



The Ramco Cements Limited

**Proposed Expansion of Ramasamy Raja Nagar Cement Plant by
Inclusion of Revamped Old Line-II operations to existing Lines I & III
(Operation of all 3 Existing Lines-as Upgraded) and
Increasing Operational Days from 320 days to 345 days
Production Enhancement of Clinker from 1.44 MTPA to 2.76 MTPA &
Cement from 2.70 MTPA to 4.00 MTPA along with associated
Waste Heat Recovery System (WHRS) of 13 MW**

**SF Nos. Parts of 1-14, 16, 22, 24, 30-32, 34-39, 49-52, 56-60, 65-66, 210, 212, 214, 221, 222,
225-230 of Tulukkappatti, 192, 194-212, 215, 216 & 287 of Thammanayakkanpatti and
100-103, 108, 109, 112 & 113 Vachchakkarappatti Villages,
Taluk & District Virudhunagar, Tamil Nadu**

**Environmental Clearance under EIA Notification 2006
Schedule Sl. No. 3(b) - Category 'A'**

**Draft Environmental Impact Assessment Report
(after TOR for Public Hearing)**

**Awarded TOR Identification No. TO24A1102TN5995426N dated 12.11.2024
Baseline Data Collection Period : Jul.-Sep. 2024 (Premonsoon Season)**

December 2024

EIA Consultant

**ABC Techno Labs India Private Limited, Chennai
Accreditation Certificate : NABET/EIA/2225/RA0290 dated 11.06.2023
with Validity till 16.11.2025**

(Sl. No. 4 of QCI/NABET List dated 29.10.2024)

Lab Accreditation : NABL Certificate No. TC-5770 dated 03.04.2024-valid till 02.04.2026

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Disclaimer

This EIA-EMP Report for 'Expansion of RR Nagar Cement Plant with inclusion of revamped Old Line-II operators to existing Lines I & III i.e. operations of all 3 existing Lines-as Upgraded and also by increasing operational days from 320 to 345 days - production enhancement of Clinker from 1.44 MTPA to 2.76 MTPA and Cement from 2.70 MTPA to 4.00 MTPA along with associated Waste Heat Recovery System (WHRS) of 13 MW' at Talukappatti, Thammanayakkanpatti & Vachchakurappatti Villages, Taluk & District Virudhunagar, Tamil Nadu by M/s. The Ramco Cements Limited has been prepared by M/s. ABC Techno Labs India Private Limited, Chennai for obtaining Environmental Clearance.

This EIA Report has been prepared using information received from Project Proponent, Site visits, collecting Primary Data and compilation of Secondary Data from available resources. This Report has been prepared with all cares and vetted and finalised with the Project Proponent M/s. The Ramco Cements Limited.

This Document, as a part or whole, cannot be used for any other purpose other than stated purpose.

Date : 27.12.2024

Yours faithfully,
For ABC Techno Labs India Private Limited.


Authorized signatory



ABC TECHNO LABS INDIA PRIVATE LIMITED

(Registered by NABL, NABET, Approved by PISAL, APEDA & Agmark, Recognized by MoEF&CC, BS)

26/85, 100/20, 100/21, 100/22, 100/23, 100/24, 100/25, 100/26, 100/27, 100/28, 100/29, 100/30, 100/31, 100/32, 100/33, 100/34, 100/35, 100/36, 100/37, 100/38, 100/39, 100/40, 100/41, 100/42, 100/43, 100/44, 100/45, 100/46, 100/47, 100/48, 100/49, 100/50, 100/51, 100/52, 100/53, 100/54, 100/55, 100/56, 100/57, 100/58, 100/59, 100/60, 100/61, 100/62, 100/63, 100/64, 100/65, 100/66, 100/67, 100/68, 100/69, 100/70, 100/71, 100/72, 100/73, 100/74, 100/75, 100/76, 100/77, 100/78, 100/79, 100/80, 100/81, 100/82, 100/83, 100/84, 100/85, 100/86, 100/87, 100/88, 100/89, 100/90, 100/91, 100/92, 100/93, 100/94, 100/95, 100/96, 100/97, 100/98, 100/99, 100/100

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DISCLOSURE OF EXPERTS

Details as per Schedule of EIA Notification 2006, as amended till date

Name of the Project:

Expansion of RR Nagar Cement Plant with inclusion of revamped Old Line-II operations to existing Lines I & III i.e. operations of all 3 existing Lines-as Upgraded and also by increasing operational days from 320 to 345 days - production enhancement of Clinker from 1.44 MTPA to 2.76 MTPA and Cement from 2.70 MTPA to 4.00 MTPA along with associated Waste Heat Recovery System (WHRS) of 13 MW at Talukkappadi, Thammanayakkanpatti & Vachchekkarappadi Villages, Taluk & District Virudhunagar, Tamil Nadu by M/s. The Ramco Cements Limited

Schedule as per EIA notification 2006 3 (ii)

Category A
NABET Sector No. 9

DECLARATION

Declaration by experts contributing to the Environmental Impact Assessment Report for 'Expansion of RR Nagar Cement Plant with inclusion of revamped Old Line-II operations to existing Lines I & III i.e. operations of all 3 existing Lines-as Upgraded and also by increasing operational days from 320 to 345 days - production enhancement of Clinker from 1.44 MTPA to 2.76 MTPA and Cement from 2.70 MTPA to 4.00 MTPA along with associated Waste Heat Recovery System (WHRS) of 13 MW' by M/s. The Ramco Cements Limited.

I hereby, certify that I was a part of the EIA team in the following capacity that developed the above EIA/EMP.

EIA Coordinator Signature :

Name : K.Sekar 

Period of involvement : Feb, 2024 to till date
Contact information : es@abctechnolab.com

FUNCTIONAL AREA EXPERTS:

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2.	SHW	Dr Muthiah Manappan	Feb, 2024 to till date	
3.	AP	Dr Muthiah Manappan	Feb, 2024 to till date	
4.	GEO	Dr S Veezhinathan	Feb, 2024 to till date	



ABC TECHNO LABS INDIA PRIVATE LIMITED

(Certified by NABL, NABTE, Approved by NIAA, APEDA & Spicarb, Recognized by NAFDAC, BIR)

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6.	RH	Mr Vinod Gautam	Feb, 2024 to till date	<i>[Signature]</i>
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13.	WP	Mr Abhis Saha	Feb, 2024 to till date	<i>[Signature]</i>

Declaration by the head of the Accredited Consultant Organization

I, G. Murugesu, hereby confirm that the above mentioned experts prepared the EIA/EMP Report for Expansion of RR Nagar Cement Plant with inclusion of revamped Old Line-II operations to existing Lines I & II i.e. operations of all 3 existing Lines-was Upgraded and also by increasing operational days from 320 to 345 days - production enhancement of Clinker from 1.44 MTPA to 2.76 MTPA and Cement from 2.70 MTPA to 4.00 MTPA along with associated Waste Heat Recovery System (WHRS) of 13 MW by M/s. The Ramco Cements Limited. I also confirm that ABC Techno Labs India Pvt. Ltd. shall be fully accountable for any misleading information mentioned in this statement.

Signature

[Signature]

Name

Mr. G. Murugesu

Designation

Chairman & Managing Director

Name of the EIA Consultant Organization

ABC Techno Labs India Private Limited

NABET Certificate No. & Issue Date:

NABET/EIA/2225/RA0290 dated 11.06.2023 - valid till 16.11.2025



ABC TECHNO LABS INDIA PRIVATE LIMITED

(Accredited by NABL, NABET, Approved by NIAA, APQSA & Apmark, Recognized by NAFDAC, BS)

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Corporate Identity Number: U28911TN1987PLC2833006

Project Proponent Declaration

[in compliance with MoEF Office Memorandum No. J-11013/41/2009-IA, II (i) dated 04.08.2009]

We, M/s. The Ramco Cements Limited (RCL), have applied for prior Environmental Clearance for Expansion of RR Nagar Cement Plant with inclusion of revamped Old Line-II operations to existing Lines I & III i.e. operations of all 3 existing Lines-as Upgraded and also by increasing operational days from 320 to 345 days - production enhancement of Glinker from 1.44 MTPA to 2.76 MTPA and Cement from 2.70 MTPA to 4.00 MTPA along with associated Waste Heat Recovery System (WHRS) of 13 MW at Tulukkappatti, Thonimandayakkanpatti & Vachchakkappatti Villages, Taluk & District Virudhunagar, Tamil Nadu. The proposed Expansion of Cement Plant (≥ 1.0 MTPA) falls under Cl. No. 3(b) - Category 'A' of EIA Notification 2006 and requires prior EC from MoEF&CC. Thus, RCL filed TOR Application vide Parivesh Online Proposal No. IA/TN/IND1/498318/2024 on 26.09.2024 with a request for Standard TOR for this existing Plant. MoEF&CC granted Standard Terms of Reference (TOR) for the Project with TOR Identification No. TQ34A1102TN5995426N dated 12.11.2024 under File No. J-11011/119/2009-IA, II(i).

EIA Consultant, M/s. ABC Techno Labs India Private Limited, Chennai has been accredited for various Sectors including Sector-1 (Mining Projects) for Category 'A' by the National Accreditation Board for Education & Training vide Certificate NABET/EIA/2225/RA0290 dated 11.06.2023 with validity till 16.11.2025 (Sl. No. 4 of List dated 29.10.2024). ABC Laboratory is accredited by the National Accreditation Board for Testing and Calibration Laboratories (NABL) vide Certificate No. TC-5770 dated 02.04.2024 with validity till 02.04.2026.

The EIA Report and Summary Environmental Impact Assessment Reports (both in English and Tamil versions) have been prepared in compliance with the awarded TORs and as per the generic structure proposed in EIA Notification 2006 and submitted. The data submitted in the EIA Report are factually correct.

For The Ramco Cements Limited

Sr. Vice President (ESG)
Authorized Signatory

Date : 27.12.2024
Place : Chennai.



EIA Consultant Undertaking

[In compliance with MoEF Office Memorandum No. J-11013412006-IA.II (I) dated 04.09.2006]

M/s. The Ramco Cements Limited (RCL), have applied for prior Environmental Clearance for 'Expansion of RR Nagar Cement Plant with inclusion of revamped Old Line-II operations to existing Lines I & III i.e. operations of all 3 existing Lines-as Upgraded and also by increasing operational days from 320 to 345 days - production enhancement of Clinker from 1.44 MTPA to 2.76 MTPA and Cement from 2.70 MTPA to 4.00 MTPA along with associated Waste Heat Recovery System (WHRS) of 13 MW' at Tulakkappatti, Thammamayakkanpatti & Vachchakkareppatti Villages, Taluk & District Virudhunagar, Tamil Nadu. The proposed Expansion of Cement Plant (≥1.0 MTPA) falls under Sl. No. 3(b) - Category 'A' of EIA Notification 2006 and requires prior EC from MoEF&CC. Thus, RCL filed TOR Application vide Parivesh Online Proposal No. IA/TN/IND1/498318/2024 on 26.09.2024 with a request for Standard TOR for this existing Plant, MoEF&CC granted Standard Terms of Reference (TOR) for the Project with TOR Identification No. TC24A1102TN5095426N dated 12.11.2024 under File No. J-11011/119/2009-IA.II(i).

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Date : 27.12.2024
Place : Chennai

Yours faithfully,
For ABC Techno Labs India Private Limited.


Authorized signatory



ABC TECHNO LABS INDIA PRIVATE LIMITED

[Accredited by NABL, NABET, Approved by FSSAI, APEDA & Agmark, Encapsulated by MoEF&CC, BIS]

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File No.: J-11011/119/2009-IA-II(I)
Government of India
Ministry of Environment, Forest and Climate Change
IA Division



Dated 12/11/2024



To,

M Srinivasan
 THE RAMCO CEMENTS LIMITED
 The Ramco Cements Limited 5th Floor, Auras Corporate Centre No. 98A, Dr.Radhakrishnan Road,
 Mylapore, Chennai, Mylapore, CHENNAI, TAMIL NADU, , 600004
 ramcoenv@ramcocements.co.in

Subject: Grant of Standard Terms of Reference (ToR) to the proposed Project under the EIA Notification 2006-and as amended thereof-regarding.

Sir/Madam,

This is in reference to your application submitted to MoEF&CC vide proposal number IA/TN/IND1/498318/2024 dated 05/11/2024 for grant of Terms of Reference (ToR) to the project under the provision of the EIA Notification 2006-and as amended thereof.

2. The particulars of the proposal are as below :

(i) ToR Identification No.	TO24A1102TN5995426N
(ii) File No.	J-11011/119/2009-IA-II(I)
(iii) Clearance Type	Fresh ToR
(iv) Category	A
(v) Project/Activity Included Schedule No.	3(b) Cement plants
(vi) Sector	Industrial Projects - 1
(vii) Name of Project	Expansion of Ramasamy Raja Nagar Cement Plant by inclusion of Revamped Old Line-II operations to existing Lines I & III (operations of all 3 existing Lines, as Upgraded) & and Increasing the Operational Days from 320 days to 345 days - Production Enhancement of Clinker from 1.44 MTPA to 2.76 MTPA & Cement from 2.70 MTPA to 4.00 MTPA at Villages Tulukkappatti, Thammanayakkanpatti & Vachchakarapatti, Taluk & District-Virudhunagar, Tamil Nadu by M/s.The Ramco Cement Limited
(viii) Name of Company/Organization	THE RAMCO CEMENTS LIMITED

(ix) Location of Project (District, State)	VIRUDHUNAGAR, TAMIL NADU
(x) Issuing Authority	MoEF&CC
(xii) Applicability of General Conditions	NO

- The MoEF&CC has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after detailed examination hereby decided to grant Standard Terms of Reference to the instant proposal of M/s. **THE RAMCO CEMENTS LIMITED** under the provisions of the aforementioned Notification.
- The brief about products and by products as submitted by the Project proponent in Form-1 (Part A, B) and Standard Terms of Reference are annexed to this letter as Annexure (1).
- PP shall ensure that the points raised in EDS are suitably incorporated in the final EIA/ EMP Report.
- The Ministry reserves the right to stipulate additional TORs, if found necessary.
- The Standard Terms of Reference (ToR) to the aforementioned project is under provisions of EIA Notification, 2006 and as amended thereof. It does not tantamount to approvals/consent/permissions etc required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.
- The granted letter, all the documents submitted as a part of application viz. Form-1 Part A and Part B are available on PARIVESH portal which can be accessed by scanning the QR Code above.

Copy To

N/A

Annexure 1

Standard Terms of Reference

1. Preliminary requirements

S. No..	Terms of Reference
1.1	EIA/EMP report cover page shall consists of project title with location, applicable schedule of the EIA Notification, 2006, ToR letter No. with date, study period along with EIA consultant & laboratory details with QCI/NABET/NABL accreditation certificate detail.
1.2	Besides, following points shall be compiled as per QCI/NABET norms: a. Disclaimer by the EIA consultant. b. Declaration by the Functional Area Experts contributed to the EIA study and declaration by the head of the accredited consultant organization/authorized person. c. Undertaking by the project proponent owning the contents (information and data) of the EIA/EMP report. d. Undertaking by the EIA consultant regarding compliance of ToR issued by MoEF&CC. e. Consultant shall submit the Plagiarism Certificate for the EIA/EMP Report.

2. Executive Summary

S. No..	Terms of Reference
2.1	Table of Contents of the EIA report including list of tables/figures/annexures/abbreviations/symbols/notations.

S. No..	Terms of Reference
2.2	Point wise compliance to the ToR issued by MoEF&CC.

3. Executive Summary

3.1. Introduction

S. No..	Terms of Reference
3.1.1	Name of the project along with applicable schedule and category as per EIA, 2006.
3.1.2	Location and accessibility

4. Executive Summary

4.1. Project description

S. No..	Terms of Reference
4.1.1	Resource requirements (Land; water; fuel; manpower)
4.1.2	Operational activity
4.1.3	Key pollution concerns

5. Executive Summary

5.1. Baseline Environment Studies

S. No..	Terms of Reference
5.1.1	Ambient air quality
5.1.2	Ambient Noise quality
5.1.3	Traffic study
5.1.4	Surface water quality
5.1.5	Ground water quality
5.1.6	Soil quality
5.1.7	Biological Environment
5.1.8	Land use
5.1.9	Socio-economic environment

6. Executive Summary

6.1. Anticipated impacts

S. No..	Terms of Reference
6.1.1	Impact on ambient air quality
6.1.2	Impact on ambient noise quality
6.1.3	Impact on road and traffic
6.1.4	Impact on surface water resource and quality
6.1.5	Impact on ground water resource and quality
6.1.6	Impact on terrestrial and aquatic habitat
6.1.7	Impact on socio-economic environment

7. Executive Summary

7.1. Alternative analysis

S. No..	Terms of Reference
7.1.1	

8. Executive Summary

8.1. Environmental Monitoring program

S. No..	Terms of Reference
8.1.1	Ambient air, noise, water and soil quality
8.1.2	Noise quality management plan
8.1.3	Emission and discharge from the plant
8.1.4	Green Belt
8.1.5	Social Parameters

9. Executive Summary

9.1. Additional Studies

S. No..	Terms of Reference
9.1.1	Risk assessment
9.1.2	Public consultation

S. No..	Terms of Reference
9.1.3	Action plan to address the issues raised during public consultation as per MoEF&CC O.M. dated 30/09/2020

10. Executive Summary

10.1. Environment management plan

S. No..	Terms of Reference
10.1.1	Air quality management plan
10.1.2	Solid and hazardous waste management plan
10.1.3	Effluent management plan
10.1.4	Storm water management plan
10.1.5	Occupational health and safety management plan
10.1.6	Green belt development plan
10.1.7	Socio-economic management plan
10.1.8	Project cost and EMP implementation budget.

11. Introduction

S. No..	Terms of Reference
11.1	Background about the project
11.2	Need of the project
11.3	Purpose of the EIA study
11.4	Scope of the EIA study

12. Project description

12.1. Site Details

S. No..	Terms of Reference
12.1.1	Location of the project site covering village, Taluka/Tehsil, District and State.
12.1.2	Site accessibility
12.1.3	A digital toposheet in pdf or shape file compatible to google earth of the study area of radius of 10km and site location preferably on 1:50,000 scale. (including all eco-sensitive areas and environmentally sensitive

S. No..	Terms of Reference
	places).
12.1.4	Latest High-resolution satellite image data having 1 m - 5 m spatial resolution like quickbird, Ikonos, IRS P-6 pan sharpened etc., along with delineation of plant boundary co-ordinates. Area must include at least 100 m all around the project location.
12.1.5	Environment settings of the site and its surrounding along with map.
12.1.6	A list of major industries with name, products and distance from plant site within study area (10km radius) and the location of the industries shall be depicted in the study area map.
12.1.7	In case if the project site is in vicinity of the water body, 50 meters from the edge of the water body towards the site shall be treated as no development/construction zone. If it's near the wetland, Guidelines for implementing Wetlands (Conservation and Management) Rules, 2017 may be followed.
12.1.8	In case if the project site is in vicinity of the river, the industry shall not be located within the river flood plain corresponding to one in 25 years flood, as certified by concerned District Magistrate/Executive Engineer from State Water Resources Department (or) any other officer authorized by the State Government for this purpose as per the provisions contained in the MoEF&CC Office Memorandum dated 14/02/2022.
12.1.9	In case of canal/ nala/ seasonal drain and any other water body passing through project site, the PP shall submit the suitable steps /conservation plan/mitigation measures along with contouring, Run -off calculations, disposal etc. A robust and full proof Drainage Conservation scheme to protect the natural drainage/water bodies and its flow parameters; along with Soil conservation scheme and multiple Erosion control measures shall be provided in the report.
12.1.10	Type of land, land use of the project site needs to be submitted.
12.1.11	Status of acquisition of land. If acquisition is not complete, stage of the acquisition process as per the MoEF&CC O.M. dated 7/10/2014 shall be furnished.
12.1.12	Project proponent shall prepare Engineering layout plan showing all internal roads minimum 6 m width and 9 m turning radius for smooth traffic flow inside including fire tender as per NBC. Road network shall connect all service areas in layout. This drawing shall include area statement showing plot area, area under roads, parking, green belt with calculations and % with respect to plot area of project site and proper indexing. If located within an Industrial area/Estate/Complex, layout of Industrial Area indicating location of unit within the Industrial area/Estate.
12.1.13	Project proponent shall submit contour map of project site along with drainage disposal system with calculations and drawings supported with proper indexing including Rain Water Harvesting details with calculations mentioning about GW recharge along with relevant drawing.
12.1.14	A detailed report covering all aspects of Fire Safety Management and Fire Emergency Plan shall be submitted.
12.1.15	Details of drone survey for the site, needs to be included in report and presented before the EAC during appraisal of the project.

13. Project description

13.1. Forest and wildlife related issues (if applicable)

S. No..	Terms of Reference
13.1.1	Status of Forest Clearance for the use of forest land shall be submitted.
13.1.2	Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife if the project site located within notified Eco-Sensitive Zone, 10 km radius of national park/sanctuary wherein final ESZ notification is not in place as per MoEF&CC Office Memorandum dated 8/8/2019.
13.1.3	The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, Eco-sensitive Zone and Eco-sensitive areas, the project proponent shall submit the map duly authenticated by Divisional Forest Officer showing the distance between the project site and the said areas.
13.1.4	Wildlife Conservation Plan duly authenticated by the Competent Authority of the State Government for conservation of Schedule I fauna along with budget and action plan, if any exists in the study area.

14. Project description**14.1. Salient features of the project**

S. No..	Terms of Reference
14.1.1	Products with capacities in Tons per Annum for the proposed project.
14.1.2	If expansion project, status of implementation of existing project, details of existing/proposed products with production capacities in Tons per Annum.
14.1.3	Site preparatory activities.
14.1.4	List of raw materials required and their source along with mode of transportation.
14.1.5	Other than raw materials, other chemicals and materials required with quantities and storage capacities.
14.1.6	Manufacturing process details along with process flow diagram of proposed units.
14.1.7	Consolidated materials and energy balance for the project.
14.1.8	Total requirement of surface/ ground water and power with their respective sources, status of approval.
14.1.9	Water balance diagram
14.1.10	Details of Emission, effluents, hazardous waste generation and mode of disposal during construction as well as operation phase.
14.1.11	Man-power requirement.
14.1.12	Cost of project and scheduled time of completion.

S. No..	Terms of Reference
14.1.13	In case of expansion projects, project proponent shall submit structural stability certificate showing whether existing structure withstand for proposed expansion activity.
14.1.14	<p>Brief on present status of compliance (Expansion/modernization proposals) a. Cumulative Environment Impact Assessment for the existing as well as the proposed expansion/modernization shall be carried out. b. Cumulative Impact Assessment need to be carried out by greenfield projects considering the nearby industries. c. In case of ground water drawl for the existing unit, action plan for phasing out of ground water abstraction in next two years except for domestic purposes and shall switch over to 100 % use of surface water from nearby source. d. Copy of all the Environment Clearance(s) including Amendments/validity of extension/transfer of EC, there to obtained for the project from MoEF&CC/SEIAA shall be attached as Annexures. A Certified Compliance Report (CCR) of the Integrated Regional Office of the Ministry of Environment, Forest and Climate Change/ or concerned authority as per OM No. IA3-22/10/2022-IA.III [E 1772581], dated 8th June, 2022 on the status of compliance of conditions stipulated in all the existing environment clearances including amendments shall be provided. A Certified Compliance Report (CCR) issued by the concerned Authority shall be valid for a period of one year from the date of inspection. e. In case the existing project has not obtained Environment Clearance, reasons for not taking EC under the provisions of the EIA Notification 1994 and/or EIA Notification 2006 shall be provided. A proper justification needs to be submitted along with documentary proof. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 1994 or 2006, CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of CTO from the Regional Office of the SPCB shall be submitted, as per OM No. IA3-22/10/2022-IA.III [E 1772581], dated 8th June, 2022. CCR on CTO conditions issued by the concerned SPCBs/PCCs shall be valid for a period of one year from the date of inspection of the project.</p>

15. Description of the Environment

S. No..	Terms of Reference												
15.1	Study period												
15.2	<p>Approach and methodology for data collection as furnished below</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 35%;">Attributes</th> <th style="width: 30%;">Network</th> <th style="width: 20%;">Sampling Frequency</th> <th style="width: 15%;">Remarks</th> </tr> </thead> <tbody> <tr> <td>Air Environment Micro-Meteorological</td> <td></td> <td></td> <td></td> </tr> <tr> <td> <ul style="list-style-type: none"> • Wind speed (Hourly) • Wind direction • Dry bulb temperature • Wet bulb temperature • Relative humidity • Rainfall • Solar radiation • Cloud cover </td> <td>Minimum 1 site in the project impact hourly continuous area</td> <td></td> <td> IS 5182 Part 1-20 <ul style="list-style-type: none"> • Site specific primary data is essential • Secondary data from IMD, New Delhi • CPCB guidelines to be considered. </td> </tr> </tbody> </table>	Attributes	Network	Sampling Frequency	Remarks	Air Environment Micro-Meteorological				<ul style="list-style-type: none"> • Wind speed (Hourly) • Wind direction • Dry bulb temperature • Wet bulb temperature • Relative humidity • Rainfall • Solar radiation • Cloud cover 	Minimum 1 site in the project impact hourly continuous area		IS 5182 Part 1-20 <ul style="list-style-type: none"> • Site specific primary data is essential • Secondary data from IMD, New Delhi • CPCB guidelines to be considered.
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S. No..	Terms of Reference
	<ul style="list-style-type: none"> • Environmental • Lapse Rate <p>Pollutants</p> <ul style="list-style-type: none"> • PM10 • SO2 • NOx • CO • HC • Other parameters relevant to the project and topography of the area <p>Noise</p> <p>Hourly equivalent noise levels</p> <p>Water</p> <p>Parameters for water quality</p> <ul style="list-style-type: none"> • pH, temp, turbidity, magnesium hardness, total alkalinity, chloride, sulphate, nitrate, fluoride, sodium, potassium, salinity • Total nitrogen, total phosphorus, DO, BOD, <p>At least 8-12 locations</p> <p>As per National Ambient Air Quality Standards, CPCB Notification.</p> <ul style="list-style-type: none"> • Sampling as per CPCB guidelines • Collection of AAQ data (except in monsoon season) • Locations of various stations for different parameters should be related to the characteristic properties of the parameters. • The monitoring stations shall be based on the NAAQM standards as per GSR 826(E) dated 16/11/2009 and take into account the predominant wind direction, population zone and sensitive receptors including reserved forests, • Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAAQM Notification of 16/11/2009 along with min., max., average and 98% values for each of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA Report. <p>At least 8-12 locations per CPCB norms</p> <p>Samples for water quality should be collected and analyzed as per:</p> <ul style="list-style-type: none"> • IS: 2488 (Part 1-5) methods for sampling and testing of Industrial effluents • Standard methods for examination of water and wastewater analysis published by American Public Health Association

S. No..	Terms of Reference
	<p>COD, Phenol</p> <ul style="list-style-type: none"> • Heavy metals • Total coliforms, faecal coliforms • Phyto plankton • Zoo plankton <p>For River Bodies</p> <ul style="list-style-type: none"> • Total Carbon • pH • Dissolved Oxygen • Biological Oxygen Demand • Free NH₄ • Boron • Sodium Absorption Ratio • Electrical Conductivity <p>For Ground Water</p> <p>Traffic Study Type of vehicles</p> <ul style="list-style-type: none"> • Frequency of vehicles for transportation of materials • Additional traffic due to proposed project <p>Soil</p> <ul style="list-style-type: none"> • Particle size distribution • Texture • pH • Electrical conductivity • Cation exchange capacity • Alkali metals • Sodium Absorption Ratio (SAR) • Permeability <p>Surface water quality of the nearest River (60m upstream and downstream) and other surface water bodies</p> <ul style="list-style-type: none"> • Yield of water sources to be measured during critical season • Standard methodology for collection of surface water (BIS standards) <p>Ground water monitoring data should be collected at minimum of 8 locations (from existing wells /tube wells/existing current records) from the study area and shall be included.</p> <p>Land Environment</p> <p>Soil samples be collected as per BIS specifications</p>

S. No..	Terms of Reference
	<p>Water holding capacity</p> <ul style="list-style-type: none"> • Porosity <p>Land use/Landscape</p> <ul style="list-style-type: none"> • Location code • Total project area • Topography • Drainage (natural) <p>Cultivated, forest, plantations, water bodies, roads and settlements</p> <p>Biological Environment</p> <p>1. Aquatic</p> <ul style="list-style-type: none"> • Primary productivity • Aquatic weeds • Enumeration of phyto plankton, zoo plankton and benthos • Fisheries • Diversity indices • Trophic levels • Rare and endangered species • Marine Parks/ Sanctuaries/ closed areas /coastal regulation zone (CRZ) <p>2. Terrestrial</p> <ul style="list-style-type: none"> • Vegetation-species list, economic importance, forest produce, medicinal value • Importance value index (IVI) of trees • Fauna • Avi fauna • Rare and endangered <ul style="list-style-type: none"> • Detailed description of flora and fauna (terrestrial and aquatic) existing in the study area shall be given with special reference to rare, endemic and endangered species. Indicator species which indicate ecological and environment degradation should be identified and included to clearly state whether the proposed project would result in to any adverse effect on any species. • Samples to collect from upstream and downstream of discharge point, nearby tributaries at downstream, and also from dug wells close to activity site. • For forest studies, direction of wind should be considered while selecting forests. • Secondary data to collect from Government offices, NGOs, published literature.

S. No..	Terms of Reference																		
	<p>species</p> <ul style="list-style-type: none"> Sanctuaries / National park / Biosphere reserve Migratory routes <p>socio-economic Demographic structure</p> <ul style="list-style-type: none"> Infrastructure resource base Economic resource base Health status: Morbidity pattern Cultural and aesthetic attributes. Education <p>Socio-economic survey is based on proportionate, stratified and random sampling method.</p> <ul style="list-style-type: none"> Primary data collection through questionnaire Secondary data from census records, statistical hand books, topo sheets, health records and relevant official records available with Govt. agencies <p>Approach and methodology for data collection as furnished below</p> <table border="1"> <thead> <tr> <th>Attributes</th> <th>Sampling</th> <th>Remarks</th> </tr> <tr> <td></td> <td>Network Frequency</td> <td></td> </tr> </thead> <tbody> <tr> <td>Air Environment Micro-Meteorological</td> <td>Minimum 1 site in the project impact hourly continuous area</td> <td>IS 5182 Part 1-20 • Site specific primary data is essential • Secondary data from IMD, New Delhi • CPCB guidelines to be considered.</td> </tr> <tr> <td> <ul style="list-style-type: none"> Wind speed (Hourly) Wind direction Dry bulb temperature Wet bulb temperature Relative humidity Rainfall Solar radiation Cloud cover Environmental Lapse Rate </td> <td></td> <td></td> </tr> <tr> <td>Pollutants</td> <td>At least 8-12 locations</td> <td> <ul style="list-style-type: none"> Sampling as per CPCB guidelines Collection of AAQ data (except in monsoon season) Locations of various stations for different parameters </td> </tr> <tr> <td></td> <td></td> <td>As per National Ambient Air Quality Standards, CPCB Notification.</td> </tr> </tbody> </table>	Attributes	Sampling	Remarks		Network Frequency		Air Environment Micro-Meteorological	Minimum 1 site in the project impact hourly continuous area	IS 5182 Part 1-20 • Site specific primary data is essential • Secondary data from IMD, New Delhi • CPCB guidelines to be considered.	<ul style="list-style-type: none"> Wind speed (Hourly) Wind direction Dry bulb temperature Wet bulb temperature Relative humidity Rainfall Solar radiation Cloud cover Environmental Lapse Rate 			Pollutants	At least 8-12 locations	<ul style="list-style-type: none"> Sampling as per CPCB guidelines Collection of AAQ data (except in monsoon season) Locations of various stations for different parameters 			As per National Ambient Air Quality Standards, CPCB Notification.
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	<p>• HC</p> <p>• Other parameters relevant to the project and topography of the area</p> <p>should be related to the characteristic properties of the parameters.</p> <p>• The monitoring stations shall be based on the NAAQM standards as per GSR 826(E) dated 16/11/2009 and take into account the predominant wind direction, population zone and sensitive receptors including reserved forests,</p> <p>• Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAAQM Notification of 16/11/2009 along with min., max., average and 98% values for each of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA Report.</p> <p>Noise</p> <p>Hourly equivalent noise levels At least 8-12 locations s per CPCB norms</p> <p>Water</p> <p>Parameters for water quality</p> <p>• pH, temp, turbidity, magnesium hardness, total alkalinity, chloride, sulphate, nitrate, fluoride, sodium, potassium, salinity</p> <p>Samples for water quality should be collected and analyzed as per:</p> <p>• Total nitrogen, total phosphorus, DO, BOD, COD, Phenol</p> <p>• IS: 2488 (Part 1-5) methods for sampling and testing of Industrial effluents</p> <p>• Heavy metals</p> <p>• Standard methods for examination of water and wastewater analysis published by American Public Health Association</p> <p>• Total coliforms, faecal coliforms</p> <p>• Phyto plankton</p> <p>• Zoo plankton</p> <p>For River Bodies</p> <p>Surface water quality of the nearest River</p> <p>• Total Carbon</p> <p>• Yield of water sources to be measured during critical season</p>

S. No..	Terms of Reference
	<p>(60m upstream and downstream) Standard methodology for collection of surface water (BIS standards)</p> <ul style="list-style-type: none"> • pH • Dissolved Oxygen • Biological Oxygen Demand • Free NH₄ • Boron • Sodium Absorption Ratio • Electrical Conductivity <p>For Ground Water Ground water monitoring data should be collected at minimum of 8 locations (from existing wells /tube wells/existing current records) from the study area and shall be included.</p> <p>Traffic Study Type of vehicles</p> <ul style="list-style-type: none"> • Frequency of vehicles for transportation of materials • Additional traffic due to proposed project <p>Land Environment</p> <p>Soil</p> <ul style="list-style-type: none"> • Particle size distribution • Texture • pH • Electrical conductivity • Cation exchange capacity • Alkali metals • Sodium Absorption Ratio (SAR) • Permeability • Water holding capacity • Porosity <p>Soil samples be collected as per BIS specifications</p> <p>Land use/Landscape</p> <ul style="list-style-type: none"> • Location code • Total project area • Topography • Drainage (natural) <p>Cultivated,</p>

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S. No..	Terms of Reference
	<ul style="list-style-type: none"> Health status: Morbidity sheets, health records and relevant official records available with Govt. agencies Cultural and aesthetic attributes. Education
15.3	Interpretation of each environment attribute shall be enumerated and summarized as given below: • Ambient air quality • Ambient Noise quality • Surface water quality • Ground water quality • Soil quality • Biological Environment • Land use • Socio-economic environment
15.4	The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.

16. Anticipated Environment Impacts and mitigation measures (In case of expansion, cumulative impact assessment shall be carried out)

S. No..	Terms of Reference												
16.1	<p>Identification of potential impacts in the form of a matrix for the construction and operation phase for all the environment components</p> <table border="1"> <thead> <tr> <th>Activity</th> <th>Environment</th> <th>Ecological</th> <th>Socio-economic</th> </tr> </thead> <tbody> <tr> <td>Construction phase</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Operation phase</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Activity	Environment	Ecological	Socio-economic	Construction phase				Operation phase			
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Construction phase													
Operation phase													
16.2	Impact on ambient air quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase • Details of stack emissions from the existing as well as proposed activity. • Assessment of ground level concentration of pollutants from the stack emission based on AQIP Modelling The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any along with wind rose map for respective period • Impact on ground level concentration, under normal, abnormal and emergency conditions. Measures to handle emergency situations in the event of uncontrolled release of emissions.												
16.3	Impact on ambient noise quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase												
16.4	Impact on traffic (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase												
16.5	Impact on soil quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase												
16.6	Impact on land use (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase												

S. No..	Terms of Reference
16.7	Impact on surface water resource and quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase
16.8	Impact on ground water resource and quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase
16.9	Impact on terrestrial and aquatic habitat (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase
16.10	Impact on socio-economic environment (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase
16.11	Impact on occupational health and safety (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase

17. Analysis of Alternatives (Technology & Site)

S. No..	Terms of Reference
17.1	No project scenario
17.2	Site alternative
17.3	Technical and social concerns
17.4	Conclusion

18. Environmental Monitoring Program

S. No..	Terms of Reference
18.1	Details of the Environment Management Cell
18.2	Performance monitoring schedule for all pollution control devices shall be furnished.
18.3	<p>Corporate Environment Policy</p> <p>a. Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.</p> <p>b. Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environment or forest norms / conditions? If so, it may be detailed in the EIA.</p> <p>c. What is the hierarchical system or Administrative order of the company to deal with the environment issues and for ensuring compliance with the environment clearance conditions? Details of this system may be given. Page 9 of 10</p> <p>d. Does the company have system of reporting of non compliances / violations of environment norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting</p>

S. No..	Terms of Reference																		
	mechanism shall be detailed in the EIA report																		
18.4	Action plan for post-project environment monitoring matrix: <table border="1"> <thead> <tr> <th>Activity</th> <th>Aspect</th> <th>Monitoring Parameter</th> <th>Location</th> <th>Frequency</th> <th>Responsibility</th> </tr> </thead> <tbody> <tr> <td>Construction phase</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Operation phase</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Activity	Aspect	Monitoring Parameter	Location	Frequency	Responsibility	Construction phase						Operation phase					
Activity	Aspect	Monitoring Parameter	Location	Frequency	Responsibility														
Construction phase																			
Operation phase																			

19. Additional Studies

S. No..	Terms of Reference																	
19.1	Project proponent shall submit a study report on Decarbonisation program, which would essentially consist of company's carbon emissions, carbon budgeting/ balancing, carbon sequestration activities and carbon capture, use and storage after offsetting strategies. Further, the report shall also contain time bound action plan to reduce its carbon intensity of its operations and supply chains, energy transition pathway from fossil fuels to Renewable energy etc. All these activities/ assessments should be measurable and monitorable with defined time frames.																	
19.2	Details of adoption/ implementation status/plan to achieve the goal of Glasgow COP26 Climate Submit with regard to enhance the non-fossil energy, use of renewable energy, minimization of net carbon emission and carbon intensity with long-term target of "net Zero" emission.																	
19.3	Implementation status/measures adopted for avoiding the generation of single used plastic waste.																	
19.4	In cases the project is located in Critically and Severely Polluted Areas, additional mitigation measures adopted and detailed action plan to be submitted in the EIA/EMP Report as per MoEF&CC O.M. No. 22-23/2028-IA.III dated 31/10/2019 and MoEF&CC O.M. No. 22-23/2028-IA.III dated 5/07/2022 has to be submitted.																	
19.5	Public consultation details (Entire proceedings as separate annexure along with authenticated English Translation of Public Consultation proceedings).																	
19.6	As part of Corporate Environment Responsibility (CER) activity, company shall adopt nearby villages based on the socio-economic survey and undertake community developmental activities in consultation with the village Panchayat and the District Administration. In this regard, time bound action plan as per the MoEF&CC Office Memorandum dated 30/09/2020 shall be submitted.																	
19.7	Summary of issues raised during public consultation along with action plan to address the same as per MoEF&CC O.M. dated 30/09/2020 <table border="1"> <thead> <tr> <th rowspan="2">S.No</th> <th rowspan="2">Name of the Physical Activity</th> <th rowspan="2">Physical plan of the Physical Targets</th> <th colspan="3">Year of implementation (Budget in INR)</th> <th rowspan="2">Total Expenditure (Rs. in Crores)</th> </tr> <tr> <th>1st</th> <th>2nd</th> <th>3rd</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	S.No	Name of the Physical Activity	Physical plan of the Physical Targets	Year of implementation (Budget in INR)			Total Expenditure (Rs. in Crores)	1st	2nd	3rd							
S.No	Name of the Physical Activity				Physical plan of the Physical Targets	Year of implementation (Budget in INR)			Total Expenditure (Rs. in Crores)									
		1st	2nd	3rd														
19.8	Risk assessment																	

S. No..	Terms of Reference
	<ul style="list-style-type: none"> • Methodology • Hazard identification • Frequency analysis • Consequence analysis • Risk assessment outcome
19.9	Emergency response and preparedness plan

20. Project Benefits

S. No..	Terms of Reference
20.1	Environment benefits
20.2	Social infrastructure
20.3	Employment and business opportunity
20.4	Other tangible benefits

21. Environment Cost Benefit Analysis

S. No..	Terms of Reference
21.1	Net present value
21.2	Internal rate of return
21.3	Benefit cost ratio
21.4	Cost effectiveness analysis

22. Environment Management Plan (Construction and Operation phase)

S. No..	Terms of Reference
22.1	Action plan for hazardous waste management
22.2	Action plan for solid waste management
22.3	Action plan for e-waste management.
22.4	Action plan for plastic waste management, considering the Plastic Waste Management Rules 2016.
22.5	Action plan for construction and demolition waste management.

S. No..	Terms of Reference
22.6	Rain water harvesting plan
22.7	Plan for maximum usage of waste water/treated water in the Unit
22.8	Green belt development plan: An action plan for Green Belt development consisting of 3 tiers of plantations of native species all along the periphery of the project of adequate width shall be raised in 33% of total area with a tree density shall not less than 2500 per ha within a time frame of one year shall be submitted. Survival rate of green belt shall be monitored on periodic basis to ensure that survival rate not be less than 80 %.
22.9	Wildlife conservation plan (In case of presence of schedule I species)
22.10	Total capital cost and recurring cost/annum for environment pollution control measures shall be included.
22.11	Explore possibilities for recycling and reusing of treated water in the unit to reduce the freshwater demand and waste disposal.
22.12	An Action Plan for improving the house-keeping activities in the raw material handling area need to be submitted
22.13	Action plan for the stock piles with impervious floor, provision of garland drains and catch pits to trap run off material shall be submitted.
22.14	Action plan to limit the dust emission from all the stacks below 30 mg/Nm ³ shall be furnished.
22.15	Action plan for fugitive emission control in the plant premises shall be provided.

Standard Terms of Reference for conducting Environment Impact Assessment Study for Cement plants and information to be included in EIA/EMP report

1.

Sr. No.	Terms of Reference
1.1	Limestone and coal linkage documents along with the status of environment clearance of limestone and coal mines.
1.2	Quantum of production of coal and limestone from coal & limestone mines and the projects they cater to;
1.3	Present land use shall be prepared based on satellite imagery. High-resolution satellite image data having 1m-5m spatial resolution like quickbird, Ikonos, IRS P-6 pan sharpened etc. for the 10 Km radius area from proposed site. The same shall be used for land used/land-cover mapping of the area.
1.4	If the raw materials used have trace elements, an environment management plan shall also be

Sr. No.	Terms of Reference
	included.
1.5	Plan for the implementation of the recommendations made for the cement plants in the Corporate Responsibility for Environmental Protection (CREP) guidelines shall be prepared.
1.6	Energy consumption per ton of clinker and cement grinding
1.7	Provision of waste heat recovery boiler
1.8	Arrangement for co-processing of hazardous waste in cement plant.
1.9	Provision of Alternate fuels.
1.10	Details of Implementation of Fly Ash Management Rules
1.11	Emission/Effluent norms as per GSR 496 (E) dated 9/5/2016 [EPA Rules 1986].
1.12	Action plan to limit the particulate matter emission from all the stacks below 30 mg/Nm ³ shall be furnished.
1.13	PP shall explore the possibility of plastic waste utilization in the Plant/Unit process.
1.14	Action plan for 100 % solid waste utilization shall be submitted.
1.15	PM (PM ₁₀ and P _{2.5}) present in the ambient air must be analysed for source analysis – natural dust/RSPM generated from plant operations (trace elements) of PM ₁₀ to be carried over.

Additional Terms of Reference

N/A

Annexure 2

Details of Products & By-products

Name of the product /By-product	Product / By-product	Existing	Proposed	Total	Unit	Mode of Transport / Transmission	Remarks (eg. CAS number)
Clinker	By-Product	1.44	1.32	2.76	MTPA	Conveyor Belt	NA
Imported Clinker from RCL Sister Units	By-Product	0.5	0	0.5	MTPA	Rail	NA
Cement (OPC/RHPC/PPC/MC/CC)	Product	2.7	1.3	4	MTPA	Road	Both Rail & Road Modes

Awarded TORs & their incorporation in EIA Report

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
I	Standard Terms of Reference	
1	Preliminary Requirements	
1.1	EIA/EMP report cover page shall consists of project title with location, applicable schedule of the EIA Notification, 2006, ToR letter No. with date, study period along with EIA consultant & laboratory details with QCI/NABET/NABL accreditation certificate detail.	Complied. Cover Page consists of project title with location, applicable schedule of the EIA Notification, 2006, ToR letter No. with date, study period along with EIA consultant & laboratory details with QCI/NABET/NABL accreditation certificate detail.
1.2	Besides, following points shall be compiled as per QCI/NABET norms: a. Disclaimer by the EIA consultant. b. Declaration by the Functional Area Experts contributed to the EIA study and declaration by the head of the accredited consultant organization/authorized person. c. Undertaking by the project proponent owning the contents (information and data) of the EIA/EMP report. d. Undertaking by the EIA consultant regarding compliance of ToR issued by MoEF&CC. e. Consultant shall submit the Plagiarism Certificate for the EIA/EMP Report.	8 10-11 12 13 9
2	Compliance	
2.1	Table of Contents of the EIA report including list of tables/figures/ annexures/ abbreviations/symbols/notations.	2-7
2.2	Point wise compliance to the ToR issued by MoEF&CC.	35-50
3	<u>Executive Summary</u>	
3.1	Introduction	51
3.1.1	Name of the project along with applicable schedule and category as per EIA, 2006.	51
3.1.2	Location and accessibility	55
4.1	Project description	
4.1.1	Resource requirements (Land; water; fuel; manpower)	57
4.1.2	Operational activity	59
4.1.3	Key pollution concerns	61
5.1	Baseline Environment Studies	
5.1.1	Ambient air quality	64
5.1.2	Ambient Noise quality	65
5.1.3	Traffic study	65
5.1.4	Surface water quality	65
5.1.5	Ground water quality	66
5.1.6	Soil quality	66
5.1.7	Biological Environment	66

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
5.1.8	Land use	66
5.1.9	Socio-economic environment	66
6.1	Anticipated impacts	
6.1.1	Impact on ambient air quality	68
6.1.2	Impact on ambient noise quality	68-69
6.1.3	Impact on road and traffic	67 & 69
6.1.4	Impact on surface water resource and quality	68 & 70
6.1.5	Impact on ground water resource and quality	68 & 70
6.1.6	Impact on terrestrial and aquatic habitat	68 & 71
6.1.7	Impact on socio-economic environment	68 & 71
7.1	Alternative analysis	72
8.1	Environmental Monitoring program	
8.1.1	Ambient air, noise, water and soil quality	72
8.1.2	Noise quality management plan	72
8.1.3	Emission and discharge from the plant	72
8.1.4	Green Belt	72
8.1.5	Social Parameters	73
9.1	Additional Studies	
9.1.1	Risk assessment	73
9.1.2	Public consultation	73
9.1.3	Action plan to address the issues raised during public consultation as per MoEF&CC O.M. dated 30/09/2020	73
10.1	Environment Management Plan	
10.1.1	Air quality management plan	74
10.1.2	Solid and hazardous waste management plan	75
10.1.3	Effluent management plan	76
10.1.4	Storm water management plan	76
10.1.5	Occupational health and safety management plan	77
10.1.6	Green belt development plan	76
10.1.7	Socio-economic management plan	77
10.1.8	Project cost and EMP implementation budget	77
II	EIA Report	
11	Introduction	78
11.1	Background about the project	78
11.2	Need of the project	106
11.3	Purpose of the EIA study	78
11.4	Scope of the EIA study	110
12	Project Description	111
12.1.1	Location of the project site covering village, Taluka/Tehsil, District and State.	111
12.1.2	Site accessibility	116
12.1.3	A digital toposheet in pdf or shape file compatible to google earth of the study area of radius of 10km and site location	113-114

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
	preferably on 1:50,000 scale. (including all eco-sensitive areas and environmentally sensitive places).	
12.1.4	Latest High-resolution satellite image data having 1 m - 5 m spatial resolution like quickbird, Ikonos, IRS P-6 pan sharpened etc., along with delineation of plant boundary co-ordinates. Area must include at least 100 m all around the project location.	88
12.1.5	Environment settings of the site and its surrounding along with map.	112-116
12.1.6	A list of major industries with name, products and distance from plant site within study area (10km radius) and the location of the industries shall be depicted in the study area map.	116
12.1.7	In case if the project site is in vicinity of the water body, 50 meters from the edge of the water body towards the site shall be treated as no development/construction zone. If it's near the wetland, Guidelines for implementing Wetlands (Conservation and Management) Rules, 2017 may be followed.	119
12.1.8	In case if the project site is in vicinity of the river, the industry shall not be located within the river flood plain corresponding to one in 25 years flood, as certified by concerned District Magistrate/Executive Engineer from State Water Resources Department (or) any other officer authorized by the State Government for this purpose as per the provisions contained in the MoEF&CC Office Memorandum dated 14/02/2022.	Not Applicable
12.1.9	In case of canal/ nala/ seasonal drain and any other water body passing through project site, the PP shall submit the suitable steps /conservation plan/mitigation measures along with contouring, Run -off calculations, disposal etc. A robust and full proof Drainage Conservation scheme to protect the natural drainage/water bodies and its flow parameters; along with Soil conservation scheme and multiple Erosion control measures shall be provided in the report.	Not Applicable
12.1.10	Type of land, land use of the project site needs to be submitted.	81
12.1.11	Status of acquisition of land. If acquisition is not complete, stage of the acquisition process as per the MoEF&CC O.M. dated	81

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
	7/10/2014 shall be furnished.	
12.1.12	Project proponent shall prepare Engineering layout plan showing all internal roads minimum 6 m width and 9 m turning radius for smooth traffic flow inside including fire tender as per NBC. Road network shall connect all service areas in layout. This drawing shall include area statement showing plot area, area under roads, parking, green belt with calculations and % with respect to plot area of project site and proper indexing. If located within an Industrial area/Estate/Complex, layout of Industrial Area indicating location of unit within the Industrial area/Estate.	119 & 121
12.1.13	Project proponent shall submit contour map of project site along with drainage disposal system with calculations and drawings supported with proper indexing including Rain Water Harvesting details with calculations mentioning about GW recharge along with relevant drawing.	142-144
12.1.14	A detailed report covering all aspects of Fire Safety Management and Fire Emergency Plan shall be submitted.	291-293
12.1.15	Details of drone survey for the site, needs to be included in report and presented before the EAC during appraisal of the project.	Will be submitted at the time of EAC Meeting.
13	Forest and Wildlife	
13.1	Forest and wildlife related issues (if applicable)	Not Applicable
13.1.1	Status of Forest Clearance for the use of forest land shall be submitted.	Not Applicable
13.1.2	Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife if the project site located within notified Eco-Sensitive Zone, 10 km radius of national park/sanctuary wherein final ESZ notification is not in place as per MoEF&CC Office Memorandum dated 8/8/2019.	Not Applicable
13.1.3	The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, Eco-sensitive Zone and Eco-sensitive areas, the project proponent shall submit the map duly authenticated by Divisional Forest Officer showing the distance between the project site and the said areas.	Not Applicable

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
13.1.4	Wildlife Conservation Plan duly authenticated by the Competent Authority of the State Government for conservation of Schedule I fauna along with budget and action plan, if any exists in the study area.	321
14	Salient features	
14.1	Salient features of the project	
14.1.1	Products with capacities in Tons per Annum for the proposed project.	111
14.1.2	If expansion project, status of implementation of existing project, details of existing/proposed products with production capacities in Tons per Annum.	94-97
14.1.3	Site preparatory activities.	Not Applicable - 250
14.1.4	List of raw materials required and their source along with mode of transportation.	145-146
14.1.5	Other than raw materials, other chemicals and materials required with quantities and storage capacities.	146
14.1.6	Manufacturing process details along with process flow diagram of proposed units.	148-152
14.1.7	Consolidated materials and energy balance for the project.	151-152 & 157-158
14.1.8	Total requirement of surface/ ground water and power with their respective sources, status of approval.	159-160
14.1.9	Water balance diagram	160
14.1.10	Details of Emission, effluents, hazardous waste generation and mode of disposal during construction as well as operation phase.	248-251, 269
14.1.11	Man-power requirement.	162
14.1.12	Cost of project and scheduled time of completion.	162
14.1.13	In case of expansion projects, project proponent shall submit structural stability certificate showing whether existing structure withstand for proposed expansion activity.	119, 123 & 133
14.1.14	Brief on present status of compliance (Expansion/modernization proposals) a. Cumulative Environment Impact Assessment for the existing as well as the proposed expansion/modernization shall be carried out. b. Cumulative Impact Assessment need to be carried out by greenfield projects considering the nearby industries. c. In case of ground water drawl for the existing unit, action plan for phasing out of ground water abstraction in next two years except for domestic purposes and shall	248 Not Applicable Not Applicable – No ground water drawl

RCL

EC for Expansion of RR Nagar Cement Plant (with all 3 Existing Lines), Virudhunagar, TN

			annexure to the EIA Report.	
Noise Hourly equivalent noise levels	At least 8-12 locations		As per CPCB norms	202-203
Water Parameters for water quality <ul style="list-style-type: none"> • pH, temp, turbidity, magnesium hardness, total alkalinity, chloride, sulphate, nitrate, fluoride, sodium, potassium, salinity • Total nitrogen, total phosphorus, DO, BOD, COD, Phenol • Heavy metals • Total coliforms, faecal coliforms • Phyto plankton • Zoo plankton 			Samples for water quality should be collected and analyzed as per: <ul style="list-style-type: none"> • IS: 2488 (Part 1-5) methods for sampling and testing of Industrial effluents • Standard methods for examination of water and wastewater analysis published by American Public Health Association 	Complied. 205-209
For River Bodies <ul style="list-style-type: none"> • Total Carbon • pH • Dissolved Oxygen • Biological Oxygen Demand • Free NH4 • Boron • Sodium Absorption Ratio • Electrical Conductivity 	Surface water quality of the nearest River (60m upstream and downstream) and other surface water bodies		<ul style="list-style-type: none"> • Yield of water sources to be measured during critical season • Standard methodology for collection of surface water (BIS standards) 	206-207
For Ground Water			Ground water monitoring data should be collected at minimum of 8 locations (from existing wells /tube wells/ existing current records) from the study area and shall be included.	208-209
Traffic Study	Type of vehicles	<ul style="list-style-type: none"> • Frequency of vehicles for transportation of materials • Additional traffic due to proposed project 		253-255
Land Environment Soil <ul style="list-style-type: none"> • Particle size distribution • Texture • pH • Electrical conductivity • Cation exchange capacity 			Soil samples be collected as per BIS specifications	211-212

	<ul style="list-style-type: none"> • Alkali metals • Sodium Absorption Ratio(SAR) • Permeability • Water holding capacity • Porosity <p>Land use/Landscape</p> <ul style="list-style-type: none"> • Location code • Total project area • Topography • Drainage (natural) • Cultivated, forest plantation, water bodies, roads and settlements 				211-213
	<p>Biological Environment</p> <p>1. Aquatic</p> <ul style="list-style-type: none"> • Primary productivity • Aquatic weeds • Enumeration of phytoplankton, zoo plankton and benthos • Fisheries Diversity indices • Trophic levels • Rare and endangered species • Marine Parks/ Sanctuaries/ closed areas /coastal regulation zone (CRZ) <p>2. Terrestrial</p> <ul style="list-style-type: none"> • Vegetation-species list, economic importance, forest produce, medicinal value • Importance value index (IVI) of trees • Fauna • Avi fauna • Rare and endangered species Sanctuaries / National park / Biosphere reserve • Migratory routes 			<ul style="list-style-type: none"> • Detailed description of flora and fauna (terrestrial and aquatic) existing in the study area shall be given with special reference to rare, endemic and endangered species. Indicator species which indicate ecological and environment degradation should be identified and included to clearly state whether the proposed project would result in to any adverse effect on any species. • Samples to collect from upstream and downstream of discharge point, nearby tributaries at downstream, and also from dug wells close to activity site. • For forest studies, direction of wind should be considered while selecting forests. • Secondary data to collect from Government offices, NGOs, published literature. 	<p>215-226</p> <p>226-227</p> <p>Not Applicable</p> <p>-</p>
	<p>Socio-economic Demographic structure</p> <ul style="list-style-type: none"> • Infrastructure resource 			<p>Socio-economic survey is based on proportionate, stratified and random sampling</p>	227-244

	<p>base</p> <ul style="list-style-type: none"> •Economic resource base •Health status: Morbidity pattern •Cultural and aesthetic attributes. •Education 			<p>method.</p> <ul style="list-style-type: none"> •Primary data collection through questionnaire •Secondary data from census records, statistical hard books, toposheets, health records and relevant official records available with Govt. agencies 	
15.3	<p>Interpretation of each environment attribute shall be enumerated and summarized as given below:</p> <ul style="list-style-type: none"> •Ambient air quality • Ambient Noise quality • Surface water quality • Ground water quality • Soil quality •Biological Environment • Land use • Socio-economic environment 			244-247	
15.4	<p>The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.</p>			Complied.	164-170 467-498

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.									
16	Anticipated Environment Impacts and mitigation measures (In case of expansion, cumulative impact assessment shall be carried out)										
16.1	<p>Identification of potential impacts in the form of a matrix for the construction and operation phase for all the environment components</p> <table border="1"> <thead> <tr> <th>Activity</th> <th>Environment</th> <th>Ecolog</th> </tr> </thead> <tbody> <tr> <td>Construction phase</td> <td></td> <td></td> </tr> <tr> <td>Operation phase</td> <td></td> <td></td> </tr> </tbody> </table>	Activity	Environment	Ecolog	Construction phase			Operation phase			249-252
Activity	Environment	Ecolog									
Construction phase											
Operation phase											
16.2	<p>Impact on ambient air quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact)</p> <p>a. Construction phase</p> <p>b. Operation phase</p> <ul style="list-style-type: none"> •Details of stack emissions from the 	248-251 251-257 257-258									

	<p>existing as well as proposed activity.</p> <ul style="list-style-type: none"> •Assessment of ground level concentration of pollutants from the stack emission based on AQIP Modelling The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any along with wind rose map for respective period •Impact on ground level concentration, under normal, abnormal and emergency conditions. Measures to handle emergency situations in the event of uncontrolled release of emissions. 	<p>258-265</p> <p>264-266</p>
16.3	<p>Impact on ambient noise quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact)</p> <p>a. Construction phase b. Operation phase</p>	250 & 266
16.4	<p>Impact on traffic (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact)</p> <p>a. Construction phase b. Operation phase</p>	250, 253 - 255
16.5	<p>Impact on soil quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact)</p> <p>a. Construction phase b. Operation phase</p>	250, 267 – 268
16.6	<p>Impact on land use (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact)</p> <p>a. Construction phase b. Operation phase</p>	250, 251
16.7	<p>Impact on surface water resource and quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase</p>	250 267
16.8	<p>Impact on ground water resource and quality (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase</p>	250 267
16.9	<p>Impact on terrestrial and aquatic habitat (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact)</p> <p>a. Construction phase b. Operation</p>	250 268

	phase									
16.10	Impact on socio-economic environment (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase	250 268								
16.11	Impact on occupational health and safety (Sources; Embedded control measures; Assessment; Mitigation measures; Residual impact) a. Construction phase b. Operation phase	250 269								
17	Analysis of Alternatives (Technology & Site)									
17.1	No project scenario	271								
17.2	Site alternative	271								
17.3	Technical and social concerns	271-276								
17.4	Conclusion	276								
18	Environmental Monitoring Program									
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Activity	Aspect	Monitoring Parameter	Location							

	Constru tion phase						
	Operati on phase						
19	Additional Studies						
19.1	Project proponent shall submit a study report on Decarbonisation program, which would essentially consist of company's carbon emissions, carbon budgeting/ balancing, carbon sequestration activities and carbon capture, use and storage after offsetting strategies. Further, the report shall also contain time bound action plan to reduce its carbon intensity of its operations and supply chains, energy transition pathway from fossil fuels to Renewable energy etc. All these activities/ assessments should be measurable and monitorable with defined time frames.					312-314	
19.2	Details of adoption/ implementation status/plan to achieve the goal of Glasgow COP26 Climate Submit with regard to enhance the non-fossil energy, use of renewable energy, minimization of net carbon emission and carbon intensity with long-term target of "net Zero" emission.					312-314	
19.3	Implementation status/measures adopted for avoiding the generation of single used plastic waste.					318	
19.4	In cases the project is located in Critically and Severely Polluted Areas, additional mitigation measures adopted and detailed action plan to be submitted in the EIA/EMP Report as per MoEF&CC O.M. No. 22- 23/2028-IA.III dated 31/10/2019 and MoEF&CC O.M. No. 22-23/2028-IA.III dated 5/07/2022 has to be submitted.					Not Applicable	
19.5	Public consultation details (Entire proceedings as separate annexure along with authenticated English Translation of Public Consultation proceedings).					To be complied after Public Hearing.	
19.6	As part of Corporate Environment Responsibility (CER) activity, company shall adopt nearby villages based on the socio-economic survey and undertake					To be complied after Public Hearing.	

	community developmental activities in consultation with the village Panchayat and the District Administration. In this regard, time bound action plan as per the MoEF&CC Office Memorandum dated 30/09/2020 shall be submitted.																				
19.7	Summary of issues raised during public consultation along with action plan to address the same as per MoEF&CC O.M. dated 30/09/2020	To be complied after Public Hearing.																			
	<table border="1"> <thead> <tr> <th rowspan="2">Sl. No.</th> <th colspan="2">Physical activity and action plan</th> <th colspan="2">Year of implement (Budget in INR)</th> </tr> <tr> <th>Name of the Activity</th> <th>Physical Targets</th> <th>1st</th> <th>2nd</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Sl. No.	Physical activity and action plan		Year of implement (Budget in INR)		Name of the Activity	Physical Targets	1st	2nd											
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19.8	Risk assessment <ul style="list-style-type: none"> •Methodology •Hazard identification •Frequency analysis •Consequence analysis •Risk assessment outcome 	283-311 286 286 286 288-291																			
19.9	Emergency response and preparedness plan	297-311																			
20	Project Benefits																				
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20.2	Social infrastructure	312																			
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22.8	Green belt development plan: An action	318																			

	plan for Green Belt development consisting of 3 tiers of plantations of native species all along the periphery of the project of adequate width shall be raised in 33% of total area with a tree density shall not less than 2500 per ha within a time frame of one year shall be submitted. Survival rate of green belt shall be monitored on periodic basis to ensure that survival rate not be less than 80 %.	
22.9	Wildlife conservation plan (In case of presence of schedule I species)	320-321
22.10	Total capital cost and recurring cost/annum for environment pollution control measures shall be included.	319-320
22.11	Explore possibilities for recycling and reusing of treated water in the unit to reduce the freshwater demand and waste disposal.	159
22.12	An Action Plan for improving the house-keeping activities in the raw material handling area need to be submitted	102-105
22.13	Action plan for the stock piles with impervious floor, provision of garland drains and catch pits to trap run off material shall be submitted.	148
22.14	Action plan to limit the dust emission from all the stacks below 30 mg/Nm ³ shall be furnished.	161
22.15	Action plan for fugitive emission control in the plant premises shall be provided.	102-105

Standard Terms of Reference for conducting Environment Impact Assessment Study for Cement plants and information to be included in EIA/EMP report

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
1.1	Limestone and coal linkage documents along with the status of environment clearance of limestone and coal mines.	Doc-IV Page 499-506
1.2	Quantum of production of coal and limestone from coal & limestone mines and the projects they cater to;	145
1.3	Present land use shall be prepared based on satellite imagery. High-resolution satellite image data having 1m-5m spatial resolution like quickbird, Ikonos, IRS P-6 pan sharpened etc. for the 10 Km radius area from proposed site. The same shall be used for land used/land-cover mapping of the area.	213 214
1.4	If the raw materials used have trace elements, an environment management plan shall also be included.	153
1.5	Plan for the implementation of the recommendations made for the cement plants in the Corporate Responsibility for Environmental Protection (CREP) guidelines shall be prepared.	102
1.6	Energy consumption per ton of clinker and cement grinding	159
1.7	Provision of waste heat recovery boiler	154-156
1.8	Arrangement for co-processing of hazardous waste in cement plant.	271-273
1.9	Provision of Alternate fuels.	273
1.10	Details of Implementation of Fly Ash Management Rules	Complied
1.11	Emission/Effluent norms as per GSR 496 (E) dated 9/5/2016 [EPA Rules 1986].	161
1.12	Action plan to limit the particulate matter emission from all the stacks below 30 mg/Nm ³ shall be furnished.	161
1.13	PP shall explore the possibility of plastic waste utilization in the Plant/Unit process.	273
1.14	Action plan for 100 % solid waste utilization shall be submitted.	275
1.15	PM (PM10 and P2.5) present in the ambient air must be analysed for source analysis – natural dust/RSPM generated from plant operations (trace elements) of PM10 to be carried over.	200

Executive Summary

1.0 Introduction

1.1 Name of the Project, Applicable Schedule & Category as per EIA, 2006

M/s. The Ramco Cements Limited (RCL) of Ramco Group is operating their Ramasamy Raja Nagar (RR Nagar) Cement Plant with CPP & Township over an extent of **191.434 Ha own patta lands** in SF Nos. Parts of 1-14, 16, 22, 24, 30-32, 34-39, 49-52, 56-60, 65-66, 210, 212, 214, 221, 222, 225-230 of Tulukkappatti, 192, 194-212, 215, 216 & 287 of Thammanayakkanpatti and 100-103, 108, 109, 112 & 113 Vachchakkarappatti Villages, Taluk & District Virudhunagar, Tamil Nadu State (**Fig. 1.1**). FMB Sketch is given as **Plate-1**. The Plant is in operation since 1961-62.

RCL had established the recent expansion activities with New Kiln Line of 3000 TPD in compliance with Environmental Clearance (EC) from MoEF&CC awarded vide EC Identification No. EC21A009TN169325 dated **25.10.2021**. After obtaining CTEs & CTOs from TNPCB, the Plant is now being operated for production of 1.44 MTPA Clinker & 2.70 MTPA Cement from **1st March 2023**. Present **CTO-Renew Orders** are obtained from TNPCB vide 2408157290712 (Water Act) & 2408257290712 (Air Act) dated 13.09.2024 with **validity till 31.03.2025**. Certified Compliance Report (**CCR**) for earlier EC has been issued by Integrated Regional Office (IRO), MoEF&CC, Chennai on 18.03.2024 and there is **no Non-Compliance** / no Partial Compliance reported.

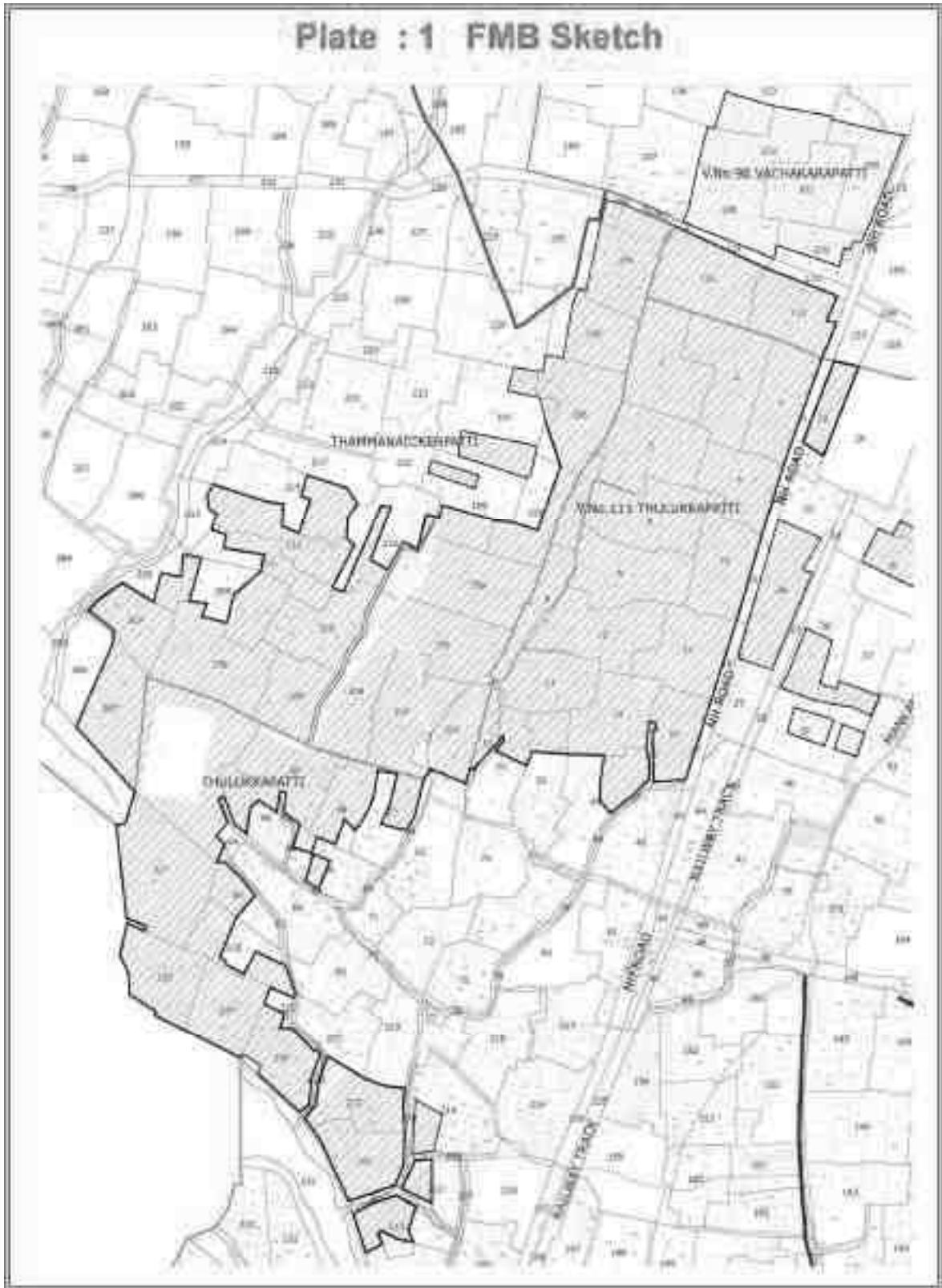
With revamping measures proposed by Engineering Consultant FLSmidth, RCL intends to expand RR Nagar Cement Plant with inclusion of revamped Old Line-II operations to existing Lines I & III i.e. **operations of all 3 existing Lines-as Upgraded** and also by increasing operational days from **320 to 345 days**.

Proposal : ‘Expansion of RR Nagar Cement Plant with inclusion of revamped Old Line-II operations to existing Lines I & III i.e. operations of all 3 existing Lines-as Upgraded and also by increasing operational days from 320 to 345 days - production enhancement of Clinker from 1.44 MTPA to 2.76 MTPA and Cement from 2.70 MTPA to 4.00 MTPA along with associated Waste Heat Recovery System of 13 MW’ at Tulukkappatti, Thammanayakkanpatti & Vachchakkarappatti Villages, Taluk & District Virudhunagar, Tamil Nadu. The additional Project Cost is Rs.103.38 Crores. On proposed Expansion, the details of Products & By-products are given in **Table 1.1**.

Table : 1.1 Details of Products & By-Products on Expansion

Production of	Product / By-product	Production, MTPA			Mode of Transportation
		Existing	Proposed	Total	
Clinker	By-product	1.44	1.32	2.76	By Conveyor
Imported Clinker from RCL Sister Units	-	0.50	0	0.50	Rail
Cement	Product	2.70	1.30	4.00	Both Road & Rail
WHRB Power Generation from all 3 Lines @ 13.0 MW					





Salient features of Proposal are given in **Table 1.2**.

Table : 1.2 Salient features of Expansion Proposal

S. No.	Details	Project Details as per Latest EC		Project Details on Expansion now	
1	Plant Extent in Ha	191.434		191.434	
2	Clinker Production, MTPA	Line	Capacity,	Line	Capacity
		I	0.48	I	0.69
		II	-	II	0.69
		III	0.96	III	1.38
		Total	1.44	Total	2.76
3	Import Clinker from Sister Units, MTPA	-	0.50	-	0.50
4	Cement Production, MTPA	Total	2.70	Total	4.00
5	WHRS	Line-I	PH&AQc Boiler	Lines I, II & III	13 MW
6	Raw Materials Demand, TPA	Limestone (& Kankar)	2.16 @ 6740 TPD	Limestone	1.794 @ 5200 TPD
		-	-	Lime Kankar	2.085 @ 6050 TPD
		-	-	Clay, Chips, Roughstone	0.209 @ 605 TPD
		Copper Slag / Laterite / Iron Ore	0.022 @ 63 TPD	Copper Slag / Laterite / Iron Ore	0.083 @ 242 TPD
		Fuel : Petcoke	0.128 @ 423 TPD	Fuel : Petcoke	0.246 @ 715 TPD
		Gypsum	0.108 @ 290 TPD	Gypsum	0.136 @ 395 TPD
		Fly Ash	0.677 @ 2050 TPD	Dry Fly Ash	1.120 @ 3246 TPD
		-	-	Wet Fly Ash	0.080 @ 232 TPD
		Slag	63 TPD	Slag	2.200 @ 6377 TPD
		-	-	Limestone Powder as PI	0.040 @ 115 TPD
7	Power, MW	32.85		40.50	
8	Water requirement in KLD & Source	1000 Ground & Surface Water		1265 Surface Water only	
9(i)	Sewage generation in KLD	280		280 (No Change)	
9(ii)	Trade Effluent generation in KLD	20		(20+60=) 80	
10	Air Pollution Control Limits	PM - <20 mg/Nm ³ SO ₂ - <100 mg/Nm ³ NOx - <600 mg/Nm ³		PM - <30 mg/Nm ³ SO ₂ - <100 mg/Nm ³ NOx - <600 mg/Nm ³	
11	Hazardous waste generation	Used/Spent Oil (Category 5.1) - 94.62 TPA		Used/Spent Oil (Category 5.1) - 94.62 TPA	
12	Project Cost	CP & CPP	Rs.894 Cr.	Addition	Rs.103.38 Cr.
	EMP-Capital	Rs.14.20 Cr.		Rs.1.00 Cr.	
	EMP-Operation	Rs.3.90 Cr./annum		Rs.0.25 Crores/annum	

All activities are **proposed within the Industry premises** and no additional land is required. Also, there is **no Rehabilitation & Resettlement (R&R)** involved. There is **no Litigation or Pending Case** against the Project.

