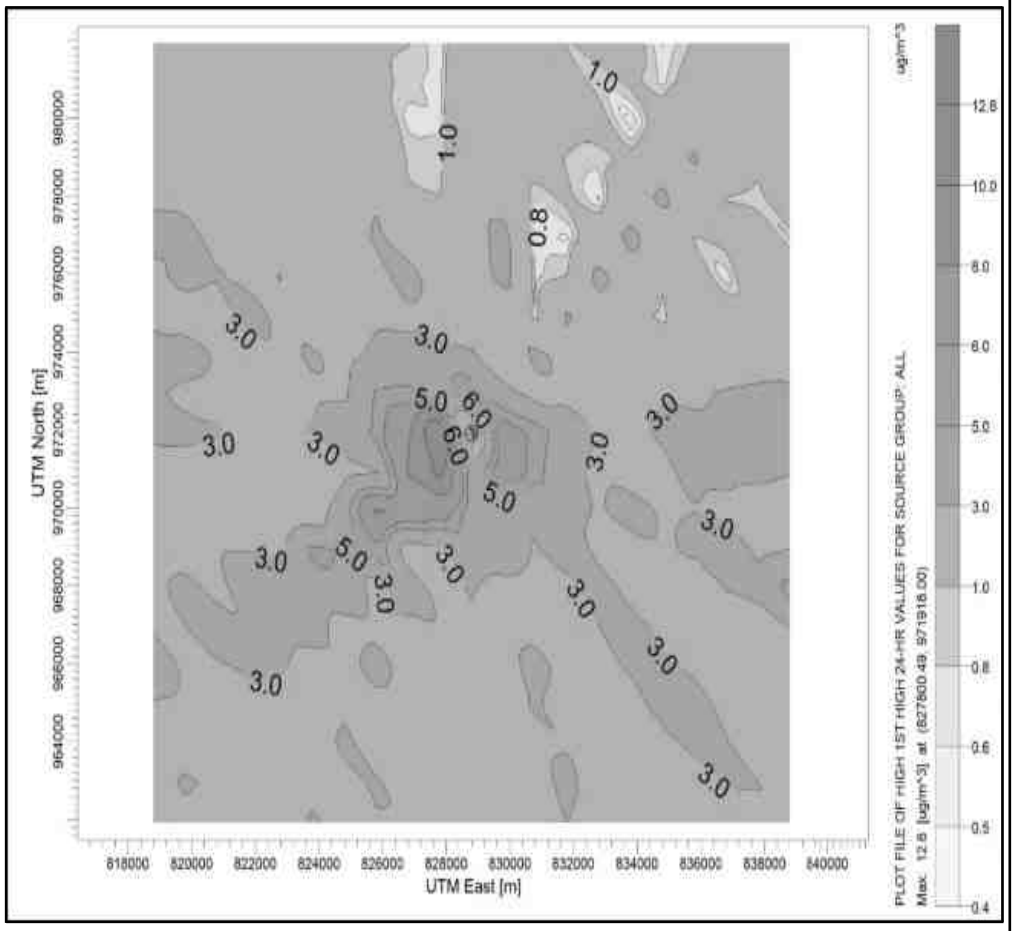
| | |
|---|---|
|  |  |
| **SO2 - Maximum GLC is 3.93 µg/m$^3$** | **NO2- Maximum GLC is 4.20 µg/m$^3$** |

*Table 19. Output file showing CO*




**CO- Maximum GLC is 0.0126 mg/m$^3$**

**The maximum ground level concentration for Future industries are mentioned below.**

*Table 20. Output file showing PM10 & PM2.5*

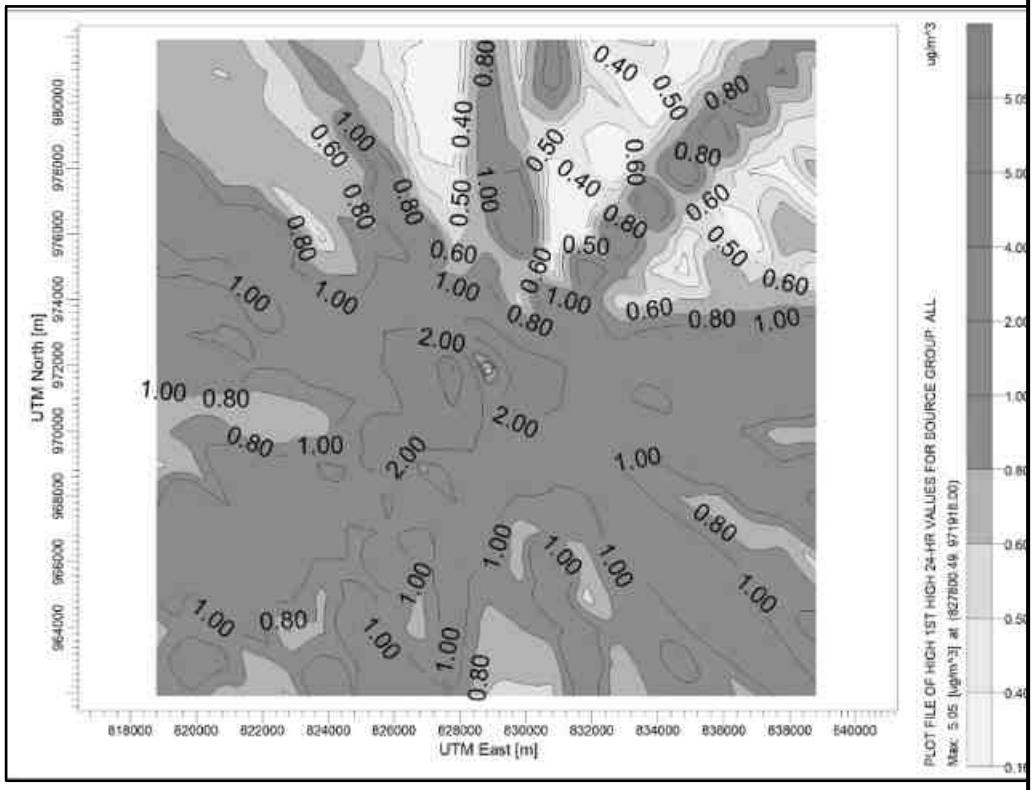
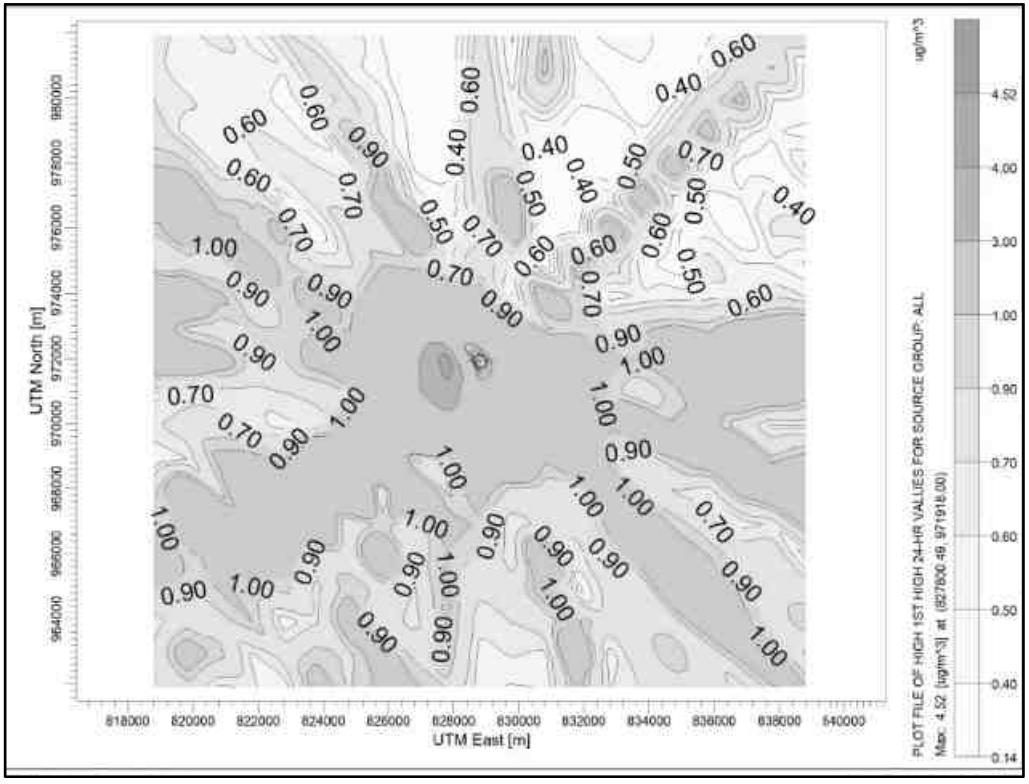
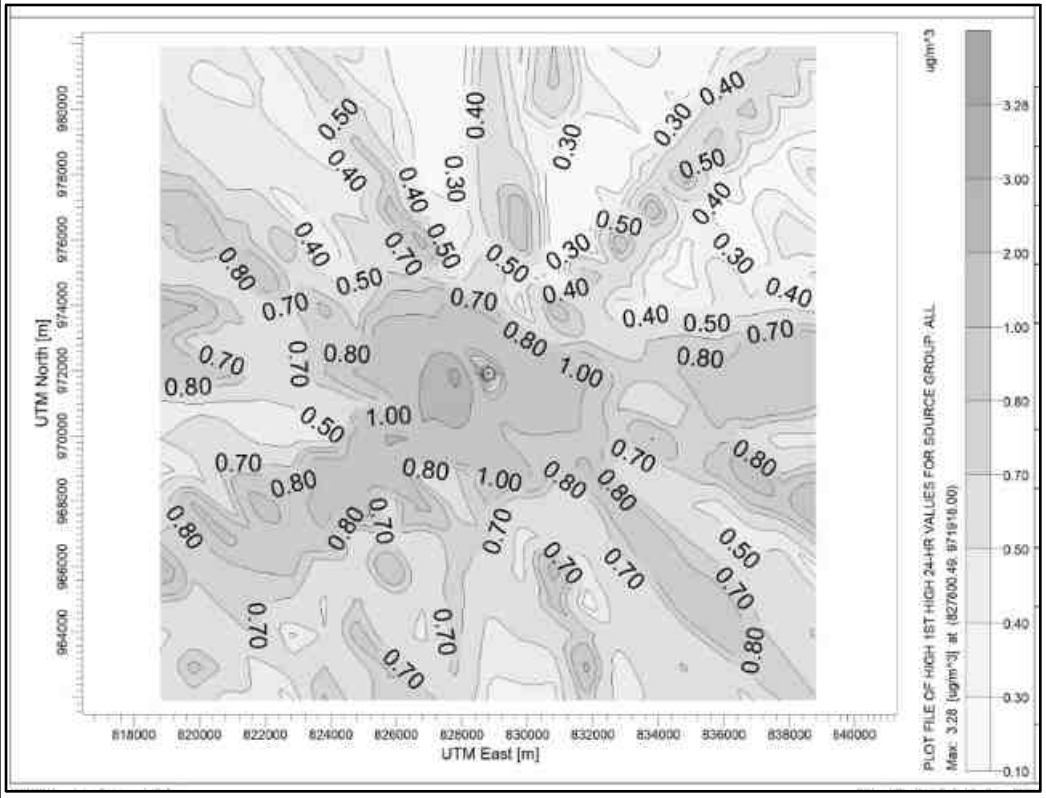
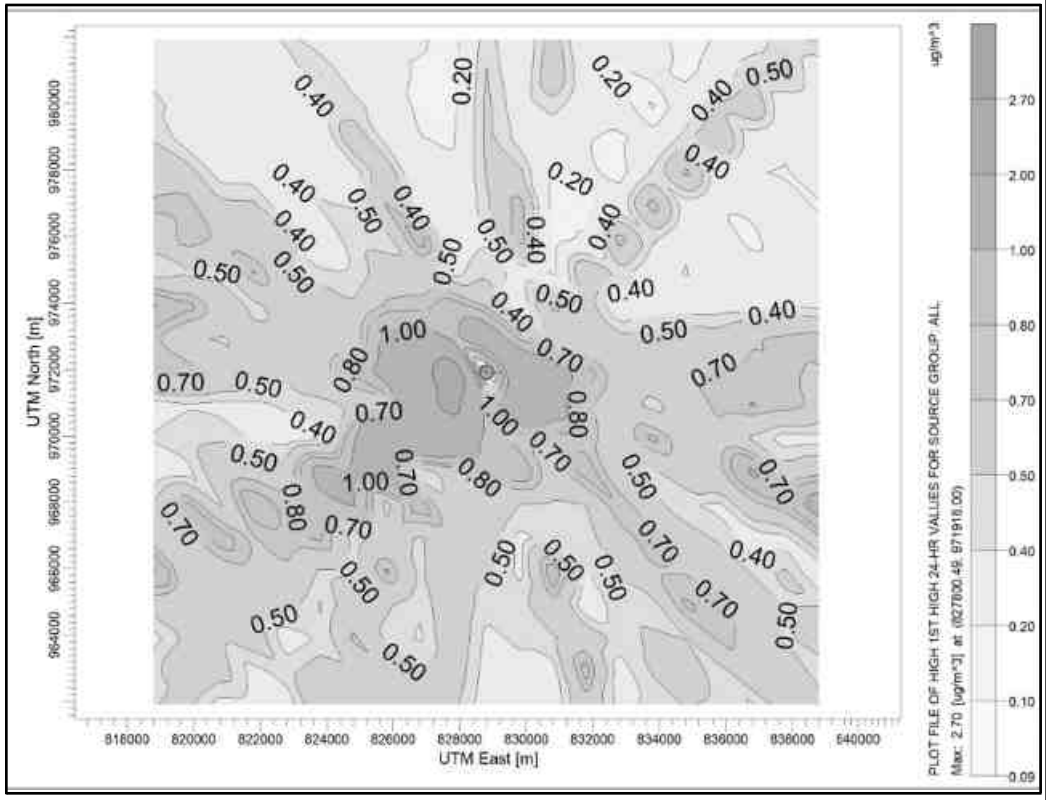
| | |
|---|---|
|  |  |
| **$PM_{10}$ - Maximum GLC is 5.05 µg/m³** | **$PM_{2.5}$ - Maximum GLC is 4.52 µg/m³** |

*Table 21. Output file showing NO2 & SO2*

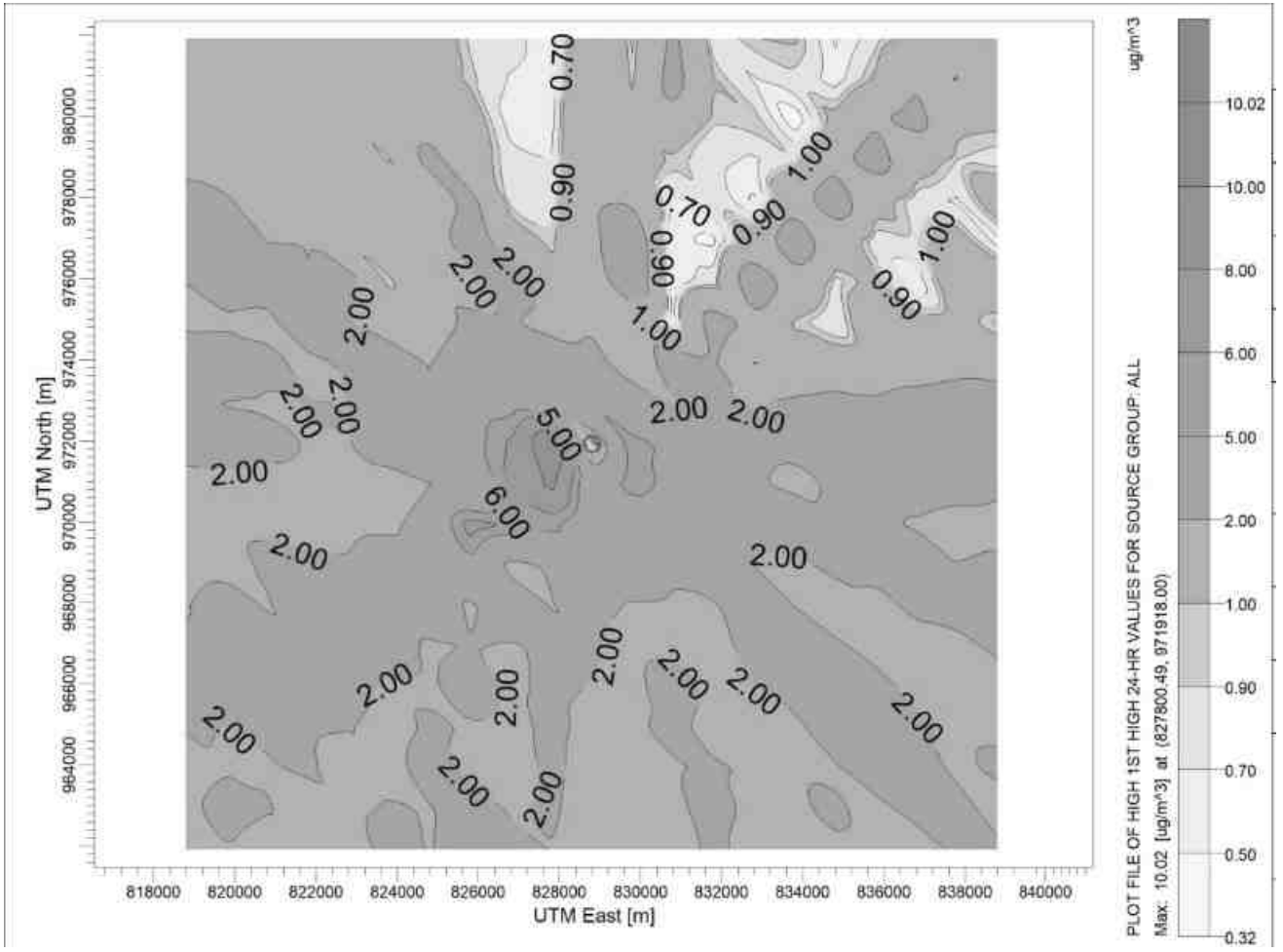



**$NO_2$ - Maximum GLC is 3.28 µg/m³**




**$SO_2$ - Maximum GLC is 2.70 µg/m³**

*Table 22. Output file showing CO*




**CO - Maximum GLC is 0.010 mg/m³**

## 2.6. RESULT AND DISCUSSIONS

## PREDICTED AMBIENT AIR QUALITY AND EMISSIONS FOR $PM_{2.5}$, $PM_{10}$, $NO_2$, $SO_2$ & CO

*Table 23. Predicted cumulative Impacts of baseline monitored locations for PM2.5 pollutant*

| $PM_{2.5}$-60 µg/m³ | | | | |
|---|---|---|---|---|
| **Location** | **Distance & Direction** | **Background Concentration $PM_2$ (µg/m³)** | **Predicted Incremental Concentration $PM_{2.5}$ (µg/m³)** | **Post Project Air Quality $PM_{2.5}$ (µg/m³)** |
| A1 | West Dir. of Site | 17.07 | 1.08 | 18.15 |
| A2 | East Dir. of Site | 20.28 | 1.26 | 21.54 |
| A3 | North Dir. of Site | 18.11 | 0.86 | 18.97 |
| A4 | South Dir. of Site | 19.18 | 0.78 | 19.96 |
| A5 | 1.05km WSW | 20.65 | 0.15 | 20.8 |
| A6 | 1.41km SE | 22.57 | 0.93 | 23.5 |
| A7 | 1.69km North | 21.79 | 3.6 | 25.39 |
| A8 | 2.47km South | 24.17 | 1.12 | 25.29 |
| A9 | 5.15 km, E | 23.37 | 4.29 | 27.66 |
| A10 | 5.81 km , NE | 13.83 | 3.64 | 17.47 |

*Table 24. Predicted cumulative Impacts of baseline monitored locations for PM10 pollutant*

| $PM_{10}$-100 µg/m³ | | | | |
|---|---|---|---|---|
| **Location** | **Distance & Direction** | **Background Concentration $PM_{10}$ (µg/m³)** | **Predicted Incremental Concentration $PM_{10}$ (µg/m³)** | **Post Project Air Quality $PM_{10}$ (µg/m³)** |
| A1 | West Dir. of Site | 26.83 | 0.86 | 27.69 |
| A2 | East Dir. of Site | 31.88 | 1.20 | 33.08 |
| A3 | North Dir. of Site | 28.46 | 1.14 | 29.60 |
| A4 | South Dir. of Site | 30.15 | 2.3 | 32.45 |

| $PM_{10}$-100 µg/m³ | | | | |
|---|---|---|---|---|
| **Location** | **Distance & Direction** | **Background Concentration $PM_{10}$ (µg/m³)** | **Predicted Incremental Concentration $PM_{10}$ (µg/m³)** | **Post Project Air Quality $PM_{10}$ (µg/m³)** |
| A5 | 1.05km WSW | 32.46 | 0.41 | 32.87 |
| A6 | 1.41km SE | 35.48 | 1.59 | 37.07 |
| A7 | 1.69km North | 34.26 | 0.88 | 35.14 |
| A8 | 2.47km South | 37.99 | 2.55 | 40.54 |
| A9 | 5.15 km, E | 36.73 | 4.36 | 41.09 |
| A10 | 5.81 km , NE | 21.73 | 5.12 | 26.85 |

*Table 25. Predicted cumulative Impacts of baseline monitored locations for NO2 pollutant*

| $NO_2$- 80 µg/m³ | | | | |
|---|---|---|---|---|
| **Location** | **Distance & Direction** | **Background Concentration $NO_2$(µg/m³)** | **Predicted Incremental Concentration $NO_2$ (µg/m³)** | **Post Project Air Quality $NO_2$(µg/m³)** |
| A1 | West Dir. of Site | 18.81 | 1.45 | 20.26 |
| A2 | East Dir. of Site | 22.34 | 1.32 | 23.66 |
| A3 | North Dir. of Site | 19.95 | 1.26 | 21.21 |
| A4 | South Dir. of Site | 21.13 | 1.40 | 22.53 |
| A5 | 1.05 km WSW | 22.76 | 0.67 | 23.43 |
| A6 | 1.41 km SE | 24.87 | 0.75 | 25.62 |
| A7 | 1.69 km North | 24.01 | 0.54 | 24.55 |
| A8 | 2.47 km South | 26.63 | 0.58 | 27.21 |
| A9 | 5.15 km, E | 25.74 | 2.71 | 45 |
| A10 | 5.81 km , NE | 15.23 | 2.94 | 18.17 |

*Table 26. Predicted cumulative Impacts of baseline monitored locations for SO2 pollutant*

| $SO_2$-80 µg/m$^3$ | | | | |
|---|---|---|---|---|
| **Location** | **Distance & Direction** | **Background Concentration $SO_2$ (µg/m$^3$)** | **Predicted Incremental Concentration $SO_2$ (µg/m$^3$)** | **Post Project Air Quality $SO_2$ (µg/m$^3$)** |
| A1 | West Dir. of Site | 7.14 | 0.68 | 7.82 |
| A2 | East Dir. of Site | 8.48 | 1.84 | 10.32 |
| A3 | North Dir. of Site | 7.58 | 1.45 | 9.03 |
| A4 | South Dir. of Site | 8.03 | 2.3 | 10.33 |
| A5 | 1.05 km WSW | 8.64 | 0.35 | 8.99 |
| A6 | 1.41 km SE | 9.44 | 2.57 | 12.01 |
| A7 | 1.69 km North | 9.12 | 4.38 | 13.5 |
| A8 | 2.47 km South | 10.11 | 2.48 | 12.59 |
| A9 | 5.15 km, E | 9.78 | 2.92 | 12.70 |
| A10 | 5.81 km , NE | 5.78 | 3.16 | 8.94 |

*Table 27. Predicted cumulative Impacts of baseline monitored locations for CO pollutant*

| CO- 2 mg/m$^3$ | | | | |
|---|---|---|---|---|
| **Location** | **Distance & Direction** | **Background Concentration CO (mg/m$^3$)** | **Predicted Incremental Concentration CO (mg/m$^3$)** | **Post Project Air Quality CO (mg/m$^3$)** |
| A1 | West Dir. of Site | 0.56 | 0.005 | 0.565 |
| A2 | East Dir. of Site | 0.67 | 0.013 | 0.684 |
| A3 | North Dir. of Site | 0.60 | 0.009 | 0.609 |
| A4 | South Dir. of Site | 0.63 | 0.007 | 0.637 |
| A5 | 1.05km WSW | 0.68 | 0.005 | 0.685 |
| A6 | 1.41 km SE | 0.75 | 0.011 | 0.761 |
| A7 | 1.69 km North | 0.72 | 0.025 | 0.745 |
| A8 | 2.47 km South | 0.80 | 0.012 | 0.812 |

| CO- 2 mg/m³ | | | | |
|---|---|---|---|---|
| **Location** | **Distance & Direction** | **Background Concentration CO (mg/m³)** | **Predicted Incremental Concentration CO (mg/m³)** | **Post Project Air Quality CO (mg/m³)** |
| A9 | 5.15 km, E | 0.77 | 0.028 | 0.798 |
| A10 | 5.81 km , NE | 0.46 | 0.036 | 0.496 |

## 2.7. DATA INTERPRETATION

The cumulative Impact Assessment study, Using AERMOD dispersion modeling, reveals that the Maximum Ground Level Concentration (mGLC) at different monitoring locations taking into account the emission generate from the proposed Industrial & other activities within the SIPCOT industrial area, along with emissions contributed by other operational industries located in the surrounding region over baseline results are within CPCB /TNPCB specified norms.