The proposed Expansion of Cement Plant (≥ 1.0 MTPA) falls under Sl. No. 3(b) - Category 'A' of EIA Notification 2006 and requires prior EC from MoEF&CC. As per Notification SO 1599 (E) dated 25.06.2014 and OM F. No. 22-24/2018-IA.III dated 22.01.2019, prior EC for installation of WHRB is exempt and is excluded for prior EC under Sl. No. 1(d). Accordingly, RCL filed TOR Application vide Parivesh Online Proposal No. IA/TN/IND1/498318/2024 on 26.09.2024. MoEF&CC granted Standard Terms of Reference (Standard TOR) for the Project with **TOR Identification No. TO24A1102TN5995426N dated 12.11.2024** under File No. J-11011/119/2009.IA.II(I). As permitted, Baseline Data was collected during Jul.-Sep. 2024 in Premonsoon Season **for this Region** in compliance with MoEF&CC Office Memorandum No. J-11013/41/2006-IA-II(I)(Part) dated 29.08.2017.

Draft Environmental Impact Assessment (EIA) Report and Summary EIA Reports in English & Tamil languages, prepared in compliance with awarded TORs by accredited EIA Consultant - M/s. ABC Techno Labs India Private Limited (Certificate NABET/EIA/2225/RA0290 dated 11.06.2023 with validity till 16.11.2025), has been submitted now for Public Consultation & Public Hearing.

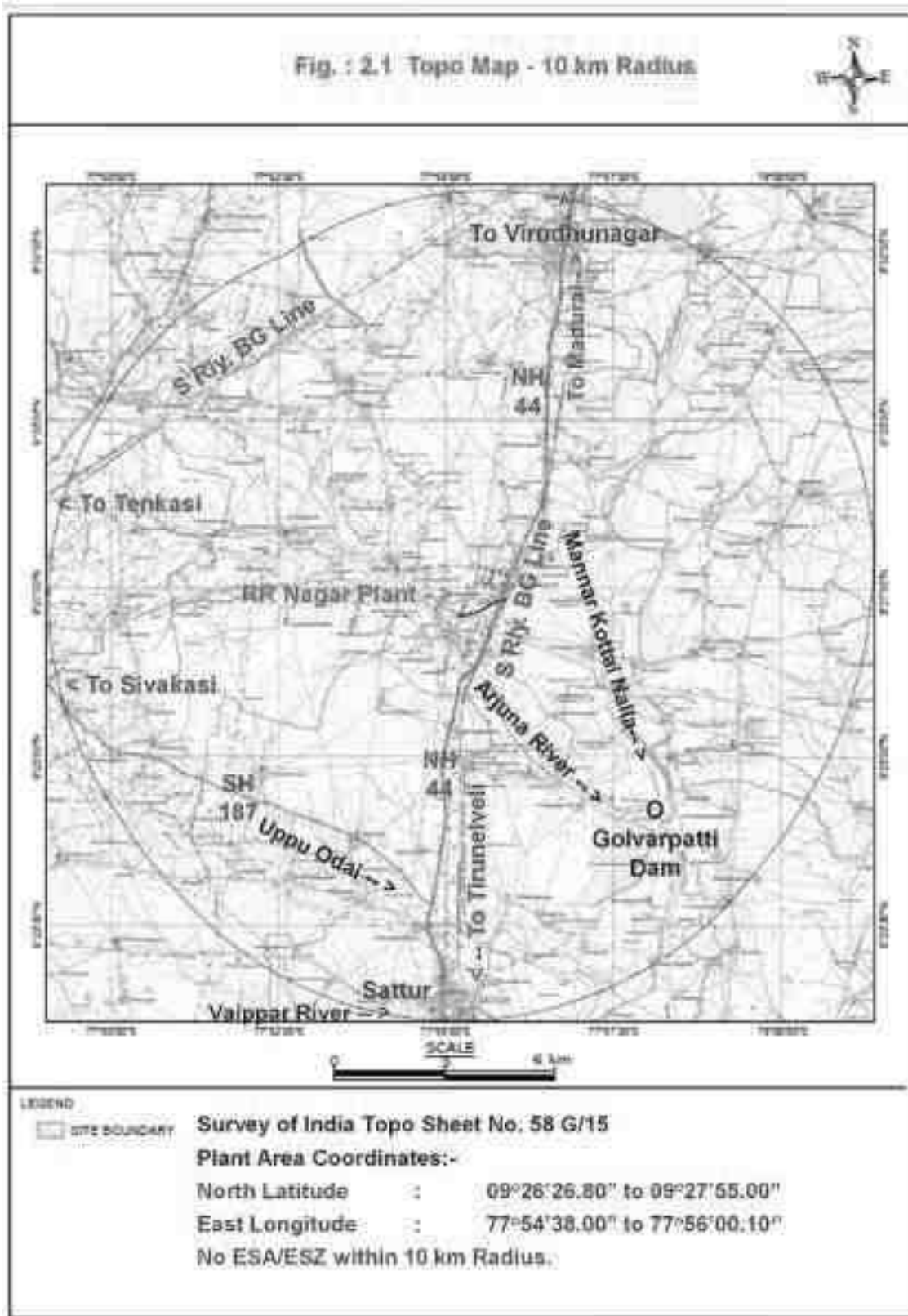
1.2 Location & Accessibility

The Cement Plant is located at a distance of 15 km in south from District Head Quarters Virudhunagar. Sattur Town is at a distance of 7.5 km (south) and Sivakasi Town is at 11 km (west). NH-44 (earlier NH-7) (4-Lane Madurai-Kanniyakumari Section) and Southern Railway BG Line (Chennai-Madurai-Kanniyakumari Section) run parallel to the Plant. Madurai is the nearest Airport (50 km in north). Thoothukudi VOC Port is the nearest Port (80 km-southeast). State Headquarters Chennai is at 450 km in northeast from the Plant.

Plant area falls in Survey of India Topo Sheet No. **58 G/15** (Open Series Map-C43R15). Topo Sheet is given as **Fig. 2.1**. Plant Coordinates are:

North Latitude	:	09°26'26.80" to 09°27'55.00"
East Longitude	:	77°54'38.00" to 77°56'00.10"

There are **no Eco Sensitive Areas** like National Parks, Wildlife Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar Sites, Tiger/Elephant Reserves, Reserved Forests, Archaeological / Historical Monuments etc. (existing as well as proposed), within 10 km Study Area. There is **no perennial River** in the Region. **Seasonal Arjuna River** (0.3 km in south) and Mannarkottai Nalla (2.0 km-east) are flowing near the Plant. There is **no major Industry** in the Study Area other than RR Nagar Cement Plant & CPP and Fire Cracker Units.



2.0 Project Description

2.1 Resource Requirements

Land : All Expansion activities i.e. **Line-II inclusion**, are proposed within the existing Premises and **no additional land** is required. **No establishment** is required for the Proposal. Proposed Layout is given as **Fig. 2.1**.

Total Builtup Area of the Complex is **61.266 Ha** (with Roof Top Area of 27.570 Ha) and Paved Area of **17.012 Ha**. The total Green Belt Area is **64.50 Ha** in the total extent of 191.434 Ha with **33.69% coverage**. **No additional Green Belt** is required. **All internal roads** are designed for minimum **6 m width and 9 m turning radius** for smooth traffic flow inside the Unit including fire tender, as per NBC Norms.

Captive Mines Limestone Supply : For 2.76 MTPA Clinker production, Raw Meal requirement is 4.17 MTPA. Lime Kankar is blended with Limestone for Raw Meal preparation. Accordingly, **Limestone requirement is 1.794 MTPA @ 5,200 TPD & Lime Kankar requirement is 2.085 MTPA @ 6,050 TPD**. Existing Captive Limestone Mines in Pandalgudi Region have consented production quantity of **2.691 MTPA Limestone** of various grades. Likely, existing Captive Lime Kankar Quarries have consented production quantity of **3.914 MTPA ROM Kankar**. Thus, **existing supply/consented quantity** of Mines & Quarries **are adequate** for the proposed Expansion.

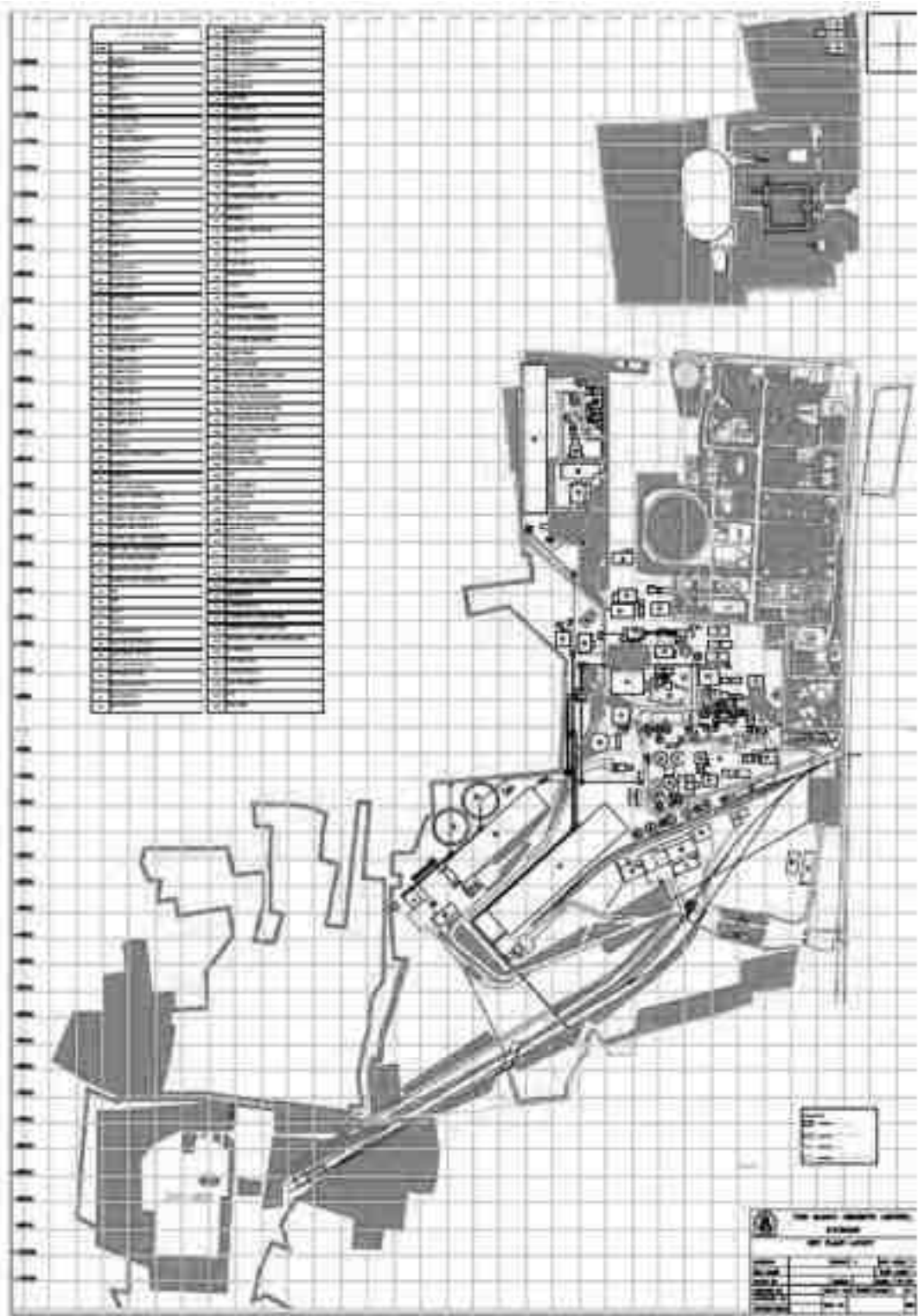
Water: Presently, the fresh water demand of the Cement Plant, CPP & Township is 1,000 KLD. **On Expansion, fresh water to the tune of 265 KLD is required** for WHRB Power Plant. Thus, total water demand will be **1,265 KLD which is well within the permitted drawl quantity of 1,500 KLD** from Arjuna River.

Fuel : Petcoke or Imported Coal is used as Fuel in the Kilns and the demand will be (i) 100% Petcoke-0.246 MTPA @ 715 TPD or 100% Imported Coal - 0.358@ 1040 TPD. There will be no change to existing demand of other fuels.

Power: The power demand of existing Plant operations and Township is 32.85 MW. Proposed Kiln-II operations will require additional Power Demand will be 7.65 MW and the total Power Demand will be 40.50 MW. In addition to 24.0 MW from CPP, 13.0 MW from WHRB Power Plant, 34.5 MW from TANGEDCO Grid) & wind power generated through RCL windmills (by wheeling within the State), **total 71.50 MW, are available** for the Plant operations.

Manpower : Presently, there are 465 Direct Employees working in the Cement Complex. Indirect Employment to about 600 persons has been provided. Due to the Expansion Proposal, **another 35 Direct Employees & 50 Indirect Employees will be added**.

Fig. : 2.1 Proposed Layout



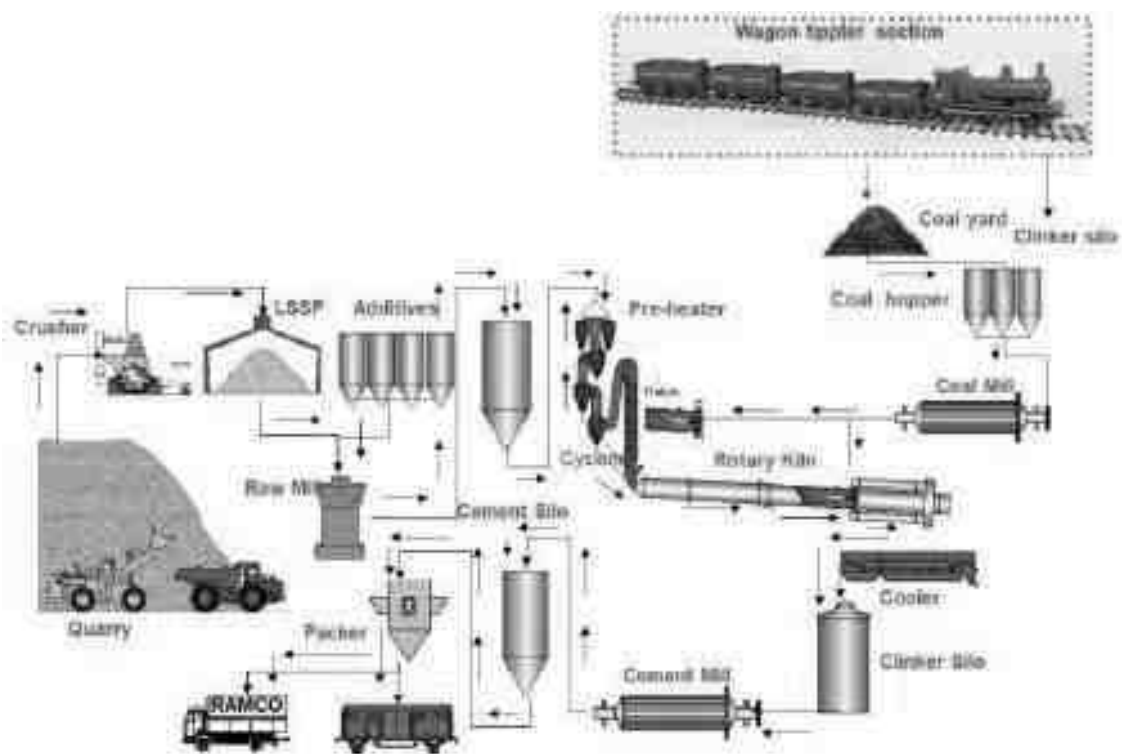
2.2 Operational Activity

Well established **Dry Process** utilising the Precaliner technology along with the technological advances in the area of grinding and homogenisation has been incorporated. General **Dry Process** Flow Chart is given as **Fig. 2.2**. The proportions for Raw Mix (average) are given below :

Raw Mix:

Limestone	:	43%
Lime Kankar	:	50%
Clay Chips & Roughstone	:	5%
Slag, Laterite, Iron Ore	:	2%
Clinkerisation Factor	:	1.512 (Raw meal to Clinker)
Fuel Consumption	:	9.28 % (100% Pet coke)
		13.62% (100% Imported coal)

Fig. : 2.2 General Process Flow Chart



Limestone & Lime Kankar along with other additives is metered in suitable proportions and sent to Raw Mill where the raw material is ground to the required size. The powdered Raw Meal is stored in the Raw Meal Silo. Belt bucket elevator is used to feed the raw material to Preheater Cyclones / Precaliner. The calcined material from the Preheater enters the Kiln and is subjected to physical and chemical changes to form Clinker. The hot molten Clinker is allowed to pass through a modern high efficient Clinker Cooler to cool it down to 150 °C. Cooled Clinker is then stored in Clinker Silos.

Clinker is then ground along with Gypsum, Slag, Fly Ash, Wet Fly Ash, PI, etc. to produce various grades of Cement. To pre grind the mill feed Clinker, Roller Press exists in the circuit. The Cement is then conveyed to the Silos through elevators. There are Electronic Packers with two discharges for automatic weighing and packing the cement in HDPE, Paper Bags and BOPP Bags. Facilities are available to dispatch Cement through Trucks as well as Rail Wagons to the Marketing Centres. Adequate **storage facilities** will be provided for the storage of raw materials & finished products. Material Balance for 2.76 MTPA Clinkerisation is given as **Fig. 2.3_Material Balance for 4.00 MTPA PPC** is given as **Fig. 2.4**.

Fig. : 2.3 Material Balance for 2.76 MTPA Clinker Production

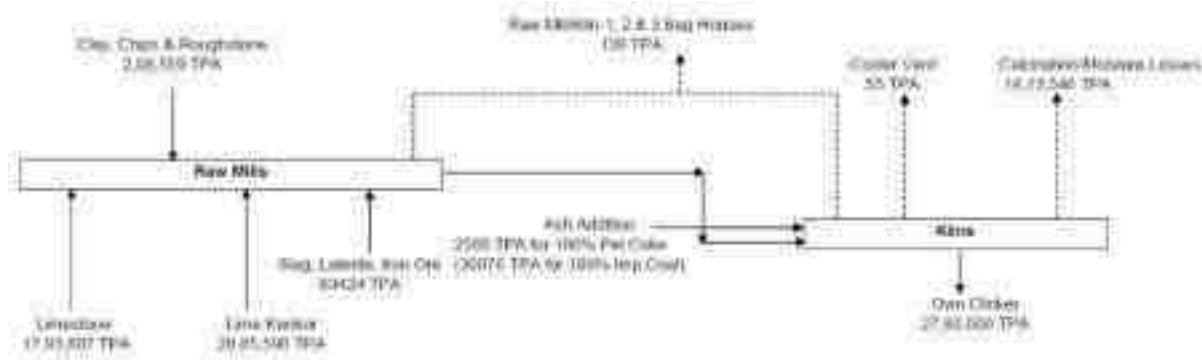
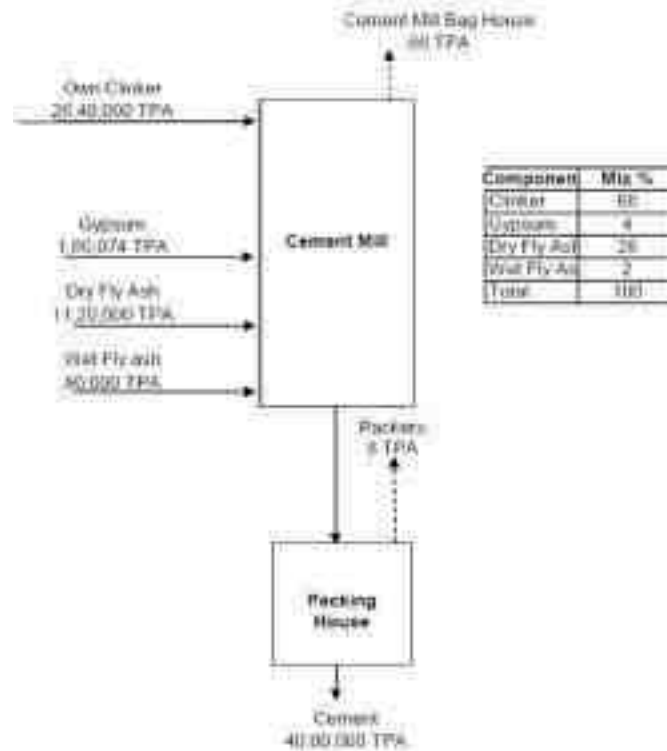


Fig. : 2.4 Material Balance for PPC Manufacturing



WHR System : The waste heat recovery (WHR) system effectively utilizes the available waste heat from exit gases of pre-heater and clinker cooler. WHR system consists of Suspension pre-heater (SP) boiler, Air Quenching Chamber (AQC) boiler, steam turbine generator, distributed control system (DCS), water-circulation system and dust-removal system, etc. In Line-I, WHR Circuit installed in Year 2019 and generated steam is utilized in the CPP for power generation. Now, PH Boilers & AQC Boilers are proposed for Lines-II & III Kiln. Existing WHR Boilers of Line-I and proposed WHRBs for Lines II & III will be combined for producing about **13 MW by a dedicated Turbine Generator.**

On obtaining all Statutory approvals, the Plant can be operated for expansion quantity from 01.04.2025.

2.3 Key Pollution Concerns

Air Pollution : The (old) Line-II Kiln is already provided with Reverse Air Bag House, Cooler with ESP, Coal Mill with Bag Filters so as to control the **Particulate Emissions from the Line-II <30 mg/Nm³**. All the Material conveyors are fully covered and provided with Bagfilters at Transfer Points. The Plant operations will be in compliance with new Emission Standards issued by MoEF&CC for Cement Industry wide Notifications dated 25.08.2014 and amended on 09.05.2016 & 10.05.2016 as below :

PM Emissions from all Major Stacks : <30 mg/Nm³.

SO₂ Emissions from all Major Stacks : <100 mg/Nm³ (pyritic Sulphur is <0.25%).

NOx Emissions from New Kiln-II : <600 mg/Nm³.

All Main Stacks of Line-II are provided with **Online Monitors** and the **Real Time Emission Levels are connected** to TNPCB Care Air Centre & CPCB Servers.

Water Pollution : There is no trade effluent from the Cement Plant. Workshop washings of 4 KLD and 16 KLD Rejects from CPP are individually neutralized and the Treated Effluent of 20 KLD is taken to the Cement Plant for equipment cooling (where it is evaporated fully). **On Expansion**, DM/RO Rejects of 40 KLD, Boiler Bleed-offs of 8 KLD and Colling Tower Rejects of 12 KLD, total **60 KLD effluent will be generated** additionally which will be treated for pH Correction in a **100 KLD Neutralisation Pit separately** and **Treated Effluent of 60 KLD** will be utilized for Equipment Cooling of (old) Line-II machineries where it will be evaporated fully.

Domestic Sewage & Canteen wastewaters of 25 KLD from the Cement Plant, 9 KLD Domestic Sewage from CPP, 160 KLD Domestic Sewage from the Township and another 86 KLD Domestic Sewage from Labour Qtrs., thus, a total of 280 KLD is generated. All the Domestic Sewage is treated in a **400 KLD Sewage Treatment Plants (350+50 KLD STPs)**. The Treated Sewage of 250 KLD is fully used for the Green Belt development. There will be **no change to existing status on Expansion**. Thus, it will be a '**Zero Effluent Discharge**' Plant.

Solid/Hazardous Wastes : The solid waste generated from the process and dust collected from various air pollution control equipment is being recycled in the process. Solid waste from the Sewage treatment plant 0.8 @ TPD is vermi-composted and used as manure for Green belt development. Fly ash (29.3 TPD) produced from CPP and Bottom ash (5.2 TPD) are transported pneumatically with the help of dense phase pneumatic pumps to the RCC storage silos. The ash is evacuated from silo and transported to Cement Plant for PPC manufacturing. The Plant has obtained **Hazardous Wastes Authorisation** from TNPCB vide No. 23HPC42009117 dated 07.06.2023 with validity till 31.03.2028 to handle 94.62 TPA used/Spent Oil (Category 5.1) from the Plant. There will not be any change to the existing Status of Solid Waste Generation, Treatment and Disposal from the Complex on Expansion.

3.0 Baseline Environmental Studies

Project Area does not fall in Critically Polluted Industrial Clusters listed by CPCB or CRZ Area. The study area of 10 km radius from boundary has been considered (Fig. 3.1) for assessing the baseline environmental status-Cumulatively. Considering the Environmental setting of the project, project activities and their interaction, environmental regulations and Standards, following Environmental Attributes have been included in EIA Study :

- ❖ **Site specific Micro-meteorological Data** from Plant Area for the Season, **on hourly basis continuously**, on wind speed, wind direction (wind roses), temperature, humidity, cloud cover, atmospheric pressure and rainfall.
- ❖ **Ambient Air Quality Monitoring** at **10 locations** on 24-hourly basis, continuously for 2 days in a week for 4 weeks in a month for 3 months in the season for all 12 parameters as per Revised NAAQ Norms.
- ❖ Noise Level Measurements at **10 locations** (air quality monitoring stations) for Leq, Lday and Lnight values once in the season.
- ❖ Water Quality Monitoring – grab sampling of Surface Water (**8 locations**) and Ground Water including Plant Raw Water (**9 Locations**) - once in the Season.
- ❖ Soil Quality Monitoring at **6 locations** once in the Season for Textural & Physical Parameters, Nutrients, etc.
- ❖ **Land Use Pattern** based on recent available Satellite Imagery.
- ❖ Biotic Attributes for : **Flora & Fauna** in Core & Buffer Zones.
- ❖ **Socio-Economic Profile**, based on 2011-Census and **Need Based Assessment**, once in the study period for: Total Population / Household Size, Gender Composition, SC / ST Population, Literacy Levels, Occupational Structure, etc.

The summary of baseline status is given in **Table 3.1**.

There is **adequate buffer** for the proposed Project in the physical, biological and edaphic environments of the study area.

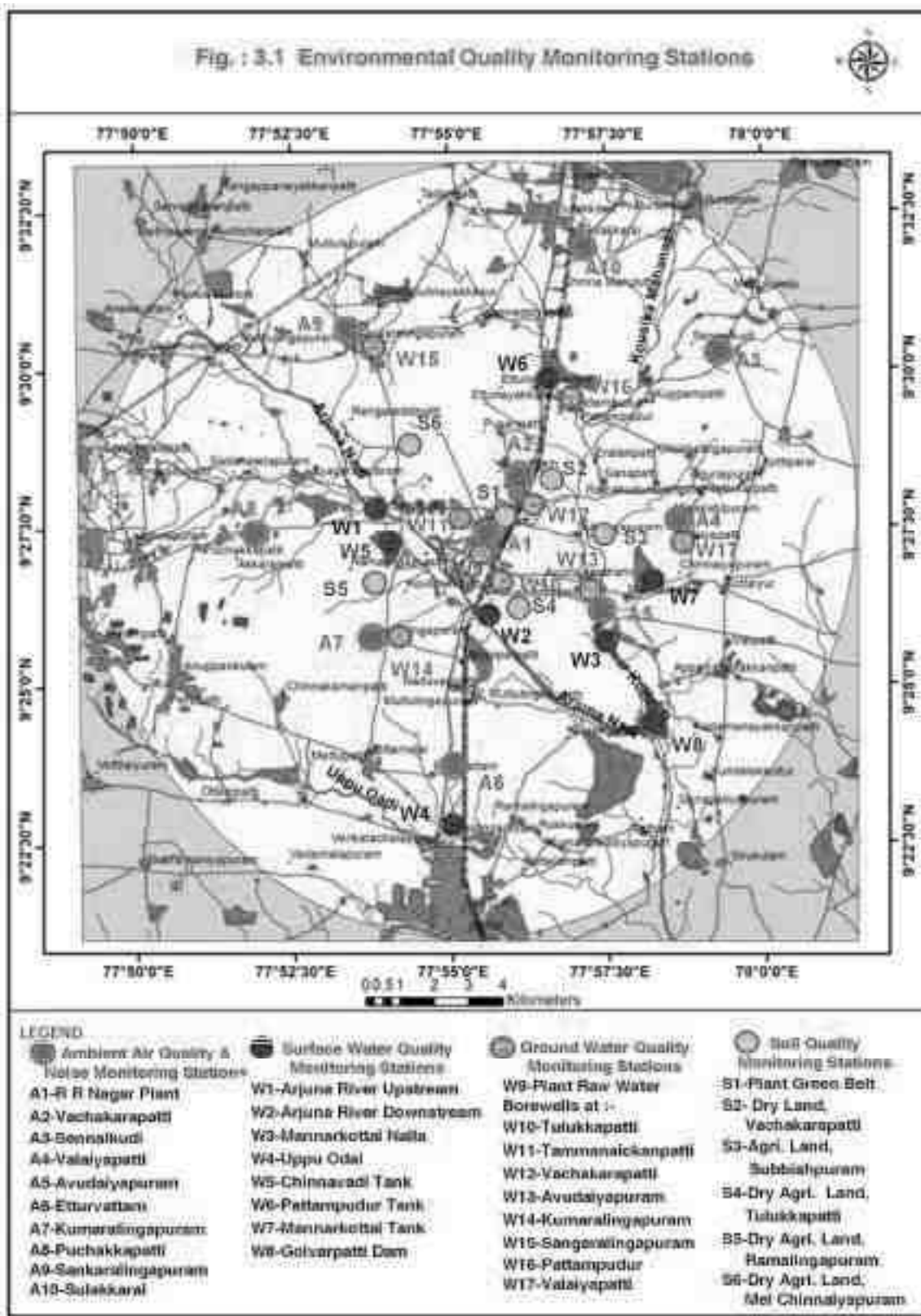


Table : 3.1 Environmental Baseline Status

Envl. Component	Main Parameters	Minimum	Maximum	Mean	Desirable Norms
Ambient Air Quality, ug/m ³	PM2.5	10	38	21.7	60
	PM10	13	65	39.0	100
	SO ₂	6	24	12.0	80
	NO _x	7	27	14.5	80
Ambient Noise, dB(A)	Leq-Day	41.5	48.1	43.5	55
	Leq-Night	40.1	44.7	41.4	45
Surface Waters	TDS, mg/l	310	560	-	500/2100
Ground Waters	TDS, mg/l	360	520	-	500-2000
Soil Status	EC, mmhos/cm	0.92	1.45	-	0.2-0.5
	SAR	2.16	5.51	-	<5

Legend : PM2.5-Particulate Matter size less than 2.5 um; PM10- Particulate Matter size less than 10 um; SO₂-Sulphur dioxide; NO_x-Oxides of Nitrogen; Leq-Day & Leq-Night - Equivalent Noise Levels during Day & Night Times; TDS-Total Dissolved Solids; EC-Electrical Conductivity & SAR-Sodium Absorption Ratio.

3.1 Ambient Air Quality

Micrometeorology : During the **Premonsoon Season (Jul.-Sep. 2024)**, predominant winds were from W/WSW/WNW directions and mean Wind velocity was 6.4 kmph. Temperature values were ranging from 24.0 °C to 40.0 °C with mean value of 30.8 °C. Mean maximum relative humidity value was 62.7%. Mean atmospheric pressure value was computed as 757.0 mm of mercury. There were 11 rainy days with total rainfall of 14.5 mm on this Premonsoon Period. The monitored meteorological data were found to be in compliance with local weather phenomena.

Ambient Air Quality : All **12 AAQ parameters (24/8/1 hourly basis)** were monitored in compliance with NAAQ Norms. During the study, each **240 samples** were collected, analysed and reported.

Particulate Matter size less than 2.5 um-**PM2.5** values (24 hours Time Weighted) were monitored in the range between 10-38 **microgram/cu.m (ug/m³)** in the Study Area with a **mean value of 21.7 ug/m³** against NAAQ Norm value of **60 ug/m³** (24 hours Time Weighted).

Particulate Matter size less than 10 um-**PM10** values were monitored in the range between 13-65 ug/m³ with a **mean value of 39.0 ug/m³** against NAAQ Norm value of **100 ug/m³** (24 hours Time Weighted).

SO₂ values were monitored in the range between 6-24 ug/m³ with a **mean value of 11.4 ug/m³** against NAAQ limit value of **80 ug/m³** (24 hours Time Weighted).

NO_x values were monitored in the range between 7-27 ug/m³ with a **mean value of 13.9 ug/m³** against NAAQ limit value of **80 ug/m³** (24 hours Time Weighted).

O₃ concentrations (**hourly samples reported for 8-hour average**) were monitored in the range between 10-35.4 ug/m³ with a **mean value of 15.1 ug/m³** against NAAQ limit value of 100 ug/m³ (8 hours Time Weighted).

NH₃-Ammonia; CO-Carbon monoxide; Pb-Particulate Lead; As-Particulate Arsenic; Ni-Particulate Nickel; C₆H₆-Benzene and BaP-Benzo (a) pyrene in particulate phase levels were monitored below respective detectable limits.

While comparing with the National Ambient Air Quality (NAAQ) Standards revised as per GSR 826(E) dated 16.11.2009, **all monitored values were found to be well within the respective limit values for 24-hourly periods** for Industrial, Residential, Rural and other Areas.

3.2 Ambient Noise Levels

Ambient Noise Levels were ranging from 32.6 dB(A) to 97.3 dB(A) during day times and from 32.0 dB(A) to 98.6 dB(A) during night times on the monitoring days. Day Equivalent Noise (Leq-d) level was found to be 43.5 dB(A) and Night Equivalent Noise (Leq-n) level was 41.4 dB(A). While comparing with the MoEF&CC Leq Norms for day and night times, the monitored **ambient noise levels were well within the limit values** for their respective Category Area.

3.3 Traffic Study

For assessing the baseline status, the Traffic Survey based on Indian Road Congress-IRC: 64/106 Norms were carried out at Mukku Road Junction on NH-44 during a Week Day (Wednesday; 28.08.2024) and also during the Week end (Sunday; 01.09.2024). Based on the Survey, existing Traffic Volumes at the Junction is computed in Passenger Car Units (PCUs). The existing traffic volume in the Project vicinity was found to be **16,510.3 PCU/day**.

3.4 Surface Water Quality

The **surface water** samples were monitored with pH in the range 7.58-7.88 against the Limit value of 6.5-8.5. DO levels were in the range 4.0-4.8 mg/l against the minimum requirement value of 4.0-6.0 mg/l for Surface Waters. While EC values were in the range 470-880, TDS values were monitored in the range of 310-560 mg/l against the Limit values of 500/2100 mg/l. Chloride values ranging from 82 mg/l to 116 mg/l. Iron content was found to be in the range 0.06-0.14 mg/l. Oil and grease, phenolic compounds, cyanides, sulphides and insecticides were found to be absent. Trace metals were found to be in traceable levels. BOD and COD values were found to be <2 mg/l and 2-10 mg/l respectively. The surface water quality was found to be within the prescribed CPCB Criteria for Surface Waters **Class-C** (Drinking Water Source after Conventional Treatment and Disinfection) Norms.

3.5 Ground Water Quality

The pH of the **ground water** samples were ranging from 7.51-7.81 against the BIS Norm of 6.5-8.5. While EC values were in the range 560-760, TDS values were monitored in the range 360-520 mg/l (Norm 500 mg/l or 2,000 mg/l in the absence of alternate source). Chloride values were found to be in the range 68-126 mg/l (Norm 250/1000 mg/l). Iron content was found to be in the range 0.06-0.11 mg/l. Oil & Grease, Cyanides, Phenols, Pesticides, etc. were found to be absent. Most of the trace metals were monitored to be below their detectable limits. In general, the water quality of ground waters were found to be within the prescribed IS:10500-2012 Norms for Drinking in the absence of an alternative source.

3.6 Soil Quality

Soils with medium compaction and Silty loam texture are dominant in the study area. Soil pH values were found to be in alkaline range (7.53-7.86) and Electrical Conductivity values were in the range 0.92-1.45 mmhos/cm. There was significant moisture content at all the monitoring locations. Significant levels of Nitrogen, Phosphorous and Potassium (NPK) values were monitored at all locations. Sodium Absorption Ratio was in the range 2.16-5.51 (desirable value being <5). There was **no heavy metals intrusion**/leaching into the ground strata. Wilting coefficient in significant levels would mean that these soils would support vegetation, if amended suitably.

3.7 Land Use

Fallow Land occupies the majority of the Study Area which is about 34.01%. Crop Lands occupy 17.41% of the study area Built-up lands occupy 5.05%. Water body occupies about 4.26% of the study area.

3.8 Biological Environment

There is **no Reserved Forests** within 10 km radius area. The Study Area is not part of any National Park, Sanctuary, Biosphere Reserve, Wildlife Corridors, Migratory Path, etc. The study area does not record the presence of any critically threatened species. Among the fauna recorded, most of them are common resident population and **no endangered species encountered** in the study area. **Peafowl placed under Schedule-I** as per Wild Life (Protection) Amendment Act, 2022 is found in the study area and its surroundings.

3.9 Socio-economic Environment

There are 39 Census villages and 5 Census Towns in the study area of 10 km radius. In the study area of 10 km radius, there are 1,34,419 persons (66,910 Males-49.8% and 67,509 Females-50.2%) in 37,349 Households (HHs). As far as the population of Scheduled Castes and

Scheduled Tribes are concerned, there were 34,424 (23.4%) Scheduled Castes Population and 45 Scheduled Tribes (0.03%). In the total population, the Literate population was 92,914 (69.1%) whereas the illiterate population was 41,505 (30.9%).

Total Workers in the total population were about 77,044 (52.1%). About 64,375 (47.9%) persons were non-workers. About 41.7% of the people were engaged in tertiary activities which included different services. The workers in the primary activities (Cultivators) and the secondary activities (Agricultural Labourers) were 2.6% and 7.9% respectively.

Local people are frequently suffering from fever, asthma, diarrhea, etc. and no occupational related disease recorded.

Almost all villagers are aware about the Ramco Cement Plant & its Captive Mines in the region.

4.0 Anticipated Environmental Impacts

Any Project would create impact on the environment in two distinct phases viz. Construction Phase which may be regarded as temporary & short term and Operation Phase which would have long term effects. The impacts have been assessed for the Project by assuming that the **existing industrial activities has already been covered under baseline environmental status** and continue to remain same till the operation of the Project.

4.1 Construction Phase

Expansion activities are proposed within the Industry premises with no additional land & infrastructures. No. of Working days will be increased to 345 days to achieve the production enhancement with existing machineries. Thus, no major establishment is required for the Proposal. Structural Works for proposed WHR System will be main works during Construction Phase.

4.1.1 Impact on Land Use

All Expansion activities i.e. **Line-II inclusion**, are proposed within the existing Premises and **no additional land** is required. There will be no excavation or cut & fill during Construction Phase.

4.1.2 Impact on Road & Traffic

On an average, 2-3 Truck loads/day will be visiting the site and will not have any adverse impact to the existing traffic volume of NH-44.

4.1.3 Impact on Ambient Air Quality

The main sources of emission during the construction period are the movement of materials & equipments at site and dust emitted during the installation related activities. However, the impact will be for short duration and confined locally.

4.1.4 Impact on Noise Levels

There will be very less impact on the existing noise levels due to construction, traffic for loading and unloading, fabrication and handling of equipments & materials, etc. The likely increase of about 1-2 dB(A) in Leq Noise Levels will be confined locally.

4.1.5 Impact on Surface & Ground Water Quality

There is no ground water drawl for the Plant. The construction water requirement is nil. Impact on water quality during construction phase may be due to non-point discharge of sewage generated from construction workforce. Existing STPs are adequate to treat additional sewage.

4.1.6 Impact on Biological Environment

Project does not warrant any cutting or transplantation of trees. Existing Green Belt will control the Air Pollution & Noise Levels, if any, generated during Construction Phase. Thus, there will not be any significant impact on existing flora-fauna of the study area.

4.1.7 Impact on Socioeconomic Environment

There is no rehabilitation and resettlement involved in the project. Presently, there are 465 Direct Employees working in the Cement Complex. Indirect Employment to about 600 persons has been provided. Due to the Expansion Proposal, another 35 Direct Employees & 50 Indirect Employees will be added. This is a positive impact due to the Proposal.

Thus, the Construction Phase activities will not cause any significant adverse impact on the surrounding areas.

4.2 Operation Phase

4.2.1 Impact on Air Quality

The (old) Line-II Kiln is already provided with Reverse Air Bag House, Cooler with ESP, Coal Mill with Bag Filters so as to control the **Particulate Emissions from Line-II <math><30 \text{ mg/Nm}^3</math>**. SO₂ Emissions from Kiln-II will be <math><100 \text{ mg/Nm}^3</math> and NO_x Emissions will be <math><600 \text{ mg/Nm}^3</math>. All material conveyors are fully covered and provided with Bagfilters at Transfer Points. The Plant operations will be in

compliance with new Emission Standards issued by MoEF&CC for Cement Industry vide Notifications dated 25.08.2014 and amended on 09.05.2016 & 10.05.2016.

SO₂ Control : The fuel sulfur will contribute for SO₂ generation. However, Pyro-process itself acts as an effective SO₂ scrubber and SO₂ emission will be reduced from the Kilns.

NO_x Control : RCL is taking adequate measures to keep NO_x at the minimum level. These measures include installation of low NO_x Calciner, Low NO_x Burner and usage of Alternate Fuel (AF). RCL is considering the use of AF including plastics and proposes to install upgraded processing and feeding system. Usage of AF would help to control NO_x level further.

Prediction Modelling : **AERMOD View (9.6.5 Version)** is used for Prediction Modelling for applicable Parameters **PM_{2.5}, PM₁₀, SO₂ & NO_x (CO levels were below BDL)**. The **maximum incremental GLC** for PM_{2.5} is 0.42 ug/m³, PM₁₀ - 0.93 ug/m³, SO₂ – 5.39 ug/m³ & NO_x 37.68 ug/m³. There will be **adequate Buffer (34.78%-78.26%)** in the Air Environment for proposed Expansion activities. The cumulative impacts were found to be confined locally i.e. within 1.0 km radius from the Plant boundaries.

4.2.2 Impact on Ambient Noise Quality

The noise level within the plant at a distance of one meter from the source will be maintained at <85 db(A) level for 8-hours exposure. Noise level at nearest plant boundary will be <55 dB(A) during day times and <45 dB(A) during night times. Thus, the noise levels will be well within the permissible MoEF&CC Norms for Residential Areas.

4.2.3 Impact on Traffic Volume

Raw and Finished Materials are being transported by **both Rail and Road Modes**. Limestone from Captive Mines & Primary Crusher at Pandalgudi is transported by 30 Tons Tippers through RCL's dedicated transportation road. There are 525 Truck movements in one way i.e. 1,050 Trucks/day now. On Expansion, 1,166 Truck movements in one way i.e. **2,332 Trucks/day** will be there. Thus, there will be **1,282 Trucks/day** additional traffic volume due to the Proposal.

The existing traffic volume in the Project vicinity was found to be **16,510.3 PCU/day**. In the Post-Project Scenario, there will be an addition of **2,332 Vehicles** (in 2 ways) to the existing traffic. Cumulatively, the traffic volume in the Project vicinity on Expansion will be **19,764 PCU/day**. **The net increase (cumulative) will be 3,254 PCU/day only**. The existing Roads/NHs are adequate to handle the proposed traffic volume due to the Project.

4.2.4 Impact on Surface Waters Resource and Quality

Presently, the fresh water demand of the Cement Plant, CPP & Township is 1,000 KLD. The Unit has been **permitted for the drawl of 1,500 KLD** from the nearby Seasonal Arjuna River. There is an Intake Well in the River Basin for tapping the required water. **On Expansion, fresh water to the tune of 265 KLD is required** for WHRB Power Plant. Thus, total water demand will be **1,265 KLD which is well within the permitted drawl quantity of 1,500 KLD** from Arjuna River.

Also, treated sewage of 250 KLD, treated Effluent of 20 KLD from CPP and harvested Rainwater of 230 KLD, in total 500 KLD, are supplementing the raw water demand of the Complex.

4.2.5 Impact on Ground Waters Resource and Quality

There is **no ground water drawl for the Plant**. There is no trade effluent from the Cement Plant. Workshop washings of 4 KLD and 16 KLD Rejects from CPP are individually neutralized and the Treated Effluent of 20 KLD is taken to the Cement Plant for equipment cooling (where it is evaporated fully). **On Expansion**, DM/RO Rejects of 40 KLD, Boiler Bleed-offs of 8 KLD and Colling Tower Rejects of 12 KLD, total **60 KLD effluent will be generated** additionally which will be treated for pH Correction in a **100 KLD Neutralisation Pit separately** and **Treated Effluent of 60 KLD** will be utilized for Equipment Cooling of (old) Line-II machineries where it will be evaporated fully.

Domestic Sewage & Canteen wastewaters of 25 KLD from the Cement Plant, 9 KLD Domestic Sewage from CPP, 160 KLD Domestic Sewage from the Township and another 86 KLD Domestic Sewage from Labour Qtrs., thus, a total of 280 KLD is generated. All the Domestic Sewage is treated in a **400 KLD Sewage Treatment Plants (350+50 KLD STPs)**. The Treated Sewage of 250 KLD is fully used for the Green Belt development. There will be **no change to existing status on Expansion**. Thus, it will be a '**Zero Effluent Discharge**' Plant.

4.2.6 Impact on Solid Wastes

The solid waste generated from the process and dust collected from various air pollution control equipment is being recycled in the process. Solid waste from the Sewage treatment plant 0.8 @ TPD is vermi-composted and used as manure for Green belt development. Fly ash (29.3 TPD) produced from CPP and Bottom ash (5.2 TPD) are transported pneumatically with the help of dense phase pneumatic pumps to the RCC storage silos. The ash is evacuated from silo and transported to Cement Plant for Portland Pozzolana Cement (PPC) manufacturing. There **will not be any change to the existing Status** of Solid Waste Generation, Treatment and Disposal from the Complex on Expansion.

4.2.7 Impact on Terrestrial and Aquatic Habitat

The plant will not have any significant impact on surrounding ecology and biodiversity. About 33% green belt has been developed and maintained in the Complex. The approved **budget for Peafowl Conservation Plan @ Rs.1.00 Lakhs/annum** is being spent for Habitat improvement, Community participation in Conservation, etc. No waste water will be discharged outside Plant boundary as well as no natural water course will be disturbed. Therefore, impact on aquatic habitat is not envisaged.

RCL has contributed Rs.75.00 Lakhs to the Director, **Srivilliputtur-Megamalai Tiger Reserve**, Srivilliputtur vide (i) Indian Bank, RR Nagar Brach DD bearing No. 560840 dated 05.09.2023 for Rs.25,00,000/-, (ii) DD bearing No. 560847 dated 12.09.2023 for Rs.30,00,000/- & (iii) DD bearing No. No. 560848 dated 12.09.2023 for Rs.20,00,000/- and all their receipts were acknowledged by its Dy. Director, Srivilliputtur-Megamalai Tiger Reserve Letters dated 20.10.2023.

4.2.8 Impact on Socio-economic Environment

The plant is significantly contributing revenue to the State & Central Govt. exchequers. As per the Companies Act 2013, Companies should spend at least 2% of the Profit after Tax of the previous year for the CSR activities but not lower than 2% of average of previous three years Profit after Tax. RCL is presently carrying out various Socio Measures for the local as well as regional populations. **RCL has implemented CER proposed** for addressing PH issues during 2021-22 to 2023-24 (I Half) at a cost of **Rs.24.00 Crores**. In addition, during the II Half of 2023-24, RCL has carried out various **CSR activities to the tune of Rs.2.18 Crores**.

As a CSR initiative, **RCL contributed Rs.66,40,000/-** vide Indian Bank, RR Nagar Brach DD bearing No. 560710 dated 03.05.2023 to the District Collector / Chairman, District Rural Development Agency for providing **1500 'Nutrition Kit' under 'Irumbu Penmani (Iron Lady) Scheme'** for Govt. School Girl Students in Virudhunagar District.

4.2.9 Impact on Occupational Health

The Upgraded **Occupational Health Centre (OHC)** for In & Out Patients Treatment with Emergency Care, Ambulance, etc. (Medical Officer with MBBS, DIH qualification) has all the Facilities to take care any emergency. Periodic medical checkups are carried out to determine the employee's current health status. Any deviations are investigated and appropriate preventive and remedial measures are suggested. Records of these examinations are maintained at the OHC. Tie-ups with Tertiary Health Care Referral Centres ensure that the best possible care is provided in case of any emergency.

5.0 Alternative Analysis

The proposal is proposed within the Industrial Complex. Therefore, alternative site selection is not required. Various cleaner production practices are initiated to control air emissions as well as fugitive emissions from various sources. Alternative Fuels are being utilised in the Kilns. Combustible wastes such as plastics, paper and cloths are segregated separately and sent to kiln for co-processing.

6.0 Environmental Monitoring Programme

6.1 Ambient Air, Noise, Water & Soil Quality

Periodical monitoring of the ambient air quality as per Revised NAAQ Norms, fugitive emissions, stack emissions, noise levels (at boundaries), water (once in a season) and soil quality (once in a season) shall be undertaken. The periodical status reports shall be submitted to TNPCB monthly, and Integrated Regional Office, MoEF&CC-Chennai as Half Yearly Status Reports.

6.2 Noise Quality Management Plan

The noise level within the plant at a distance of one meter from the source will be maintained at <85 db(A) level for 8-hours exposure. Noise level at nearest plant boundary will be <55 dB(A) during day times and <45 dB(A) during night times. Thus, the noise levels will be well within the permissible MoEF&CC Norms for Residential Areas.

6.3 Emission & Discharge from the Plant

Continuous online stack monitoring equipment/systems for PM, SO₂ and NO_x are installed at all main stacks and the online real time monitoring data are being transmitted to SPCB & CPCB servers continuously. **Four (4 Nos.) Continuous Ambient Air Quality Monitoring Stations** are installed in the Plant for transmission of real time monitoring data to CPCB & SPCB Servers round-the-clock. Data on Stack Emissions and Ambient Levels of PM_{2.5}, PM₁₀, SO₂ & NO_x are also displayed at the Main Gate for general public view.

Further Online Continuous Effluent Monitoring (CEM) System is installed in the STP and it is connected to the TNPCB Water Watch Centre.

6.4 Green Belt

Green Belt has been developed with 33% coverage @2500 Trees/Ha. Survival rate of green belt developed shall be monitored on periodic basis to ensure that damaged plants are replaced with new plants in the subsequent years.

6.5 Social Parameters

RCL has estimated the demand of infrastructure (Physical & Social) in the nearby area of the plant site and appropriate developmental activities will be undertaken under for various rural developmental programmes and initiatives for the up-liftment of the nearby communities from time to time.

7.0 Additional Studies

Risk Assessment : Detailed risk assessment and mitigative measures are delineated and an effective Disaster Management Plan, for natural and man-made disasters, is in place.

Public Consultation & Hearing : Adequate Budget will be allotted in **EMP Budget** for addressing Public Hearing issues for execution in 2 years period, in compliance with MoEF&CC OM F. No. 22-65/2017.IA.III dated 01.05.2018.

8.0 Project Benefits

Environmental Benefits : Plant Modernization & Expansion is necessary to increase the plant efficiency by adopting the state-of the-art technologies, machineries and operation of the Plant for optimum standards. WHRS will convert waste heat into productive use. Waste including Hazardous waste of industries, can be used as AFR in sustainable manner by co-processing in kiln. The numerous potential benefits possible through the use of hazardous and other wastes in cement manufacturing processes as AFR include: the recovery of the energy content of waste, conservation of non-renewable fossil fuels and natural resources, reduction of CO₂ emissions, and reduce the problem of disposal of HW and thus reduce contamination.

Social Benefits : There are 465 Direct Employees working in the Cement Complex. Indirect Employment to about 600 persons has been provided. Due to the Proposal, another 35 Direct Employees & 50 Indirect Employees will be added. Adequate Corporate Environmental Responsibility (**CER**) **Budget** will be allotted in compliance with MoEF&CC OM F. No. 22-65/2017.IA.III dated 01.05.2018.

Financial Benefits : The Project will bring **Rs.103.38 Crores** additional investment to the Region, improve the local and regional economy. Incremental GST of Rs. 117 Crores to the Government on this expansion of Cement production from 2.70 MTPA to 4.00 MTPA. Rs.20.25 Crores will be paid additionally to the Government for Minerals consumption on this expansion. This project will boost the economy of the area as well as generate direct & indirect employment opportunities resulting in overall development of the region.

9.0 Environmental Management Plan

An Environmental Management Plan (EMP) is formulated for mitigation of adverse impacts and is based on present environmental status and impact appraisal. It is mandatory to comply with the various regulatory Norms for Prevention and Control of Pollution. The following environmental management plans are proposed for mitigation of impacts on the environment :

9.1 Construction Phase

The following EMP measures shall be undertaken during the Expansion :

- ❖ PPE shall be provided to the workers.
- ❖ Construction employees shall have access to safe drinking water and to existing Toilet facilities.
- ❖ Protection devices viz. ear plugs/ear muffs shall be provided to the workers during welding works.
- ❖ All the debris resulting from the site shall be disposed off effectively as per existing Norms.
- ❖ EMP Cell ensure the periodical Monitoring of Environmental Parameters during the Construction Period and ensure its compliance with Norms.

9.2 Operation Phase

9.2.1 Traffic Volume

Adequate parkings are provided in the Plant. Facilities for **drivers (rest room, toilet, etc.)** are also provided. Other Measures are :

- ❖ Green Belt with thick foliage along the Plant/Ore Haulage/Transportation roads.
- ❖ Security Guards at the Road Junction to handle the inward and outward vehicles from the Plant to the Highway.
- ❖ All Trucks are to be fully covered with Tarpaulin to avoid any spillage on transportation.
- ❖ Restriction of over loading of Trucks/Tippers.
- ❖ Speed restrictions
- ❖ Restriction of Truck parking in the Highway and Public Roads.
- ❖ Regular and preventive maintenance of transport vehicles has to be ensured.
- ❖ Compliance to 'Pollution under Control' Certification has to be checked periodically.

9.2.2 Air Quality Management Plan

RCL has installed adequate air pollution control systems viz. Electro statistic precipitators, Bag house, bag filters, etc. are installed in the stacks to control the emissions. Also, adequate dust collection and extraction systems are installed at various transfer points raw mill handling (unloading, conveying, transporting, stacking), vehicle movement, bagging and packing areas, etc.

- ❖ All efforts shall be undertaken to maintain the PM emission levels from the main stacks of Old Line-II New Kiln as $<30 \text{ mg/Nm}^3$.
- ❖ NO_x emission levels from Line-II with New Kiln shall be $<600 \text{ mg/Nm}^3$.
- ❖ The periodical evaluation for the efficiency performance of ESPs and Bag Filters shall be carried out.
- ❖ Fugitive emissions due to storage, transportation, etc. and the leakages and spillages shall be continuously monitored and controlled.
- ❖ Thermal insulation is provided wherever necessary to minimize heat radiation from the equipment, piping etc, to ensure protection of personnel.
- ❖ Periodical Ambient Air Quality and Stack Emissions shall be undertaken and the Status Reports shall be submitted to the Authorities as required.

9.2.3 Noise Quality Management Plan

- ❖ All rotating items are well lubricated and provided with enclosures as far as possible to reduce noise termination.
- ❖ Extensive vibration monitoring systems are provided to check and reduce vibrations.
- ❖ For all fans, compressors etc. vibration isolators are provided to reduce noise.
- ❖ Provision of silencers are made wherever possible.
- ❖ Proper lubrication and housekeeping are maintained.
- ❖ The operator provided with necessary safety and protection equipment like ear plugs, ear muffs etc.

9.2.4 Solid & Hazardous Waste Management Plan

- ❖ It should be ensured that there is no industrial solid waste from the Plants.
 - ❖ The dust collected from APC Measures will be consumed in the Cement Plant fully.
 - ❖ Solid wastes from STP Plant shall be vermi composted and used as manure for Green Belt.
 - ❖ Waste Oil shall be collected and sold to the CPCB/TNPCB Authorised Agency for further treatment & disposal.
 - ❖ The municipal wastes shall be collected, transported, treated in a landfill (composting) within the Plant vicinity to make use of it as manure for Green Belt.
 - ❖ Redundant machinery or equipment scraps (1500 Tons/Annum) as and when generated, will be segregated, stored and sold to the authorised recyclers.
 - ❖ Municipal solid waste generated from plant and will be disposed off after segregating into bio-degradable and non- biodegradable waste.
 - ❖ Bio-degradable waste will be composted & will be used as manure in greenbelt development. Non-biodegradable waste will be disposed off suitably.
 - ❖ Used Lead acid batteries will be generated which will be stored in the designated storage area and will be disposed off / sold to registered vendors as per prevalent rules.
-

9.2.5 Effluent Management Plan

- ❖ No ground water tapping for industrial use.
- ❖ Water consumption shall not be more than the consented quantity.
- ❖ No trade effluent shall be discharged from the Plant.
- ❖ Cooling water is put into closed circuit to minimize the evaporation losses.
- ❖ The domestic sewages from the Cement Plant, Power Plant and Township shall be treated effectively in the Sewage Treatment Plant so to meet the TNPCB Discharge Norms and the treated sewage shall be used for Green Belt.
- ❖ 'Zero Effluent Discharge' shall be practiced.
- ❖ No percolation of treated water to the deep ground water table is done.
- ❖ Periodical monitoring for specific parameters shall be done regularly.

9.2.6 Storm Water Management Plan

- ❖ **Surface Drainage Network** has been developed in the Complex. Surface Drains created are connected to Rain Water Harvesting Ponds in the Plant.
- ❖ RCL is harvesting Rain Water through Roof Tops, RWH Ponds with Recharge Mechanism. Roof Top Collections shall be directly stored and used as Raw Water for the Plant.
- ❖ Harvested water by surface drain shall also be utilized for the industrial needs so as to conserve the fresh water demand.

9.2.7 Biodiversity Plan

- ❖ Green Belt shall be maintained effectively.
- ❖ Local species and fruit bearing trees may also be developed to have a thick canopy cover.
- ❖ The treated sewage shall be used fully for the Green Belt development.
- ❖ There will be **ban on one time use and throw away Plastic usage** in the Plant in compliance with Tamil Nadu, Environment and Forests (EC-2) Department, G.O.(D) No. 84 dated 25.06.2018. RCL will encourage the use of eco friendly alternative such as banana leaf, areca nut palm plate, stainless steel glass, porcelain plates / cups, cloth bag, jute bag etc.

9.2.8 Green Belt Development Plan

Total Green Belt extent is 64.50 Ha (33.69% Coverage) with 1,61,250 Trees @ 2,500 Trees/Ha with Survival Rate @ 90% average. Predominantly, native plant species are preferred for Green Belt like Azadirachta indigo (Neem), Cassia Siamea (Manjakondrai), Pongamia pinnata (Pungan), Albizia lebeck (Vagai), Samanea saman (Thoongumoonji), Holoptelia integrifolia (Arali), Tecoma stans (Thangarali), Cassia fistula (Sarakondrai), etc. Local women are engaged for the maintenance of Green Belt.

9.2.9 Occupational Health

- ❖ RCL shall provide a safety & healthy working conditions and continually improve the occupational health and safety performance.
- ❖ Its objectives shall be to achieve zero accident and safe work environment, to improve moral and health of all employees and to maintain the emission levels below the norms.
- ❖ RCL shall provide ergonomic support in work comfortness with periodical review.

9.2.10 Socio-economic Management Plan

- ❖ As per the Companies Act 2013, Companies should spend at least 2% of the Profit after Tax of the previous year for the CSR activities but not lower than 2% of average of previous three years Profit after Tax.
- ❖ RCL is presently carrying out various Socio Measures for the local as well as regional populations which shall be continued as per existing CSR Norms.

9.3 Project Cost & EMP Implementation Budget

The Project Cost of the existing Cement Plant Complex is Rs.894.00 Crores. A budget Rs.14.20 Crores is presently the EMP Capital Cost and Rs.3.90 Crores/annum is the EMP Recurring Cost. **For proposed Expansion**, with existing Line-II infrastructures and facilities, the Project Cost will be **additional Rs.103.38 Crores**. Thus, total Project Cost on this Expansion will be Rs.997.38 Crores.

A budget **Rs.1.00 Crores as EMP Capital Cost** and Rs.0.25 Crores/annum as EMP Recurring Cost are proposed additionally for the Expansion. Thus, total EMP Capital Budget will be Rs.15.20 Crores and EMP Operating Budget will be Rs.4.20 Crores per Annum.

The **Conservation Plan for Peafowl** duly approved with the Budget Provision of **Rs.1.00 Lakh/Annum** by the Wildlife Warden, Srivilliputhur is being implemented and continued.

Adequate Budget will be allotted in **EMP Budget** for addressing Public Hearing issues for execution in 2 years period, in compliance with MoEF&CC OM F. No. 22-65/2017.IA.III dated 01.05.2018.

1.0 Introduction

1.1 Purpose of the Report

M/s. The Ramco Cements Limited (RCL) are operating their Ramasamy Raja Nagar (**RR Nagar Cement Plant**) over an extent of **191.434 Ha own Patta Lands** in SF Nos. Parts of 1-14, 16, 22, 24, 30-32, 34-39, 49-52, 56-60, 65-66, 210, 212, 214, 221, 222, 225-230 of Tulukkappatti, 192, 194-212, 215, 216 & 287 of Thammanayakkanpatti and 100-103, 108, 109, 112 & 113 Vachchakkarappatti Village, Taluk & District Virudhunagar, Tamil Nadu which is **in operation since 1961-62**.

RCL had established the recent expansion activities with New Kiln Line of 3000 TPD (upto Clinkerisation) in compliance with Environmental Clearance (EC) from the Ministry of Environment, Forest & Climate Change (MoEF&CC) awarded vide EC Identification No. EC21A009TN169325 dated 25.10.2021. After obtaining Consents to Establish (CTEs) & Consents to Operate (CTOs) Orders from Tamil Nadu Pollution Control Board (TNPCB), the Plant is now being operated for production of 1.44 MTPA Clinker & 2.70 MTPA Cement from **1st March 2023**. Present CTO-Renew Orders are obtained from TNPCB vide 2408157290712 (Water Act) & 2408257290712 (Air Act) dated 13.09.2024 with validity till 31.03.2025. Certified Compliance Report (CCR) for earlier EC has been issued by Integrated Regional Office (IRO), MoEF&CC, Chennai on 18.03.2024 and there is no Non-Compliance / Partial Compliance reported.

With revamping measures proposed by Engineering Consultant FLSmidth, RCL intends to expand RR Nagar Cement Plant with inclusion of revamped Old Line-II operations to existing Lines I & III i.e. **operations of all 3 existing Lines-as Upgraded** and also by increasing operational days from 320 to 345 days. Due to the Proposal, production of the Plant will be enhanced viz. **Clinker from 1.44 MTPA to 2.76 MTPA and Cement from 2.70 MTPA to 4.00 MTPA** along with associated Waste Heat Recovery System (**WHRS**) of **13 MW**. The additional Project Cost is **Rs.103.38 Crores**. Salient features of Proposal are given in **Table 1.1**.

The proposed Expansion of Cement Plant (≥ 1.0 MTPA) falls under Sl. No. 3(b) - Category 'A' of EIA Notification 2006 and requires prior EC from MoEF&CC. Thus, RCL filed TOR Application vide Parivesh Online Proposal No. IA/TN/IND1/498318/2024 on 26.09.2024 with a request for Standard TOR for this existing Plant. On scrutiny of the Application, the Ministry raised 'Essential Details Sought-EDS' on 07.10.2024. RCL submitted Reply to EDS on 05.11.2024 (**Document-I**). MoEF&CC granted Standard Terms of Reference (TOR) for the Project with **TOR Identification No. TO24A1102TN5995426N dated 12.11.2024** under File No. J-11011/119/2009.IA.II(I). As permitted, Baseline Data was collected during Jul.-Sep. 2024 in Premonsoon Season Period **for this Region**. Draft Environmental Impact Assessment (EIA) Report, prepared in compliance with awarded TORs by accredited EIA Consultant - M/s. ABC Techno Labs India Private Limited, Chennai (Certificate NABET/EIA/2225/RA0290 dated 11.06.2023 - valid till 16.11.2025) - has been submitted now for Public Consultation & Public Hearing.

Table : 1.1 Salient features of Expansion Proposal

Sl. No.	Details	Project Details – as per Latest EC		Project Details – on Expansion now	
1	Plant Extent in Ha	191.434		191.434	
2	Clinker Production, MTPA	Line	Capacity,	Line	Capacity
		I	0.48	I	0.69
		II	-	II	0.69
		III	0.96	III	1.38
		Total	1.44	Total	2.76
3	Import Clinker from Sister Units, MTPA	-	0.50	-	0.50
4	Cement Production, MTPA	Total	2.70	Total	4.00
5	WHRS	Line-I	PH&AQC Boiler	Lines I, II & III	13 MW
6	Raw Materials Demand, TPA	Limestone (& Kankar)	2.16 @ 6740 TPD	Limestone	1.794 @ 5200 TPD
		-	-	Lime Kankar	2.085 @ 6050 TPD
		-	-	Clay, Chips, Roughstone	0.209 @ 605 TPD
		Copper Slag / Laterite / Iron Ore	0.022 @ 63 TPD	Copper Slag / Laterite / Iron Ore	0.083 @ 242 TPD
		Fuel : Petcoke	0.128 @ 423 TPD	Fuel : Petcoke	0.246 @ 715 TPD
		Gypsum	0.108 @ 290 TPD	Gypsum	0.136 @ 395 TPD
		Fly Ash	0.677 @ 2050 TPD	Dry Fly Ash	1.120 @ 3246 TPD
		-	-	Wet Fly Ash	0.080 @ 232 TPD
		Slag	63 TPD	Slag	2.200 @ 6377 TPD
		-	-	Limestone Powder as PI	0.040 @ 115 TPD
7	Power, MW	32.85		40.50	
8	Water requirement in KLD & Source	1000 Ground & Surface Water		1265 Surface Water only	
9(i)	Sewage generation in KLD	280		280 (No Change)	
9(ii)	Trade Effluent generation in KLD	20		(20+60=) 80	
10	Air emission : Pollution control Limits	PM - <20 mg/Nm ³ SO ₂ - <100 mg/Nm ³ NO _x - <600 mg/Nm ³		PM - <30 mg/Nm ³ SO ₂ - <100 mg/Nm ³ NO _x - <600 mg/Nm ³	
11	Hazardous waste generation	Used/Spent Oil (Category 5.1) - 94.62 TPA		Used/Spent Oil (Category 5.1) - 94.62 TPA	
12	Project Cost	CP & CPP	Rs.894 Cr.	Addition	Rs.103.38 Cr.
	EMP-Capital	Rs.14.20 Cr.		Rs.1.00 Cr.	
	EMP-Operation	Rs.3.90 Cr./annum		Rs.0.25 Crores/annum	

1.2 Identification of Project Proponent

Ramco Group is one of the leading, highly reputed and Second Largest Industrial Group in South India. It is well diversified in the fields of Cement, Ready Mix Concrete, Cement Fiber Products, Cotton and Synthetic Yarn, Software Systems, Wind Farms, Research & Development, Dry Mortar Plants, Cotton Textiles and Surgical. The total employees are about 15,700 and the Turnover of the Group is Rs.8,000 Crores. The main companies of RAMCO Group are:

- ❖ **M/s. The Ramco Cements Limited** (formerly M/s. Madras Cements Limited).
- ❖ M/s. Rajapalayam Mills Limited.
- ❖ M/s. Ramco Industries Limited.
- ❖ M/s. Ramco Systems Limited.

The Ramco Cements Limited (RCL) is one of the reputed Cement Companies in India. The Company is the Second Largest cement producer in South India and sixth largest manufacturer of cement in the Country. The cement production of RCL is about 16.85 million tons per annum (MTPA) from their **Cement Plants** in India.

- ❖ Ramasamy Raja Nagar near Virudhunagar, Tamil Nadu (established in 1961) with 2 Lines - 2.7 MTPA Cement (being expanded for 4.0 MTPA Clinker with all 3 existing Kilns).
- ❖ Kumarasamy Raja Nagar, near Jaggayyapeta, Andhra Pradesh (1986)-3.65 MTPA (3 Lines).
- ❖ Alathiyur near Vriddhachalam, Tamil Nadu (1997): 3.0 MTPA (2 Lines).
- ❖ Govindapuram near Ariyalur, Tamil Nadu-5.5 MTPA (2009) (2 Lines).
- ❖ Kolimigundla, Andhra Pradesh (Cement 2.0 MTPA).

RCL is operating **Cement Grinding Units** at:

- ❖ Kolaghat (2.0 MTPA) in West Bengal.
- ❖ Kattuputtur (0.75 MTPA) near Chennai, Tamil Nadu.
- ❖ Valapadi (2.0 MTPA) near Salem, Tamil Nadu.
- ❖ Method near Chithradurga, Karnataka (0.3 MTPA; being expanded to 0.5 MTPA).
- ❖ Vizag (2.0 MTPA) near Anakapalli, Andhra Pradesh.
- ❖ Haridaspur (1.8 MTPA), Jajpur District, Odisha.

It is also operating a **Packing Plant** at Nagercoil.

RCL is producing Ordinary Portland Cement (OPC), Portland Pozzolana Cement (PPC), Slag Cement (PSC), Composite Cement (CC), etc. The cement produced by RCL is marketed in the brand name of 'RAMCO'. The market centers are mainly in Tamil Nadu, Andhra Pradesh, Telangana, Kerala, Karnataka, Odisha and West Bengal States. RCL which has always been striving for Total Quality, possesses International Certificate **ISO:9001**, **ISO:14001**, **ISO:45001** and **ISO:50001**. The company has achieved various awards for '**Best Performance**' in Cement Industry.

The Ramco Cements Limited is managed by a Board of Directors comprising of eminent personalities as its members. Under the dynamic leadership of **Late Shri.P.R.Ramasubrahmaneya Rajha**, the company has grown into a massive organization. **Shri.P.R.Venketrama Raja** is the **Managing Director (MD)** of the Board. **Shri.A.V.Dharmakrishnan, Chief Executive Officer (CEO)** is heading the Cement Division. Each Unit is headed by a Unit Head in the President Level.

RCL has the well laid down Safety, Health and Environmental (SHE) Policy approved by the CMD. The units are having their **Integrated Management System (IMS)** Policy. The Environmental Management Plan (EMP) Cell is functioning under the Unit Head and Corporate Social Responsibility (CSR) Committee is functioning under the Corporate Office. There is a **Hierarchical System** in the company **to deal with the environmental issues and for ensuring compliance** with the environmental clearance conditions. Any non-compliance/violations of environmental norms and corrective actions taken will be reported by the Unit Heads to EDO & CEO and by CEO to the Chairman, Board and Shareholders. The **Contact information of RCL Corporate Office** is :

Shri.M.Srinivasan,
Executive Director (Operations),
 The Ramco Cements Limited,
 5th Floor, Auras Corporate Centre,
 No. 98A, Dr.Radhakrishnan Road,
 Mylapore, Chennai-600 004.
 Tel. No. : 044-28478666 & Fax No. : 044-28478676
 e-Mail : ramcoenv@ramcocements.co.in

1.3 Identification of the Project

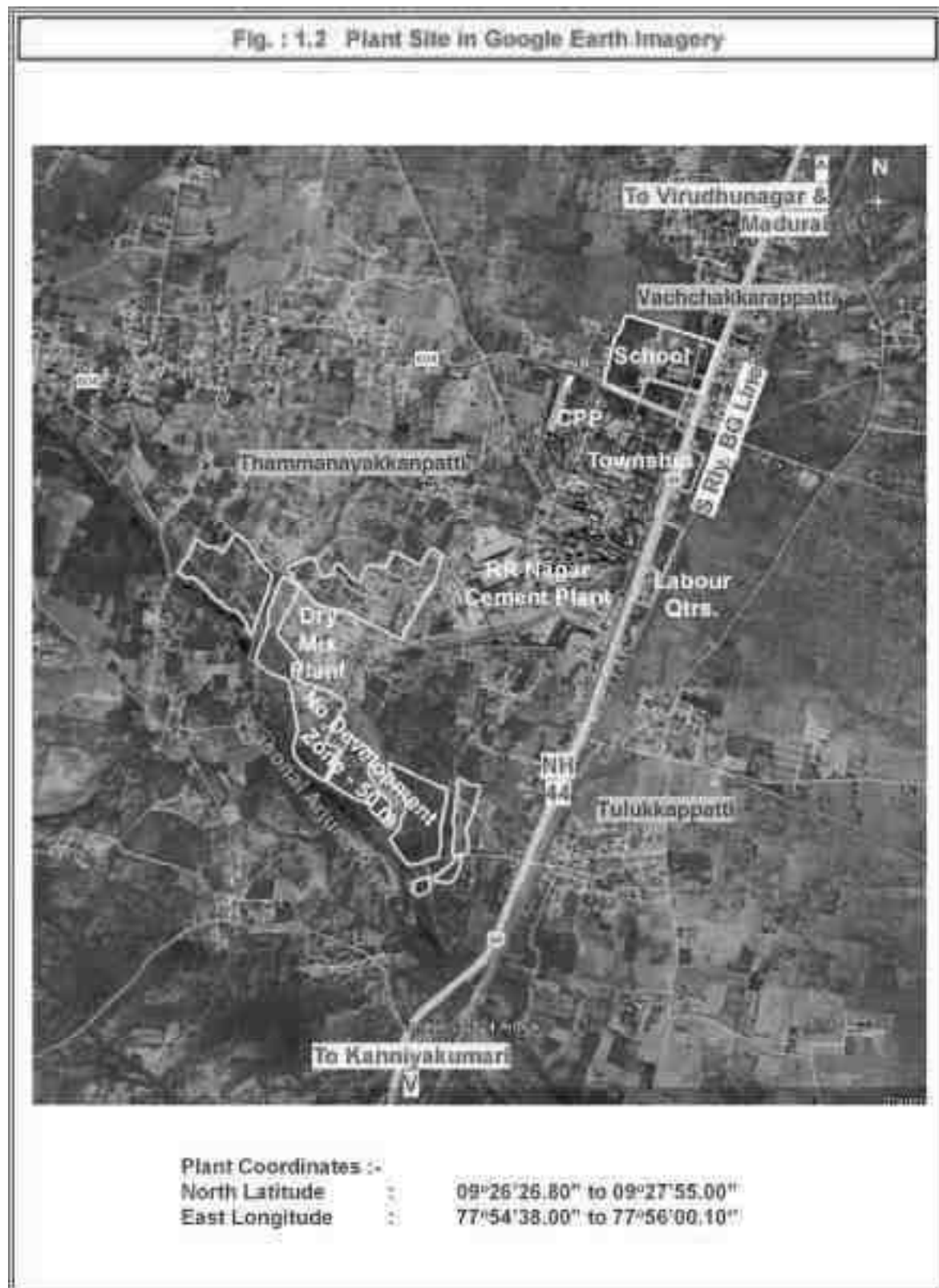
1.3.1 Ramasamy Raja Nagar Cement Plant

Location : RCL is operating their Ramasamy Raja Nagar (RR Nagar) Cement Plant with CPP & Township over an extent of **191.434 Ha own patta lands** in SF Nos. Parts of 1-14, 16, 22, 24, 30-32, 34-39, 49-52, 56-60, 65-66, 210, 212, 214, 221, 222, 225-230 of Tulukkappatti, 192, 194-212, 215, 216 & 287 of Thammanayakkanpatti and 100-103, 108, 109, 112 & 113 Vachchakkarappatti Villages, Taluk & District Virudhunagar, Tamil Nadu State. **Location/Index Map** is given as **Fig. 1.1**). **No Forest/Govt. Land** is involved.

Land Use : Entire lands is under '**Industrial Use**' Category (**Google Earth Imagery** as **Fig. 1.2**). Recent **Industry License** issued by the State Government is annexed as **Annex. Document-2**. The Village Administrative Officers of Tulukkappatti, Thammanayakkanpatti & Vachchakkarappatti villages under TN Revenue Department have issued the **Certificates for Possession** of the Lands in the name of RCL with Survey Nos. & Land extent (attached as **Annex. Document--3**).

Accessibility : The plant @ 15 km south of Virudhunagar is well connected by Madurai-Kanniyakumari Section of **National Highway-44** (4-Lane) & **Southern Railway BG Line** which run parallel to the Plant. Madurai is the nearest Airport @ 50 km in the north.





Site/Plant History : The Plant was established in the Year 1959-60 and commenced production from the Year 1961-62. Wet Process to Dry Process conversion (Line-I) was carried out in the Year 1977 (India's First Dry Process Kiln of 1,200 TPD capacity). An additional Line-II of 650 TPD Kiln was commissioned in the Year 1994 and upgraded to 1,000 TPD Kiln in the Year 2001. After obtaining EC from MoEF&CC, Replacement & Upgradation of old Line-I Kiln (1,200 TPD Kiln with a new 1,800 TPD Kiln) and Modernization of Line-II (1,400 TPD Kiln) were undertaken in the Year 2011.

RCL has established the recent expansion activities with New Kiln Line of 3000 TPD (upto Clinkerisation as Line-II in-lieu of old Line-II Kiln) in compliance with EC awarded by MoEF&CC vide **EC Identification No. EC21A009TN169325 dated 25.10.2021 (Document-1)**. After the CTE, RCL obtained **CTO-Expansion** from TNPCB vide Orders 2307149733843 (Water Act) & 2307249733843 (Air Act) dated 27.02.2023 with validity till 31.03.2024. The Plant is now being operated for Clinker production of 1.44 MTPA and Cement production of 2.70 MTPA of various grades from 1st March 2023. The production Line-I & Line-III (new Kiln) are in operation (**Table 1.2**). CTO-Renew Orders are obtained from TNPCB vide 2408157290712 (Water Act) & 2408257290712 (Air Act) dated 13.09.2024 with validity till 31.03.2025 (**Document-2**).

Table : 1.2 Existing Production in Compliance with awarded EC-2021

Production	EC-2021 Stage		Total
	Line-I	Line-III (now) (New Kiln in lieu of old Line-II Kiln)	Lines I & III
Clinker Mfg., MTPA	0.48	0.96	1.44
Clinker from other Sister Units/Imported, MTPA	0.50		0.50
Cement Mfg., MTPA	Own Clinker	1.50	2.70
	Import Clinker	0.40	
Cement Waste Heat Recovery (CWHR) Boilers	1 PH Boiler (11 TPH) & 1 AQC Boiler (6.55 TPH)	No WHRB	-

The Plant has 25 MW Captive Thermal Power Plant (CPP) since 2012 in the Capus with all statutory approvals (**Table 1.3**).

Table 1.3 Captive Power Generation of RR Nagar Plant

Power Source	Capacity	Total
Captive Thermal Power Generation (CPP)-Coal based	1x25 MW	25 MW
Standby Power Generation - Standby DG Sets	1x7 MW & 2x4 MW	15 MW

Township with about 476 Quarters exists in the Complex to accommodate the Employees & Officials of the Unit. Also, Guest Houses and Bachelor Quarters for temporary stay of employees and Guests are provided. **Occupational Health Centre (OHC)** is located in the Township. **Existing Layout is shown as Fig. 1.3.**

Captive Limestone Mines & Quarries : Cement Plant Limestone requirements are met from Captive Limestone Mines and Lime Kankar Quarries in Pandalgudi Region (**Plate-I**). Captive Limestone Mines are in operation since 1976 and Kankar Quarries from 2021-22. EC/Consent Quantity of production from these Limestone Mines is about **2.691 MTPA** of Low to High Grade Limestone & Lime Kankar production is **3.914 MTPA** (**Tables 1.4 & 1.5**).

The common **Centralised Crushing Plant** with Optical Ore Sorting Facility (2.0 MTPA Throughput/1.88 MTPA Clean Ore) is located at Pandalgudi at about 18 km (aerially) in SE from RR Nagar Cement Plant. Also, a **Lime Kankar Beneficiation Plant** (Throughput Capacity 2.0 MTPA- EC vide EC22B007TN152869 dated 20.12.2022 & CTO 2304151092191 (Water Act) & 2304251092191 (Air Act) dated 10.08.2024 with validity till 31.03.2028 - has been established at Pandalgudi which is now proposed to be expanded.

These Captive Mines and Pandalgudi Crusher & Beneficiation Plants are connected with **RCL's own Tar Road** (40+10 km) for transportation of the Ore. There is a Road-over-Bridge on the NH-38 at Pandalgudi and an Underpass in the NH-44 at RR Nagar to fully avoid the impact on Public Transport System.

There are **465 Direct Employees & about 600 Contract Workers** are working in the Cement Complex. In the Direct Employees, 273 Employees (58.70%) are from Virudhunagar District.

The Unit has the well laid down Integrated Management System (IMS) Policy. The Environmental Management Plan (EMP) Cell is functioning under the Unit Head and Corporate Social Responsibility (CSR) Committee is functioning under the Corporate Office. The **Organisation Chart of RR Nagar Cement Plant** is appended.

Organization Chart

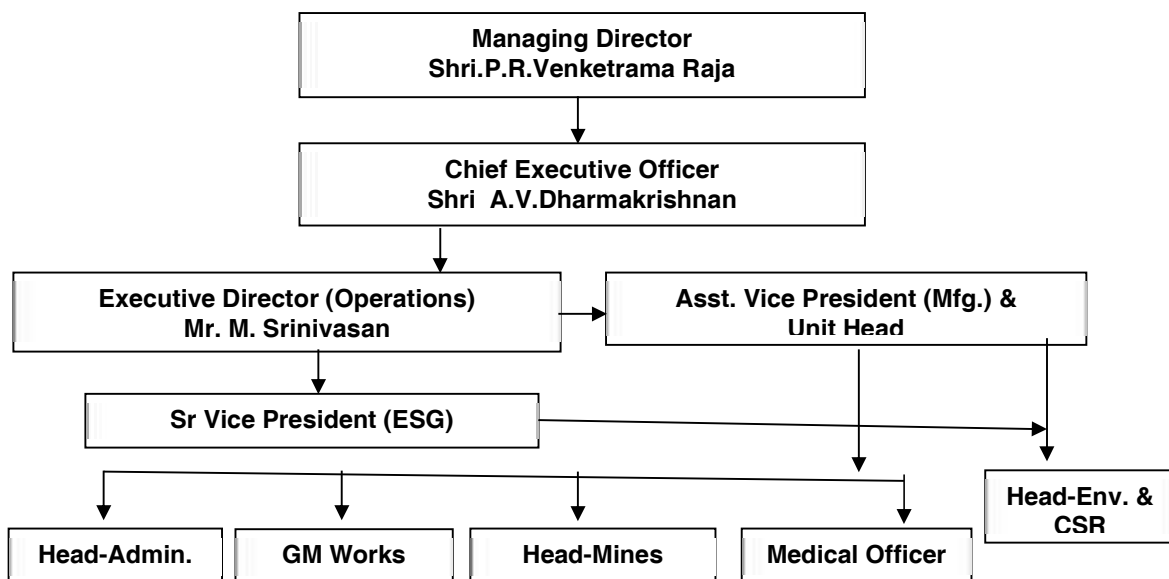



Table : 1.4 Captive Limestone Mines and their Existing Production

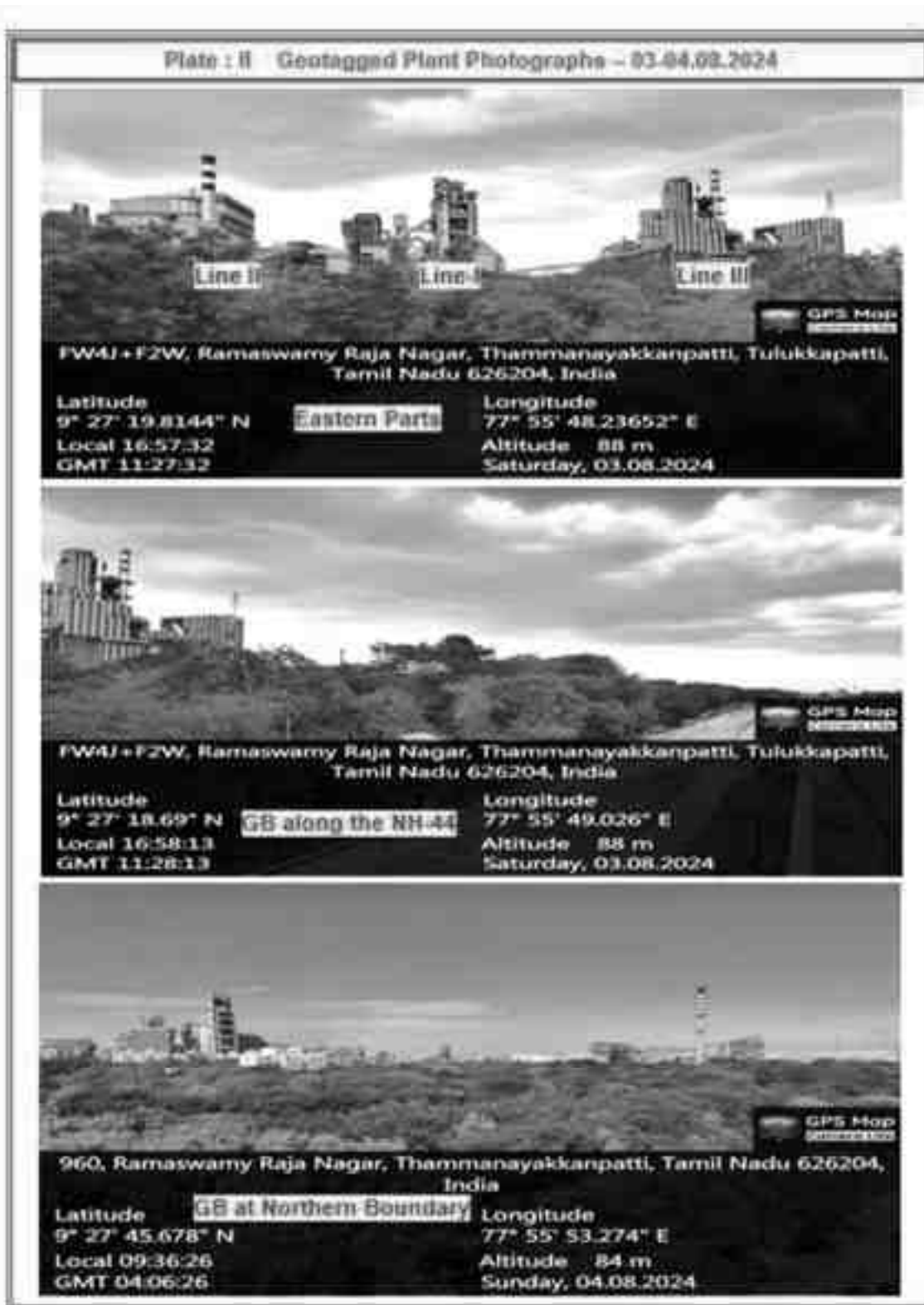
Sl. No.	RCL Mines & (Mineral)	GO No. & Validity	Extent, Ha	Mineable Reserves as on 01.04.2024, Million Tonnes	Production Qty., MTPA	EC Reference	TNPB CTOs Order Reference
1	Pandalgudi Lease (Limestone)	GO (Ms) No. 26 dated 26.03.2018 - valid till 31.03.2030	186.680	0.32	0.305	J.11015/544/2 007-IA-II(M) dt: 26.03.2009, 12.02.2014 & 01.01.2015	2405156797042 (W) & 2405256797042 (A) dt. 07.05.2024 - valid till 31.03.2026
2	Pandalgudi Lease (Limestone)	GO 28 dated 26.03.2018 - valid till 17.03.2032	9.460	0	(0.028)	SEIAA-TN/F.No.631/1 (a)/EC-Amdnt/2014 dt. 01.04.2015	-
3	Pandalgudi Lease (Limestone)	GO 33 dated 02.04.2018 - valid till 31.03.2030	4.745	0	(0.056)	SEIAA-TN/F.3262/VR D/1(a)/EC-2084/2015 dt. 01.04.2015	2008131388051 (W) & 2008231388051 (A) dt. 11.05.2020 - valid till 31.03.2025
4	Sivalarpatti Lease-I (Limestone)	GO 34 dated 02.04.2018 - valid till 22.05.2045	150.110	1.88	0.690	J.11015/192/2 005-IA-II(M) dt. 02.02.2006	2008131231706 (W) & 2008231231706 (A) dt. 14.05.2020 - valid till 31.03.2025
5	Sivalarpatti Lease-II (Limestone)	GO 5 dated 06.01.2017 - valid till 10.01.2067	129.720	2.05	0.210	J.11015/126/2 016.IA.II(M) dt. 23.06.2021	2204141859876 (W) & 2204241859876 (A) dt. 07.01.2022 - valid till 31.03.2026
6	Sivalarpatti Lease-III (Limestone)	GO No. 247 dated 23.11.2020 - valid till 21.08.2033	7.665	0.13	0.063	SEIAA-TN/F.No.407/1(a)/EC-1061/2014 dt. 18.02.2014	2008131213981 (W) & 2008231213981 (A) dt. 14.05.2020 - valid till 31.03.2025
7	Sivalarpatti Lease-IV (Limestone)	GO No. 145 dated 19.07.2019 - valid till 06.02.2044	7.340	0.07	0.063	SEIAA-TN/F.No.408/1(a)/EC-1062/2014 dt. 18.02.2014	2008131216272 (W) & 2008231216272 (A) dt. 14.05.2020 - valid till 31.03.2025
8	Melvenkateswarapuram (Limestone)	GO 98 dated 07.09.2018 - valid till 28.07.2033	98.620	8.35	0.720	J.11015/136/2 013-IA-II(M) dt. 11.01.2019	2408157359048 (W) & 2408257359048 (A) dt. 01.04.2024 - valid till 31.03.2029
9	Maravarperungudi (Lime Kankar & Clay)	Rc. No. 15823 dt. 24.11.2010 - valid till 10.03.2041	198.515	1.02	0.640	J.11015/69/20 08-IA-II(M) dt. 26.03.2009	2008131389823 (W) & 2008231389823 (A) dt. 11.05.2020 - valid till 31.03.2025
Total				13.82	2.691	-	-

Table : 1.5 Captive Lime Kankar Quarries and their Existing Production

Sl. No.	RCL Quarry	GO No. & Validity	Extent, Ha	Mineable Reserves as on 01.04.2024, Million Tonnes	Prodn. Qty., MTPA	EC Reference	TNPCB CTOs Order Reference
1	Maravarperungudi QL-I	GO (2D) No. 4 dated 28.07.2023 - valid till 24.08.2033	498.870	10.020	1.333	SEIAA-TN EC23B001T N141972 dated 12.07.2023	2405154370379 (W) & 2405254370379 (A) dt. 22.01.2024 with validity till 31.03.2028
2	Maravarperungudi QL-II	GO (2D) No. 32 dated 19.12.2022 - valid till 11.01.2028	23.290	0.240	0.254	SEIAA EC22B001T N177835 dated 24.11.2022	2304151031895 (W) & 2304251031895 (A) dt. 04.05.2023 with validity till 31.03.2027
3	Maravarperungudi QL-III	-	158.865	3.071	0.600	TOR Application being filed	-
4	Koppuchithampatti QL-IV	GO(2D)No. 6 dated 16.08.2023 - valid till 29.08.2033	294.185	6.150	1.227	SEIAA EC23B001T N120186 dated 06.07.2023	2305154456639 (W) & 2305254456639 (A) dt. 22.12.2023 with validity till 31.03.2028
5	Vadakkunatham QL-V	GO (2D) No. 5 dated 09.08.2023 - valid till 28.08.2033	123.265	2.427	0.500	SEIAA EC23B001T N169842 dated 12.07.2023	2305154221589 (W) & 2305254221589 (A) dt. 22.12.2023 with validity till 31.03.2028
Total				21.908	3.914	-	-

	<p>The Contact Information of RR Nagar Cement Plant is as follows :</p> <p>Mr.S.Lakshmanan, Asst. Vice President (Mfg.), The Ramco Cements Limited, Ramasamy Raja Nagar Post, Virudhunagar District, Tamil Nadu-626 204. Tel. Nos. : 04562-256201 to 256203 Fax : 04562-256268.</p>
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The Photographs of RR Nagar Plant & its Environs, along with **Geotagged Green Belt**, are appended as **Plates II-IX**.









1.4 Regulatory Approvals for the Plant

1.4.1 Environmental Clearances

RR Nagar Plant's establishment and operations were carried out Pre-EIA Notification 1994 period. The first EC for the Plant was obtained for Replacement of Line-I Kiln & Modernization of both Lines vide MoEF&CC Letter dated 06.07.2009. MoEF&CC awarded the EC for 25 MW CPP vide F. No. J-13012/112/2011 IA.II(T) dated 06.02.2012. Again, EC was obtained for the addition of 3rd Packer vide MoEF&CC Letter dated 29.11.2017. Expansion with New Kiln Line of 3000 TPD (Line-III upto Clinkerisation) - Clinker 1.44 MTPA & Cement 2.70 MTPA EC has been awarded by MoEF&CC on 25.10.2021. Cement Plant EC details are given in Table 1.6 and annexed to the Report.

Table : 1.6 RR Nagar Cement Plant - Existing ECs

Sl. No.	Cement Plant Project Activity	EC Reference
1	RR Nagar Plant Modernisation & Upgradation for Cement production from 1.0 MTPA to 2.0 MTPA	F. No. J-11011/119/2009 IA.II (I) dated 06.07.2009
2	Addition of 3 rd Packer	F. No. J-11011/119/2009 IA.II (I) dated 29.11.2017
3	Expansion with New Kiln Line of 3000 TPD (upto Clinkerisation) - Clinker 1.44 MTPA & Cement 2.70 MTPA	EC Identification No. EC21A009TN169325 dated 25.10.2021

1.4.2 Consents from TNPCB

The Consents to Establish (CTEs) and Consents to Operate (CTOs) from TNPCB were obtained and are being renewed periodically. The Consent Orders, including Hazard Waste Authorisation, list is given in Table 1.7 and annexed to the Report.

Table : 1.7 CTE / CTO & HWA Details

I	Consents to Establish	Order Reference	Validity
1	CTE-Cement production of 6,200 T/day (or) 2.0 MTPA (with addition of 0.3 MTPA Cement Mill)	CTE Order No. 5145 (Expansion) (Air Act) and 5204 (Expansion) (Water Act) dated 03.12.2009	For 2 years CTO obtained on 03.01.2011
2	CTE for Expansion (Cement)	Consent Order No. 2206141656739 (Water Act) & 2206241656739 (Air Act) dated 17.02.2022	- CTO obtained on 27.02.2023
II	Consents to Operate	Order Reference	Validity
1	CTO-Cement production of 6,200 T/day (or) 2.0 MTPA (with addition of 0.3 MTPA Cement Mill)	CTO Order No. 18354 (Air Act) and 22318 (Water Act) dated 03.01.2011	Valid till 31.03.2011
2	CTO (Cement)-Renewal	Consent Order No. 16831 (Air) and 20796 (Water) dated 09.05.2011	Valid till 31.03.2012

3	CTO (Cement)-Renewal	Consent Order No. 16831 (Air) and 20796 (Water) dated 29.01.2013	Valid till 31.03.2013
4	CTO (Cement)-Renewal	Consent Order No. 16831 (Air) and 20796 (Water) dated 21.06.2013	Valid till 31.03.2014
5	CTO (Cement)-Renewal	Consent Order No. 18354 (Air) and 22318 (Water) dated 11.09.2014	Valid till 31.03.2015
6	CTO (Cement)-Renewal	Consent Order No. 15082294874 (Air) and 15081294874 (Water) dated 10.08.2015	Valid till 31.03.2016
7	Renewed CTO (Cement)	Consent Order No. 160824725855 (Air) and 160814725855 (Water) dated 02.08.2016	Valid till 31.03.2017
8	Renewed CTO (Cement)	Order No. 180828260593 (Air) and 180818260593 (Water) dated 28.02.2018-for 01.04.2017 to 31.03.2019 period	Valid till 31.03.2019
9	Renewed CTO (Cement)	Consent Order No. 1908221827195 (Air) and 1908121827195 (Water) dated 18.09.2019	Valid till 31.03.2022
10	CTO for Expansion (Cement)	Consent Order No. 2307249733843 (Air Act) and 2307149733843 (Water Act) dated 27.02.2023	Valid till 31.03.2024
11	Renewed CTO (Cement)	Consent Order No. 2408157290712 (Water Act) & 2408257290712 (Air Act) dated 13.09.2024	Valid till 31.03.2025
III	Hazardous Wastes Authorisations (HWA) :	(i) No. 16HFC5144632 dated 01.12.2016 (ii) No. 23HPC42009117 dated 07.06.2023	Valid till 01.12.2021 Valid till 31.03.2028
IV	Existing CTOs for Captive Power Plant	Consent Order No. 2208143536794 (Water) & 2208243536794 (Air) dated 30.06.2022	Validity till 31.03.2027

1.5 Compliance to Statutory Approvals

1.5.1 Certified EC Compliance Report

Certified Compliance Report (CCR) for earlier EC has been issued by Integrated Regional Office (IRO), MoEF&CC, Chennai vide Letter EP 12.1/867/TN/353 dated **18.03.2024** and annexed to the Report (**Document-3**). **There is no Non-Compliance / Partial Compliance** reported. Self Compliance Report for the Period Apr.-Sep. 2023 is attached as Annex. Doc-1.

Production : During the FY 2023-24, Clinker production of RR Nagar Plant was 1.425 MTPA and Cement production was 2.514 MTPA.

CER Budget : A budget of Rs.12.78 Crores was earmarked for addressing the issues raised in the Public Hearing and issue based on Need based Assessment. RCL has implemented CER/EMP proposed for addressing PH issues during 2021-22 to 2023-24 (I Half) at a cost of Rs.24.00 Crores (Table 1.8). In addition, during the II Half of 2023-24, RCL has carried out various CSR activities to the tune of Rs.2.18 Crores as detailed in Table 1.9.

Table : 1.8 Implementation of CER/EMP Activities to address PH Issues

Sl. No.	Concerns Raised during Public Hearing	Major Activity Heads	CER Budget Allotted (Rs. in Crores)	CER Amount Spent (Rs. in Crores)		Total Amount, Rs. in Crores
				Till 2022-23	2023-24	
1	Pollution (Dust) Control Measures	Provision of Pulse Jet Bagfilters with Woven Fibre Glass with PTFE Membrane & acid resistance to Kiln RABH, Coal Mill & Cement Mill Bag Filters and ESPs for Cooler Stack – Line-III	9.00	10.97	8.67	19.64
2	Pollution Monitoring	Provision of Continuous Ambient Air Quality Monitoring Stations (CAAQMs) 3 Nos. for Cement Plant & 1 No. for CPP, total 4 Nos.	2.00	1.83	0.58	2.41
3	Generation of local employment and skill development programmes	Computer based Skill Development Center at Thammanickenpatti for the benefits of local youths- As instructed by the District Collector, Science Park for Students was developed	0.75	-	0.75	0.75
4	Eco Development Measures	Desilting & Clearing of Water bodies at:-				
i		River water course from NH road to Vadiyur (6 km length an 120 m width)	0.0960	0.10		0.10
ii		Aranmanaiurani Area of 1.5 acre & plantation of 2000 trees	0.0800	0.09		0.09
iii		Thathampattikanmai area of 50 acres extent	0.0724	-	0.08	0.08
5	Green Belt Development in nearby villages	Tulukappatti, Thammanayakkanpatti & Vachchakkarappatti	0.15	0.10	0.05	0.15
6	Drinking water supply to nearby villages	4 Nos. borewells with a Sintex tank for water supply at Vachchakkarappatti Village	0.16		0.20	0.20
ii		Construction of new Borewells & OH tanks for Meenatchipuram,	0.15		0.20	0.20

		Pattamputhur and Ettanayakkanpatti villages				
iii		Borewell for Vadi Panchayat will be constructed for Green Belt maintenance	0.02	0.03		0.03
iv		Borewell at Muniyasamy kovil street	0.03	0.03		0.03
v		Borewell at Nallurpatti village	0.03	0.03		0.03
7	Infrastructures					
i		Bus stop and health facility at RR Nagar - Contributed to MLA Fund for the same	0.09	0.10		0.10
ii		Road works for Pattamputhur Adithiravidar Colony	0.10	0.13		0.13
iii		Disinfection of nearby Villages	0.05	0.06		0.06
Total			12.7784	20.46	10.78	24.00

Table : 1.9 Implementation of CSR Activities at Expansion Stage

Date	Contribution by RCL for	Amount, Rs.
30.06.2023	Providing Health Kit (Irumbu Penmani Thittam) for Govt & Govt Aided Schools – to District Collector, Virudhunagar	66,40,000
29.07.2023	Bus Shelter Work at Aralvoimozhi	5,06,667
30.08.2023	Road works for Jumma Pallivasal, Vachchakkarappatti	2,65,338
31.08.2023	Desilting of Pond & Construction of Steps at Tirumalaipuram	2,95,454
30.11.2023	High mast Light at Thammanayakkanpatti Panchayath	5,01,807
14.12.2023	Electric Dryer Machine to Virudhunagar Medical College Hospital	4,01,200
18.12.2023	Tree Saplings provided to the Chief Education Officer (CEO) Virudhunagar	2,00,000
31.01.2024	Tuticorin Flood Relief Materials provided	8,20,063
31.01.2024	Borewell & Submersible Pump to Thavasilingapuram	2,84,331
31.01.2024	Borewell & Submersible Pump to Kallupatti Village	2,85,170
31.01.2024	Water Facility provided to Vachchakkarappatti Panchayath	1,80,332
01.02.2024	Panchayath Union Office Compound Wall Construction Works Phase -II	4,12,232
15.03.2024	Financial Assistance to Sri Ambal Educational & Charitable Trust for Plantation of Saplings in the Villages	10,00,000
21.03.2024	DD to Wildlife Warde, Grizzled Wildlife Sanctuary, Srivilliputtur for Conservation of Indian Peafowl in Virudhunagar District	75,00,000
29.03.2024	Construction of Bus Shelter for Muthuswamipuram Village	2,12,400
31.03.2024	Provision of Borewell & Erection of Submersible Pump with Sintex Tank at Koppuchithampatti Village	2,62,126
31.03.2024	Construction of Toilets at Government School, Sennamareddipatti Village	5,25,886
31.03.2024	Installation of RO Units at Vachchakkarappatti Panchayath	9,32,112
31.03.2024	Gravel Transportation to nearby Villages for Road works	5,62,881
Total Amount Spent during II Half of 2023-24		2,17,87,998

1.5.2 Compliance to CTO Conditions

RR Nagar Plant operations are in compliance with existing CTO conditions as given in **Table 1.10**.

Table : 1.10 Compliance to CTO Conditions (Dated 13.09.2024)

Sl. No.	Additional Conditions	Compliance Status
I	Water Act (Order 2408157290712)	
A	Special Conditions :	
1	The unit shall obtain No Objection Certificate (NOC) from the Tamil Nadu Bio Diversity Board /National Bio Diversity Authority if the unit is using any Biological resources or knowledge associated thereto as per the provisions of Biological Diversity Act 2002	Not Applicable. RCL is not using any biological resources for the operation.
2	The industries shall take all efforts to use and popularize "Mission LiFE" logo and mascot which is available in TNPCB & MoEF&CC website. They shall also request their employees to adopt "Mission LiFE" action points and document the same and furnish half yearly report to Board.	Complied. The logo and mascot of "Mission LiFE" are actively utilized in all environmental awareness initiatives. A training program focused on the 7 themes of "Mission LiFE" was conducted for all employees and contract workmen and the action points related to the seven themes have been prominently displayed on notice boards to enhance awareness. Documentation of these activities are furnished in the half yearly report to the Board.
B	Additional Conditions :	
1	The unit shall operate and maintain the Sewage Treatment Plant efficiently and continuously to achieve the Standards prescribed by the Board	Complied. Sewage Treatment Plant is operated efficiently to meet the prescribed standards. NABL accredited third party is engaged to monitor the quality of treated STP water and in addition TNPCB officials also inspecting and collecting the treated sewage samples regularly. The results of treated sewage water parameters are within the limit prescribed by the Board. Further Online Continuous Effluent Monitoring System is installed in the STP and it is connected to the TNPCB Water Watch Centre.
2	The unit shall utilize the treated sewage for gardening and industrial cooling purposes.	Complied. The Treated Sewage is used for Green belt development and also for industrial cooling purpose during monsoon seasons.
3	The unit shall develop rainwater harvesting system as per the action plan submitted in order to achieve the gradual shifting of ground water	Complied. Rain water harvesting ponds 6 Nos. are created in the complex as detailed below :

Sl. No.	Additional Conditions	Compliance Status		
	usage within the time frame fixed in the EC condition.	Location	Dimension in m (Dia.x Depth)	Holding Capacity, KL
		Near Materials Gate	50 x 2	3,930
		Near STP	30 x 2	1,410
		Near CPP	30 x 2	1,410
		Near Ramco Vidyalaya School South	24 x 2	900
		Near Ramco Vidyalaya School North	24 x 2	900
		Near Sriram School in Colony	27 x 2	1,150
		Total Capacity		9,700
		About 230 KLD harvested Rainwater from these RWH Structures is supplementing the raw water demand of the Complex.		
4	The unit shall comply with conditions mentioned in the environmental clearance issued by MoEF&CC, Gol vide proceeding No. J-11011/119/2009.IA.II(I) dt. 25.10.2021.	Complied. All conditions mentioned in the environmental clearance issued by MoEF&CC, Gol vide proceeding No. J-11011/119/2009.IA.II (I) dt. 25.10.2021 are being complied. CCR has been issued by Integrated Regional Office (IRO), MoEF&CC, Chennai vide Letter EP 12.1/867/TN/353 dated 18.03.2024. There is no Non-Compliance / Partial Compliance reported.		
II	Air Act (Order 2408257290712):			
B	Additional Conditions			
1	The unit shall operate and maintain APC measures efficiently and continuously so as to adhere to the AAQ/SE/ANL standards prescribed by the Board.	Complied. RCL is operating and maintaining all APC measures efficiently and continuously so as to adhere to the AAQ/SE/ANL standards prescribed by the Board. Continuous Ambient Air Quality Monitoring Station (CAAQMS) 4 Nos., Continuous Emission Monitoring System (CEMS) for all main Stacks are installed and real time data being transmitted continuously to Care Air Centre of TNPCB & CPCB Servers. All monitored values are with the prescribed limits.		
2	The unit shall provide the Waste Heat Recovery Boiler System to Line 3 kiln in compliance to the conditions imposed in EC and CTE Exp. as	Complied. An order for the installation of a Waste Heat Recovery Boiler System in the Line 3 kiln has been placed with M/s. ISGES, Noida, for a sum of Rs. 81.81 Crores, on 04.01.2024. The		

Sl. No.	Additional Conditions	Compliance Status
	committed by the unit vide letter dated 15.07.2024.	commissioning tasks will be completed by January 2026.
3	The unit shall operate all the dust containment measures in the coal stock yard efficiently and continuously to control the fugitive emission	Complied. RCL installed Coal stacker and reclaimers with covered shed for coal storage. Coal is conveyed through belt conveyers with covered sheds and bag filters are installed at all transfer points to control the fugitive emission.
4	The unit is permitted to use the permitted quantity of petcoke 423T/day as feed stock or in the manufacturing process to use pet coke as feed stock for the consumption. Also comply with the following conditions for import of pet coke:	Complied. Only indigenous Petcoke less than 423 T/day is utilized in kiln for cement manufacturing.
i.	The industry is permitted to directly import petcoke and consignment shall be in the name of the user industrial units for their own use only.	Complied. RCL is receiving indigenous Petcoke in the unit name and it is being used for own operational needs only.
ii.	Import of pet coke for the purpose of trading shall not be permitted.	Complied. From January 2024, only indigenous Petcoke is being used for cement manufacturing, Petcoke is not traded.
iii.	The industry shall furnish opening and closing stock of imported Petcoke and consumption of the same to the TNPCB on a monthly basis.	Complied. The opening and closing stock, along with its consumption, is being reported to TNPCB on a monthly basis.
5	The unit has to maintain minimum drop height while unloading the coal from the Tippers	Complied. Minimum drop height is being maintained while unloading coal from tippers, Additionally, a bag filter has been installed at the feeder to capture dust generated during unloading.
6	The unit shall carry out cleaning of spilled materials such as Gypsum, Fly ash, and Coal dust inside the working area periodically to avoid carryover of dust to the surrounding	Complied. All Raw materials are stored in closed Sheds. A dedicated heavy-duty vacuum cleaning machine and two sweeping machines are deployed for cleaning up spilled materials in the working area. These machines are functioning continuously throughout the day.
7	The industry shall utilize /enhance the usage of Alternate Fuels and Raw materials (AFR such as Plastic wastes, Hazardous wastes) for Co-processing/Co-incineration in Cement Kiln so as to improve the Thermal Substitution Ratio (TSR). Also the unit shall provide necessary infrastructure facilities such as	Complied. Alternate Fuels and Raw materials being utilized for Co-processing depending on the quality and market availability, Necessary feeding arrangements like dedicated storage shed, hopper, belt conveyor and elevators are provided for Co-processing.

Sl. No.	Additional Conditions	Compliance Status
	feeding system, conveyor systems, etc., for Coprocessing.	
8	The unit shall operate the four CAAQMS in the receptors like public school, temple, Health Care Facility etc., in and around 10 km radius and shall be connected to Care Air Centre, TNPCB, Chennai as well as CPCB portal.	Complied. RCL has installed four CAAQMS at Plant Laboratory Building, Ramco Vidyalaya School Building, Tulukkappatti village near river bed and Thammanayakkanpatti village (West compound wall area). Real time data from all 4 CAAQMS are connected to Care Air Centre, TNPCB and to CPCB Server.
9	The unit shall increase the green belt around the boundary adjoining with the Highway.	Complied. Green belt has been developed around the boundary adjoining the highway
10	The unit shall maintain a good housekeeping	Complied. Housekeeping is being maintained in the factory premises. A Heavy-duty vacuum cleaning machine and two sweeping machines are operated continuously throughout the day.
11	The unit has to ensure that its operation shall not evoke any complaints from the surroundings	Complied. Plant operations are in compliance with statutory norms. There is no public complaint received in recent time.
12	The unit shall not use 'use and throwaway plastics' such as plastic sheets used for food wrapping, spreading on dining table etc., plastic plates, plastic coated tea cups, plastic tumbler, water pouches and packets, plastic straw, plastic carry bag and plastic flags irrespective of thickness, within the industry premises. Instead it shall encourage use of ecofriendly alternative such as banana leaf, areca nut palm plate, stainless steel, glass, porcelain plates/cups, cloth bag, Jute bag etc.	Complied. RCL has banned usage of one time use and throwaway plastics in our factory and colony premises as per the direction of Government of Tamil Nadu. RCL has carried out awareness through notice, hoardings, and display boards, competitions for school children and training sessions for employees to avoid plastic usage in the factory and colony premises. RCL has also replaced the one time plastic waste with stainless steel, glass and porcelain materials, cloth bags, etc.
13	The unit shall comply with conditions mentioned in the environmental clearance issued by MoEF&CC, Gol vide proceeding No. J-11011/119/2009.IA.II(I) dt. 25.10.2021.	Complied. All conditions mentioned in the environmental clearance issued by MoEF&CC, Gol vide proceeding No. J-11011/119/2009.IA.II (I) dt. 25.10.2021 are being complied. CCR has been issued by Integrated Regional Office (IRO), MoEF&CC, Chennai vide Letter EP 12.1/867/TN/353 dated 18.03.2024. There is no Non-Compliance / Partial Compliance reported.

1.5.3 Compliance to CREP Guidelines

A series of industry specific interaction meetings had been organized to formulate the **Charter on Corporate Responsibility for Environmental Protection (CREP)** and action points were enlisted for the Cement Industry. RCL is in full compliance of the Action Points as detailed in the **Table 1.11**.

Table : 1.11 Compliance to CREP Guidelines

Sl. No.	Control Measures to be Provided	Guidelines	Action taken
1. Unloading Section (Limestone, Coal & other relevant material)			
1	Enclosure should be provided for all unloading operations, except wet materials like gypsum	The enclosures for the unloading sides could be flexible curtain type material covering up to height of dumpers discharge from the roof.	Curtain type enclosures are provided at unloading section.
2	Water shall be sprayed on the material prior and during unloading	A dust suppression system should be provided to spray water. The amount of water sprayed should preferably be optimized by employing proper design of spray system. Suitable systems may be adopted to reduce the problems like choking, jamming of the moving parts.	Dust suppression system with spray nozzles is in operation at unloading section.
2. Material Handling Section (Including Transfer Points)			
1	All transfer point locations should be fully enclosed.	The enclosures from all sides with the provision for access doors, which shall be kept, closed during operation. Spillages should be periodically removed.	Transfer points are fully enclosed.
2	Airborne dust at all transfer operations/points should be controlled either by spraying water or by extracting to bag filter.	Either water spray system should be provided for suppressing the air borne dust or dry extraction cum bag filter with adequate extraction volume.	Bag Filters are provided at all transfer points to control fugitive emissions
3	Belt conveyors should preferably be closed.	This will avoid wind blowing of fines.	All belt conveyors are closed ones.
3. Coal Storage Section			
1	Coal yard/storage area should be clearly earmarked.	A board should be erected to display the area earmarked.	Coal stacker and reclaimer with covered shed are provided for coal storage. Coal is conveyed through belt conveyors with covered sheds.
2	The pathways in coal yard for vehicle movement should be paved.	Proper pathways with entry and exit point should be provided.	
3	Accumulated dust shall be removed/swept regularly and water the area after sweeping.	Any deposits of dust on the concrete roads should be cleaned regularly by sweeping machines.	
4	Coal other than coal stock pile should preferably be stored under covered shed.	Where ever blending activity is carried out by chaining in open ground, covered shed should be provided to reduce the fine coal dust getting airborne. The enclosure walls shall cover minimum three sides up to roof level.	
5	The coal stock pile should preferably be under	The enclosure should be from three sides and roof so as to contain the airborne emissions.	

Sl. No.	Control Measures to be Provided	Guidelines	Action taken
	covered shed for new plants.		
6	Instead of dust extraction cum bag filter system, If dust suppression measure is used, following additional control measures should be provided.		
a	Wetting before unloading.	Coal should be sufficiently moistened to suppress fines by spraying minimum quantity of water, if possible.	Bag filters are provided at all transfer points and coal mill area
b	Spray water at crusher discharge and transfer points.	Water spray should also be applied at crusher discharge and transfer points.	
4. Clinker Cooler Section			
1	Air borne fines extracted from clinker cooler shall be separated and sent to last possible destination directly, if possible.	The possibilities especially in new cement plant may be explored for the following: The unit may need to add on/install necessary provisions for separating fine particulates from the clinker cooler ESP collection. Fines separation may be achieved by passing collected dust through cyclone, the fines escaping cyclone to be separated, cyclone collection (coarse particles) could be recycled. The fines shall be recycled to the last possible destination (like clinker day silo) suitable or safely disposed.	ESP is installed or Cooler in both the kilns. Dust collected in ESP is collected through bottom hopper and reused in the process.
5. Clinker Stock Piles Section			
1	In new cement plant, clinker should be stored preferably in silo.	Bag filter may be provided before venting out the gases.	Clinker is being stored in silos. We have provided bag filter at silo top. Clinker is conveyed through deep pan conveyors and we have provided bag filters at all transfer points. The dust collected in the bag filter is recycled in the process.
2	Clinker should be stored in closed enclosure covered from all sides and should have a venting arrangement along with a bag filter.	The enclosures should have a venting arrangement located at transfer point where clinker is dropped to the stockpile. The extraction/venting should be sufficient enough. Clinker stockpile access door should be covered by mechanical gate or by flexible rubber curtain. The access doors shall be kept closed at all possible times.	
3	The dust extracted and captured in bag filter should be avoided to feed back/recycled to the clinker stockpile, if possible.	Extracted dust should be captured in bag filter and the collected dust should be avoided to feed back to the clinker stockpile, if layout permits. It may be recycled at last possible destination i.e., cement mill section through suitable arrangement, if possible.	
4	Generally open storage of clinker should be avoided. Only in case of emergency clinker should be stored in open with following control measures.		
5	Area for open storage of clinker should be clearly earmarked.	After earmarking the open storage area of clinker, a board should be erected to display the area earmarked.	Clinker is being stored in silos only.
6	Provide cover on openly stored clinker.	During the period when the openly stored clinker is inactive, it should be covered fully by HDPE or tarpaulin type sheets to prevent wind blowing of fugitive dust.	

Sl. No.	Control Measures to be Provided	Guidelines	Action taken
7	Provide windbreak walls or greenbelt on three sides of open stock piles	Install three sided enclosures, which extend to average height of the stockpile, where ever feasible.	
8	Provide partial enclosure for retrieving area.	Flexible type wind breaking enclosure should be provided covering the clinker retrieval area as wind barrier to prevent dust carry over by wind. The enclosure could be of lightweight material like moulded plastic material or similar, which could be dismantled/assembled and shifted from one place to other.	
9	The travel path of pay loaders should be paved and frequently swept.	Travel areas path used by the front - end pay loader shall be paved with concrete. It should be regularly swept by high efficiency vacuum sweeper to minimize the material build up.	
10	Provide loading of clinker by pay loaders into trucks / trailers be carried out in an enclosure vented to a bag filter.	An enclosure fitted with bag filter could be located at the most central place adjacent to the clinker storage area. The pay loader moves to the fixed loading area from one end of the enclosure and the truck/trailer enters the enclosure from other end.	
6. Storage of Limestone, Gypsum, Fly ash and other additives:			
1	The storage should be done under covered shed.	The enclosure walls shall cover minimum two sides up to roof level.	Limestone and gypsum are stored in closed sheds. We have installed Limestone stacker and reclaimer with closed shed. Fly ash is stored in silos.
2	Dry fly ash shall be transported by closed tankers. In case of wet fly ash trucks may be used for transportation.	Fly ash shall be pumped directly from the tankers to silos pneumatically in closed loop or mechanically such that fugitive emissions do not occur.	Dry Fly ash is transported through closed tankers and pneumatically transferred and stored in silos. We have provided bag filters for silo venting.
3	Dry Fly ash shall be stored in silos only.	The silo vent be provided with a bag filter type system to vent out the air borne fines.	
4	Fly ash in the dry form should be encouraged and in wet form should be discouraged. In case wet fly ash is to be used, it may be stored in open temporarily for the purpose of drying with necessary wind break arrangement to avoid wind carryover of fly ash. The fly ash should be removed immediately after drying.	If possible, the dry fly ash should be sent to closed silos. Otherwise, fly ash should be transported through closed belt conveyors to avoid wind carryover of fly ash.	
7. Cement Packing Section			
1	Provide dust extraction arrangement for packing machines.	The packing machines should be equipped with dust extraction arrangement such that the packing operation is performed under negative	Bag filters are provided in packers. The dust collected in bag filter is reused in process.

Sl. No.	Control Measures to be Provided	Guidelines	Action taken
		pressure. The dust may be captured in bag filters.	
2	Provide adequate ventilation for the packing hall.	Adequate ventilation for the packing hall should be provided for venting out suspended particulate thereby ensuring dust free work environment.	The packing section is designed with proper ventilation to maintain dust free environment.
3	Spillage of cement on floor shall be minimized and cleared daily to prevent fugitive emissions.	The spilled cement from the packing machine should be collected properly and sent for recycling. The spilled cement on the shop floor should be swept by vacuum sweeping machines periodically. Proper engineering controls to prevent the fugitive emissions may include arrangements like providing guiding plate, scrapper brush for removing adhered dust on cement bag etc.	High vacuum spillage cleaning machines and One truck mounted and one high vacuum road sweeping machines are continuously operated to keep the area neat and clean. Also, self-bag cleaning device is provided with suction arrangements to remove the dust from bags.
4	Prevent emissions from the recycling screen by installing appropriate dust extraction system.	The vibratory screen provided for screening/ recycling spilled cement should be provided with a dust extraction arrangement to prevent fugitive emission from that section.	
8. Silo Section			
1	The silo vent to be provided with a bag filter type system to vent out the air borne fines.	The bag filter should be operated and maintained properly, especially the cleaning of bags to avoid pressurization of silos thereby causing fugitive emissions from leakages etc.	Bag filters are provided at all Silos.
9. Roads			
1	All roads on which vehicle movement of raw materials or products take place should be paved.	The paved roads should be maintained as paved at all times and necessary repairs to be done immediately after damages to the road if any.	All roads are concrete paved.
2	Limit the speed of vehicles.	Limit the speed of vehicle to 10 km/h for heavy vehicles with in the plant premises to prevent the road dust emissions.	Vehicle speed is restricted inside the plant premises and continuous inspection is being done by security guards.
3	Employ preventive measures to minimize dust build up on roads.	Preventive measures include covering of trucks and paving of access areas to unpaved areas.	All raw materials are transported through covered trucks and truck mounted and high vacuum road sweeping machines are continuously operated to control dust emissions.
4	Carry out regular sweeping of roads to minimize emissions.	Mitigative controls include vacuum sweeping, water flushing.	

1.6 Important to the Country & Region

1.6.1 Demand - Supply Gap

The Union Budget's focus on infrastructure is projected to drive a 10-15% rise in cement demand, fueled by the swift implementation of various infrastructure projects such as new airports, major road developments, ports, Metro rail initiatives, and energy sector ventures. Additionally, robust activity in the real estate and rural affordable housing sectors under the Pradhan Mantri Awas Yojana – Gramin (PMAY-G) is expected to further bolster demand.

RCL successfully marketed 3.0-3.5 MTPA cement recently across the South Tamil Nadu and South Kerala. However, the sales growth in these regions has been consistently increasing between 15 to 40% annually. To accommodate this growth, RCL is planning to increase cement production from 2.70 MTPA to 4.00 MTPA, representing 48% increase from existing capacity.

1.6.2 Imports & Indigenous Production

Entire cement produced from the Plant is marketed in the local markets in Southern Districts of Tamil Nadu & Kerala States. On demand, cement from RR Nagar Plant will also be transported to RCL Nagercoil Packing Unit for packing dispatch to the local markets. There is no import of cement proposed.

1.6.3 Export Possibility

Currently, there are no export plans from the Plant. Major production will be consumed locally.

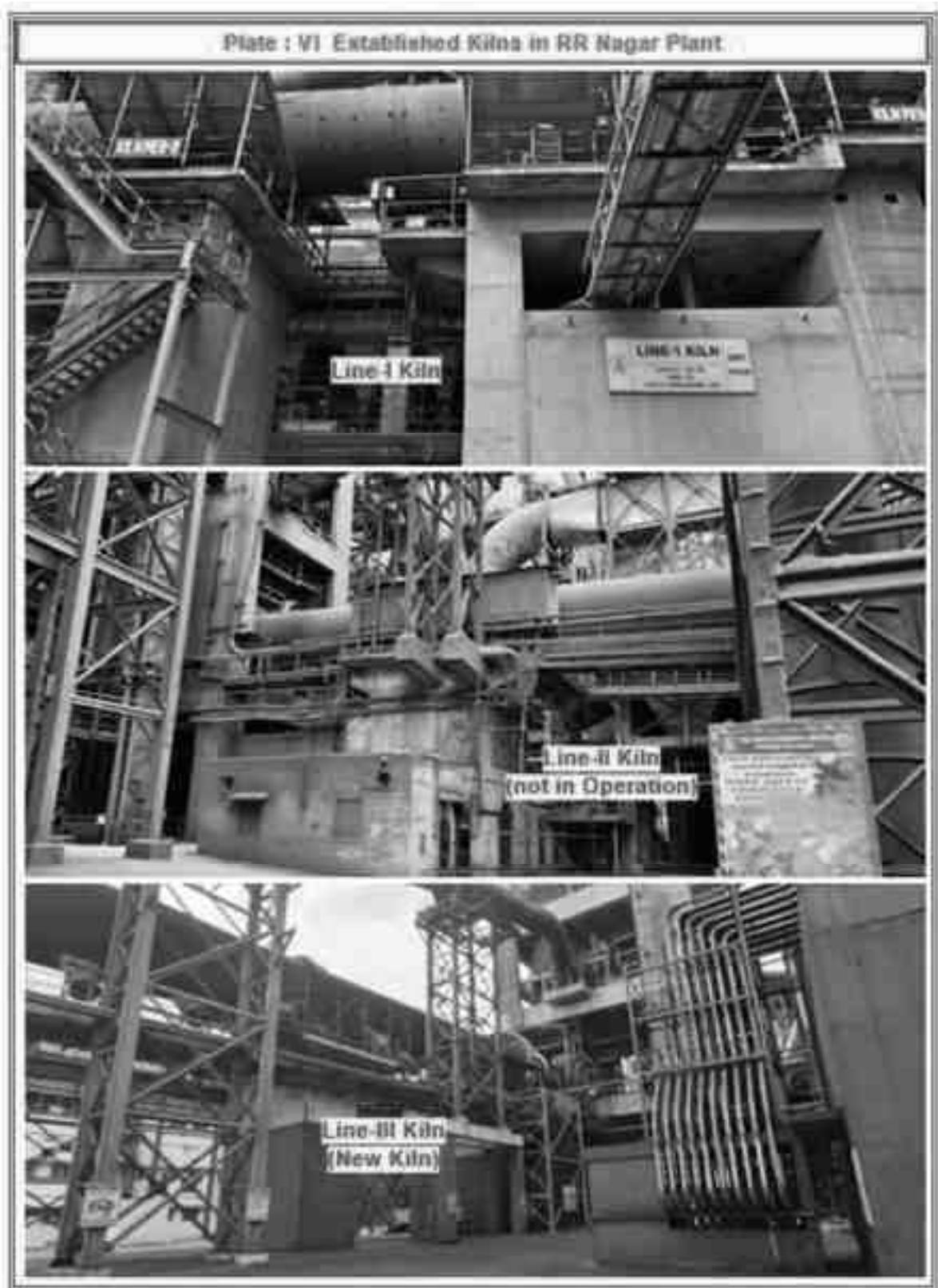
1.6.4 Domestic / Export Markets

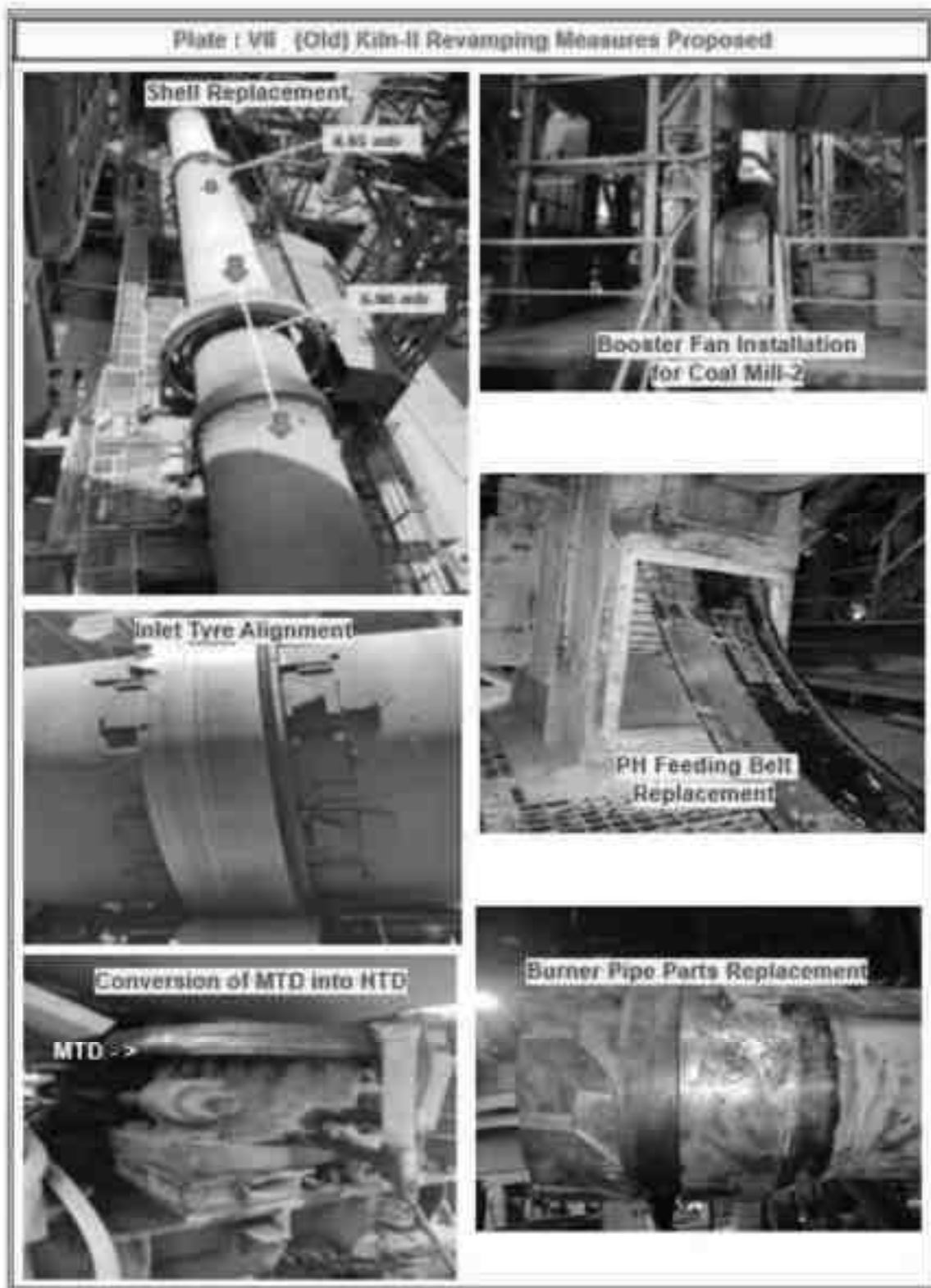
Domestic market for the Plant is mainly Southern Districts of Tamil Nadu and Kerala States.

1.7 Need for the Proposal

On commissioning of New Kiln-III, the old Kiln-II operations are stopped. RCL took the services of the Plant Engineering Consultant & Supplier, FLSmith (FLS), for evaluation of Line-II Kiln & its accessories for sale value, they took detailed inspection and suggested certain required modifications so that **Kiln-II can be operated for another 10 years sustainably**. FLS has **also advised to revamp the production of Kiln-I & New Kiln-III** by increasing the volumetric flows and with some possible minor modifications. Kiln-II Modifications suggested (**Plates VI & VII**) include:

- ✓ Kiln shell 1.91-meter replaced.
 - ✓ Kiln inlet tyre replacement.
-





- ✓ Kiln Drive pinion and gearbox replacement.
- ✓ Hydraulic thrust device replacement.
- ✓ Kiln Old burner replaced with latest pillard burner.
- ✓ Cooler internals replaced.
- ✓ ID fan shaft & hub replaced.

To meet the increasing market demand, the Cement production of RR Nagar Cement Plant has to be increased to 4.00 MTPA. In addition to the Limestone Mines, operations of Lime Kankar Quarries in Pandalgudi Region commenced and accordingly, Raw Materials viz. Limestone & Lime Kankar supply increased to double time. With increased Raw Material supply, Clinker production of the Plant can be increased by inclusion of Old Kiln-II operations. Also, by increasing the No. of **operational days of the Kilns from existing 320 days to 345 days**, Clinker production can be increased.

1.8 The Proposal

With the Proposal, **Clinker production** of RR Nagar Cement Plant will be increased from existing 1.44 MTPA to 2.76 MTPA (**91.67% increase**) (Table 1.12) and **Cement production** from 2.70 MTPA to 4.00 MTPA of various Cements (**48.15% increase**) (OPC 43 & 53 Grades, Rapid Hardening Portland Cement-RHPC, Portland Pozzolana Cement-PPC, Masonry Cement-MC, Composite Cement-CC, etc.) along with associated Waste Heat Recovery System (WHRS) of 13 MW. Imported Clinker from RCL's other Cement Plants demand will be 0.50 MTPA, on demand.

Table : 1.12 Proposed Clinker Production with Operation of all 3 Existing Lines

RR Nagar Plant Kilns	Existing Operational Capacity, TPD	No. of Days	Clinker Production, TPA	Operational Capacity on Revamping of Kilns, TPD	No. of Days	Proposed Clinker Production, TPA
Line-I	1,500	320	4,80,000	2,000	345	6,90,000
Line-II	(1,400)	0	0	2,000	345	6,90,000
Line-III	3,000	320	9,60,000	4,000	345	13,80,000
Total	4,500	-	14,40,000	8,000	-	27,60,000

Existing Waste Heat Recovery (**WHR**) **Boilers** of Line-I and proposed WHRBs for Lines II & III will be combined for producing about **13 MW by a dedicated Turbine Generator**. Project Cost for this Expansion will be **additional Rs.103.38 Crores**.

All activities are **proposed within the Industry premises** and no additional land is required. Also, there is **no Rehabilitation & Resettlement (R&R)** involved. There is **no Litigation or Pending Case** against the Project.

1.9 Scope

The proposed Expansion of Cement Plant (≥ 1.0 MTPA) falls under Sl. No. 3(b) - Category 'A' of EIA Notification 2006 and requires prior EC from MoEF&CC. As per General Condition No. (ii) of the amendment vide MoEF&CC Notification S.O. 1599 (E) dated 25th June, 2014 and as per OM vide F. No. 22-24/2018-IA.III dated 22.01.2019, prior EC for installation of WHRB is exempted. Hence, application for prior EC under Project or Activity 1(d) is excluded. Thus, RCL filed TOR Application vide Parivesh Online Proposal No. IA/TN/IND1/498318/2024 on 26.09.2024 with a request for Standard TOR for this existing Plant. On scrutiny of the Application, the Ministry raised 'Essential Details Sought-EDS' on 07.10.2024. RCL submitted Reply to EDS on 05.11.2024. MoEF&CC granted Standard Terms of Reference (Standard TOR) for the Project with **TOR Identification No. TO24A1102TN5995426N dated 12.11.2024** under File No. J-11011/119/2009.IA.II(I).

As permitted, Baseline Data was collected during Jul.-Sep. 2024 in Premonsoon Season Period **for this Region** as the area experiences (Northeast) Monsoon Season during Oct.-Dec. months in compliance with MoEF&CC Office Memorandum No. J-11013/41/2006-IA-II(I)(Part) dated 29.08.2017. EIA Consultant, M/s. ABC Techno Labs India Private Limited, Chennai has been accredited for various Sectors including **Sector-9 (Cement Plants) for Category 'A'** by the National Accreditation Board for Education & Training (**NABET**) vide Certificate NABET/EIA/2225/RA0290 dated 11.06.2023 with validity till 16.11.2025 (Sl. No. 4 of List dated 29.10.2024). ABC Laboratory is accredited by the National Accreditation Board for Testing and Calibration Laboratories (**NABL**) vide Certificate No. TC-5770 dated 03.04.2024 with validity till 02.04.2026.

The Draft Environmental Impact Assessment (Draft EIA) Report has been prepared in compliance with **Awarded Standard TORs & Specific TORs** for Cement Plants and also as per the generic structure proposed in Appendix III of EIA Notification 2006 with the following Chapters:

- ❖ Introduction with Need for the Project
- ❖ Project Profile - Environmental Setting of the Project & an outline of the Project and allied activities .
- ❖ Baseline Environmental Status.
- ❖ Anticipated Impacts along with Prediction of Impacts and Mitigation Measures.
- ❖ Analysis of Alternatives (Technology & Site).
- ❖ Environmental Quality Monitoring Programme.
- ❖ Project Benefits.
- ❖ Additional Studies like Risk Assessment, DMP, etc.
- ❖ Cost-Benefit Analysis, if any.
- ❖ Environmental Management Plan
- ❖ Summary & Conclusion.
- ❖ Disclosure of Consultants engaged.

The Draft EIA along with Summary EIA Reports (both in English & Tamil Languages) are submitted for the Public Consultation & Public Hearing.

2.0 Project Profile

2.1 Description of the Proposal

The Proposal is an **Interdependent Project**. The following Expansion activities are **proposed within the existing Premises with no additional Land & no R&R**:

- ❖ Operation of Kiln-II & its accessory Units, stalled earlier, are to be commenced as Line-II.
- ❖ To increase the Life Span of Kiln-II, Modifications proposed by FLS are to be carried out to the revamped level of 2,000 TPD.
- ❖ Kiln-I operations not to be de-rated and to be continued to the design level of 2,000 TPD by increasing the volumetric loading.
- ❖ Volumetric loading of Kiln-III has to be increased to the design/capable level of 4,000 TPD.
- ❖ Line-I-Ball Mill of 125 TPH and Pre Grinder Mill of 150 TPH operations are to be commenced.
- ❖ Coal grinding Ball Mills-I & II of each 12 TPH capacity (total 24 TPH) operations are to be commenced.
- ❖ Bag House & Bag Filter bags are to be replaced in Line-II Kiln & its Units to meet PM emission standards 30 mg/Nm³ with a cost of **Rs.1.50 Crores**.
- ❖ Additive pumping from existing Silo to cement grinding section with a cost of **Rs.4.07 Crores**.
- ❖ Increasing the operational days of all 3 Kilns from existing 320 days to **345 days**.
- ❖ Increasing operational capacity of all 3 Cement Mills to 500 TPH total for **345 days**.
- ❖ Accordingly, Plant production capacity has to be increased as : **Clinker from 1.44 MTPA to 2.76 MTPA & Cement from 2.70 MTPA to 4.00 MTPA**.
- ❖ Waste Heat Recovery Boilers - 1 No. Pre-Heater (PH) Boiler & 1 No. Air Quenching Cooler (AQC) Boiler are proposed now for Line-III Kiln.
- ❖ Existing WHR Boilers of Line-I and proposed WHRBs for Lines II & III will be combined for producing about **13 MW by a dedicated Turbine Generator** at a cost of **Rs.97.81 Crores**.
- ❖ Expansion activities are proposed with a **Project Cost of Rs.103.38 Crores**.
- ❖ No change in Land Use & **existing Green Belt has to be maintained**.

2.2 Magnitude of Operation

On proposed Expansion, the details of Products & By-products are given in **Table 2.1**.

Table : 2.1 Details of Products & By-Products on Expansion

Production of	Product / By-product	Production, MTPA			Mode of Transportation
		Existing	Proposed	Total	
Clinker	By-product	1.44	1.32	2.76	By Conveyor
Imported Clinker from RCL Sister Units	By-product	0.50	0	0.50	Rail
Cement	Product	2.70	1.30	4.00	Both Road & Rail
WHRB Power Generation from all 3 Lines @ 13.0 MW					

With the Proposal, **Clinker production** of RR Nagar Cement Plant will be increased from existing 1.44 MTPA to 2.76 MTPA (**91.67% increase**) and **Cement production** from 2.70 MTPA to 4.00 MTPA of various Cements (**48.15% increase**) (OPC 43 & 53 Grades, Rapid Hardening Portland Cement-RHPC, Portland Pozzolana Cement-PPC, Masonry Cement-MC, Composite Cement-CC, etc.). Imported Clinker from RCL's other Cement Plants demand will be 0.50 MTPA, on demand. Existing WHR Boilers of Line-I and proposed WHRBs for Lines II & III will be combined for producing about **13 MW by a dedicated Turbine Generator**.

2.3 Environmental Setting

Plant area falls in Survey of India Topo Sheet No. **58 G/15** (Open Series Map-C43R15). Topo Sheet is given as **Fig. 2.1** & Environmental Setting as **Fig. 2.2**. Plant Coordinates (**Table 2.2**) are:

North Latitude : 09°26'26.80" to 09°27'55.00"
East Longitude : 77°54'38.00" to 77°56'00.10".

Table : 2.2 Plant Site Coordinates

Site Location ID	Latitude	Longitude	Site Location ID	Latitude	Longitude
North	9°27'55.00"	77°55'46.74"	NE Corner	9°27'51.63"	77°56'00.10"
East	9°27'22.70"	77°55'55.69"	SE Corner	9°26'54.36"	77°55'39.81"
South	9°26'26.80"	77°55'14.90"	SW Corner	9°27'16.65"	77°54'38.00"
West	9°27'20.61"	77°55'19.58"	NW Corner	9°27'47.49"	77°55'37.41"

There are **no Eco Sensitive Areas** like National Parks, Wildlife Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar Sites, Tiger/Elephant Reserves, Reserved Forests, etc. (existing as well as proposed), within 10 km Study Area. **None of the followings are located** in the Study Area :

- Protected areas** notified under the Wild life (Protection) Act, 1972.
- Critically Polluted Area (CPA) or Severely Pollution Area (SPA)** as notified by Central Pollution Control Board.
- Eco -Sensitive areas** as notified.
- Interstate boundaries** within 5 km radius from the boundary of the proposed site.
- Coastal Regulation Zone (**CRZ**) Area.

The elevation of the Plant area ranges from 67 m to 89 m above MSL. The region falls in Seismic Zone III. Administrative Units within 10 km radius zone comprises of parts of Virudhunagar, Aruppukottai, Sattur and Sivakasi Taluks of Virudhunagar District. Environmental Setting of 15 km Radius is delineated in **Table 2.2**. There is **no perennial River** in the Region. **Seasonal Arjuna River** (0.3 km in south) and Mannarkottai Nalla (2.0 km-east) are flowing near the Plant. These Streams are flowing towards south to southeast and confluences at Golvarpatti Dam (7.0 km in SE). Vaippar River flows at 9.8 km in south near Sattur.

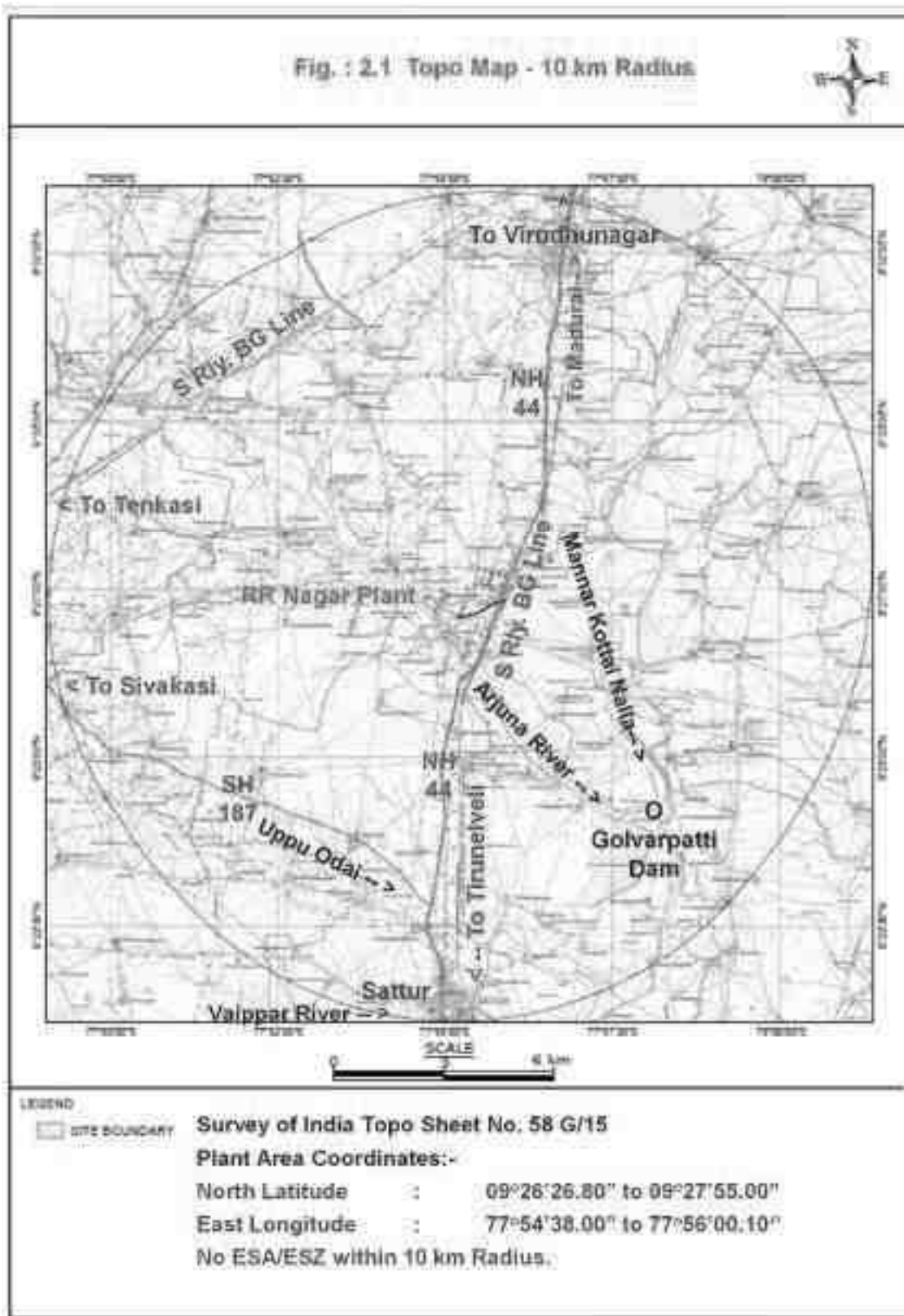




Table : 2.3 Environmental Setting – 15 km Radius

Sl. No.	Areas	Aerial Distance(within 15 km) Proposed Project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	Nil
2	Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	Nil
3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	Nil
4	Inland, coastal, marine or underground waters	Seasonal Arjuna River flows - 0.3 km (S) Mannarkottai Nalla - 2.0 km (E) River Vaippar – 9.8 km (S)
5	State, National boundaries	Nil
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	NH-44 (adjacent in east) Madurai-Kanniyakumari Southern Railway BG Line @ 0.5 km in east.
7	Defence installations	Nil
8	Densely populated or built-up area & Areas occupied by sensitive man-made land uses (<i>hospitals, schools, places of worship, community facilities</i>)	Sattur – 8 km (S) Virudhunagar – 15 km (N) Sivakasi – 11 km (W)
9	Areas containing important, high quality or scarce resources(<i>ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals</i>)	Nil
10	Areas already subjected to pollution or environmental damage. (<i>those where existing legal environmental standards are exceeded</i>)	Nil
12	Areas susceptible to natural hazard which could cause the project to present environmental problems	The region falls in Seismic Zone III. Seasonal Arjuna River flows at 0.3 km (S)

The Cement Plant is located at a distance of 15 km in south from District Head Quarters Virudhunagar. Sattur Town is at a distance of 7.5 km (south) and Sivakasi Town is at 11 km (west). NH-44 (earlier NH-7) (4-Lane Madurai-Kanniyakumari Section) and Southern Railway BG Line (Chennai-Madurai-Kanniyakumari Section) run parallel to the Plant. The **Railway siding for the Plant** is from Tulukkappatti Railway Station (0.5 km in east). A Road Under Pass has been made in the NH-44 for the Plant vehicular traffic. Madurai is the nearest Airport (50 km in north). Thoothukudi VOC Port is the nearest Port (80 km-southeast). Chennai is at 450 km in northeast from the Plant. The nearest habitations are :

<u>Village</u>	<u>Distance & Direction</u>	<u>Total Population</u>	<u>No. of Households</u>
Thammanayakkanpatti	0.2 km in N	3360	883
Vachchakkarappatti	0.2 km in NNE	3859	994
Tulukkappatti	0.5 km in SE	2684	671

There is **no major Industry** in the Study Area other than RR Nagar Cement Plant & CPP in the Region. Pandalgudi Region Mines of RCL are at 18-30 km distance (ESE). Dalmia Sattur Grinding Unit is at 18 km distance (S). Both Small & Medium Scale **Fire Cracker Units** predominantly exist in the Study Area. Stone Quarries exist in scattered places. Small Textile Mills exist in northern as well as southern parts of the Study Area,

Vulnerable Groups i.e. Man made Sensitive Areas (**Schools & Health Centres**) in the Study Area are given in **Tables 2.4-2.5**. All Institutions are functioning after the establishment of the Plant. Workship places like Temples, Churches, Mosques, etc. exist in predominant villages.