The report clearly distinguishes the contributions from proposed industrial and commercial activities within the SIPCOT industrial park over existing emission sources from industries within 10 km radius on mGLC values for $PM_{2.5}$, $PM_{10}$, $SO_2$, $NO_2$, and CO. These values have been summarized in a comparison table, enabling direct evaluation of the relative contributions of proposed industrial and commercial activities within the SIPCOT industrial park.

*Table 25. Details of The maximum incremental GLC (miGLC) due to proposed Industrial park , Existing Industries and near future industries*

| **Pollutant** | **Baseline Concentration** | **Simulation results on maximum Incremental Concentration , (µg/m³)** | | | |
|---|---|---|---|---|---|
| | | **Only by SIPCOT industrial park, Allikulam** | **Only by Existing industries within 10 Km** | **Only by Industries coming up in near future** | **Cumulative Impact** |
| PM2.5 (µg/m³) | 24.17 | 0.86 | 5.97 | 4.52 | 4.29 |
| PM10 (µg/m³) | 37.99 | 1.14 | 7.42 | 5.05 | 5.12 |
| NO2 (µg/m³) | 26.63 | 1.26 | 3.36 | 3.28 | 2.94 |
| SO2 (µg/m³) | 10.11 | 1.45 | 3.45 | 2.70 | 3.16 |
| CO (mg/m³) | 0.80 | 0.013 | 0.051 | 0.01 | 0.036 |

Overall, the interpretation of model outputs indicates that maximum incremental impact due to emission by industrial and commercial activities within the proposed SIPCOT industrial

park will have lesser cumulative impact on ambient air quality than that of standard limits for individual Pollutants. Also, cumulative impact considering emissions from industries present within 10 km radius and those upcoming in near future do not pose any exceedance risk for sensitive receptors in the study area. The results confirm that the study area possesses adequate assimilative capacity and that air quality remains compliant with the mandated regulatory standards.

Predicted cumulative Emission load on account of operations of existing industries , those units (Industrial & Commercial) within proposed SIPCOT industrial park at Allikulam and the industries that will start operations in near future within 10 km radius is given in Table 26.

*Table 26. Cumulative Ground Level Concentration (GLC) for Proposed SIPCOT Industrial Park, Nearby Industries within 10 km & Industries come in Near Future*

| Pollutant | Estimated Conc. ( Proposed SIPCOT Industrial Park at Allikulam) A | Estimated Conc. (Nearby Industries within 10 km ) B | Estimated Conc. (Industries come in Near Future ) C | Total Concentration D=A+B+C |
|---|---|---|---|---|
| PM10(µg/m3) | 1.14 | 6.82 | 5.05 | 13.01 |
| PM2.5(µg/m3) | 0.86 | 5.97 | 4.52 | 11.35 |
| NO2(µg/m3) | 1.45 | 4.20 | 3.28 | 8.93 |
| SO2(µg/m3) | 1.26 | 3.93 | 2.70 | 7.89 |
| CO(mg/m3) | 0.013 | 0.0126 | 0.01 | 0.035 |

In addition , proposed exhaustive greenbelt development with 466786 Nos. of Trees within the SIPCOT Industrial Park at allikulam will contribute positively to reduce predicted incremental impact.

# 3. REFERENCES

1. Epa, U. S., and OAR. 2016. “Air Quality Dispersion Modeling - Preferred and Recommended Models,”November.https://www.epa.gov/scram/air-quality-dispersion-modeling-prefe rred-and-recommended-models.

# Annexure 11- Hydro Geological study based seasonal drains (Odais) Rejuvenation and Ground Water Recharging report

# HYDRO GEOLOGICAL STUDY BASED SEASONAL DRAINS (ODAIs) REJUVENATION AND GROUND WATER RECHARGING REPORT

**AT**

**ALLIKULAM, KEELATHATTAPARAI, PERURANI, UMARIKOTTAI, MELATHATTAPARAI, RAMASAMYPURAM AND THERKUSILLUKKANPATTI VILLAGES, THOOTHUKUDI TALUK, TAMIL NADU**

## PROJECT PROPONENT

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**DECEMBER 2025**

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# 1. INTRODUCTION

SIPCOT proposes to develop an Industrial Park primarily catering to Technical Textile, textile, and allied industries, along with supporting amenities, commercial facilities, project offices, security infrastructure, solid waste handling facilities, and essential services, in Thoothukudi District, Tamil Nadu. The proposed Industrial Park will be developed over a total land extent of 796.240 hectares (1966.713 acres), with an estimated project cost of ₹666.11 Crores. The proposed plotted development will be undertaken over 721.338 hectares while 27.994 hectares existing Nilaviyal Odai, 20.957 hectares Right-of-Way (RoW) buffer for High Tension (HT) Transmission line and 25.951 hectares "falling distance buffer (Radius 181 m)" for windmill as non-developable area.

The proposed SIPCOT Industrial Park falls under Category 'A' , Schedule 7(c) – Industrial Estates / Parks of the EIA Notification, 2006 and its subsequent amendments, requires prior Environmental Clearance from the Ministry of Environment, Forest and Climate Change (MoEF&CC). In this regard, MOEFCC has granted TOR vide TO25A3102TN5260559N dated 21.09.2025.

The Environmental Impact Assessment has been carried out as per the approved Terms of Reference, considering the cumulative environmental implications associated with large-scale industrial estate development. As per Specific TOR Condition No. TO25A3102TN5260559N , The report on Rejuvenation plan for Seasonal Drains (Odai) passing through proposed SIPCOT Industrial Park is prepared based on Project specific details and Site specific Environmental settings .

*Table 1. Land Use Distribution Details of SIPCOT Industrial Park*

| S.No | Description | Unit | Area (Ha) | Area (Acres) |
|---|---|---|---|---|
| 1. | Industrial Plot Area* ( including 15% (193.182 acres) greenbelt as applicable to red category Industries ) | Hectare | 521.409 | 1287.880 |
| 2. | Plots for Common Amenities | Hectare | 14.425 | 35.630 |
| 3. | Plots for Commercial Activities | Hectare | 21.640 | 53.450 |
| 4. | Area for Solid Waste Management | Hectare | 2.024 | 5.000 |
| 5. | Road, Storm Water Drain area | Hectare | 53.337 | 131.740 |
| 6. | Greenbelt by SIPCOT (30 m on either side of Water body (Odai), 15 m on either side of Nilaviyal Odai & & 15m along the Periphery of Lyocell unit and 10m all along the boundary) | Hectare | 108.503 | 268.005 |
| **Total Developable area** | | **Hectare** | **721.338** | **1781.705** |
| 7. | Area of windmill falling distance (Radius 181m) | Hectare | 25.951 | 64.100 |
| 8. | Existing Nilaviyal Odai (Non-developable area) | Hectare | 27.994 | 69.145 |
| 9. | RoW HT Line Buffer(Non-developable area) | Hectare | 20.957 | 51.763 |
| **Total Non-developable area** | | **Hectare** | **74.902** | **185.008** |
| **Grand Total area of the Industrial Park** | | **Hectare** | **796.240** | **1966.713** |

*Table 2. Greenbelt Development*

| Description | | Unit | Area (Ha) | % of Total Area | No: of Trees @2500 |
|---|---|---|---|---|---|
| **Developed by SIPCOT** | Greenbelt by SIPCOT (30 m on either side of Water body (Odai) , 15 m on either side of Nilaviyal Odai & 15m along the Periphery of Lyocell unit and 10m all along the boundary) | Hectare | 108.503 | 13.63% | 271258 |
| **Developed by Individual Industries** | Greenbelt within Industrial Plot Area – Red/Orange/Green/ White Category (@ 15%) | Hectare | 78.211 | 9.83% | 195528 |
| **Total Greenbelt within the Industrial Park** | | **Hectare** | **186.714** | **23.46** | **466786** |

The proposed SIPCOT Industrial Park at Allikulam, Thoothukudi District, encompasses natural drainage features that form an integral part of the local hydrological system. Two existing natural drainage channels, namely a seasonal odai traversing the central portion of the project site and the Nilaviyal Odai passing through the northern plots and partly along the southern side of the proposed Industrial Park, are present within the project area. These channels function as primary conduits for surface runoff during monsoon periods and play an important role in groundwater recharge in the surrounding areas.

In view of the proposed industrial development and in compliance with environmental safeguards, SIPCOT has prepared a Groundwater Rejuvenation Plan aimed at protecting, restoring, and enhancing the hydraulic and ecological functionality of the existing drainage channels within the project area. The plan emphasizes retention of the natural alignment of the odai and Nilaviyal Odai, prevention of encroachments, stabilization of channel banks, improvement of flow characteristics, and unobstructed conveyance of stormwater by appropriately channelising runoff within the project area into the odais, while ensuring flood safety.

**Greenbelt along Odai:**

A dedicated greenbelt has been provided along both sides of the seasonal odai traversing the central portion of the project site. This greenbelt is proposed to be developed as a multilayered, minimum three-tier plantation using native, drought-resistant, and pollution-tolerant species. The plantation along the odai will aid in bank stabilization, reduction of soil erosion and sediment inflow, enhancement of infiltration, and improvement of the local microclimate, while maintaining the natural drainage continuity.

**Greenbelt along Nilaviyal Odai:**

Along the Nilaviyal Odai, a continuous riparian greenbelt has been earmarked on both sides throughout its stretch within the project area. The greenbelt will be developed with multilayered native vegetation to act as an ecological buffer, prevent encroachments, regulate surface runoff entry, support groundwater recharge, and enhance riparian ecology, without altering the natural flow regime of the odai.

Overall, SIPCOT proposes to develop 108.503 hectares of greenbelt along the Odai and Nilaviyal Odai, comprising approximately 271,258 trees, as part of the integrated groundwater rejuvenation and environmental management strategy. The rejuvenation plan for seasonal drains (odais) passing through the proposed SIPCOT Industrial Park is integrated with the stormwater management and rainwater harvesting systems of the project, ensuring controlled conveyance of runoff into the odais, mitigation of flood risks, promotion of groundwater recharge, and long-term environmental sustainability of the project area and downstream regions.

**Location of the project**

*Table 3. Taluk & Firka Details*

| S.No | Taluk | Firka | Village |
|---|---|---|---|
| 1. | Thoothukudi | Keelathattaparai | Allikulam |
| | | | Keelathattaparai |
| | | | Umarikottai |
| | | | Melathattaparai |
| | | | Ramasamypuram |
| | | | Therkusillukkanpatti |
| | | Mudivaithanendal | Perurani |

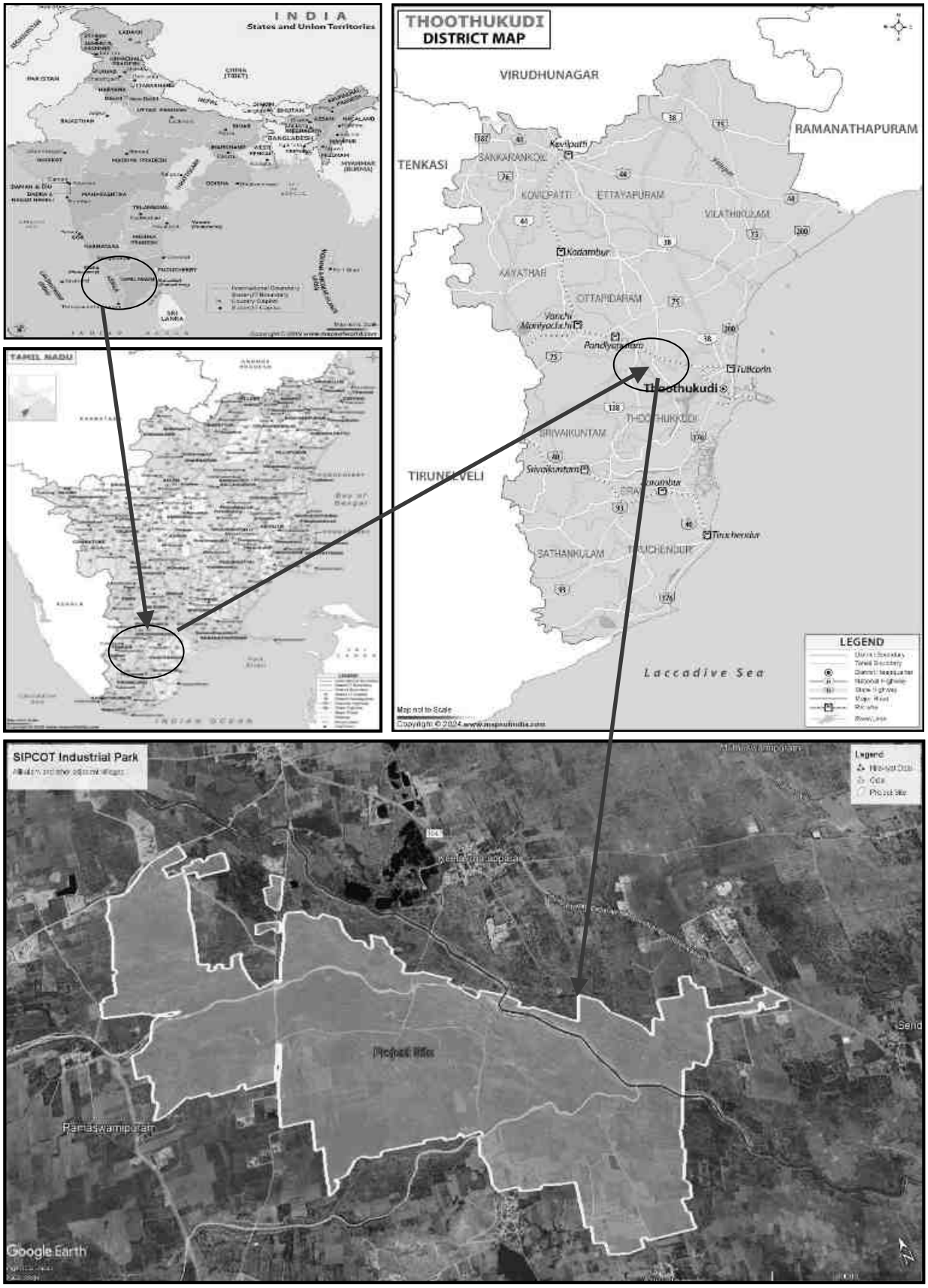



*Figure 1. Site Location*

# 2. THOOTHUKUDI DISTRICT PROFILE

Thoothukudi District is located in south-eastern Tamil Nadu and has a well-defined administrative structure comprising 1 Municipal Corporation, 2 Municipalities, 12 Panchayat Unions, 19 Town Panchayats, 403 Village Panchayats, 41 Revenue Firkas, and 480 Revenue Villages. The Proposed project area falls within Thoothukudi Taluk, under the Keelathattaparai Firka and Mudivaithanendal Firka. The associated villages include Allikulam, Keelathattaparai, Umarikottai, Melathattaparai, Ramasamypuram, Therkusillukkanpatti, and Perurani. It is located in the Kallar basin within the influence of the Vaippar Basin and the Thamirabarani River system. The site drainage is mainly seasonal in nature, comprising existing odais and natural runoff paths that carry monsoon flows. Rainfall in the area is low and predominantly received during the Northeast Monsoon, and groundwater availability in the project influence area is limited. Existing Odai and Nilaviyal odai rejuvenation measures within the project site, including desilting of existing odais by recharge pits, and check dams along Odai, will enable effective percolation of stormwater, improve groundwater recharge, and maintain natural flow continuity without altering existing flow patterns.

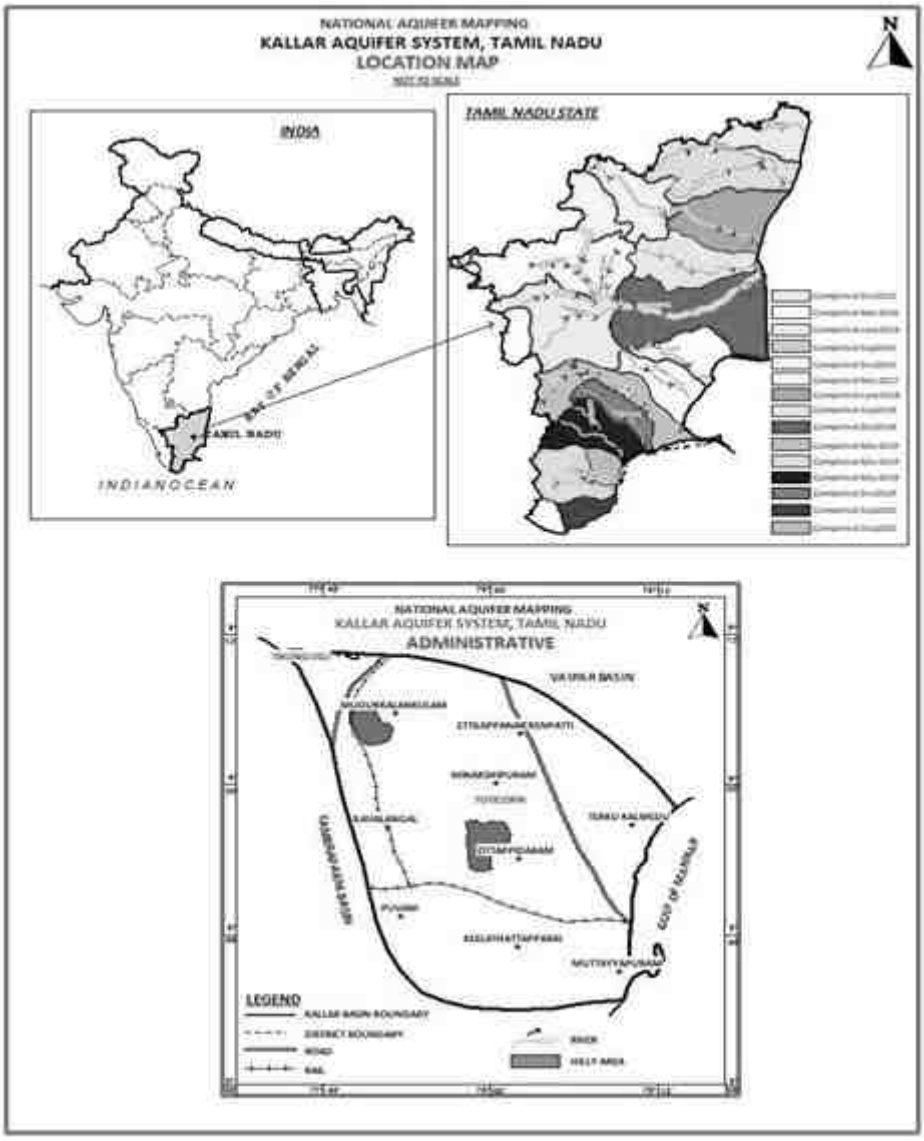



*Figure 2. Location map of Kallar basin*

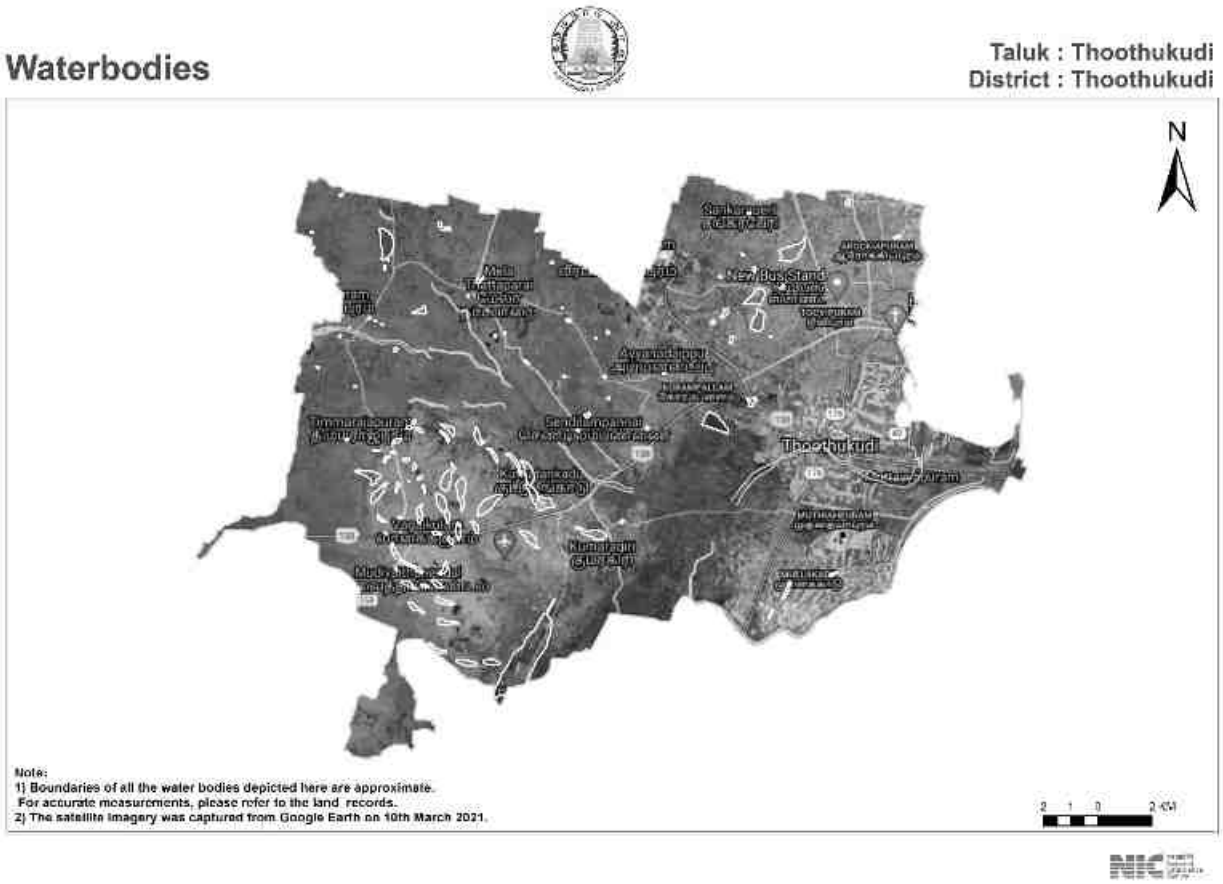
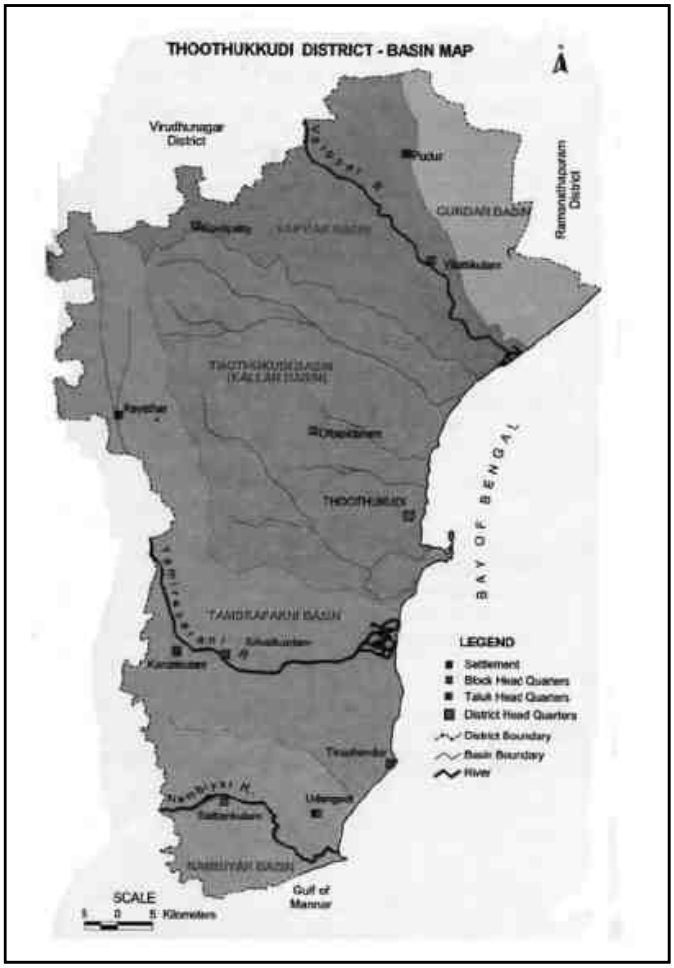



*Figure 3. Waterbodies in Thoothukudi District & Taluk*

## 2.1 Rivers and Basins of the District

The Proposed Industrial park lies in Thoothukudi District, Thoothukudi Taluk within the Kallar Basin, which forms an intermediate drainage basin between the Vaippar Basin and the Thamirabarani River systems. The Kallar Basin is characterized by seasonal drainage, consisting mainly of odais and minor streams that convey monsoon runoff and contribute to gr oundwater recharge through infiltration.