Table: 2.4 Vulnerable Groups within 10 Km radius - Schools

SI. No.	School Particulars	Village
1	Ramco Vidhya Mandir	Ramco Colony
2	Sriram Primary School	Ramco Colony
3	Amirtha Training Institute	Vachchakkarappatti
4	Upper Primary School	Ettanayakanpatti
5	Panchayat Union Primary School	Pattampudur
6	Govt. High School	Pattampudur
7	Govt. High School	Inam Reddiyapatti
8	Wisdom Wealth International School	Inam Reddiyapatti
9	Wisdom Wealth Catering School	Inam Reddiyapatti
10	Panchayat Union Primary School	Chinnathathampatti
11	Panchayat Union Primary School	Thathampatti
12	Elementary School	Sevalpatti
13	Dhamu Memorial Matric. Sec. School	Sevalpatti
14	Govt. Induatrial Training Institute	Sulakarai
15	Sevendiran Special Hr. Sec. School for Deaf	Sulakarai
16	Govt. Higher Secondary School	Sulakarai

Sl. No.	School Particulars	Village
17	Govt. School	Periya Maruluttu
18	Panchayat Union Primary School	Meenakshipuram
19	Govt. High School	Sennalkudi
20	Govt. Higher Secondary School	Malayapatti
21	Govt. High School	Avudayapuram
22	Panchayat Union Middle School	Kotthiparai
23	Hindu Nadar Hr. Sec. School	Melakottaiyur
24	Panchayat Union Primary School	Avudayapuram
25	Panchayat Union Primary School	Mannarkottai
26	Panchayat Union Primary School	Ammapatti
27	Middle School	Ramalingapuram
28	Upper Primary School	Kumarareddiyapuram
29	Govt. Hr. Sec. School	Naduvapatti
30	Sri Vastha College	Sattur
31	P S N L College of Education	Mettamalai Road, Sattur
32	Govt. Arts & Science College	Mettamalai Road, Sattur
33	Sri Krishnasamy Arts & Science College	Sattur
34	Primary, Middle, High & Hr. Sec. Schools	Sattur
35	Sri S Ramasamy Naidu Mem. Polytechnic	Venkatachalapuram
36	KMT Girls Higher Secondary School	Venkatachalapuram
37	Govt. Higher Secondary School	Chinnakamanpatti
38	Govt. Higher Secondary School	Perapatti
39	Panchayat Union Primary School	Puchakapatti
40	Govt. Higher Secondary School	Sankaralingapuram

Table: 2.5 Vulnerable Groups within 10 Km radius – Health Centres

Sl. No.	Hospital Particulars	Village
1	Ramco Occupational Health Centre	RR Nagar
2	Govt. Primary Health Centre	Kanniseri Pudhur
3	Urban PHC	Kovilpatti
4	Primary Health Centre	Amathur
5	Primary Health Centre	Malayapatti
6	Primary Health Centre	Avudayapuram
7	Sub-Health Centre	Chokkalingapuram
8	Sub-Health Centre	Alamarathupatti
9	Govt. Hospital	Puchakapatti
10	Govt. Hospital	Minnampatti
11	Primary Health Centre	Vadamalapuram
12	Govt. & Private Hospitals	Sattur
13	Hanumandha Multispecialty Hospital	Chokkalingapuram
14	Govt. Primary Health Centre	Alamarathupatti
15	Government Veterinary Hospital	Thathapatti

Existing EMP measures: Existing mitigation measures for Air Quality, Water Quality & Solid Wastes Control in safeguarding Vulnerable Groups in the vicinity are detailed below:

- ✓ The (old) Line-II Kiln is already provided with Reverse Air Bag House, Cooler with ESP, Coal Mill with Bag Filters so as to control the Particulate Emissions from the Line-II <math><30 \text{ mg/Nm}^3</math>.
- ✓ All the Material conveyors are fully covered and provided with Bagfilters at Transfer Points.
- ✓ Dry Fly ash is pneumatically transferred to the RCC storage silo and pumped to the cement grinding section through pneumatic pipelines.
- ✓ Bag filters are provided in the material loading hoppers, transporting conveyors, feeding area, cement grinding, storage & packing areas to control the fugitive emissions from the unit.
- ✓ Thus, fugitive emissions during loading and unloading operations are controlled effectively in compliance with CREP Guideline Norms.
- ✓ There is no trade effluent generation from the Cement Plant.
- ✓ On Expansion, DM/RO Rejects of 40 KLD, Boiler Bleed-offs of 8 KLD and Colling Tower Rejects of 12 KLD, total 60 KLD effluent will be generated additionally which will be treated for pH Correction in a 100 KLD Neutralisation Pit separately and Treated Effluent of 60 KLD will be utilized for Equipment Cooling of (old) Line-II machineries where it will be evaporated fully.
- ✓ Domestic Sewage & Canteen wastewaters of 25 KLD from the Cement Plant, 9 KLD Domestic Sewage from CPP, 160 KLD Domestic Sewage from the Township and another 86 KLD Domestic Sewage from Labour Qtrs., thus, a total of 280 KLD is generated. All the Domestic Sewage is treated in a 400 KLD Sewage Treatment Plants (350+50 KLD STPs). The Treated Sewage of 250 KLD is fully used for the Green Belt development. There will be no change to existing status on Expansion.
- ✓ Thus, it will be a 'Zero Effluent Discharge'.
- ✓ The solid waste generated from the process and dust collected from various air pollution control equipment is being recycled in the process. Solid waste from the Sewage treatment plant 0.8 @ TPD is vermi-composted and used as manure for Green belt development. Fly ash (29.3 TPD) produced from CPP and Bottom ash (5.2 TPD) are transported pneumatically with the help of dense phase pneumatic pumps to the RCC storage silos. The ash is evacuated from silo and transported to Cement Plant for Portland Pozzolana Cement (PPC) manufacturing.
- ✓ Spent Oil (Category 5.1) generation is 94.62 TPA and is being sold to TNPCB/CPCB Authorised Recyclers for further processing & recycling.

Thus, all EMP measures will be in place to control the pollution levels within the Plant premises and there will not be any impact on the nearby environment including the sensitive man-made land uses.

2.4 Plant Layout & Land Use

All Expansion activities i.e. **Line-II inclusion**, are proposed within the existing Premises and **no additional land** is required. **No establishment** is required for the Proposal. No change in Land Use. Proposed Layout is given as **Fig. 2.3** and detailed in **Table 2.6**. **No development area of 50 m** is provided along Seasonal Arjuna River Bank.

All internal roads are designed for minimum **6 m width and 9 m turning radius** for smooth traffic flow inside the Unit including fire tender, as per NBC Norms. Road network is connecting all service areas. Layout with Internal Roads is attached as **Fig. 2.4**.

Total Builtup Area of the Complex is **61.266 Ha** (with Roof Top Area of 27.570 Ha) and Paved Area of **17.012 Ha**. The total Green Belt Area is **64.50 Ha** in the total extent of 191.434 Ha with **33.69% coverage**. **No additional Green Belt** is required.

Table : 2.6 Land Use at the Plant

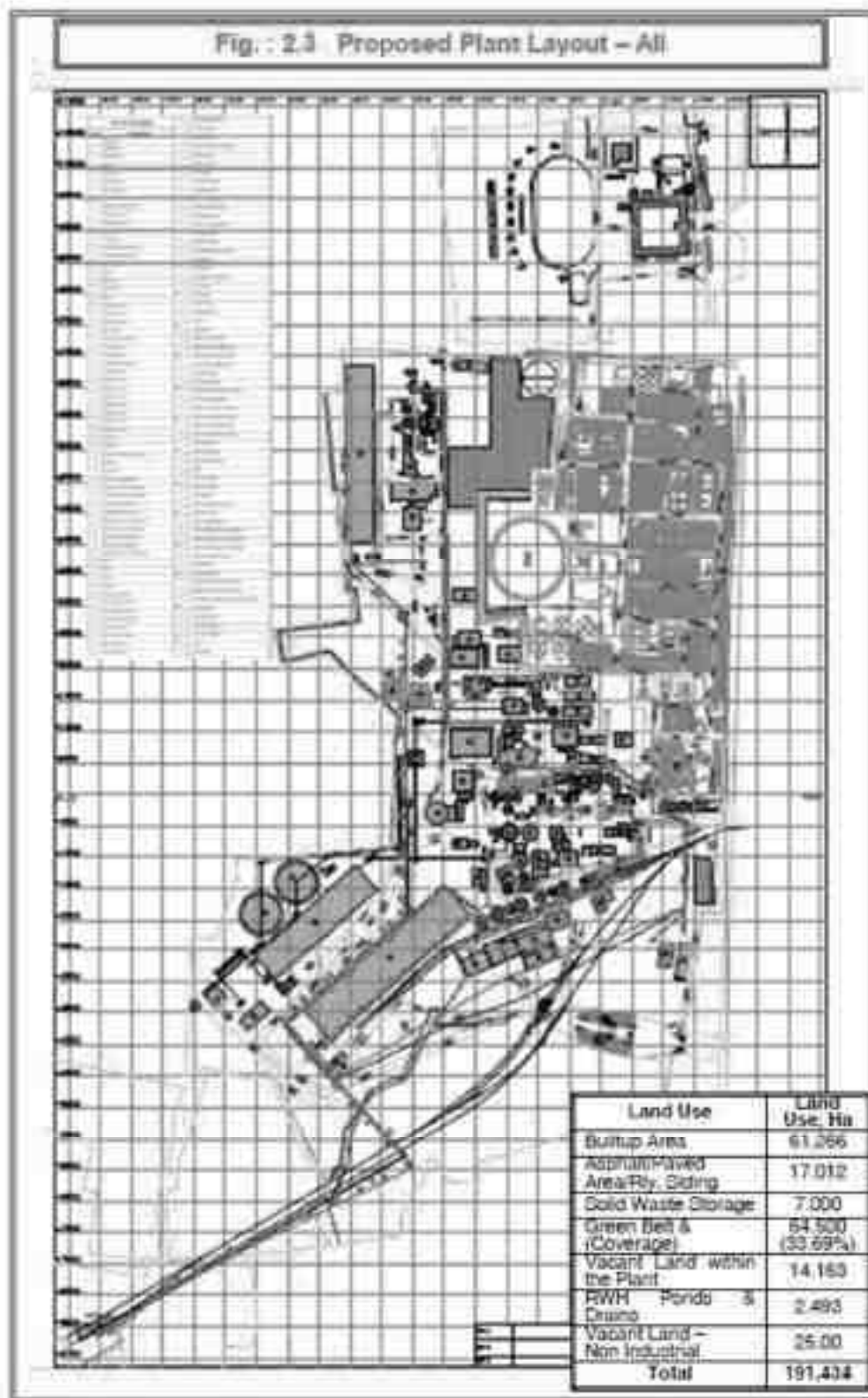
Land Use	Land Use, Ha			
	Cement Plant & School	Township	CPP	Total
Builtup Area	50.638	9.998	0.630	61.266
Asphalt/Paved Area/Rly. Siding	15.552	1.110	0.350	17.012
Solid Waste Storage	7.000	-	-	7.000
Green Belt & (Coverage)	52.500 (33.27%)	9.500 (36.35%)	2.500 (33.20%)	64.500 (33.69%)
Vacant Land within the Plant	4.588	5.525	4.050	14.163
RWH Ponds & Drains	2.493	-	-	2.493
Vacant Land – Non Industrial	25.00	-	-	25.00
Grand Total	157.771	26.133	7.53	191.434

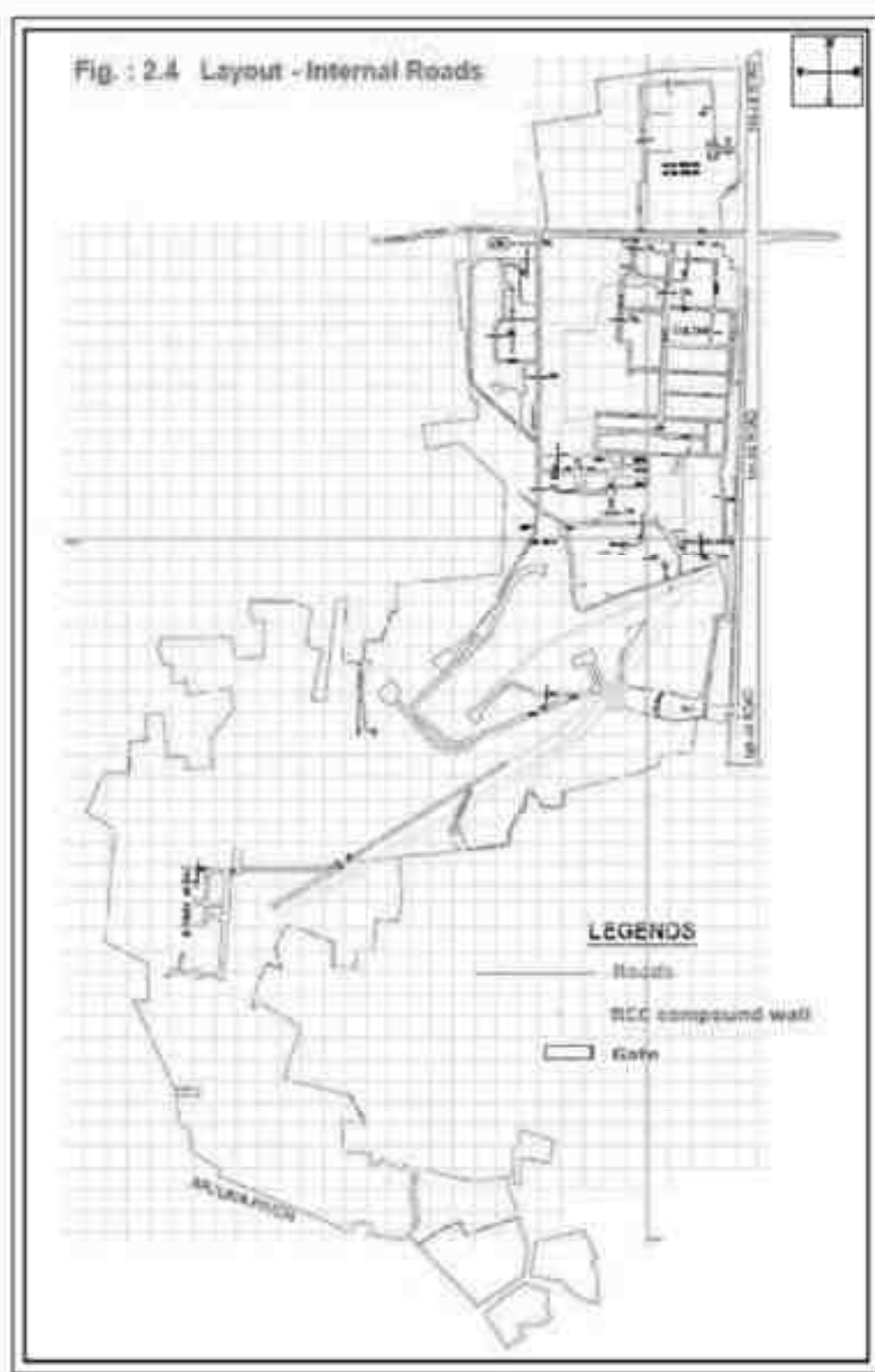
2.5 Stability Certificate

RCL has engaged Mr.M.Senthilkumar, a '**Certified Competent Person** for carrying out examination and certification of Stability of Buildings used in a factory' by the Directorate of Industrial Safety and Health Department, Govt. Of Tamil Nadu for inspect and issue the Stability Certificate for the RR Nagar Factory Structures.

He has inspected the Plant on 22.11.2024, carry out the required Tests and issued the Building Stability Certificate with validity till 21.11.2027.

All the Buildings & Structures of RR Nagar Cement Plant are rated under '**A' & 'B' Rating** viz. 'Very Good' & 'Good' and **found to be Good**. Excerpts of the Report are appended.





Stability Certificate for Plant Structures (Excerpts)



Dr. M. Senthil Kumar
BE, MIE, PhD

BUILDING STABILITY (2024 – 2027)

Client Name

M/s. THE RAMCO CEMENTS LTD.,

No.180,181/W4, Ramasamy Raja Nagar,
 Thukikapatti Village, Virudhunagar District - 625 204.

CONTENT & VALIDITY

ANNEXURE	PARTICULARS	INSPECTION DATE	NEXT DUE DATE
I	1. DSH Approval Copy	22.11.2024	21.11.2027
II	1. Index (List of building with approval number and validity)		
III	1. Building stability certificate		
	2. Machinery installation certificate 3. Building construction certificate		
IV	1. Rebound Hammer Test result		

ISSUED BY



Dr. M. SENTHIL KUMAR, Ph.D.
 Chartered Civil Engineer,
 SENTHIL SAFETY SOLUTIONS PVT. LTD.,
 Plot No. 114B, West End Colony,
 Anna Nagar West Extension, Chennai - 55.

Competent Person Under Factories Act, DSH Chennai.
 DSH Order : FC /17204/2023, Dt.06.10.2023 to 05.10.2026.
 MOEF- RH Report : OC/NARET/ENV/ACO/30/1573, Dt.18.11.2020

Plot No.114B, West End Colony, Anna Nagar West Extension, Chennai-600 050.
 Mob : 98430 76333, Email : ms@senthilsafety.com, Web : www.ssppl.in



GOVERNMENT OF TAMIL NADU
DIRECTORATE OF INDUSTRIAL SAFETY AND HEALTH
Chennai- 32.

No.H1/17204/2023

Dated:06.10.2023

CERTIFICATE OF COMPETENCY ISSUED TO A PERSON

(Under Sub-Rule (3) of Rule 2A)

I, **M.V. Senthil Kumar**, the Director (FAC), Industrial Safety and Health in exercise of the powers conferred on me under Section 2 (ca) of the Factories Act and the rules made there under, hereby recognize **Thiru.M.SENTHILKUMAR**, Plot No.1146, Anna Nagar West end Colony, Mugappair, Chennai - 50 to be the Competent Person for the purpose of carrying out examinations and certification of **Stability of buildings** used in a factory located in the State of Tamil Nadu under **section 6** of the Factories Act, 1948 and the Rules made there under.

This certificate is valid for Three Years from 06.10.2023 to 05.10.2026

This certificate is issued subject to the conditions stipulated hereunder:

- i) Tests, Examinations and Inspections shall be carried out in accordance with the provisions of the Act and Rules made there under.
- ii) Tests, Examinations Inspections shall be carried out under the direct supervision of the competent person.
- iii) The Director, Industrial Safety and Health, Chennai - 32 reserves the right to revoke or amend this order at anytime during its valicity period in accordance with the provisions under Sub-rule (4) of Rule 2-A of the Tamil Nadu Factories Rules 1950.
- iv) Record of the daily work done by the Competent Person should be maintained in a log book, Incorporating therein the name of the factories, the details of work done, observations made, directions given, etc.,



INDEX

LIST OF THE BUILDING

Sl. NO.	NAME OF THE BUILDING	APPROVAL NO.	INSPECTION DATE	DNF DATE
1	LINE - 1 RAW MILL	R.DS. NO: (D1) /12653/2022 Dt 23.05.2022	22.11.2024	21.11.2027
2	LINE - 1 RAW MILL HOPPER	R.DS. NO: (D1) /12653/2022 Dt 23.05.2022	22.11.2024	21.11.2027
3	LINE - 1 KILN PIER	R.DS. NO: (D1) /12653/2022 Dt 23.05.2022	22.11.2024	21.11.2027
4	LINE - 1 PRE HEATER	R.DS. NO: (D1) /12653/2022 Dt 23.05.2022	22.11.2024	21.11.2027
5	LINE - 1 COOLER	R.DS. NO: (D1) /12653/2022 Dt 23.05.2022	22.11.2024	21.11.2027
6	LINE - 1 COAL MILL	R.DS. NO: (D1) /12653/2022 Dt 23.05.2022	22.11.2024	21.11.2027
7	LINE - 1 KILN SUB STATION	R.DS. NO: (D1) /12653/2022 Dt 23.05.2022	22.11.2024	21.11.2027
8	LINE - 1 CEMENT MILL	R.DS. NO: (D1) /12653/2022 Dt 23.05.2022	22.11.2024	21.11.2027
9	LINE - 1 RAW MILL B	R.DS. NO: (D1) /12653/2022 Dt 23.05.2022	22.11.2024	21.11.2027
10	LINE - 1 RAW MILL - 4	R.DS. NO: (D1) /12653/2022 Dt 23.05.2022	22.11.2024	21.11.2027
11	LINE - 1 PRE HEATER	R.DS. NO: (D1) /12653/2022 Dt 23.05.2022	22.11.2024	21.11.2027
12	LINE - 3 KILN PIER FO RAW MILL	R.DS. NO: (D1) /12653/2022 Dt 23.05.2022	22.11.2024	21.11.2027
13	LINE - 3 KILN SUB STATION	R.DS. NO: (D1) /12653/2022 Dt 23.05.2022	22.11.2024	21.11.2027
14	LINE - 3 COOLER	R.DS. NO: (D1) /12653/2022 Dt 23.05.2022	22.11.2024	21.11.2027
15	LINE - 3 RAW MILL HOPPER	R.DS. NO: (D1) /12653/2022 Dt 23.05.2022	22.11.2024	21.11.2027
16	LINE - 3 COAL MILL	R.DS. NO: (D1) /12653/2022 Dt 23.05.2022	22.11.2024	21.11.2027
17	LINE - 2 RAW MILL	R.DS. NO: (D1) /12653/2022 Dt 23.05.2022	22.11.2024	21.11.2027



18	LINE -2 PRE HEATER	R.DS. NO: (D1)/12853/2022 Dt 23.05.2022	22.11.2024	21.11.2027
19	LINE -2 ROLLER	R.DS. NO: (D1)/12853/2022 Dt 23.05.2022	22.11.2024	21.11.2027
20	LINE -2 ROLLER	R.DS. NO: (D1)/12853/2022 Dt 23.05.2022	22.11.2024	21.11.2027
21	LINE -2 COOLER	R.DS. NO: (D1)/12853/2022 Dt 23.05.2022	22.11.2024	21.11.2027
22	LINE -2 COAL MILL	R.DS. NO: (D1)/12853/2022 Dt 23.05.2022	22.11.2024	21.11.2027
23	LINE -2 CEMENT MILL	R.DS. NO: (D1)/12853/2022 Dt 23.05.2022	22.11.2024	21.11.2027
24	LINE -2 RAW MILL HOPPER	R.DS. NO: (D1)/12853/2022 Dt 23.05.2022	22.11.2024	21.11.2027
25	CEMENT SILO (3 NOS)	R.DS. NO: (D1)/12853/2022 Dt 23.05.2022	22.11.2024	21.11.2027
26	CYLINKER SILO (3 NOS)	R.DS. NO: (D1)/12853/2022 Dt 23.05.2022	22.11.2024	21.11.2027
27	RAW MILL SILO (3 NOS)	R.DS. NO: (D1)/12853/2022 Dt 23.05.2022	22.11.2024	21.11.2027
28	FLY ASH SILO (3 NOS)	R.DS. NO: (D1)/12853/2022 Dt 23.05.2022	22.11.2024	21.11.2027
29	PACKING PLANT	R.DS. NO: (D1)/12853/2022 Dt 23.05.2022	22.11.2024	21.11.2027



Dr. M. Senthil Kumar, Ph.D.

Chartered Civil Engineer

SENTHIL SAFETY SOLUTIONS PVT, LTD.,

Plot No. 1248, West End Colony,

Anna Nagar West Extension, Chennai - 600050.

Competent Person Under Factories Act, DSH Chennai.

DSH Order: H1/17284/2023, Dt. 06.10.2023 to 05.10.2026

MDEF- RM Expert: OCI/NABET/ENV/ACD/20/1575, Dt. 18.12.2020



SENTHIL SAFETY SOLUTIONS PVT LTD

Chartered Engineers & Consultants Private Limited, Chennai, Tamil Nadu, India

Date: 22.11.2024

BUILDING NO. 19	LINE - 2 KOLN PIER
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FORM OF CERTIFICATE OF STABILITY

(Under Rule 120 (1) of Tamil Nadu Factories Rules 1950)

1. Name of the Factory	M/s. THE RAMCO CEMENTS LIMITED, Reg. No. VM000015
2. Village and Town and District in which Factory Situated	Thiruvazhath Village, Virudhunagar Taluk & District - 626 204.
3. Name and Address of the Factory	M/s. THE RAMCO CEMENTS LIMITED, Door No. 180/181/64, Kammasamy Raja Nagar, Thiruvazhath, Virudhunagar District - 626 204.
4. Name of the Occupier of this factory	Mr. P.R. VENKATRAMA RAJA (Occupier)
5. Nature of Manufacturing Process Carried on.	Manufactures of Cement
6. Number of Floors on which Workers will be Employed.	Ground Floor Only (RCC Column (3x3))

I certify that I have inspected the building on 22.11.2024 in which **M/s. THE RAMCO CEMENT LIMITED** is housed and examined the various parts including foundations as shown in the complete plans Approved by **DIRECTORATE OF INDUSTRIAL SAFETY AND HEALTH, CHENNAI, N(MUD)/12653/2022** with special reference to the machinery, Plants etc. that have been installed. I am of the opinion that the building has been constructed / extended in accordance with the plans approved by **DIRECTORATE OF INDUSTRIAL SAFETY AND HEALTH, CHENNAI, N(MUD)/12653/2022** and that it is structurally sound and its stability will not be endangered by its use as a factory for the **MANUFACTURES OF CEMENT** for which machinery and plant etc. (installed and intended).

THIS CERTIFICATE IS VALID FROM 22.11.2024 TO 21.11.2027 FOR THREE YEARS ONLY




Dr. N. SENTHIL KUMAR, Ph.D.,
Chartered Civil Engineer,
SENTHIL SAFETY SOLUTIONS PVT. LTD.,
Plot No. 154E, West End Circle,
Anna Nagar West Extension, Chennai - 600017
Company Regd Under Factories Act, Tamil Nadu.
Order Order: HC/17285/2022, Dt. 24.09.2023 to 06.10.2026
MOOP - BY Order: DC/NARET/TN/ACD/30/1575, Dt. 18.12.2020



SENTHIL SAFETY SOLUTIONS PVT LTD

RCL

EC for Expansion of RR Nagar Cement Plant (with all 3 Existing Lines), Virudhunagar, TN

TEST REPORT OF REBOUND HAMMER**M/S. THE RAMCO CEMENTS LTD,**

No.280,181/W4, Ramasamy Raja Nagar,
Thullupatti Village, Virudhunagar District – 626 204.

TEST CONDUCTED BY SENTHIL SAFETY SOLUTIONS PVT LTD CHENNAI

TEST CONDUCTED BY SENTHIL SAFETY SOLUTIONS PVT LTD CHENNAI							
					Date: 22.11.2024		
Test Certificate No: TRCL/RMF-22.11.2024							
APPROVAL NO: DIRECTORATE OF INDUSTRIAL SAFETY AND HEALTH, CHENNAI, U.DIS. NO: (03) /12553/2022 Dt: 23.05.2022							
EQUIPMENT NAME	CONCRETE TEST HAMMER						
MAKE	SILVER SCHMIDT LIVE						
MODEL	DNK200						
SERIAL NUMBER	K19 001						
TEST CONDUCTED AS PER IS CODE	IS 13321 (PART 2): 1992						
DATA ARE AS FOLLOWS:							
REBOUND HAMMER TEST: BELOW STANDARDS AS PER SILVER SCHMIDT – PROCEDURE							
REMARKS	VERY GOOD HARD LAYER	GOOD LAYER	FAIR	POOR CONCRETE	DELAMINATED		
VALUE	GREATER THAN 40	IN BETWEEN 30 to 40	IN BETWEEN 20 to 30	LESSER THAN - 20	VALUE 0		
RATING	A	B	C	D	E		
Sl. NO.	LOCATION	AREA / SPOT	Q VALUE			RATING	
1	Line-1 Raw Mill (Ground floor)	Column-1	50	48	55	38	33
			35	33	34	30	31
			40	35	36	32	33

RCL

EC for Expansion of RR Nagar Cement Plant (with all 3 Existing Lines), Virudhunagar, TN

SL. NO.	LOCATION	AREA / SPGT	Q VALUE					RATING
16b	Line-1 Coal Mill (Ground Floor)	Column-2	38	37	40	35	37	B
			35	37	34	33	35	
			40	35	35	38	33	
17	Line-2 Raw Mill	Column-2	50	45	55	30	35	B
			25	25	34	30	35	
			40	35	30	32	33	
17a	Line-2 Raw Mill	Column-1	42	43	42	39	38	A
			43	43	48	45	41	
			40	42	43	44	38	
17b	Line-2 Raw Mill	Column-2	42	41	45	35	38	A
			40	35	30	32	28	
			40	42	40	40	30	

RCL

EC for Expansion of RR Nagar Cement Plant (with all 3 Existing Lines), Virudhunagar, TN

SL. NO.	LOCATION	AREA / SP11	Q VALUE					RATING
18	Line-2 Pre-Heater	Column-2	50	52	56	58	52	A
			52	56	58	58	52	
			51	53	54	55	50	
19	Line-2 Kiln Pre	Retaining Wall	42	41	45	39	38	A
			43	43	48	45	41	
			40	42	45	46	38	
20	Line-3 Kiln YSP	Column-3	35	42	41	45	46	B
			36	35	36	33	40	
			40	39	38	35	36	
21	Line-2 Kiln Cooler (Ground Floor)	Column-1	42	41	45	39	38	A
			40	35	30	32	33	
			42	42	45	45	38	

RCL

EC for Expansion of RR Nagar Cement Plant (with all 3 Existing Lines), Virudhunagar, TN

SL. NO.	LOCATION	AREA / SPQT	Q VALUE					RATING
			38	37	40	35	32	
21	Line-2 Wm Cooler (Ground Floor)	Near Cooler Fan	38	37	40	35	32	B
			35	37	38	32	31	
			40	35	35	38	31	
22	Line-2 Coal Mill (Ground Floor)	Column-2	50	45	55	50	35	B
			35	33	34	30	31	
			40	35	30	32	33	
22	Line-2 Coal Mill (Ground Floor)	Column-3	42	41	45	39	38	A
			43	42	46	45	42	
			40	42	45	46	38	
22	Line-2 Coal Mill (Second Floor)	Column-3	43	43	45	39	38	A
			40	35	30	32	33	
			40	42	45	46	38	

RCL

EC for Expansion of RR Nagar Cement Plant (with all 3 Existing Lines), Virudhunagar, TN

SL. NO.	LOCATION	AREA / SPOT	Q VALUE					RATING
23	Line - 2 Cement Mill (Ground Floor)	Column-2	30	45	55	30	33	B
			25	35	44	30	31	
			40	35	30	32	31	
23a	Line - 2 Cement Mill (Second Floor)	Column-2	42	41	43	39	38	A
			43	42	46	45	41	
			40	42	45	40	38	
23b	Line - 2 Cement Mill (Ground Floor)	Column-2	46	45	50	53	51	B
			47	45	42	41	43	
			52	50	48	51	56	
23c	Line - 2 Cement Mill (Second Floor)	Column-2	42	41	45	38	38	A
			40	35	30	32	33	
			40	42	43	46	38	

RCL

EC for Expansion of RR Nagar Cement Plant (with all 3 Existing Lines), Virudhunagar, TN

SL. NO.	LOCATION	AREA / SPOT	Q VALUE					RATING
28	Packing Plant	Column-1	40	42	45	46	38	A
			42	41	45	39	38	
			43	42	48	45	41	
29	Packing Plant	Column-3	42	41	43	39	38	A
			43	42	48	43	43	
			40	42	45	40	38	
29a	Packing Plant	Column-1	42	41	45	39	38	A
			43	42	48	45	41	
			40	42	45	40	38	
29b	Packing Plant	Column-3	42	41	45	39	38	A
			40	39	40	42	33	
			40	42	45	40	38	

REBOUND HAMMER TEST REPORT

M/S. THE RAMCO CEMENTS LTD,

No.180,181/W4, Ramasamy Raja Nagar,
Thulukapatti Village, Virudhunagar District – 626 204.

TYPE: REBOUND HAMMER TEST		
LAYER	VALUE	RATING
VERY GOOD HARD LAYER	GREATER THAN 40	A
GOOD LAYER	IN BETWEEN 30 to 40	B
FAIR	IN BETWEEN 20 to 30	C
POOR CONCRETE	LESSER THAN - 20	D
DELAMINATED	VALUE 0	E

Conclusion:

The above result shows the quality of concrete and construction is found good




Dr. M.SENTHIL KUMAR, Ph.D.,
 Chartered Civil Engineer,
SENTHIL SAFETY SOLUTIONS PVT. LTD.,
 Plot No. 114B, West End Colony,
 Anna Nagar West Extension, Chennai - 600050.
 Competent Person Under Factories Act, DISH Chennai,
 DISH Order: H1 /17204/2023, Dt.06.10.2023 to 05.10.2026.
 MOEF- RH Expert: QCI/NABET/ENV/ACO/20/1575, DT.18.12.2020

2.6 Green Belt Development

Green Belt was maintained in the Complex over an extent of 33.00 Ha with 62,910 Trees @ 1,906 Trees/Ha & Survival Rate of 85-90% before 2021 Expansion. During last EIA Stage, it was submitted that additional Green Belt to an extent of 31.50 Ha with 78,750 Nos. to be raised in the vacant areas of western & southern parts.

On Expansion, **additional Plantations were done over an extent of 31.50 Ha with 98,340 Trees** in the western & southern sides (**where recent Expansion activities took place**). Now, total Green Belt extent is **64.50 Ha (33.69% Coverage) with 1,61,250 Trees @ 2,500 Trees/Ha (Table 2.7)** with **Survival Rate @ 90% average. No additional Green Belt** is required.

Table : 2.7 Green Belt Development

Period	GB Extent, Ha	No. of Trees
EIA Stage	33.00	62,910
End of 2021-22	12.00	28,624
2022-23	18.00	64,865
2023-24 till Jan. 24	1.50	4,851
Total	64.50	1,61,250

Green Belt Layout is given as **Fig. 2.5. Geotagged Green Belt Photographs**, all along the boundaries of the Complex, are attached as **Plates VIII-XI**.

As shown in the Photographs, **recently planted trees are 1-2 years old which are yet to be reflected in Google Earth KML file**. However, recent Certified Compliance Report (CCR) issued by the Integrated Regional Office (IRO), MoEF&CC, Chennai vide Letter EP 12.1/867/TN/353 dated 18.03.2024 captured the Green Belt developed in the Complex.

Predominantly, **native plant species are preferred** for Green Belt like Azadirachta indigo (Neem), Cassia Siamea (Manjakondrai), Pongamia pinnata (Pungan), Albizia lebeck (Vagai), Samanea saman (Thoongumoonji), Holoptelia integrifolia (Arali), Tecoma stans (Thangarali), Cassia fistula (Sarakondrai), etc. Additionally fruit bearing trees are also planted and maintained. Local women are engaged for the maintenance of Green Belt.

Area-wise Green Belt developed in the Complex is detailed in **Table 2.8**.

Green Belt Covered in Areas listed in Table 2.8	:	50.40 Ha with 1,06,675 Plants
Other Areas including Labour Quarters covered	:	14.10 Ha with 54,575 Plants
Grand Total - Green Belt Development	:	64.50 Ha with 1,61,250 Plants @ 2,500 Plants/Ha (90% Survival)

Plate : VIII – Green Belt Photographs (Geotagged-26.10.2024)



Plate : IX – Green Belt Photographs (Geotagged-26.10.2024)



Plate : X- Green Belt on Expansion – New Plantations (Geotagged)



Plate : XI- Green Belt on Expansion – New Plantations (Geotagged)



RCL

EC for Expansion of RR Nagar Cement Plant (with all 3 Existing Lines), Virudhunagar, TN

Sl. No.	Scientific Name	Common Name	No. of Trees Planted & Maintained											
			RV School	CPJ	Workshop	Behind DM Plant	Southern Side Periphery	Wagon Trolley South Area	Railway Siding Slope Area	South Gate Area	Packing Plant Area	Adrain Block Area	Township	
47	Jasminum sambac	Jasmin	-	-	-	-	-	-	-	-	-	-	200	200
48	Lagerfloraria speciosa	Queen-Croze Myrtle	-	5	-	-	-	-	-	-	-	-	-	-
49	Lantana cam	Lantana	-	-	-	-	-	-	-	-	-	-	-	15
50	Lecanona inermis	Fernia	-	-	-	-	-	-	-	-	-	-	-	100
51	Leucosiphium frutescens	Tennis sage	-	-	-	-	-	-	-	-	-	-	-	175
52	Lycoris radiolobata	Stone apple	-	-	-	-	150	-	-	-	-	-	-	-
53	Madhura longifolia	Sugar tree	-	-	-	300	-	-	-	-	50	300	150	-
54	Mangifera indica	Mango	-	-	-	-	-	-	-	-	-	-	-	10
55	Mimosa catalpa	Bullet wood tree	150	250	50	700	-	-	70	-	300	50	500	450
56	Murrango gambura	Jarvaka cherry	50	-	-	-	-	-	-	-	-	-	-	450
57	Nerium oza	Gladiolus	450	-	-	10	-	-	-	100	-	300	250	-
58	Ompocela patris	Palm	-	-	-	-	-	-	-	-	-	200	100	-
59	Pectinaria thymelaeoides	Flute flower	-	-	-	-	-	-	-	-	-	100	70	-
60	Pithecolobium brenesepurum	Copper pod tree	1000	550	100	3500	100	100	70	450	80	1000	1050	-
61	Plumeria sp.	Frangipani	50	-	-	-	-	-	-	-	-	150	300	-
62	Podaltria bracteata	Pink jethika tree	-	-	-	-	-	-	-	-	-	-	300	300
63	Pongamia pinnata	Pongam	5000	1000	100	2500	800	1050	-	270	150	1500	1500	-
64	Portulaca sp.	Little hogweed	-	-	-	-	-	-	-	-	-	50	50	-
65	Wernia serrulata	Headache tree	50	-	-	-	-	-	-	100	-	-	500	-
66	Pithecolobium brenesepurum	Indian silk tree	-	-	50	100	-	-	-	-	-	-	-	100
67	Pithecolobium brenesepurum	Bell sandal	-	-	-	10	150	-	-	-	-	-	-	10
68	Spandus amargatus	Goat nut tree	-	-	-	-	-	-	-	-	-	-	-	10
69	Senecio auriculata	Tanger's Cecoc	-	200	-	-	-	-	-	50	-	-	-	150
70	Suripatia angustifolia	tater tree tree	1000	-	-	-	100	-	-	-	-	-	-	-
71	Sesuvium mahopani	Indian mahopani	-	-	-	100	250	-	-	-	-	-	-	-
72	Syzygium cumini	Jamun	200	-	100	-	-	-	50	-	-	100	200	-
73	Tuberosemontana bicolorata	Pinkwheel flower	-	-	-	-	-	-	-	-	-	200	450	-
74	Tabusera javanica	Pink trumpet tree	-	50	-	-	-	-	-	-	-	-	-	-
75	Tabusera pulchra	Pink trumpet tree	-	250	-	-	-	-	-	-	-	500	250	-
76	Tabusera rosea	Yellow trumpet tree	-	-	-	-	-	-	-	-	-	-	-	2
77	Taraxacum indicum	Taraxacum	-	-	-	-	-	-	-	-	-	-	50	500
78	Tecoma stans	Cape honey suckle	-	-	-	-	-	-	-	-	-	100	50	-
79	Tecoma stans	Yellow trumpet tree	1000	-	-	-	-	-	100	-	-	250	575	-
80	Terminalia arjuna	Arjun tree	200	-	100	1100	450	300	-	150	-	150	185	-
81	Terminalia catappa	Indian almond tree	200	-	-	750	-	50	-	-	-	-	100	-
82	Terminalia catappa	Indian almond tree	100	-	50	70	300	-	-	50	-	1000	225	-
83	Terminalia malaya	Madagascar almond	-	-	-	-	-	-	-	-	-	-	-	15
84	Tetra grandis	Teak	-	-	-	-	-	-	-	-	-	50	50	-
85	Thespesia populanea	Portia tree	200	-	-	100	300	100	-	-	125	-	145	-
86	Veronica filanaghiolia	Outlain tree	-	-	-	-	-	-	-	-	-	100	20	-
87	Velutaria jacobsoniae	Velutaria	-	-	-	-	-	-	-	300	-	-	-	-
88	Viburnum negundo	Cherry tree	200	-	-	-	-	-	-	150	-	-	-	-
89	Walnut indica	Indian peach tree	-	-	-	-	150	-	-	-	-	-	-	-
90	Wrightia indica	Indigo tree	-	-	50	-	-	-	-	-	-	-	-	-
91	Others	-	400	70	80	1100	550	80	80	125	20	3000	3500	-
1	Total Plantations	-	2850	8200	790	16100	8200	3000	2250	2625	320	19500	26550	-
2	Area Covered, Ha	-	10.80	2.50	0.90	6.30	2.20	1.50	2.50	1.75	0.75	12.0	6.50	-

2.7 Plant Contour Levels & Drainage Pattern

The elevation of the Plant area ranges from 67 m to 89 m above MSL with sloping towards north (from Colony area) and predominantly towards south (from Line-II area. Based on the Slope, **Surface Drainage Network** has been developed and **Rainwater harvested effectively** in the Complex (Fig. 2.6).

The 70 year **Normal Rainfall** of the Plant Area is **895 mm**. Peak Rainfall (Intensity) considered is **10 cm/hr**. Pre-Project and Post Project Surface Runoffs from the Plant Area is estimated as per Manual of Artificial Recharge of Ground Water (CGWB, 2007) and given in **Table 2.9**.

Table : 2.9 Estimation of Quantum of Runoff available through RWH

Sl. No.	Land Use	Area, sq.m	Rainfall, m	Runoff Coefficient*	Quantum of Runoff Available, KL/Annum
I	Pre-Project Runoff				
1	Total Area	1914340	0.895	0.20	3,42,666.86
II	Post-Project Runoff				
1	Roof Top of building/Sheds	275700	0.895	0.85	209738.775
2	Road/Paved area	170120	0.895	0.65	98967.31
3	Open Land	728590	0.895	0.20	130417.61
4	Green Belt	715000	0.895	0.15	95988.75
5	RWH Ponds & Canals	24930	0.895	0.90	20081.115
	Total	1914340	-	-	5,55,193.56

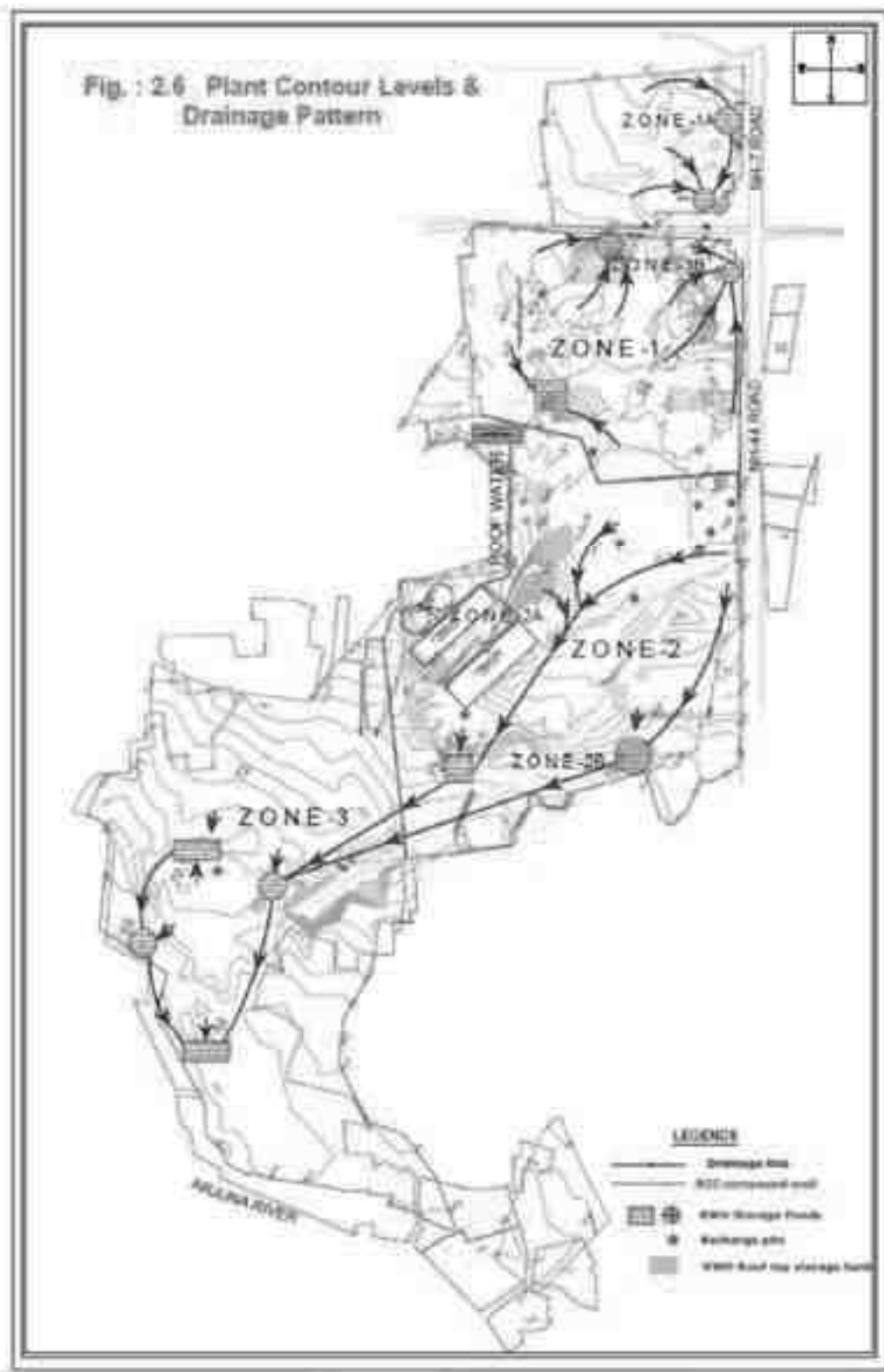
* Ref: Manual of Artificial Recharge of Ground Water (CGWB, 2007).

Pre-Project Runoff : 3,42,666 KL/Year
 Post Project Runoff : 5,55,193 KL/Year

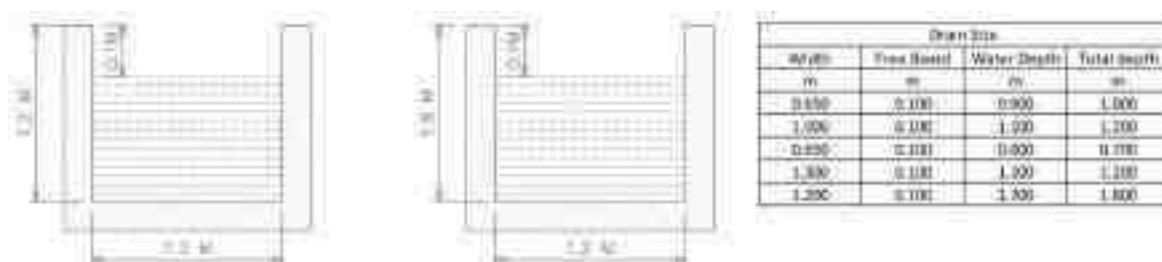
Total Plant Area is dived into **3 Zones** viz. Zone-1 of 49 Ha (with 1A & 1B), Zone-2 of 54 Ha (with 2A & 2B) and Zone-3 of 88 Ha and Surface Drains created are connected to Rain Water Harvesting Ponds in the Plant vicinity. Design Parameters are given in **Table 2.10 & Plate XII**.

Table : 2.10 Surface Drains Design Data

Sl. No.	Design Parameter	Zone-1		Zone-2		Zone-3
		1A	1B	2A	2B	
1	Catchment Area, Ha	15	34	10	44	88
2	Length, km	0.5	0.7	0.8	0.7	1.1
3	Max. Velocity through Catchment, m/s	2.010	2.345	2.080	2.495	3.273
4	Peak Runoff from Catchment, cu.m/sec	1.176	2.580	0.811	3.569	6.677
5	Dimension of Drain, Width x Depth, m	0.65x1.0	1.0x1.2	0.65x0.7	1.3x1.2	1.2x1.8
6	Slope of the Drain	1:200	1:250	1:150	1:325	1:200
7	Max. Velocity through Drain, m/s	2.268	2.586	2.470	2.545	3.427
8	Drain Discharge, cu.m/sec	1.327	2.845	0.963	3.640	6.911



**Plate : XII Hydraulic Design of Rectangular Drains
(As per IRC SP013-2004 & SP050-2013)**



As water flow (Velocity) in Surface Drains are designed more than the water flow of Catchment Area as well as Peak Discharge designed for Surface Drains are more than Discharge generated in the Catchment Area, **provided Surface Drains are adequate**. The Dimension of Rain Water Harvesting Structures in the Complex are given as **Plate XIII** .

Plate : XIII Dimension of Rain Water Harvesting Structures

S.NO	Location	Dimension (Dia. X Depth) in m	Holding Capacity, KL
1	Near Materials Gate	50 x 2	3930
2	Near STP	30 x 2	1410
3	Near CPP	30 x 2	1410
4	Near Ramco Vidyalaya School South	24 x 2	900
5	Near Ramco Vidyalaya School North	24 x 2	900
6	Near Sriram School in Colony	27 x 2	1150
7	North side of DRY Mix Plant	50 X 3.5	6870
8	Western side of DRY Mix Plant	50 X 3.5	6870
9	North east of Dry Mix Plant	30 X 3.5	2460
		(L X B X Depth) in m	
10	North side of DRY Mix plant	50 X 40 X 4	8000
11	south side of DRY Mix plant	60 X 25 X 3.5	5250
12	Recharge Pits-15 Nos	2 x 3 x 15	450
13	Roof top-Collection tank		1780
			41380

In total, **41,380 KL** Surface Drain water can be stored and utilised effectively through these Structures. Roof Top Collection of 2,09,738 KL/Year is directly collected in a **above GL Sump of 1,780 KL** capacity and utilised for supplementing Raw Water Demand. Additionally, 20,081 KL/Year is collected in RWH Ponds and utilized for Green Belt development. The balance 3,25,373 KL/Year Rain water reaches the natural Drains to discharge into Arjuna River.

2.8 Raw Materials Demand, Source & Mode of Transportation

On Expansion, Clinker production of RR Nagar Cement Plant will be increased from existing 1.44 MTPA to 2.76 MTPA and Cement production from 2.70 MTPA to 4.00 MTPA of various Cements. The Raw Materials demand for enhanced production, Source and their mode of Transportation are given in **Table 2.11**.

2.9 Sustainable Limestone & Kankar Supply

For 2.76 MTPA Clinker production, Raw Meal requirement is 4.17 MTPA. Lime Kankar is blended with Limestone for Raw Meal preparation. Accordingly, **Limestone requirement is 1.794 MTPA @ 5,200 TPD & Lime Kankar requirement is 2.085 MTPA @ 6,050 TPD**. Existing Captive Limestone Mines in Pandalgudi Region have consented production quantity of **2.691 MTPA Limestone** of various grades. Likely, existing Captive Lime Kankar Quarries have consented production quantity of **3.914 MTPA ROM Kankar**. Pandalgudi Lime Kankar Beneficiation Plant is being expanded which will supply adequate beneficiated Kankar.

Mineral	Demand on Expansion, MTPA	Consented Production of Existing Mines / Quarries, MTPA
Limestone	1.794	2.691
Lime Kankar	2.085	3.914

For proposed Expansion of Cement Plant, Limestone supply will be **67%** of existing consented production quantity of Captive Limestone Mines. Likewise, Lime Kankar supply will be **53%** of existing consented production quantity of Captive Lime Kankar Quarries. Thus, **existing supply/consented quantity** of Mines & Quarries **are adequate** for the proposed Expansion of RR Nagar Plant. RCL is having Surface Rights for new Lime Kankar Quarries in Pandalgudi Region with about 10.00 Million Tonnes Mineable Reserves for which Applications will be made soon.

2.10 Machineries & Storages

Centralised Crusher & Colour Sorter is located at about 18 km away (in the East) from RR Nagar Plant at Pandalgudi near Captive Mines in the Region. Also, one Lime Kankar Beneficiation Plant exists at Pandalgudi. Limestone & Lime Kankar are being transported to the Cement Plant by Tippers/Trailers in RCL's own (dedicated) Road.

The Plant Machineries are given in **Table 2.12** and Storage Facilities are given in **Table 2.13**.

Table : 2.11 Raw Materials Demand – Existing & Proposed

Sl. No.	Raw Material	Source	Existing Demand, MTPA	Proposed Demand, MTPA	Mode of Transport	Avg. Moisture, %
1	Limestone (& Lime Kankar)	Captive Mines in Pandalgudi Region & Crusher at Pandalgudi	2.16 @ 6740 TPD	1.794 @ 5200 TPD	By Tippers through Own Haulage Roads	6
2	Beneficiated Lime Kankar	Captive Quarries in Pandalgudi Region & Beneficiation Plant at Pandalgudi	-	2.085 @ 6050 TPD	By Tippers through Own Haulage Road	8-10
3	Clay, Chips & Roughstone	-	-	0.209 @ 605 TPD	By Road (Covered Trucks)	-
4	Copper Slag / Laterite / Iron Ore	Thoothukudi (Tuticorin)	0.022 @ 63 TPD	0.083 @ 242 TPD	By Road (Covered Trucks)	10
5	Fuel for Cement Plant i) 100% Petcoke	Indigenous from BPCL, MRPL Imported from USA, Middle East, Australia.	0.128 @ 423 TPD	0.246 @ 715 TPD	By Ship, Rail & Road	10
6	ii) 100% Imported Coal	South Africa, Indonesia	0.187 @ 584 TPD	0.358 @ 1040 TPD	By Ship, Rail & Road	25
6	Clinker	Own Plant production	1.44 @ 4500 TPD	2.760 @ 8000 TPD	By closed conveyors	-
		From Sister Concerns/Import	0.42-0.50 @ 1220 TPD	0.504 @ 1460 TPD	By Rail & Road	-
7	Gypsum	SPIC, Thoothukudi	0.108 @ 290 TPD	0.136 @ 395 TPD	By road (Covered Trucks)	20
8	Dry Fly Ash	TTPS, Coastal Energy, NTPL, Thoothukudi	0.677 @ 2050 TPD	1.120 @ 3246 TPD	By road (By Bowsers)	-
9	Wet Fly Ash	TTPS, Thoothukudi	0.054 @ 50 TPD	0.080 @ 232 TPD	By road (Covered Trucks)	25
10	Slag	Jindal, Salem / ECL, Srikalahasthi	63 TPD	2.200 @ 6377 TPD	By road (Covered Trucks)	-
11	Limestone/ Limestone Powder as PI	Captive Mines at Pandalgudi Region	-	0.040 @ 115 TPD	By Tippers through Own Haulage Roads	6

Table : 2.12 Plant Machineries

Machinery	Line-I	Line-II	Line-III	Cumulative
Truck Tippler	-		100 T	100 T
Raw Mill	Ball Mill of -125 TPH & Pre-grinder Mill of 150 TPH	-	Hydraulic Roller Press (HRP) 2x200 TPH	Ball Mill of -125 TPH & Pre-grinder Mill of 150 TPH Hydraulic Roller Press (HRP) 2x200 TPH
Coal Mill	Ball Mill of -12 TPH	Ball Mill of 12 TPH	Vertical Roller Mill (VRM) of 24 TPH on Petcoke	Ball Mills 2 x 12 TPH Vertical Roller Mill (VRM) of 24 TPH on Petcoke
Rotary Kiln	2000 TPD	2000 TPD	4000 TPD (New Kiln)	8000 TPD
Cement Mill	Roller Press with Ball Mill - 270 TPH PPC	Ball mill of 60 TPH PPC	Vertical Roller Pregrinder (VRPM) Ball Mill-170 TPH	Roller Press-BM -270 TPH Ball Mill-60 TPH VRPM-BM-170 TPH
Rotary Packers	-	2x180 TPH 1x120 TPH	1x240 TPH	2x180 TPH 1x120 TPH 1x240 TPH
Wagon Tippler	-	-	1,500 TPH	1,500 TPH
Crusher	-	-	200 TPH	200 TPH

Table : 2.13 Cement Plant Storage Facilities

Storage	Lines I & II	Line-III	Cumulative
Limestone Stacker & Reclaimer (LSR)	-	2x18,000 MT (Circular) New	2x18,000 MT
Additives Stacker & Reclaimer (Gypsum, Wet Fly Ash, Slag, etc.)	30,000 MT	-	30,000 MT
Coal/Fuels Stacker & Reclaimer	45,000 MT	-	45,000 MT
Raw Meal RCC Silos	2x8000 MT 1x7000 MT	1x14000 MT 1x6000 MT	2x8000 MT 1x7000 MT 1x14000 MT 1x6000 MT
Clinker RCC Silos	3 x 18000 MT	1x30000 MT	3x18000 MT 1x30000 MT
Cement Silos	1x5000 MT (RCC) 2x9000 MT(RCC) 1x1000 MT (Steel)	2x9000 MT (RCC) 1x1000 MT (Steel)	1x5000 MT (RCC) 4x9000 MT (RCC) 2x1000 MT (Steel)
Fly Ash Silos	2x5000 MT (RCC)	-	2x5000 MT (RCC)

2.11 Action Plan for Stock Piles

Stacker Reclaimers are provided - two circular ones, each with a diameter of 80 m, for Limestone storage and two linear ones for Additives (230 x 55 m) and Coal (310 x 70 m). Positioned on an **impervious RCC bed**, the site incorporates strategic topographical planning, including graded elevations (0.3-0.6 m above) relative to nearby surfaces. This gradient, subtly designed to slope outward toward the periphery, facilitates efficient runoff management. The **garland drainage and catch pit systems**, spaced at 30-50 m intervals, are tailored for each stacker reclaimer, considering their unique configurations, materials handled, and operational requirements. Constructed with gravel linings and perforated pipes, they efficiently manage both surface and subsurface runoff.

2.12 Process

The manufacturing process includes various stages viz. Limestone Mining & Kankar Quarrying, Crushing/Beneficiation at Pandalgudi and transportation to Cement Plant through own Haulage Road, Raw meal preparation, Clinkerisation, Cement grinding, Cement Packing and Dispatch by trucks and bulkers. General Process Flow Chart is given as **Fig. 2.7**. The proportions for Raw Mix (average) are given below :

Raw Mix:

Limestone	:	43%
Lime Kankar	:	50%
Clay Chips & Roughstone	:	5%
Slag, Laterite, Iron Ore	:	2%
Clinkerisation Factor	:	1.512 (Raw meal to Clinker)
Fuel Consumption	:	9.28 % (100% Pet coke) 13.62% (100% Imported coal)

Material Balance for 2.76 MTPA Clinkerisation is given as **Fig. 2.8**. The **Cement Mix** for various Cement varieties are given in **Table 2.14**.

Table : 2.14 Various Cements & their Composition

Component	Proportion by Weight (%)			
	OPC/RHPC	PPC	PSC	PCC
Clinker	96	66	41	40
Gypsum & Phospho Gypsum	4	4	4	4
Fly Ash	0	28	0	23
Wet Fly Ash	0	2	0	2
Limestone/Lime Powder (as PI)	0	0	0	1
Slag	0	0	55	30
Total	100	100	100	100

Fig. : 2.7 General Process Flow Chart

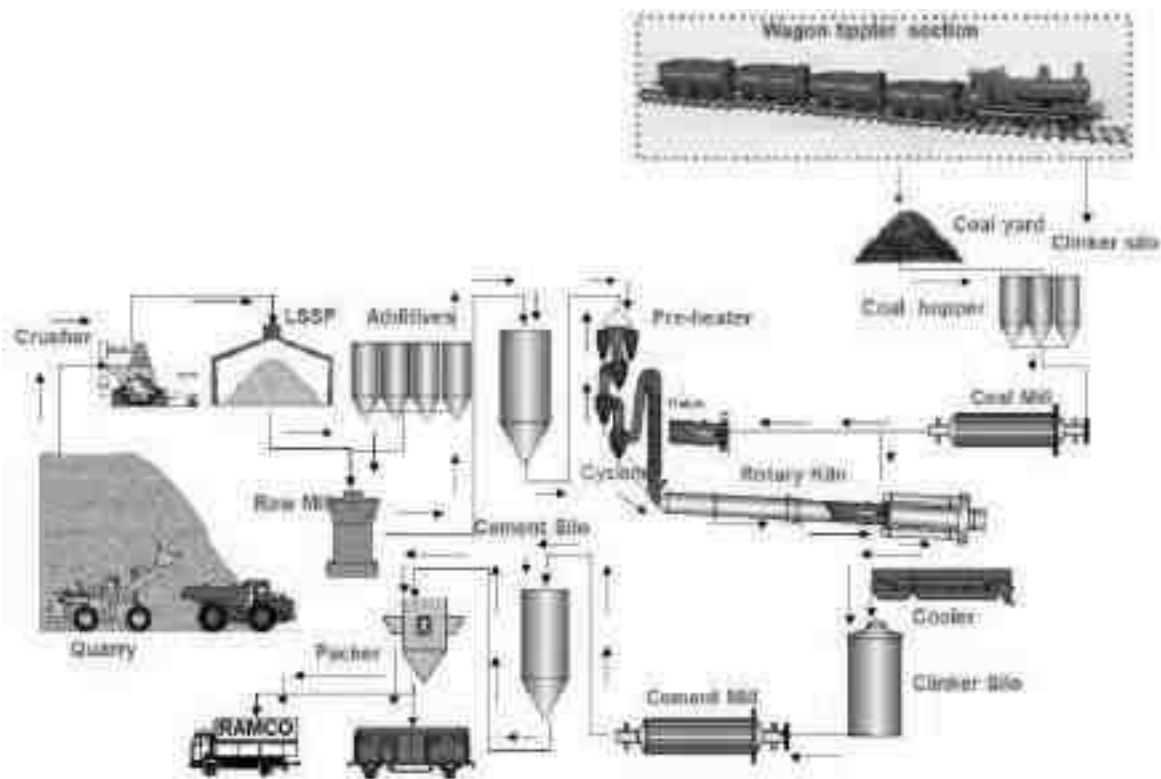
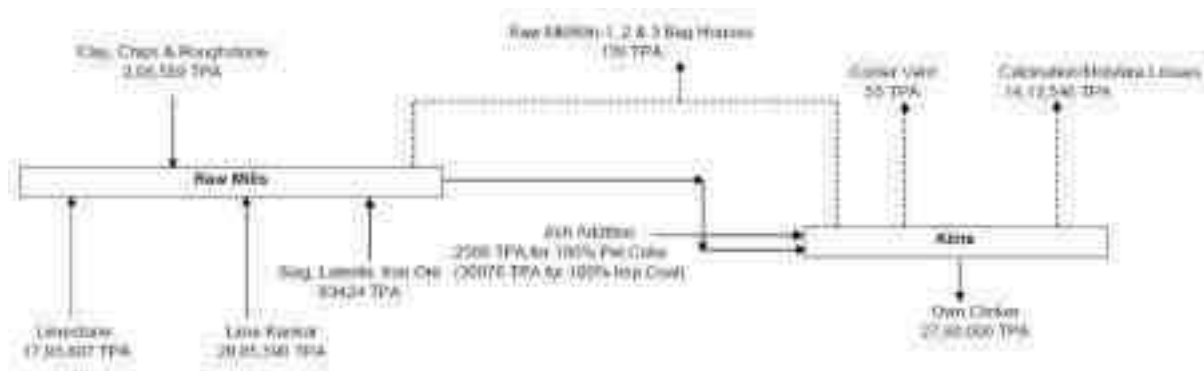


Fig. : 2.8 Material Balance for 2.76 MTPA Clinker Production



Ordinary Portland Cement (OPC)/RHPC: -OPC/RHPC is manufactured by inter-grinding well-burnt ordinary Clinker with Gypsum only.

Pozzolana Portland Cement (PPC): -PPC is manufactured by inter-grinding well-burnt Clinker with gypsum and pozzolanic materials like fly ash or silicious earths, limestone/lime powder, etc.

Portland Slag Cement (PSC): - PSC is manufactured by either inter-grinding the clinker, Gypsum & Granulated Slag or blending the Ground Granulated Blast Furnace Slag (GGBS) with Ordinary Portland Cement by means of mechanical blenders.

Portland Composite Cement (PCC): - Provides moderate sulphate resistance, and gives off less heat during hydration. This type of cement costs about the same as PPC. Composite Cement is covered under IS: 16415-2015 and presents a good opportunity to produce high strength concrete which is highly durable. Composite cement is a mixture of high quality clinker (IS:16353-2015), fly ash (IS:3812 (Part 1) - 2013), granulated slag (IS:12089-1987) and gypsum.

Material Balance for various Cement varieties are given in **Figs. 2.9-2.12**.

Well established **Dry Process** utilising the Precalciner technology along with the technological advances in the area of grinding and homogenisation has been incorporated. The basic raw materials used in clinker manufacturing are Limestone, Lime Kankar, Chips & Roughstone and Iron rich Slag. Petcoke / Imported coal from Indonesia and South Africa are being used in the process. Petcoke is being imported from USA, Australia, Middle East and also sourced indigenously.

Limestone mined out from Captive Mines located about 20-35 km from the Plant is being crushed to the required size Centralised Crusher at Pandalgudi. Lime Kankar from Captive Quarries are beneficiated for Silica Removal at Pandalgudi Lime Kankar Beneficiation Plant. Both Limestone and Beneficiated Kankar are brought to RR Nagar Plant by Tippers/Trailers of 40 T capacity in RCL's own Black Topped Road. Limestone & Lime Kankar is then unloaded and stacked in the existing Stacker Reclaimer by means of Samson Feeder and Belt conveyor for reclamation to the respective Hoppers in Raw Mill.

Limestone & Lime Kankar along with other additives is metered in suitable proportions and sent to Raw Mill where the raw material is ground to the required size. The powdered Raw Meal is stored in the Raw Meal Silo. Belt bucket elevator is used to feed the raw material to Preheater Cyclones / Precalciner. The calcined material from the Preheater enters the Kiln and is subjected to physical and chemical changes to form Clinker. The hot molten Clinker is allowed to pass through a modern high efficient Clinker Cooler to cool it down to 150 °C. Cooled Clinker is then stored in Clinker Silos.

Fig. : 2.9 Material Balance for OPC Manufacturing

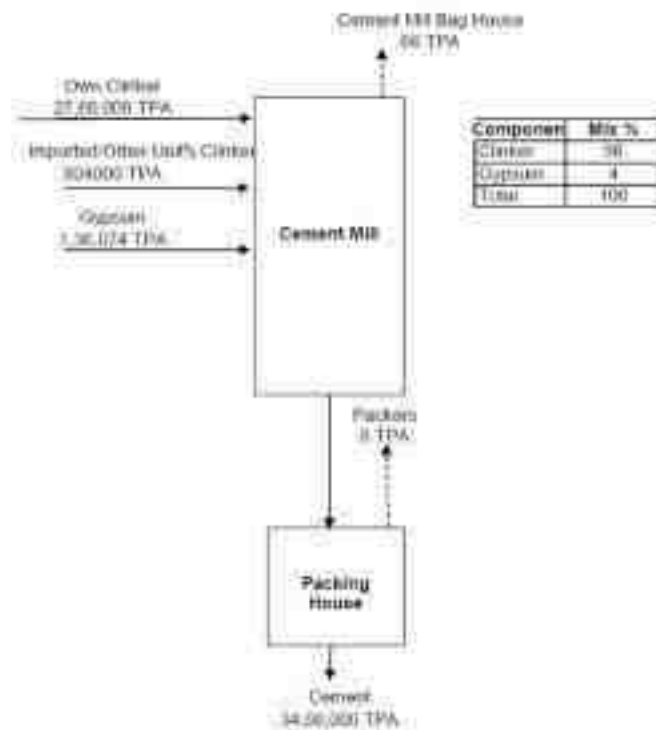


Fig. : 2.10 Material Balance for PPC Manufacturing

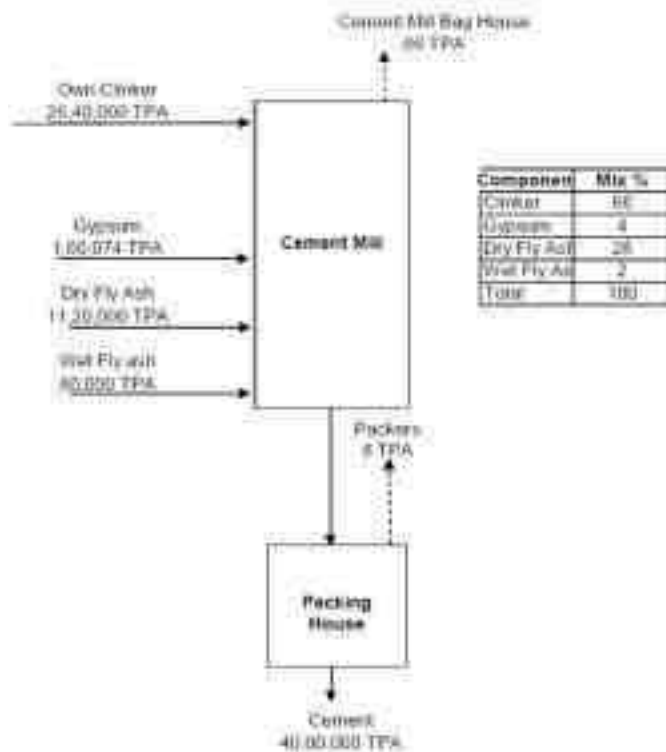


Fig. : 2.11 Material Balance for PSC Manufacturing

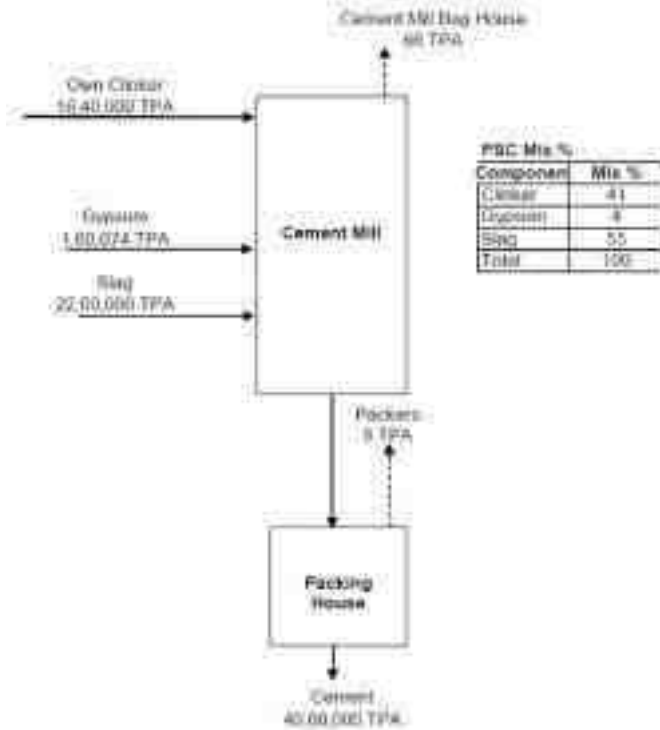
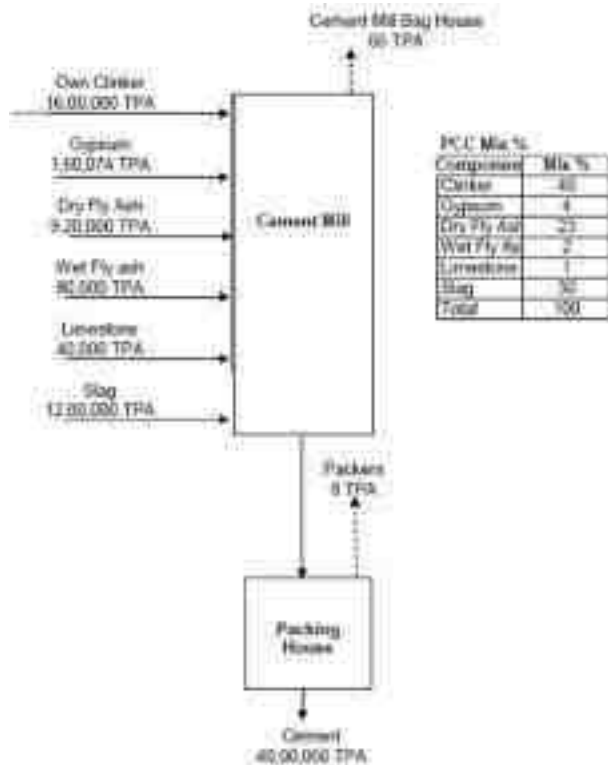


Fig. : 2.12 Material Balance for PCC Manufacturing



Clinker is then ground along with Gypsum, Slag, Fly Ash, Wet Fly Ash, PI, etc. to produce various grades of Cement. To pre grind the mill feed Clinker, Roller Press exists in the circuit. The Cement is then conveyed to the Silos through elevators. There are Electronic Packers with two discharges for automatic weighing and packing the cement in HDPE, Paper Bags and BOPP Bags. Facilities are available to dispatch Cement through Trucks as well as Rail Wagons to the Marketing Centres.

2.13 Raw Materials Characteristics & Fuel Linkages

Required **Limestone & Lime Kankar** will be from own Captive Mines & Quarries in Pandalgudi Region (**no Linkage** Document is required). Presently, **Petcoke** is sourced from Dubai in addition to BPCL, Kochi. For **Imported Coal** supply, a MOU has been signed with M/s. Visa Resource Pte Ltd., Singapore on Shipment basis. Purchase Agreements are made for Gypsum from SPIC, Tuticorin and Fly Ash from NLC Tamil Nadu Power Limited, Tuticorin. All **MOU/Sale Agreement & Purchase Order** copies are appended in the Annexure.

The average characteristics of Raw Materials & Fuels are given in **Tables 2.15-2.16**. As per the analysis Report, **there is no trace elements** in the Raw Materials and Fuels supplied.

Table : 2.15 Raw Materials Characteristics

Parameter	Limestone	Copper Slag	Fly Ash	Phospho Gypsum
Moisture %	2.0	4.0	0.5	16.0
LOI	33.70	5.14	0.50	20.65
SiO ₂ %	14.00	28.60	59.09	5.06
Al ₂ O ₃ %	3.08	5.78	28.91	0.47
Fe ₂ O ₃ %	1.94	55.58	8.97	0.31
CaO %	43.55	3.85	0.01	30.55
MgO %	2.12	0.01	1.01	0.91
SO ₃ %	0.10	0.43	0.15	41.14
Na ₂ O%	0.48	0.07	0.28	0.39
K ₂ O%	0.52	0.05	1.09	0.02
Cl%	0.006	0.09	0.020	0.02
MS	2.79	-	-	-
MA	1.59	-	-	-
LSF	98.63	-	-	-

Table : 2.16 Fuel Characteristics (Avg.)

Parameter	Imported Coal	Petcoke
Surface Moisture, %	19.2	7.0
Inherent Moisture, %	12.10	0.86
Volatile Matters, %	40.73	9.84
Fixed Carbon, %	40.14	88.97
Ash Content, %	7.03	0.33
SO ₃ , %	0.54	18.24
Sulphur Content, %	0.22	7.30
GCV, kcal/kg	5804	8420
NCV, kcal/kg	5544	8015

2.14 Waste Heat Recovery Boilers

Waste heat is recovered from the following areas in Clinkerisation : Recovery from preheater / calciner / clinker cooler vent duct etc. to generate steam for power generation or regenerative feed water heating (HP/LP Heater) in captive power plant. Waste heat recovery system consists of the following two Boilers commonly in most of the cement plants :

- ✓ **Preheater (PH) Boiler** - Installed between preheater exhaust gas duct and preheater ID fan.
- ✓ **Clinker Cooler Boiler** - Installed between clinker cooler and ESP inlet duct (diverted from self cleaning duct area of an ESP).

The waste heat recovery (WHR) system effectively utilizes the available waste heat from exit gases of pre-heater and clinker cooler. The WHR system consists of Suspension pre-heater (SP) boiler, Air Quenching Chamber (AQC) boiler, steam turbine generator, distributed control system (DCS), water-circulation system and dust-removal system, etc. General Process Flow Chart of WHR System is given in **Plate XIV**.

In Line-I, WHR circuit installed in Year 2019, there is a Pre-Heater (PH) Boiler and an Air Quenching Cooler (AQC) Boiler which are used for steam generation and generated steam is utilized in the CPP for power generation. Now, PH Boilers & AQC Boilers are proposed for Lines-II & III Kiln. Existing WHR Boilers of Line-I and proposed WHRBs for Lines II & III will be combined for producing about **13 MW by a dedicated Turbine Generator**. WHRB Power Plant specifications are given in **Table 2.17**.

Plate : XIV General Process Flow Chart of WHR System

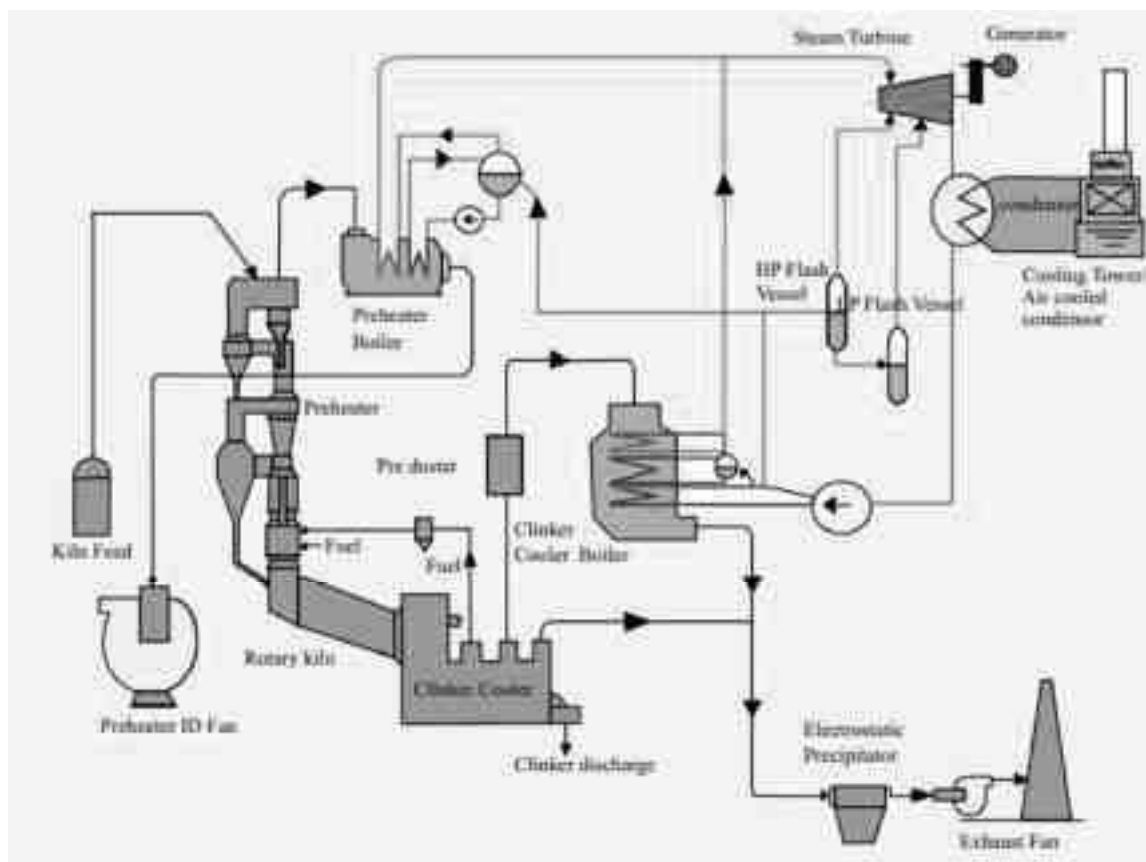


Table : 2.17 WHRB Power Plant - Specifications

Boiler Specification		AQC	PH
No of boilers		1 No AQC	1 no PH
Type of Boiler		Water Tube	
Drum		Single	
Circulation Type		Natural Circulation	
Flue gas volume at WHR boiler inlet	Nm ³ /hr	93333	213333
Flue gas temp at inlet	Deg. C	450	325
Flue Gas temp at outlet	Deg. C	90 +/- 5	160 +/- 5
Dust Load at exhaust	gm/Nm ³	100	90
Flue gas Pressure at boiler inlet	Mm Wc	-50	-550
Flue gas pressure drop across boiler	Mm Wc	<90	<90
HP Super heated steam flow	TPH	7.5	8.3
HP Super heated steam Pressure	kg/cm ² (a)	17.5	20
HP Super heated steam Temp.	Deg. C	385 +/- 5	310 +/- 5
LP Super heated steam flow	TPH	2	3.8
LP Super heated steam Pressure	kg/cm ² (a)	3.5	3.5
LP Super heated steam Temp.	Deg. C	200 +/- 5	240 +/- 5

RCL

EC for Expansion of RR Nagar Cement Plant (with all 3 Existing Lines), Virudhunagar, TN

Feed water temp. at economiser	Deg. C	126	
Steam Turbine			
Type		Multi stage, Injection cum condensing Type	
Rated Capacity	MW	10	
Superheated steam pressure at turbine inlet	Ata	HP 16.5 / LP 2.5	
Superheated steam Temperature at turbine inlet (HP / LP)	Deg. C	395 / 205	
Superheated steam Flow at turbine inlet (HP / LP)	TPH	41.5 / 11.5	
Type of Condenser		Air Cooled Condenser	
Exhaust Pressure	Ata	0.18	
Alternator			
Rated Power Factor	cos Ø	0.80 lag	
Rated active power	KW	10000	
Rated Voltage	KV	11 +/- 10 %	
Rated Frequency	Hz	50 +/- 5	
number of Phases		3	
Rated Speed	RPM	1500	
Air Cooled Condenser			
Exhaust Steam Flow	TPH	53	
Exhaust steam Pressure	Ata	0.18	
No of Cells	Nos.	4	
Type of Fins		KL / LL type Aluminium Fins	
No of Condensate Extraction Pumps / unit	Nos.	2 x 100 %	
Type of Fins		Horizontal centrifugal type	
Auxiliary Cooling Tower			
Structure		FRP	
Type		Induced Draft Counter Flow	
Fill		PVC Fill	
Each Fill capacity	m ³ /hr	250	
Total Cells	No.	1 working cell + 1 standby	
Pumps			
Pump Description	Qty	Type	Flow (m ³ /hr)
Auxiliary Cooling Water Transfer Pump	1 W + 1 S	Centrifugal horizontal end suction	250 Head – 45 m WC
DM water transfer pump	1W + 1S		2.2 Head – 90 m WC
Boiler Initial fill pump	1W		20 Head – 90 m WC
Sump pump	1	Portable Pump	
Ash Handling - Drag chain conveyor			
DCC Capacity in PH boiler	TPH		25
DCC Capacity in AQC Boiler	TPH	12.5	

2.15 Power Demand & Source

The power demand of existing Plant operations and Township is 32.85 MW. Proposed Kiln-II operations will require additional Power Demand will be 7.65 MW and the total Power Demand will be 40.50 MW (Table 2.18). RCL is operating 25 MW CPP along with Furnace Oil based DG sets of 2x4 MW, 1x7 MW & 1x0.5 MW for standby operations. In addition to 24.0 MW from CPP, 13.0 MW from WHRB Power Plant, 34.5 MW from TANGEDCO Grid) & wind power generated through RCL windmills (by wheeling within the State), **total 71.50 MW, are available** for the Plant. Depending upon the availability of Power supply from Renewable Energy Sources, the operation of CPP will be reduced for meeting total Power demand of RR Nagar Cement Plant on Expansion.

Table : 2.18 Power Demand – Existing & Proposed

Process / Load Centre	Actual Demand, KW	Existing Power Demand, KW	Power Demand on Expansion, KW	Power Source
RM - VRMP			2,100	
RM – Ball Mill			2,500	
Limestone SR	950	350		
Kiln-I	2,150	2,150		
Coal Mill 1			550	
Kiln-II			2,000	
Coal Mill 2			500	
Coal SR	750	250		
Roller Press	3,800	3,800		
RP-Ball mill 1	2800	2800		
RP-Ball mill 2	850	850		
Cement Mill new	4,850	4,500		
Packing Plants	1,360	600		
PG Mines	1,600	1,600		
Factory & Colony Lighting	650	370		
Genset Aux.	120	120		
TPP Aux	1,800	1,800		
Wagon Tippler	1,200	1,200		
cement mill 9 & 10 - filling		80		
cement mill 9 & 10 - extraction		80		
Line-III New Kiln	10,000	10,000		
ASR (LSR 1 & 2-Circular Yard)	800	700		
4th packer		300		
Beneficiation Plant at Pandalgudi	1,300	1,300		
Blackstone Crusher	850			
New Thickners-LKBP	970			
Total Power Demand	36,800	32,850	7,650	40,500
Total Power Generation:-				

Process / Load Centre	Actual Demand, KW	Existing Power Demand, KW	Power Demand on Expansion, KW	Power Source
From Existing CPP Power Generation	24,000			24,000
WHRB Power Plant			13,000	13,000
Wind Wheeling through TNEB Grid	34,500			34,500
Total Supply (available)			40,500	71,500

2.16 Solar Power Harnessing

RCL has installed a **30 KW** solar panel installed in Ramco Vidyalaya School. Totally 90 Nos. Solar lights have been installed in the Colony premises and nearby Villages (in CSR)

2.17 Fuel Storages

RCL has obtained the License for Storage of Petroleum Products as detailed in Table from the Chief Controller of Explosives, Nagpur P/SC/TN/15/5259(P499385) dt. 30.06.2022, which is valid up to 31.12.2031 (**Table 2.19**).

Table 2.19 Consented HSD & HFO Storages

Materials	Hazardous Properties	Installed Capacity	License Valued Upto	No. of Tanks in the Plant	Design Capacity	Threshold Quantity for MAH
High Speed Diesel (HSD)	Class B	63 KL	31.12.2031	2	1 x 50 KL	2500 Tonnes
		53.55 Tonnes				
Heavy Fuel Oil (HFO)	Class C	775 KL	31.12.2031	7	2 x 200 KL	
		689.85 Tonnes			1 x 50 KL 3 x 30 KL 1 x 5 KL	

* : MAH-Major accident hazards Installations which is defined as the isolated storage and industrial activity at a site handling (including transport through carrier or pipeline) of hazardous chemicals equal to or, in excess of the threshold quantities specified in Column 3 of Schedule 2 and 3 respectively.

Other Fuels Storages in the Plant are as follows :

Waste Oils : 1x44 KL & 1x15 KL Tank.

Engine Oil Wastes : 1x30 KL Tank.

2.18 Electrical Energy and Heat Energy Consumption

On Expansion, Specific Fuel consumption will be 721.7 kcal/kg of Clinker and Specific Power consumption will be 58.3 kwh/Ton of Clinker (**Table 2.20**).

Table : 2.20 Electrical Energy and Heat Energy Consumption

Lines	Specific Fuel Consumption, kcal/kg Clinker		Specific Power Consumption (Clinker Stage), kwh/T Clinker	
	Existing	On Expansion	Existing	On Expansion
Line-I	730	730	65	55
Line-II	(860)*	730	(70.5)*	68
Line-III	705	705	52	52
Average	765	721.7	62.5	58.3

* : At the time of operation.

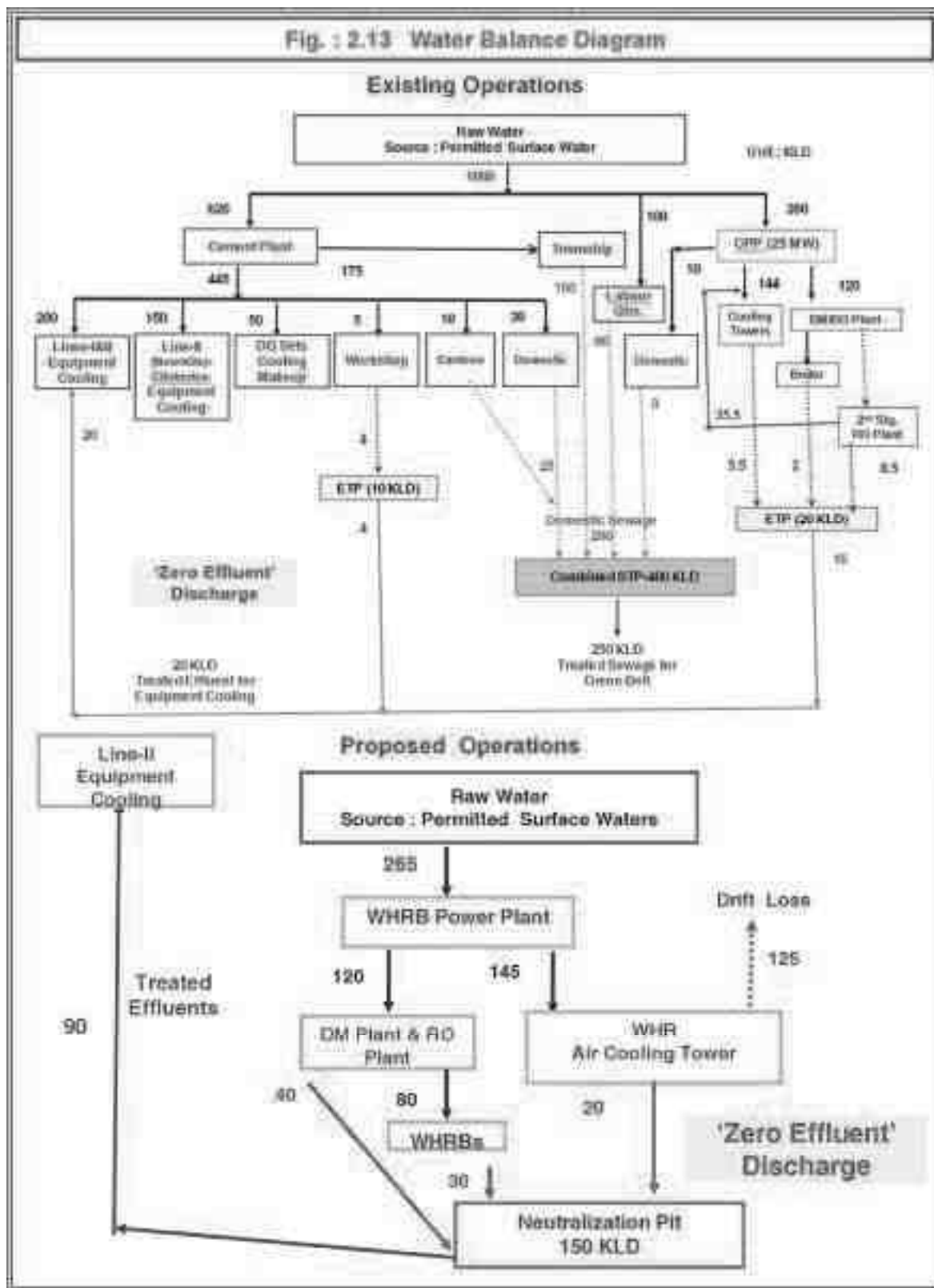
2.19 Water Demand & Source

Presently, the fresh water demand of the Cement Plant, CPP & Township is 1,000 KLD. The Unit has been **permitted for the drawl of 1,500 KLD** from the nearby Seasonal Arjuna River. There is an Intake Well in the River Basin for tapping the required water. There is **no ground water drawl for the Plant**. Also, treated sewage of 250 KLD, treated Effluent of 20 KLD from CPP and harvested Rainwater of 230 KLD, in total 500 KLD, are supplementing the raw water demand of the Complex.

On Expansion, fresh water to the tune of 265 KLD is required for WHRB Power Plant. Thus, total water demand will be **1,265 KLD which is well within the permitted drawl quantity of 1,500 KLD** from Arjuna River.

There is no trade effluent from the Cement Plant. Workshop washings of 4 KLD and 16 KLD Rejects from CPP are individually neutralized and the Treated Effluent of 20 KLD is taken to the Cement Plant for equipment cooling (where it is evaporated fully). **On Expansion, DM/RO Rejects of 40 KLD, Boiler Bleed-offs of 8 KLD and Colling Tower Rejects of 12 KLD, total 60 KLD effluent will be generated** additionally which will be treated for pH Correction in a **100 KLD Neutralisation Pit separately** and **Treated Effluent of 60 KLD** will be utilized for Equipment Cooling of (old) Line-II machineries where it will be evaporated fully.

Domestic Sewage & Canteen wastewaters of 25 KLD from the Cement Plant, 9 KLD Domestic Sewage from CPP, 160 KLD Domestic Sewage from the Township and another 86 KLD Domestic Sewage from Labour Qtrs., thus, a total of 280 KLD is generated. All the Domestic Sewage is treated in a **400 KLD Sewage Treatment Plants (350+50 KLD STPs)**. The Treated Sewage of 250 KLD is fully used for the Green Belt development. There will be **no change to existing status on Expansion**. Thus, it will be a **'Zero Effluent Discharge'** Plant. **Water Balance** is shown in **Fig. 2.13**.



The STP Units and Dimensions will be as detailed below :

Name of the Unit	No. of Unit	Dimensions in meter
Bar Screen	1	1x 1
Collection Tank	1	8.5 x 8.5 x 4.0
Aeration Tanks	2	8.5 x 4.25 x 4
Clarifier Tank	1	Dia – 6.0 m, depth – 3.8 m
Pressure Sand Filter	1	Dia – 1.5 m, Height – 2.5m
Activated Carbon Filter	1	Dia – 1.5 m, depth – 2.5m
Sludge Drying Beds	3	1.5 x 1.5x 1
Filter feed tank	1	6 x 6 x 3
Treated water tank	1	6 x 6 x 3
UV System	1	1.0 x0.75

2.20 APC Measures

The (old) Line-II Kiln is already provided with Reverse Air Bag House, Cooler with ESP, Coal Mill with Bag Filters so as to control the **Particulate Emissions from the Line-II <30 mg/Nm³**. All the Material conveyors are fully covered and provided with Bagfilters at Transfer Points. The Plant operations will be in compliance with new Emission Standards issued by MoEF&CC for Cement Industry vide Notifications dated 25.08.2014 and amended on 09.05.2016 & 10.05.2016 as below :

PM Emissions from all Major Stacks : <30 mg/Nm³.

SO₂ Emissions from all Major Stacks : <100 mg/Nm³ (pyritic Sulphur is <0.25%).

NOx Emissions from New Kiln-II : <600 mg/Nm³.

All Main Stacks of Line-II is provided with **Online Monitors** and the **Real Time Emission Levels are connected to the TNPCB Care Air Centre & CPCB Servers.**

2.21 Solid Wastes

The solid waste generated from the process and dust collected from various air pollution control equipment is being recycled in the process. Solid waste from the Sewage treatment plant 0.8 @ TPD is vermi-composted and used as manure for Green belt development. Fly ash (29.3 TPD) produced from CPP and Bottom ash (5.2 TPD) are transported pneumatically with the help of dense phase pneumatic pumps to the RCC storage silos. The ash is evacuated from silo and transported to Cement Plant for Portland Pozzolana Cement (PPC) manufacturing. There **will not be any change to the existing Status** of Solid Waste Generation, Treatment and Disposal from the Complex on Expansion.

2.22 Hazardous Wastes

The Plant has obtained Hazardous Wastes Authorisation from TNPCB vide No. 23HPC42009117 dated 07.06.2023 with validity till 31.03.2028 to handle 94.62 TPA used/Spent

Oil (Category 5.1) from the Plant. There **will not be any change to the existing Status** on Expansion.

2.23 Employment Generation

Presently, there are 465 Direct Employees working in the Cement Complex. Indirect Employment to about 600 persons has been provided. Due to the Expansion Proposal, **another 35 Direct Employees & 50 Indirect Employees will be added.**

Description	Additional Manpower Requirement
Construction Phase	Nil (No construction is involved)
Operation Phase	Direct – 35 Indirect – 50 (in 3 shifts) Total – 85

2.24 Project Cost

The Project Cost of the existing Cement Plant Complex is Rs.894.00 Crores. A budget Rs.14.20 Crores is presently the EMP Capital Cost and Rs.3.90 Crores/annum is the EMP Recurring Cost. **For proposed Expansion**, with existing Line-II infrastructures and facilities, the Project Cost will be **additional Rs.103.38 Crores**. Thus, total Project Cost on this Expansion will be Rs.997.38 Crores. A budget **Rs.1.00 Crores as EMP Capital Cost** and Rs.0.25 Crores/annum as EMP Recurring Cost are proposed additionally for the Expansion. Thus, total EMP Capital Budget will be Rs.15.20 Crores and EMP Operating Budget will be Rs.4.20 Crores per Annum.

2.25 Project Completion Schedule

No establishment is required for the Proposal. No. of Working days will be increased to 345 days to achieve the production enhancement **with existing machineries**. Thus, on obtaining all Statutory approvals, the Plant can be operated for expansion quantity from 01.04.2025 (**Table 2.21**).

Table : 2.21 Project Schedule

Sl. No.	Activities	FY 2024-25									
		Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	
1	Application for TOR										
2	Grant of TOR										
3	Public Hearing										
4	EC										
5	DCTO										
6	Expansion Operations										

3.0 Description of the Environment (Baseline Status)

3.1 Study Area

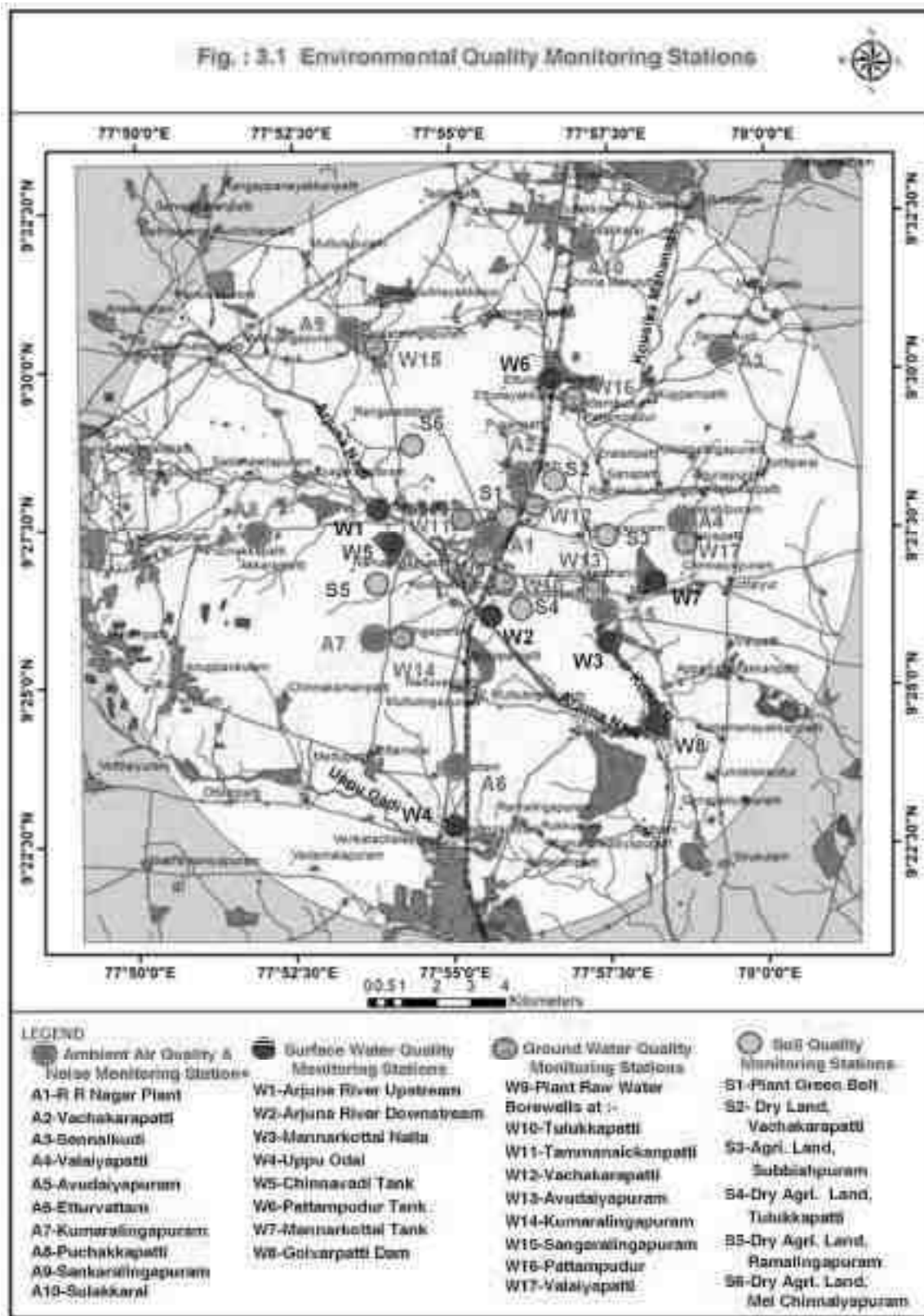
The study area of **10 km radius (from boundary)** has been considered for assessing the baseline environmental status. **Project area does not fall in Critically Polluted Industrial Clusters** listed by CPCB. As Bay of Bengal is at 100 km from the Plant, Coastal Regulation Zone (**CRZ applicability is not there**). The nearest IMD Station is Madurai Airport. The Wind Rose of Madurai for the Period 1953 to 2019 (Source IEM Website) is referred while fixing the Monitoring Stations (**Fig. 3.1**). **Geotagged Monitoring Station** Photographs are given in **Plates VIII-XIII**. Baseline Data (BLD) is being collected during **Jul.-Sep. 2024 (Premonsoon Season)** for the EIA Study as the area experiences (Northeast) Monsoon Season during Oct.-Dec. months.



Physiography : The general elevation of the Study Area ranges from 55 m to 121 m above MSL (aMSL) (**Fig. 3.2**). The elevation of the Plant area ranges from 67 m to 89 m above MSL. The elevation contour indicates the area is sloping towards south and southeast. The natural landforms like buried pediments and valley fills are seen near the Arjuna River. The region falls in Seismic Zone III.

Drainage Pattern : The Area is characterized by parallel to sub parallel drainage pattern which are controlled by the structural features. There is **no perennial river** in the study area. The **seasonal nallas Arjuna River** (0.3 km in south) and **Mannarkottai Nalla** (2.0 km in east) (**Fig. 3.3**) are flowing near the Plant. These Streams are flowing towards south to southeast and confluences at Golvarpatti Dam (7.0 km in SE). Vaippar River flows at 9.8 km in south near Sattur.

Geology : The Plant area is part of the hard rock terrain and predominantly occupied by crystalline rocks of Archaean Age. The commonly occurring rock types are Granitic gneisses, Charnockites and its derivatives, Calc granulites, etc. River alluvium associated with Kankar nodules is observed in the Arjuna River bed.



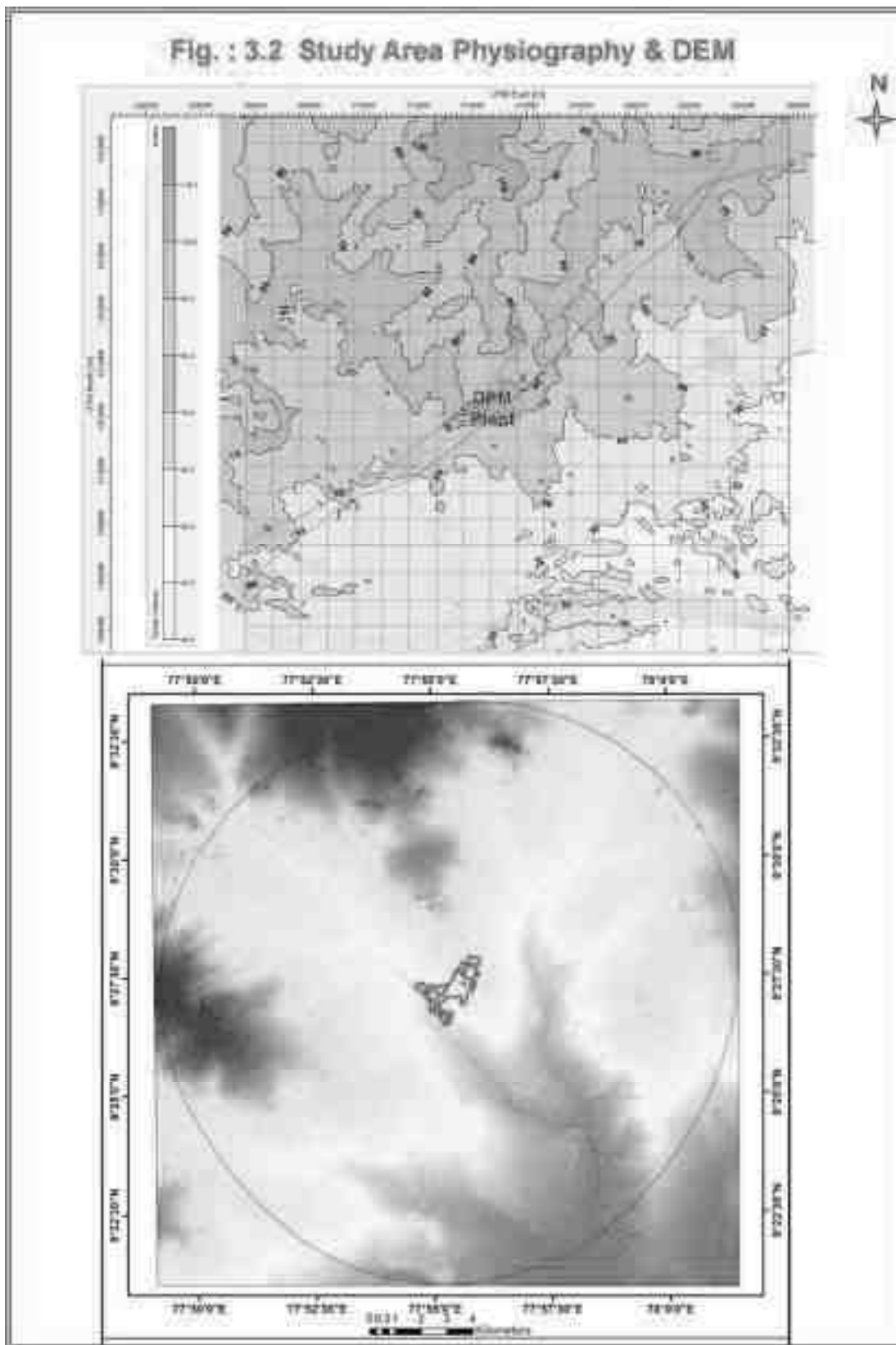


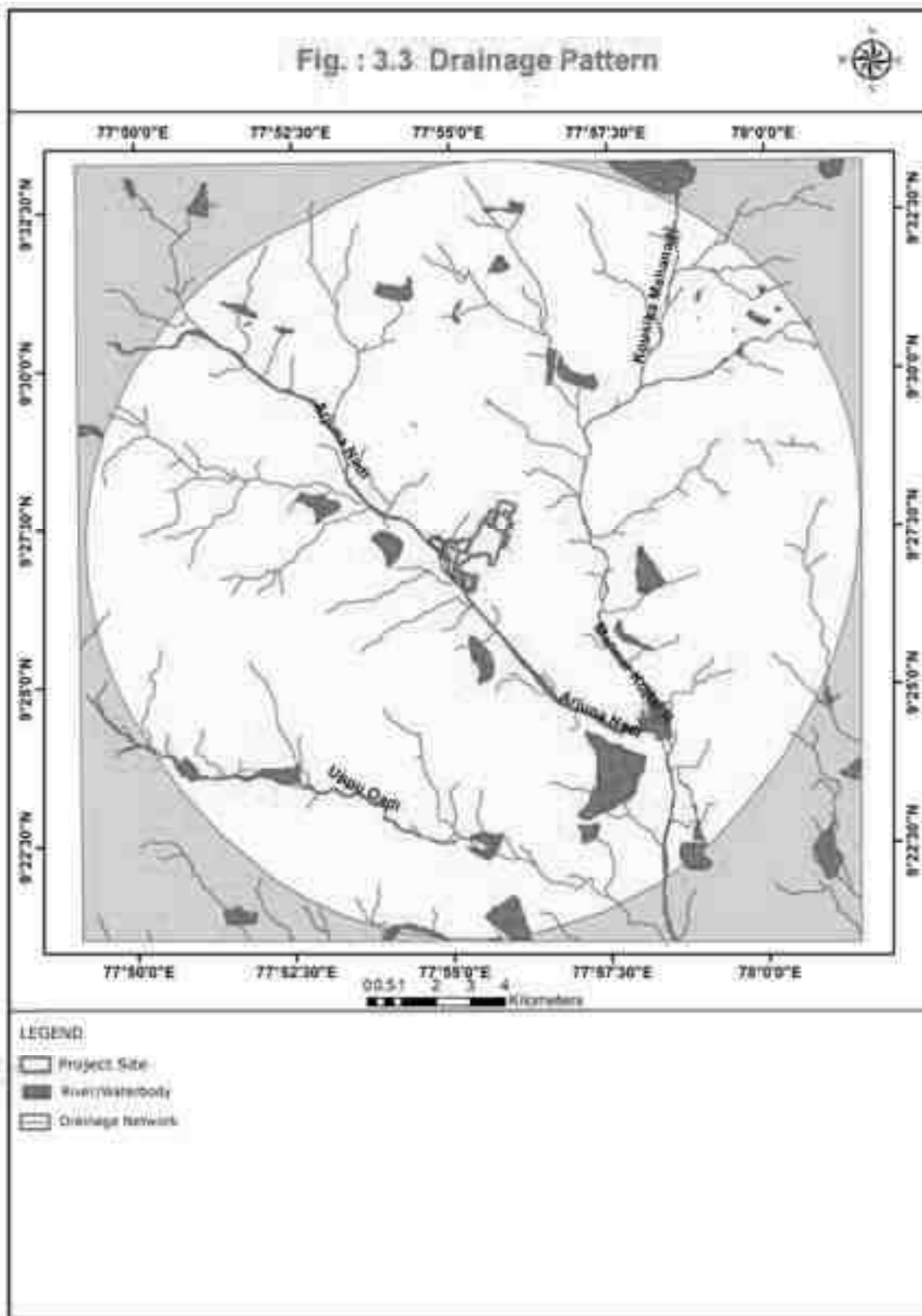












3.2 Environmental Components

Considering the Environmental setting of the project, project activities and their interaction, environmental regulations and Standards, Environmental Attributes included for the EIA Study are given in **Table 3.1**.

Table : 3.1 Baseline Data Collection – Monitoring Locations

Attributes		Sampling		Remarks
		No. of Locations	Frequency	
Air	Meteorological Parameters at Core Zone	1	For a Season	Wind speed, wind direction (wind rose), temperature, humidity, cloud cover, atmospheric pressure, rainfall, etc.
	AAQ Parameters	10	24-hourly basis, continuously for 2 days in a week for 4 weeks in a month for a season	For the parameters as per Revised NAAQ Norms
Noise	Leq Levels	10	Once in the season	For Leq, Lday and Lnight values
Water	Surface Water Quality Parameters	8	Once in the Season	As per CPCB Norms (including existing Plant Raw Water)
	Ground Water Quality Parameters	9		As per IS:10500 Norms
Land	Soil Quality	6	Once in the Season	Season for Textural & Physical Parameters & Nutrients.
	Land Use	Study Area	Once during the Study Period	Based on recent available Satellite Imagery
Biological (Flora & Fauna)	Aquatic	Study Area	Once during the Study Period	Flora & Fauna in Core & Buffer Zones
	Terrestrial			
Socio economic Parameters		Study Area	Once during the Study Period	Based on 2011-Census and Need Based Assessment for: Total Population / Household Size, Gender Composition, S.C / S.T Population, Literacy Levels, Occupational Structure, etc.

- ❖ **Site specific Micro-meteorological Data** from Plant Area for the Season, **on hourly basis continuously**, on wind speed, wind direction (wind roses), temperature, humidity, cloud cover, atmospheric pressure and rainfall.
- ❖ **Ambient Air Quality Monitoring at 10 locations** on 24-hourly basis, continuously for 2 days in a week for 4 weeks in a month for 3 months in the season for all 12 parameters as per Revised NAAQ Norms.
- ❖ Noise Level Measurements at **10 locations** (air quality monitoring stations) for Leq, Lday and Lnight values once in the season.
- ❖ Water Quality Monitoring – grab sampling of Surface Water (**8 locations**) and Ground Water including Plant Raw Water (**9 Locations**) - once in the Season.
- ❖ Soil Quality Monitoring at **6 locations** once in the Season for Textural & Physical Parameters, Nutrients, etc.
- ❖ **Land Use Pattern** based on recent available Satellite Imagery.
- ❖ Biotic Attributes for : **Flora & Fauna** in Core & Buffer Zones.
- ❖ **Socio-Economic Profile**, based on 2011-Census and **Need Based Assessment**, once in the study period for: Total Population / Household Size, Gender Composition, SC / ST Population, Literacy Levels, Occupational Structure, etc.

3.3 Methodology Adopted

Micrometeorology : As a part of the study, the micrometeorology and microclimatic parameters were recorded by installing a weather monitoring station (Envirotech WM 200) at the Plant at 10 m height. Data of wind velocity, wind direction, ambient temperature, relative humidity, cloud cover and atmospheric pressure were recorded at hourly intervals along with rainfall during the monitoring period.

Ambient Air Quality : The study area represents the Industrial, Residential, Rural and other Areas with respect to Revised National Ambient Air Quality (NAAQ) Norms stipulated by CPCB. Calibrated Fine Particulate Samplers (Envirotech APM 550) & Respirable Dust Samplers (Envirotech APM 460) were used for monitoring of PM_{2.5} & PM₁₀. Gaseous samples are collected by integrated gas sampling assembly (Envirotech APM 411). A tapping provided in the hopper of the sampler is utilised for gaseous sampling. with proper flow controller and a flow of 1.0 l/min.

PM_{2.5} & PM₁₀ : APM 550 system is a manual method for sampling fine particles and is based on impactor designs standardized by EPA for Ambient Air Quality Monitoring. Ambient Air enters the APM 550 system through an omni-directional inlet designed to provide a clean aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and the fine particulates existing from the PM_{2.5} impactor is passed through a 47 mm dia filter. Teflon filter

membrane that retains the FPM. The APM 550 system allows removal of the PM_{2.5} impactor from the sample stream so that the same system may be optionally used as a PM₁₀ sampler also.

SO₂ : Modified West & Gaeke method (spectrophotometric) was adopted. SO₂ was collected in a scrubbing solution of sodium tetrachloro mercurate (TCM) and was allowed to react with sulphamic acid, formaldehyde and then with pararosaniline hydrochloride. The absorbance of product red-violet dye was measured using UV Visible Spectrophotometer at a wavelength of 560 nm. Concentration of SO₂ was calculated by multiplying the absorbance with calibration factor and dividing by volume of air sampled.

NO_x : Jacob and Hocheiser modified method was adopted. Nitrogen oxides as nitrogen dioxide were collected by bubbling air through sodium hydroxide-sodium arsenite solution to form a stable solution of sodium nitrite. The nitrite ion produced during sampling was determined spectrophotometrically (at 540 nm) by reacting the exposed absorbing reagent with phosphoric acid, sulphanilamide and N (1-naphthyl) ethylamine dihydrochloride. Concentration of NO_x was calculated as described in SO₂ measurement.

Ammonia : Indophenols method (APHA Method 401, Air Sampling and Analysis, 3rd Edition) was adopted. Ammonia in the atmosphere is collected by bubbling a measured volume of air through a dilute solution of sulphuric acid to form ammonium sulphate. The ammonium sulphate formed in the sample is analysed colorimetrically by reaction with phenol and alkaline sodium hypochlorite to produce indophenols. The reaction is accelerated by addition of Sodium nitroprusside as catalyst.

Ozone : IS:5182 Part IX (Methods for Measurement of Air Pollution - Oxidants)/ APHA Method 410 was adopted. Micro amounts of ozone and the oxidants liberate iodine when absorbed in a 1% solution of potassium iodine buffered at pH 6.8 ±0.2. The iodine is determined spectrophotometrically by measuring the absorption of tri-iodide ion at 352 nm. Drager Multiwarn Detector was also used for real time value.

CO : Envirotech APM 850 Organic Vapour Samplers are used for CO monitoring. Standard MSA tubes are used for monitoring carbon monoxide. A measured volume of air is passed at the flow rate of 100 to 200 ml/min for 1 to 8 hours and the colour change (yellow to green) in indicating gel filled in the detector tubes and is matched with the colour chart provided with detector tubes for finding out CO concentration. Drager Multiwarn Detector was also used for real time value.

Particulate Lead : The exposed glass fibre filter papers were cut into small pieces and to it 100 ml distilled water and 10 ml nitric acid were added and heated on a hot plate for 4-6 hours. The clear solution obtained after digestion was filtered and made upto 25 ml and were analysed on a Analytic Jena Atomic Absorption Spectrophotometer (AAS) employing Lead Hollow Cathode Lamp. Concentration of lead was calculated by taking the result obtained from AAS analysis and dividing it with the volume of air sampled.

Benzene : The charcoal tubes are available in different sizes and contain varying amount of activated charcoal. The ambient air was sucked through the tube using a low flow sampler used for collection of BTX sample in a way that results in an enrichment of the relevant substances in the activated charcoal. Desorption of the adsorbed benzene was done using Carbon disulphide (CS₂). The substances desorbed in CS₂ were analyzed by capillary Gas Chromatography.

Benzo (a) Pyrene (BaP) is one of the most important constituent of PAH compounds and also one of the most potent carcinogens. This can be measured in both particulate phase and vapour phase. In the vapour phase the concentration of B(a)P is significantly less than the particulate phase. Therefore, more care to be taken for the measurement of Benzo(a) Pyrene in the particulate phase. It is based on BIS method IS 5182 (Part XII). This method is designed to collect particulate phase PAHs in ambient air and fugitive emissions and to determine individual PAH compounds using capillary Gas Chromatography equipped with flame ionization detector.

Nickel and Arsenic : The Atomic Absorption Spectroscopy (AAS) technique makes use of absorption spectrometry to assess the concentration of an analyte in the sample. The method is based on active sampling using PM10 High Volume Sampler and then sample analysis is done by atomic absorption spectroscopy.

The **detectable range** of the Air Pollutants are given in **Table 3.2**.

Table : 3.2 AAQ Parameters– Detectable Range

Parameter	Method	Range
Respirable Particulate Matter (less than 10 µm or PM10)	IS 5182: (Part 23) : 2006 RA: 2017	5-1000 µg/m ³
Particulate matter (less than 2.5 µm or PM2.5)	USEPA Quality Assurance Handbook Vol II Part II - Guidance Documents 2.12 issue year: Nov-1998	10-1000 µg/m ³
Sulphur Dioxide	IS 5182: (Part 2), 2001 RA: 2017	5-1000 µg/m ³
Nitrogen Dioxide	IS 5182: (Part 6), 2006 RA: 2017	6-750 µg/m ³
Carbon Monoxide	IS 5182: (Part 10), 1999 RA: 2014	1-200 mg/m ³
Ammonia	Indophenol Method (Method of Air sampling and analysis 3 rd edition method 401)	5-700 µg/m ³
Ozone	IS 5182: (Part 9), 1974, RA 2014	10-19000 µg/m ³
Benzene (C ₆ H ₆)	IS 5182 (Part 11), 2006 RA: 2017	0.01-1000 µg/m ³
Banzo (α) Pyrene Particulate Phase only	IS 5182: (Part 12): 2004, RA: 2014	0.1-10,000 ng/ m ³
Nickel	IS 5182: (Part 22), 2004, RA: 2014 /NAAQS Monitoring & Analysis Guidelines Volume-I	1.0 -50 ng/m ³
Arsenic		1.0-10 ng/ m ³
Lead		0.1-50 µg/m ³

Noise Levels : Noise levels were monitored at all air monitoring locations during day time as well as night time in a day. A totally portable measurement systems, Lutron SL 4001 with an internal calibrator and wind screen was used. The built-in internal oscillation system 1 KHz sine wave

generator is used for on the spot calibration at 94.0 dB(A) at 1000 Hz. The basic unit of measurement is A-weighted sound level.

Water Quality : Water samples of both surface and ground waters were collected during the survey period and analysed for physico-chemical and bacteriological parameters (Table 3.3).

Table : 3.3 Methodology Adopted for Water Analysis

Sl. No.	Parameter	Unit	Reference	Method
1	Taste & Odour	-	IS:3025 (5/7)*	As perceived
2	pH	-	IS:3025 (11)	Digital pH meter
3	Colour	Hazen units	IS:3025 (4)	Comparison with Standards
4	Turbidity	NTU	IS:3025 (10)	Nephelometric
5	Total Dissolved Solids	mg/l	IS:3025 (16)	Gravimetric
6	Total Hardness	mg/l	IS:3025 (21)	Titrimetric (EDTA)
7	Iron (as Fe)	mg/l	32 of IS3025	Colorimetric (Phenanthroline)
8	Chlorides (as Cl)	mg/l	IS:3025 (32)	Titrimetric (Argentometric)
9	Residual Chlorine	mg/l	IS:3025 (26)	Titrimetric
10	Calcium (as Ca)	mg/l	IS:3025 (40)	Titrimetric (EDTA)
11	Magnesium (as Mg)	mg/l	IS:3025 (46)	Titrimetric (by difference between Total Hardness and Calcium Hardness)
12	Alkalinity (as CaCO ₃)	mg/l	IS:3025 (23)	Colour indicator titration
13	Dissolved Oxygen	mg/l	IS:3025 (38)	Winkler titrimetric-azide modification
14	Sulphate (as SO ₄)	mg/l	IS:3025 (24)	Turbidimetric/Gravimetric
15	Fluoride (as F)	mg/l	IS:2488 (II)*	Distillation followed by Colorimetric (SPADNS)
16	Nitrate (as NO ₃)	mg/l	IS:3025 (34)	Colorimetric (PDA)
17	Cyanide (as CN)	mg/l	IS:3025 (27)	Colorimetric (Pyridine-Bispyrazolone)
18	Pesticides	mg/	IS:2488 (III)	Gas chromatograph
19	Phenols (as C ₆ H ₅ OH)	mg/l	IS:3025 (43)	Distillation followed by colorimetric (4-Aminoantipyrine)
20	Manganese (as Mn)	mg/l	35 of IS3025	Colorimetric (Persulpahte)
21	Chromium (as Cr ⁶⁺)	mg/l	IS:2488 (II)	Colorimetric (Diphenyl carbazide)
22	Copper (as Cu)	mg/l	IS:3025 (42)	Atomic Absorption Spectrophotometric
23	Selenium (as Se)	mg/l	IS:2488 (II)	Atomic Absorption Spectrophotometric
24	Cadmium (as Cd)	mg/l	IS:3025 (41)	Atomic Absorption Spectrophotometric
25	Arsenic (as As)	mg/l	IS:3025 (37)	Atomic Absorption Spectrophotometric
26	Boron (as B)	mg/l	IS:2488 (III)	Colorimetric (Curcumin)
27	Mercury (as Hg)	mg/l	IS:3025 (48)	Mercury analyser
28	Lead (as Pb)	mg/l	IS:3025 (47)	Atomic Absorption Spectrophotometric
29	Zinc (as Zn)	mg/l	IS:3025 (49)	Colorimetric (Dithizone)
30	Percent sodium	%	IS:2488 (V)	From Na, K, Ca & Mg values
31	BOD-3 days @ 27 °C	mg/l	IS:3025 (44)	3 days @ 27°C
32	COD	mg/l	IS:2488 (V)	Dichromate reflux
33	Oil & Grease	mg/l	IS:3025 (39)	Gravimetric
34	Coliforms	MPN/100 ml	IS:1622	Multiple tube fermentation (5 tubes)
35	Plate Counts	No. of Colonies/ml	IS:1622	Colony count in Agar-agar medium

* : IS:3025 (Parts)-Methods of Sampling and Test (Physical and Chemical) for Water and Wastewater;

+ : IS:2488 (Parts)-Methods of Sampling and Test for Industrial Effluents.

Parameters like pH, conductivity, temperature, DO, etc. were measured in the field itself while collecting the samples using a microprocessor based Portable Water Analysis Kit (Elico Model PE136). Samples for chemical analysis were collected as per IS:2488. Sterilised bottles were used for collection of bacteriological samples.

Soil Quality : Samples at 3 depths viz. 0-30 cm, 30-60 cm and 60-90 cm were collected using sampling augers and field capacity apparatus. Soil extraction (10%) were used for analysis.

Calibration : The monitoring and analytical instruments are being calibrated periodically. The correction factors, if any, are being used in computation of the data.

Flora & Fauna : A general ecological survey covering an area of 10 km radius area were conducted and reported. Faunal survey covers the Terrestrial and Avian Fauna.

Based on the **Wildlife Protection Act, 1972 (as amended in 2022)**, species were short-listed as Schedule II or I and considered as endangered species.

Indian Peafowl (*Pavo cristatus*), Schedule-I Fauna as per Wild Life (Protection) Act, 1972 as amended in 2022, is found in the study area and its surroundings. The **Conservation Plan for Peafowl duly approved with the Budget Provisions** by the Wildlife Warden, Srivilliputhur, Virudhunagar District - for Habitat improvement, Community participation in Conservation, etc., is being implemented and will be continued.

This study included the identification of endangered and rare species as per Red Book.

Socio-Economic profile of population in study area is based on Census 2011 data.

3.4 Micrometeorological Status

3.4.1 Regional Status

Sub-tropical climate prevails over the study area. The temperature is maximum during March to May and it drops from June onwards. The maximum temperature ranges from 40 °C to 44 °C and minimum temperature from 22 °C to 27 °C. The nearest IMD station is **Madurai Airport** (45 km in north) and nearest rain gauge station is located at Sattur. The Normal Rainfall of the Plant Area is **895 mm**.

NE Monsoon Rainfall : 419.0

SW Monsoon Rainfall : 196.8

(Source: Revenue Department, Virudhunagar)

3.4.2 Site Specific Status

The abstract of collected hourly meteorological data are presented in **Tables 3.4-3.6**. Based on the wind parameters, wind rose is drawn and presented as **Fig. 3.4**.

July 2024 : Predominant winds were from W/WSW direction with mean value of 274.7 Degrees. Mean Wind velocity was 7.4 kmph. Temperature values were ranging from 25.0 °C to 40.0 °C with mean value of 31.0 °C. Mean maximum relative humidity value was 60.9%. Mean atmospheric pressure value was computed as 756.5 mm of mercury. There were 5 rainy days with total rainfall of 7.0 mm in this month.

August 2024 : Predominant winds were from W/WSW directions with mean value of 270.5 Degrees. Mean Wind velocity was 5.5 kmph. Temperature values were ranging from 24.0 °C to 39.0 °C with mean value of 29.7 °C. Mean maximum relative humidity value was 70.5%. Mean atmospheric pressure value was computed as 757.5 mm of mercury. There were 4 rainy days with total rainfall of 5.0 mm in this month.

September 2024 : Predominant winds were from W/WNW directions with mean value of 275.5 Degrees. Mean Wind velocity was 6.3 kmph. Temperature values were ranging from 25.0 °C to 40.0 °C with mean value of 31.8 °C. Mean maximum relative humidity value was 56.6%. Mean atmospheric pressure value was computed as 757.1 mm of mercury. There was 2 rainy days with total rainfall of 2.5 mm in this month.

Premonsoon Season (Jul.-Sep. 2024) :

- ❖ Predominant winds were from W/WSW/WNW directions.
- ❖ Mean Wind velocity was 6.4 kmph.
- ❖ Temperature values were ranging from 24.0 °C to 40.0 °C with mean value of 30.8 °C.
- ❖ Mean maximum relative humidity value was 62.7%.
- ❖ Mean atmospheric pressure value was computed as 757.0 mm of mercury.
- ❖ There were 11 rainy days with total rainfall of 14.5 mm on this Premonsoon Period.

The monitored meteorological data were found to be **in compliance with local weather phenomena**.

Table : 3.4 Micrometeorological Data – Jul.2024

Location : RR Nagar Plant

Date	Mean Wind Velocity, kmph	Pred. Wind Direction in Deg. (from)	Temperature, °C			Relative Humidity (Mean), %	Cloud Cover, oktas	Atm. Pressure (Mean), mm of Hg	Rain-fall, mm
			Min.	Max.	Mean				
01.07.2024	6.7	283	27.0	36.0	31.0	65	4	757.5	0
02.07.2024	6.2	302	26.5	38.0	31.5	61	5	757.0	0
03.07.2024	7.2	282	27.0	39.0	32.5	60	4	757.0	0
04.07.2024	6.2	259	26.5	37.5	32.0	59	4	757.5	0
05.07.2024	8.2	291	27.0	39.0	31.5	62	5	756.5	0
06.07.2024	7.7	284	26.0	35.0	30.5	63	6	756.5	0.5
07.07.2024	7.2	293	27.0	38.0	31.5	59	4	756.0	0
08.07.2024	7.2	293	27.0	37.0	31.0	60	4	756.0	0
09.07.2024	6.7	261	26.0	35.5	30.0	62	6	756.5	0
10.07.2024	4.1	288	27.0	39.0	31.5	62	4	758.0	0
11.07.2024	3.6	170	26.0	38.0	31.0	67	4	757.5	1.0
12.07.2024	7.7	277	26.0	37.0	30.0	71	4	757.0	0
13.07.2024	7.7	266	25.0	35.0	29.5	69	4	756.5	3.0
14.07.2024	7.7	266	26.0	36.0	30.0	65	5	755.5	0
15.07.2024	8.8	270	25.0	35.0	28.5	74	6	755.5	1.0
16.07.2024	9.8	269	26.0	33.0	29.5	66	6	756.0	0
17.07.2024	8.2	272	25.5	34.0	29.5	64	5	756.5	0
18.07.2024	7.7	274	26.0	33.0	29.5	65	6	756.5	0
19.07.2024	9.3	275	28.0	36.0	31.5	54	4	755.5	0
20.07.2024	7.7	274	26.5	36.0	31.5	54	5	756.0	0
21.07.2024	8.8	275	28.0	37.0	32.0	52	4	756.5	0
22.07.2024	7.2	281	26.0	38.0	31.5	55	5	758.0	0
23.07.2024	7.2	267	27.0	37.0	31.5	59	4	758.0	0
24.07.2024	6.7	277	26.5	40.0	32.5	56	3	757.0	0
25.07.2024	7.2	273	27.0	36.0	30.5	61	5	756.0	0
26.07.2024	7.7	277	28.0	39.0	32.2	55	5	756.0	0
27.07.2024	6.7	275	28.0	37.5	32.5	54	4	756.0	0
28.07.2024	7.7	285	26.5	38.0	31.5	56	5	755.0	0
29.07.2024	8.8	285	27.5	36.0	31.0	58	6	755.0	0
30.07.2024	7.5	281	26.5	37.0	31.0	61	6	757.0	1.5
31.07.2024	7.2	292	28.0	35.0	31.0	58	5	757.5	0
Monthly Abstract	7.4	274.7	25.0	40.0	31.0	60.9	4.7	756.5	7.0

Note : Abstract values are taken from the hourly readings (00:00-24:00 hrs.) recorded continuously during the monitoring period.

Table : 3.5 Micrometeorological Data – Aug. 2024

Location : RR Nagar Plant

Date	Mean Wind Velocity, kmph	Pred. Wind Direction in Deg. (from)	Temperature, °C			Relative Humidity (Mean), %	Cloud Cover, oktas	Atm. Pressure (Mean), mm of Hg	Rain-fall, mm
			Min.	Max.	Mean				
01.08.2024	6.2	281	26.0	39.0	32.0	58	4	757.5	0
02.08.2024	7.2	284	28.0	38.0	31.0	59	4	757.5	0
03.08.2024	6.2	297	27.0	39.0	31.5	59	3	758.0	0
04.08.2024	5.1	214	26.0	38.0	31.5	61	4	758.0	1.0
05.08.2024	4.1	273	25.0	35.0	29.0	75	6	758.5	0
06.08.2024	4.6	342	25.0	38.0	29.5	72	5	757.5	1.0
07.08.2024	5.1	283	25.0	34.5	28.5	76	6	758.0	0
08.08.2024	3.1	254	25.0	34.0	28.0	78	5	758.5	0
09.08.2024	5.1	289	25.0	35.0	29.5	72	4	758.0	0
10.08.2024	5.1	282	25.0	36.0	29.5	71	4	758.0	0
11.08.2024	6.2	270	24.0	34.0	29.0	78	6	757.0	0
12.08.2024	5.1	263	25.0	36.0	29.5	75	3	756.0	0
13.08.2024	5.1	293	25.0	34.0	29.0	78	5	756.5	1.5
14.08.2024	3.1	311	26.0	33.0	28.0	81	5	756.0	0
15.08.2024	4.1	226	26.0	35.0	29.5	79	4	755.5	0
16.08.2024	4.1	288	26.8	35.0	30.0	77	5	755.0	0
17.08.2024	3.6	235	27.0	35.0	29.0	80	5	756.0	0
18.08.2024	4.6	213	26.0	35.0	30.0	73	4	756.5	0
19.08.2024	4.1	238	25.0	35.0	28.5	81	5	756.5	1.5
20.08.2024	4.1	296	25.0	34.0	28.5	80	4	756.5	0
21.08.2024	6.2	226	25.0	34.0	28.5	75	4	758.0	0
22.08.2024	4.1	283	26.0	34.0	29.0	72	6	758.5	0
23.08.2024	4.1	241	26.0	35.5	29.5	76	4	759.0	0
24.08.2024	7.7	261	25.0	36.0	30.0	70	4	759.5	0
25.08.2024	6.7	271	26.0	37.0	30.5	57	4	759.0	0
26.08.2024	7.7	251	25.0	38.0	31.0	59	4	758.5	0
27.08.2024	7.7	269	26.0	38.0	31.0	59	3	758.5	0
28.08.2024	6.2	300	26.0	36.0	30.5	61	6	758.0	0
29.08.2024	6.2	288	27.0	37.0	30.5	62	5	757.5	0
30.08.2024	6.2	291	26.0	33.0	29.5	67	5	757.5	0
31.08.2024	10.3	275	26.0	38.0	30.5	65	5	757.0	0
Monthly Abstract	5.5	270.5	24.0	39.0	29.7	70.5	4.5	757.5	5.0

Note : Abstract values are taken from the hourly readings (00:00-24:00 hrs.) recorded continuously during the monitoring period.

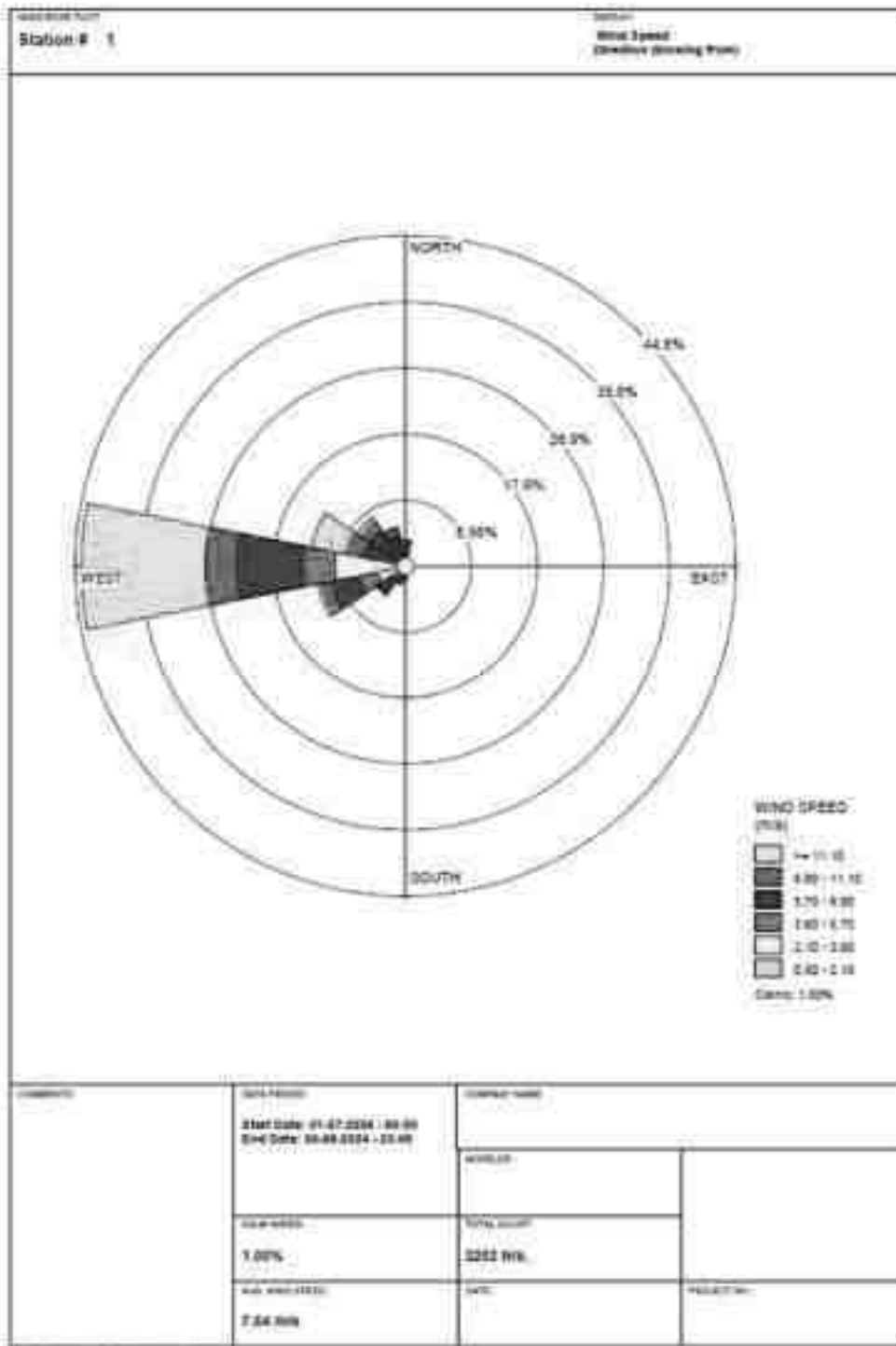
Table : 3.6 Micrometeorological Data – Sep.2024

Location : RR Nagar Plant

Date	Mean Wind Velocity, kmph	Pred. Wind Direction in Deg. (from)	Temperature, °C			Relative Humidity (Mean), %	Cloud Cover, oktas	Atm. Pressure (Mean), mm of Hg	Rain fall, mm
			Min.	Max.	Mean				
01.09.2024	4.6	286	26.0	37.0	30.5	65	4	756.6	0
02.09.2024	6.2	293	27.0	37.0	31.0	60	4	756.8	0
03.09.2024	7.2	272	27.0	37.0	31.5	58	5	757.7	0
04.09.2024	6.2	295	26.0	38.0	31.5	56	3	757.8	0
05.09.2024	5.1	313	27.0	39.0	32.0	55	3	757.0	0
06.09.2024	5.1	323	27.5	38.0	32.0	57	4	757.1	0
07.09.2024	6.2	315	27.0	38.0	32.0	55	3	757.4	0
08.09.2024	9.3	273	27.0	37.0	31.5	57	3	758.3	0
09.09.2024	7.2	270	28.0	37.0	31.5	56	3	756.9	0
10.09.2024	7.2	262	27.0	38.0	32.0	56	3	756.8	0
11.09.2024	7.7	271	28.0	38.0	32.0	57	4	757.8	0
12.09.2024	8.2	285	28.0	39.0	33.0	52	3	758.2	0
13.09.2024	7.2	311	27.0	39.0	32.5	53	3	757.7	0
14.09.2024	8.8	292	27.25	39.0	32.5	54	3	757.4	0
15.09.2024	6.2	304	27.0	38.0	32.5	53	4	757.4	0
16.09.2024	5.1	247	27.0	39.0	32.5	53	3	757.2	0
17.09.2024	4.1	230	28.0	40.0	33.0	51	2	757.0	0
18.09.2024	5.7	219	27.0	39.0	31.0	54	3	756.2	0
19.09.2024	4.1	217	27.0	39.0	32.0	53	3	756.5	0
20.09.2024	4.6	214	27.0	39.0	32.0	51	3	756.4	0
21.09.2024	4.6	270	27.0	37.0	32.0	53	3	756.6	0
22.09.2024	4.6	244	26.0	37.0	32.0	51	3	756.2	0
23.09.2024	7.7	230	28.0	38.0	32.0	54	4	755.8	0
24.09.2024	8.2	287	28.0	39.0	32.5	51	4	755.5	0
25.09.2024	6.2	296	27.0	40.0	33.0	51	3	755.6	0
26.09.2024	6.2	315	28.0	37.0	32.0	55	4	756.2	0
27.09.2024	6.2	327	27.0	39.0	31.5	59	4	757.5	0
28.09.2024	7.2	260	26.0	38.0	30.5	68	4	758.2	0
29.09.2024	5.7	279	25.0	36.0	30.5	70	4	759.0	0.5
30.09.2024	5.1	265	25.0	32.0	28.5	79	5	759.4	2.0
Monthly Abstract	6.3	275.5	25.0	40.0	31.8	56.6	3.5	757.1	2.5

Note : Abstract values are taken from the hourly readings (00:00-24:00 hrs.) recorded continuously during the monitoring period.

Fig. : 3.4 Seasonal Wind Rose
 Location : RR Nagar Plant
 Premonsoon (Jul.-Sep.) 2024



3.5 Ambient Air Quality

3.5.1 Monitoring Locations

Existing Cement and Power Plants are the major industries in operation within the Study Area. Sivakasi Region and this part of Virudhunagar District are famous for Match Industries, Fire Cracker and Printing Industries. AAQ Monitoring Stations were selected based on the **Upwind & Downwind directions** for that Season and also considering the Annual Wind Rose (**Table 3.7**). **Mobile Monitoring Stations** were also established for the monitoring.

Table : 3.7 Ambient Air Quality Monitoring Stations - Location & Bearing

Sl. No.	Location	North Latitude	East Longitude	Direction from Plant	Distance from Plant, km	Location Scenario
1	A1-RCL Plant	09°27'09.86"	77°55'36.54"	-	-	-
2	A2-Vachchakarapatti	09°28'06.88"	77°56'02.83"	NNE	0.5	Crosswind
3	A3-Sennalkudi	09°30'21.46"	77°59'26.90"	NE	7.6	Downwind
4	A4-Valaiyapatti	09°27'18.15"	77°58'54.51"	E	5.0	Downwind
5	A5-Avudaiyapuram	09°26'36.69"	77°56'58.95"	ESE	2.5	Downwind
6	A6-Etturvattam	09°23'33.91"	77°54'41.74"	S	5.3	Downwind
7	A7-Kumaralingapuram	09°25'46.35"	77°54'01.87"	SW	2.5	Upwind
8	A8-Puchakkapatti	09°27'19.4"	77°51'26.1"	W	6.0	Upwind
9	A9-Sankaralingapuram	09°30'42.85"	77°53'38.45"	NW	6.0	Upwind
10	A10-Sulakkarai	09°32'11.95"	77°56'31.33"	NNE	8.2	Crosswind

3.5.2 AAQ Status

All **12 AAQ parameters (24/8/1 hourly basis)** were monitored in compliance with NAAQ Norms. The monitored ambient air quality data are presented in **Tables 3.8-3.17**. The abstract of those monitored data is given as **Table 3.18** and ambient air quality status in the study area as **Table 3.19**. During the study, each **240 samples** were collected, analysed and reported. On the synthesized data, the following observations are made :

PM_{2.5} values (24 hours Time Weighted) were monitored in the range between 10-38 **microgram/cu.m (ug/m³)** in the Study Area with a **mean value of 21.7 ug/m³** against NAAQ Norm value of **60 ug/m³** (24 hours Time Weighted).

PM₁₀ values were monitored in the range between 13-65 **ug/m³** with a **mean value of 39.0 ug/m³** against NAAQ Norm value of **100 ug/m³** (24 hours Time Weighted).

SO₂ values were monitored in the range between 6-24 ug/m³ with a **mean value of 11.4 ug/m³** against NAAQ limit value of **80 ug/m³** (24 hours Time Weighted).

NO_x values were monitored in the range between 7-27 ug/m³ with a **mean value of 13.9 ug/m³** against NAAQ limit value of **80 ug/m³** (24 hours Time Weighted).

Ammonia (NH₃) concentrations were monitored **less than 5 ug/m³** at all monitoring locations against NAAQ limit value of 400 ug/m³ (24 hours Time Weighted).

O₃ concentrations (**hourly samples reported for 8-hour average**) were monitored in the range between 10-35.4 ug/m³ with a **mean value of 15.1 ug/m³** against NAAQ limit value of 100 ug/m³ (8 hours Time Weighted).

CO : Monitored values were **less than 1000 ug/m³** during the study period against NAAQ limit value of 2 mg/m³ (2,000 ug/m³) (8 hours Time Weighted).

Particulate Lead (Pb) concentrations were monitored **less than 0.1 ug/m³** at all monitoring locations against NAAQ limit value of 1.0 ug/m³ (24 hours Time Weighted).

Arsenic (As) concentrations were monitored **less than 1 nanogram/cu.m (ng/m³)** at all monitoring locations against NAAQ limit value of 6 ng/m³ (annual mean).

Nickel (Ni) concentrations were monitored **less than 1 ng/m³** at all monitoring locations against NAAQ limit value of 20 ng/m³ (annual mean).

Benzene (C₆H₆) concentrations were monitored **less than 0.01 ug/m³** at all monitoring locations against NAAQ limit value of 5 ug/m³ (annual mean).

Benzo(a) Pyrene (BaP) concentrations were monitored **less than 0.1 ng/m³** at all monitoring locations against NAAQ limit value of 1.0 ng/m³ (annual mean).

While comparing with the National Ambient Air Quality (NAAQ) Standards revised as per GSR 826(E) dated 16.11.2009, **all monitored values were found to be well within the respective limit values for 24-hourly periods** for Industrial, Residential, Rural and other Areas.

Table : 3.8 Ambient Air Quality Data at A1-RCL RR Nagar Plant

Season : Premonsoon (Jul.-Sep.2024)

Sample Size : 24 hly. (otherwise mentioned)

Monitoring		Particulates, ug/m ³		Gaseous Pollutants, ug/m ³					Other Pollutants (Particulate Phase)				
Date	Period, hrs.	PM2.5	PM10	SO ₂	NOx	NH ₃	O ₃ (8-hly Avg.)	CO (8-hly Avg.)	Pb, ug/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , ug/m ³	BaP, ng/m ³
04-05.07.2024	06:00-06:00	32	58	10	13	<5	22.7	<1000	<0.1	<1	<1	<0.01	<0.1
05-06.07.2024	06:00-06:00	28	54	12	15	<5	20.4	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.07.2024	06:00-06:00	35	62	11	14	<5	19.3	<1000	<0.1	<1	<1	<0.01	<0.1
13-14.07.2024	06:00-06:00	31	57	13	17	<5	21.6	<1000	<0.1	<1	<1	<0.01	<0.1
20-21.07.2024	06:00-06:00	34	60	10	14	<5	28.4	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.07.2024	06:00-06:00	37	62	12	15	<5	27.2	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.07.2024	06:00-06:00	33	58	14	18	<5	20.6	<1000	<0.1	<1	<1	<0.01	<0.1
29-30.07.2024	06:00-06:00	30	55	12	15	<5	21.3	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.08.2024	06:00-06:00	26	51	13	17	<5	20.5	<1000	<0.1	<1	<1	<0.01	<0.1
04-05.08.2024	06:00-06:00	30	54	11	14	<5	27.2	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.08.2024	06:00-06:00	34	58	15	21	<5	25.1	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.08.2024	06:00-06:00	31	56	12	16	<5	24.3	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.08.2024	06:00-06:00	33	55	14	18	<5	22.6	<1000	<0.1	<1	<1	<0.01	<0.1
22-23.08.2024	06:00-06:00	38	60	13	15	<5	21.8	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.08.2024	06:00-06:00	32	54	12	14	<5	20.7	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.08.2024	06:00-06:00	30	51	14	18	<5	21.3	<1000	<0.1	<1	<1	<0.01	<0.1
05-06.09.2024	06:00-06:00	27	49	16	20	<5	22.7	<1000	<0.1	<1	<1	<0.01	<0.1
06-07.09.2024	06:00-06:00	30	53	13	17	<5	24.1	<1000	<0.1	<1	<1	<0.01	<0.1
13-14.09.2024	06:00-06:00	34	56	15	21	<5	20.6	<1000	<0.1	<1	<1	<0.01	<0.1
14-15.09.2024	06:00-06:00	38	65	14	18	<5	15.8	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.09.2024	06:00-06:00	35	60	12	15	<5	20.1	<1000	<0.1	<1	<1	<0.01	<0.1
22-23.09.2024	06:00-06:00	33	55	13	17	<5	17.4	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.09.2024	06:00-06:00	30	53	15	19	<5	18.3	<1000	<0.1	<1	<1	<0.01	<0.1
29-30.09.2024	06:00-06:00	37	63	14	17	<5	20.1	<1000	<0.1	<1	<1	<0.01	<0.1
Range (Minimum-Maximum)		26-38	49-65	10-16	13-21	<5	15.8-28.4	<1000	<0.1	<1	<1	<0.01	<0.1
Mean Value		32.4	56.6	12.9	16.6	<5	21.8	<1000	<0.1	<1	<1	<0.01	<0.1
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2,000 (8 hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)

Legend : **PM2.5**-Particulate Matter size less than 2.5 um; **PM10**-Respirable Particulate Matter size less than 10 um; **SO₂**-Sulphur dioxide; **NOx**-Oxides of Nitrogen; **NH₃**-Ammonia; **O₃**-Ozone; **CO**-Carbon monoxide; **Pb**-Particulate Lead; **As**-Particulate Arsenic; **Ni**-Particulate Nickel; **C₆H₆**-Benzene & **BaP**- Benzo (a) pyrene in particulate phase. ug-microgram & ng-nanogram.