The Vaippar basin predominantly influences the northern drainage characteristics, while the Thamirabarani River system governs the southern hydrological regime. The Kallar Basin acts as a transitional zone, receiving and dispersing surface runoff through natural drainage channels rather than perennial river flow. Rainfall is largely dependent on the Northeast Monsoon, and surface flows are short-lived but hydrologically significant.


THOOTHUKKUDI DISTRICT - BASIN MAP
Virudhunagar District
Ramanathapuram District
BAY OF BENGAL
LEGEND
Settlement
Block Head Quarters
Taluk Head Quarters
District Head Quarters
District Boundary
Basin Boundary
River
SCALE
Gulf of Mannar

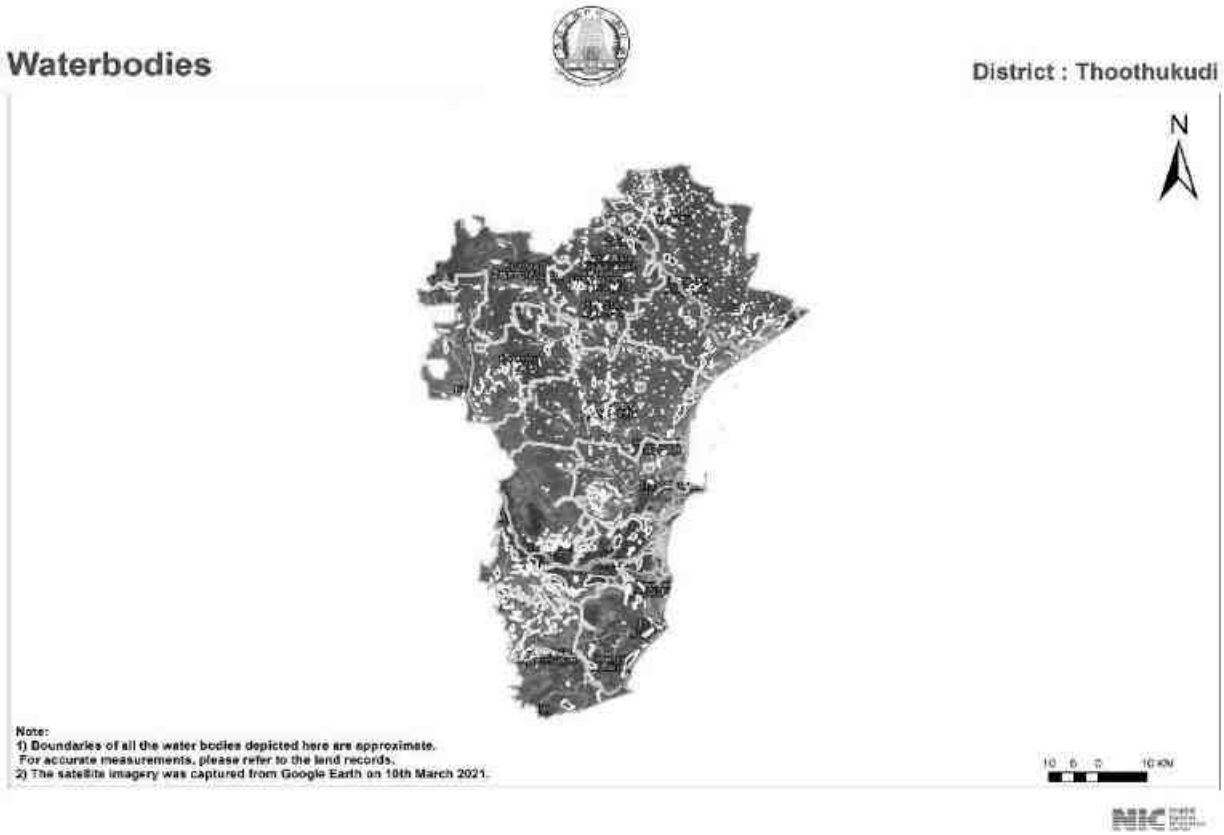

Waterbodies
District : Thoothukudi
N
Note:
1) Boundaries of all the water bodies depicted here are approximate.
For accurate measurements, please refer to the land records.
2) The satellite imagery was captured from Google Earth on 10th March 2021.

*Figure 4. Rivers, Odai's & stream in the Thoothukudi District*

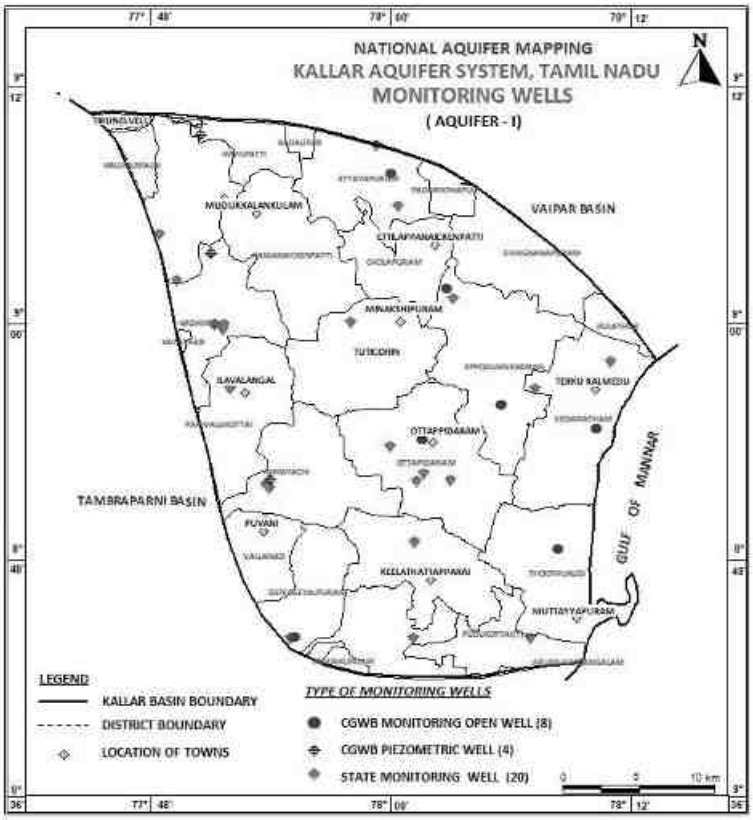



*Figure 5. Monitoring wells and Vaipar basin & Tamirabarani basin*

## 2.2. Data on Average Rainfall , Peak Rainfall and Carrying capacity of the drains

### 2.2.1 Micrometeorological data

The data was collected from 01 March 2025 to 31 May 2025, which is as follows:

*Table 4. Micro-meteorological Data*

| Month | Temperature($^0$C) | | | Relative Humidity (%) | | | Wind Speed (m/s) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Max | Min | Mean | Max | Min | Mean | Max | Min | Mean |
| March | 33.80 | 25.30 | 28.80 | 93.35 | 40.57 | 73.20 | 8.40 | 0.19 | 3.47 |
| April | 34.87 | 27.18 | 30.00 | 89.95 | 47.34 | 73.50 | 6.62 | 0.34 | 3.50 |
| May | 35.53 | 27.31 | 30.52 | 92.94 | 44.83 | 72.74 | 12.08 | 0.32 | 5.92 |

### 2.2.2. Temperature

During the survey of the area, the maximum temperature was recorded at 35.53ºC on 11 May 2025, while the minimum temperature was recorded at 25.30ºC on 10 March 2025.

### 2.2.3 Precipitation

The maximum precipitation was recorded as 179.05 mm on 03 April 2025.

Talk about annual average Rainfall (696 mm/annum) , Rainfall intensity per day ( 21cm max in Thoothukudi Taluk ) and no.of Average Rainy days 43 /year.

### 2.2.4 Soil Characteristics

The soils of the Kallar Basin have been shown in Plate KAL. No 15. The predominant soil types found in this river basin are Inceptisols, Alfisol, Entisol and Vertisol. Due to different stage of weathering of parent material, the above soil types are met within combination. In general, based on the analysis of data, it is inferred that the weathered rock aquifer of this basin exists upto a depth of 20 to 40 m below ground level, fractured rock aquifer occurs upto a depth of 40 to 70 m below ground level. In sedimentary region the resistivity of the formation is low from 50 to 70 m below ground level, may be due to the sedimentary intercalated with saline water. The weathering / fracturing or both seems to be more in the gneissic region than charnockitic region, may be due to weak zones resulting from fault zone, shears zones, folds, lineaments etc.

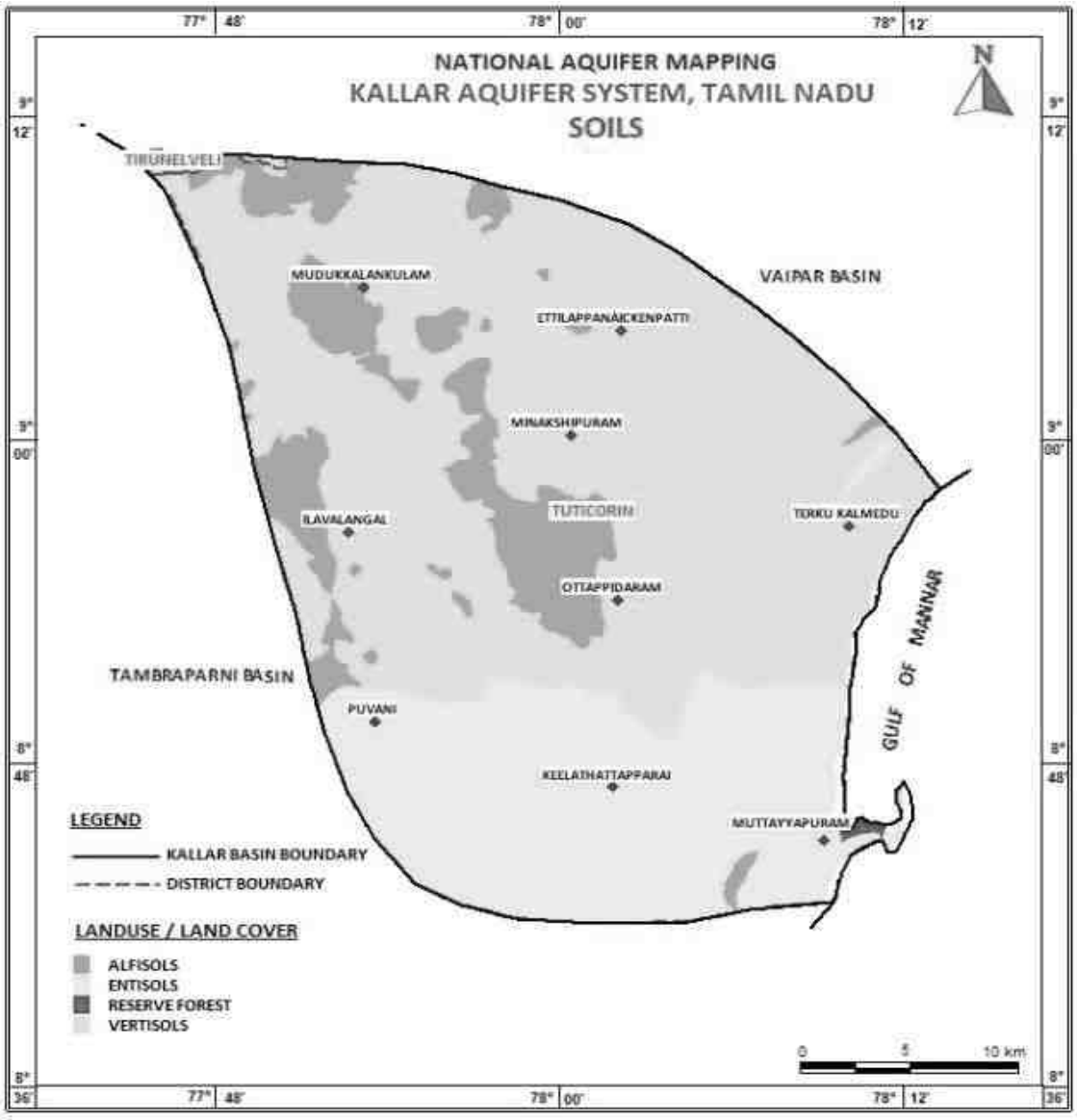



*Figure 6. Soil map of Kallar aquifer system*

*Table 5 Details of area irrigated and cultivated under wet and dry crops (Kallar Basin).*

| District | Firka | Area irrigated as % of | | | |
|---|---|---|---|---|---|
| | | Area irrigated | Area cultivated | Area irrigated | Area cultivated |
| Thoothukudi | Keelathataparai | 56.73 | 1472 | 3.710923 | 3.85394 |

In the regions where the depth to bedrock is shallow, dugwell would be the better structure for augmenting groundwater especially in the hard rock regions. In the areas where the depth to bedrock is at moderate or at deeper depth, borewell would be the suitable structure for tapping groundwater. This is common for both sedimentary and hard rock areas.

### 2.2.5 Groundwater Classification as per CGWA/WRD & Quality

The project site falls under Thoothukudi Block, which is classified as "Safe" as per the Central Ground Water Authority (CGWA) and Water Resources Department, Tamil Nadu (WRD) groundwater resource assessment. The depth to groundwater level in the area generally ranges from 12 to 18 m below ground level (bgl).Groundwater quality in the block is generally fresh to marginally

mineralized, suitable for domestic and industrial use after conventional treatment where required. Localized variations in parameters such as TDS and hardness are observed, which are typical for semi-arid regions. Overall, the groundwater regime is considered stable under existing conditions, with scope for improvement through recharge measures such as recharge pits and check dams.

#### 2.2.5.1 Average depth and yield

The average depth to groundwater level in the area varies from 12 to 18 m below ground level (bgl). Groundwater is tapped from weathered and fractured formations and exhibits a moderate yield, which is sufficient for domestic and project-related requirements under controlled abstraction. The existing yield conditions indicate stable aquifer behavior, with further improvement possible through artificial recharge measures such as recharge pits and check dams

#### 2.2.5.2 Groundwater Parameters

Phreatic zone groundwater is slightly alkaline (pH neutral-alkaline), with EC 280-12020 µS/cm at 25°C; 50% samples suitable for drinking/domestic use if wells are properly sited in multi-aquifer systems. Major issues include excess Cl, $NO_3$, $SO_4$ exceeding permissible limits, Na-Cl type water, salinity hazards (high-very high), and vulnerability to saline ingress in coastal/alluvial zones near Kallar basin. About 60% samples in Thoothukudi are good quality, but 29% saline, especially in coastal taluks like Ottapidaram; irrigation suitability requires soil management due to medium-high alkali hazard.

# 3. KALLAR BASIN

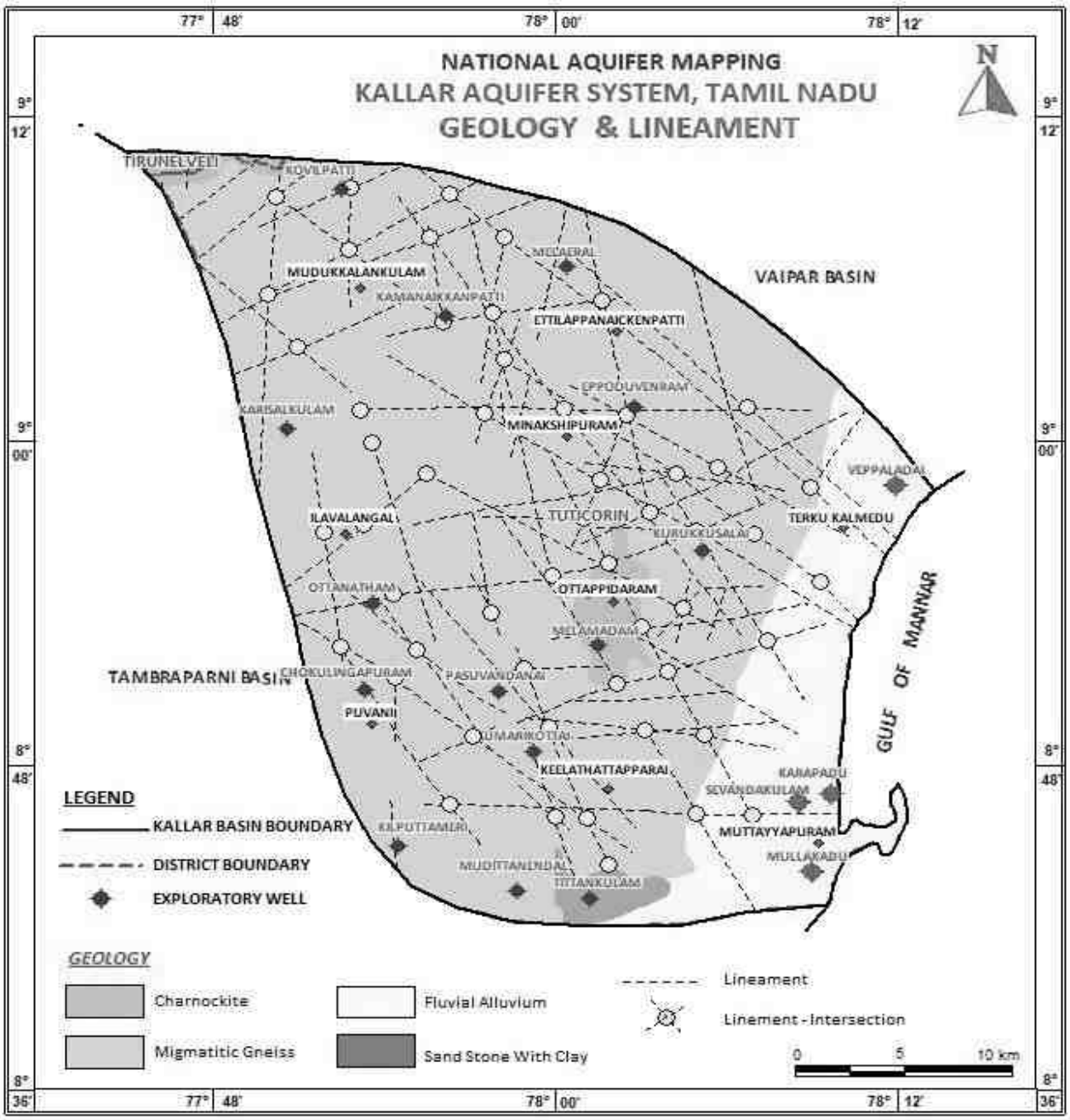



*Figure 7. Geological map of the KallarAquifer system*

## 3.1 Geology

Geologically the area is characterized by the Thoothukudi district represents a well-developed lithopackage of meta-sedimentary sequence interbanded with charnockite Group of rocks. The rock types exposed are of quartzite, calc-granulite, garnet-biotite-sillimanite gneiss, garnet quartz-feldspathic gneiss, and garnet-biotite-cordierite gneiss, belonging to the Khondalite Group of rock. Charnockite and pyroxene Granulite are the Charnockite Group. Hornblende-biotite gneiss belongs to the Migmatitic Complex. Besides, basic intrusive (pyroxenite) and acid intrusive (granite). The younger intrusions are represented by pegmatite and quartz veins. Evidence of the development of incipient/patchy charnockite along the shear plane is noticed in the district along the Western Ghat high hills.