* : **NAAQ Norms**-National Ambient Air Quality Norms-Revised as per GSR 826(E) dated 16.11.2009 for Industrial, Residential, Rural and other Areas.

Table : 3.9 Ambient Air Quality Data at A2-Vachchakarapatti

Season : Premonsoon (Jul.-Sep.2024)

Sample Size : 24 hly. (otherwise mentioned)

Monitoring		Particulates, ug/m ³		Gaseous Pollutants, ug/m ³					Other Pollutants (Particulate Phase)				
Date	Period, hrs.	PM2.5	PM10	SO ₂	NOx	NH ₃	O ₃ (8-hly Avg.)	CO (8-hly Avg.)	Pb, ug/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , ug/m ³	BaP, ng/m ³
04-05.07.2024	06:00-06:00	35	62	18	21	<5	26.4	<1000	<0.1	<1	<1	<0.01	<0.1
05-06.07.2024	06:00-06:00	33	58	22	24	<5	30.7	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.07.2024	06:00-06:00	28	50	18	20	<5	32.1	<1000	<0.1	<1	<1	<0.01	<0.1
13-14.07.2024	06:00-06:00	31	54	23	26	<5	30.6	<1000	<0.1	<1	<1	<0.01	<0.1
20-21.07.2024	06:00-06:00	30	51	17	19	<5	32.1	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.07.2024	06:00-06:00	34	55	20	23	<5	35.4	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.07.2024	06:00-06:00	29	51	18	21	<5	33.7	<1000	<0.1	<1	<1	<0.01	<0.1
29-30.07.2024	06:00-06:00	33	54	16	20	<5	32.8	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.08.2024	06:00-06:00	37	58	15	18	<5	30.1	<1000	<0.1	<1	<1	<0.01	<0.1
04-05.08.2024	06:00-06:00	26	50	21	26	<5	26.7	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.08.2024	06:00-06:00	30	53	17	20	<5	26.9	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.08.2024	06:00-06:00	24	47	15	18	<5	30.2	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.08.2024	06:00-06:00	34	55	16	19	<5	28.4	<1000	<0.1	<1	<1	<0.01	<0.1
22-23.08.2024	06:00-06:00	37	58	20	24	<5	23.7	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.08.2024	06:00-06:00	30	54	22	24	<5	22.6	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.08.2024	06:00-06:00	35	57	17	20	<5	29.1	<1000	<0.1	<1	<1	<0.01	<0.1
05-06.09.2024	06:00-06:00	33	55	19	22	<5	25.4	<1000	<0.1	<1	<1	<0.01	<0.1
06-07.09.2024	06:00-06:00	30	53	21	25	<5	30.7	<1000	<0.1	<1	<1	<0.01	<0.1
13-14.09.2024	06:00-06:00	34	57	17	20	<5	32.1	<1000	<0.1	<1	<1	<0.01	<0.1
14-15.09.2024	06:00-06:00	32	52	20	24	<5	28.1	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.09.2024	06:00-06:00	30	50	22	26	<5	26.7	<1000	<0.1	<1	<1	<0.01	<0.1
22-23.09.2024	06:00-06:00	28	48	24	27	<5	25.9	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.09.2024	06:00-06:00	31	52	21	25	<5	28.2	<1000	<0.1	<1	<1	<0.01	<0.1
29-30.09.2024	06:00-06:00	26	46	23	27	<5	30.4	<1000	<0.1	<1	<1	<0.01	<0.1
Range (Minimum-Maximum)		24-37	46-62	15-24	18-27	<5	22.6-35.4	<1000	<0.1	<1	<1	<0.01	<0.1
Mean Value		31.3	53.3	19.3	22.5	<5	29.1	<1000	<0.1	<1	<1	<0.01	<0.1
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2,000 (8 hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)

Legend : **PM2.5**-Particulate Matter size less than 2.5 um; **PM10**-Respirable Particulate Matter size less than 10 um; **SO₂**-Sulphur dioxide; **NOx**-Oxides of Nitrogen; **NH₃**-Ammonia; **O₃**-Ozone; **CO**-Carbon monoxide; **Pb**-Particulate Lead; **As**-Particulate Arsenic; **Ni**-Particulate Nickel; **C₆H₆**-Benzene & **BaP**- Benzo (a) pyrene in particulate phase. ug-microgram & ng-nanogram.

* : **NAAQ Norms**-National Ambient Air Quality Norms-Revised as per GSR 826(E) dated 16.11.2009 for Industrial, Residential, Rural and other Areas.

Table : 3.10 Ambient Air Quality Data at A3-Sennalkudi

Season : Premonsoon (Jul.-Sep.2024)

Sample Size : 24 hly. (otherwise mentioned)

Monitoring		Particulates, ug/m ³		Gaseous Pollutants, ug/m ³					Other Pollutants (Particulate Phase)				
Date	Period, hrs.	PM2.5	PM10	SO ₂	NOx	NH ₃	O ₃ (8-hly Avg.)	CO (8-hly Avg.)	Pb, ug/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , ug/m ³	BaP, ng/m ³
04-05.07.2024	06:00-06:00	14	27	6	8	<5	10.1	<1000	<0.1	<1	<1	<0.01	<0.1
05-06.07.2024	06:00-06:00	17	31	7	8	<5	10.6	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.07.2024	06:00-06:00	13	25	6	7	<5	11.2	<1000	<0.1	<1	<1	<0.01	<0.1
13-14.07.2024	06:00-06:00	15	29	8	9	<5	10.7	<1000	<0.1	<1	<1	<0.01	<0.1
20-21.07.2024	06:00-06:00	12	24	8	10	<5	10.5	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.07.2024	06:00-06:00	16	30	7	8	<5	12.1	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.07.2024	06:00-06:00	12	21	7	9	<5	11.5	<1000	<0.1	<1	<1	<0.01	<0.1
29-30.07.2024	06:00-06:00	14	25	8	10	<5	10.7	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.08.2024	06:00-06:00	15	28	9	11	<5	10.3	<1000	<0.1	<1	<1	<0.01	<0.1
04-05.08.2024	06:00-06:00	12	24	8	10	<5	13.6	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.08.2024	06:00-06:00	14	20	7	8	<5	12.8	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.08.2024	06:00-06:00	17	31	7	9	<5	11.4	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.08.2024	06:00-06:00	13	24	8	10	<5	10.5	<1000	<0.1	<1	<1	<0.01	<0.1
22-23.08.2024	06:00-06:00	16	30	6	8	<5	11.2	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.08.2024	06:00-06:00	12	23	8	9	<5	10.3	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.08.2024	06:00-06:00	11	20	7	8	<5	11.7	<1000	<0.1	<1	<1	<0.01	<0.1
05-06.09.2024	06:00-06:00	15	28	6	7	<5	10.1	<1000	<0.1	<1	<1	<0.01	<0.1
06-07.09.2024	06:00-06:00	12	23	9	10	<5	10.5	<1000	<0.1	<1	<1	<0.01	<0.1
13-14.09.2024	06:00-06:00	16	33	8	9	<5	10.4	<1000	<0.1	<1	<1	<0.01	<0.1
14-15.09.2024	06:00-06:00	14	27	7	8	<5	10.8	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.09.2024	06:00-06:00	13	25	8	10	<5	10.0	<1000	<0.1	<1	<1	<0.01	<0.1
22-23.09.2024	06:00-06:00	15	31	7	9	<5	11.2	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.09.2024	06:00-06:00	18	34	7	8	<5	10.6	<1000	<0.1	<1	<1	<0.01	<0.1
29-30.09.2024	06:00-06:00	21	38	8	11	<5	11.0	<1000	<0.1	<1	<1	<0.01	<0.1
Range (Minimum-Maximum)		11-21	20-38	6-9	7-11	<5	10-13.6	<1000	<0.1	<1	<1	<0.01	<0.1
Mean Value		14.5	27.1	7.4	8.9	<5	11.0	<1000	<0.1	<1	<1	<0.01	<0.1
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2,000 (8 hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)

Legend : **PM2.5**-Particulate Matter size less than 2.5 um; **PM10**-Respirable Particulate Matter size less than 10 um; **SO₂**-Sulphur dioxide; **NOx**-Oxides of Nitrogen; **NH₃**-Ammonia; **O₃**-Ozone; **CO**-Carbon monoxide; **Pb**-Particulate Lead; **As**-Particulate Arsenic; **Ni**-Particulate Nickel; **C₆H₆**-Benzene & **BaP**- Benzo (a) pyrene in particulate phase. ug-microgram & ng-nanogram.

* : **NAAQ Norms**-National Ambient Air Quality Norms-Revised as per GSR 826(E) dated 16.11.2009 for Industrial, Residential, Rural and other Areas.

Table : 3.11 Ambient Air Quality Data at A4-Valaiyapatti

Season : Premonsoon (Jul.-Sep.2024)

Sample Size : 24 hly. (otherwise mentioned)

Monitoring		Particulates, ug/m ³		Gaseous Pollutants, ug/m ³					Other Pollutants (Particulate Phase)				
Date	Period, hrs.	PM2.5	PM10	SO ₂	NOx	NH ₃	O ₃ (8-hly Avg.)	CO (8-hly Avg.)	Pb, ug/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , ug/m ³	BaP, ng/m ³
04-05.07.2024	06:00-06:00	10	18	6	7	<5	12.4	<1000	<0.1	<1	<1	<0.01	<0.1
05-06.07.2024	06:00-06:00	17	30	8	9	<5	10.7	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.07.2024	06:00-06:00	15	27	7	8	<5	10.2	<1000	<0.1	<1	<1	<0.01	<0.1
13-14.07.2024	06:00-06:00	13	24	9	10	<5	11.0	<1000	<0.1	<1	<1	<0.01	<0.1
20-21.07.2024	06:00-06:00	15	29	10	11	<5	10.6	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.07.2024	06:00-06:00	12	22	9	10	<5	10.4	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.07.2024	06:00-06:00	14	25	8	9	<5	10.2	<1000	<0.1	<1	<1	<0.01	<0.1
29-30.07.2024	06:00-06:00	11	21	8	10	<5	10.0	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.08.2024	06:00-06:00	10	20	10	12	<5	11.3	<1000	<0.1	<1	<1	<0.01	<0.1
04-05.08.2024	06:00-06:00	13	24	7	9	<5	10.7	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.08.2024	06:00-06:00	11	21	9	11	<5	12.4	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.08.2024	06:00-06:00	15	27	9	10	<5	12.1	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.08.2024	06:00-06:00	12	24	11	12	<5	11.5	<1000	<0.1	<1	<1	<0.01	<0.1
22-23.08.2024	06:00-06:00	14	28	10	11	<5	12.3	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.08.2024	06:00-06:00	12	23	8	10	<5	10.6	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.08.2024	06:00-06:00	13	25	11	13	<5	12.1	<1000	<0.1	<1	<1	<0.01	<0.1
05-06.09.2024	06:00-06:00	16	29	10	12	<5	15.2	<1000	<0.1	<1	<1	<0.01	<0.1
06-07.09.2024	06:00-06:00	14	25	8	10	<5	10.4	<1000	<0.1	<1	<1	<0.01	<0.1
13-14.09.2024	06:00-06:00	17	31	9	11	<5	10.7	<1000	<0.1	<1	<1	<0.01	<0.1
14-15.09.2024	06:00-06:00	12	26	7	9	<5	11.8	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.09.2024	06:00-06:00	15	32	8	10	<5	10.6	<1000	<0.1	<1	<1	<0.01	<0.1
22-23.09.2024	06:00-06:00	18	35	8	9	<5	10.0	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.09.2024	06:00-06:00	14	30	7	9	<5	12.1	<1000	<0.1	<1	<1	<0.01	<0.1
29-30.09.2024	06:00-06:00	16	33	7	8	<5	10.4	<1000	<0.1	<1	<1	<0.01	<0.1
Range (Minimum-Maximum)		10-18	18-35	6-11	7-13	<5	10-15.2	<1000	<0.1	<1	<1	<0.01	<0.1
Mean Value		13.7	26.2	8.5	10.0	<5	11.2	<1000	<0.1	<1	<1	<0.01	<0.1
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2,000 (8 hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)

Legend : **PM2.5**-Particulate Matter size less than 2.5 um; **PM10**-Respirable Particulate Matter size less than 10 um; **SO₂**-Sulphur dioxide; **NOx**-Oxides of Nitrogen; **NH₃**-Ammonia; **O₃**-Ozone; **CO**-Carbon monoxide; **Pb**-Particulate Lead; **As**-Particulate Arsenic; **Ni**-Particulate Nickel; **C₆H₆**-Benzene & **BaP**- Benzo (a) pyrene in particulate phase. ug-microgram & ng-nanogram.

* : **NAAQ Norms**-National Ambient Air Quality Norms-Revised as per GSR 826(E) dated 16.11.2009 for Industrial, Residential, Rural and other Areas.

Table : 3.12 Ambient Air Quality Data at A5-Avudaiyapuram

Season : Premonsoon (Jul.-Sep.2024)

(Ore Transport Road)

Sample Size : 24 hly. (otherwise mentioned)

Monitoring		Particulates, ug/m ³		Gaseous Pollutants, ug/m ³					Other Pollutants (Particulate Phase)				
Date	Period, hrs.	PM2.5	PM10	SO ₂	NOx	NH ₃	O ₃ (8-hly Avg.)	CO (8-hly Avg.)	Pb, ug/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , ug/m ³	BaP, ng/m ³
04-05.07.2024	06:00-06:00	19	35	13	15	<5	11.4	<1000	<0.1	<1	<1	<0.01	<0.1
05-06.07.2024	06:00-06:00	20	38	11	14	<5	12.3	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.07.2024	06:00-06:00	18	34	10	13	<5	10.7	<1000	<0.1	<1	<1	<0.01	<0.1
13-14.07.2024	06:00-06:00	22	40	12	15	<5	12.1	<1000	<0.1	<1	<1	<0.01	<0.1
20-21.07.2024	06:00-06:00	21	38	11	14	<5	15.4	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.07.2024	06:00-06:00	17	35	10	13	<5	10.7	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.07.2024	06:00-06:00	20	37	13	15	<5	11.3	<1000	<0.1	<1	<1	<0.01	<0.1
29-30.07.2024	06:00-06:00	19	39	12	14	<5	11.6	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.08.2024	06:00-06:00	20	41	16	18	<5	12.1	<1000	<0.1	<1	<1	<0.01	<0.1
04-05.08.2024	06:00-06:00	22	44	12	15	<5	15.2	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.08.2024	06:00-06:00	26	47	14	18	<5	11.4	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.08.2024	06:00-06:00	20	42	11	14	<5	12.0	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.08.2024	06:00-06:00	23	45	13	15	<5	11.8	<1000	<0.1	<1	<1	<0.01	<0.1
22-23.08.2024	06:00-06:00	20	38	10	12	<5	10.6	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.08.2024	06:00-06:00	18	34	12	15	<5	11.3	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.08.2024	06:00-06:00	21	41	15	16	<5	10.7	<1000	<0.1	<1	<1	<0.01	<0.1
05-06.09.2024	06:00-06:00	23	44	10	13	<5	12.1	<1000	<0.1	<1	<1	<0.01	<0.1
06-07.09.2024	06:00-06:00	22	40	12	15	<5	11.8	<1000	<0.1	<1	<1	<0.01	<0.1
13-14.09.2024	06:00-06:00	24	46	15	17	<5	12.5	<1000	<0.1	<1	<1	<0.01	<0.1
14-15.09.2024	06:00-06:00	20	43	13	16	<5	11.6	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.09.2024	06:00-06:00	23	45	15	19	<5	12.1	<1000	<0.1	<1	<1	<0.01	<0.1
22-23.09.2024	06:00-06:00	27	48	14	17	<5	10.4	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.09.2024	06:00-06:00	21	38	12	15	<5	11.3	<1000	<0.1	<1	<1	<0.01	<0.1
29-30.09.2024	06:00-06:00	28	52	16	20	<5	13.7	<1000	<0.1	<1	<1	<0.01	<0.1
Range (Minimum-Maximum)		17-28	34-52	10-16	12-20	<5	10.4-15.4	<1000	<0.1	<1	<1	<0.01	<0.1
Mean Value		21.4	41.0	12.6	15.3	<5	11.9	<1000	<0.1	<1	<1	<0.01	<0.1
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2,000 (8 hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)

Legend : **PM2.5**-Particulate Matter size less than 2.5 um; **PM10**-Respirable Particulate Matter size less than 10 um; **SO₂**-Sulphur dioxide; **NOx**-Oxides of Nitrogen; **NH₃**-Ammonia; **O₃**-Ozone; **CO**-Carbon monoxide; **Pb**-Particulate Lead; **As**-Particulate Arsenic; **Ni**-Particulate Nickel; **C₆H₆**-Benzene & **BaP**- Benzo (a) pyrene in particulate phase. ug-microgram & ng-nanogram.

* : **NAAQ Norms**-National Ambient Air Quality Norms-Revised as per GSR 826(E) dated 16.11.2009 for Industrial, Residential, Rural and other Areas.

Table : 3.13 Ambient Air Quality Data at A6-Etturvattam

Season : Premonsoon (Jul.-Sep.2024)

Sample Size : 24 hly. (otherwise mentioned)

Monitoring		Particulates, ug/m ³		Gaseous Pollutants, ug/m ³					Other Pollutants (Particulate Phase)				
Date	Period, hrs.	PM2.5	PM10	SO ₂	NOx	NH ₃	O ₃ (8-hly Avg.)	CO (8-hly Avg.)	Pb, ug/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , ug/m ³	BaP, ng/m ³
04-05.07.2024	06:00-06:00	21	43	11	14	<5	14.1	<1000	<0.1	<1	<1	<0.01	<0.1
05-06.07.2024	06:00-06:00	19	40	13	16	<5	12.8	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.07.2024	06:00-06:00	23	45	15	18	<5	15.1	<1000	<0.1	<1	<1	<0.01	<0.1
13-14.07.2024	06:00-06:00	24	47	12	14	<5	13.6	<1000	<0.1	<1	<1	<0.01	<0.1
20-21.07.2024	06:00-06:00	20	43	14	17	<5	12.7	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.07.2024	06:00-06:00	26	53	17	21	<5	14.4	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.07.2024	06:00-06:00	22	41	16	18	<5	12.1	<1000	<0.1	<1	<1	<0.01	<0.1
29-30.07.2024	06:00-06:00	24	45	12	15	<5	15.3	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.08.2024	06:00-06:00	27	49	14	19	<5	12.8	<1000	<0.1	<1	<1	<0.01	<0.1
04-05.08.2024	06:00-06:00	25	45	15	20	<5	16.1	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.08.2024	06:00-06:00	30	51	13	16	<5	13.6	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.08.2024	06:00-06:00	28	48	11	15	<5	12.7	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.08.2024	06:00-06:00	31	53	15	17	<5	15.1	<1000	<0.1	<1	<1	<0.01	<0.1
22-23.08.2024	06:00-06:00	25	46	13	19	<5	11.4	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.08.2024	06:00-06:00	33	52	14	18	<5	13.7	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.08.2024	06:00-06:00	30	52	17	20	<5	20.2	<1000	<0.1	<1	<1	<0.01	<0.1
05-06.09.2024	06:00-06:00	26	48	15	18	<5	15.8	<1000	<0.1	<1	<1	<0.01	<0.1
06-07.09.2024	06:00-06:00	29	50	16	19	<5	13.2	<1000	<0.1	<1	<1	<0.01	<0.1
13-14.09.2024	06:00-06:00	30	54	14	18	<5	17.1	<1000	<0.1	<1	<1	<0.01	<0.1
14-15.09.2024	06:00-06:00	32	55	18	20	<5	20.1	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.09.2024	06:00-06:00	27	51	15	18	<5	12.2	<1000	<0.1	<1	<1	<0.01	<0.1
22-23.09.2024	06:00-06:00	30	58	16	18	<5	14.7	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.09.2024	06:00-06:00	24	46	13	15	<5	15.9	<1000	<0.1	<1	<1	<0.01	<0.1
29-30.09.2024	06:00-06:00	28	48	15	17	<5	12.8	<1000	<0.1	<1	<1	<0.01	<0.1
Range (Minimum-Maximum)		19-33	40-58	11-18	14-21	<5	11.4-20.2	<1000	<0.1	<1	<1	<0.01	<0.1
Mean Value		26.4	48.5	14.3	17.5	<5	14.5	<1000	<0.1	<1	<1	<0.01	<0.1
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2,000 (8 hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)

Legend : **PM2.5**-Particulate Matter size less than 2.5 um; **PM10**-Respirable Particulate Matter size less than 10 um; **SO₂**-Sulphur dioxide; **NOx**-Oxides of Nitrogen; **NH₃**-Ammonia; **O₃**-Ozone; **CO**-Carbon monoxide; **Pb**-Particulate Lead; **As**-Particulate Arsenic; **Ni**-Particulate Nickel; **C₆H₆**-Benzene & **BaP**- Benzo (a) pyrene in particulate phase. ug-microgram & ng-nanogram.

* : **NAAQ Norms**-National Ambient Air Quality Norms-Revised as per GSR 826(E) dated 16.11.2009 for Industrial, Residential, Rural and other Areas.

Table : 3.14 Ambient Air Quality Data at A7-Kumaralingapuram

Season : Premonsoon (Jul.-Sep.2024)

Sample Size : 24 hly. (otherwise mentioned)

Monitoring		Particulates, ug/m ³		Gaseous Pollutants, ug/m ³					Other Pollutants (Particulate Phase)				
Date	Period, hrs.	PM2.5	PM10	SO ₂	NOx	NH ₃	O ₃ (8-hly Avg.)	CO (8-hly Avg.)	Pb, ug/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , ug/m ³	BaP, ng/m ³
04-05.07.2024	06:00-06:00	20	37	9	11	<5	10.4	<1000	<0.1	<1	<1	<0.01	<0.1
05-06.07.2024	06:00-06:00	21	39	8	10	<5	10.7	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.07.2024	06:00-06:00	18	35	7	8	<5	11.2	<1000	<0.1	<1	<1	<0.01	<0.1
13-14.07.2024	06:00-06:00	23	40	9	10	<5	10.5	<1000	<0.1	<1	<1	<0.01	<0.1
20-21.07.2024	06:00-06:00	26	42	8	10	<5	10.1	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.07.2024	06:00-06:00	22	39	10	12	<5	10.0	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.07.2024	06:00-06:00	18	34	8	11	<5	13.1	<1000	<0.1	<1	<1	<0.01	<0.1
29-30.07.2024	06:00-06:00	16	33	7	9	<5	10.7	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.08.2024	06:00-06:00	19	36	9	11	<5	11.5	<1000	<0.1	<1	<1	<0.01	<0.1
04-05.08.2024	06:00-06:00	22	40	8	10	<5	14.0	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.08.2024	06:00-06:00	20	38	10	12	<5	11.8	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.08.2024	06:00-06:00	24	42	8	10	<5	15.1	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.08.2024	06:00-06:00	18	33	9	11	<5	12.4	<1000	<0.1	<1	<1	<0.01	<0.1
22-23.08.2024	06:00-06:00	20	41	9	12	<5	10.6	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.08.2024	06:00-06:00	17	33	7	9	<5	10.3	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.08.2024	06:00-06:00	16	31	11	13	<5	11.8	<1000	<0.1	<1	<1	<0.01	<0.1
05-06.09.2024	06:00-06:00	19	38	8	10	<5	10.4	<1000	<0.1	<1	<1	<0.01	<0.1
06-07.09.2024	06:00-06:00	23	41	9	12	<5	10.9	<1000	<0.1	<1	<1	<0.01	<0.1
13-14.09.2024	06:00-06:00	21	40	11	14	<5	11.2	<1000	<0.1	<1	<1	<0.01	<0.1
14-15.09.2024	06:00-06:00	20	38	10	11	<5	11.5	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.09.2024	06:00-06:00	26	45	8	10	<5	10.2	<1000	<0.1	<1	<1	<0.01	<0.1
22-23.09.2024	06:00-06:00	22	40	9	12	<5	11.3	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.09.2024	06:00-06:00	24	42	8	10	<5	15.2	<1000	<0.1	<1	<1	<0.01	<0.1
29-30.09.2024	06:00-06:00	23	40	10	11	<5	11.8	<1000	<0.1	<1	<1	<0.01	<0.1
Range (Minimum-Maximum)		16-26	31-45	7-11	8-14	<5	10-15.2	<1000	<0.1	<1	<1	<0.01	<0.1
Mean Value		20.8	38.2	8.8	10.8	<5	11.5	<1000	<0.1	<1	<1	<0.01	<0.1
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2,000 (8 hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)

Legend : **PM2.5**-Particulate Matter size less than 2.5 um; **PM10**-Respirable Particulate Matter size less than 10 um; **SO₂**-Sulphur dioxide; **NOx**-Oxides of Nitrogen; **NH₃**-Ammonia; **O₃**-Ozone; **CO**-Carbon monoxide; **Pb**-Particulate Lead; **As**-Particulate Arsenic; **Ni**-Particulate Nickel; **C₆H₆**-Benzene & **BaP**- Benzo (a) pyrene in particulate phase. ug-microgram & ng-nanogram.

* : **NAAQ Norms**-National Ambient Air Quality Norms-Revised as per GSR 826(E) dated 16.11.2009 for Industrial, Residential, Rural and other Areas.

Table : 3.15 Ambient Air Quality Data at A8-Pochakapatti

Season : Premonsoon (Jul.-Sep.2024)

Sample Size : 24 hly. (otherwise mentioned)

Monitoring		Particulates, ug/m ³		Gaseous Pollutants, ug/m ³					Other Pollutants (Particulate Phase)				
Date	Period, hrs.	PM2.5	PM10	SO ₂	NOx	NH ₃	O ₃ (8-hly Avg.)	CO (8-hly Avg.)	Pb, ug/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , ug/m ³	BaP, ng/m ³
04-05.07.2024	06:00-06:00	20	38	10	12	<5	12.4	<1000	<0.1	<1	<1	<0.01	<0.1
05-06.07.2024	06:00-06:00	18	35	9	10	<5	11.7	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.07.2024	06:00-06:00	22	40	11	13	<5	10.6	<1000	<0.1	<1	<1	<0.01	<0.1
13-14.07.2024	06:00-06:00	26	43	13	15	<5	11.3	<1000	<0.1	<1	<1	<0.01	<0.1
20-21.07.2024	06:00-06:00	21	38	12	14	<5	12.4	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.07.2024	06:00-06:00	20	36	11	13	<5	11.8	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.07.2024	06:00-06:00	23	41	10	12	<5	11.5	<1000	<0.1	<1	<1	<0.01	<0.1
29-30.07.2024	06:00-06:00	18	35	15	18	<5	12.1	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.08.2024	06:00-06:00	19	37	12	14	<5	13.6	<1000	<0.1	<1	<1	<0.01	<0.1
04-05.08.2024	06:00-06:00	20	40	14	17	<5	12.1	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.08.2024	06:00-06:00	22	41	10	13	<5	10.7	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.08.2024	06:00-06:00	18	37	12	15	<5	12.4	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.08.2024	06:00-06:00	24	41	12	14	<5	11.8	<1000	<0.1	<1	<1	<0.01	<0.1
22-23.08.2024	06:00-06:00	21	38	13	18	<5	13.6	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.08.2024	06:00-06:00	18	36	10	14	<5	12.4	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.08.2024	06:00-06:00	20	42	11	15	<5	11.8	<1000	<0.1	<1	<1	<0.01	<0.1
05-06.09.2024	06:00-06:00	23	45	12	15	<5	12.6	<1000	<0.1	<1	<1	<0.01	<0.1
06-07.09.2024	06:00-06:00	22	41	11	13	<5	14.1	<1000	<0.1	<1	<1	<0.01	<0.1
13-14.09.2024	06:00-06:00	20	40	10	13	<5	14.5	<1000	<0.1	<1	<1	<0.01	<0.1
14-15.09.2024	06:00-06:00	17	38	14	17	<5	13.7	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.09.2024	06:00-06:00	19	41	11	15	<5	15.2	<1000	<0.1	<1	<1	<0.01	<0.1
22-23.09.2024	06:00-06:00	22	44	13	16	<5	14.3	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.09.2024	06:00-06:00	20	41	10	12	<5	12.1	<1000	<0.1	<1	<1	<0.01	<0.1
29-30.09.2024	06:00-06:00	24	45	12	15	<5	14.0	<1000	<0.1	<1	<1	<0.01	<0.1
Range (Minimum-Maximum)		17-26	35-45	9-15	10-18	<5	10.6-15.2	<1000	<0.1	<1	<1	<0.01	<0.1
Mean Value		20.7	39.7	11.6	14.3	<5	12.6	<1000	<0.1	<1	<1	<0.01	<0.1
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2,000 (8 hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)

Legend : **PM2.5**-Particulate Matter size less than 2.5 um; **PM10**-Respirable Particulate Matter size less than 10 um; **SO₂**-Sulphur dioxide; **NOx**-Oxides of Nitrogen; **NH₃**-Ammonia; **O₃**-Ozone; **CO**-Carbon monoxide; **Pb**-Particulate Lead; **As**-Particulate Arsenic; **Ni**-Particulate Nickel; **C₆H₆**-Benzene & **BaP**- Benzo (a) pyrene in particulate phase. ug-microgram & ng-nanogram.

* : **NAAQ Norms**-National Ambient Air Quality Norms-Revised as per GSR 826(E) dated 16.11.2009 for Industrial, Residential, Rural and other Areas.

Table : 3.16 Ambient Air Quality Data at A9-Sankaralingapuram

Season : Premonsoon (Jul.-Sep.2024)

Sample Size : 24 hly. (otherwise mentioned)

Monitoring		Particulates, ug/m ³		Gaseous Pollutants, ug/m ³					Other Pollutants (Particulate Phase)				
Date	Period, hrs.	PM2.5	PM10	SO ₂	NOx	NH ₃	O ₃ (8-hly Avg.)	CO (8-hly Avg.)	Pb, ug/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , ug/m ³	BaP, ng/m ³
04-05.07.2024	06:00-06:00	12	15	8	10	<5	10.6	<1000	<0.1	<1	<1	<0.01	<0.1
05-06.07.2024	06:00-06:00	14	17	10	12	<5	10.0	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.07.2024	06:00-06:00	13	15	9	11	<5	10.5	<1000	<0.1	<1	<1	<0.01	<0.1
13-14.07.2024	06:00-06:00	15	18	8	10	<5	10.9	<1000	<0.1	<1	<1	<0.01	<0.1
20-21.07.2024	06:00-06:00	11	14	11	13	<5	11.5	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.07.2024	06:00-06:00	13	13	8	10	<5	10.4	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.07.2024	06:00-06:00	14	17	9	10	<5	10.0	<1000	<0.1	<1	<1	<0.01	<0.1
29-30.07.2024	06:00-06:00	11	14	11	14	<5	12.8	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.08.2024	06:00-06:00	11	13	10	12	<5	11.6	<1000	<0.1	<1	<1	<0.01	<0.1
04-05.08.2024	06:00-06:00	12	15	12	15	<5	10.6	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.08.2024	06:00-06:00	16	18	10	11	<5	11.3	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.08.2024	06:00-06:00	13	14	10	13	<5	10.5	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.08.2024	06:00-06:00	15	18	13	15	<5	12.7	<1000	<0.1	<1	<1	<0.01	<0.1
22-23.08.2024	06:00-06:00	11	13	11	14	<5	14.1	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.08.2024	06:00-06:00	14	17	10	12	<5	12.0	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.08.2024	06:00-06:00	12	13	9	11	<5	10.6	<1000	<0.1	<1	<1	<0.01	<0.1
05-06.09.2024	06:00-06:00	10	13	9	10	<5	11.2	<1000	<0.1	<1	<1	<0.01	<0.1
06-07.09.2024	06:00-06:00	12	14	8	10	<5	10.5	<1000	<0.1	<1	<1	<0.01	<0.1
13-14.09.2024	06:00-06:00	12	15	10	13	<5	10.0	<1000	<0.1	<1	<1	<0.01	<0.1
14-15.09.2024	06:00-06:00	16	18	8	10	<5	11.2	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.09.2024	06:00-06:00	13	15	9	11	<5	10.5	<1000	<0.1	<1	<1	<0.01	<0.1
22-23.09.2024	06:00-06:00	14	17	11	13	<5	10.2	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.09.2024	06:00-06:00	17	19	10	13	<5	11.0	<1000	<0.1	<1	<1	<0.01	<0.1
29-30.09.2024	06:00-06:00	13	15	9	11	<5	10.5	<1000	<0.1	<1	<1	<0.01	<0.1
Range (Minimum-Maximum)		10-17	13-19	8-13	10-15	<5	10-14.1	<1000	<0.1	<1	<1	<0.01	<0.1
Mean Value		13.1	15.4	9.7	11.8	<5	11.1	<1000	<0.1	<1	<1	<0.01	<0.1
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2,000 (8 hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)

Legend : **PM2.5**-Particulate Matter size less than 2.5 um; **PM10**-Respirable Particulate Matter size less than 10 um; **SO₂**-Sulphur dioxide; **NOx**-Oxides of Nitrogen; **NH₃**-Ammonia; **O₃**-Ozone; **CO**-Carbon monoxide; **Pb**-Particulate Lead; **As**-Particulate Arsenic; **Ni**-Particulate Nickel; **C₆H₆**-Benzene & **BaP**- Benzo (a) pyrene in particulate phase. ug-microgram & ng-nanogram.

* : **NAAQ Norms**-National Ambient Air Quality Norms-Revised as per GSR 826(E) dated 16.11.2009 for Industrial, Residential, Rural and other Areas.

Table : 3.17 Ambient Air Quality Data at A10-Sulakkarai

Season : Premonsoon (Jul.-Sep.2024)

Sample Size : 24 hly. (otherwise mentioned)

Monitoring		Particulates, ug/m ³		Gaseous Pollutants, ug/m ³					Other Pollutants (Particulate Phase)				
Date	Period, hrs.	PM2.5	PM10	SO ₂	NOx	NH ₃	O ₃ (8-hly Avg.)	CO (8-hly Avg.)	Pb, ug/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , ug/m ³	BaP, ng/m ³
04-05.07.2024	06:00-06:00	20	41	14	17	<5	14.1	<1000	<0.1	<1	<1	<0.01	<0.1
05-06.07.2024	06:00-06:00	23	44	17	20	<5	11.8	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.07.2024	06:00-06:00	21	40	13	15	<5	13.6	<1000	<0.1	<1	<1	<0.01	<0.1
13-14.07.2024	06:00-06:00	24	44	12	15	<5	15.7	<1000	<0.1	<1	<1	<0.01	<0.1
20-21.07.2024	06:00-06:00	27	48	15	18	<5	19.2	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.07.2024	06:00-06:00	25	46	11	14	<5	15.4	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.07.2024	06:00-06:00	23	42	13	17	<5	12.8	<1000	<0.1	<1	<1	<0.01	<0.1
29-30.07.2024	06:00-06:00	21	38	15	18	<5	16.1	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.08.2024	06:00-06:00	24	43	16	18	<5	13.7	<1000	<0.1	<1	<1	<0.01	<0.1
04-05.08.2024	06:00-06:00	20	38	17	19	<5	16.9	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.08.2024	06:00-06:00	23	44	18	21	<5	20.2	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.08.2024	06:00-06:00	25	48	15	18	<5	17.7	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.08.2024	06:00-06:00	22	43	15	16	<5	18.5	<1000	<0.1	<1	<1	<0.01	<0.1
22-23.08.2024	06:00-06:00	27	50	13	15	<5	13.6	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.08.2024	06:00-06:00	20	43	15	17	<5	13.1	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.08.2024	06:00-06:00	23	47	14	18	<5	14.8	<1000	<0.1	<1	<1	<0.01	<0.1
05-06.09.2024	06:00-06:00	21	43	14	17	<5	15.2	<1000	<0.1	<1	<1	<0.01	<0.1
06-07.09.2024	06:00-06:00	18	38	12	15	<5	17.1	<1000	<0.1	<1	<1	<0.01	<0.1
13-14.09.2024	06:00-06:00	20	41	15	18	<5	19.2	<1000	<0.1	<1	<1	<0.01	<0.1
14-15.09.2024	06:00-06:00	23	45	13	16	<5	18.2	<1000	<0.1	<1	<1	<0.01	<0.1
21-22.09.2024	06:00-06:00	26	47	14	17	<5	14.4	<1000	<0.1	<1	<1	<0.01	<0.1
22-23.09.2024	06:00-06:00	23	43	15	18	<5	17.0	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.09.2024	06:00-06:00	25	48	18	21	<5	15.2	<1000	<0.1	<1	<1	<0.01	<0.1
29-30.09.2024	06:00-06:00	22	44	16	19	<5	16.1	<1000	<0.1	<1	<1	<0.01	<0.1
Range (Minimum-Maximum)		18-27	38-50	11-18	14-21	<5	11.8-20.2	<1000	<0.1	<1	<1	<0.01	<0.1
Mean Value		22.8	43.7	14.6	17.4	<5	15.8	<1000	<0.1	<1	<1	<0.01	<0.1
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	400 (24 hrs.)	100 (8 hrs.)	2,000 (8 hrs.)	1.0 (24 hrs.)	6.0 (annual)	20 (annual)	5.0 (annual)	1.0 (annual)

Legend : **PM2.5**-Particulate Matter size less than 2.5 um; **PM10**-Respirable Particulate Matter size less than 10 um; **SO₂**-Sulphur dioxide; **NOx**-Oxides of Nitrogen; **NH₃**-Ammonia; **O₃**-Ozone; **CO**-Carbon monoxide; **Pb**-Particulate Lead; **As**-Particulate Arsenic; **Ni**-Particulate Nickel; **C₆H₆**-Benzene & **BaP**- Benzo (a) pyrene in particulate phase. ug-microgram & ng-nanogram.

* : **NAAQ Norms**-National Ambient Air Quality Norms-Revised as per GSR 826(E) dated 16.11.2009 for Industrial, Residential, Rural and other Areas.

Table : 3.18 Abstract of Ambient Air Quality Data

Sl. No.	Parameter	Pollutant Concentration, ug/m ³							
		PM2.5	PM10	SO ₂	NO _x	PM2.5	PM10	SO ₂	NO _x
		A1-RCL RR Nagar Plant				A2-Vachchakarapatti			
1	No. of Observations	24	24	24	24	24	24	24	24
2	Minimum	26	49	10	13	24	46	15	18
3	10 th Percentile Value	29	52	11	14	27	49	16	19
4	20 th Percentile Value	30	54	12	15	29	50	17	20
5	30 th Percentile Value	30	54	12	15	30	51	17	20
6	40 th Percentile Value	31	55	12	15	30	52	18	21
7	50 th Percentile Value	33	56	13	17	31	54	20	23
8	60 th Percentile Value	33	58	13	17	33	54	20	24
9	70 th Percentile Value	34	58	14	18	33	55	21	24
10	80 th Percentile Value	35	60	14	18	34	57	22	25
11	90 th Percentile Value	37	62	15	20	35	58	23	26
12	95 th Percentile Value	38	63	15	21	37	58	23	27
13	98 th Percentile Value	38	64	16	21	37	60	24	27
14	Maximum	38	65	16	21	37	62	24	27
15	Arithmetic Mean	32.4	56.6	12.9	16.6	31.3	53.3	19.3	22.5
16	Geometric Mean	32.3	56.5	12.8	16.4	31.1	53.2	19.1	22.3
17	Standard Deviation	3.3	4.1	1.6	2.3	3.4	3.9	2.7	2.9
18	NAAQ Norms*	60	100	80	80	60	100	80	80
19	% Values exceeding Norms*	0	0	0	0	0	0	0	0
		A3-Sennalkudi				A4-Valayapatti			
1	No. of Observations	24	24	24	24	24	24	24	24
2	Minimum	11	20	6	7	10	18	6	7
3	10 th Percentile Value	12	22	6	8	11	21	7	8
4	20 th Percentile Value	12	24	7	8	12	23	7	9
5	30 th Percentile Value	13	24	7	8	12	24	8	9
6	40 th Percentile Value	14	25	7	8	13	25	8	10
7	50 th Percentile Value	14	27	7	9	14	26	8	10
8	60 th Percentile Value	15	28	8	9	14	27	9	10
9	70 th Percentile Value	15	30	8	10	15	29	9	11
10	80 th Percentile Value	16	31	8	10	15	30	10	11
11	90 th Percentile Value	17	32	8	10	17	32	10	12
12	95 th Percentile Value	18	34	9	11	17	33	11	12
13	98 th Percentile Value	20	36	9	11	18	34	11	13
14	Maximum	21	38	9	11	18	35	11	13
15	Arithmetic Mean	14.5	27.1	7.4	8.9	13.7	26.2	8.5	10.0
16	Geometric Mean	14.3	26.8	7.3	8.8	13.5	25.9	8.4	9.9
17	Standard Deviation	2.3	4.6	0.9	1.1	2.2	4.4	1.4	1.4
18	NAAQ Norms*	60	100	80	80	60	100	80	80
19	% Values exceeding Norms*	0	0	0	0	0	0	0	0

Legend : PM2.5-Particulate Matter size less than 2.5 um; PM10-Respirable Particulate Matter size less than 10 um; SO₂-Sulphur dioxide; NO_x-Oxides of Nitrogen. O₃-Ozone values are reported locationwise. ug-microgram.

NH₃-Ammonia; CO-Carbon monoxide; Pb-Particulate Lead; As-Particulate Arsenic; Ni-Particulate Nickel; C₆H₆-Benzene and BaP-Benzo (a) pyrene in particulate phase levels were monitored below respective detectable limits.

* : NAAQ Norms-National Ambient Air Quality Norms-Revised as per GSR 826(E) dated 16.11.2009 for Industrial, Residential, Rural and other Areas.

Table : 3.18 (Contn.) Abstract of Ambient Air Quality Data

Sl. No.	Parameter	Pollutant Concentration, ug/m ³							
		PM2.5	PM10	SO ₂	NOx	PM2.5	PM10	SO ₂	NOx
		A5- Avudaiyapuram				A6-Etturvattam			
1	No. of Observations	24	24	24	24	24	24	24	24
2	Minimum	17	34	10	12	19	40	11	14
3	10 th Percentile Value	18	35	10	13	21	43	12	15
4	20 th Percentile Value	20	38	11	14	24	45	13	16
5	30 th Percentile Value	20	38	12	14	24	46	13	17
6	40 th Percentile Value	20	39	12	15	25	47	14	17
7	50 th Percentile Value	21	41	12	15	27	48	15	18
8	60 th Percentile Value	22	42	13	15	28	50	15	18
9	70 th Percentile Value	22	44	13	16	29	51	15	18
10	80 th Percentile Value	23	45	14	17	30	52	16	19
11	90 th Percentile Value	25	47	15	18	31	54	17	20
12	95 th Percentile Value	27	48	16	19	32	55	17	20
13	98 th Percentile Value	28	50	16	20	33	57	18	21
14	Maximum	28	52	16	20	33	58	18	21
15	Arithmetic Mean	21.4	41.0	12.6	15.3	26.4	48.5	14.3	17.5
16	Geometric Mean	21.3	40.7	12.4	15.2	26.1	48.2	14.2	17.4
17	Standard Deviation	2.8	4.7	1.9	2.0	3.8	4.6	1.9	2.0
18	NAAQ Norms*	60	100	80	80	60	100	80	80
19	% Values exceeding Norms*	0	0	0	0	0	0	0	0
		A7-Kumaralingapuram				A8-Puchakapatti			
1	No. of Observations	24	24	24	24	24	24	24	24
2	Minimum	16	31	7	8	17	35	9	10
3	10 th Percentile Value	17	33	7	9	18	36	10	12
4	20 th Percentile Value	18	35	8	10	19	37	10	13
5	30 th Percentile Value	19	37	8	10	20	38	11	13
6	40 th Percentile Value	20	38	8	10	20	38	11	14
7	50 th Percentile Value	21	39	9	11	20	40	12	14
8	60 th Percentile Value	22	40	9	11	21	41	12	15
9	70 th Percentile Value	22	40	9	11	22	41	12	15
10	80 th Percentile Value	23	41	10	12	22	41	13	15
11	90 th Percentile Value	24	42	10	12	24	44	14	17
12	95 th Percentile Value	26	42	11	13	24	45	14	18
13	98 th Percentile Value	26	44	11	14	25	45	15	18
14	Maximum	26	45	11	14	26	45	15	18
15	Arithmetic Mean	20.8	38.2	8.8	10.8	20.7	39.7	11.6	14.3
16	Geometric Mean	20.6	38.0	8.7	10.7	20.6	39.6	11.5	14.2
17	Standard Deviation	2.8	3.6	1.2	1.4	2.3	2.9	1.5	2.0
18	NAAQ Norms*	60	100	80	80	60	100	80	80
19	% Values exceeding Norms*	0	0	0	0	0	0	0	0

Legend : PM2.5-Particulate Matter size less than 2.5 um; PM10-Respirable Particulate Matter size less than 10 um; SO₂-Sulphur dioxide; NOx-Oxides of Nitrogen. O₃-Ozone values are reported locationwise. ug-microgram.

NH₃-Ammonia; CO-Carbon monoxide; Pb-Particulate Lead; As-Particulate Arsenic; Ni-Particulate Nickel; C₆H₆-Benzene and BaP-Benzo (a) pyrene in particulate phase levels were monitored below respective detectable limits.

* : NAAQ Norms-National Ambient Air Quality Norms-Revised as per GSR 826(E) dated 16.11.2009 for Industrial, Residential, Rural and other Areas.

Table : 3.18 (Contn.) Abstract of Ambient Air Quality Data

Sl. No.	Parameter	Pollutant Concentration, ug/m ³							
		PM2.5	PM10	SO ₂	NOx	PM2.5	PM10	SO ₂	NOx
		A9-Sankaralingapuram				A10-Sulakarai			
1	No. of Observations	24	24	24	24	24	24	24	24
2	Minimum	10	13	8	10	18	38	11	14
3	10 th Percentile Value	11	13	8	10	20	39	12	15
4	20 th Percentile Value	12	14	9	10	21	41	13	16
5	30 th Percentile Value	12	14	9	11	21	43	14	17
6	40 th Percentile Value	12	15	9	11	22	43	14	17
7	50 th Percentile Value	13	15	10	12	23	44	15	18
8	60 th Percentile Value	13	15	10	12	23	44	15	18
9	70 th Percentile Value	14	17	10	13	24	45	15	18
10	80 th Percentile Value	14	17	11	13	25	47	16	18
11	90 th Percentile Value	16	18	11	14	26	48	17	20
12	95 th Percentile Value	16	18	12	15	27	48	18	21
13	98 th Percentile Value	17	19	13	15	27	49	18	21
14	Maximum	17	19	13	15	27	50	18	21
15	Arithmetic Mean	13.1	15.4	9.7	11.8	22.8	43.7	14.6	17.4
16	Geometric Mean	13.0	15.3	9.6	11.7	22.6	43.5	14.5	17.3
17	Standard Deviation	1.8	2.0	1.3	1.7	2.4	3.3	1.8	1.9
18	NAAQ Norms*	60	100	80	80	60	100	80	80
19	% Values exceeding Norms*	0	0	0	0	0	0	0	0

Legend : PM2.5-Particulate Matter size less than 2.5 um; PM10-Respirable Particulate Matter size less than 10 um; SO₂-Sulphur
 Legend : PM2.5-Particulate Matter size less than 2.5 um; PM10-Respirable Particulate Matter size less than 10 um;
 SO₂-Sulphur dioxide; NOx-Oxides of Nitrogen. O₃-Ozone values are reported locationwise. ug-microgram.

NH₃-Ammonia; CO-Carbon monoxide; Pb-Particulate Lead; As-Particulate Arsenic; Ni-Particulate Nickel; C₆H₆-
 Benzene and BaP-Benzo (a) pyrene in particulate phase levels were monitored below respective detectable limits.

* : NAAQ Norms-National Ambient Air Quality Norms-Revised as per GSR 826(E) dated 16.11.2009 for Industrial, Residential, Rural and other Areas.

Table : 3.19 Ambient Air Quality Status

Season : Premonsoon (Jul.-Sep. 2024)

No. of Locations : 10

Sample Size : 24-Hourly

Sl. No.	Parameter	Pollutant Concentration, ug/m ³			
		PM2.5	PM10	SO ₂	NO _x
1	No. of Observations	240	240	240	240
2	Minimum	10	13	6	7
3	10 th Percentile Value	13	19	8	9
4	20 th Percentile Value	15	27	8	10
5	30 th Percentile Value	17	33	10	11
6	40 th Percentile Value	20	38	10	13
7	50 th Percentile Value	21	41	12	14
8	60 th Percentile Value	23	43	13	15
9	70 th Percentile Value	25	46	14	17
10	80 th Percentile Value	28	51	15	18
11	90 th Percentile Value	32	55	17	20
12	95 th Percentile Value	34	58	19	22
13	98 th Percentile Value	37	60	22	25
14	Maximum	38	65	24	27
15	Arithmetic Mean	21.7	39.0	12.0	14.5
16	Geometric Mean	20.5	36.4	11.4	13.9
17	Standard Deviation	7.1	12.8	3.8	4.4
18	NAAQ Norms*	60	100	80	80
19	% Values exceeding NAAQ Norms	0	0	0	0

Legend : PM2.5-Particulate Matter size less than 2.5 um; PM10-Respirable Particulate Matter size less than 10 um; SO₂-Sulphur dioxide; NO_x-Oxides of Nitrogen. O₃-Ozone values are reported locationwise. ug-microgram.

NH₃-Ammonia; CO-Carbon monoxide; Pb-Particulate Lead; As-Particulate Arsenic; Ni-Particulate Nickel; C₆H₆-Benzene and BaP-Benzo (a) pyrene in particulate phase levels were monitored below respective detectable limits.

* : NAAQ Norms-National Ambient Air Quality Norms-Revised as per GSR 826(E) dated 16.11.2009 for Industrial, Residential, Rural and other Areas.

The levels of air quality with an adequate margin of safety, to protect the public health, vegetation and property. Whenever and wherever two consecutive values exceed the limit specified above for the respective category, it would be considered adequate reason to institute regular/continuous monitoring and further investigations.

1. 24-hly./8-hly. values should be met 98% of the time in a year; however, 2% of the time it may exceed but not on two consecutive days.

2. Annual arithmetic mean of minimum 104 measurements in a year taken twice a week 24-hourly at uniform interval.

3.5.3 RSPM Analysis

With the samples of Respirable Suspended Particulate Matter (RSPM or PM₁₀) monitored, the main focus is on characterization and apportionment of PM₁₀ to have a better understanding and correlation between the RSPM fraction at source and receptor. The results are tabulated in **Table 3.20**. There was no significant variation in the characteristics of RSPM values in the upwind and downwind direction locations. Free Respirable Silica in RSPM was also monitored using Personal Sampler and FTIR Method of Analysis. The Silica Content was found to be 2.2% of RSPM that monitored in the Study Area.

Free Respirable Silica Content (FTIR Method) : 2.2%.

Table : 3.20 RSPM Analytical Data

Parameter	Percentage in RSPM Content	
	Upwind Direction (Location A8)	Downwind Direction (Location A5)
Loss on Ignition	12.7	13.2
Iron oxides (Fe ₂ O ₃)	8.0	7.7
Calcium oxide (CaO)	15.9	15.2
Magnesium oxide (MgO)	10.1	8.7
Sodium oxide (Na ₂ O)	0.29	0.30
Potassium oxide (K ₂ O)	0.18	0.20
Aluminium oxide (Al ₂ O ₃)	11.4	12.2
Titanium oxide (TiO ₂)	0.03	0.03

3.5.4 Fugitive Emissions

The 'Charter on Corporate Responsibility for Environmental Protection (CREP)' stipulates the Environmental Guidelines for Prevention and Control of Fugitive Emissions from Cement Plants. As per the guideline, PM concentration was monitored at 10 m distance from the enclosure wall housing the emission source/edge of the stockpiles/pavement area, etc. Respirable Dust Samplers (Envirotech APM 460 BL) were used for the sampling as per standard method prescribed by CPCB/BIS, in the downwind direction, on 8-hourly basis for a day during the normal working hours. The monitored values are given in **Table 3.21**.

Table : 3.21 Fugitive Emissions

Sl. No.	Monitoring Date	Monitoring Time, hrs.	Location	Monitored PM, ug/m ³	CREP Standards, PM, ug/m ³
1	28-29.09.2024	10:00-18:00	Limestone Stacker & Reclaimer	361	<5000
2	28-29.09.2024	10:00-18:00	Coal Stacker & Reclaimer	419	<2000
3	28-29.09.2024	10:00-18:00	Gypsum Shed	335	<5000

The monitored fugitive emissions were found to be well within the PM limit values stipulated by **CREP Guidelines**.

3.5.5 Stack Emissions

The Plant operations are in compliance with new **Emission Standards issued by MoEF&CC** for Cement Industry vide Notifications dated 25.08.2014 and amended on 09.05.2016 & 10.05.2016 as below :

Particulate Matter (PM) Emissions from all Major Stacks : <20 mg/Nm³.

SO₂ Emissions from Kiln Stacks : <100 mg/Nm³ (pyritic Sulphur is <0.25%).

NO₂ Emissions from Kiln Stacks : <600 mg/Nm³.

All Main Stacks are provided with **Online Monitors** and the **Real Time Emission Levels are connected to the TNPCB Care Air Centre** and **4 Continuous AAQ Stations** real time data are being transmitted to CPCB & SPCB Servers. Manual Monitoring of Stack Survey is also being carried out by an external agency accredited by NABL (**Tables 3.22-23**). All the monitored stack emission values were found to be well within the stipulated Norms for Cement and Power Plants. Also, from the Survey Reports, the values of HCL, HF, TOC, Hg, Cd+Ti, etc. from Kiln Stack emissions were found to be below their respective detectable limits.

Table : 3.22 Stack Emissions-Cement Plant (Existing)

Parameter	Lines I & III Emissions (GLens Report dated 31.08.2024)								
	Kiln-I PJBH	Coal Mill-I Bag Filter	Cooler-I ESP	Cement Mill 1&2 Bag Filter	Kiln-III Bag Filter	Coal Mill-III Bag Filter	Cooler-III ESP	Cement Mill 3 Bag Filter	Packer Bag Filter
Particulate Matter									
Stack Height, m	104	52.2	31	65	123	67	45	70	30
Stack Diameter, m	2.36	1.1	1.8	3	4.5	1.7	2.65	1.6	0.98
Stack Temperature, °C	133	56	186	90	143	69	217	79	48
Stack Velocity, m/s	16.6	7.33	15.2	8.4	10.4	9.6	14.9	9.3	23.4
Stack Discharge, Nm ³ /hr.	188938	22,748	89290	174058	416913	67687	184758	56244	57735
PM Concentration, mg/Nm ³	7.56	19	11.5	9.26	9.03	5.2	11.8	9.41	5.49
Pollution Load, g/sec	0.397	0.120	0.285	0.447	1.045	0.098	0.605	0.147	0.088
Pollution Load, kg/day	34	10	25	39	90	8	52	13	8
Gaseous Pollutants									
SO ₂ Concentration, mg/Nm ³	BLQ(LOQ:3.0)				BLQ(LOQ:3.0)				
NO _x Concentration, mg/Nm ³	545				571				

Table : 3.23 Stack Emissions-CPP (21.08.2024)

Parameter	CPP Boiler ESP
Stack Height, m	90
Stack Diameter, m	3.3
Stack Temperature, °C	134
Stack Velocity, m/s	14.3
Stack Discharge, Nm ³ /hr.	1,12,261
PM Concentration, mg/Nm ³	26.9
SO ₂ Concentration, mg/Nm ³	555
NO _x Concentration, mg/Nm ³	433

3.6 Noise Levels

Ambient Noise Levels : The Study area represents Industrial, Commercial and Residential Areas for comparing with the MoEF&CC Ambient Noise Norms. Industrial activities and the traffic flow in nearby NH are the main sources of Noise in the area. The abstract of monitored monthly noise data are presented in **Table 3.24**.

Table : 3.24 Ambient Noise Level Data (Abstract)

Monitoring Dates : 10-11.07.2024; 02-03.08.2024 & 28-29.09.2024

Sl. No.	Location	Location Coordinates	Area	Noise Levels, dB(A)					
				Day Time (06:00-22:00 hrs.)			Night Time (22:00-06:00 hrs.)		
				Lmin.	Lmax.	Leq	Lmin.	Lmax.	Leq
1	A1-RCL Plant	09°27'17.86" N 77°55'44.16" E	Industrial	36.8	92.4	48.1	34.1	94.0	44.7
2	A2-Vachchakarapatti-NH Jn.	09°28'06.14" N 77°56'07.10" E	Commercial	35.0	97.3	46.4	33.0	98.2	43.8
3	A3-Sennalkudi	09°30'25.93" N 77°59'26.61" E	Residential	33.5	88.2	42.6	32.8	80.4	40.1
4	A4-Valaiyapatti	09°27'17.53" N 77°58'54.94" E	Residential	32.8	87.0	42.0	32.1	81.3	40.3
5	A9-Avudaiyapuram-Trans. Rd.	09°26'34.01" N 77°57'13.14" E	Residential	34.0	95.3	43.7	32.9	90.1	41.3
6	A6-Etturvattam	09°23'33.91" N 77°54'41.74" E	Residential	33.8	97.1	43.9	33.1	94.2	41.5
7	A7-Kumaralingapuram	09°25'45.65" N 77°54'02.25" E	Residential	33.0	88.4	42.4	32.4	83.5	40.7
8	A8-Puchakkapatti	09°30'51.50" N 77°59'00.84" E	Residential	33.5	91.1	42.0	32.6	88.2	40.9
9	A9-Sankaralingapuram	09°30'42.85" N 77°53'38.45" E	Residential	32.9	88.8	41.5	32.0	85.4	40.1
10	A10-Sulakkarai	09°32'15.81" N 77°56'33.39" E	Residential	33.0	85.7	42.0	32.4	86.1	40.5
Study Area				32.8	97.3	43.5	32.0	98.2	41.4
MoEF&CC Norms* for Residential Areas				-		55	-		45
MoEF&CC Norms for Commercial Areas				-		65	-		55
MoEF&CC Norms for Industrial Areas				-		75	-		70

Lmin.-Minimum Levels; Lmax.-Maximum Levels & Leq-Equivalent Noise Levels.

* : MoEF&CC Norms-Ministry of Environment, Forest & Climate Change Ambient Noise Norms (Leq).

Day time is reckoned in between 6 a.m and 10 p.m. and Night time is reckoned in between 10 p.m. and 6 a.m.

Ambient Noise Levels were ranging from 32.6 dB(A) to 97.3 dB(A) during day times and from 32.0 dB(A) to 98.6 dB(A) during night times on the monitoring days. Day Equivalent Noise (Leq-d) level was found to be 43.5 dB(A) and Night Equivalent Noise (Leq-n) level was 41.4 dB(A). While comparing with the MoEF&CC Leq Norms for day and night times, the monitored **ambient noise levels were well within the limit values** for their respective Category Area.

Workzone Noise (Leq) Levels within the Plant Area, at a distance of 1.0-1.5 m from the sources, were monitored between 71.3-74.8 dB(A) which were found to be well within the **OSHA Standard of 85 dB(A) for 8-hours exposure**. However, the Noise levels at the Plant boundaries were found to be within the MoEF&CC Ambient Noise Leq Norms of <55 dB(A) during day times and <45 dB(A) during night times.

3.7 Water Environment

3.7.1 Hydrogeology

Virudhunagar District is divided into two distinct regions viz. the eastern slopes of the Western Ghats in Srivilliputhur and Rajapalayam Taluks with undulations and the Eastern plains (District Profile of Tamil Nadu Water Supply and Drainage -TWAD- Board). Western Ghats occur as a series of parallel ridges running in an NE-SW directions and the eastern plain region is a flat terrain with isolated hillocks around Aruppukottai and Sattur. The area falls in two major river basins namely **Vaippar and Gundar**. River Vaippar has a number of tributaries of which Arjuna River/Nadi is an important one. The 70 year **Normal Rainfall** of the Plant Area is **895 mm**.

The general hydro-geological setup of the study area indicates that the ground water potential of the site and its surroundings is **poor to moderate**. In crystalline metamorphic formations, ground water occurs under phreatic conditions in shallow weathered mantle and under semi-confined conditions in the deeper fractured zones and is heterogeneous in nature.

The deeper secondary openings have been developed by weathering and fracturing of the hard rock formations which act as water bearing formations. Ground water is exploited through deep bore wells and shallow dug wells. Hence, the yield from the aquifer system in these rocks has wide variations.

The study area is covered by hard rocks consisting of meta-sedimentary rocks like granitic gneisses and calc granulites. The ground water in such type of formations occurs within the secondary porosity developed within the host rocks such as joints, fractures and bedding planes or within the weathered mantle. The top soil overlying the basement rock is negligible in thickness over the study site.

The abandoned mine pits are located in high grounds and the localized ground water flow from the fractures occurs which again depends on the rain water storage in the pits and recharge on the upstream side of the mines area.

Ground Water Levels : The Ground Water Levels from the **60 number of Observation Wells of TWAD** in Virudhunagar District have been analysed for Post-Monsoon and Pre-Monsoon periods and give as 5 years average in **Table 3.25**. The Data for the Period 1991-2019 is also appended.

Table : 3.25 Ground Water Level Data

Monitored Month & Ground Water Level, m BGL													
Jan. 2013	May 2013	Jan 2014	May 2014	Jan 2015	May 2015	Jan 2016	May 2016	Jan 2017	May 2017	Jan 2018	May 2018	Jan 2019	May 2019
7.8	13.1	12.7	11.5	9.3	9.6	4.9	7.3	10.8	11.5	5.0	10.4	5.3	8.2
5-Years Pre-monsoon Average – 10.2 m BGL 5-Years Post-monsoon Average – 8.0 m BGL District.													
Source : TWAD Data for Viridhunagar District.													

Stage of Development : As per Central Ground Water Board (CGWB) - Virudhunagar District Profile, the Pumping Test parameters and Stage of Ground Water Development are as follows :

<u>CGWB Data</u>	<u>Hard Rock</u>	<u>River Alluvium</u>
Specific Yield, lpm	40-110	200-400
Transmissivity, m ² /day	0.224-0.6	14.91-671.14
Hydraulic Conductivity, m/day	0.049-0.147	19.57-83.17
Net Ground Water Availability	:	495.19 MCM
Existing Gross Ground Water Draft for all Users	:	341.86 MCM
Stage of Ground Water Development	:	69%
Categorization of the District	:	Safe Category

However, as per PWD TN GO No. 43 dated 24.10.2018, the ground water Stage of Development of Vachchakarapatti Firka is in **Semi-Critical Category (90-100%)**.

3.7.2 Water Quality

The Central Pollution Control Board (CPCB) has identified Five **Designated Best Use of Surface Waters** viz. **Class A** (Drinking Water Source without Conventional Treatment but after Disinfection), **B** (Out Door Bathing-Organised), **C** (Drinking Water Source after Conventional Treatment and Disinfection), **D** (Propagation of Wild life and Fisheries) & **E** (Irrigation, Industrial Cooling, Controlled Waste Disposal) and stipulated the Norms for the Classes; for few Parameters (**Table 3.26**).

Table : 3.26 CPCB Criteria for Designated Best Use of Water

Parameter	Designated Best Use Class & Required Criteria				
	A	B	C	D	E
pH	6.5-8.5	6.5-8.5	6.5-9.0	6.5-8.5	6.5-8.5
EC, umhos/cm (max.)	-	-	-	-	2,250
DO, mg/l	6 or more	5 or more	4 or more	4 or more	6 or more
BOD-3 days @ 27 °C	2 or less	3 or less	3 or less	-	2 or less
Total Coliforms, MPN/100 ml	50 or less	500 or less	5000 or less	-	50 or less
Free Ammonia (as N), mg/l	-	-	-	1.2 or less	-
Boron, mg/l (max.)	-	-	-	-	2
Sodium Absorption Ratio (max.)	-	-	-	-	26

- : Not included/Not specified.

Further, Bureau of Indian Standards (BIS) had also recommended Tolerance Limits for Inland Surface Waters for the different uses (**IS 2296:1982**). Even though, IS 2296:1982 has been withdrawn, the analysed data are compared with this Standard to have better understanding about the Surface Water Quality in the Study Area. The Ground Water Quality Parameters were compared with **BIS 10500:2012 Standards** of Acceptable and Permissible Limits for Drinking purpose with Ground Water as source.

The monitored water quality data are presented in **Tables 3.27-3.28** and the abstract of those data is given as **Table 3.29**.

The **surface water** samples were monitored with pH in the range 7.58-7.88 against the Limit value of 6.5-8.5. DO levels were in the range 4.0-4.8 mg/l against the minimum requirement value of 4.0-6.0 mg/l for Surface Waters. While EC values were in the range 470-880, TDS values were monitored in the range of 310-560 mg/l against the Limit values of 500/2100 mg/l. Chloride values ranging from 82 mg/l to 116 mg/l. Iron content was found to be in the range 0.06-0.14 mg/l. Oil and grease, phenolic compounds, cyanides, sulphides and insecticides were found to be absent. Trace metals were found to be in traceable levels. BOD and COD values were found to be <2 mg/l and 2-10 mg/l respectively.

The surface water quality were found to be within the prescribed CPCB Norms.

Table : 3.27 Surface Water Quality Data

Monitoring Dates : 27-28.09.2024
(Worst case & Mean values are reported)

Sl. No.	Parameter	W1 Arjuna River Upstream	W2 Arjuna River Downstream	W3 Mannarkottai Nallah	W4 Uppu Odai	CPCB Norms*
i.	Location Co-ordinates	09°27'39.26" N 77°54'13.05" E	09°26'12.84" N 77°55'22.95" E	09°26'29.69" N 77°57'28.35" E	09°22'31.59" N 77°54'46.11" E	-
ii.	Date in Sep. 2024 / Time, Hrs.	27/11:40	28/11:15	27/13:50	27/10:10	-
1	pH	7.73	7.68	7.84	7.88	6.5-8.5
2	Colour, Hazen units	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)	10-30
3	Temperature, °C	27.4	27.1	27.6	27.8	-
4	Turbidity, NTU	2.7	2.1	3.1	3.4	-
5	Residual Chlorine, mg/l	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	-
6	Dissolved Oxygen, mg/l	4.8	4.6	4.3	4.0	4.0-6.0
7	Total Suspended Solids, mg/l	33	25	36	38	-
8	Electrical Conductivity, umhos/cm	620	580	740	880	-
9	Total Dissolved Solids, mg/l	390	370	470	560	500-2100
10	Total Hardness (as CaCO ₃), mg/l	180	170	230	270	-
11	Calcium Hardness, mg/l	100	90	110	130	-
12	Magnesium Hardness, mg/l	80	80	120	140	-
13	Calcium (as Ca), mg/l	40	36	44	52	-
14	Magnesium (as Mg), mg/l	19	19	29	34	-
15	Sodium (as Na), mg/l	34	30	38	42	-
16	Potassium (as K), mg/l	2	1	3	6	-
17	Chlorides (as Cl), mg/l	92	84	102	116	250-600
18	Sulphates (as SO ₄), mg/l	24	28	33	43	400-1000
19	Total Alkalinity (as CaCO ₃), mg/l	90	80	120	140	-
20	BOD-3 days @ 27°C, mg/l	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	<3
21	COD, mg/l	6	2	8	10	-
22	Oil & Grease, mg/l	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	-
23	Iron (as Fe), mg/l	0.10	0.06	0.12	0.14	0.3-5.0
24	Fluorides (as F), mg/l	0.18	0.14	0.21	0.26	1.5
25	Nitrates (as NO ₃), mg/l	1.5	1.0	2.0	3.5	20-50
26	Phosphates (as PO ₄), mg/l	<0.01	<0.01	<0.01	<0.01	-
27	Cyanides (as CN), mg/l	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	-
28	Pesticides (as Malathion), mg/l	<0.01	<0.01	<0.01	<0.01	-
29	Phenols (as C ₆ H ₅ OH), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	-
30	Manganese (as Mn), mg/l	BDL(DL:0.002)	BDL(DL:0.002)	BDL(DL:0.002)	BDL(DL:0.002)	-
31	Chromium (as Cr), mg/l	BDL(DL:0.03)	BDL(DL:0.03)	BDL(DL:0.03)	BDL(DL:0.03)	-
32	Copper (as Cu), mg/l	<0.001	<0.001	<0.001	<0.001	1.5
33	Selenium (as Se), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	-
34	Aluminium (as Al), mg/l	<0.001	<0.001	<0.001	<0.001	-
35	Cadmium (as Cd), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	-
36	Arsenic (as As), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.05-0.2
37	Boron (as B), mg/l	BDL(DL:0.025)	BDL(DL:0.025)	BDL(DL:0.025)	BDL(DL:0.025)	2
38	Mercury (as Hg), mg/l	BDL(DL:0.0005)	BDL(DL:0.0005)	BDL(DL:0.0005)	BDL(DL:0.0005)	-
39	Lead (as Pb), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.1
40	Zinc (as Zn), mg/l	<0.001	<0.001	<0.001	<0.001	1.5-15
41	Percent Sodium, %	28.8	27.6	26.1	24.7	-
42	Total Coliforms, MPN/100 ml	39	70	24	120	50-5000
43	Faecal Coliforms, MPN/100 ml	17	33	14	58	-
44	E. Coli, MPN/100 ml	11	17	9	27	-

* : CPCB Norms-Central Pollution Control Board Norms for Surface Waters-**Class C**. - : Not included/Not available.

Table : 3.27 (Contn.) Surface Water Quality Data

Monitoring Dates : 27-28.09.2024
(Worst case & Mean values are reported)

Sl. No.	Parameter	W5 Tank, Chinnavadi	W6 Tank, Pattampudur	W7 Tank, Mannarkottai	W8 Golvarpatti Dam	CPCB Norms*
i.	Location Co-ordinates	09°27'21.48" N 77°53'35.60" E	09°29'20.06" N 77°57'00.02" E	09°26'28.51" N 77°57'52.53" E	09°24'19.19" N 77°58'25.56" E	-
ii.	Date in Sep. 2024 / Time, Hrs.	27/11:25	28/11:45	27/13:55	27/14:50	-
1	pH	7.62	7.58	7.63	7.59	6.5-8.5
2	Colour, Hazen units	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)	10-30
3	Temperature, °C	27.1	27.0	26.9	27.2	-
4	Turbidity, NTU	3.6	3.1	2.7	3.0	-
5	Residual Chlorine, mg/l	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	-
6	Dissolved Oxygen, mg/l	4.1	4.6	4.8	4.6	4.0-6.0
7	Total Suspended Solids, mg/l	38	34	30	33	-
8	Electrical Conductivity, umhos/cm	530	580	470	540	-
9	Total Dissolved Solids, mg/l	340	370	310	340	500-2100
10	Total Hardness (as CaCO ₃), mg/l	150	170	140	140	-
11	Calcium Hardness, mg/l	80	90	70	80	-
12	Magnesium Hardness, mg/l	70	80	70	60	-
13	Calcium (as Ca), mg/l	32	36	28	32	-
14	Magnesium (as Mg), mg/l	17	19	17	14	-
15	Sodium (as Na), mg/l	32	36	21	28	-
16	Potassium (as K), mg/l	3	4	2	4	-
17	Chlorides (as Cl), mg/l	84	88	82	90	250-600
18	Sulphates (as SO ₄), mg/l	20	18	14	22	400-1000
19	Total Alkalinity (as CaCO ₃), mg/l	70	90	60	70	-
20	BOD-3 days @ 27°C, mg/l	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	<3
21	COD, mg/l	6	4	3	4	-
22	Oil & Grease, mg/l	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	-
23	Iron (as Fe), mg/l	0.11	0.10	0.08	0.10	0.3-5.0
24	Fluorides (as F), mg/l	0.14	0.12	0.08	0.14	1.5
25	Nitrates (as NO ₃), mg/l	1.8	1.4	1.0	1.6	20-50
26	Phosphates (as PO ₄), mg/l	<0.01	<0.01	<0.01	<0.01	-
27	Cyanides (as CN), mg/l	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	-
28	Pesticides (as Malathion), mg/l	<0.01	<0.01	<0.01	<0.01	-
29	Phenols (as C ₆ H ₅ OH), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	-
30	Manganese (as Mn), mg/l	BDL(DL:0.002)	BDL(DL:0.002)	BDL(DL:0.002)	BDL(DL:0.002)	-
31	Chromium (as Cr), mg/l	BDL(DL:0.03)	BDL(DL:0.03)	BDL(DL:0.03)	BDL(DL:0.03)	-
32	Copper (as Cu), mg/l	<0.001	<0.001	<0.001	<0.001	1.5
33	Selenium (as Se), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	-
34	Aluminium (as Al), mg/l	<0.001	<0.001	<0.001	<0.001	-
35	Cadmium (as Cd), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	-
36	Arsenic (as As), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.05-0.2
37	Boron (as B), mg/l	BDL(DL:0.025)	BDL(DL:0.025)	BDL(DL:0.025)	BDL(DL:0.025)	2
38	Mercury (as Hg), mg/l	BDL(DL:0.0005)	BDL(DL:0.0005)	BDL(DL:0.0005)	BDL(DL:0.0005)	-
39	Lead (as Pb), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.1
40	Zinc (as Zn), mg/l	<0.001	<0.001	<0.001	<0.001	1.5-15
41	Percent Sodium, %	31.1	30.9	24.3	29.5	-
42	Total Coliforms, MPN/100 ml	31	22	20	17	50-5000
43	Faecal Coliforms, MPN/100 ml	17	14	13	9	-
44	E. Coli, MPN/100 ml	13	12	10	6	-

* : CPCB Norms-Central Pollution Control Board Norms for Surface Waters-**Class C**. - : Not included/Not available.