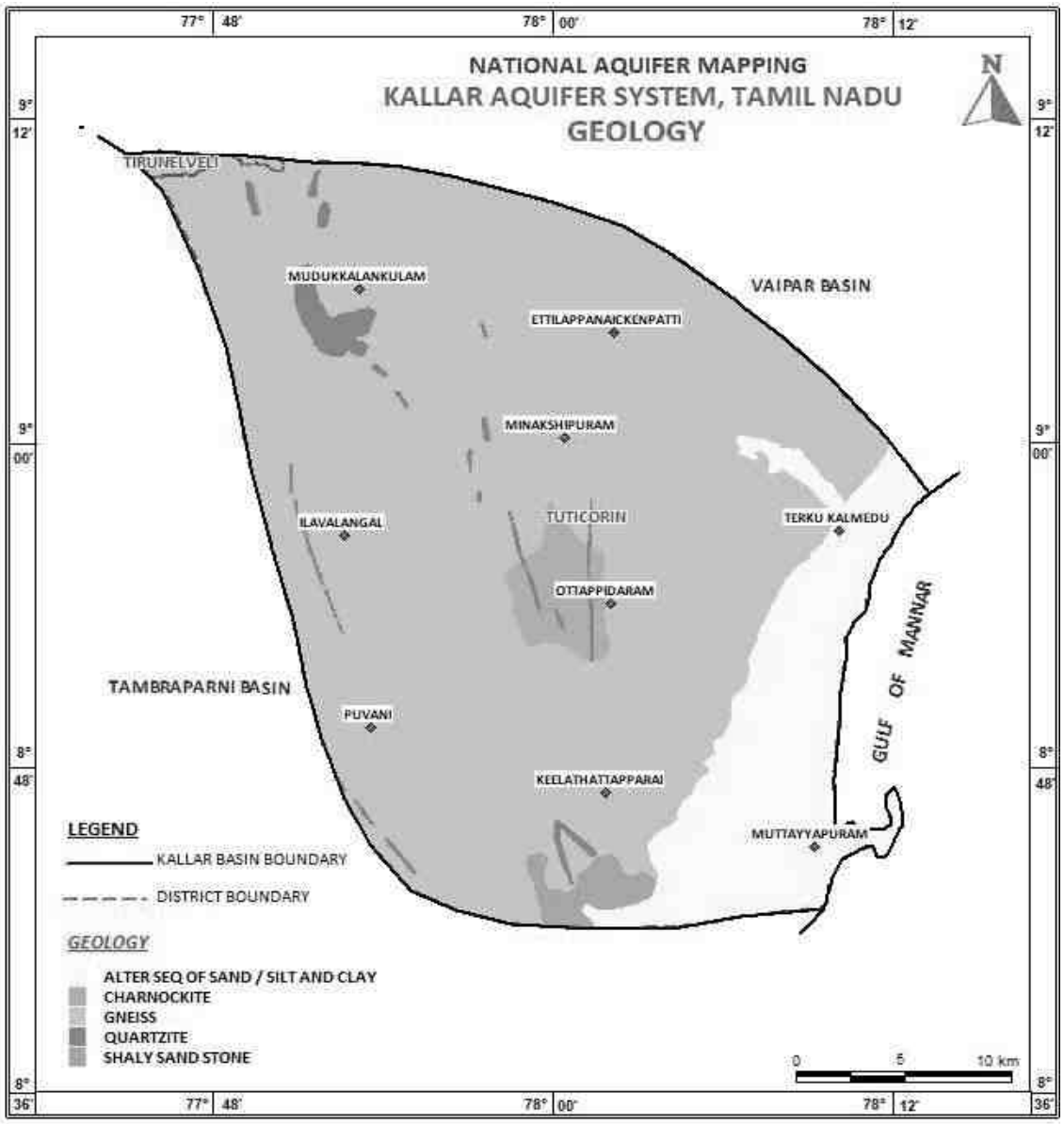



*Figure 8.Geological map of the KallarAquifer system*

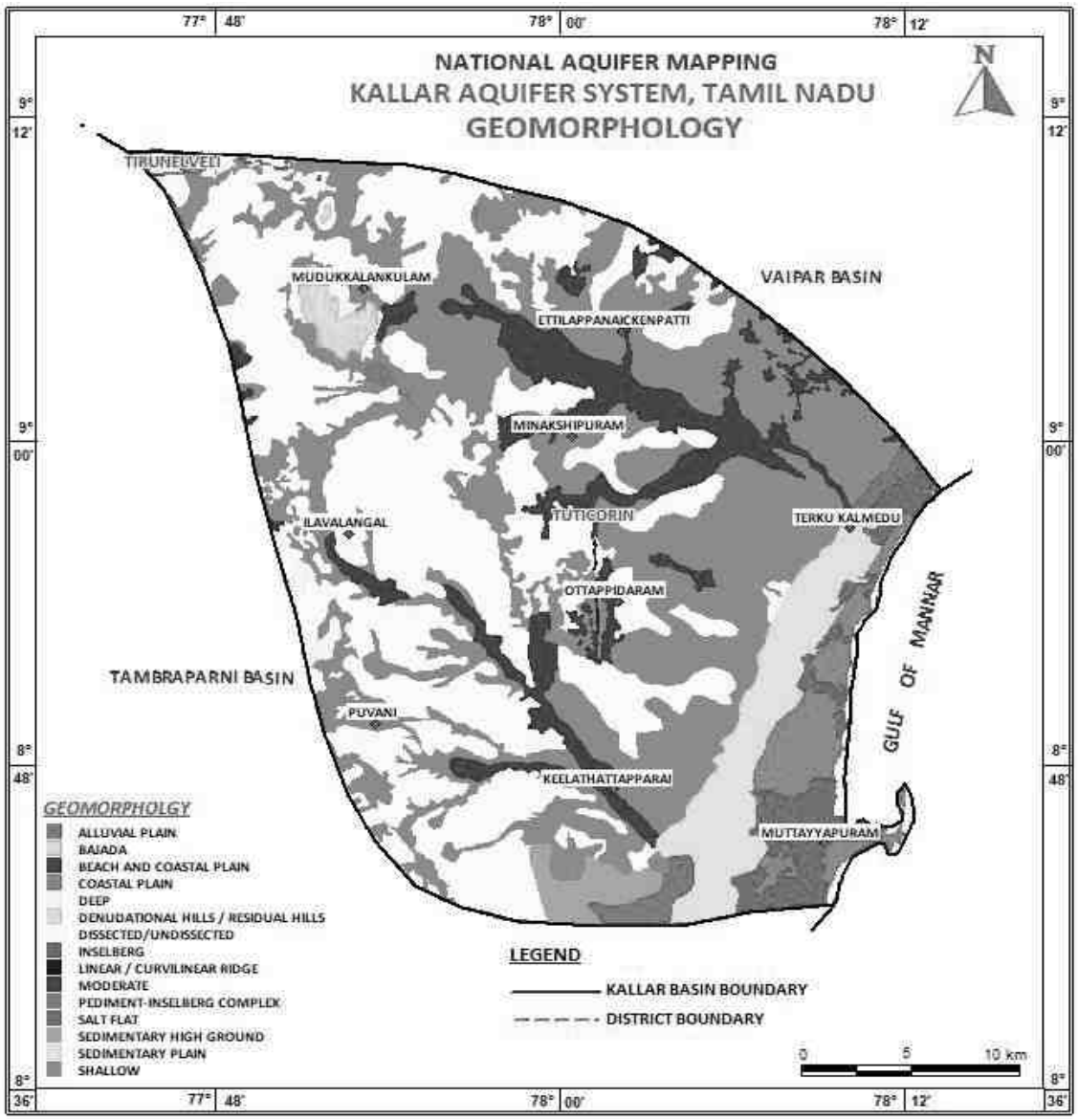



*Figure 9. Geomorphology map of the Kallar aquifer system*

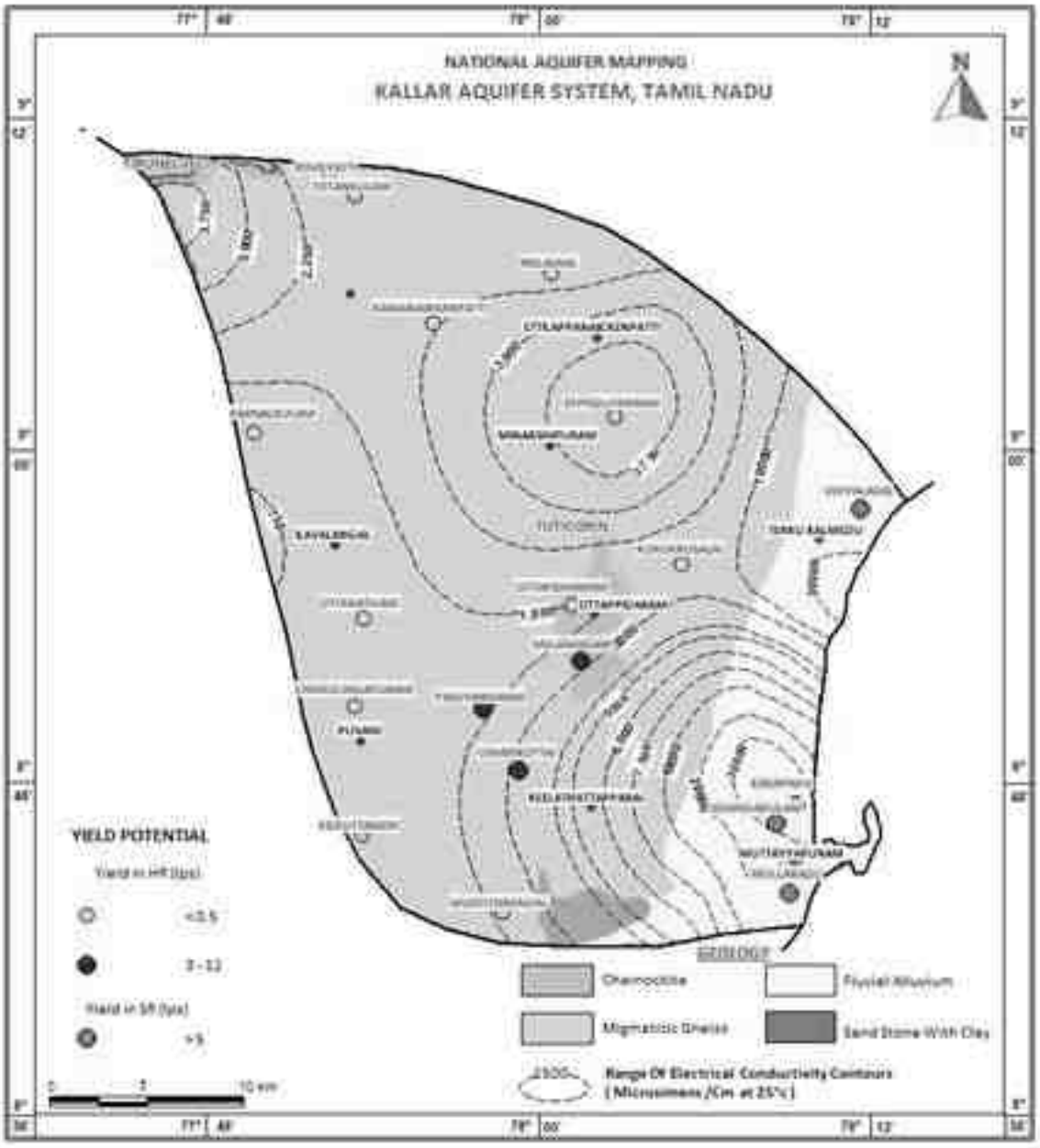



*Figure 10. Kallar Aquifer system*

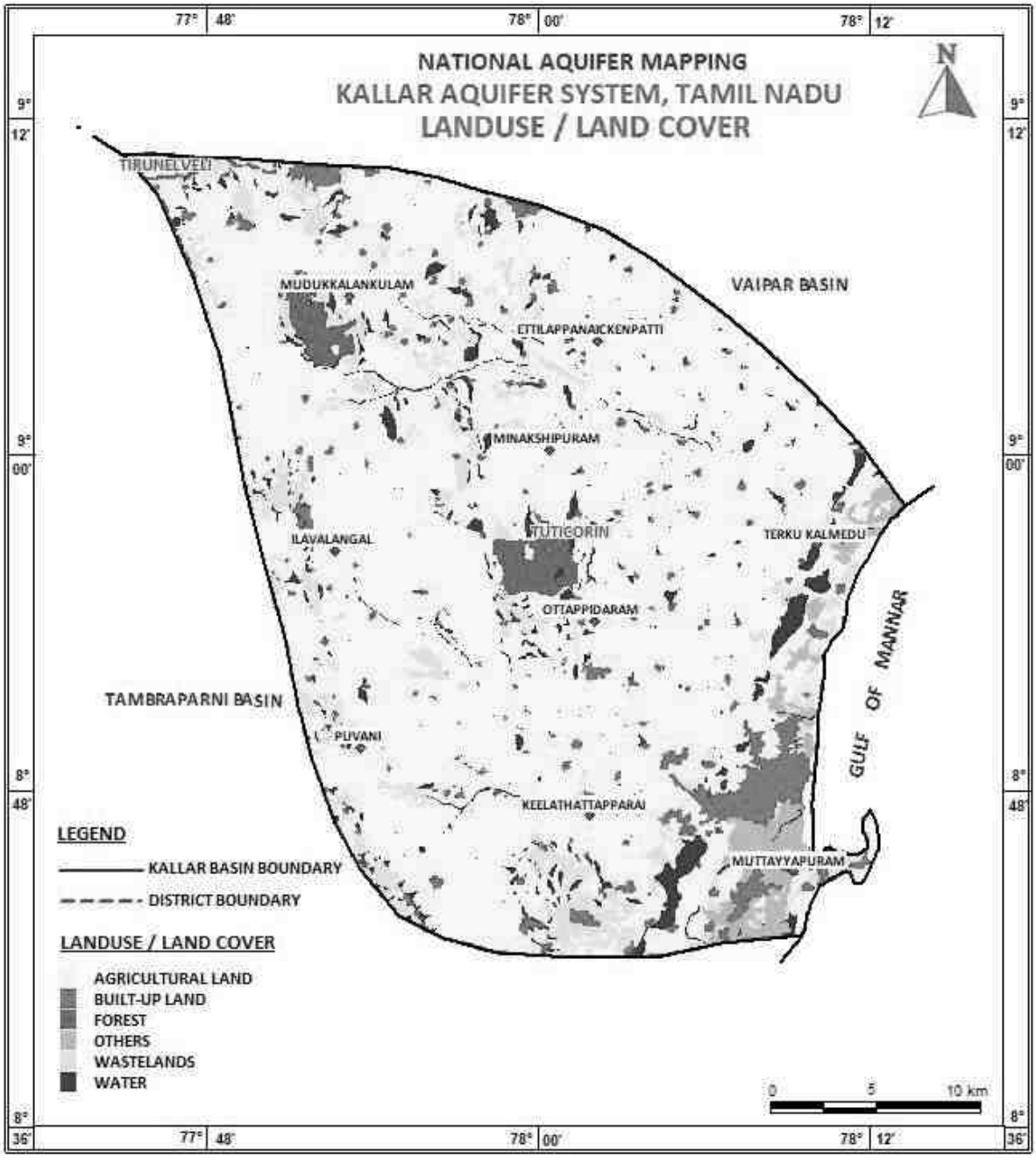



*Figure 11.Level 3 Landuse /Land cover map of the Kallar aquifer system*

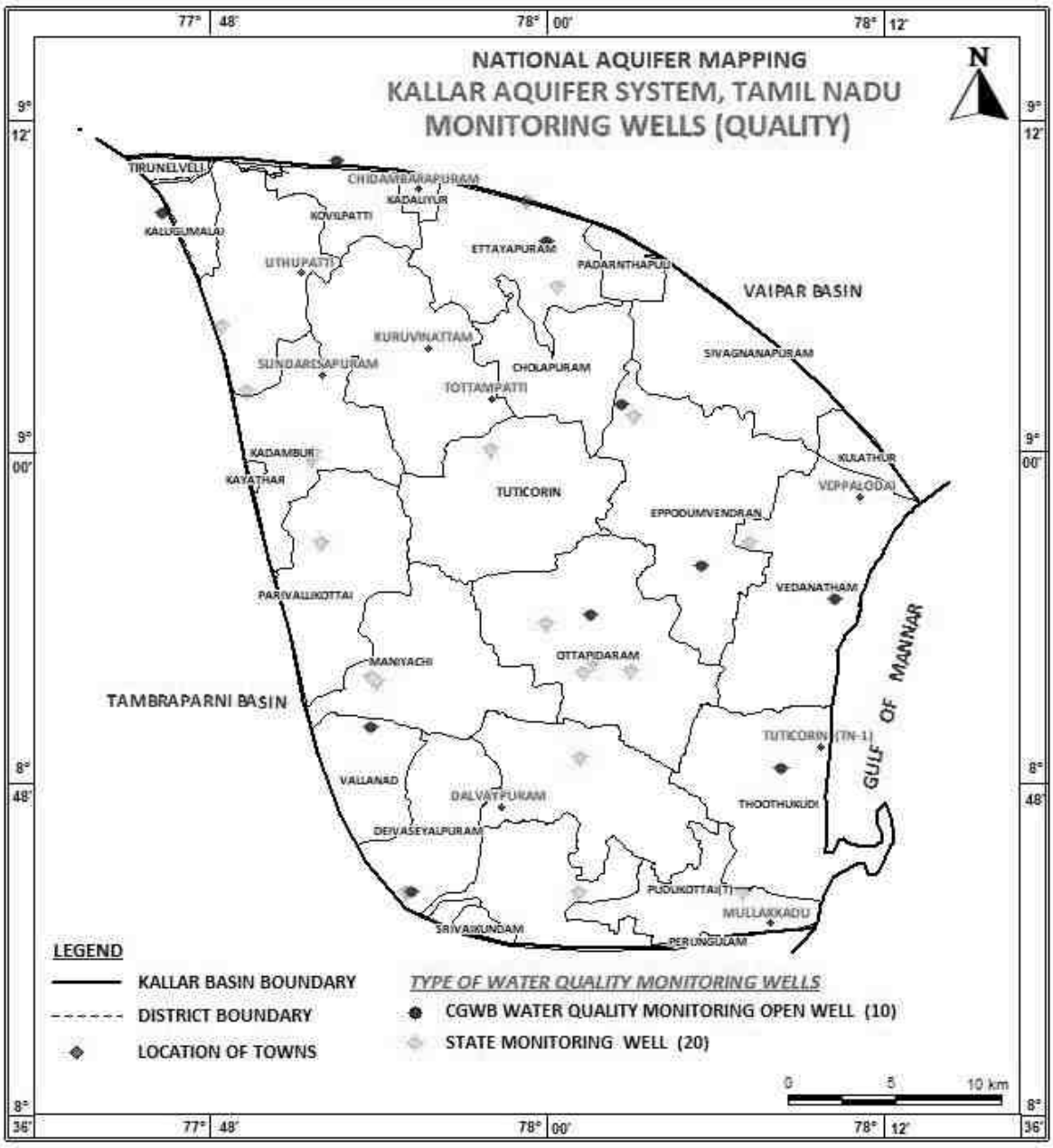



*Figure 12. Locations of Groundwater quality Monitoring Wells ofKallar Aquifer System*

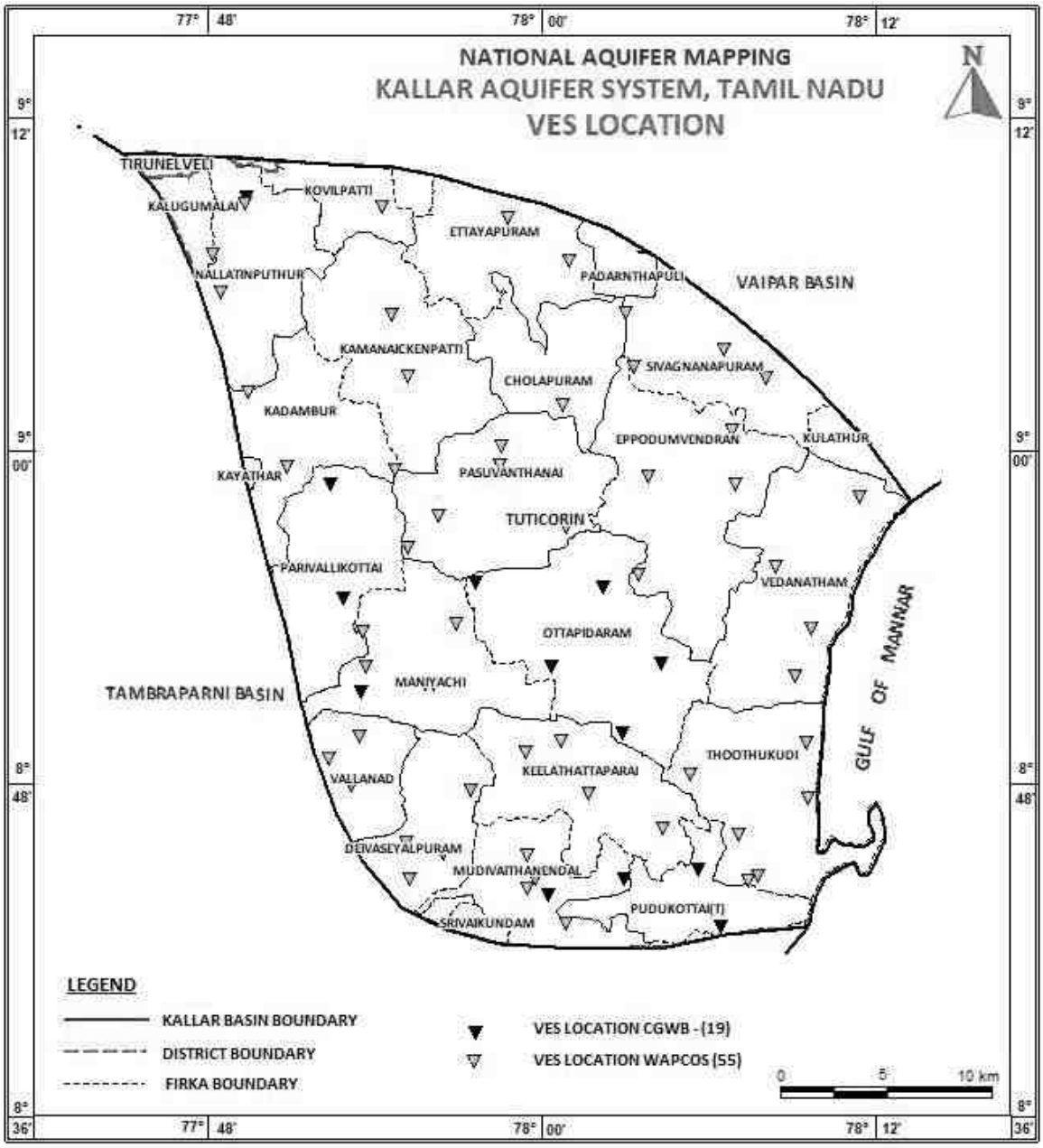



*Figure 13. Locations of Vertical Electrical Soundings (VES) of Kallar Aquifer System*

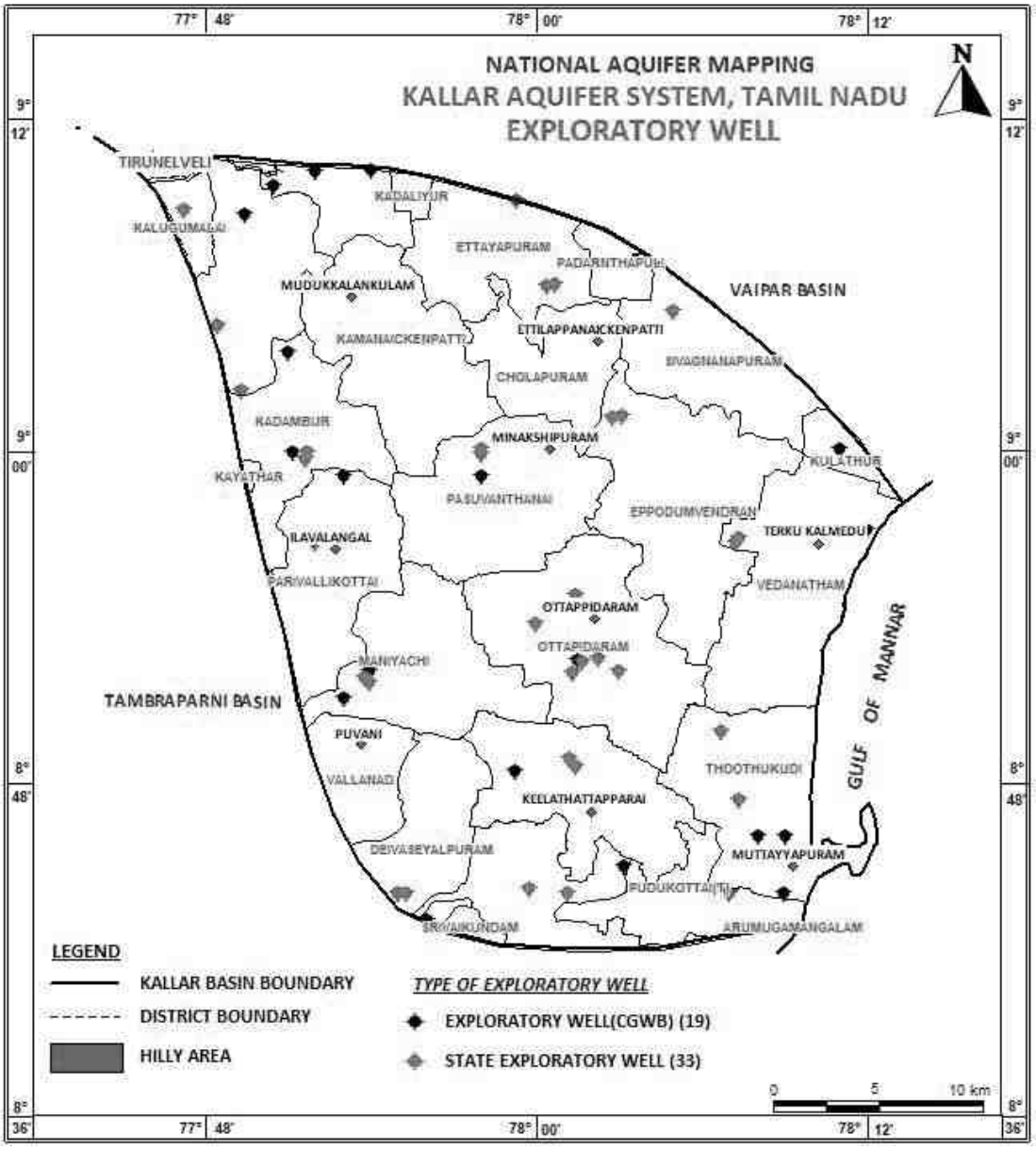



*Figure 14. Locations of all Exploratory WellsofKallar Aquifer System*

*Table 6 Salient features of the aquifer units in hardrock ofKallar aquifer system.*

| Type of Aquifer | Formation | Top & Bottom of | Thickness/ occurrence of | Range of Yield (m3/h) | Sustainability (hrs) | Aquifer parameter (Transmissivity – | EC values (µs/c | Suitable for Drinking |
|---|---|---|---|---|---|---|---|---|
| Aquifer unit - I | Weathered gneiss | Top: GL Bottom: 5 - | 5 – 40 (Avg. - 20m) | 1.5-25 (generally- 20 m3/hr) | Monsoon: 2-4 hrs& non monsoon | 10-25 | 750 >2500 | Yes – except pockets of |
| Aquifer Unit - II | Jointed & Fractured Gneiss/Charnockite | Top: 5 – 40 Bott | 18-193 ( 3 to 4 fractures | <5 to 43 (Avg-5 | for 4-6 hours in monsoon and < 1 | General range 10-42 578 | 400-2500 | Yes – except SE parts |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | o m: | exist) | m3/hr) | to | (Melamado | | |

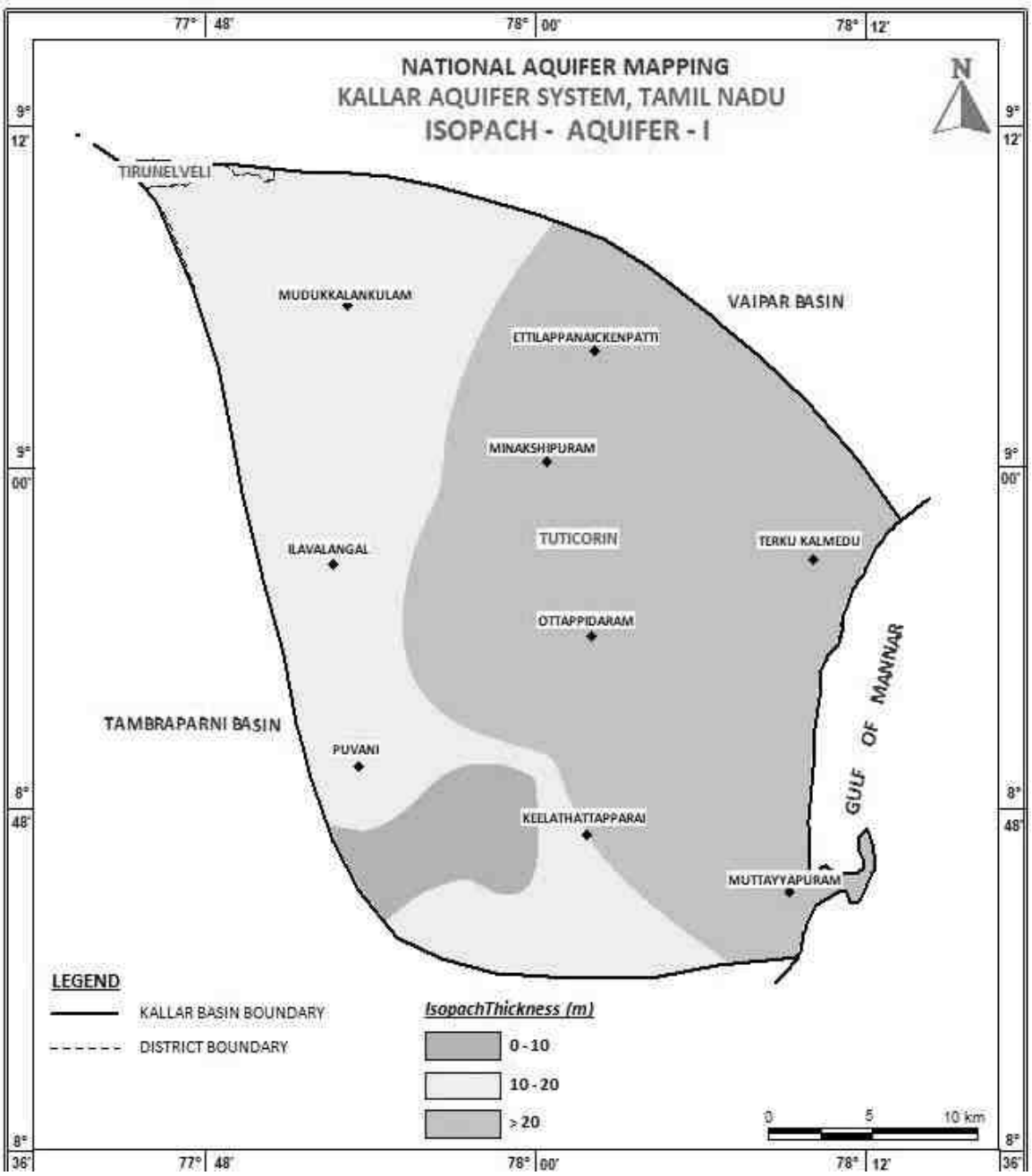



*Figure 15. Weathered thickness of Aquifer-I, Kallar Aquifer System*

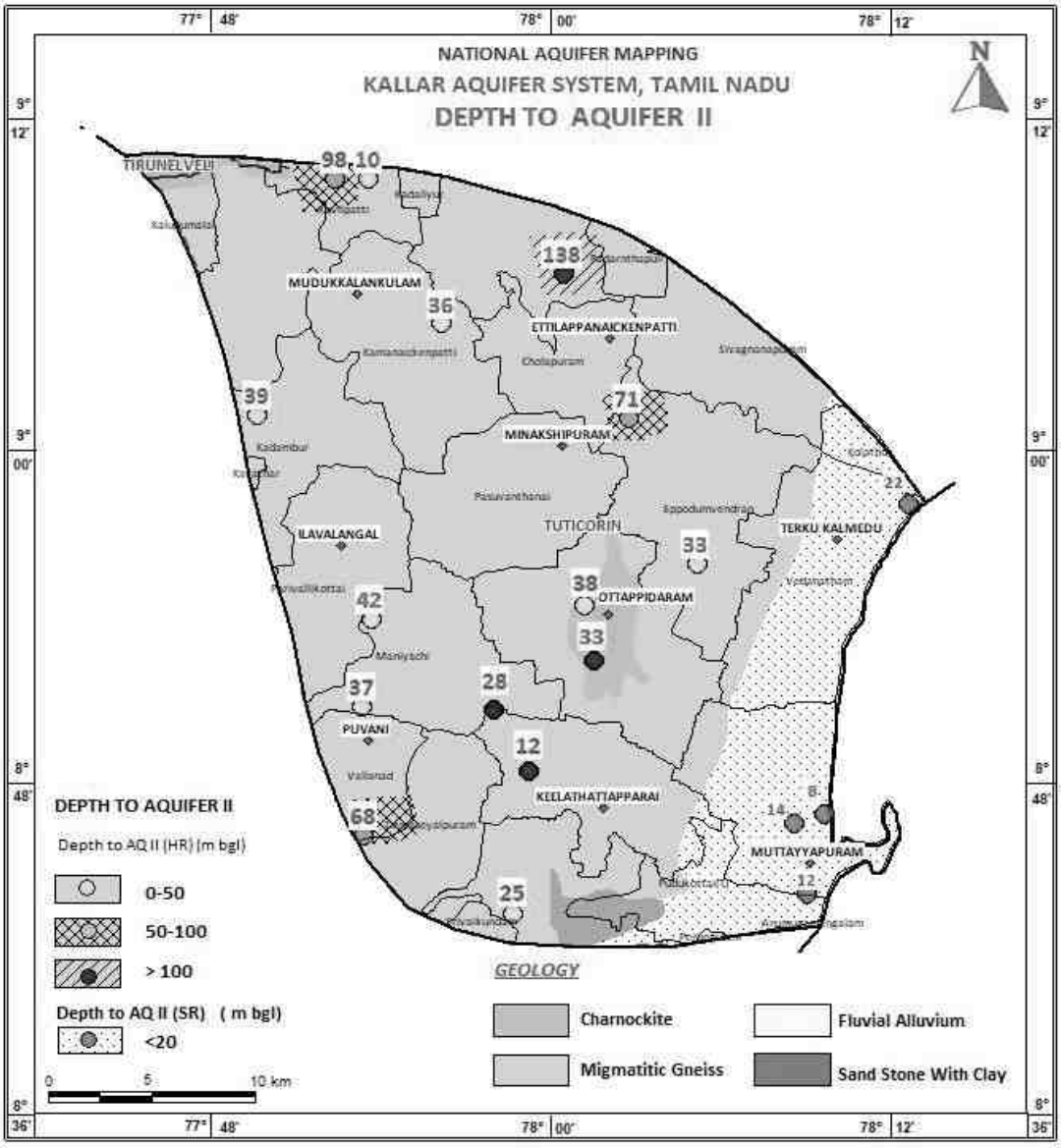



*Figure 16. Depth of occurrence of Aquifer-II of Kallar Aquifer System*

Hard rocks

| | |
|---|---|
| •Number of wells drilled in HR | : 15 |
| •Depth drilled | : 200 |
| •Depth to occurence of first Fracture | : 10-138 m bgl |
| •Potential fractures encountered | : 24-193, 40% potential fractures in the range 24-38 mbgl |

Sedimantaries

| | |
|---|---|
| •Number of wells drilled in SR | : 4 |
| •Depth drilled | : 46-70 m bgl |
| •Depth to AQ I | : 7-20 m bgl |

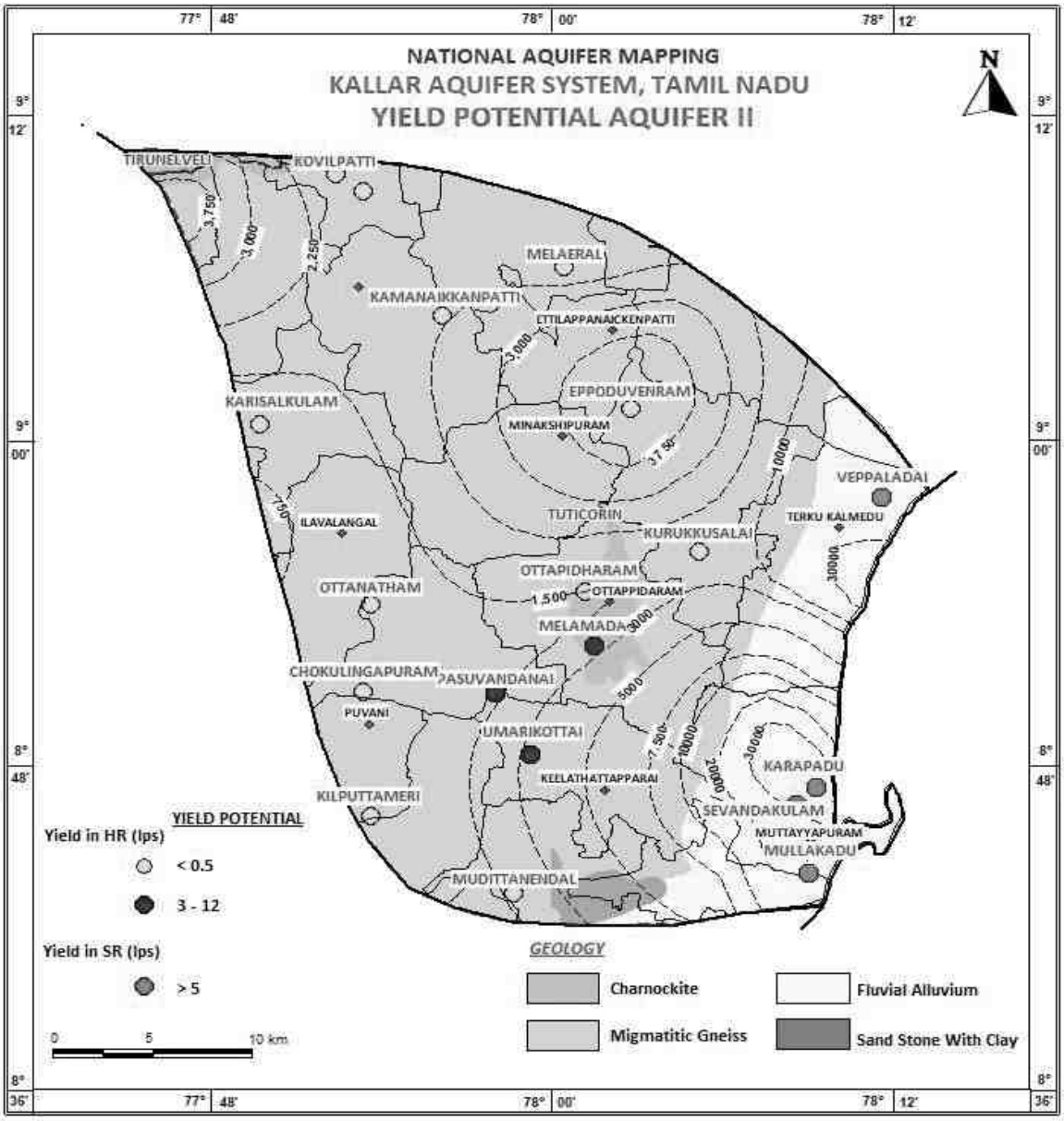



*Figure 17. Hydrogeology map of the Kallar aquifer system*

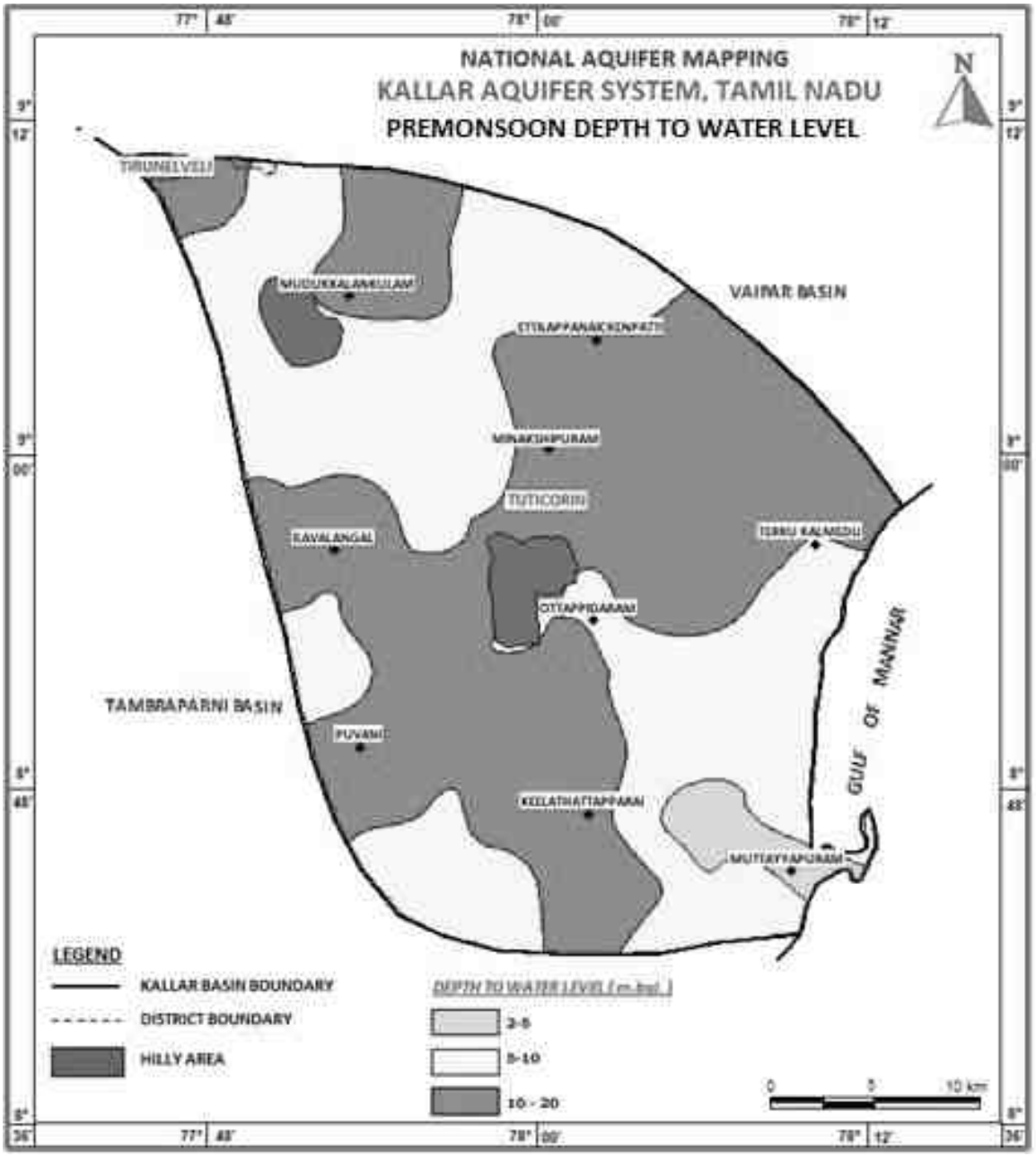



*Figure 18. Depth to water level (Aquifer-I) Pre-monsoon of the Kallar aquifer system*

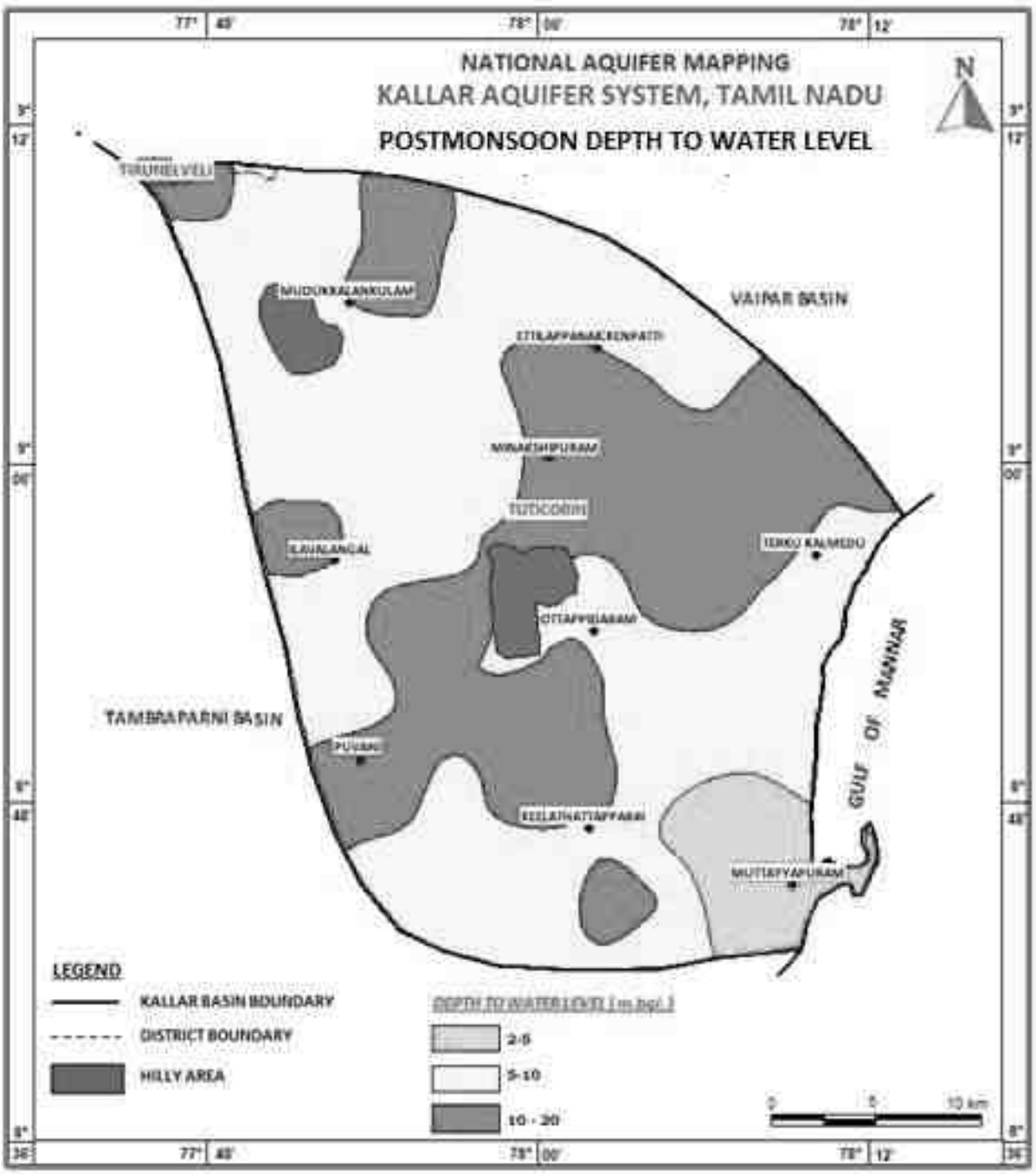



*Figure 19. Depth to water level (Aquifer-I): Postmonsoon of the Kallar aquifer system*

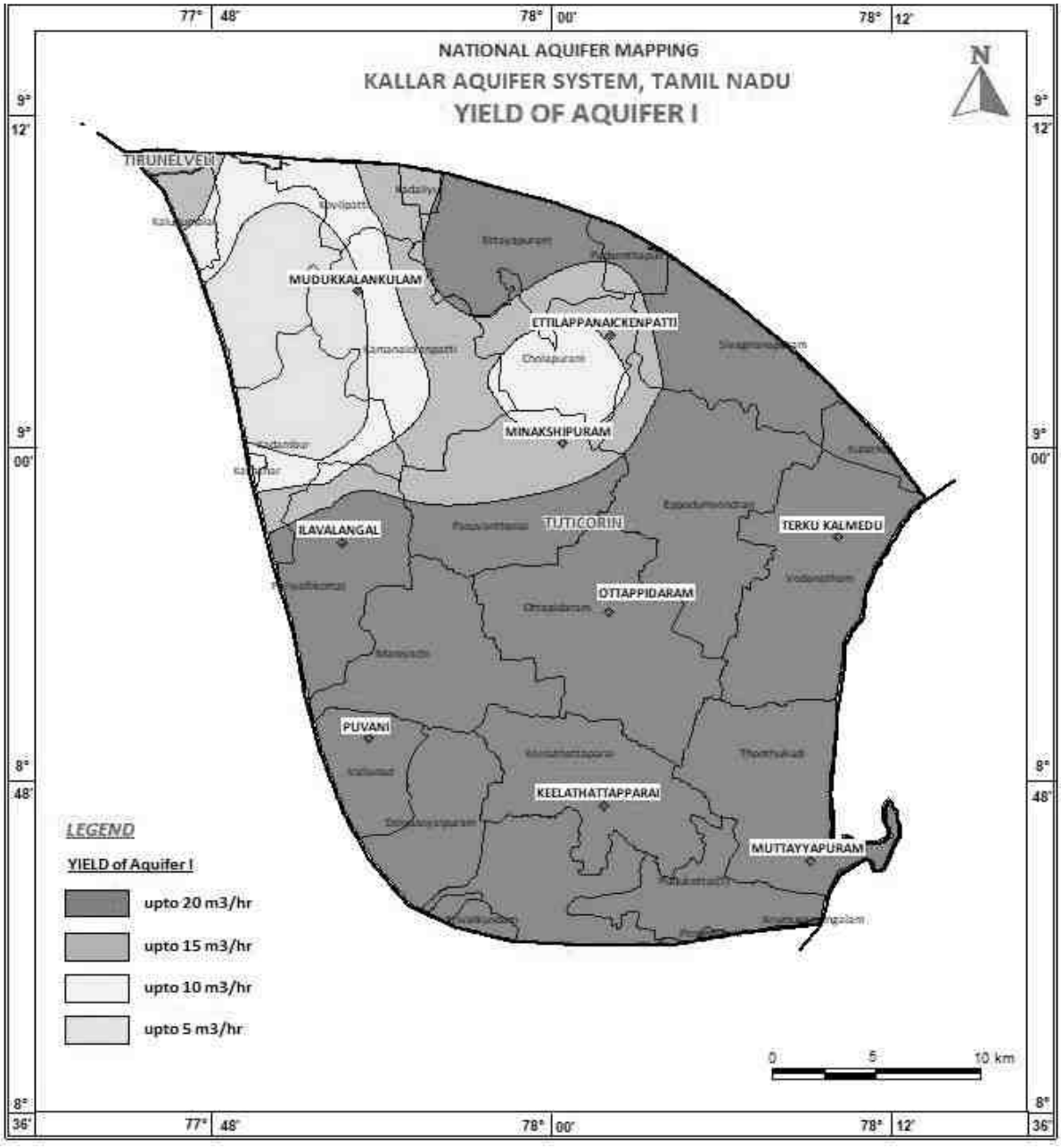



*Figure 20.Yield of Aquifer I- Kallar aquifer system*

**YIELD POTENTIAL HARD ROCK**

**Yield of Dug wells is 20 m3/hr in major swaths of SE and Central portion of the basin**

**NW flanks of the basin have lower yield ranging from 10-15 m3/hr**

**SEDIMENTARY**

**Yield > 20 m3/hr**

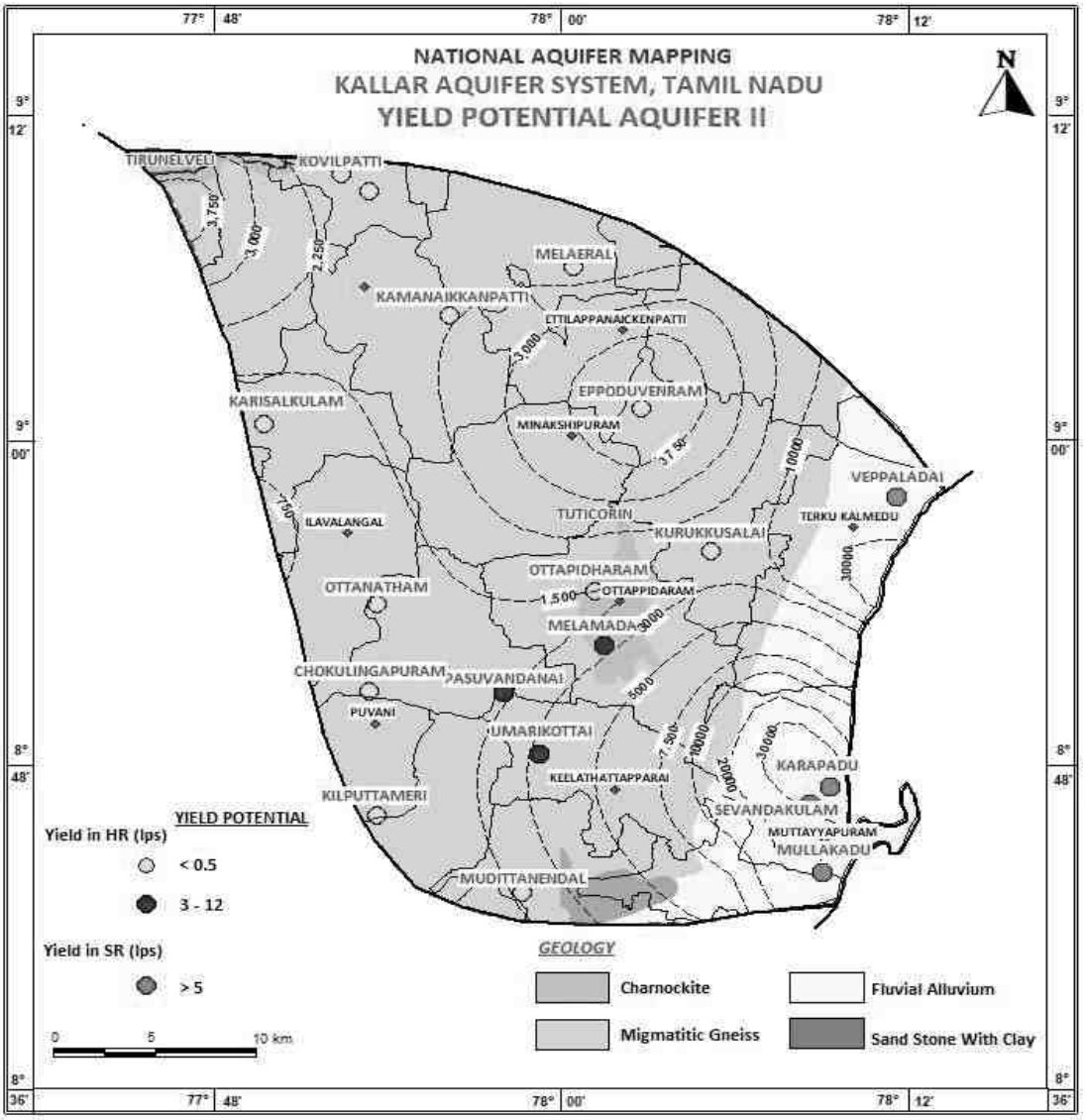



*Figure 21. Yield of Aquifer II- Kallar aquifer system*

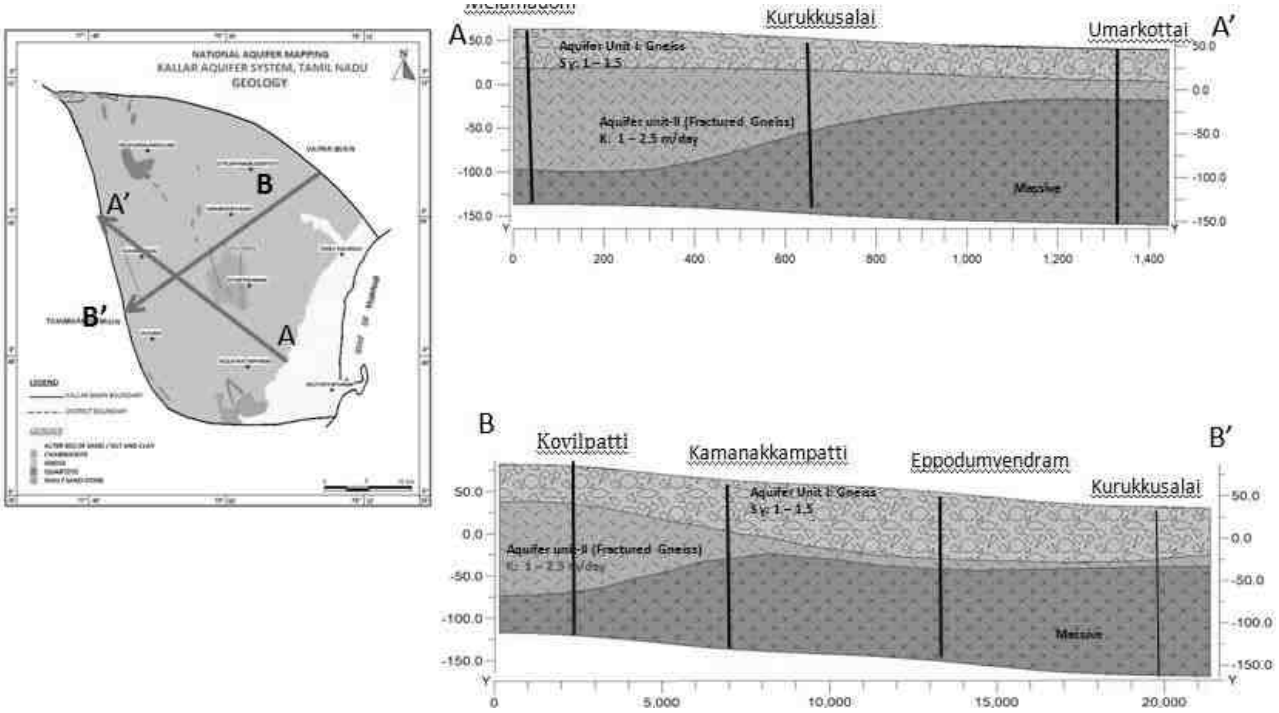



*Figure 22. 2D Aquifer Disposition along A-A' (NE-SW direction in Hard rock terrain of the Kallar Aquifer system).*