Table : 3.28 Ground Water Quality Data

Monitoring Dates : 27-28.09.2024
(Worst case & Mean values are reported)

Sl. No.	Parameter	W9 Plant Raw Water	W10 Borewell, Tulukka- patti	W11 Borewell, Tammanai ckenpatti	W12- Borewell, Vachchak arapatti	W13- Borewell, Avudaiya- puram	IS:10500 Norms*
i.	Location Co-ordinates	09°26'29.37" N 77°55'15.87" E	09°26'27.89" N 77°55'42.75" E	09°26'52.86" N 77°54'33.88" E	09°27'38.17" N 77°55'59.05" E	09°26'36.75" N 77°57'06.94" E	-
ii.	Date in Sep. 2024 / Time, Hrs.	27/09:25	28/10:50	27/12:45	27/12:55	27/13:30	-
1	pH	7.63	7.71	7.77	7.81	7.66	6.5-8.5
2	Colour, Hazen units	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)	5/15#
3	Temperature, °C	26.1	26.4	26.1	26.4	26.0	-
4	Turbidity, NTU	0.8	1.1	1.3	1.1	0.8	1/5
5	Residual Chlorine, mg/l	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:0.1)	BDL(DL:0.1)	0.2/1.0
6	Dissolved Oxygen, mg/l	4.4	4.1	4.0	4.0	4.4	-
7	Total Suspended Solids, mg/l	12	14	16	14	10	-
8	Electrical Conductivity, umhos/cm	460	680	660	760	630	-
9	Total Dissolved Solids, mg/l	300	440	430	520	410	500/2000
10	Total Hardness (as CaCO ₃), mg/l	120	190	210	230	190	200/600
11	Calcium Hardness, mg/l	70	100	110	120	90	-
12	Magnesium Hardness, mg/l	50	90	100	110	100	-
13	Calcium (as Ca), mg/l	28	40	44	48	36	75/200
14	Magnesium (as Mg), mg/l	12	22	24	26	24	30/100
15	Sodium (as Na), mg/l	21	36	32	42	36	-
16	Potassium (as K), mg/l	1	3	2	4	2	-
17	Chlorides (as Cl), mg/l	68	112	106	126	94	250/1000
18	Sulphates (as SO ₄), mg/l	14	36	31	38	23	200/400
19	Total Alkalinity (as CaCO ₃), mg/l	60	100	100	110	100	200/600
20	BOD-3 days @ 27°C, mg/l	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	-
21	COD, mg/l	2	4	3	6	3	-
22	Oil & Grease, mg/l	Nil	Nil	Nil	Nil	Nil	-
23	Iron (as Fe), mg/l	0.06	0.08	0.10	0.11	0.08	0.3
24	Fluorides (as F), mg/l	0.08	0.14	0.18	0.21	0.16	1.0/1.5
25	Nitrates (as NO ₃), mg/l	0.50	0.55	0.50	0.60	0.50	45
26	Phosphates (as PO ₄), mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	-
27	Cyanides (as CN), mg/l	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	0.05
28	Pesticides (as Malathion), mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	Abs./0.001
29	Phenols (as C ₆ H ₅ OH), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.001/0.002
30	Manganese (as Mn), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.1/0.3
31	Chromium (as Cr), mg/l	BDL(DL:0.03)	BDL(DL:0.03)	BDL(DL:0.03)	BDL(DL:0.03)	BDL(DL:0.03)	0.05
32	Copper (as Cu), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.05/1.5
33	Selenium (as Se), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.01
34	Aluminium (as Al), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.03/0.2
35	Cadmium (as Cd), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.003
36	Arsenic (as As), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.01/0.05
37	Boron (as B), mg/l	BDL(DL:0.025)	BDL(DL:0.025)	BDL(DL:0.025)	BDL(DL:0.025)	BDL(DL:0.025)	0.5/1.0
38	Mercury (as Hg), mg/l	BDL(DL:0.0005)	BDL(DL:0.0005)	BDL(DL:0.0005)	BDL(DL:0.0005)	BDL(DL:0.0005)	0.001
39	Lead (as Pb), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.01
40	Zinc (as Zn), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	5/15
41	Percent Sodium, %	27.3	28.8	24.7	28.0	28.9	-
42	Total Coliforms, MPN/100 ml	Absent	<2	<2	<2	<2	Absent
43	Faecal Coliforms, MPN/100 ml	Absent	<2	<2	<2	<2	Absent
44	E. Coli, MPN/100 ml	Absent	<2	<2	<2	<2	Absent

* : IS:10500 :2012-Drinking Water Standards; # : Requirement/Permissible Limit in the absence of alternate source.

Table : 3.28 (Contn.) Ground Water Quality Data

Monitoring Dates : 27-28.09.2024
(Worst case & Mean values are reported)

Sl. No.	Parameter	W14 Borewell, Kumara-lingapuram	W14 Borewell, Sankara-lingapuram	W15 Borewell, Pattampudur	W16 Borewell, Valayapatti	IS:10500 Norms*
i.	Location Co-ordinates	09°25'43.60" N 77°54'06.93" E	09°30'35.13" N 77°53'35.35" E	09°29'26.87" N 77°56'49.14" E	09°27'14.79" N 77°58'51.70" E	-
ii.	Date in Sep. 2024 / Time, Hrs.	10:40	12:20	11:35	14:15	-
1	pH	7.81	7.63	7.75	7.51	6.5-8.5
2	Colour, Hazen units	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:5.0)	5/15#
3	Temperature, °C	26.8	26.4	26.7	26.3	-
4	Turbidity, NTU	1.1	0.8	1.3	0.6	1/5
5	Residual Chlorine, mg/l	BDL(DL:1.0)	BDL(DL:0.1)	BDL(DL:1.0)	BDL(DL:1.0)	0.2/1.0
6	Dissolved Oxygen, mg/l	4.3	4.4	4.2	4.4	-
7	Total Suspended Solids, mg/l	13	10	14	8	-
8	Electrical Conductivity, umhos/cm	650	560	690	590	-
9	Total Dissolved Solids, mg/l	420	360	450	380	500/2000
10	Total Hardness (as CaCO ₃), mg/l	190	160	210	170	200/600
11	Calcium Hardness, mg/l	100	80	110	90	-
12	Magnesium Hardness, mg/l	90	80	100	80	-
13	Calcium (as Ca), mg/l	40	32	44	36	75/200
14	Magnesium (as Mg), mg/l	22	19	24	19	30/100
15	Sodium (as Na), mg/l	36	32	40	31	-
16	Potassium (as K), mg/l	3	1	4	2	-
17	Chlorides (as Cl), mg/l	96	80	106	88	250/1000
18	Sulphates (as SO ₄), mg/l	24	21	30	22	200/400
19	Total Alkalinity (as CaCO ₃), mg/l	90	80	100	90	200/600
20	BOD-3 days @ 27°C, mg/l	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	-
21	COD, mg/l	4	2	6	2	-
22	Oil & Grease, mg/l	Nil	Nil	Nil	Nil	-
23	Iron (as Fe), mg/l	0.10	0.08	0.11	0.06	0.3
24	Fluorides (as F), mg/l	0.14	0.10	0.18	0.08	1.0/1.5
25	Nitrates (as NO ₃), mg/l	0.55	0.50	0.60	0.50	45
26	Phosphates (as PO ₄), mg/l	<0.01	<0.01	<0.01	<0.01	-
27	Cyanides (as CN), mg/l	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	0.05
28	Pesticides (as Malathion), mg/l	<0.01	<0.01	<0.01	<0.01	Abs./0.001
29	Phenols (as C ₆ H ₅ OH), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.001/0.002
30	Manganese (as Mn), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.1/0.3
31	Chromium (as Cr), mg/l	BDL(DL:0.03)	BDL(DL:0.03)	BDL(DL:0.03)	BDL(DL:0.03)	0.05
32	Copper (as Cu), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.05/1.5
33	Selenium (as Se), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.01
34	Aluminium (as Al), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.03/0.2
35	Cadmium (as Cd), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.003
36	Arsenic (as As), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.01/0.05
37	Boron (as B), mg/l	BDL(DL:0.025)	BDL(DL:0.025)	BDL(DL:0.025)	BDL(DL:0.025)	0.5/1.0
38	Mercury (as Hg), mg/l	BDL(DL:0.0005)	BDL(DL:0.0005)	BDL(DL:0.0005)	BDL(DL:0.0005)	0.001
39	Lead (as Pb), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.01
40	Zinc (as Zn), mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	5/15
41	Percent Sodium, %	28.8	30.1	28.8	28.1	-
42	Total Coliforms, MPN/100 ml	<2	<2	<2	<2	Absent
43	Faecal Coliforms, MPN/100 ml	<2	<2	<2	<2	Absent
44	E. Coli, MPN/100 ml	<2	<2	<2	<2	Absent

* : IS:10500 :2012-Drinking Water Standards; # : Requirement/Permissible Limit in the absence of alternate source.

Table : 3.29 Water Quality Status

Monitoring Dates : 27-28.09.2024

Sl. No.	Parameter	Concentration Range & Norms			
		Surface Waters	CPCB Norms* for Surface Waters	Ground Waters	IS:10500 Norms** for Drinking Waters
1	pH	7.58-7.88	6.5-8.5	7.51-7.81	6.5-8.5
2	Total Dissolved Solids, mg/l	310-560	-	360-520	500-2000*
3	Dissolved Oxygen, mg/l	4.0-4.8	4.0-6.0	4.0-4.4	-
4	BOD (3 days @ 27 °C), mg/l	BDL(DL:2.0)	<3	BDL(DL:2.0)	-
5	COD, mg/l	2-10	-	2-6	-
6	Oil & Grease, mg/l	BDL(DL:1.0)	-	BDL(DL:1.0)	-
7	Chlorides (as Cl), mg/l	82-116	250-600	80-16	250-1000
8	Iron (as Fe), mg/l	0.06-0.14	0.3-5.0	0.06-0.11	0.3
9	Trace Metals, mg/l	<0.01	-	<0.01	<0.001-<0.01
10	Total Coliforms, MPN/100 ml	17-120	50-5000	<2	Absent

* : CPCB Norms-Central Pollution Control Board Norms for Surface Waters-**Class C**. - : Not included/Not available.

** : * : IS:10500 :2012-Drinking Water Standards; # : Requirement/Permissible Limit in the absence of alternate source.

The pH of the **ground water** samples were ranging from 7.51-7.81 against the BIS Norm of 6.5-8.5. While EC values were in the range 560-760, TDS values were monitored in the range 360-520 mg/l (Norm 500 mg/l or 2,000 mg/l in the absence of alternate source). Chloride values were found to be in the range 68-126 mg/l (Norm 250/1000 mg/l). Iron content was found to be in the range 0.06-0.11 mg/l. Oil & Grease, Cyanides, Phenols, Pesticides, etc. were found to be absent. Most of the trace metals were monitored to be below their detectable limits. In general, the water quality of ground waters were found to be within the prescribed IS:10500-2012 Norms for Drinking in the absence of an alternative source.

3.8 Land Environment

3.8.1 Soil Status

The major soil types encountered in the district are black cotton soils, red sandy to loamy soils and alluvial soils. The monitored soil quality data are given as **Table 3.30**. Soils with medium compaction and Silty loam texture are dominant in the study area. Soil pH values were found to be in alkaline range (7.53-7.86) and Electrical Conductivity values were in the range 0.92-1.45 mmhos/cm. There was significant moisture content at all the monitoring locations. Significant levels of Nitrogen, Phosphorous and Potassium (NPK) values were monitored at all locations. Sodium Absorption Ratio was in the range 2.16-5.51 (desirable value being <5). There was **no heavy metals intrusion/leaching** into the ground strata. Wilting coefficient in significant levels would mean that these soils would support the vegetation, if amended suitably.

3.8.2 Land Use

For Land Use study of the Study Area, IRS P6-LIS IV- Imagery dated 11.07.2024 Satellite Digital Data of NRSA, Hyderabad was used (**Fig. 3.5**). Level-3 Classification with 1:50,000 scale was made for the preparation of land use mapping (**Fig. 3.6**). Land Use Pattern of the Study Area is given in **Table 3.31**. Fallow Land occupies the majority of the study area which is about 34.01%. Crop Lands occupy 17.41% of the study area Built-up lands occupy 5.05%. Water body occupies about 4.26% of the study area.

Table : 3.31 Land Use Pattern

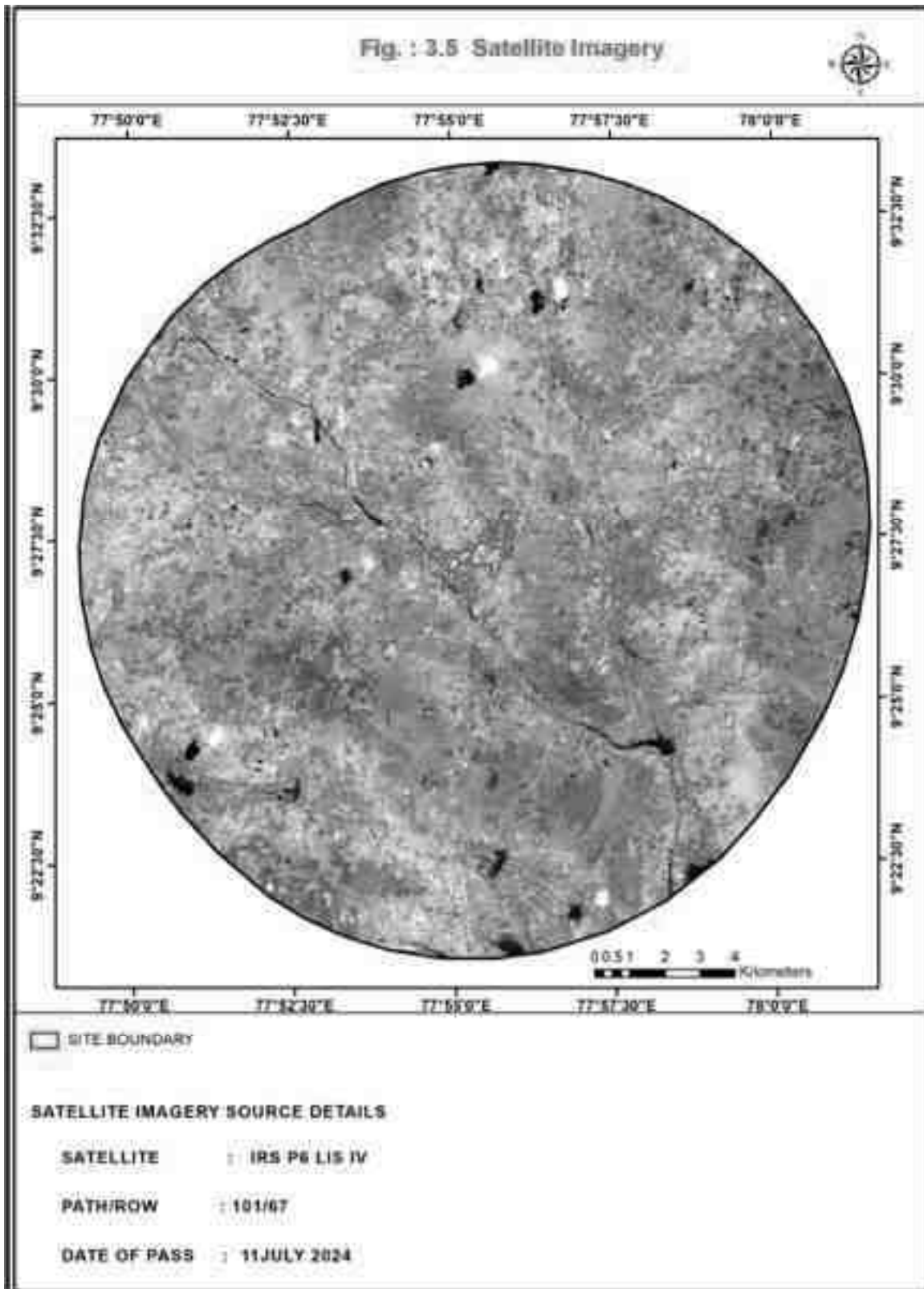
Land Use	Area, sq.km	Percentage, %
Agricultural Crop Land	68.72	17.41
Fallow Land	134.28	34.01
Vegetation	98.26	24.89
Barren/Unculturable/Waste/Scrub Lands	55.21	13.98
Other Mine/Quarry/Industry Land	1.58	0.40
Built-up Land	19.93	5.05
Water Body	16.83	4.26
Total	394.81	100

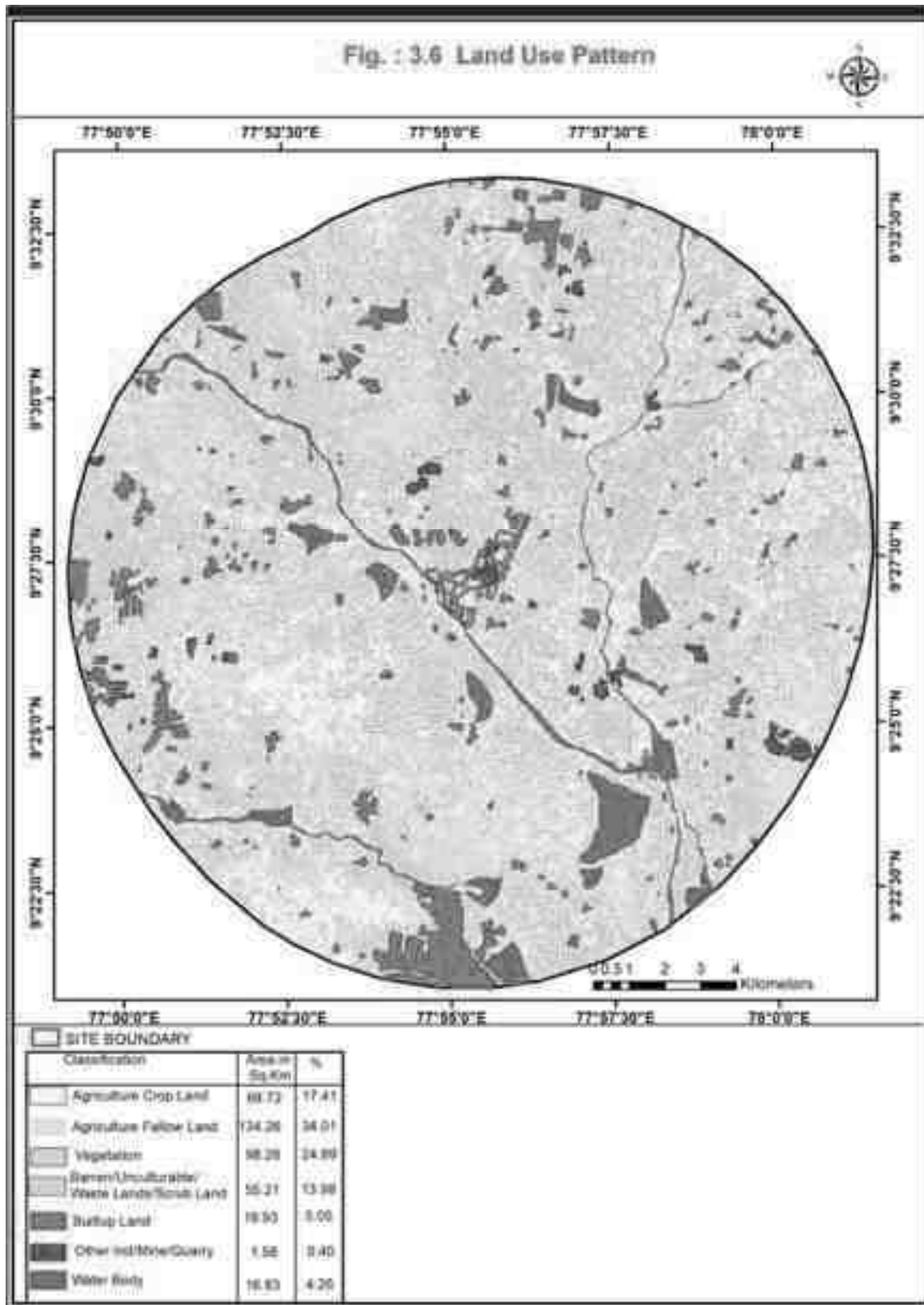
Table : 3.30 Soil Status

Monitoring Date : 27-28.09.2024

Sl. No.	Parameter	S1-Plant Green Belt	S2-Dry Land, Vachch akara-patti	S3-Agri. Land, Subbiah puram	S4-Dry Agri. Land, Tulukka patti	S5-Dry Agri. Land, Ramalingapuram	S6-Dry Agri. Land, Mel Chinnia puram	Desirable Range*
i.	Location Co-ordinates	09°27'28.41" N 77°55'47.20" E	09°28'00.29" N 77°56'21.22" E	09°27'21.92" N 77°56'55.69" E	09°26'27.47" N 77°55'52.77" E	09°26'49.72" N 77°53'36.81" E	09°28'34.33" N 77°54'10.52" E	-
ii.	Date in Sep. 2024 / Time, Hrs.	28/ 12:30- 12:45	27/ 13:00- 13:10	27/ 13:20- 13:30	28/ 10:45- 11:00	27/ 11:00- 11:15	27/ 11:45- 12:00	-
iii.	Colour	Brown	Grey	Brown	Brown	Brown	Brown	-
iv.	Compaction	Medium	Medium	Medium	Medium	Medium	Medium	-
1	pH (10% Solution)	7.68	7.86	7.71	7.74	7.80	7.53	5.5-9.0
2	Electrical Conductivity, mmhos/cm	1.21	1.45	0.92	1.30	1.25	1.28	0.2-0.5
3	Natural Moisture Content, %	12.4	8.7	11.6	9.5	9.1	10.1	-
4	Organic Carbon, %	1.10	0.72	1.12	0.94	0.88	0.97	>0.75
5	Nitrogen (as N), %	0.012	0.006	0.011	0.010	0.008	0.010	0.01-0.02
6	Phosphorus (as P), %	0.010	0.005	0.006	0.006	0.005	0.006	0.002-0.004
7	Potassium (as K), %	0.008	0.01	0.003	0.008	0.007	0.008	>0.01
8	Sodium (as Na), ppm	110	240	110	130	150	140	-
9	Calcium (as Ca), ppm	80	60	50	100	90	80	-
10	Magnesium (as Mg), ppm	70	50	40	80	70	90	-
11	Chlorides (as Cl), ppm	180	210	130	180	170	190	-
12	Sulphates (as SO ₄), ppm	80	90	40	90	70	90	-
13	Cation Exchange Capacity, meq/100 g	24.2	17.1	25.3	22.1	22.6	23.1	10-30
14	Grain Size Distribution :- i. Sand, %	25.8	30.5	25.7	24.8	27.6	27.5	-
	ii. Silt	63.8	62.5	63.0	65.8	64.1	63.7	-
	iii. Clay	10.4	7.0	11.3	9.4	8.3	8.8	-
15	Textural Class	Silty loam	Silty loam	Silty loam	Silty loam	Silty loam	Silty loam	Loam
16	Bulk Density, g/cc	1.36	1.33	1.37	1.34	1.33	1.35	-
17	Infiltration Rate, cm/hr	3.4	4.0	3.5	3.7	3.6	3.8	-
18	Field Capacity, %	25.4	19.7	24.6	23.2	23.8	21.2	-
19	Wilting Coefficient, %	1.6	0.7	1.5	1.2	1.0	0.9	>0.4
20	Available Water Storage Capacity, %	23.8	19.0	23.1	22.0	22.8	20.3	-
21	Sodium Absorbing Ratio	2.16	5.51	2.80	2.34	2.87	2.54	<5

* :Desirable Range for High Production Soil.





3.9 Flora and Fauna

3.9.1 Flora

There is no Reserved Forests within 10 km radius area. The Study Area is not part of any National Park, Sanctuary, Biosphere Reserve, Wildlife Corridors, Migratory Path, etc. The list of plant species in the study area are presented in Table 3.32.

Table : 3.32 List of Flora in the Study Area

Sl. No.	Botanical Name	Family	Common Name	Habit
Agricultural Crops				
1	<i>Arachis hypogea</i>	Fabaceae	Groundnut	Herb
2	<i>Cajanus cajan</i>	Fabaceae	Pigeon Pea, Red Gram	Herb
3	<i>Capsicum frutescens</i>	Solanaceae	Milagaai, Chilly	Herb
4	<i>Cicer arietinum</i>	Fabaceae	Bengal Gram	Herb
5	<i>Cyamopsis tetragonoloba</i>	Fabaceae	Cluster bean	Shrub
6	<i>Eleusine corocana</i>	Poaceae	Ragi	Herb
7	<i>Hibiscus esculentus</i>	Malvaceae	Lady's finger, Vendai	Herb
8	<i>Lagenaria vulgaris</i>	Cucurbitaceae	Bottle gourd	Creeper
9	<i>Momordica charantia</i>	Cucurbitaceae	Bittergourd	Creeper
10	<i>Moringa oleifera</i>	Moringaceae	Drumstick, Murungai	Tree
11	<i>Musa paradisiaca</i>	Musaceae	Plantain, Vazhai	Tree
12	<i>Oryza sativa</i>	Poaceae	Rice	Herb
13	<i>Phaseolus mungo</i>	Fabaceae	Black gram	Herb
14	<i>Ricinus communis</i>	Euphorbiaceae	Castor Seed	Herb
15	<i>Sesamum indicum</i>	Pedaliaceae	Seasame, Ellu	Herb
16	<i>Solanum melongena</i>	Solanaceae	Brinjal	Herb
17	<i>Solanum torvum</i>	Solanaceae	Turkey berry	Shrub
18	<i>Trichosanthes cucurmina</i>	Cucurbitaceae	Snake gourd	Creeper
19	<i>Vicia faba</i>	Fabaceae	Broad Bean	Creeper
20	<i>Vigna radiata</i>	Fabaceae	Green Gram	Herb
21	<i>Zea mays</i>	Poaceae	Maize	Herb
Commercial Crops				
1	<i>Capsicum frutescens</i>	Solanaceae	Milagaai, Chilly	Herb
2	<i>Cocos nucifera</i>	Arecaceae	Coconut, Thennai	Tree
3	<i>Citrus aurantifolia</i>	Rutaceae	Lemon	Tree
4	<i>Gossypium arboreum</i>	Malvaceae	Cotton, Paruthi	Shrub
5	<i>Helianthus annuus</i>	Asteraceae	Sunflower	Herb
6	<i>Mangifera indica</i>	Anacardiaceae	Mango	Tree
7	<i>Ricinus communis</i>	Euphorbiaceae	Castor Bean Plant	Shrub
Plantations				
1	<i>Casuarina equisetifolia</i>	Casuarinaceae	Casuarina, Savukku	Tree
2	<i>Cocos nucifera</i>	Palmae	Coconut	Tree
3	<i>Eucalyptus sp.</i>	Myrtaceae	Eucalyptus	Tree
4	<i>Mangifera indica</i>	Anacardiaceae	Mango	Tree
5	<i>Tectona grandis</i>	Lamiaceae	Teak	Tree
Natural Vegetation				
1	<i>Abrus precatorius</i>	Fabaceae	Coral bead vine, Rosary pea,	Climber
2	<i>Abutilon indicum</i>	Malvaceae	Country Mallow, Tutti	Herb
3	<i>Acacia arabica</i>	Mimosoideae	Green Amaranth	Herb
4	<i>Acacia auriculiformis</i>	Mimosaceae	Karuvelan	Tree

Sl. No.	Botanical Name	Family	Common Name	Habit
5	<i>Acacia catechu</i>	Mimosaceae	karunkali	Tree
6	<i>Acacia latronum</i>	Mimosaceae	Kakka odai	Tree
7	<i>Acacia leucophloea</i>	Mimosaceae	Velvelam, White babool	Tree
8	<i>Acacia nilotica</i>	Mimosaceae	Babul, Karuvelam	Tree
9	<i>Acalypha indica</i>	Euphorbiaceae	Indian Copperleaf, Kuppaimeni	Herb
10	<i>Acanthospermum hispidum</i>	Asteraceae	Seruppadithazhai,	Herb
11	<i>Achchyranthes aspera</i>	Amaranthaceae	Prickly Chaff flower, Nayuruvi	Herb
12	<i>Adathoda vasica</i>	Acanthaceae	Vasaca, Adathodai	Shrub
13	<i>Adenium obesum</i>	Apocynaceae	Desert Rose	Shrub
14	<i>Adina cordifolia</i>	Rubiaceae	Manjakadambu	Tree
15	<i>Aegle marmelos</i>	Rutaceae	Wood Apple, vilvam	Tree
16	<i>Aerva lanata</i>	Amaranthaceae	Sirupulai	Herb
17	<i>Agave americana</i>	Agavaceae	Century Plant, Karunkatralai	Herb
18	<i>Agave sisalana</i>	Agavaceae	Kathalai	Herb
19	<i>Ageratum conyzoides</i>	Asteraceae	Goat weed, Pumppillu	Herb
20	<i>Ailanthus excelsa</i>	Simaroubaceae	Indian Tree of Heaven,	Tree
21	<i>Alangium salvifolium</i>	Alangiaceae	Alingi, Sage-leaved alangium	Climber
22	<i>Albizia amara</i>	Mimosaceae	Usilamaram	Tree
23	<i>Albizia lebbek</i>	Mimosaceae	Siris Tree, Vagai	Tree
24	<i>Albizia odoratissima</i>	Fabaceae	Karuvagai	Tree
25	<i>Aloe vera</i>	Asphodelaceae	Choththukattalai	Shrub
26	<i>Alternanthera sessilis</i>	Amaranthaceae	Dwarf Copperleaf, Ponnanganni	Herb
27	<i>Amaranthus spinosus</i>	Amaranthaceae	Mullukkirai, Prickly Amaranth	Herb
28	<i>Amaranthus viridis</i>	Amaranthaceae	Kuppaikeerai	Herb
29	<i>Ammannia baccifera</i>	Lythraceae	Acrid weed, Kalluruvi	Herb
30	<i>Andrographis paniculata</i>	Acanthaceae	Asian Waterwillow, Siriyanangai	Herb
31	<i>Anisomeles indica</i>	Lamiaceae	Marutti	Herb
32	<i>Anisomeles malabarica</i>	Lamiaceae	Peyimarutli	Herb
33	<i>Annona squamosa</i>	Annonaceae	Custard Apple, Seethapalam	Tree
34	<i>Apluda mutica</i>	Poaceae	Mauritian Grass	Grass
35	<i>Arachis hypogea</i>	Faboideae	Ground nut	Herb
36	<i>Argemone mexicana</i>	Papaveraceae	Prickly poppy, Kudiyotti	Shrub
37	<i>Aristida adscensionis</i>	Poaceae	Coomon Needle grass	Herb
38	<i>Aristolochia bracteolata</i>	Aristolochiaceae	Aduthinnarppalai	Herb
39	<i>Artocarpus heterophyllus</i>	Moraceae	Jackfruit	Tree
40	<i>Asparagus racemosus</i>	Asparaceae	Satawari, Tanneervittan	Climber
41	<i>Atalantia monophylla</i>	Rutaceae	Kattu Elumeachi	Tree
42	<i>Azadirachta indica</i>	Meliaceae	Neem, Vembu	Tree
43	<i>Baliospermum motanum</i>	Euphorbiaceae	Wild Castor, Peyamanakku	Herb
44	<i>Bambusa arundanacea</i>	Poaceae	Bamboo, Mungil	Tree
45	<i>Bambusa vulgaris</i>	Poaceae	Mulmungil	Bamboo
46	<i>Barleria prionitis</i>	Acanthaceae	Porcupine flower, Kundan	Herb
47	<i>Bassia latifolia</i>	Sapotaceae	Iluppai	Tree
48	<i>Bauhinia racemosa</i>	Fabaceae	Bidi leaf tree, Aatti	Tree
49	<i>Bidens biternata</i>	Asteraceae	Spanish needles	Herb
50	<i>Biophytum sensitivium</i>	Oxalidaceae	Telegraph plant	Climber
51	<i>Blumea lacera</i>	Asteraceae	Kattumullangi, Narakkarandai	Herb
52	<i>Boerheavia diffusa</i>	Nyctaginaceae	Pig weed, Mukkarattai Keerai	Herb
53	<i>Boerheavia erecta</i>	Nyctaginaceae	Erect spiderling	Herb
54	<i>Borassus flabellifer</i>	Arecaceae	Palmyra Palm	Tree
55	<i>Bougainvillea spectabilis</i>	Nyctaginaceae	Kaakithapoo	Climber
56	<i>Bulbostylis barbatta</i>	Cyperaceae	Mukkutikorei	Herb

Sl. No.	Botanical Name	Family	Common Name	Habit
57	<i>Butea monosperma</i>	Fabaceae	Flame of Forest	Tree
58	<i>Cactus sp.</i>	Cactaceae	Kalli, Spurge	Shrub
59	<i>Cadiospermum halicacabum</i>	Sapindaceae	Mudakattan	Climber
60	<i>Caesalpinia pulcherrima</i>	Caesalpinieaceae	Peacock Flower, Mayurkondrai	Tree
61	<i>Cajanus cajan</i>	Fabaceae	Pigeon Pea, Red Gram, Tuvarai	Herb
62	<i>Calendula officinalis</i>	Asteraceae	Marigold	Herb
63	<i>Calophyllum inophyllum</i>	Clusiaceae	Punnai	Tree
64	<i>Calotropis gigantea</i>	Asclepiadaceae	Crown Flower, Erukku	Shrub
65	<i>Canna indica</i>	Cannaceae	Indian shot, Kalvalai	Shrub
66	<i>Capparis divaricata</i>	Capparaceae	Turatti	Climber
67	<i>Capparis sepiaria</i>	Capparaceae	Kattukathiri, Wild Caper Bush	Herb
68	<i>Capsicum annum</i>	Solanaceae	Capsicum, Chilli Pepper, Milakai	Herb
69	<i>Carica papaya</i>	Caricaceae	Pappaali	Tree
70	<i>Carissa carandas</i>	Apocynaceae	Karanda, Kalakkai	Shrub
71	<i>Caryota urens</i>	Arecaceae	kuntarpanai, Talippanai	Palm
72	<i>Cassia auriculata</i>	Fabaceae	Aavarampoo	Shrub
73	<i>Cassia biflora</i>	Fabaceae	Twin Flowered Cassia,	Tree
74	<i>Cassia fistula</i>	Fabaceae	Golden shower tree, Kondrai	Tree
75	<i>Cassia occidentalis</i>	Caesalpinieaceae	Coffee weed, Payaverai	Herb
76	<i>Cassia roxburghii</i>	Caesalpinieaceae	Red Cassia, Vakai	Tree
77	<i>Cassia siamea</i>	Caesalpinieaceae	Manja konnai	Tree
78	<i>Cassia tora</i>	Caesalpinieaceae	Sickle senna, Tagarai	Herb
79	<i>Casuarina equisetifolia</i>	Casuarinaceae	Whistling Pine, Savukku	Tree
80	<i>Catharanthus roseus</i>	Apocynaceae	Periwinkle, Nithyakalyani	Herb
81	<i>Ceiba pentandra</i>	Bombacaceae	Silk-Cotton Tree,	Tree
82	<i>Cenchrus ciliaris</i>	Poaceae	Buffel grass	Grass
83	<i>Cenchrus setigerus</i>	Poaceae	Birdwood Grass, Black	Grass
84	<i>Centella asiatica</i>	Apiaceae	Pennyweed, Vallarai	Herb
85	<i>Chloris barbata</i>	Poaceae	Kodaipullu	Grass
86	<i>Chloris dolichostachya</i>	Poaceae	Finger grass, Kuruthupillu	Grass
87	<i>Chloroxylon sweitenia</i>	Flindersiaceae	Porasu	Tree
88	<i>Chromolaena odorata</i>	Asteraceae	Devil Weed, Siam Weed	Shrub
89	<i>Chrysanthemum indicum</i>	Asteraceae	Chrysanthemum, Samanthi	Herb
90	<i>Cissus quadrangularis</i>	Vitaceae	Devil's Backbone, Pirandai	Climber
91	<i>Citrus aurantifolia</i>	Rutaceae	Common Sour Lime, Elumichai	Tree
92	<i>Citrus medica</i>	Rutaceae	Citron, Kodiyelumichai, Narathai	Tree
93	<i>Cleome gynandra</i>	Cleomaceae	Wild Spider flower, Nalvelai	Herb
94	<i>Cleome viscosa</i>	Cleomaceae	Tickweed, Naikkaduku	Herb
95	<i>Clitoria ternatea</i>	Fabaceae	Sankupushpam, Butterfly Pea	Climber
96	<i>Coccinia indica</i>	Cucurbitaceae	Kovai	Climber
97	<i>Cocculus hirsutus</i>	Menispermaceae	Broom Creeper, Kattukkodi	Climber
98	<i>Cocos nucifera</i>	Palmae	Coconut	Tree
99	<i>Codiaeum variegatum</i>	Euphorbiaceae	Croton	Shrub
100	<i>Coleus amboinicus</i>	Lamiaceae	Indian Mint, Karpooravalli	Herb
101	<i>Combretum indicum</i>	Combretaceae	Rangoon Creeper, Iranganmalli	Shrub
102	<i>Commelina benghalensis</i>	Commelinaceae	Dew Flower, Kanavachai	Herb
103	<i>Commiphora candata</i>	Burseraceae	Kiluvai	Tree
104	<i>Conocarpus erectus</i>	Combretaceae	Buttonwood	Tree
105	<i>Convolvulus arvensis</i>	Covolvulaceae	Bhoomi Chakra poondu	Climber
106	<i>Corchorus olitorius</i>	Tiliaceae	Perattikkirai	Shrub
107	<i>Crotalaria retusa</i>	Fabaceae	Rattlepod, Kilukilupai	Herb
108	<i>Croton sparsiflorus</i>	Euphorbiaceae	Reilpoondu	Herb

Sl. No.	Botanical Name	Family	Common Name	Habit
109	Cucumis melo	Cucurbitaceae	Musk melon, Thumattikai	Herb
110	Cucumis sativus	Cucurbitaceae	Cucumber	Climber
111	Cuscuta reflexa	Convolvulaceae	Verillakothan, Kodyagundal	Climber
112	Cymbopogon sp.	Poaceae	Lemon grass	Grass
113	Cynodon dactylon	Poaceae	Bermuda grass, Arugampul	Grass
114	Cyprus rotundus	Cyperaceae	Korai, Nut grass	Grass
115	Dalbergia latifolia	Fabaceae	Indian Black Rosewood,	Tree
116	Datura metel	Solanaceae	Thorn apple, Oomathai	Shrub
117	Decalepis hamiltonii	Apocynaceae	Sawallow Root, Mavilinga	Shrub
118	Delonix elata	Fabaceae	White Gulmohr, Vadanarayanan	Tree
119	Delonix regia	Fabaceae	Gulmohar	Tree
120	Dendrocalamus sp.	Poaceae	Stone Bamboo, Sirumungil	Shrub
121	Dendrophthoe falcata	Loranthaceae	Honey Suckle Mistletoe,	Herb
122	Desmoslachie bipinnata	Poaceae	Darbhaipul	Grass
123	Dichanthium annulatum	Poaceae	Marvel grass	Grass
124	Dichrostachis cinerea	Fabaceae	Sickle Bush, Veduttalam	Tree
125	Digetaria adscendens	Poaceae	Crab grass	Herb
126	Digetaria bicornis	Poaceae	Finger grass	Herb
127	Dodonaea viscosa	Sapindaceae	Hop Bush, Virali	Shrub
128	Eclipta alba	Asteraceae	Bhringaraj, Karisalankanni	Herb
129	Eclipta prostrata	Asteraceae	False daisy, Karisalankanni	Herb
130	Eleusine coracana	Poaceae	Finger Millet, Ragi	Herb
131	Emblica officinalis	Phyllanthaceae	Indian gooseberry, Nelli	Tree
132	Enicostemma axillare	Gentianaceae	Vellarugu	Herb
133	Eragrostis spectabilis	Poaceae	Bunchgrass	Herb
134	Erythrina indica	Fabaceae	Mullu murungai, Indian Coral	Tree
135	Erythrina variegata	Fabaceae	Indian coral tree,	Tree
136	Erythroxylum monogynum	Erythroxylacea	Bastard Sandal, Sembulichan	Shrub
137	Eucalyptus tereticomis	Myrtaceae	Thailamaram	Tree
138	Euphorbia antiquorum	Euphorbiaceae	Kalli, Triangular Spurge	Tree
139	Euphorbia heterophylla	Euphorbiaceae	Painted euphorbia, Palperukki	Herb
140	Euphorbia hirta	Euphorbiaceae	Asthma weed, Ammam	Herb
141	Euphorbia thymifolia	Euphorbiaceae	Amman pacharisi	Herb
142	Euphorbia tirucalli	Euphorbiaceae	Pencil cactus, Thirukalli	Shrub
143	Evolvulus alsinoides	Convolvulaceae	Dwarf Morning Glory,	Herb
144	Ficus benghalensis	Moraceae	Banyan, Alamaram	Tree
145	Ficus benjamina	Moraceae	Weeping Fig, Vellal,	Tree
146	Ficus hispida	Moraceae	Peyathi	Tree
147	Ficus racemosa	Moraceae	Cluster Fig, Athi	Tree
148	Ficus religiosa	Moraceae	Peepal, Arasamaram	Tree
149	Gardenia jasminoides	Rubiaceae	Cape jasmine, Kumbai	Shrub
150	Gisekia pharmaceoides	Aizoaceae	Manal keerai	Herb
151	Gloriosa superba	Colchicaceae	Flame lily, Kallappai kilangu	Herb
152	Gmelina arborea	Verbenaceae	Gamhar, Kumil	Tree
153	Gomphrena globosa	Amaranthaceae	Globe Amaranth, Vaadamalli	Herb
154	Grewia disperma	Tiliaceae	Narathai	Tree
155	Grewia abutilifolia	Tiliaceae	Palicamaram	Shrub
156	Gymnema sylvestre	Apocynaceae	Cowplant, Sirukurinjan	Shrub
157	Gynmosporia montana	Celastraceae	Mountain Spike thorn, Kattangi	Shrub
158	Hardwickia binata	Cesalpiniaceae	Anjan, Acchamaram	Tree
159	<i>Helianthus annuus</i>	Asteraceae	Sunflower	Herb
160	Heliotropium indicum	Boraginaceae	Indian heliotrope, Thel kodukku	Herb

Sl. No.	Botanical Name	Family	Common Name	Habit
161	Hemidesmus indicus	Apocynaceae	Indian sarasaparilla, Nannari	Herb
162	Heteropogon contortus	Poaceae	Bunch Speargrass	Grass
163	Heterostemma tanjorensis	Asclepiadaceae	Palakeerai	Herb
164	Hibiscus cannabinus	Malvaceae	Brown Indian Hemp, Puliccha	Shrub
165	Hibiscus esculentus	Malvaceae	Lady's finger, Vendai	Herb
166	Hibiscus micranthus	Malvaceae	Tiny Flower Hibiscus	Herb
167	Hibiscus rosasinensis	Malvaceae	Shoeflower, Sembaruthi	Shrub
168	Holoptelea integrifolia	Ulmaceae	Indian Elm Tree, Aya	Tree
169	Hygrophila auriculata	Acanthaceae	Marsh Barbel, Neermulli	Herb
170	Hyptis suaveolens	Lamiaceae	Pignut	Shrub
171	Impatiens balsamina	Balsaminaceae	Garden Balsam,	Herb
172	Indigofera tinctoria	Fabaceae	Cassia Indigo, Avuri	Shrub
173	Ipomea carnea	Convolvulaceae	Bush Morning Glory	Shrub
174	Ipomea hederfolia	Convolvulaceae	Kanavalikkodi	Herb
175	Ipomea obscura	Convolvulaceae	Obscure morning glory, Chirutali	Herb
176	Ipomea reniformis	Convolvulaceae	Roundleaf bindweed,	Climber
177	Ixora coccinea	Rubiaceae	Ixora, Vedchi	Shrub
178	Ixora parviflora	Rubiaceae	Torch tree, Shulundu	Tree
179	Jasminum arborescens	Oleaceae	Shrubby Jasmine, Kattumalligai	Shrub
180	Jasminum sambac	Oleaceae	Jasmine, Kundumalli	Shrub
181	Jatropha curcas	Euphorbiaceae	Physic Nut, Kattukkottai	Shrub
182	Jatropha glandulifera	Euphorbiaceae	Vellaikattukottai, Kattamanakku	Shrub
183	Jatropha gossypifolia	Euphorbiaceae	Seemaiamanakku	Shrub
184	Justicia adhatoda	Acanthaceae	Adathoda	Shrub
185	Justicia gendarusa	Acanthaceae	Asian Water willow, Karunochchi	Shrub
186	Kedrostis foetidissima	Cucurbitaceae	Appakovai	Climber
187	Kyllinga triceps	Cyperaceae	Spikes edge, Velutta Nirbasi	Herb
188	Lagerstroemia speciosa	Lythraceae	Queen Crape Myrtle, Kadali	Tree
189	Lanea coromandelica	Anacardiaceae	Indian Ash Tree, Othiyamaram	Tree
190	Lantana camara	Verbenaceae	Lantana, Unnichi	Shrub
191	Lawsonia inermis	Lythraceae	Henna, Maruthondri	Shrub
192	Lepidagathis cristata	Acanthaceae	Karappanpoondu	Herb
193	Leucaena leucocephala	Fabaceae	Periyataragai, Horse Tamarind	Shrub
194	Leucas aspera	Lamiaceae	Common Leucas, Thumbai	Herb
195	Limonia acidissima	Rutaceae	Wood apple, Vilampazham	Tree
196	Lycopersicon esculentum	Solanaceae	Thakkali	Herb
197	Maduca longifolia	Sapotaceae	Indian Butter Tree, Iluppai	Tree
198	Malvastrum	Malvaceae	False Mallow	Herb
199	Mangifera indica	Anacardiaceae	Mango	Tree
200	Marselia quadrifolia	Marsileaceae	Four Leaf Clover, Aaraikkeerai	Herb
201	Melia azadirachta	Meliaceae	Indian Liliac, Malaivembu	Tree
202	Melia dubia	Meliaceae	Karuvembu, Malaivembu	Tree
203	Merremia emarginata	Convolvulaceae	Kidney Leaf Morning Glory,	Herb
204	Millingtonia hortensis	Bignoniaceae	Tree Jasmine, Katmalli	Shrub
205	Mimosa catechu	Mimosaceae	Black Catechu, Karungali,	Tree
206	Mimosa hamata	Mimosaceae	Hooked Mimosa	Shrub
207	Mimosa pudica	Mimosaceae	Touch-me-not, Thottachurungi	Herb
208	Mimusops elengi	Sapotaceae	Maulsari, Magizhamboo	Tree
209	Mimusops elengi	Sapotaceae	Maulsari, Magizhamboo	Tree
210	Mimusops elengi	Sapotaceae	Magizhamboo	Tree
211	Mitragyna parvifolia .	Rubiaceae	Nirkadambai	Tree
212	Morinda tinctoria	Rubiaceae	Nuna	Tree

Sl. No.	Botanical Name	Family	Common Name	Habit
213	Morinda tinctoria	Rubiaceae	Nuna, Manjanathi	Tree
214	Moringa oleifera	Moringaceae	Drumstick, Murungai	Tree
215	Muntigia calabura	Muntigiaceae	Cotton Candy Berry,	Tree
216	Murraya koengii	Rutaceae	Curry leaf, Karuveppilai	Shrub
217	Murraya paniculata	Rutaceae	Orange Jasmine, Vengarai	Shrub
218	Musa paradisiaca	Musaceae	Banana	Tree
219	Nerium indicum	Apocynaceae	Sevvarali	Shrub
220	Nerium oleander	Apocynaceae	Oleander, Arali	Shrub
221	Nyctanthes arbortristis	Oleaceae	Coral Jasmine, Pavizhamalli	Shrub
222	Ocimum americanum	Lamiaceae	Hoary Basil, Nai Thulasi	Herb
223	Ocimum americanum	Lamiaceae	Nai Thulasi	Herb
224	Ocimum basilicum	Lamiaceae	Sweet Basil, Thirunitruthulasi	Herb
225	Ocimum gratissimum	Lamiaceae	Wild Basil, Peruntulasi	Herb
226	Ocimum sanctum	Lamiaceae	Holy Basil, Thulasi	Herb
227	Ocimum tenuiflorum	Lamiaceae	Thulasi	Herb
228	Odina wodier	Anacardiaceae	Odiyan	Tree
229	Oldenlandia umbellata	Rubiaceae	Choyroot, Chayaver	Herb
230	Opuntia dillenii	Cactaceae	Prickly Pear, Chappathikkalli	Shrub
231	Opuntia elatior	Cactaceae	Prickly Pear, Chappattukalli	Shrub
232	<i>Opuntia stricta</i>	Cactaceae	Sappathikkalli	Cactus
233	Opuntia vulgaris	Aizoaceae	Pricklypear	Shrub
234	Oxalis corniculata	Oxalidaceae	Creeping Wood Sorrel, Paliakiri	Climber
235	Pandanus odoraltissimus	Pandanaceae	Thazhai, Kewda	Shrub
236	Parthenium hysterophorus	Asteraceae	Parthenium, Carrot Grass	Herb
237	Passiflora foetida	Passifloraceae	Stinking passionflower,	Climber
238	Pavetta indica	Rubiaceae	Indian Pavetta, Kattukkarantai	Shrub
239	Pavonia zeylanica	Malvaceae	Sittamutti, Thengai poondu	Shrub
240	Peltophorum pterocarpum	Caesalpiniaceae	Copper pod, Perungondrai,	Tree
241	Pergularia extensa	Apocynaceae	Hair Knot Plant, Veliparuthi,	Climber
242	Phoenix acaulis	Arecaceae	Stemless Date Palm	Shrub
243	Phoenix sylvestris	Arecaceae	Eeachamaram	Tree
244	Phyla nodiflora	Verbenaceae	Creeping Lip Plant, Poduthalai	Herb
245	Phyllanthus emblica	Euphorbiaceae	Nelli	Tree
246	Phyllanthus nirurii	Phyllanthaceae	Keelanelli, Seed under leaf	Herb
247	Phyllanthus reticulatus	Phyllanthaceae	Black-berried featherfoil,	Herb
248	Physalis minima	Solanaceae	Ground Cherry, Kupanti	Herb
249	Pisonia alba	Nyctaginaceae	Lettuce Tree, Lachakatta Keerai	Shrub
250	Pistia stratiotes	Arecaceae	Water lettuce, Agasatamarai	Aquatic
251	Pithecellobium dulce	Mimosaceae	Sweet tamarind, Kodukkappuli	Tree
252	Plectranthus amboinicus	Lamiaceae	Indian borage	Herb
253	Plumeria acuminata	Apocyanaceae	Frangipani	Tree
254	Plumeria acutifolia	Apocynaceae	Sampangi	Tree
255	Plumeria alba	Apocynaceae	White Frangipani, Champangi	Tree
256	Polyalthia longifolia	Anonaceae	Indian mast tree, Asoka,	Tree
257	Pongamia pinnata	Fabaceae	Indian Beech, Pungam	Tree
258	Portulaca grandiflora	Portulacaceae	Moss Rose, Table Rose	Herb
259	Portulaca oleracea	Portulacaceae	Common Purslane, Paruppu	Herb
260	Prosopis glandulosa	Mimosodeae	Vaelikkaruvai	Tree
261	Prosopis juliflora	Fabaceae	Algaroba, Seemaikaruvai	Tree
262	Prosopis spicigera	Fabaceae	Vaelikkaruvai	Shrub
263	Psidium gujava	Myrtaceae	Guava	Tree
264	Pterocarpus marsupium	Fabaceae	Vengai, Indian kino tree	Tree

Sl. No.	Botanical Name	Family	Common Name	Habit
265	<i>Punica granatum</i>	Lythraceae	Pomegranate, Mathulai	Shrub
266	<i>Rosa indica</i>	Rosaceae	Rose	Herb
267	<i>Saccharum munja</i>	Poaceae	Munja grass	Herb
268	<i>Saccharum spontaneum</i>	Poaceae	Kans grass, Pekkarimpu	Herb
269	<i>Salvadora persica</i>	Salvadoraceae	Peruvila, Ukaa	Tree
270	<i>Samanea saman</i>	Mimosodeae	rain tree, Thoongumoonij maram	Tree
271	<i>Sapindus emarginatus</i>	Sapindaceae	Notched Leaf Soapnut,	Tree
272	<i>Securinega virosa</i>	Phyllanthaceae	Common Bush Weed, Pula	Herb
273	<i>Senna siamea</i>	Fabaceae	Manjalkondrai	Tree
274	<i>Sesbania grandiflora</i>	Fabaceae	Agathikeerai	Tree
275	<i>Sida acuta</i>	Malvaceae	Common Wireweed, Palambasi	Herb
276	<i>Sida cordifolia</i>	Malvaceae	Country mallow, Kurunthotti,	Shrub
277	<i>Sida rhombifolia</i>	Malvaceae	Wild mallow, Jelly Leaf	Herb
278	<i>Solanum incanum</i>	Solanaceae	Karimulli	Herb
279	<i>Solanum nigrum</i>	Solanaceae	Black-berry night	Herb
280	<i>Solanum surattense</i>	Solanaceae	Kandan kattiri	Herb
281	<i>Solanum torvum</i>	Solanaceae	Turkey berry, Sundaikkai	Shrub
282	<i>Solanum trilobatum</i>	Solanaceae	Thoodhuvilai	Shrub
283	<i>Solanum xanthocarpum</i>	Solanaceae	Yellow berried nightshade,	Herb
284	<i>Sorghum bicolor</i>	Poaceae	Fox tail millet, Maize	Herb
285	<i>Sterculia urens</i>	Sterculiaceae	Gum Karaya, Kavalam	Tree
286	<i>Sterculia villosa</i>	Sterculiaceae	Anainaar	Tree
287	<i>Streblus asper</i>	Moraceae	Toothbrush Tree, Kurripila	Shrub
288	<i>Strychnos nuxvomica</i>	Loganaceae	Poison Nut, Ettimaram	Tree
289	<i>Swietenia mahagoni</i>	Meliaceae	Mahagony, Ciminukku,	Tree
290	<i>Syzygium cumini</i>	Myrtaceae	Jamun, Navalpazham	Tree
291	<i>Tabernaemontana coronaria</i>	Apocynaceae	Nandiyarvattai	Shrub
292	<i>Tabernaemontana divaricata</i>	Apocynaceae	Crape Jasmine,	Shrub
293	<i>Tamarindus indicus</i>	Fabaceae	Tamarind, Puliyaaram	Tree
294	<i>Tecoma stans</i>	Bignoniaceae	Yellow trumpet	Shrub
295	<i>Tectona grandis</i>	Lamiaceae	Teak	Tree
296	<i>Tephrosia purpurea</i>	Fabaceae	Fish poison, Kollukkai Velai	Herb
297	<i>Terminalia arjuna</i>	Combretaceae	Arjun, Maruthu	Tree
298	<i>Terminalia catappa</i>	Combretaceae	Indian Almond, Nattuvadhumi,	Tree
299	<i>Terminalia chebula</i>	Combretaceae	Kadullai	Tree
300	<i>Thespesia lampas</i>	Malvaceae	Common Mallow, Kattupparuthi	Herb
301	<i>Thespesia populnea</i>	Malvaceae	Indian Tulip Tree, Poovarasu	Tree
302	<i>Thevetia peruviana</i>	Apocynaceae	Yellow Oleander, Arali	Tree
303	<i>Tinospora cordifolia</i>	Menispermaceae	Guduchi, Shindilakodi	Climber
304	<i>Toddalia aculeata</i>	Rutaceae	Milagaranai, Orange Climber	Shrub
305	<i>Tribulus terrestris</i>	Zygophyllaceae	Puncture Vine, Nerunji	Herb
306	<i>Tridax procumbens</i>	Asteraceae	Tridax daisy,	Herb
307	<i>Typha angustata</i>	Typhaceae	Cat tail reed	Herb
308	<i>Vernonia cinerea</i>	Asteraceae	Purple Fleabane,	Herb
309	<i>Vicia faba</i>	Fabaceae	Broad Bean, Avarai, Mochchai	Creeper
310	<i>Vicoa indica</i>	Asteraceae	Mukkuthipoo	Herb
311	<i>Vigna unguiculata</i>	Fabaceae	Cow Pea, Kaaraamani	Herb
312	<i>Vinca rosea</i>	Apocynaceae	Nithyakalyani	Herb
313	<i>Vitex negundo</i>	Lamiaceae	Nochi	Shrub
314	<i>Wedelia calendulacea</i>	Asteraceae	Ponniraichi	Herb
315	<i>Wrightia tinctoria</i>	Apocynaceae	Dyers Oleander, Paalai	Tree
316	<i>Xanthium strumarium</i>	Asteraceae	Common Cocklebur,	Shrub

Sl. No.	Botanical Name	Family	Common Name	Habit
317	Ziziphus jujube	Rhamnaceae	Jujube, Elandhai	Tree
318	Ziziphus mauritiana	Rhamanaceae	Indian Plum, Elandhai	Tree
319	Ziziphus nummularia	Rhamnaceae	Jhar Beri, Narielandai	Shrub
320	Ziziphus oenoplia	Rhamnaceae	Jackal Jujube, Suraimullu	Shrub
Medicinal Species				
1	Abrus precatorius	Fabaceae	Coral bead vine, Kundumani	Creepers
2	Achyranthes aspera	Amaranthaceae	Prickly Chaff flower, Nayuruvi	Herb
3	Adathoda vasica	Acanthaceae	Vasaca, Adathodai	Shrub
4	Aegle marmelos	Rutaceae	Wood Apple, vilvam	Tree
5	Aloe vera	Liliaceae	Kathalai	Herb
6	Alternanthera sessilis	Amaranthaceae	Dwarf Copperleaf, Ponnanganni	Herb
7	Amaranthus viridis	Amaranthaceae	Kuppaikeerai	Herb
8	Azadirachta indica	Meliaceae	Neem, Vembu	Tree
9	Calotropis gigantea	Asclepiadaceae	Crown Flower, Erukku	Shrub
10	Cassia auriculata	Fabaceae	Tanners cassia, Avaram	Shrub
11	Cissus quadrangularis	Vitaceae	Devil's Backbone, Pirandai	Climber
12	Cynodon dactylon	Poaceae	Bermuda grass, Arugampul	Herb
13	Eclipta alba	Asteraceae	Bhringaraj, Karisalankanni	Herb
14	Enicostemma axillare	Gentianaceae	Vellarugu	Herb
15	Euphorbia hirta	Euphorbiaceae	Asthma weed, Ammam	Herb
16	Leucas aspera	Lamiaceae	Common Leucas, Thumbai	Herb
17	Ocimum sanctum	Lamiaceae	Holy Basil, Thulasi	Herb
18	Solanum surattense	Solanaceae	Yellow-berried Nightshade,	Herb
19	Solanum trilobatum	Solanaceae	Thoodhuvalai	Shrub
20	Tridax procumbens	Asteraceae	Tridax daisy,	Herb
21	Vitex negundo	Lamiaceae	Nochi	Shrub

Endangered Plants :The study area does not record the presence of any critically threatened species. The records of Botanical survey of India and Forest department also does not indicate presence of any endangered and or Vulnerable Species in this area.

3.9.2 Fauna

Both direct and indirect observation methods were used for the faunal survey. Visual Encounter (search) Method was employed to record vertebrate species. Additionally, survey of relevant literature was also done to consolidate the list of vertebrate fauna distributed in the area. Quantitative data were gathered by :

- Determining the bird population of migratory and local birds by taking 10 random readings at every location.
- Observing mammals, amphibians and reptiles, noting their calls, droppings, burrows, pugmarks and other signs.
- **Point Survey Method:** Observations were made in each site for 15 minutes duration.
- **Road Side Counts:** The observer traveled by motor vehicles from site to site, all sightings were recorded (this was done both in the day and night time). An index of abundance of each species was also established.

- **Pellet and Track Counts:** All possible animal tracks and pellets were identified and recorded (South Wood, 1978).
- Physical observations may also carried out from the machans (if required) for two-twelve hour periods, one during day time and the other during night time for terrestrial fauna and
- Local inhabitants were interviewed for details of plants and animals and to get ethnobiological data.

Peafowl placed under Schedule-I as per Wild Life (Protection) Amendment Act, 2022 is found in the study area and its surroundings.

The details of fauna found in the Study Area are given in **Tables 3.33-3.34**.

Table : 3.33 List of Fauna

Sl. No.	Scientific Name	Common Name	Schedule as per WP(A) Act, 2022
Insects			
1	<i>Apis indica</i>	Honey bee	II
Butterflies			
1	<i>Pachliopta hector</i>	Crimson rose	II
2	<i>Papilio polytes</i>	Common mormon	II
3	<i>Triodes minos</i>	Southern birdwing	II
Amphibians			
1	<i>Bufo melanrostictus</i>	Common Indian Toad	II
2	<i>Euphylyctis cyanophlyctis</i>	Skittering frog	II
3	<i>Phrynomeris hexadactylum</i>	Indian Pond frog	II
4	<i>Hoplobatrachus tigerinus</i>	Indian Bull frog	II
Reptiles			
1	<i>Ahaetulla nasuta</i>	Common Green Whip Snake	II
2	<i>Amphiesma stolatum</i>	Stripped Keelback	II
3	<i>Bangarus caeruleus</i>	Common Indian Krait	II
4	<i>Hemidactylus flaviviridis</i>	House gecko	II
5	<i>Passerita mycterizaris</i>	Common Green Snake	II
Birds			
1	<i>Acridotheres tristis</i>	Common myna	II
2	<i>Alcedo atthis</i>	Common kingfisher	II
3	<i>Apus affinis</i>	Indian House swift	II
4	<i>Apus nipalensis</i>	House swift	II
5	<i>Ardea alba</i>	Large Egret	II
6	<i>Ardeola grayii</i>	Pond Heron or PaddyBird	II
7	<i>Athene brama</i>	Spotted Owlet	II
8	<i>Bubulcus ibis</i>	Cattle Egret	II
9	<i>Centropus sinensis</i>	Crow-Pheasant or coucal	II
10	<i>Cinnyris asiaticus</i>	Purple sunbird	II
11	<i>Cinnyris lotenius</i>	Loten's sunbird	II

Sl. No.	Scientific Name	Common Name	Schedule as per WP(A) Act, 2022
12	<i>Clamator jacobinus</i>	Pied Cuckoo	II
13	<i>Columba pallumbus</i>	Common Wood Pigeon	II
14	<i>Copsychus saularis</i>	Magpie robin	II
15	<i>Coracias benghalensis</i>	Indian Roller	II
16	<i>Corvus macrohynchos</i>	Large billed Crow	II
17	<i>Coturnix coturnix</i>	Common quail	II
18	<i>Cuculus canorus</i>	Common Cuckoo	II
19	<i>Cuculus micropterus</i>	Indian cuckoo	II
20	<i>Cypsiurus balasiensis</i>	Asian Palm Swift	II
21	<i>Dicaeum erythrorhynchos</i>	Tickell's Flowerpecker	II
22	<i>Dicrurus macrocerus</i>	Black Drongo	II
23	<i>Egretta garzetta</i>	Little egret	II
24	<i>Eudynamys scolopacea</i>	Asian Koel	II
25	<i>Francolinus pondicerianus</i>	Grey Partridge	II
26	<i>Gallus gallus</i>	Red jungle fowl	II
27	<i>Halcyon smyrnensis</i>	White throated Kingfisher	II
28	<i>Hierococys varius</i>	Common hawk cuckoo	II
29	<i>Hirundo rustica</i>	Barn Swallow	II
30	<i>Milvus migrans</i>	Black kite	II
31	<i>Mirafra erythroptera</i>	Indian Bushlark	II
32	<i>Motacilla maderaspatensis</i>	White browed wagtail	II
33	<i>Nectarina asiatica</i>	Purple Sunbird	II
34	<i>Orthotomus sutorius</i>	Tailor Bird	II
35	<i>Passer domesticus</i>	House Sparrow	II
36	Pavo cristatus	Pea Fowl	I
37	<i>Phalacrocorax carbo</i>	Large Cormorant	II
38	<i>Picus canus</i>	Grey headed Woodpecker	II
39	<i>Ploceus philippinus</i>	Weaver bird	II
40	<i>Prinia socialis</i>	Ashy Wren Warbler	II
41	<i>Psittacula krameri</i>	RoseRinged Parakeet	II
42	<i>Pycnonotus cafer</i>	Redvented Bulbul	II
43	<i>Saxicoloides fulicata</i>	Indian Robin	II
44	<i>Streptopelia chinensis</i>	Spotted Dove	II
45	<i>Tephrodornis pondicerianus</i>	Common Wood shrike	II
46	<i>Vanellus indicus</i>	Red Wattled Lapwing	II
Mammals			
1	<i>Funambulus palmarum</i>	Indian Palm squirrel	II
2	<i>Lepus nigricollis</i>	Indian Hare	II
3	<i>Pteropus giganteus</i>	Bat, Indian Flying Fox	II

Legend : C- Common, M- Migratory, R- Resident, T- Threatened

Note: Other than Peafowl there is no Schedule-I species in the study area.

Table : 3.34 Other Fauna found in the Study Area

Sl. No.	Scientific Name	Common Name
Insects		
1	Aranea sp	Spider
2	Carausius morosus	Stick insect
3	Cicada sp.	Cicadas
4	Coccinella septempunctata	Lady bird beetle
5	Coenagrion sp	Damsel fly
6	Eumenus sp.	Wasp
7	Hamitermes silvestri	Termite
8	Hieroglyphus sp.	Grasshopper
9	Ischnura	Common bluetail damselfly
10	Mantis religiosa	Praying mantis
11	Monomorium indicum	Ant
12	Myreoleon sp.	Ant lion larva
13	Palamnaeus swammerdam	Scorpion
14	Petalura sp.	Dragonfly
15	Pseudagrion indicum	Yellow striped dart damselfly
16	Scolopendra sp.	Centipede
Butterflies		
1	Acraea terpsicore	Tawny coster
2	Catopsilla pomona	Common emigrant
3	Colotis danae	Tip Crimson
4	Danaus chiysippus	Plain tiger
5	Danaus plexippus	Striped tiger
6	Euploea core	Common crow
7	Eurema hecabe	Common Grass Yellow
8	Euthalia nais	Baronet
9	Graphium agamemnon	Tailed jay
10	Ixias Marianne	White orange tip
11	Junonia almana	Peacock pansey
12	Junonia atlites	Grey pansey
13	Junonia hierta	Yellow Pansy
14	Neptis hylas	Common sailor
15	Papilio demoleus	Lime butterfly
16	Parantica aglea	Glassy tiger
Fish		
1	Catla catla	Catla
2	Chela sp	Trout
3	Cirrhinus mrigala	Mrigal
4	Cyprinus carpio	Common Carp
5	Labeo rohita	Rohu
6	Ophiocephalus punctatus	Kuravai
7	Oreochromis mossambicus	Tilapia
Reptiles		

Sl. No.	Scientific Name	Common Name
1	Calotes versicolor	Common Garden lizard
2	Eumeces taeniolatus	Yellow bellied mole skink
3	Gongylophis conicus	Rough tailed Sand boa, Pudaiyan
4	Mabuya carinata	Brahminy Skink
5	Sauria lacertidae	Lizard
Birds		
17	Corvus splendens	House Crow
Mammals		
1	Bandicota bengalensis	Indian mole rat
2	Bandicota indica	Bandicoot
3	Bos indicus	Cow
4	Bubalus bubalis	Buffalo
5	Canis familiaris	Dog
6	Capra hircus	Goat
7	Felis catus	Domestic Cat
8	Mus booduga	Indian Field Mouse
9	Ovis aries	Sheep
10	Paraduxurus hermaphroditus	Common palm civet
11	Rattus norvegicus	Field mouse
12	Rattus rattus	House Rat
13	Rhinolopus sps.	Bat
14	Sorex caeruleus	Common mush shrew

Legend : C- Common, M- Migratory, R- Resident, T- Threatened

Endangered Species: Among the fauna recorded, **most of them are common resident population and no endangered species encountered** in the study area.

Plankton : The studies on the aquatic biological environment were carried out in selected sites. The analysis of Phyto and Zoo-plankton was carried out as per the procedures of APHA. The List of Planktons are tabulated below:

Phytoplanktons	Chlorella sp, Chlorococcum sp, Spirogyra sp, Euglena sp, Fragillaria sp, Gomphonema sp, Melosira sp, Merismopedia sp, Mecrocystis sp, Navicula sp, Nitzschia sp, Oscillatoria sp, Scendesmus sp, Spirulina sp, Tetradron sp, Moughtia sp, Ankistrodesmus sp., Anabaena sp, Rivularia sp
Zooplanktons	Amoeba sp, Arcella sp, Cypris sp., Cyclops sp., Condylostoma sp, Daphnia sp, Kertella sp, Macrotric sp, Brachionus sp, Filinia sp

Shannon Wiener Index (SWI) is a way to measure the diversity of species in a community and it may be considered as an overall index of diversity as it concedes a true picture of the information theory. The species diversity of such a community may be computed by employing the SWI of diversity by applying the Index.

$$H = - \sum n/N \log n/N$$

Or

$$H = - \sum p_i \ln(p_i)$$

where,

n = Number of individual species

N = Total number of individual species

Pi = Importance value for each species n/N.

The SWI can be interpreted based on the SWI-H values obtained by computing the values of quantitative plankton analysis. Based on the H-values of SWI, the quality of water can be classified into the following four categories.

Diversity Level	SWI values	Pollution Level
High	3.0-4.5	Slight
Moderate	2.0-3.0	Light
Low	1.0-2.0	Moderate
Very Less	0.0-1.0	Heavily Polluted

In the study area, two sampling sites were fixed as the field stations for the study of aquatic environment. (Table 3.35). The SWI-H values were calculated and the results indicate that the water bodies in the study area are not polluted due any industrial and domestic activity.

Table : 3.35 Diversity Index

Sl. No.	Water body	Usage	Diversity Index	
			Phytoplankton	Zooplankton
1	Pond, Vachchakarapatti	Bathing, Washing	2.12	2.64
2	Pond, Maniparpatti	Bathing, Washing	1.89	1.47

3.10 Socio-economic Environment

The socio-economic and health environment surveys were carried out for assessing the baseline status. There are 39 Census villages and 5 Census Towns in the study area of 10 km radius. The relevant socio-economic data such as demographic features including population distribution, literacy rate, occupational status, educational facilities and medical facilities were collected from Census 2011 Data and presented as Tables 3.36-3.42.

Population : In the study area of 10 km radius, there are 1,34,419 persons (66,910 Males-49.8% and 67,509 Females-50.2%) in 37,349 Households (HHs). As far as the population of Scheduled Castes and Scheduled Tribes are concerned, there were 34,424 (23.4%) Scheduled Castes Population and 45 Scheduled Tribes (0.03%). In the total population, the Literate population was 92,914 (69.1%) whereas the illiterate population was 41,505 (30.9%).