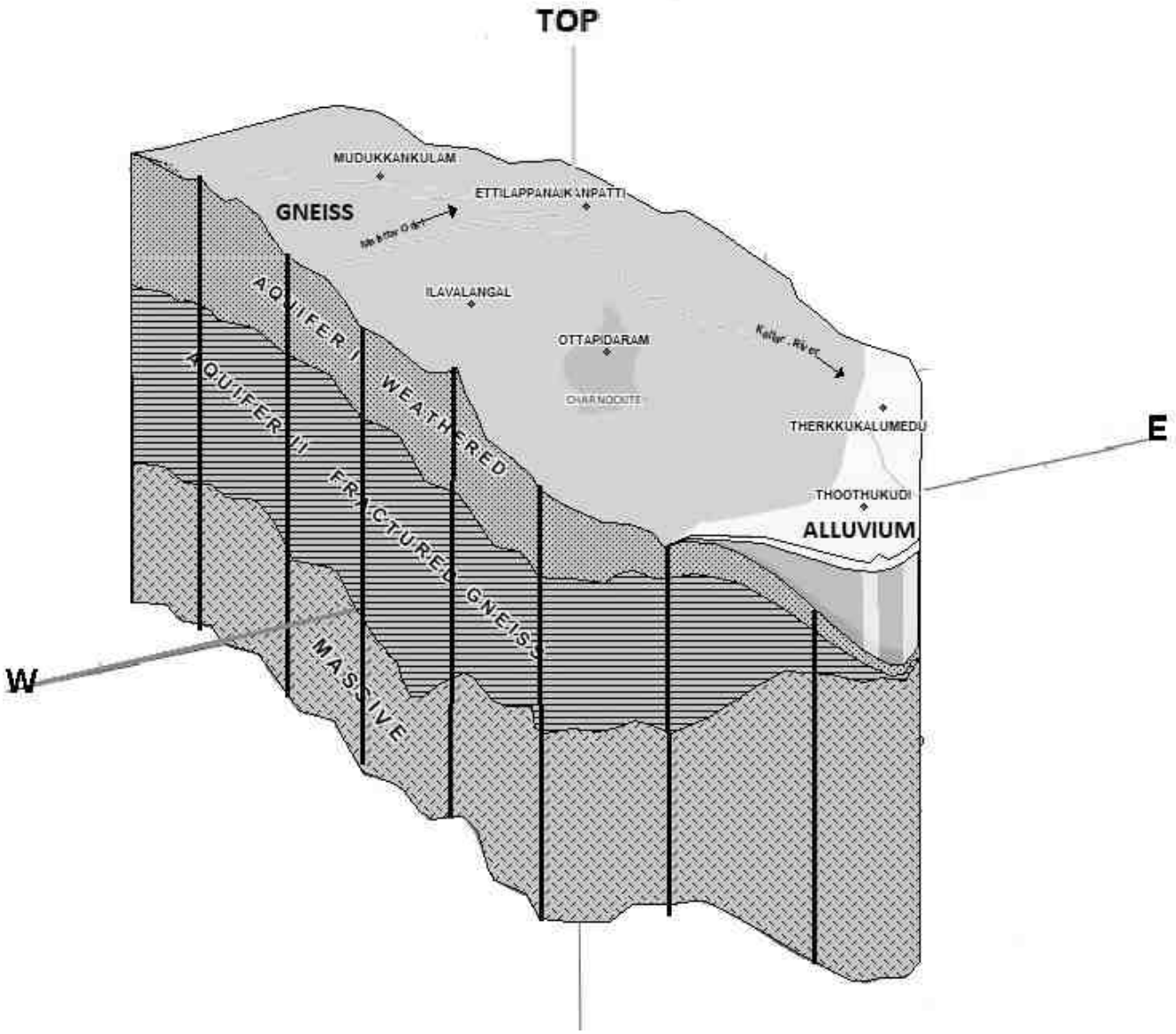
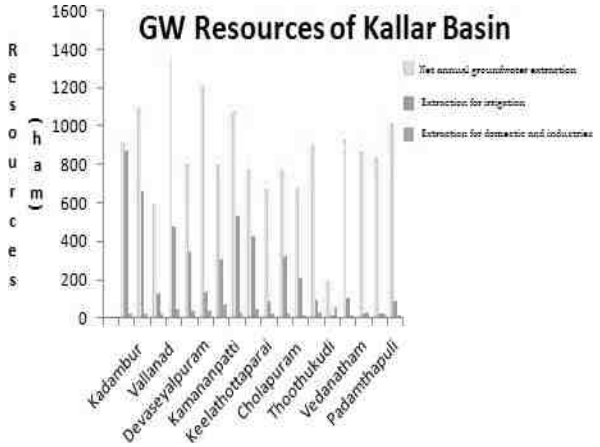
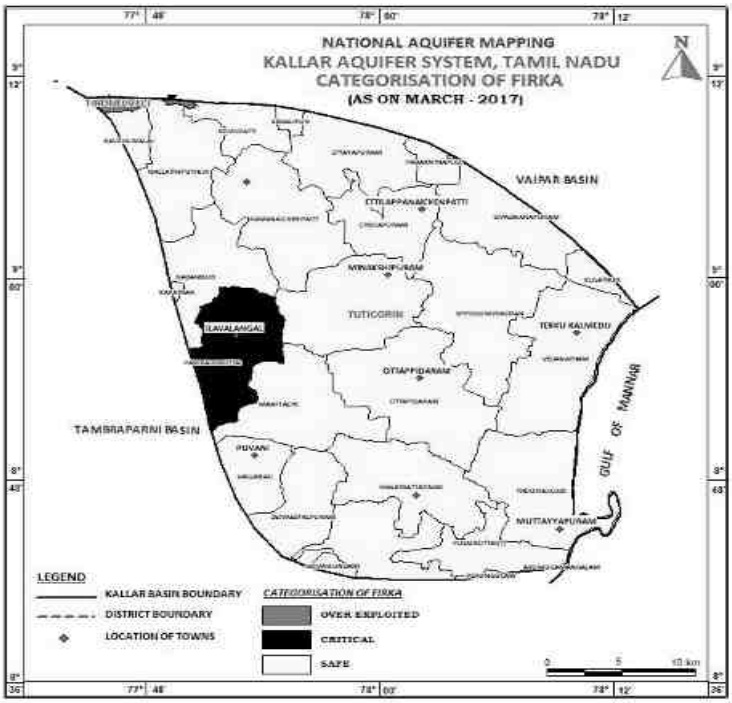



*Figure 23. 3D Aquifer Disposition of the Kallar Aquifer system.*




**Total firkas -19**

**Critical – 1 ; Safe - 18**



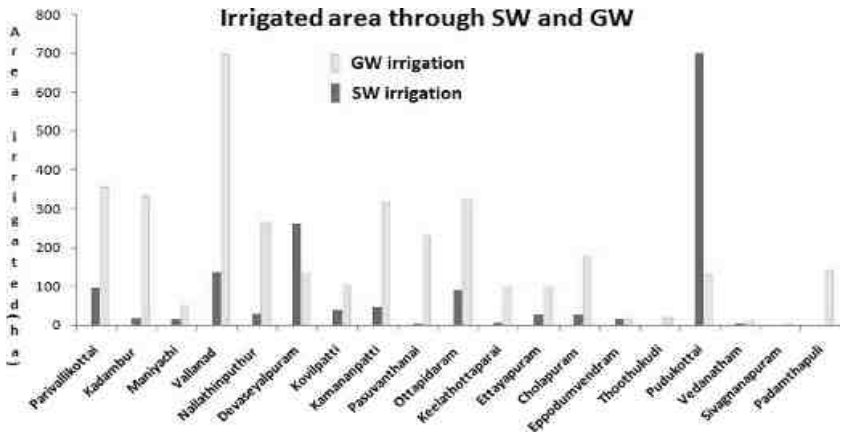




*Figure 24. Categorisation of assessment units in Kallar aquifer system*

*Table 7. Details of the Artificial recharge structures implemented by the State Groundwater Department*

| Sl No. | District | Village | Structure | Locatin | Department |
|---|---|---|---|---|---|
| 1. | Thoothuk Kudi | Thoothu kudi | CD | Ramasamypuram | AED |
| 2. | Thoothuk Kudi | Thoothu kudi | CD | Ramasamypuram | AED |
| 3. | Thoothuk Kudi | Thoothu kudi | RS | Peroorani, Allikulam | AED |

*Table 8. Groundwater Resources of KallarAquifer System*

| Assessment Unit (Firka) | Annual extractable Groundwater Recharge Ham | Existing Groundwater Extractionfor Irrigation in Ha m | Existing Grround water extraction for industrial Water supply in Ha m | Existing Grround water extraction for Domestic Water supply in Ha m | Existing Grround water extraction for All uses in Ha m | Allocation for domestic and industrial water supply in Ha m | Net Groundwater Availability for future irrigation extraction in Ha m | Stage of Groundwater extraction in % |
|---|---|---|---|---|---|---|---|---|
| Keelathataparai | 667.83 | 87.80 | 0.00 | 22.10 | 109.90 | 23.45 | 556.58 | 16.46 |
| Thoothukudi | 280.15 | 9.00 | 22.60 | 82.52 | 114.12 | 87.55 | 161.00 | 40.74 |

## 3.2 Kallar basin details

Rock types found in the area belong to the Khondalite and Charnockite groups and Migmatite Complex of Easter Ghats Supergroup (Archaean Age), which are unconformably overlain by Tertiary and Quaternary sediments. Garnet-biotite-sillimanite gneiss, quartzite, calc-granulite, and limestone of the Khondalite group, with epidiorite occurring as narrow linear bands. The Charnockite group is represented by acid variants. These rock types occur as xenoliths within the Migmatite Complex, occupy a major part of the area, comprising medium-grained hornblende-biotite gneiss and garnet-biotite gneiss. Gypsum, limestone, beach sand, kankar, and shell limestone are the Economic minerals of the district. Hard Rocks - 73% Sedimentary Rocks - 27% Crystalline Limestone, Multi-color dimension stone, rough stone/gravel, garnet, and ilmenite sand are notable economic importance minerals found in Thoothukudi District. Minor occurrences of Quartzite are also reported in the district, and the Stratigraphic succession of the area is given in Table 1:

*Table 9. Stratigraphic succession of the area:*

| Age | Period | Formation | Lithology |
|---|---|---|---|
| Quaternary | Holocene to Recent | Alluvium Colluvium | Red Soil, Coastal Sand, Clay, River Alluvium, Laterite, Red Teri, Kankar, Tuffaceous Kankar, Shell, Limestone, and Calcareous Sandstone. |
| Tertiary | Mio-Pliocence | Panamparai Sandstone | Hard Compact Calcareous Sandstone, Shell Limestone. |
| Proterozoic | Precambrian | Crystalline Complex | Charnockite, Mixed Composite Gneiss, Pelitic gneiss, Calc-Granulite and Quartzite. |

*Source: District survey report of Thoothukudi (Department of Geology and Mining) 2019*

## 3.3 Seismicity

As per the Seismic Zonation Map of India, the project site falls within Seismic Zone II, which signifies a low earthquake intensity zone. Recent records indicate earthquakes near the vicinity of the project area of magnitude 5.1, reported in the Bay of Bengal, which is located at about 818.79 km northeast of the site. The seismicity map is shown in Fig. No. 2.

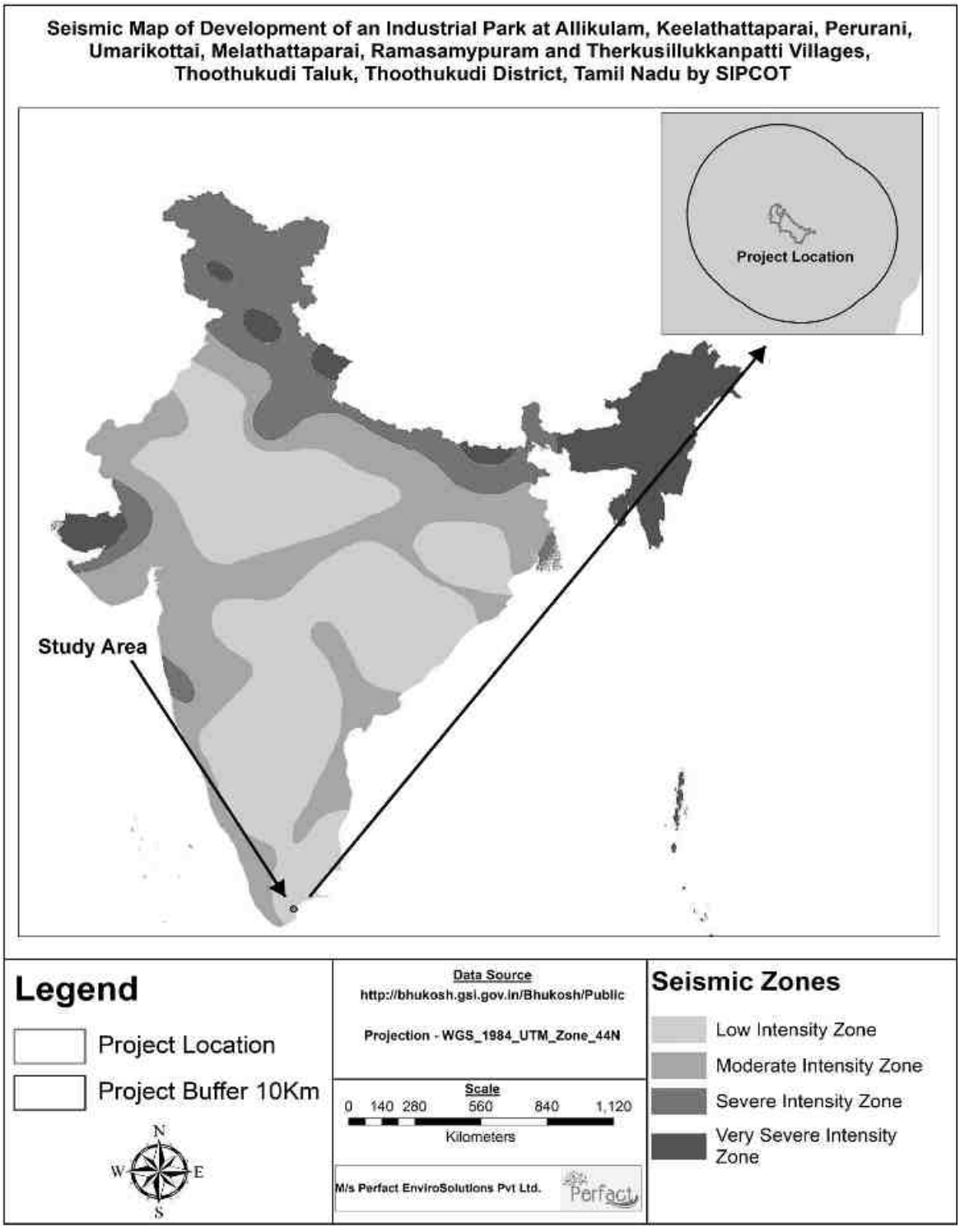



*Figure 25. Seismicity Map, 2025*

# 4. KORAMPALLAM BASIN

## 4.1 Proposed layout and zonation of SIPCOT Industrial Park at Allikulam

The proposed SIPCOT Industrial Park at Allikulam has been planned with due consideration to the existing physiography, natural drainage pattern, land capability, and environmental sensitivities of the region. The layout and zonation have been evolved based on topography, availability of infrastructure, environmental safeguards, and regulatory requirements under the EIA Notification, 2006.

The total project area has been systematically zoned into industrial plots, common infrastructure and utility areas, circulation networks, greenbelt zones, and conservation buffers, ensuring optimal land utilization while maintaining environmental sustainability. The layout clearly demarcates areas for EC category industries, Non-EC category industries, internal roads, common utilities, greenbelt, and stormwater drainage. The industrial park is zoned to maintain orderly land use, facilitate efficient movement, and integrate existing natural drainage features. Existing odais and drainage courses are retained within the layout, and suitable buffer areas are provided to ensure uninterrupted flow and groundwater recharge.

The land-use zonation of the SIPCOT Industrial Park at Allikulam is given below.

*Figure 26. Zonation details for SIPCOT Industrial Plot*

| Category | Type of Industries / Activities | Extent (ha) | Environmental Classification | Regulatory Requirement |
|---|---|---|---|---|
| **EC Category** | Technical Textiles, Man-Made Fibre (Lyocell, Tissue and other Technical Textile) (Red Category) | 202.43 | Schedule 5(d) – EC Category | Prior Environmental Clearance |
| **Non-EC Category** | Auto Components, Electrical, Engineering and Warehousing (Orange/Green/White Category ) | 318.979 | Orange/ Green/White | CTE & CTO from TNPCB |
| **Total Industrial Plot Area** | | **521.409** | | |

## 4.2 Topography ( falls in Korampallam Drain Basin )

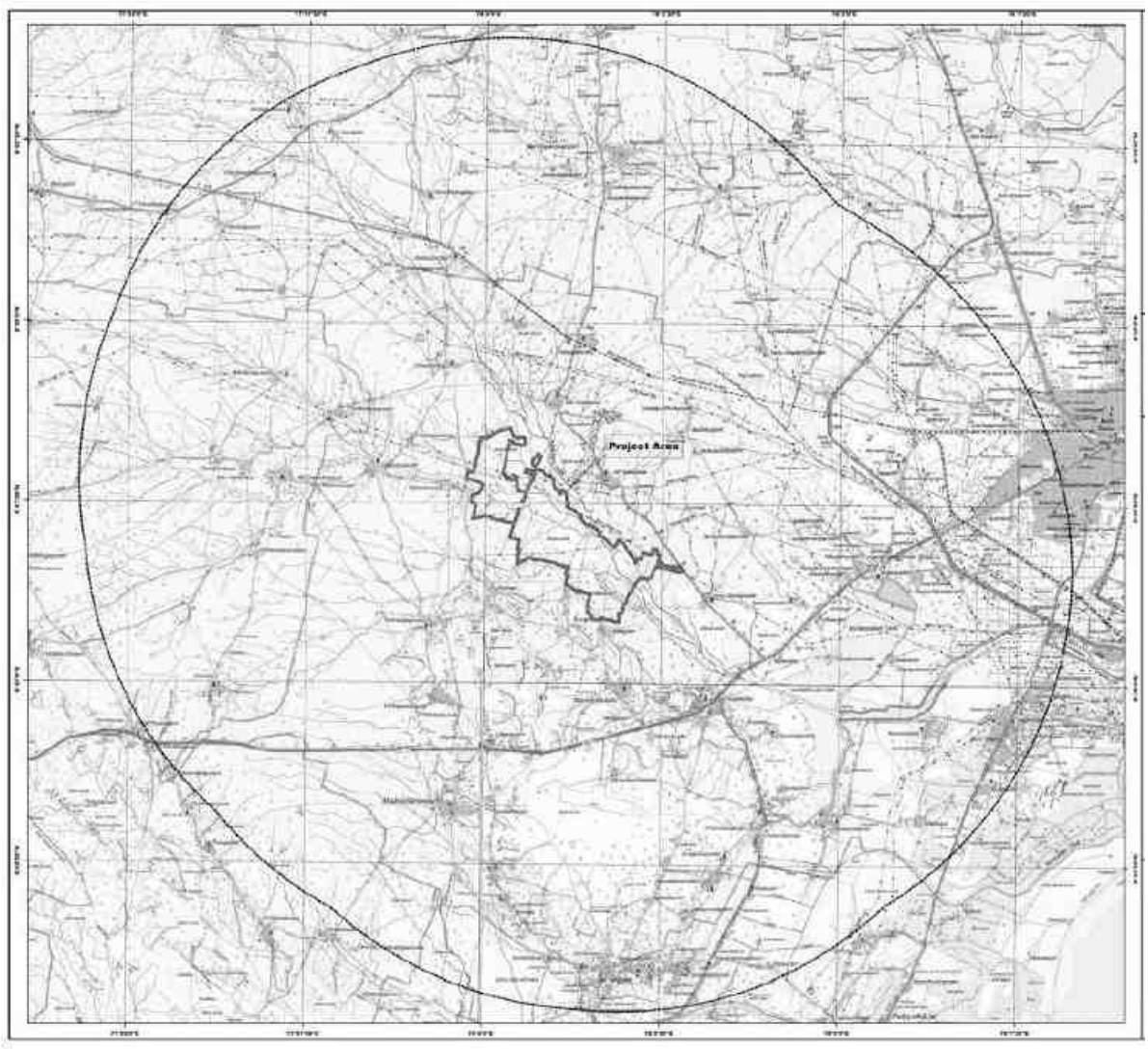



*Figure 27. Topography showing Site falls in Kallar basin*

### 4.2.1 Core zone

Topographically, the proposed site area is almost flat. As per the KML file, the minimum elevation of the project site is 32 m AMSL in the east of the site, whereas the maximum elevation is 38 m AMSL in the north, close to the project boundary.

### 4.2.2 Buffer zone

The buffer area has almost flat topography. As per the KML file, the maximum elevation of 82 m AMSL is in the north close to the periphery, whereas the minimum elevation is 20 m AMSL in the southeast close to the periphery, as shown in the map given in Fig. 28.

## 4.3 Water Environment

### 4.3.1 Core Zone

The project site is drained by the Odai and Nilaviyal odai which finally drains into Korampallam tank . These streams flow through the project site . One stream of Nilaviyal odai flows in the North and another flows in the south -Southeast.

- Odai passing from West to East -Southeast .
- The core zone has dendritic drainage patterns having first to third order streams.
- It is a Zero Liquid Discharge (ZLD) project; therefore, no stormwater will be discharged outside the project premises. Detailed information regarding the stormwater management system is given in Paragraph 5.3 below.

### 4.3.2 Buffer Zone

- Part of buffer zone area is also drained by the Nilaviyal odai and Odai.
- The first to third order streams in a northwest direction join together to form the Nilaviyal Odai, which flows from northwest to east through the project site.
- The confluence of the Nilaviyal and Odai is located within the project site near the northern boundary.
- The buffer zone comprises various water bodies such as streams, drains, ponds, and Ponds, etc.
- The area has a dendritic drainage pattern having first to fourth-order streams.
- The rainwater flows and slopes of the area both towards the eastern periphery.

The drainage map is given in Figure No. 5. The water bodies of the area are given in Table No.4.

*Table 10. Water Bodies*

| Environmental Feature / Sensitive Receptor | Approximate Distance (km) | Direction (from Project Site) |
|---|---|---|
| **Water Bodies** | | |
| Nilviyal odai Within Project Area | Odai Within Project Area | Passing through the site |
| Odai within Project Area | Odai Within Project Area | Passing through the site |
| Nilaviyal odai Within Project Area | Odai Within Project Area | Passing through the site |
| Pond near Project Area | 0.21 | NE |
| Pond near Project Area | 0.31 | NW |
| Pond near Project Area | 0.39 | SSW |
| Allikulam Pond | 0.43 | S |
| Pond near Perurani | 0.80 | S |
| Pond near Allikulam | 0.80 | SSE |

| Environmental Feature / Sensitive Receptor | Approximate Distance (km) | Direction (from Project Site) |
|---|---|---|
| Swimming Pond near Perurani | 1.01 | S |
| Neeravi Pond Perurani | 1.13 | SW |
| Pond near Perurani | 1.25 | WSW |
| Perurani Pond | 1.28 | SW |
| Kadamba Kulam ( Fishing Pond ) | 1.53 | SSE |
| Pond near Perurani | 1.56 | SW |
| Pond near Mel Kuttudankadu | 1.90 | S |
| Pond Elim (Kanchan Kulam) | 2.07 | SSE |
| Vepan Pond | 2.11 | SW |
| Pond near Umari kkottai | 2.39 | NW |
| Pond near Putupatti | 3.04 | SSW |
| Koram Pallam Tank | 3.52 | SE |
| Pond near Varthagareddypatti | 3.52 | SW |
| Pond near Varthagareddypatti | 3.60 | SW |
| periya Kulam water body | 3.80 | SW |
| Pond Bethesda | 3.85 | SSE |
| Senkulam River (River Port) | 4.49 | ENE |
| Pond near Korampallam | 5.06 | E |
| Pond near Korampallam Check Dam | 5.38 | SE |
| North Channal | 6.31 | SSE |
| Pond near Jambulinga Puram | 6.84 | NNE |
| Canal near Tiruvai Puram | 7.18 | SSE |
| Pond near Melmatan | 7.68 | NNE |
| Pond near Sakkammal Puram | 7.73 | SSE |
| Canal near Peykulam | 7.75 | SSE |
| Canal near Brahmapuram | 8.10 | SSE |
| Canal near Manakkudu | 8.50 | SSE |
| Sivathaiya Puram Pond | 8.57 | SSE |

## 4.4 Surface Water Quality

Water sampling locations were selected based on the following criteria: source of water, flow of water, geological structure (hydrogeology), use of water, depth of water table, etc. Surface water was collected from upstream and downstream to study the chemical parameters. During surface water sampling, flows of water play an important role.

In the present study, sources of surface water are Niaviyal Odai Upstream (SW1), Drain onsite(SW2), Odai onsite(SW3), Thiruvanthapuram Pond (0.43km S) (SW4), Pond near Keelathatapparai (0.46km N) (SW5), Allikulam Pond (0.53km SE)(SW6), Perurani Pond (0.65km SW) (SW7), Elim Pond (2.12km SSE) (SW8) and Bethesda pond (4.12 km SSE) (SW9) and Pond near Korampallam (5.28 km E) (SW10).. The surface water sample results are shown below:

- The surface water quality of the Niaviyal Upstream (SW1) shows that the maximum of the parameters is within the CPCB Surface Water Quality Criteria. pH is 6.94, BOD is 3.2 mg/l, DO is 6.0 mg/l, and total Coliform is 109.0 MPN/100 ml. Thus it can be concluded based on the results that the surface water quality of the collected sampling location can be placed in Class "D" i.e., the propagation of wildlife and fisheries.
- The surface water quality of the Drain onsite(SW2) shows that the maximum of the parameters is within the CPCB Surface Water Quality Criteria. pH is 7.41, BOD is 8.2 mg/l, DO is 6.5 mg/l, and total Coliform is 141.0 MPN/100 ml. Thus, it can be concluded based on the results that the surface water quality of the collected sampling location can be placed in Class "D" i.e., the propagation of wildlife and fisheries.
- The surface water quality of the stream onsite(SW3) shows that the maximum of the parameters is within the CPCB Surface Water Quality Criteria. pH is 7.5, BOD is 28.0 mg/l, DO is 3.9 mg/l, and total Coliform is 278.0 MPN/100 ml. Thus, it can be concluded based on the results that the surface water quality of the collected sampling location can be placed in Class "D", i.e., the propagation of wildlife and fisheries.
- The surface water quality of the Thiruvanthapuram Pond (0.43km S) (SW4) shows that the maximum of the parameters is within the CPCB Surface Water Quality Criteria. pH is 7.2, BOD is 14.0 mg/l, DO is 4.7 mg/l, and total Coliform is 141.0 MPN/100 ml. Thus, it can be concluded based on the results that the surface water quality of the collected sampling location can be placed in Class "D," i.e., the propagation of wildlife and fisheries.
- The surface water quality of the Pond near Keela Thatapparai (0.46km N) (SW5) shows that the maximum of the parameters is within the CPCB Surface Water Quality Criteria. pH is 7.4, BOD is 20.0 mg/l, DO is 4.8 mg/l, and total Coliform is 94.0 MPN/100 ml. Thus, it can be concluded based on the results that the surface water quality of the collected sampling location can be placed in Class "D," i.e., the propagation of wildlife and fisheries.
- The surface water quality of the Allikulam Pond (0.53km SE)(SW6) shows that the maximum of the parameters is within the CPCB Surface Water Quality Criteria. pH is 7.2, BOD is 28.0 mg/l, DO is 4.4 mg/l, and total Coliform is 54.0 MPN/100 ml. Thus, it can be concluded based on the results that the surface water quality of the collected sampling location can be placed in Class "D" i.e., the propagation of wildlife and fisheries.
- The surface water quality of the Perurani Pond (0.65km SW) (SW7) shows that the maximum of the parameters is within the CPCB Surface Water Quality Criteria. pH is 7.1, BOD is 4.0 mg/l, DO is 5.4 mg/l, and total Coliform is 84.0 MPN/100 ml. Thus, it can be concluded based on the results that the surface water quality of the collected sampling location can be placed in Class "D" i.e., the propagation of wildlife and fisheries.
- The surface water quality of the Elim Pond (2.12km SSE) (SW8) shows that the maximum of the parameters is within the CPCB Surface Water Quality Criteria. pH is 7.06, BOD is 34.0 mg/l, DO is 4.1 mg/l, and total Coliform is 70.0 MPN/100 ml. Thus, it can be concluded based on the results that the surface water quality of the collected sampling location can be placed in Class "D", i.e., the propagation of wildlife and fisheries.
- The surface water quality of the Bethesda Pond shows that the values of the parameters including TDS, total hardness, calcium, magnesium, and alkalinity are within the IS drinking

water quality standards. BOD and DO value indicating that the surface water quality of Bethesda Pond can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality- Designated Best Use Water Quality Criteria.

- The surface water quality of the Pond near Korampallam shows that the values of the parameters including TDS, total hardness, calcium, magnesium, and alkalinity are within the IS drinking water quality standards. BOD and DO value indicating that the surface water quality of Pond near Korampallam can be placed in Class "C" i.e., Drinking water source after conventional treatment and disinfection per CPCB surface water quality- Designated Best Use Water Quality Criteria.

The details are given in paragraph no. 3.8.1.5 in Chapter 3. The water sampling locations map is shown in Fig. 4.

## 4.5 Flood History

The Odai and Nilaviyal Odai in the project area are ephemeral, with flow occurring during the monsoon season. During the primary survey, local people informed that there were no records of flooding associated with these streams. They generally carry runoff from the surrounding terrain during periods of heavy rainfall but do not pose a major threat to the area. However, both streams pass through the project site; therefore, flood precautions should be taken during the monsoon season.

## 4.6 Groundwater

### 4.6.1 Geohydrology

As per the Central Ground Water Board (CGWB) report 2009, the area is underlain by both porous and fissured formations. The important aquifer systems in the area comprise:

i) Unconsolidated and semi-consolidated formations,
ii) Weathered and fractured crystalline rocks.

The porous formations in the district KALLAR REGION , Korampallam Drain. include Redsoil, sandstones and clays of Recent to Sub-Recent and Tertiary (Quaternary) age. The recent formations, consisting mainly of Redsoil, clays, and gravels, are confined to the major drainage courses of the area. Groundwater in these formations occurs under both water table (unconfined) and confined conditions and is developed through dug wells and filter points. The alluvium also forms a productive aquifer system in the region.

The occurrence and movement of groundwater in the crystalline rocks occur under unconfined conditions within joints and fissures and depend on the nature, extent, and interconnection of the fracture zones. The pre-monsoon depth to water level in the area ranges from 1.20 to 12.12 m below ground level (BGL), while the post-monsoon water level varies from 0.33 to 9.24 m BGL.

*Source: District Groundwater Brochure Thoothukudii District, Tamil Nadu 2009*

### 4.6.2 Groundwater Development

The area falls under the taluka and district Thoothukudi. As per the CGWB report (2023-24), the area falls under the safe category with the stage of groundwater development at about 16.06%.

*Table 11 Details of Thoothukudi Taluka Groundwater Resource.*

| Taluka | Total Annual Groundwater (Ham) Recharge | Annual Extractable Groundwater Resource (Ham) | Total Extraction (Ham) | Annual GW Allocation for for Domestic Use as on 2025 (Ham) | Net Groundwater Availability for future use (Ham) | Stage of Groundwater Development (in %) | Category |
|---|---|---|---|---|---|---|---|
| Thoothukudi | 408.72 | 367.83 | 59.09 | 87.55 | 228.38 | 16.06 | Safe |

*Source: CGWB Report Of Dynamic Groundwater Resources Of Tamil Nadu 2024*

### 4.6.3 Groundwater Quality

The various indicators of water quality form one of the most important tools for impact assessment in the future; therefore, it is imperative to assess the existing water quality of both ground and surface water occurring in the area. To generate the baseline water quality (physicochemical and biological) of the region, a study was undertaken, and eight sampling locations were identified.

The groundwater quality was analyzed at eight locations, namely Onsite /Nearby (W1), Thiruvanthapuram (1.05km WSW) (W2), Therku Silukkanpatti (1.41km SE) (W3), Keela Thatapparai (1.69km N) (W4), Kuttudankadu (2.47km S) (W5), Perurani (2.94km SW) (W6), Melathattaparai (3.92km NNW) (W7), and Allikulam (1.25km SSW) (W8). The detailed groundwater quality parameters for all sampling locations are given below:

- Total dissolved solids at the sampling locations vary from 140.80 mg/l in Perurani (2.94km SW) (W6) to 1901.50 mg/l in Onsite /Nearby (W1).
- The Total Hardness at the sampling locations varies from 88.00 mg/l in Perurani (2.94km SW) (W6) to 1484.00 mg/l in Onsite /Nearby (W1).
- The Magnesium content at the sampling locations varies from 8.70 mg/l in Perurani (2.94km SW) (W6) to 117.60 mg/l in Onsite /Nearby (W1).
- The Alkalinity at the sampling locations varies from 92.00 mg/l in Perurani (2.94km SW) (W6) to 300.00 mg/l in Keela Thatapparai (1.69km N) (W4).
- The Calcium Concentration at the sampling locations varies from 21.00 mg/l in Perurani (2.94km SW) (W6) to 401 mg/l in Onsite /Nearby (W1).
- The Chloride Concentration at all the sampling locations varies from 34.00 mg/l in Perurani (2.94km SW) (W6) to 519.00 mg/l in Onsite /Nearby (W1).
- All the above samples were collected from different sources at various locations. Sample W1 represents water supplied through tankers. Samples W2, W3, W5, and W6 were collected

from groundwater sources (household submersible pumps), while samples W8 and W4 were collected from a hand pump and an open well, respectively.

- It was observed that the sample water supplied through tankers (W1) shows higher values of total hardness, Ca, and Mg. The values are even higher than the permissible limits in the absence of an alternate source. The issue needs to be addressed.

The details are given in Chapter 4. The water sampling locations map is shown in Fig. 29.

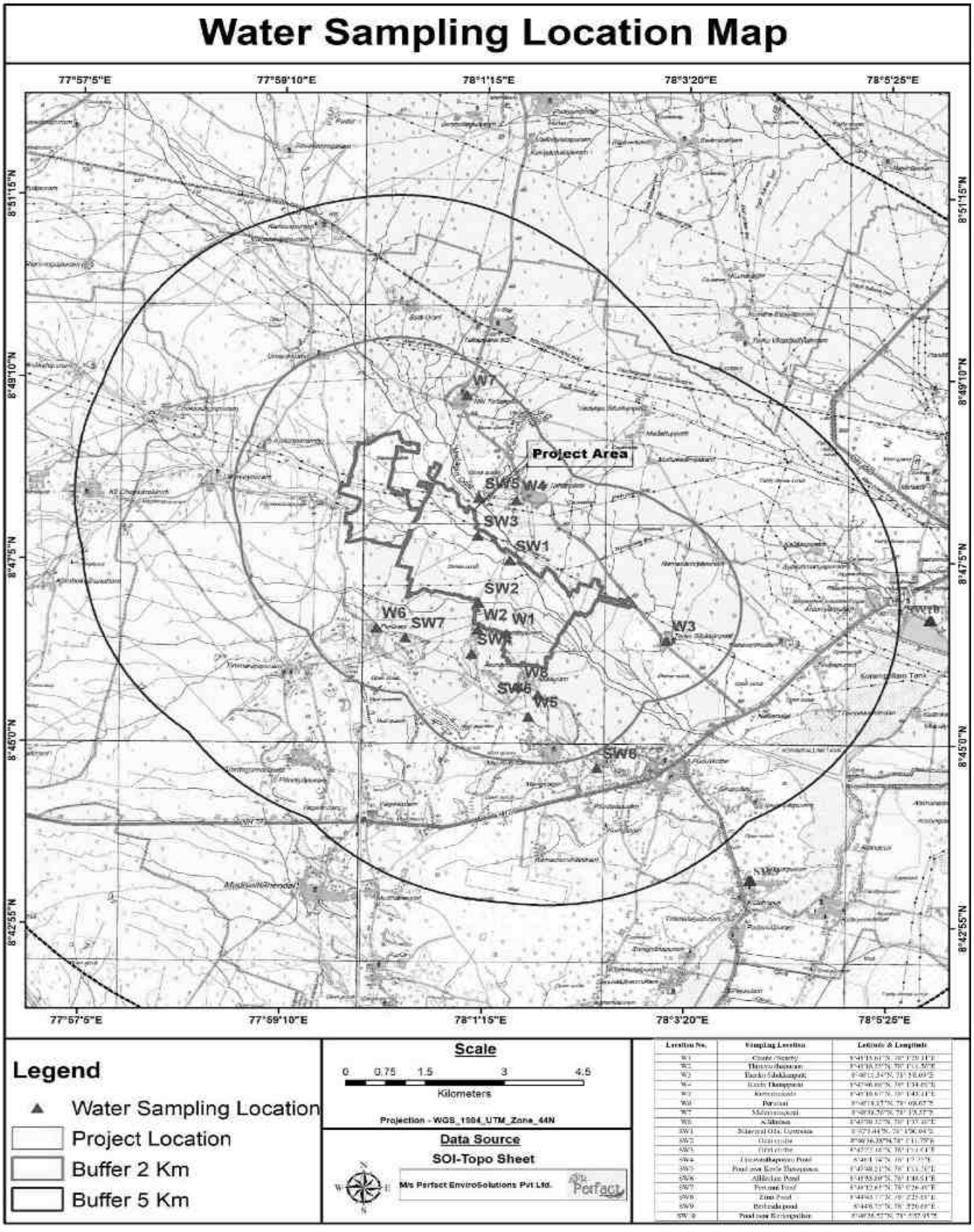



*Figure 29.Water Sampling Location Map*

# 5. PROJECT RELATED DETAILS AS APPLICABLE FOR GROUNDWATER REJUVENATION PLAN

## 5.1 Stormwater Management

- A comprehensive stormwater drainage network has been planned for the SIPCOT Industrial Park to ensure efficient collection and disposal of surface runoff during rainfall events. The system is designed considering the natural terrain and slope of the site to prevent waterlogging and ensure safe discharge into the existing stream after necessary silt removal through catch pits and sedimentation chambers.
- The stormwater will be regularly monitored for water quality before discharge into the natural stream.

**The Stormwater drainage system will consist of:**

- Drains following the road network grid pattern.
- Collection chambers and culverts at appropriate intervals.
- Proper outfall connections to natural drainage channels.
- Silt traps and oil & grease separators at industrial plot outlets (to be installed by individual industries).
- The stormwater drain network area accounts for 54.462 ha (6.84% of the total developable area).

**Although SIPCOT will not provide a common Rainwater Harvesting (RWH) facility,** each individual industry within the park will be mandated to install roof-top rainwater harvesting systems and ground recharge pits as per TNPCB and BIS standards. These provisions will ensure groundwater recharge and minimize surface runoff from individual plots, contributing to the overall water sustainability of the industrial park.

# 6. ASSESSMENT OF TOTAL RAINFALL WITHIN THE PROPOSED INDUSTRIAL DEVELOPMENT

## 6.1. Potential Collection of Roof top Rainwater

The proposed SIPCOT Industrial Park comprises extensive roof-top areas from industrial, commercial, and amenities developments, offering significant potential for rainwater harvesting. Based on an average annual rainfall of 0.69615 m and 43 rainy days, the average roof-top rainwater harvesting potential of the Industrial Park is estimated at 34,394 m³/day, excluding the Lyocell unit. This includes 26,930 m³/day from industrial plots (other than the Lyocell unit), 1,596.5 m³/day from commercial plots, and 529 m³/day from amenities plots. SIPCOT does not propose any common rainwater harvesting system for the Industrial Park. Individual industries shall be mandated to install rooftop rainwater harvesting and groundwater recharge systems within their respective plots as per TNPCB and BIS norms. Each unit shall harvest not less than 50% of its roof-top rainwater potential within the plot. The surplus roof-top rainwater of about 14,518 m³/day will be safely conveyed to the stormwater drainage network.

The proposed Lyocell Manufacturing Unit has an independent roof-top rainwater harvesting potential of 5,358 m³/day under average rainfall conditions. Two ponds are proposed within the Lyocell unit with an average holding capacity of three days of roof-top rainwater, ensuring effective storage and reuse.

In addition to roof-top runoff, stormwater generated from open areas, roads, greenbelt, and non-development areas will be managed through a dedicated stormwater drainage system. The average stormwater generation during a rainy day is estimated at 48,720 m³/day. Including excess roof-top runoff, the total stormwater volume to be managed works out to approximately 63,238 m³/day.

For peak rainfall conditions, a design rainfall of 0.21 m/day has been considered. The stormwater drainage system comprises Drains, collection chambers, culverts, silt traps, sedimentation chambers, and oil & grease separators at plot outlets. A drain of 1.5 m width and 1.2 m depth, with a total length of 28,650 m, is proposed along the site boundary. Percolation pits of 1 m diameter and 3.5 m depth (2.75 m³ capacity) are provided at 50 m intervals to maximize groundwater recharge.

Surplus stormwater and excess roof-top runoff will be safely discharged into Nilaviyal Odai after sediment control, ensuring prevention of waterlogging, moderation of peak flows, and protection of downstream drainage and river systems. A suitable groundwater rejuvenation plan will be implemented in consultation with WRD and local administration.

*Table 12.Break-up of Roof-top Rainwater, Stormwater and Excess Runoff – Proposed SIPCOT Industrial Park*

| Sl. No. | Component | Source Area / Description | Average Quantity (m³/day) | Management / Disposal Method |
|---|---|---|---|---|
| **A.** | **Roof-top Rainwater** | | | |
| 1 | Industrial Units (other than Lyocell) | Roof-top areas within industrial plots | 26,930 | ≥50% harvested within plots; surplus to stormwater drain |
| 2 | Commercial Plots | Roof-top areas | 1,596.5 | Harvested within plots; |

| Sl. No. | Component | Source Area / Description | Average Quantity ($m^3$/day) | Management / Disposal Method |
|---|---|---|---|---|
| | | | | surplus to stormwater drain |
| 3 | Amenities Plots | Roof-top areas | 529 | Harvested within plots; surplus to stormwater drain |
| **Subtotal – Other Units** | | | **34,394** | Plot-level RWH |
| 4 | Lyocell Manufacturing Unit | Roof-top area of Lyocell plant | 5,358 | Stored in two ponds (3-day holding) |
| **Total Roof-top Rainwater** | | | **39,752** | Harvested / Stored / Drained |
| **B.** | **Excess Roof-top Runoff** | | | |
| 5 | Surplus roof-top runoff from other units | After minimum 50% harvesting | 14,518 | Conveyed to stormwater drainage system |
| **C.** | **Stormwater from Open Areas** | | | |
| 6 | Roads, greenbelt, open & non-development areas | Surface runoff on rainy day | 48,720 | Stormwater drainage network |
| **D.** | **Total Stormwater to Drainage System** | | | |
| 7 | Open-area stormwater + excess roof-top runoff | — | 63,238 | Drain → Nilaviyal Odai |
| **E.** | **Drainage & Recharge Infrastructure** | | | |
| 8 | Stormwater drain | 1.5 m (W) × 1.2 m (D), 28,650 m length | — | Drain |
| 9 | Percolation pits | 1 m dia × 3.5 m deep (2.75 $m^3$), @ 50 m | — | Groundwater recharge |
| 10 | Final outfall | After silt & sediment control | — | Nilaviyal Odai |

### 6.2. Catchment area and Peak Rainwater flow through these streams

The proposed SIPCOT Industrial Park forms a defined hydrological catchment comprising roof-top areas, paved surfaces, roads, greenbelt, and non-development areas. Rainwater generated within the site is managed through a combination of plot-level rooftop rainwater harvesting, groundwater recharge structures, and a comprehensive stormwater drainage network. The system is designed to safely convey excess runoff during peak rainfall events to Nilaviyal Odai after adequate silt and sediment control, without increasing downstream flood risk.

For peak rainfall assessment, a design rainfall of 0.21 m/day has been adopted. Peak runoff generation and conveyance have been evaluated to ensure that the proposed development does not result in flooding, erosion, or adverse impacts on the natural drainage system.

#### 6.2.1 Proposed Roof-top RWH scheme

Roof-top areas constitute a major portion of the catchment and generate relatively clean runoff. SIPCOT does not propose a common roof-top rainwater harvesting system. Instead, individual

industries are mandated to adopt rooftop rainwater harvesting and groundwater recharge systems within their respective plots, as per TNPCB and BIS standards.

Each unit shall harvest not less than 50% of its roof-top rainwater potential within the plot. Surplus roof-top runoff will be safely diverted to the stormwater drainage network. The Lyocell Manufacturing Unit has an independent roof-top rainwater harvesting and storage system with ponds designed for three days holding capacity.

*Table 13. Catchment-wise Roof-top Rainwater Harvesting Potential*

| Sl. No. | Catchment / Plot Type | Roof-top Area (m²) | Average RWH Potential (m³/day) | Management Strategy |
|---|---|---|---|---|
| 1 | Industrial Units (other than Lyocell) | 1,848,244 | 26,930 | ≥50% harvested within plots; surplus to drains |
| 2 | Commercial Plots | 108,200 | 1,596.5 | Plot-level RWH; surplus to drains |
| 3 | Amenities Plots | 36,316 | 529 | Plot-level RWH; surplus to drains |
| **Subtotal – Other Units** | | | **34,394** | Individual plot RWH |
| 4 | Lyocell Manufacturing Unit | 367,750 | 5,358 | Stored in ponds (3-day holding) |
| **Total Roof-top Runoff** | | | **39,752** | Harvested / Stored / Drained |

## 6.2.2 Proposed Stormwater Management

Stormwater generated from open areas, roads, greenbelt, and non-development zones, along with excess roof-top runoff, will be managed through a dedicated stormwater drainage system. The drainage network includes drains, collection chambers, culverts, silt traps, sedimentation chambers, and oil & grease separators at plot outlets.

During an average rainy day, stormwater generation from open areas is estimated at 48,720 m³/day. Including excess roof-top runoff of 14,518 m³/day, the total stormwater volume to be handled by the drainage system works out to approximately 63,238 m³/day.

Under peak rainfall conditions (0.21 m/day), the stormwater drains are designed to safely convey runoff without overtopping. A drain of 1.5 m width and 1.2 m depth with a total length of 28,650 m is proposed along the site boundary. Percolation pits of 1 m diameter and 3.5 m depth (2.75 m³ capacity) are provided at 50 m intervals to enhance groundwater recharge and attenuate peak flows.

*Table 14. Stormwater Catchment Peak Flow and Management Measures*

| Sl. No. | Catchment Component | Average Runoff (m³/day) | Peak Rainfall Consideration | Management / Conveyance |
|---|---|---|---|---|
| 1 | Open areas, roads, greenbelt & non-development zones | 48,720 | Peak RF = 0.21 m/day | Stormwater drains |

| | | | | |
|---|---|---|---|---|
| 2 | Excess roof-top runoff (after RWH) | 14,518 | Included in peak flow | Drain |
| **Total Stormwater Flow** | | **63,238** | Peak flow safely conveyed | To Nilaviyal Odai |
| 3 | **Drain** | | Designed for peak flow | 1.5 m (W) × 1.2 m (D), 28,650 m |
| 4 | **Percolation pits** | | Peak attenuation | 1 m dia × 3.5 m deep @ 50 m |
| 5 | **Final outfall** | | After sediment control | Nilaviyal Odai |

## 6.3 Proposed Rejuvenation Scheme

The proposed rejuvenation scheme for the SIPCOT Industrial Park has been designed to effectively manage runoff generated from the proposed industrial development, with specific emphasis on attenuation of peak flows, temporary storage of stormwater surges, groundwater recharge, and regulated discharge into Nilaviyal Odai. The scheme is fully integrated with the site drainage and rainwater harvesting infrastructure and is adequate to handle runoff arising from the proposed land use and built-up conditions.

The rejuvenation strategy integrates plot level rooftop rainwater harvesting, stormwater detention within Drains, percolation pits, and storage ponds within the Lyocell unit. These measures collectively ensure that rainwater generated within the Industrial Park is captured, delayed, infiltrated, and reused to the maximum extent feasible, and only the regulated excess is conveyed to the natural drainage system after adequate sediment control.

This approach significantly reduces instantaneous discharge, moderates peak flows, and improves the hydrological response of the catchment, thereby ensuring that the proposed Industrial Park does not cause flooding, erosion, or adverse impacts on Nilaviyal Odai and downstream areas.

### 6.3.1 Holding time of Huge water surge within the Park

During peak rainfall events, the proposed Industrial Park is expected to generate a temporary surge of stormwater due to increased impervious surfaces. The site has been designed with sufficient on-site holding and attenuation capacity to manage such surges without immediate transmission to the receiving stream.

Based on the hydrological analysis, the incremental peak runoff due to the proposed development is estimated at 42036 KLD, which corresponds to a peak inflow of approximately 1.46 KL per second under design rainfall conditions. Through the implementation of rooftop rainwater harvesting systems, storage ponds within the Lyocell unit, stormwater drain detention capacity, and percolation pits, the effective discharge rate at the outfall is reduced to approximately 0.17 KL per second.

The stormwater drainage network provides a total holding capacity of about 53261 cubic metres, supplemented by 1691 cubic metres of recharge capacity through percolation pits and three days of rooftop runoff storage within the Lyocell unit. This combined capacity provides adequate holding time to absorb peak inflows, delay runoff release, and allow gradual infiltration and controlled conveyance.

Accordingly, the proposed stormwater management and rejuvenation measures are adequate to manage peak rainfall events for the proposed SIPCOT Industrial Park, ensuring protection of Nilaviyal Odai by reducing flood peaks, preventing erosion, and supporting long-term hydrological stability.

*Table 15. Holding Capacity and Surge Attenuation within the Industrial Park*

| Sl. No. | Component | Holding Capacity | Holding Time Contribution | Functional Role |
|---|---|---|---|---|
| 1 | Rooftop rainwater harvesting within individual plots | Plot specific | Immediate capture | Reduction of direct runoff |
| 2 | Ponds within Lyocell unit | Three days rooftop runoff | Temporary storage | Surge buffering and reuse |
| 3 | Stormwater drainage network | 53261 cubic metres | Short term detention | Flow attenuation and conveyance |
| 4 | Percolation pits | 1691 cubic metres | Continuous infiltration | Groundwater recharge |
| 5 | Controlled discharge to Nilaviyal Odai | Regulated flow | Delayed release | Flood moderation and river protection |

### 6.3.2 Stormwater discharge into Odai and Nilaviyal Odais

Stormwater generated within the proposed SIPCOT Industrial Park, including runoff from open areas and excess roof-top water after on-plot harvesting, will be discharged into the natural drainage system comprising seasonal odais, ultimately draining into Nilaviyal Odai. The discharge system has been designed to ensure controlled, non-erosive, and regulated release of stormwater under both average and peak rainfall conditions. The total stormwater generation from the proposed Industrial Park during an average rainy day is estimated at approximately 63,238 $m^3$/day, which includes 48,720 $m^3$/day of surface runoff from open areas and 14,518 $m^3$/day of excess roof-top runoff. Under peak rainfall conditions, the incremental peak runoff is estimated at 42,036 KLD, corresponding to a peak inflow of about 1.46 KL per second.

To manage this flow, the Industrial Park is provided with a comprehensive stormwater drainage system comprising drains, collection chambers, culverts, silt traps, sedimentation chambers, and oil and grease separators at plot outlets. The drainage network provides a holding capacity of approximately 53,261 cubic metres, supplemented by percolation pits with a recharge capacity of 1,691 cubic metres and storage ponds within the Lyocell unit with three days holding capacity of roof-top runoff. Owing to these measures, the effective discharge rate at the outfall is reduced to approximately 0.17 KL per second, ensuring that stormwater is released into Nilaviyal Odai in a gradual and regulated manner. This controlled discharge prevents sudden surges, minimizes erosion of odai banks, and avoids flooding in downstream areas.

Accordingly, the proposed stormwater discharge system is adequate for the proposed SIPCOT Industrial Park and ensures that runoff entering Nilaviyal Odai remains within the natural carrying capacity of the drainage system, thereby supporting flood moderation, groundwater recharge, and long-term river rejuvenation objectives.

*Table 16. Stormwater Discharge to Odai and Nilaviyal Odai*

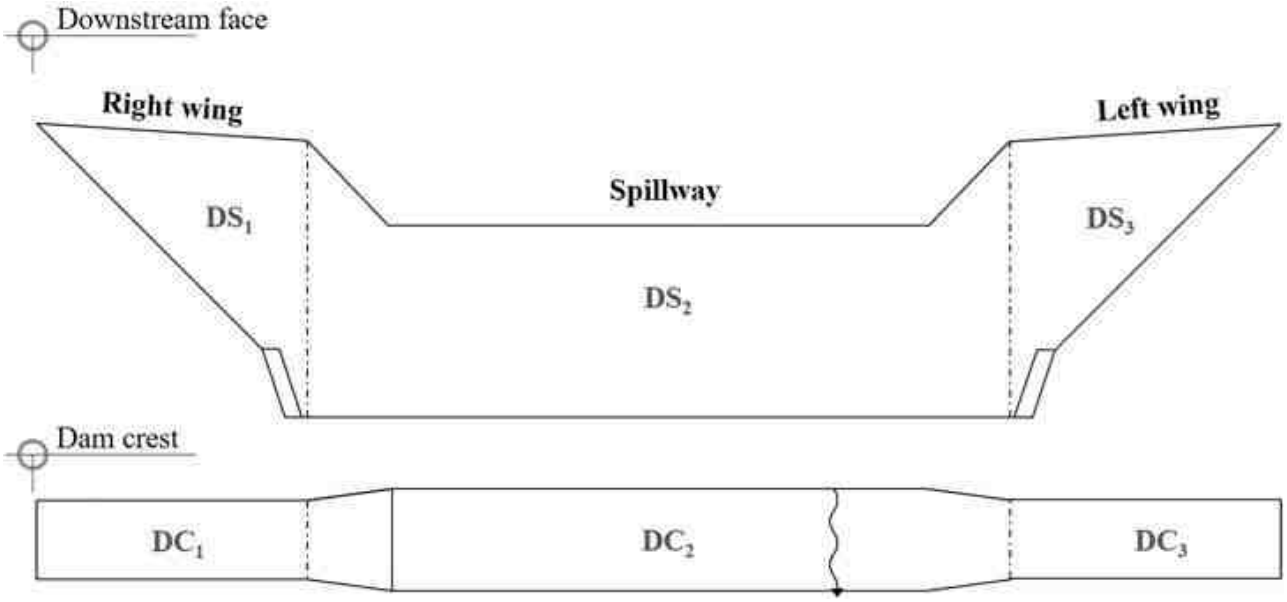
| Sl. No. | Particulars | Quantity | Remarks |
|---|---|---|---|
| 1 | Surface runoff from open areas | 48,720 m³ per day | Collected through drains |
| 2 | Excess roof-top runoff after harvesting | 14,518 m³ per day | Conveyed to stormwater network |
| 3 | Total stormwater generated | 63,238 m³ per day | Managed within drainage system |
| 4 | Incremental peak runoff | 42,036 KLD | Peak rainfall condition |
| 5 | Peak inflow rate | 1.46 KL per second | Before attenuation |
| 6 | Holding capacity of stormwater drains | 53,261 cubic metres | Short-term detention |
| 7 | Recharge capacity through percolation pits | 1,691 cubic metres | Groundwater recharge |
| 8 | Effective discharge at outfall | 0.17 KL per second | Regulated release |
| 9 | Final receiving drain | Nilaviyal Odai | After sediment control |

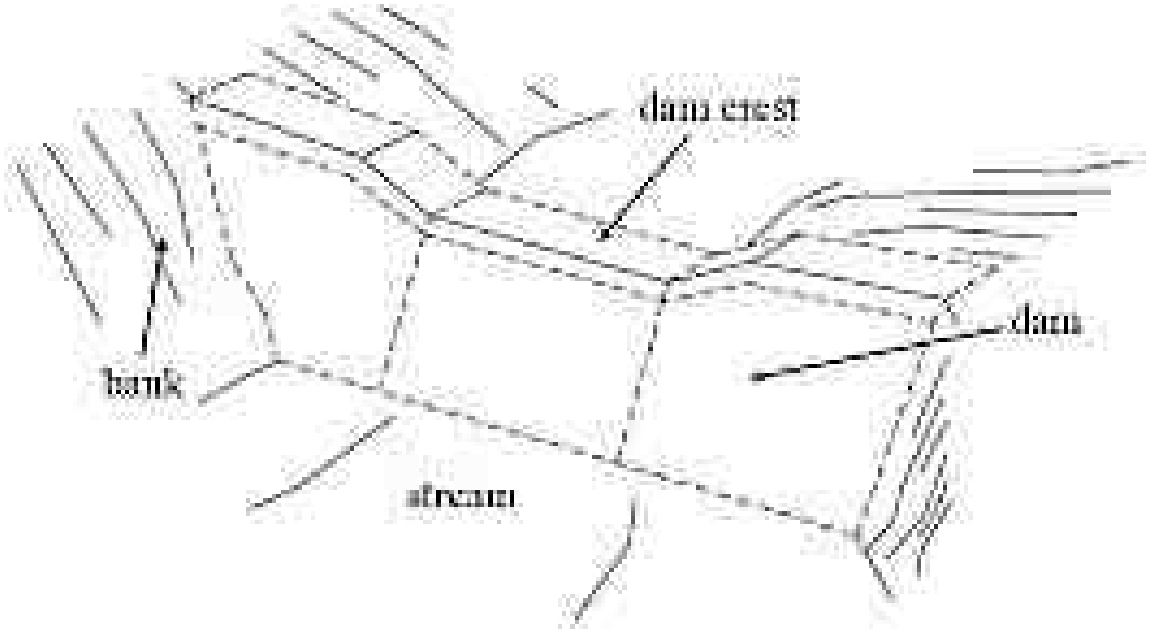
### 6.3.3 Construction of Check-Dams within the Industrial Park

As part of the integrated stormwater management and rejuvenation strategy for the proposed SIPCOT Industrial Park, Check dams, Recharge shaft and percolation pit are proposed along stormwater drains at suitable locations to reduce flow velocity, increase holding time, promote groundwater recharge, and control erosion during peak rainfall events. The check dams are designed as low-height hydraulic control structures across drains and seasonal channels, ensuring continuity of natural drainage while providing temporary storage and energy dissipation to facilitate subsurface infiltration.

During peak rainfall, when an incremental peak runoff of 42,036 KLD is generated within the Industrial Park, the check dams assist in attenuating flow peaks, thereby reducing instantaneous discharge into downstream odais and Nilaviyal Odai. These structures function in coordination with rooftop rainwater harvesting systems, percolation pits, stormwater drain detention capacity, and storage ponds within the Lyocell unit.

The check dams will be designed considering site topography, drain gradients, and hydraulic capacity, ensuring structural safety, ease of maintenance, and prevention of upstream submergence, while contributing to groundwater recharge and long-term hydrological stability within the Industrial Park.



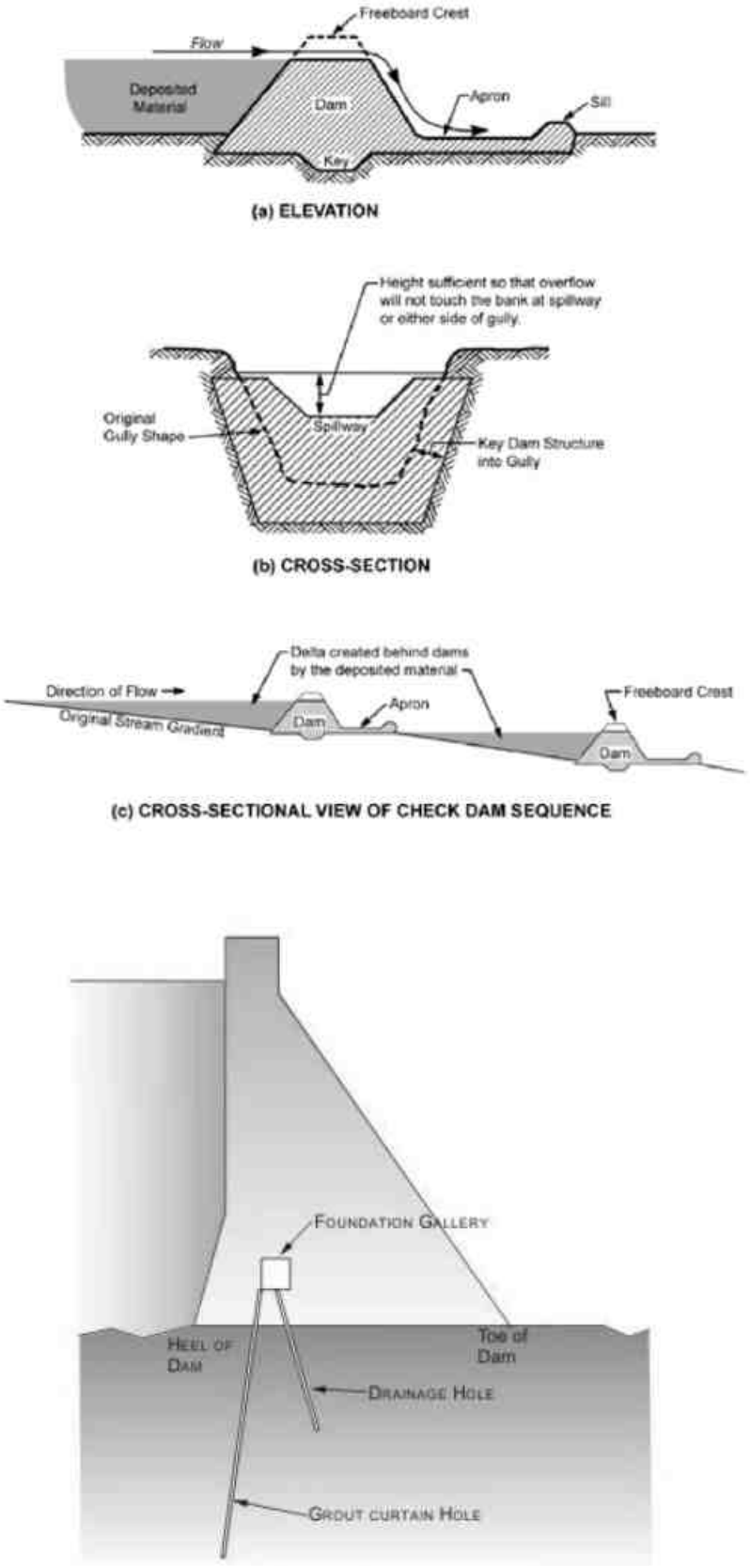



*Figure 30. Check dam*

### 6.3.4 Parshall Plume arrangements

Parshall flumes are proposed at strategic locations along the stormwater drainage network and near the final outfall points of the proposed SIPCOT Industrial Park to enable measurement and regulation of stormwater discharge. The flumes will facilitate accurate monitoring of flow rates during both normal and peak rainfall conditions.

The Parshall flume arrangements will be designed to handle the peak attenuated discharge of approximately 0.17 KL per second and will function in coordination with the stormwater drains, check dams, percolation pits, and other attenuation measures. These structures will not obstruct flow but will ensure hydraulically stable, non-submerged flow conditions suitable for reliable measurement.

Installation of Parshall flumes will support quantification of stormwater discharge into Nilaviyal Odai, enable performance assessment of the stormwater management system, and assist in regulatory compliance and long-term monitoring of runoff from the proposed Industrial Park.

### 6.3.5 Steps to be taken with respect to upkeeping of Seasonal streams

| **Artificial Recharge / Conservation Measures** | |
|---|---|
| **Proposed Artificial Recharge (AR) Structures** | **Description** |
| | Drains with Recharge pits - 615 Nos. |
| | Parshall flume ( flow measurement ) – 8 Nos. |
| | Online Percolation pits in the drians – 615 Nos. |
| | Check dams with 0.15 and 0.3 m within Greenbelt area (30m greenbelt area along odai and 15m greenbelt area along Nilaviyal odai) – 12 Nos. |
| | Strengthening the Stream Bunds – 24560 m. |
| | Dug / Catch pits – 360 Nos. |
| | Stone Pitching in selected areas to reduce the velocity and scouring – 24560 m. |
| **Water Conservation Measure** | **Recharge Ponds /shafts by Individual Industries** |
| **Total Cost** | |
| ➢ The Project Proponent has identified and allocated an estimated budget of **₹4.00 Crores**.<br>➢ The above components and budget will be implemented under / as part of the Environmental Management Plan (EMP). | |

Rain water harnessing by Individual industries.

Surplus runoff during peak into the channel 4811$m^3$ per average rainy day. Surplus runroff during peak rainy day considering 0.21 m.

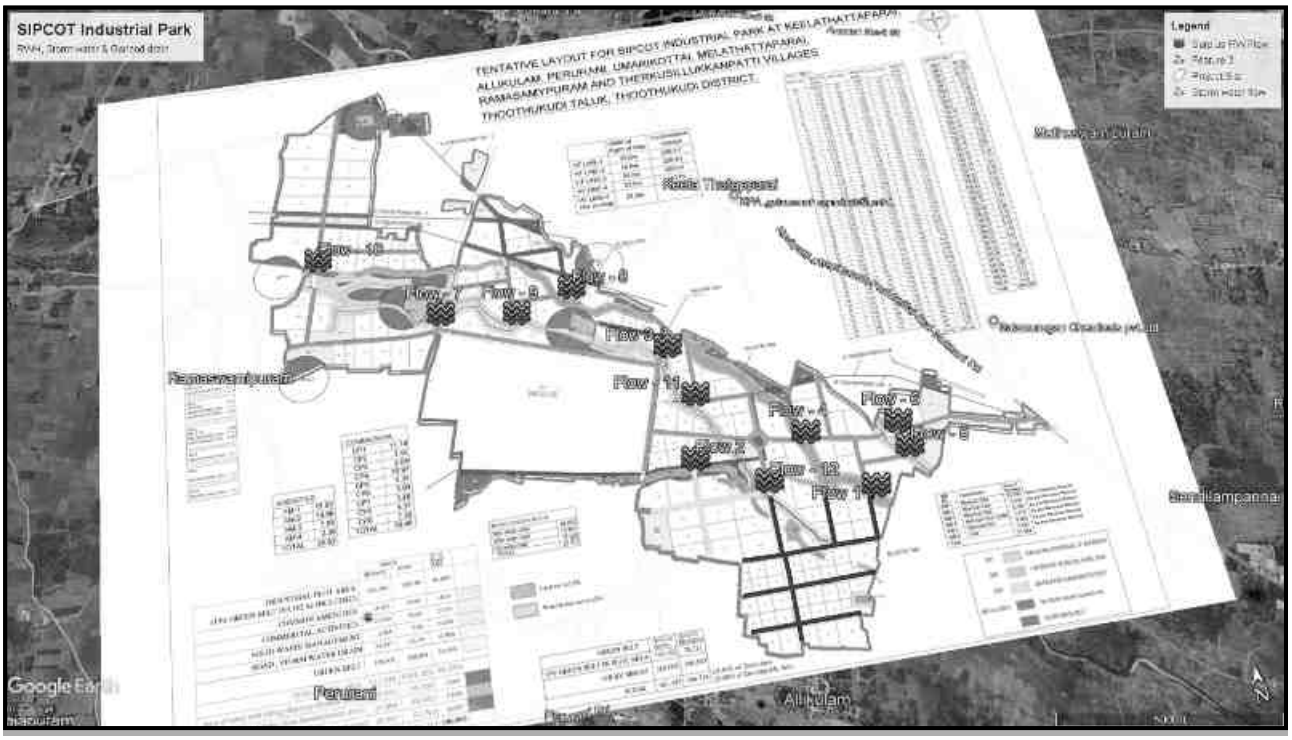



*Figure 31. Google Earth image showing Stormwater Drain in the Layout – Proposed SIPCOT Industrial Park*

# 7. PREDICTED OUTCOMES / COST–BENEFIT ANALYSIS

The Rejuvenation of Seasonal Drains (odai's) passing through proposed SIPCOT Industrial Park are designed to deliver measurable hydrological, environmental, and regulatory benefits. The predicted outcomes are based on quantified runoff generation, attenuation capacity, recharge potential, and controlled discharge mechanisms incorporated in the project design.

## 7.1 Predicted Outcomes

Implementation of rooftop rainwater harvesting, stormwater detention, percolation pits, check dams, and controlled discharge systems is expected to result in the following outcomes:

- Reduction in peak runoff discharge from approximately 1.46 KL per second to an attenuated discharge of about 0.17 KL per second, thereby preventing sudden surges into Nilaviyal Odai.
- Effective management of approximately 63,238 $m^3$/day of stormwater generated during rainy days within the Industrial Park through on-site holding, recharge, and regulated conveyance.
- Enhanced groundwater recharge through percolation pits with a recharge capacity of 1,691 $m^3$ and additional infiltration facilitated by check dams and stormwater detention within drains.
- Flood moderation and erosion control within drains and downstream odais due to reduced flow velocity and controlled discharge.
- Improved hydrological stability of Nilaviyal Odai, supporting base flow conditions and reducing stress during peak rainfall events.
- Compliance with TNPCB, SEAC, and MoEF guidelines for stormwater management, runoff control, and river protection.
- Long-term sustainability of the proposed Industrial Park, ensuring that development does not adversely impact surface water or groundwater resources.

*Table 17. Predicted Outcomes and Benefits of Rejuvenation Measures*

| Sl. No. | Component | Predicted Outcome | Benefit |
|---|---|---|---|
| 1 | Rooftop rainwater harvesting | Capture of roof runoff at plot level | Reduction in direct surface runoff |
| 2 | Stormwater detention in drains | Temporary holding of peak flows | Flood moderation within the park |
| 3 | Percolation pits | Recharge capacity of 1,691 $m^3$ | Groundwater level improvement |
| 4 | Check dams | Reduced flow velocity and peak attenuation | Erosion control and recharge |
| 5 | Parshall flumes | Accurate discharge measurement | Regulatory monitoring and compliance |
| 6 | Controlled discharge to Nilaviyal Odai | Attenuated discharge of 0.17 KL per second | Protection of downstream odai |
| 7 | Integrated system | Peak runoff reduced from 1.46 to 0.17 KL per second | River and groundwater rejuvenation |

## 7.2 Cost–Benefit Analysis

The rejuvenation measures primarily utilize engineered drainage structures and nature-based solutions, offering high hydrological benefits with comparatively low capital and maintenance costs. The benefits derived from flood prevention, groundwater recharge, and regulatory compliance significantly outweigh the implementation costs.

## 7.3 Overall Assessment

The predicted outcomes demonstrate that the Rejuvenation of Seasonal Drains (odai's) passing through proposed SIPCOT Industrial Park is technically adequate, environmentally beneficial, and cost-effective. The integrated stormwater management system ensures that the proposed SIPCOT Industrial Park will not increase flood risk or degrade downstream water bodies, while actively contributing to groundwater recharge and long-term river rejuvenation.

# 8. WAY FORWARD

The way forward for the River and Groundwater Rejuvenation Plan focuses on effective implementation, monitoring, and continuous improvement of the proposed stormwater management and recharge measures within the SIPCOT Industrial Park.

During the detailed design and execution stage, all proposed rejuvenation components including rooftop rainwater harvesting systems, stormwater drains, percolation pits, check dams, and Parshall flumes shall be implemented as per approved layouts and hydraulic design criteria. Individual industries will be mandated to install and maintain rooftop rainwater harvesting and recharge systems in compliance with TNPCB and BIS norms.

Regular inspection and maintenance of stormwater drains, silt traps, sedimentation chambers, and check dams will be carried out to ensure uninterrupted flow, adequate holding capacity, and effective recharge performance. Periodic desilting and upkeep will be undertaken, especially before and after monsoon seasons.

Stormwater discharge into Nilaviyal Odai and Odai will be continuously monitored using Parshall flume arrangements to verify that attenuated discharge levels are maintained during rainfall events. Monitoring data will be used to assess system performance and to implement corrective measures, if required.

The rejuvenation measures will be reviewed periodically, and adaptive improvements will be incorporated based on site performance, rainfall variability, and regulatory guidance. This approach will ensure long-term protection of downstream odais, sustained groundwater recharge, and environmentally responsible operation of the proposed SIPCOT Industrial Park.