Table : 3.36 Demographic Profile- 2011 Census

Sl. No.	Name of the Village	No. of House holds	Population			Scheduled Castes			Scheduled Tribes			Literates			Illiterates		
			Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
1	A.Meenachipuram	377	1359	695	664	248	124	124	0	0	0	914	513	401	445	182	263
2	Alagapuri	377	1362	698	664	262	133	129	0	0	0	1027	576	451	335	122	213
3	Ammapatti	755	2516	1220	1296	279	141	138	0	0	0	1578	879	699	938	341	597
4	Anuppankulam (CT)	3679	13526	6753	6773	4301	2131	2170	7	3	4	9377	5146	4231	4149	1607	2542
5	Appayyanayakkanpatti	354	1231	609	622	117	58	59	0	0	0	889	480	409	342	129	213
6	Avudaiyapuram	1100	3975	2032	1943	233	114	119	0	0	0	2559	1540	1019	1416	492	924
7	Bommakottai	252	815	399	416	17	6	11	0	0	0	642	322	320	173	77	96
8	Chinnakamanpatti	831	2894	1421	1473	602	282	320	0	0	0	2050	1132	918	844	289	555
9	Chinnavadi	422	1410	720	690	399	208	191	0	0	0	913	540	373	497	180	317
10	Chokkalingapuram	1035	3968	1998	1970	1812	911	901	0	0	0	2388	1365	1023	1580	633	947
11	Endappuli	508	1893	984	909	1404	732	672	0	0	0	1100	666	434	793	318	475
12	Golwarpatti	753	2667	1321	1346	2599	1287	1312	0	0	0	1854	1050	804	813	271	542
13	Gopalapuram	371	1307	593	714	322	139	183	0	0	0	1097	542	555	210	51	159
14	Kadambankulam	842	3084	1569	1515	404	216	188	2	1	1	2126	1229	897	958	340	618
15	Kariseri	652	2409	1194	1215	565	270	295	0	0	0	1470	829	641	939	365	574
16	Koilvirarpatti	170	698	355	343	102	54	48	0	0	0	428	262	166	270	93	177
17	Kottaiyur	319	1187	585	602	154	67	87	0	0	0	808	449	359	379	136	243
18	Kumaralingapuram	724	2590	1293	1297	174	87	87	0	0	0	1673	924	749	917	369	548
19	Kundalakkuttu	407	1327	639	688	187	89	98	0	0	0	918	508	410	409	131	278
20	Mannarkottai	380	1332	651	681	204	101	103	0	0	0	987	522	465	345	129	216
21	Maruluthu	335	1297	657	640	788	397	391	0	0	0	884	510	374	413	147	266
22	Mettamalai (CT)	1476	5175	2499	2676	1506	738	768	0	0	0	3375	1851	1524	1800	648	1152
23	Mettukkundu	737	2604	1288	1316	969	494	475	0	0	0	1752	958	794	852	330	522
24	Muthulingapuram	583	2042	977	1065	390	188	202	0	0	0	1340	736	604	702	241	461
25	Nallamanayakkanpatti	117	425	204	221	237	124	113	0	0	0	305	162	143	120	42	78
26	Naranapuram (Part)	609	2031	987	1044	591	294	297	0	0	0	1217	666	551	814	321	493

Table : 3.36 (Contd.) Demographic Profile- 2011 Census

Sl. No.	Name of the Village	No. of House holds	Population			Scheduled Castes			Scheduled Tribes			Literates			Illiterates		
			Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
27	Naranapuram (CT)	3303	11665	5766	5899	1372	661	711	2	1	1	7979	4336	3643	3686	1430	2256
28	Ondippulinayakkanur	2113	7395	3633	3762	519	251	268	0	0	0	5205	2863	2342	2190	770	1420
29	Pattampudur	828	3032	1560	1472	578	289	289	0	0	0	1991	1144	847	1041	416	625
30	Pudupatti	685	2409	1167	1242	1065	519	546	0	0	0	1595	890	705	814	277	537
31	Pudur	1010	3518	1778	1740	1243	636	607	0	0	0	2562	1415	1147	956	363	593
32	Rajagopalapuram	201	919	469	450	31	20	11	0	0	0	692	377	315	227	92	135
33	Sennalkudi	705	2433	1216	1217	100	51	49	0	0	0	1386	810	576	1047	406	641
34	Sevalpatti	1316	4806	2438	2368	579	307	272	21	12	9	3098	1795	1303	1708	643	1065
35	Soolakkarai (CT)	1269	4990	2478	2512	1044	506	538	0	0	0	3728	1986	1742	1262	492	770
36	Sundaralingapuram	97	319	157	162	88	46	42	0	0	0	191	111	80	128	46	82
37	Thammanayakkanpatti	1088	3824	1928	1896	217	116	101	0	0	0	2902	1622	1280	922	306	616
38	Thathampatti	459	1699	863	836	829	411	418	0	0	0	1109	656	453	590	207	383
39	Tulukkapatti	768	2934	1479	1455	781	386	395	1	0	1	2173	1197	976	761	282	479
40	V.Muthulingapuram	1006	3471	1678	1793	1689	825	864	0	0	0	2267	1238	1029	1204	440	764
41	Vachakkarapatti	1308	4754	2407	2347	701	354	347	0	0	0	3585	1969	1616	1169	438	731
42	Valayapatti	286	1138	578	560	8	5	3	0	0	0	722	434	288	416	144	272
43	Venkatachalapuram	2594	9540	4752	4788	1540	791	749	12	8	4	7787	4046	3741	1753	706	1047
44	Veppilapatti	148	449	222	227	174	77	97	0	0	0	271	156	115	178	66	112
Study Area Total		37349	134419	66910	67509	31424	15636	15788	45	25	20	92914	51402	41512	41505	15508	25997
Percentage, %		-	-	49.8	50.2	23.4	11.6	11.7	0.03	0.02	0.01	69.1	38.2	30.9	30.9	11.5	19.3

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EC for Expansion of RR Nagar Cement Plant (with all 3 Existing Lines), Virudhunagar, TN

Table : 3.37 Occupation of Population and Work Forces

Sl. No.	Name of the Census Village	Total Population	Workers			Non-Workers			Main Workers				Marginal Workers			
			Total	Male	Female	Total	Male	Female	Cultivators	Agricultural Labourers	Household Industrial Workers	Other Workers	Cultivators	Agricultural Labourers	Household Industrial Workers	Other Workers
1	A.Meenachipuram	1359	751	429	322	608	266	342	6	79	4	605	1	4	3	49
2	Alagapuri	1362	694	403	291	668	295	373	195	123	48	311	5	1	2	9
3	Ammappatti	2516	1332	690	642	1184	530	654	45	102	102	1044	1	7	12	19
4	Anuppankulam (CT)	13526	7272	4139	3133	6254	2614	3640	78	148	126	6602	2	17	17	282
5	Appayyanayakkanpatti	1231	630	360	270	601	249	352	99	147	2	366	1	12	0	3
6	Avudaiyapuram	3975	1893	1219	674	2082	813	1269	305	395	43	909	12	89	4	136
7	Bommakottai	815	432	213	219	383	186	197	41	229	0	160	0	0	0	2
8	Chinnakamanpatti	2894	1594	866	728	1300	555	745	9	58	27	1486	1	0	0	13
9	Chinnavadi	1410	822	431	391	588	289	299	29	46	0	737	0	2	0	8
10	Chokkalingapuram (Part)	3968	2197	1156	1041	1771	842	929	40	83	40	2022	2	1	2	7
11	Endappuli	1893	878	566	312	1015	418	597	64	322	3	262	0	178	0	49
12	Golwarpatti	2667	1456	758	698	1211	563	648	97	365	4	374	4	398	2	212
13	Gopalapuram	1307	610	315	295	697	278	419	3	3	11	241	0	327	3	22
14	Kadambankulam	3084	1759	985	774	1325	584	741	532	348	17	798	8	14	1	41
15	Kariseri	2409	1347	707	640	1062	487	575	90	95	34	1061	6	18	5	38
16	Koilvirarpatti	698	367	207	160	331	148	183	2	166	9	158	1	14	0	17
17	Kottaiyur	1187	705	380	325	482	205	277	13	155	0	153	6	175	9	194
18	Kumaringapuram	2590	1404	775	629	1186	518	668	129	319	7	819	7	80	7	36
19	Kundalakkuttu	1327	766	383	383	561	256	305	118	504	1	111	3	26	1	2
20	Mannarkottai	1332	668	387	281	664	264	400	19	4	2	396	2	212	6	27
21	Maruluthu	1297	683	386	297	614	271	343	13	10	2	292	51	51	42	222
22	Mettamalai (CT)	5175	3167	1614	1553	2008	885	1123	4	22	100	2449	2	10	16	564
23	Mettukkundu	2604	1344	757	587	1260	531	729	52	323	16	539	16	242	7	149
24	Muthulingapuram	2042	1168	638	530	874	339	535	4	190	23	742	3	70	25	111

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EC for Expansion of RR Nagar Cement Plant (with all 3 Existing Lines), Virudhunagar, TN

Table : 3.37 (Contd.) Occupation of Population and Work Forces

Sl. No.	Name of the Census Village	Total Population	Workers			Non-Workers			Main Workers				Marginal Workers			
			Total	Male	Female	Total	Male	Female	Cultivators	Agricultural Labourers	Household Industrial Workers	Other Workers	Cultivators	Agricultural Labourers	Household Industrial Workers	Other Workers
25	Nallamanayakkanpatti	425	228	116	112	197	88	109	1	152	0	68	1	6	0	0
26	Naranapuram (Part)	2031	1096	581	515	935	406	529	43	38	15	968	0	2	1	29
27	Naranapuram (CT)	11665	6268	3592	2676	5397	2174	3223	31	41	136	5952	1	0	5	102
28	Ondippulinayakkanur	7395	3893	2216	1677	3502	1417	2085	215	405	103	2930	12	109	23	96
29	Pattampudur	3032	1553	929	624	1479	631	848	127	171	62	628	5	39	39	482
30	Pudupatti	2409	1213	668	545	1196	499	697	188	237	19	485	19	73	8	184
31	Pudur	3518	1797	1036	761	1721	742	979	37	71	105	1524	5	7	7	41
32	Rajagopalapuram	919	577	291	286	342	178	164	18	402	0	57	2	84	0	14
33	Sennalkudi	2433	1301	751	550	1132	465	667	17	652	11	557	0	42	1	21
34	Sevalpatti	4806	2702	1493	1209	2104	945	1159	82	407	58	2086	4	9	5	51
35	Soolakkarai (CT)	4990	2193	1401	792	2797	1077	1720	16	27	48	1800	3	148	13	138
36	Sundaralingapuram	319	137	110	27	182	47	135	0	0	0	16	0	121	0	0
37	Thammanayakkanpatti	3824	1780	1140	640	2044	788	1256	15	14	22	1508	6	32	80	103
38	Thathampatti	1699	949	527	422	750	336	414	47	76	17	683	3	16	4	103
39	Tulukkapatti	2934	1306	851	455	1628	628	1000	104	314	7	804	14	7	2	54
40	V.Muthulingapuram	3471	2108	1053	1055	1363	625	738	65	110	42	1838	5	13	4	31
41	Vachakkarapatti	4754	2176	1393	783	2578	1014	1564	95	151	126	1653	4	41	9	97
42	Valayapatti	1138	687	352	335	451	226	225	37	282	0	216	6	127	1	18
43	Venkatachalapuram (CT)	9540	3880	2606	1274	5660	2146	3514	13	34	79	3521	0	5	13	215
44	Veppilaipatti	449	261	149	112	188	73	115	51	6	1	144	4	7	0	48
Study Area Total		134419	70044	40019	30025	64375	26891	37484	3189	7826	1472	50075	228	2836	379	4039
Percentage, %		-	52.1	29.8	22.3	47.9	20.0	27.9	2.4	5.8	1.1	37.3	0.2	2.1	0.3	3.0

Note : Others category includes Constructions, Trade & Commerce, Transport Storage & Communications, Other Services, etc.

Table : 3.38 Educational Facilities in the Study Area

Sl. No.	Name of the Village	PPS*	PS*	MS*	SS*	SSS*	DC*	EC*	MC*	MI*	PT*	VTS*	SSD*
1	A.Meenachipuram	a	1	a	a	b	2	b	c	2	2	2	c
2	Alagapuri	1	2	a	a	a	a	a	c	a	b	a	a
3	Ammapatti	1	1	1	b	b	b	c	c	c	b	b	c
4	Appayyanayakkanpatti	1	1	1	1	1	c	c	c	c	c	c	c
5	Avudaiyapuram	2	1	1	1	1	c	c	c	c	c	c	c
6	Bommakottai	1	2	a	a	a	c	c	c	c	c	c	c
7	Chinnakamanpatti	1	1	1	1	1	b	c	c	b	2	b	c
8	Chinnavadi	1	1	a	a	a	c	c	c	c	c	c	c
9	Chokkalingapuram (Part)	1	1	1	a	a	b	b	c	b	b	b	c
10	Endappuli	1	1	1	b	b	c	c	c	c	c	b	b
11	Golwarpatti	1	1	c	c	c	c	c	c	c	c	c	c
12	Gopalapuram	1	1	1	1	a	a	b	c	a	a	b	c
13	Kadambankulam	1	1	1	a	a	c	c	c	c	c	b	b
14	Kariseri	1	1	1	a	a	c	2	c	b	a	b	c
15	Koilvirarpatti	1	1	a	a	a	c	c	c	c	c	c	c
16	Kottaiyur	1	1	2	2	2	c	c	c	c	c	c	c
17	Kumaralingapuram	1	1	2	b	b	b	2	c	b	b	b	b
18	Kundalakkuttu	1	1	1	b	b	c	c	c	c	c	c	c
19	Mannarkottai	1	1	2	2	2	c	c	c	c	c	c	c
20	Maruluthu	1	1	1	a	a	b	b	c	b	b	a	a
21	Mettukkundu	1	1	1	1	b	b	b	c	b	b	b	b
22	Muthulingapuram	1	1	1	1	1	b	c	c	c	b	a	c
23	Nallamanayakkanpatti	1	b	b	b	b	c	c	c	c	c	c	c
24	Naranapuram (Part)	1	1	1	1	2	b	b	c	b	b	b	b
25	Ondippulinayakkanur	1	1	1	1	1	c	c	c	c	c	c	c

Table : 3.38 Educational Facilities in the Study Area

Sl. No.	Name of the Village	PPS*	PS*	MS*	SS*	SSS*	DC*	EC*	MC*	MI*	PT*	VTS*	SSD*
26	Pattampudur	1	1	1	b	b	b	b	c	b	b	b	b
27	Pudupatti	2	1	1	1	1	c	c	c	c	c	c	c
28	Pudur	1	1	1	1	1	c	c	c	c	c	c	c
29	Rajagopalapuram	1	1	1	a	a	c	c	c	c	c	c	1
30	Sennalkudi	1	1	a	a	a	b	b	c	b	b	b	b
31	Sevalpatti	1	1	1	1	1	c	a	c	c	a	2	c
32	Thammanayakkanpatti	1	1	1	1	b	c	c	c	c	c	b	b
33	Thathampatti	1	1	1	a	c	c	c	c	c	c	b	a
34	Tulukkapatti	1	1	a	a	a	b	c	c	c	b	b	b
35	V.Muthulingapuram	1	1	a	a	a	c	c	c	c	c	c	c
36	Vachakkarapatti	1	1	1	b	b	b	c	c	c	b	b	b
37	Valayapatti	1	2	a	a	a	c	c	c	c	c	c	c
38	Veppilaipatti	1	1	a	a	a	b	c	c	c	b	c	c

PPS-Pre-Primary
PS-Primary School
MS-Middle School
SS-Secondary School

SSS-Senior Secondary
DC-Degree College
EC-Engineering College
MC-Medical College

MI-Management College / Institute
PT-Polytechnic
VTS-Vocational School/ITI
SSD-Special School for Disabled

1-Available
a-Facility available at <5 Kms
b-Facility available at 5-10 Kms
c-Facility available at >10 Kms

Table : 3.39 Medical Facilities in the Study Area

SI. No.	Name of the Village	CHC	PHC	PHSC	MCW	TB	HA	HAM	D	VH	FWC
1	A.Meenachipuram	b	b	a	b	b	c	c	b	b	b
2	Alagapuri	b	b	b	a	b	b	b	b	a	b
3	Ammapatti	c	c	b	b	b	b	b	c	b	c
4	Appayyanayakkanpatti	b	a	1	a	c	c	c	a	b	a
5	Avudaiyapuram	b	1	1	1	1	c	c	1	1	1
6	Bommakottai	c	a	1	a	c	c	c	a	a	a
7	Chinnakamanpatti	c	b	1	1	b	b	b	b	b	b
8	Chinnavadi	b	b	1	b	c	c	c	b	a	b
9	Chokkalingapuram (Part)	a	a	1	a	c	c	c	a	b	a
10	Endappuli	b	b	a	b	c	c	c	b	b	b
11	Golwarpatti	c	b	1	b	c	c	c	b	c	b
12	Gopalapuram	1	1	1	1	1	a	a	1	a	1
13	Kadambankulam	c	b	1	b	c	c	c	b	c	b
14	Kariseri	c	b	b	1	c	c	c	b	1	b
15	Koilvirarpatti	a	a	a	a	c	c	c	a	c	a
16	Kottaiyur	a	a	1	a	c	c	c	a	a	a
17	Kumaralingapuram	b	b	b	b	b	b	b	b	b	b
18	Kundalakkuttu	b	b	b	b	c	c	c	b	a	b
19	Mannarkottai	a	a	a	a	c	c	c	a	a	a
20	Maruluthu	b	b	a	b	b	b	b	b	a	b
21	Mettukkundu	c	b	b	b	b	b	b	b	b	b
22	Muthulingapuram	b	b	a	b	b	b	b	b	b	b
23	Nallamanayakkanpatti	b	b	b	b	c	c	c	b	a	b
24	Naranapuram (Part)	b	a	1	a	a	b	b	a	b	a
25	Ondippulinayakkanur	b	b	3	1	c	c	c	b	1	b

Table : 3.39 (Contn.) Medical Facilities in the Study Area

SI. No.	Name of the Village	CHC	PHC	PHSC	MCW	TB	HA	HAM	D	VH	FWC
26	Pattampudur	b	b	1	b	b	b	b	b	b	b
27	Pudupatti	b	a	a	a	c	c	c	a	b	a
28	Pudur	a	a	1	a	c	c	c	a	1	a
29	Rajagopalapuram	a	a	a	a	c	c	c	a	c	a
30	Sennalkudi	c	b	1	b	b	b	b	b	a	b
31	Sevalpatti	c	c	1	c	c	c	c	c	c	c
32	Thammanayakkanpatti	1	1	1	1	1	c	c	1	a	1
33	Thathampatti	b	b	1	b	b	b	b	b	b	b
34	Tulukkapatti	b	a	1	a	c	c	c	a	a	a
35	V.Muthulingapuram	b	b	1	b	c	c	c	b	a	b
36	Vachakkarapatti	a	a	1	a	c	c	c	a	a	a
37	Valayapatti	b	a	a	a	c	c	c	a	b	a
38	Veppilaipatti	b	b	b	b	b	b	b	b	b	b

CHC-Community Health Centre
 PHC-Primary Health Centre
 PHSC-Primary Health Sub Centre
 MCW- Maternity and Child Welfare Centre

TBC-TB Clinic
 HA-Aallopathic Hospital
 HAM- Alternative Medicine
 D-Dispensary

VH-Veterinary Hospital
 FWC-Family Welfare Centre

1-Available
 a-Facility available at <5 Kms
 b-Facility available at 5-10 Kms
 c-Facility available at >10 Kms

Table : 3.40 Communication & Transport Facilities in the Study Area

Sl. No.	Name of the Village	PO	P&T	T	PCO	MP	IC	PCF	BS	PBS	RS	NH	SH	MDR	BTR	GR	AWR
1	A.Meenachipuram	b	b	1	1	1	b	1	1	a	b	c	b	1	1	1	1
2	Alagapuri	b	b	1	1	1	b	b	1	a	a	b	b	b	1	1	1
3	Ammapatti	b	b	1	b	1	b	b	1	1	b	b	c	b	1	1	1
4	Appayyanayakkanpatti	c	c	1	b	1	c	c	1	1	c	c	b	1	1	1	1
5	Avudaiyapuram	a	b	1	1	1	1	c	1	1	a	a	b	1	1	1	1
6	Bommakottai	a	a	1	a	1	c	a	1	1	c	c	c	1	1	1	1
7	Chinnakamanpatti	b	b	1	1	1	b	b	1	a	b	b	1	b	1	1	1
8	Chinnavadi	a	a	1	a	1	c	b	a	a	b	b	c	1	1	1	1
9	Chokkalingapuram (Part)	b	b	1	1	1	b	b	1	1	b	c	1	1	1	1	1
10	Endappuli	c	c	1	1	1	c	b	1	a	c	a	c	a	1	1	1
11	Golwarpatti	c	c	1	1	1	c	c	1	c	c	c	c	c	1	1	1
12	Gopalapuram	a	a	1	1	1	a	1	1	1	a	1	1	1	1	1	1
13	Kadambankulam	c	c	1	1	1	c	c	1	1	c	c	c	c	1	1	1
14	Kariseri	1	1	1	1	1	1	1	a	a	c	c	1	c	1	a	1
15	Koilvirarpatti	b	b	1	1	1	c	c	1	b	b	b	1	1	1	1	1
16	Kottaiyur	b	b	1	1	1	b	b	1	1	c	c	1	b	1	a	1
17	Kumaralingapuram	b	b	1	1	1	b	b	1	1	b	b	1	1	1	1	1
18	Kundalakkuttu	c	c	1	b	1	c	c	1	1	c	c	c	1	1	1	1
19	Mannarkottai	b	b	1	1	1	c	c	1	1	c	b	1	1	1	1	1
20	Maruluthu	b	b	1	1	1	b	b	1	1	b	1	b	1	1	1	1
21	Mettukkundu	c	b	1	1	1	b	b	1	1	b	b	b	1	1	1	1
22	Muthulingapuram	b	b	1	b	1	b	b	1	b	b	1	c	1	1	1	1
23	Nallamanayakkanpatti	c	c	1	b	1	c	c	1	1	c	c	c	c	1	1	1
24	Naranapuram (Part)	b	b	1	1	1	b	b	1	1	b	c	c	1	1	1	1
25	Ondippulinayakkanur	1	1	1	1	1	c	1	1	1	c	c	c	c	1	1	1

RCL

EC for Expansion of RR Nagar Cement Plant (with all 3 Existing Lines), Virudhunagar, TN

Table : 3.40 (Contn.) Communication & Transport Facilities in the Study Area

Sl. No.	Name of the Village	PO	P&T	T	PCO	MP	IC	PCF	BS	PBS	RS	NH	SH	MDR	BTR	GR	AWR
26	Pattampudur	b	b	1	1	1	b	b	1	a	b	1	b	1	1	1	1
27	Pudupatti	b	b	1	b	1	c	c	1	1	c	c	b	1	1	1	1
28	Pudur	c	c	1	1	1	b	c	1	1	c	b	b	1	1	1	1
29	Rajagopalapuram	c	c	1	1	1	c	a	1	a	c	c	1	1	1	1	1
30	Sennalkudi	b	b	1	1	1	b	b	1	1	b	b	b	b	1	1	1
31	Sevalpatti	1	1	1	1	1	1	c	1	1	c	c	1	1	1	1	1
32	Thammanayakkanpatti	a	a	1	a	1	c	c	1	a	c	a	c	a	a	1	1
33	Thathampatti	a	b	1	1	1	b	b	1	b	c	a	1	a	1	1	1
34	Tulukkapatti	b	c	1	a	1	a	c	1	1	a	1	c	1	1	1	1
35	V.Muthulingapuram	a	a	1	1	1	b	b	1	a	b	b	b	a	a	1	a
36	Vachakkarapatti	1	1	1	1	1	c	1	1	1	1	1	b	1	1	1	1
37	Valayapatti	b	b	1	1	1	c	c	1	a	c	b	1	1	1	a	1
38	Veppilaiipatti	b	b	1	b	1	b	b	a	b	b	a	c	a	1	1	1

PO-Post Office

PCO- Public Call Office/Mobile PCO)

BS-Public Bus Service

SH-State Highway

AWR-All Weather Road

a-Facility available at <5 Kms

SPO-Sub Post Office

MP- Mobile Phone Coverage

PBS-Private Bus Service

MDR-Major District Road

*-Status

b-Facility available at 5-10 Kms

P&T-Post/Telegraph Office

IC-Internet Cafes / Common Service Centre

RS-Railway Station

BTR-Black Topped (Pucca) Roads

1-Available

c-Facility available at >10 Kms

T-Telephones (landlines)

PCF-Private Courier Facility

NH-National Highway

GR-Gravel (kuchha) Roads

2-Not Available

Table : 3.41 Water & Drainage Facilities in the Study Area

Sl. No.	Name of the Village	TP	CW	UCW	HP	TW/BH	S	R/C	T/P/L	CD	OD	CT
1	A.Meenachipuram	1	2	2	2	1	2	2	2	1	1	2
2	Alagapuri	1	1	2	1	1	2	2	2	1	1	1
3	Ammapatti	1	2	1	1	1	1	2	2	1	1	1
4	Appayyanayakkanpatti	1	1	2	2	2	2	2	2	1	1	2
5	Avudaiyapuram	1	1	2	1	1	2	1	2	1	1	2
6	Bommakottai	1	1	2	1	1	2	2	2	1	1	2
7	Chinnakamanpatti	2	2	2	1	2	2	2	2	1	1	1
8	Chinnavadi	1	2	2	1	1	2	2	2	1	1	1
9	Chokkalingapuram (Part)	1	1	2	1	1	2	1	2	1	1	2
10	Endappuli	1	2	2	2	2	2	2	2	1	1	2
11	Golwarpatti	2	2	2	2	1	2	2	2	1	1	2
12	Gopalapuram	1	1	2	1	1	2	2	2	1	1	2
13	Kadambankulam	2	2	2	2	2	2	2	2	1	1	1
14	Kariseri	1	2	1	1	1	2	2	2	1	1	1
15	Koilvirarpatti	1	1	1	1	1	2	2	2	2	2	2
16	Kottaiyur	2	2	2	1	2	2	2	2	1	1	2
17	Kumaralingapuram	1	2	2	2	1	2	2	2	1	1	1
18	Kundalakkuttu	1	2	2	2	1	2	2	2	1	1	2
19	Mannarkottai	1	2	2	1	1	2	2	2	1	1	1
20	Maruluthu	1	2	2	1	1	2	1	2	1	1	2
21	Mettukkundu	1	2	1	1	1	2	2	2	1	1	1
22	Muthulingapuram	1	2	2	1	1	2	2	2	1	1	1
23	Nallamanayakkanpatti	1	2	1	2	1	2	2	2	1	1	2
24	Naranapuram (Part)	1	2	1	1	1	2	2	1	1	1	2
25	Ondippulinayakkanur	1	1	1	2	1	2	2	2	1	1	1

RCL

EC for Expansion of RR Nagar Cement Plant (with all 3 Existing Lines), Virudhunagar, TN

Table : 3.41 (Contn.) Water & Drainage Facilities in the Study Area

Sl. No.	Name of the Village	TP	CW	UCW	HP	TW/BH	S	R/C	T/P/L	CD	OD	CT
26	Pattampudur	1	2	2	2	2	2	2	2	1	1	1
27	Pudupatti	1	2	2	1	2	2	2	2	1	1	1
28	Pudur	1	2	2	2	1	2	2	2	1	1	2
29	Rajagopalapuram	1	2	2	1	1	2	2	2	1	1	1
30	Sennalkudi	1	2	2	1	1	1	2	2	1	1	1
31	Sevalpatti	1	2	1	1	1	2	2	2	1	1	1
32	Thammanayakkanpatti	1	2	1	1	1	2	2	2	1	1	1
33	Thathampatti	1	2	1	1	1	1	2	2	1	1	2
34	Tulukkapatti	1	2	2	1	1	2	2	2	1	1	2
35	V.Muthulingapuram	1	2	2	2	1	2	2	2	1	1	2
36	Vachakkarapatti	1	1	2	1	2	2	2	2	1	1	1
37	Valayapatti	1	2	2	1	1	2	2	2	2	2	1
38	Veppilaipatti	1	2	1	2	1	2	2	2	1	1	1

T-Tap Water
 CW-Covered Well
 UCW-Uncovered Well
 HP-Hand Pump

TW/BH-Tube Well/Bore Well
 S-Spring
 R/C- River/Canal
 T/P/L-Tank/Pond/Lake

CD-Covered Drainage
 OD-Open Drainage
 CT-Community Toilet Complex for General

*-Status
 1-Available
 2-Not

Table : 3.42 (Contn.) Other Facilities in the Study Area

Sl. No.	Name of the Village	ATM	CB	COB	ACS	SHG	PDS	RM	AMS	NC	NC-AC	CC	SF	PL	NP	APS	BDRO	PS
26	Pattampudur	b	b	b	1	1	1	b	b	a	1	a	a	1	1	1	1	1
27	Pudupatti	b	b	a	1	1	1	c	c	1	1	b	b	1	1	1	1	1
28	Pudur	b	b	1	1	1	1	1	c	1	1	a	a	1	1	1	1	1
29	Rajagopalapuram	c	c	a	c	1	1	1	c	1	1	a	1	1	1	1	1	1
30	Sennalkudi	b	a	1	1	1	1	b	b	1	1	1	b	1	1	1	1	1
31	Sevalpatti	c	b	1	1	1	1	1	b	1	1	1	1	1	1	1	1	1
32	Thammanayakkanpatti	a	a	a	a	1	1	a	c	a	1	1	1	1	1	1	1	1
33	Thathampatti	a	b	b	b	1	1	b	b	1	1	1	b	1	1	1	1	1
34	Tulukkapatti	1	1	c	1	1	1	1	b	1	1	1	b	b	1	1	1	1
35	V.Muthulingapuram	b	b	a	a	1	a	c	c	1	1	a	1	1	1	1	1	1
36	Vachakkarapatti	1	1	a	a	1	1	1	c	1	1	1	1	c	1	1	1	1
37	Valayapatti	b	b	a	c	1	1	b	c	1	1	1	1	1	1	1	1	1
38	Veppilaipatti	b	b	b	b	1	1	b	b	1	1	1	1	1	1	1	1	1

CB-Commercial Bank

COB-Co-operative Bank

ACS-Agricultural Credit Societies

SHG-Self Help Group

ATM-Automatic Teller Machine

PDS-Public Distribution System (Shop)

RM-Regular Market

AMS-Agricultural Marketing Society

NC-Nutritional Centres-ICDS

NC-AC-Nutritional Centres-Anganwadi Centre

CC-Community Centre with/without TV

SF-Sports Field

PL-Public Library

NP-Daily Newspaper Supply

APS-Assembly Polling Station

BDRO-Birth and Death Registration Office

PS-Power Supply

a-Facility available at <5 Kms

b-Facility available at 5-10 Kms

c-Facility available at >10 Kms

1-Available

2-Not Available

Occupational Structure : According to the 2011 census, Total Workers in the total population were about 77,044 (52.1%). About 64,375 (47.9%) persons were non-workers. About 41.7% of the people were engaged in tertiary activities which included different services. The workers in the primary activities (Cultivators) and the secondary activities (Agricultural Labourers) were 2.6% and 7.9% respectively.

Educational Facilities : Primary and Middle Schools are available in almost all villages whereas Senior secondary schools are available in some of the villages. However, college education is available nearby only at Virudhunagar, Sattur, Aruppukkottai, Sivakasi, Madurai, etc. Thanks to Tamil Nadu Government's constant encouragement, almost all villages are having one or more Self Help Groups through which the people earn various sources of livelihood and are financially secured. There are community based organizations in some of the villages. Nearby Vocational Training Facilities are available at Soolakkarai, Sattur, Sivakasi, Kalkurichi and Thiruthangal whereas Special School for the Disabled is available at Soolakkarai and Aruppukkottai.

Medical Facilities : Medical facilities are available in many of the villages either in the form of primary health centers / primary health sub centers, Maternity & Child Welfare Centre., etc. Some of the villages have private medical practitioners. For major ailments villagers have to go to nearby Virudhunagar, Madurai, etc. Highest proportion of the study area population goes to Government hospital and Government health centres and other people approach nearest private hospitals and Private medical practitioners. Study area population has a good number of hospitals and health facilities are available very near from their residential places.

Drinking Water : Drinking water facilities are available almost in all villages in the study area. Wells and hand pumps are the major source of drinking water. Villagers depend upon both rain water and also irrigation tanks for the agriculture needs. Public water supply and Power supply are available in most of the villages.

Communication : There are good approach roads in the form of Panchayat roads, National Highways, etc. passing through the major villages and metal roads link all the smaller villages. People use different modes of transportation for commuting.

Market : The villages situated on the main road have market facilities for their day to day requirements. These daily/weekly markets are used for both purchasing the essential commodities and selling the cultivated produce and the products of the cottage industries. For major purchases they move to nearby Virudhunagar, Madurai, etc.

Post & Telegraph : There are post offices in many of the villages. Telecommunications are available in some villages. The possession and use of Cellular phones were widely noted in almost all the villages. All the villages in the study area have electricity.

Public Health : Local people are frequently suffering from fever, asthma, diarrhea, etc. and no occupational related disease recorded. Health Report from Kanniseri Pudur PHC is appended. Primary Health Centres Maternity & Child Welfare Centre are available only in some of the villages. For major ailments villagers have to go to Virudhunagar, Madurai, etc.

To: Dr.P.Arunachal Kumar, Director
Block Medical Officer
Govt Primary Health Centre
Kannurpallur

From: The General Manager
RINCO Cement
Kannurpallur
Virudhunagar

Sl.No: 1286/2024/23/0002 Dated: 22.11.2024

Subject: Re:

With reference to the above subject, the Government Primary Health Centre is functioning in Virudhunagar Block, under the administrative control of Block Medical Officer, Govt Primary Health Centre, Kannurpallur, Virudhunagar. The Government Primary Health Centre is providing health services to 2,30,000 people. The Government Primary Health Centre is providing health services for the period (epidemiology, infectious diseases, nutritional status, vitamin, deficiency, hypertension and non-communicable disease control).

In this connection, the Government Primary Health Centre is an upgraded Primary Health Centre. The details of patients treated for NCD and chronic non-communicable diseases are as follows:

Year	Total No. patients for the year	Hypertension	Diabetes	Chronic Kidney Disease	Respiratory	Ischaemic Heart Disease	Stroke	Other	ICD10	ICD9	ICD11
2023-2024	79340	89	12	103	1100	1321	112	3025	4150	4002	40020
2024-2025 till 10th October	90000	12	18	82	1112	812	120	2422	3050	3012	30412

Kindly note, we have been providing necessary assistance to Kannurpallur Primary Health Centre through your company's social responsibility fund. I would like to express my gratitude to you as the Block Medical Officer. At present the primary health centre requires the following equipment to give additional service to the people living in Kannurpallur PHC area:

1. X-ray Machine
2. Digital X-ray

I request them to contribute through their corporate social responsibility fund and help support the services available to the general public.


 Block Medical Officer
 Govt Primary Health Centre
 Kannurpallur

Economic Activities : Major Agricultural Commodities in the study area includes Paddy, Maize, Cotton, Groundnut, Corn, Chilli, Pulses, Sunflower, Jasmine, Black Gram, Green Gram, Cattle Feeds, Bajra, Groundnut, Vegetables, etc., and Manufacturer Commodities includes Limestone, Cement, Match Box, Indigo, Bricks, Crackers, etc. A sizable percentage of households in each village are engaged in cattle rearing, which fetches them a reasonable income.

Perception of the Project : Almost all villagers are aware about the Ramco Cement Plant & its Captive Mines in the region.

3.11 Interpretations of Baseline Data

3.11.1 Interpretation of Ambient Air Quality

Air Quality Index (AQI) : AQI is a tool for effective dissemination of air quality information. There are six AQI categories viz. Good, Satisfactory, Moderately Polluted, Poor, Very Poor, and Severe. The AQI will consider eight pollutants (PM₁₀, PM_{2.5}, NO₂, SO₂, CO, O₃, NH₃, and Pb) for which short-term (24-hourly averaging period) National Ambient Air Quality Standards are prescribed. Based on the measured ambient concentrations, corresponding standards and likely health impact, a sub-index is calculated for each pollutants. The worst sub-index reflects overall AQI. The AQI values and corresponding ambient concentrations (health breakpoints) for the identified eight pollutants are as follows:

AQI Category, Pollutants (ug/m ³ ; other than CO)								
AQI Category (Range)	PM ₁₀ 24-hr	PM _{2.5} 24-hr	NO ₂ 24-hr	O ₃ 8-hr	CO 8-hr (mg/m ³)	SO ₂ 24-hr	NH ₃ 24-hr	Pb 24-hr
Good (0-50)	0-50	0-30	0-40	0-50	0-1.0	0-40	0-200	0-0.5
Satisfactory (51-100)	51-100	31-60	41-80	51-100	1.1-2.0	41-80	201-400	0.5 –1.0
Moderately Polluted (101-200)	101-250	61-90	81-180	101-168	2.1- 10	81-380	401-800	1.1-2.0
Poor (201-300)	251-350	91-120	181-280	169-208	10-17	381-800	801-1200	2.1-3.0
Very Poor (301-400)	351-430	121-250	281-400	209-748*	17-34	801-1600	1200-1800	3.1-3.5
Severe (401-500)	430 +	250+	400+	748+*	34+	1600+	1800+	3.5+

* One hourly monitoring (for mathematical calculations only).

Exceedance Factor (EF) is the Monitored Avg. Value of criteria Pollutant/NAAQ Norm of the Pollutant. Critical Pollution if EF is 1.5; High Pollution if EF is between 1.0-<1.5, Moderate Pollution if EF is between 0.5-<1.0 and Low Pollution if EF is <0.5.

Study Area is falling under Low Pollution as monitored Pollutant Levels were <0.5 EF.

Pollutant	Mean Concentration	NAAQ Norm	Exceedance Factor (EF)	Pollution Category
PM2.5, ug/m ³	21.7	60	0.36	Low
PM10, ug/m ³	39.0	100	0.39	Low
SO ₂ , ug/m ³	12.0	80	0.15	Low
NO ₂ , ug/m ³	14.5	80	0.18	Low

3.11.2 Interpretation of Ambient Noise Levels

Day Equivalent Noise (Leq-d) level monitored in Core Zone (Plant area) was 48.1 dB(A) and monitored in Buffer Zone was in the range 41.5-46.4 dB(A). Night Equivalent Noise (Leq-n) level monitored in Core Zone (Plant area) was 44.7 dB(A) and monitored in Buffer Zone was in the range 40.1-43.8 dB(A). While comparing with the MoEF&CC Leq Norms for day and night times, the monitored ambient noise levels were well within the limit values for corresponding Zone/Area.

Zone	Category	Day Time Leq, dB(A)		Night Time Leq, dB(A)		MoEF&CC Norm, Leq, dB(A)	
		From	To	From	To	Day	Night
Core Zone	Industrial area	48.1	48.1	44.7	44.7	75	70
Buffer Zone	Residential area	41.5	46.4	40.1	43.8	55	45

3.11.3 Interpretation of Surface Water Quality

The surface water quality was found to be within CPCB Norms Class-C.

Zone	Parameter	Unit	From	To	Standard	Class	Standard
Buffer Zone	TSS	mg/l	25	38	0	C	0
Buffer Zone	Fluoride	mg/l	0.08	0.26	1.5	C	0
Buffer Zone	COD	mg/l	2	10	0	C	0
Buffer Zone	pH	NA	7.58	7.88	6.5-8.5	C	6.5-9.0
Buffer Zone	DO	mg/l	4.0	4.8	4.0-6.0	C	4
Buffer Zone	TDS	mg/l	310	560	500-2100	C	0
Buffer Zone	Total Hardness	mg/l	140	270	0	C	0
Buffer Zone	Chlorides	mg/l	82	116	250-600	C	0
Buffer Zone	BOD	mg/l	2	2	3	C	3
Buffer Zone	Total Coliform	MPN/100 ml	17	120	50-5000	C	5000

Exceedance Factor (EF) : All the monitored Surface Water Quality Parameters were found to be well within the respective Limit Values and there was no Exceedance of the Norms.

3.11.4 Interpretation of Ground Water Quality

In general, the water quality of ground waters was found to be within the prescribed IS:10500-2012 Norms for Drinking in the absence of an alternative source.

Zone	Parameter	Unit	From	To	Prescribed Norms
Buffer Zone	TSS	mg/L	8	16	0
Buffer Zone	Fluoride	mg/L	0.08	0.21	1.0/1.5
Buffer Zone	COD	mg/L	2	6	0
Buffer Zone	pH	NA	7.51	7.81	6.5-8.5
Buffer Zone	DO	mg/L	4.0	4.4	0
Buffer Zone	TDS	mg/L	360	520	500/2000
Buffer Zone	Total Hardness	mg/L	160	230	200/600
Buffer Zone	Chlorides	mg/L	80	126	250-1000
Buffer Zone	BOD	mg/L	2	2	-
Buffer Zone	Total Coliform	MPN/100 ml	<2	<2	Absent

Exceedance Factor (EF) : All the monitored Ground Water Quality Parameters were found to be well within the respective Limit Values and there was no Exceedance of the Norms.

3.11.5 Interpretation of Soil Quality

Soils with Medium compaction and Silty Loam texture are dominant in the study area. There was **no heavy metals intrusion/leaching** into the ground strata. Sodium Absorption Ratio was in the range 2.16-5.51 (desirable value being <5).

Zone	Parameter	Value/Remarks
Core Zone	Soil Texture	Silt Loam
	Org. Carbon	1.10%
	SAR	2.16
Buffer Zone	Soil Texture	Silt Loam
	Org. Carbon	0.72-1.12%
	SAR	2.34-5.51

3.11.6 Interpretation of Flora-Fauna

There is **no Reserved Forests / eco sensitive areas** exists in the study area. The study area is not part of any National Park, Sanctuary, Biosphere Reserve, Wildlife Corridors, Migratory Path, etc. and did not record the presence of any critically threatened species. Among the fauna recorded, **most of them are common resident population and no endangered species encountered** in the study area. **Peafowl placed under Schedule-I** as per Wildlife (Protection) Amendment Act, 2022 is found in the study area and its surroundings.

3.11.7 Interpretation of Socio-economics

During the survey, the following demands/expectations were observed from the public:

- ❖ Job opportunities.
- ❖ Training of local youths for suitable jobs.
- ❖ Training in computer typing, driving heavy vehicles, etc.
- ❖ Facilities like Medical assistance, health care, educational, community centres, etc.

3.12 Summary of Baseline Status

The findings of baseline environmental status of the study area are summarized below :

- ❖ Study Area is not falling in Critically Polluted Industrial Clusters listed by CPCB and also not falling in Coastal Regulation Zone (CRZ). There is no Reserved Forest and no Ecologically Sensitive Area within 10 km Radius Area.
- ❖ The collected meteorological data represented the local weather phenomena.
- ❖ The monitored ambient air quality in the study area was found to be in compliance with the National Ambient Air Quality (NAAQ) 24-hourly Norms for Industrial, Residential, Rural and other areas.
- ❖ Study Area is falling under Low Pollution Category as monitored Pollutant Levels were <0.5 Exceedance Factor.
- ❖ Ambient equivalent Noise Levels (Leq) during day and night times were found to be well within the MoEF&CC Norms.
- ❖ Workzone Noise Levels were well within the Limit of 85 DB(A) for 8-hours exposure
- ❖ The water quality of surface waters were found to be in compliance with CPCB/BIS Norms.
- ❖ The ground water quality was found to be in compliance with the IS:10500-2012 Norms.
- ❖ The soil in the study area would very well support vegetation after amending it suitably.
- ❖ There is no eco sensitive area exists in the study area and only domesticated animals exist.
- ❖ **Schedule-I Fauna**, Peafowl are found inhabiting the Study area.
- ❖ The area is thinly populated and basic amenities are available almost in all villages.

Thus, there is **adequate buffer** for the proposed Project in the physical, biological and edaphic environments of the study area.

4.0 Anticipated Environmental Impact and Mitigation Measures

4.1 Identification of Impacts

Environmental Impacts are categorized as primary or secondary impacts. Primary impacts are those which are attributed directly to the project and secondary impacts are those which are indirectly induced by the proposed Project. Any Project would create impact on the environment in two distinct phases viz. **Construction Phase** which may be regarded as Temporary & Short Term and **Operation Phase** which would have Long Term effects. Identification of all potential environmental impacts due to the Proposal are critically examined and major impacts (**both beneficial & adverse**) are assessed.

The impacts have been divided into two categories, viz. **Localised and Cumulative**. Localised Impact is confined to the area of influence of the Project and is not transmitted beyond its area. Cumulative Impact is the aggregate impact of a number of projects on any component. **Cumulative impacts** can result from individually minor but collectively significant actions taking place over a period of time.

There is **no major Industry** in the Study Area. For **Cumulative Impact Assessment**, the existing industrial activities viz. Cement Plant & Captive Power Plant activities are considered and their Contribution are also assessed. The impacts have been assessed for the Project assuming that the **existing industrial activities has already been covered under baseline environmental status** and continue to remain same till the operation of the project.

4.2 Construction Phase

Expansion activities are proposed within the Industry premises with no additional land & infrastructures. No. of Working days will be increased to 345 days to achieve the production enhancement with existing machineries. Thus, no major establishment is required for the Proposal. Structural Works for proposed WHR System will be the main works during Construction Phase.

Required materials for WHR installation like steel, etc. is readily available in the Plant. Local labourers will be engaged and provided with all Personal Protective Equipments (PPEs) like Mask, Gloves, Ear plugs/muffs, etc. Water, electricity, toilet facilities, etc. will be provided from existing facilities in the Plant during Construction Phase.

The widely adopted **Matrix Method** for identifying & evaluating potential Impacts due to the Proposal is used. Impact Matrix for Construction Phase is given as **Table 4.1**.

Table : 4.1 Impact Matrix - Construction Phase

Environmental Components & Parameters		Project Activity during Construction Phase							
		Land	Transportation	Air Pollution	Noise	Raw Water	Waste water	Solid Wastes	Green Belt
Land	Land Use								
	Soil Quality								
	Agricultural Resources								
Air	Meteorology								
	Air Quality								
Noise	Intensity								
	Duration / Frequency								
Water	Surface Water Quality								
	Ground Water Quality								
	Water-table								
Biological (Flora & Fauna)	Species								
	Population								
	Habitat								
Socio-Economics	Population								
	Employment								
	Infrastructures								
	Economy								
	Public Health								
	Occupational Health								

Legend :

	Positive Impact
	Insignificant Negative Impact
	Significant Negative Impact

4.2.1 Impact on Land Use

All Expansion activities i.e. **Line-II inclusion**, are proposed within the existing Premises and **no additional land** is required. There will be no excavation or cut & fill during Construction Phase.

4.2.2 Impact on Road & Traffic

On an average, 2-3 Truck loads/day will be visiting the site and will not have any adverse impact to the existing traffic volume of NH-44.

4.2.3 Impact on Ambient Air Quality

The main sources of emission during the construction period are the movement of materials & equipments at site and dust emitted during the installation related activities. However, the impact will be for short duration and confined locally.

4.2.4 Impact on Noise Levels

There will be very less impact on the existing noise levels due to construction, traffic for loading and unloading, fabrication and handling of equipments & materials, etc. The likely increase of about 1-2 dB(A) in Leq Noise Levels will be confined locally.

4.2.5 Impact on Surface & Ground Water Quality

There is no ground water drawl for the Plant. The construction water requirement is nil. Impact on water quality during construction phase may be due to non-point discharge of sewage generated from construction workforce. Existing STPs are adequate to treat additional sewage.

4.2.6 Impact on Biological Environment

Project does not warrant any cutting or transplantation of trees. Existing Green Belt will control the Air Pollution & Noise Levels, if any, generated during Construction Phase. Thus, there will not be any significant impact on existing flora-fauna of the study area.

4.2.7 Impact on Socioeconomic Environment

There is no rehabilitation and resettlement involved in the project. Presently, there are 465 Direct Employees working in the Cement Complex. Indirect Employment to about 600 persons has been provided. Due to the Expansion Proposal, another 35 Direct Employees & 50 Indirect Employees will be added. This is a positive impact due to the Proposal.

Thus, the Construction Phase activities will not cause any significant adverse impact on the surrounding areas.

Mitigating Measures : The following EMP measures shall be undertaken during the Expansion :

- ❖ All Personal Protective Equipments (PPEs) shall be provided to the workers.
- ❖ Construction employees shall have access to safe drinking water and Toilet facilities.
- ❖ Protection devices viz. ear plugs/ear muffs shall be provided to the workers during welding and structural works.
- ❖ All the debris resulting from the site shall be disposed off effectively as per existing Norms.
- ❖ EMP Cell ensure the periodical Monitoring of Environmental Parameters during the Construction Period and ensure its compliance with Norms.

4.3 Impacts during Operation Phase

The impacts have been assessed for the Project assuming that the **existing industrial activities has already been covered under baseline environmental status** and continue to remain same till the operation of the project. The following activities related to the Operational Phase of the Project will have varying impacts on the environment and are considered for the impact assessment :

- ❖ Land Environment.
- ❖ Traffic Volume.
- ❖ Air Quality.
- ❖ Noise Levels.
- ❖ Water Environment.
- ❖ Solid Wastes.
- ❖ Biological Environment.
- ❖ Socio-economics.

The Impact Matrix for Operation Phase is given as **Table 4.2**.

4.3.1 Impact on Land

All Expansion activities i.e. **Line-II inclusion**, are proposed within the existing Premises and **no additional land** is required. **No establishment** is required for the Proposal. No change in Land Use as existing facilities are utilised on Expansion.

Total Builtup Area of the Complex is **61.266 Ha** (with Roof Top Area of 27.570 Ha) and Paved Area of **17.012 Ha**. The total Green Belt Area is **64.50 Ha** in the total extent of 191.434 Ha with **33.69% coverage**.

Table : 4.2 Impact Matrix - Operation Phase

Environmental Components & Parameters		Project Activity during Operation Phase							
		Land	Transportation	Air Pollution	Noise	Raw Water	Waste water	Solid Wastes	Green Belt
Land	Land Use								
	Soil Quality								
	Agricultural Resources								
Air	Meteorology								
	Air Quality								
Noise	Intensity								
	Duration / Frequency								
Water	Surface Water Quality								
	Ground Water Quality								
	Water-table								
Biological (Flora & Fauna)	Species								
	Population								
	Habitat								
Socio-Economics	Population								
	Employment								
	Infrastructures								
	Economy								
	Public Health								
	Occupational Health								

Legend :

	Positive Impact
	Insignificant Negative Impact
	Significant Negative Impact

4.3.2 Impact on Road & Traffic

Raw and Finished Materials are being transported by **both Rail and Road Modes**. Limestone from Captive Mines & Primary Crusher at Pandalgudi is transported by 30 Tons Tippers through RCL's dedicated transportation road. There are 525 Truck movements in one way i.e. 1,050 Trucks/day now. On Expansion, 1,166 Truck movements in one way i.e. **2,332 Trucks/day** will be there. Thus, there will be **1,282 Trucks/day** additional traffic volume due to the Proposal (**Table 4.3**).

Table : 4.3 Traffic Volume - Existing & Proposed

Sl. No.	Raw Material	Existing Demand, MTPA	Proposed Demand, MTPA	Mode of Transport	No. of Trucks per Day (one way)		Increase in No. of Trucks per Day (2-ways)
					Existing	Prop.	
1	Limestone (& Lime Kankar)	2.16 @ 6740 TPD	1.794 @ 5200 TPD	By Own Haulage Road – 30 T Covered Tippers	225	174	(-) 102
2	Beneficiated Lime Kankar	-	2.085 @ 6050 TPD		-	202	404
3	Clay, Chips & Roughstone	-	0.209 @ 605 TPD	By Road - 20 T Covered Trucks	-	31	62
4	Copper Slag / Laterite / Iron Ore	0.022 @ 63 TPD	0.083 @ 242 TPD	By Road - 20 T Covered Trucks	4	12	16
5	Fuel for Cement Plant i) 100% Petcoke	0.128 @ 423 TPD	0.246 @ 715 TPD	50% by Rail & 50% by Road 20 T Covered Trucks	11	18	14
5	ii) 100% Imported Coal	0.187 @ 584 TPD	0.358 @ 1040 TPD	50% by Rail & 50% by Road - 20 T Covered Trucks	(Or) 15	(Or) 26	(Or) 22
6	Clinker	1.44 @ 4500 TPD	2.760 @ 8000 TPD	By closed conveyors	-	-	-
		0.42-0.50 @ 1220 TPD	0.504 @ 1460 TPD	By Rail	-	-	-
7	Gypsum	0.108 @ 290 TPD	0.136 @ 395 TPD	By Road- 20 T Covered Trucks	15	20	10
8	Dry Fly Ash	0.677 @ 2050 TPD	1.120 @ 3246 TPD	By Road - 40 T Bowsers	52	82	60
9	Wet Fly Ash	0.054 @ 50 TPD	0.080 @ 232 TPD	By Road - 20 T Covered Trucks	3	12	18
10	Slag	63 TPD	2.200 @ 6377 TPD	By Road - 20 T Covered Trucks	4	319	630
11	Limestone/ Limestone Powder as PI	-	0.040 @ 115 TPD	By Road - 20 T Covered Trucks	-	6	12
12	Cement	8440	11600	25% by Rail & 75% by Road – 30 T Covered Trucks	211	290	158
Total					525	1166	1282

Baseline Status : For assessing the baseline status, the Traffic Survey based on Indian Road Congress-IRC: 64/106 Norms were carried out at Mukku Road Junction on NH-44 during a Week Day (Wednesday; 28.08.2024) and also during the Week end (Sunday; 01.09.2024). Based on the Survey, existing Traffic Volumes at the Junction is computed in **Passenger Car Units (PCUs)** and given in **Table 4.4**. The existing traffic volume in the Project vicinity was found to be **16,510.3 PCU/day**.

Table : 4.4 Existing Traffic Volume - Baseline Status

Type of Vehicle	No. of Vehicles/day*			PCU Factor as per IRC:106	Average Traffic at NH-Plant Road Junction, PCU/day*
	Week Day (28.08.2024; Wed)	Week End (01.09.2024; Sun)	Avg. Traffic		
Two Wheelers	1224	984	1189.7	0.5	594.9
Autos	684	672	682.3	1.0	682.3
Vans/Tempos	744	792	750.9	1.0	750.9
Cars	1860	2058	1888.3	1.0	1888.3
Buses	840	888	846.9	3.0	2540.6
Trucks	2470	2662	2497.4	3.0	7492.3
Trailers	576	528	569.1	4.5	2561.1
Total	8398	8584	8424.6	-	16510.3

* - Including the existing Traffic Volume to & from Mines.

In the Post-Project Scenario, there will be an addition of **2,332 Vehicles** (in 2 ways) to the existing traffic. Cumulatively, the traffic volume in the Project vicinity on Expansion will be **19,764 PCU/day** (Table 4.5). **The net increase (cumulative) will be 3,254 PCU/day only**. The existing Roads/NHs are adequate to handle the proposed traffic volume due to the Project.

Table : 4.5 Projected Traffic Volume in the Vicinity

Type of Vehicle	Avg. Traffic, No. of Vehicles/day	Proposed Addition, No. of Vehicles/day	Cumulative Volume, No. of Vehicles/day	PCU Factor as per IRC:106	Post Project, No. of vehicles in PCU/day
Two Wheelers	1189.7	-	1190	0.5	594.9
Autos	682.3	-	682	1.0	0.0
Vans/Tempos	750.9	-	751	1.0	750.9
Cars	1888.3	-	1888	1.0	1888.3
Buses	846.9	-	847	3.0	2540.6
Trucks	2497.4	1222	3719	3.0	11158.3
Trailers	569.1	60	629	4.5	2831.1
Total	8424.6	1282	9707	-	19764.0

Level of Service (LOS) : Capacity Standards of Roads are fixed in relation with the LOS which is commonly designated from A (best operating condition) to F (forced or breakdown flow). Normally LOS-C will be adopted for smooth traffic flow in Urban/Rural Areas. At this Level, traffic volume will be 0.7 times of the maximum capacity. Capacity/Design Service Volume is the maximum hourly volume at which a vehicle can be expected to transfer a point/section of a road at a given time period.

Ratio of existing Volume of PCU on road (V) and its Capacity (C) with corresponding LOS and their performance are given in Tables 4.6-4.7. Thus, there will not be any significant impact on the existing baseline traffic volume during Expansion Period also.

Table : 4.6 Level of Service & Performance of a Road (IRC:64-1990 Norms)

Volume/Capacity Ratio	Level of Service	Performance of the Road
0-0.2	A	Excellent
0.2-0.4	B	Very Good
0.4-0.6	C	Good/Average/Fair
0.6-0.8	D	Poor
0.8-1.0	E	Very Poor

Table : 4.7 Predicted Traffic Scenario at the Junction

Road	Volume, PCU/hr.	Capacity of the Road, PCU/hr.	V/C Ratio	Level of Service	Performance of the Road
Existing:-					
NH-44	687.9	3600	0.19	A	Excellent
On Expn. :-					
NH-44	823.5	3600	0.23	B	Very Good

Mitigating Measures : Adequate parkings are provided in the Plant. Facilities for **drivers (rest room, toilet, etc.)** are also provided. Other Measures are :

- ❖ Green Belt with thick foliage along the Plant/Ore Haulage/Transportation roads.
- ❖ Security Guards at the Road Junction to handle the inward and outward vehicles from the Plant to the Highway.
- ❖ All Trucks are to be fully covered with Tarpaulin to avoid any spillage on transportation.
- ❖ Restriction of over loading of Trucks/Tipper.
- ❖ Speed restrictions
- ❖ Restriction of Truck parking in the Highway and Public Roads.
- ❖ Regular and preventive maintenance of transport vehicles has to be ensured.
- ❖ Compliance to 'Pollution under Control' Certification has to be checked periodically.

4.3.3 Impact on Air Quality

The (old) Line-II Kiln is already provided with Reverse Air Bag House, Cooler with ESP, Coal Mill with Bag Filters so as to control the **Particulate Emissions from Line-II <30 mg/Nm³**. SO₂ Emissions from Kiln-II will be <100 mg/Nm³ and NO_x Emissions will be <600 mg/Nm³. All material conveyors are fully covered and provided with Bagfilters at Transfer Points. The Plant operations will be in compliance with new Emission Standards issued by MoEF&CC for Cement Industry vide Notifications dated 25.08.2014 and amended on 09.05.2016 & 10.05.2016.

Stack Emission details, as monitored by a NABL Accredited Lab, are given in **Tables 4.8-4.9**.

Table : 4.8 Stack - Particulate Matter

Sl. No.	Stack Name	Stack Attached to	Monitoring Date (by NABL Lab)					
			09-10.07.2024		20-21.08.2024		20-23.09.2024	
			Stack Discharge, Nm ³ /hr.	PM Conc., mg/Nm ³	Stack Discharge, Nm ³ /hr.	PM Conc., mg/Nm ³	Stack Discharge, Nm ³ /hr.	PM Conc., mg/Nm ³
1	Kiln-I	RABH	157036	11.30	188938	7.56	196358	8.56
2	Coal Mill-I	Bag Filter	38000	16.08	38500	17.00	38200	16.02
3	Cooler-I	ESP	89557	10.80	89290	11.50	94036	12.40
4	Kiln-III	RABH	416913	9.03	383219	5.0	424797	6.40
5	Coal Mill-III	Bag Filter	60615	6.14	67687	5.20	65403	7.50
6	Cooler-III	ESP	188547	14.90	184758	11.80	184895	13.10
7	Cement Mill 1&2	Bag Filter	135657	11.30	174058	9.26	190547	10.10
8	Cement Mill 3	Bag Filter	55893	10.30	56244	9.41	61695	11.30
9	Packer	Bag Filter	55391	6.85	57735	5.49	58806	6.20
10	CPP Boiler	ESP	101386	40.30	112261	26.90	115441	25.10

Table : 4.9 Stack - Gaseous Emissions

Sl. No.	Stack Name	Stack Attached to	Monitoring Date (by NABL Lab)					
			09-10.07.2024		20-21.08.2024		20-23.09.2024	
			SO ₂ , mg/Nm ³	NO _x , mg/Nm ³	SO ₂ , mg/Nm ³	NO _x , mg/Nm ³	SO ₂ , mg/Nm ³	NO _x , mg/Nm ³
1	Kiln-I	RABH	BLQ (LOQ:3.0)	536	BLQ (LOQ:3.0)	545	BLQ (LOQ:3.0)	520
2	Kiln-III	RABH	BLQ (LOQ:3.0)	571	BLQ (LOQ:3.0)	552	BLQ (LOQ:3.0)	475
3	CPP Boiler	ESP	566	412	555	433	482	395

Load Based Emission : Based on the monitored values, on 3-month average, PM Emission was 8.98 kg/hr. For 4,500 TPD Clinker production, the Load Based Emission is computed as **0.048 kg/Tonne of Clinker** which well within the MoEF&CC Norm of 0.125 kg/Tonne of Clinker.

For arriving the Pollutant emissions from all Stacks, designed/consented capacity of Discharges and Limit values are considered for Worst Case Scenario (Table 4.10-4.11).

Table : 4.10 Particulate Matter Emission (Cumulative)

Sl. No.	Line & Stack Attached to	Discharge, Nm ³ /hr.	PM Conc., mg/Nm ³	PM Emission, kg/hr.
I	Existing Scenario :-			
A	Line-I			
1	RM/Kiln-I RABH	3,03,876	20	6.08
2	Coal Mill-1 BFs	40,000	20	0.80
3	Cooler-1 ESP	1,77,840	20	3.56
B	Line-III			
4	RM/Kiln-III RABH	7,20,000	20	14.40
5	Coal Mill-3 BFs	1,54,800	20	3.10
6	Cooler-3 ESP	3,56,040	20	7.12
C	Common Stacks			
7	Cement Mill-1 & 2 BFs	3,50,000	20	7.00
8	Cement Mill-3 BFs	3,30,000	20	6.60
9	Packer Nos. 1 & 2	1,10,000	20	2.20
10	Packer No. 3	75,000	20	1.50
11	Packer No. 4	75,000	20	1.50
12	Wagon Tippler	1,00,000	50	5.00
13	Crusher - 200 TPH	15,000	100	1.5
D	Standby DG Sets			
14	7 MW	45,000	100	4.5
15	4 MW	23,000	100	2.3
16	4 MW	23,000	100	2.3
E	Captive Power Plant			
15	CPP 25 MW	2,00,000	50	10.00
16	0.5 MW DG Set	20,000	100	2.00
Sub-Total		31,18,556	-	81.45
II	Expansion Scenario :-			
F	Line-II			
1	RM/Kiln-II RABH	3,00,000	30	9.00
2	Coal Mill-2 BFs	35,000	30	5.25
3	Cooler-2 ESP	1,75,000	30	1.05
Sub-Total		5,10,000	-	15.30
Total		36,28,556		96.75

On Expansion, PM emission will increase by **18.78%** to existing Levels.

Table : 4.11 Gaseous Emission (Cumulative & Designed)

Sl. No.	Line & Stack Attached to	Discharge, Nm ³ /hr.	SO ₂ Conc., mg/Nm ³	SO ₂ Emission, kg/hr.	NOx Conc., mg/Nm ³	NOx Emission, kg/hr.
I	Existing Scenario :-					
A	Line-I					
1	RM/Kiln-I RABH	3,03,876	100	30.39	600	182.33
B	Line-III					
2	RM/Kiln-III RABH	7,20,000	100	4.00	600	24.00
C	Captive Power Plant					
3	CPP 25 MW	2,00,000	600	120.00	450	90.00
Sub-Total		12,23,876	-	154.39	-	296.33
II	Expansion Scenario :-					
D	Line-II					
1	RM/Kiln-II RABH	3,00,000	100	30.00	600	180.00
Sub-Total		3,00,000	-			
Total		15,23,876	-	184.39		476.33

On Expansion, SO₂ emission will increase by **19.43%** and NOx will increase by **60.74%** to existing Levels.

PM Pollution Load :

PM Pollution Load – Existing	:	0.23 kg/T of Cement
PM Pollution Load – On Expn.	:	0.20 kg/T of Cement
Reduction in Stack PM Levels on Expn.	:	13.04%

Based on the Monitored Data status, Emission of Pollutants from the Plant will be as detailed in **Table 4.12**.

Table : 4.12 Emission Levels from the Complex (Cumulative & Designed)

Sl. No.	Pollutant	Existing Emission, g/sec.	Emission on Expn., g/sec.
1	PM2.5	0.792	0.940
2	PM10	2.263	2.690
3	SO ₂	42.885	51.219
4	NOx	82.31	132.31

Prediction Modelling : AERMOD View (9.6.5 Version) is used for the Prediction Modelling for applicable Parameters PM2.5, PM10, SO₂ & NOx (**CO levels were below BDL**). The Model was run for proposed Plant operations. The **Model Inputs and Outputs** are appended. The predicted GLCs (cumulative impact) are given in **Table 4.13**. The predicted values are spatially distributed and given as **Fig. 4.1**.

PM2.5 – Input Data

Source Pathway - Source Inputs

APR 2012

Point Sources

Source Type	Source ID	Emission Rate (t/d)	Emission Rate (t/a)	Base Emission (t/a)	Source Height (m)	Source Rate (g/s)	1st Pass Temp. (K)	1st Pass Velocity (m/s)	Stack Emission (t/a)
POINT	BTCK1	421131.00 KAT RABR	154670.76	32.00	35.00	0.00900	370.00	15.00	2.30
POINT	BTCK2	421560.70 Coke-1 ESP	500000.00	34.00	31.00	0.03800	450.00	15.00	5.00
POINT	BTCK3	421544.44 Cement Mill-1 ESP	344000.00	36.00	36.00	0.00600	300.00	6.00	0.00
POINT	BTCK4	421570.00 KOL RABR	300000.00	38.00	37.00	0.14300	470.00	10.00	6.50
POINT	BTCK5	421561.22 Coke Mill-1 ESP	344000.00	34.00	37.00	0.00900	330.00	6.00	1.10
POINT	BTCK6	421487.40 Coke Mill-2 ESP	344000.00	37.00	40.00	0.00600	400.00	14.00	0.00
POINT	BTCK7	421520.00 Pulverizer ESP	344000.00	37.00	30.00	0.07100	320.00	20.00	0.00
POINT	BTCK8	421488.70 Cement Mill-2	344000.00	36.00	35.00	0.00400	300.00	6.00	1.00
POINT	BTCK9	421570.00 Rough Taper	344000.00	71.00	14.00	0.00900	300.00	12.00	1.00
POINT	BTCK10	421487.40 CSP-1 ESP	344000.00	34.00	40.00	0.00900	400.00	6.00	0.00
POINT	BTCK11	421562.00 Coke Mill-3 ESP	344000.00	37.00	40.00	0.00600	400.00	14.00	1.00
POINT	BTCK12	421520.00 KOL RABR	344000.00	35.00	32.00	0.00600	300.00	12.00	1.00

Source Pathway - Source Inputs

APR 2012

Source Type	Source ID	Emission Rate (t/d)	Emission Rate (t/a)	Base Emission (t/a)	Source Height (m)	Source Rate (g/s)	1st Pass Temp. (K)	1st Pass Velocity (m/s)	Stack Emission (t/a)
POINT	BTCK13	421520.00 Coke-2 ESP	500000.00	35.00	30.00	0.01000	320.00	15.00	2.00
POINT	BTCK14	421562.00 Coke Mill-2 ESP	344000.00	37.00	25.00	0.03800	320.00	12.00	0.00
POINT	BTCK15	421548.00 Coke Mill-3 ESP	344000.00	34.00	37.00	0.03000	340.00	6.00	1.70

PM2.5 – Output Data

Results Summary									
C:\Lakes\WERSOQ View\PM25\Main\Exp_H\RRN\Main\Exp_PM25									
PM2.5 - Concentration - Source Group - ALL									
Averaging Period	Rank	Point	Date	X (m)	Y (m)	Z1 (m)	Z1 (m)	ZML (m)	Peak Date, Start Hour
24 HR	1ST	0.34704	02/28/2024	022499.00	108622.40	0.00	0.00	10.00	02-08-2024, 24
24 HR	2ND	0.34696	02/28/2024	022499.00	108622.40	0.00	0.00	10.00	02-08-2024, 24
24 HR	3RD	0.34456	02/28/2024	022499.00	108622.40	0.00	0.00	10.00	12-08-2024, 24
24 HR	4TH	0.32758	02/28/2024	022499.00	108622.40	0.00	0.00	10.00	09-08-2024, 24
24 HR	5TH	0.32463	02/28/2024	022499.00	108622.40	0.00	0.00	10.00	18-07-2024, 24
24 HR	6TH	0.31223	02/28/2024	022499.00	108622.40	0.00	0.00	10.00	05-08-2024, 24
24 HR	7TH	0.30613	02/28/2024	022499.00	108622.40	0.00	0.00	10.00	11-08-2024, 24
24 HR	8TH	0.30563	02/28/2024	022499.00	108622.40	0.00	0.00	10.00	02-07-2024, 24
24 HR	9TH	0.29962	02/28/2024	022499.00	108622.40	0.00	0.00	10.00	05-08-2024, 24
24 HR	10TH	0.29743	02/28/2024	022499.00	108622.40	0.00	0.00	10.00	30-08-2024, 24
PERIOD		0.31191	02/28/2024	022505.71	108624.00	0.00	0.00	10.00	

PM10 – Input Data

Source Pathway - Source Inputs

Source Type	Source ID	X Location (m)	Y Location (m)	Flow Emission (kg/hr)	Release Height (m)	Flow Rate (m³/hr)	Hot Gas Temp (°C)	Gas Exit Velocity (m/s)	Particle Emission (kg/hr)
POINT	ST0A1	021910.00	108073.75	0.00	10.00	0.10000	170.15	10.00	0.00
		RRN RABH							
POINT	ST0A2	021962.75	108082.75	0.00	10.00	0.00000	450.15	15.00	0.00
		Coiler-1 ESP							
POINT	ST0A3	021956.00	108089.50	0.00	40.00	0.10000	300.15	8.00	0.00
		Cement Mill-1 ESP							
POINT	ST0A4	021970.00	108090.25	0.00	10.00	0.00000	410.15	10.00	0.00
		RRN RABH							
POINT	ST0A5	021930.75	108090.00	0.00	10.00	0.00000	320.15	8.00	0.00
		Coiler-2 SF							
POINT	ST0A6	021463.00	108043.25	0.00	40.00	0.10000	400.15	14.00	0.00
		Coiler-3 ESP							
POINT	ST0A7	021303.00	108013.10	0.00	30.00	0.14000	321.15	21.00	0.00
		Preheater SF							
POINT	ST0A8	021460.75	108041.75	0.00	70.00	0.00000	350.15	8.00	0.00
		Coiler-4 MS							
POINT	ST0A9	020070.75	108005.25	75.00	10.00	0.12000	300.00	12.00	0.00
		Wagon Tipper							
POINT	ST0A10	021497.00	108027.00	0.00	40.00	0.20000	430.00	8.75	0.00
		Coiler-5 ESP							
POINT	ST0A11	021802.50	108068.00	100.00	40.00	0.20000	350.15	10.00	0.00
		Coiler-6 MS							
POINT	ST0A12	021522.00	108051.00	0.00	70.00	0.17000	300.15	12.00	0.00
		RRN RABH							

Source Pathway - Source Inputs

Source Type	Source ID	X Coordinate (m)	Y Coordinate (m)	Flow Direction (Degrees)	Flow Height (m)	Flow Rate (m ³ /s)	Gas Flow Rate (kg/s)	Gas Flow Velocity (m/s)	Gas Flow Diameter (m)
PCWT	ST003	82109.85	948937.30	90.00	30.00	0.00000	888.88	13.28	1.00
PCWT	ST014	82109.20	948936.00	90.00	25.00	0.00000	828.75	12.00	0.85
PCWT	ST045	82104.00	948792.15	90.00	47.00	0.00000	842.88	8.80	1.00

PM10 – Output Data

Results Summary

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PM10 - Concentration - Source Group ALL

Average Period	Stack	Peak	Units	X (m)	Y (m)	Z115V (m)	Z115Q (m)	Z101 (m)	Peak Date, Start Hour
24-HR	101	0.0044	ug/m ³	822400.10	948922.45	10.00	0.00	10.00	17-06-2024, 24
24-HR	240	0.02372	ug/m ³	822400.10	948922.45	10.00	0.00	10.00	02-08-2024, 24
24-HR	380	0.00027	ug/m ³	822400.10	948922.45	10.00	0.00	10.00	18-07-2024, 24
24-HR	434	0.05487	ug/m ³	822400.10	948922.45	10.00	0.00	10.00	07-09-2024, 24
24-HR	614	0.02864	ug/m ³	822400.10	948922.45	10.00	0.00	10.00	18-08-2024, 24
24-HR	674	0.00520	ug/m ³	822400.10	948922.45	10.00	0.00	10.00	09-08-2024, 24
24-HR	774	0.01366	ug/m ³	822400.10	948922.45	10.00	0.00	10.00	31-07-2024, 24
24-HR	874	0.00647	ug/m ³	822400.10	948922.45	10.00	0.00	10.00	12-07-2024, 24
24-HR	974	0.01195	ug/m ³	822400.10	948922.45	10.00	0.00	10.00	05-07-2024, 24
24-HR	1074	0.00088	ug/m ³	822400.10	948922.45	10.00	0.00	10.00	18-07-2024, 24
PERIOD		0.00344	ug/m ³	822400.10	948922.45	10.00	0.00	10.00	

SO₂ – Input Data

Source Pathway - Source Inputs

Source Type	Source ID	X Coordinate (m)	Y Coordinate (m)	Flow Direction (Degrees)	Flow Height (m)	Flow Rate (m ³ /s)	Gas Flow Rate (kg/s)	Gas Flow Velocity (m/s)	Gas Flow Diameter (m)
PCWT	ST003	82109.85	948937.30	90.00	30.00	0.00000	888.88	13.28	1.00
PCWT	ST014	82109.20	948936.00	90.00	25.00	0.00000	828.75	12.00	0.85
PCWT	ST045	82104.00	948792.15	90.00	47.00	0.00000	842.88	8.80	1.00

Source Pathway - Source Inputs

Source Type	Source ID	X Coordinate (m)	Y Coordinate (m)	Area (sqm)	Height (m)	Source Rate (kg/hr)	SO ₂ Rate (kg/hr)	NO _x Rate (kg/hr)	PM ₁₀ Rate (kg/hr)
POBT	STDA1	121014.81	104671.71	10.00	11.00	0.22E+02	0.75E+01	0.00E+00	1.30E+00
POBT	STDA2	121082.71	104668.18	10.00	11.00	0.20E+02	0.70E+01	0.00E+00	1.30E+00
POBT	STDA3	121094.41	104668.91	10.00	10.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
POBT	STDA4	121070.31	104666.71	10.00	12.00	1.10E+02	0.15E+01	0.00E+00	0.00E+00
POBT	STDA5	121028.71	104670.48	10.00	10.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
POBT	STDA6	121082.81	104666.25	10.00	10.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
POBT	STDA7	121022.27	104673.18	10.00	10.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
POBT	STDA8	121082.71	104664.71	10.00	10.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
POBT	STDA9	121070.31	104666.31	11.00	10.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
POBT	STDA10	121027.31	104673.48	10.00	10.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
POBT	STDA11	121022.31	104666.42	10.00	10.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
POBT	STDA12	121022.40	104666.48	10.00	10.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

SO₂ – Output Data

Results Summary

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NO_x Concentration - Source Group All

Average Period	Year	Peak	Units	X (m)	Y (m)	Z1 (m)	Z2 (m)	Z3 (m)	Peak Time Start Hour
24-Hr	10T	5.20877	µg/m ³	121014.81	104671.71	10.00	0.00	10.00	09-05-2024, 24
24-Hr	2ND	5.20877	µg/m ³	121014.81	104671.71	10.00	0.00	10.00	10-05-2024, 24
24-Hr	3RD	5.10520	µg/m ³	121014.81	104671.71	10.00	0.00	10.00	02-05-2024, 24
24-Hr	4TH	4.85061	µg/m ³	121014.81	104671.71	10.00	0.00	10.00	01-05-2024, 24
24-Hr	5TH	4.46691	µg/m ³	121014.81	104671.71	10.00	0.00	10.00	01-05-2024, 24
24-Hr	6TH	4.30228	µg/m ³	121014.81	104671.71	10.00	0.00	10.00	18-01-2024, 24
24-Hr	7TH	4.17822	µg/m ³	121014.81	104671.71	10.00	0.00	10.00	21-05-2024, 24
24-Hr	8TH	3.90240	µg/m ³	121014.81	104671.71	10.00	0.00	10.00	20-05-2024, 24
24-Hr	9TH	3.80003	µg/m ³	121014.81	104671.71	10.00	0.00	10.00	28-05-2024, 24
24-Hr	10TH	3.70520	µg/m ³	121014.81	104671.71	10.00	0.00	10.00	12-07-2024, 24
PERIOD		3.17143	µg/m ³	121014.81	104671.71	10.00	0.00	10.00	

NOx – Input Data

Source Pathway - Source Inputs

Address

Plant Sources

Source Type	Source ID	X Coordinate (m)	Y Coordinate (m)	Stack Diameter (m)	Stack Height (m)	Emission Rate (g/s)	Gas Exit Temp. (K)	Gas Exit Velocity (m/s)	Stack Inside Diameter (m)	
POINT	STDK1	621810.81	626675.72	32.00	60.00	25.7500E-03	678.75	16.60	2.30	
		SH 1 RAHM								
POINT	STDK2	621850.75	626680.70	31.00	51.00	0.000E+00	476.95	16.20	1.60	
		Coker 1 ESP								
POINT	STDK3	621844.41	626688.23	31.00	60.00	0.000E+00	382.25	8.40	3.00	
		Coker 2 ESP								
POINT	STDK4	621970.38	626680.23	31.00	121.00	50.4000E-03	476.95	16.40	4.50	
		KIND RAHM								
POINT	STDK5	621836.72	626681.48	31.00	67.00	0.000E+00	519.55	7.20	1.60	
		Coker 1 BF								
POINT	STDK6	621863.00	626682.25	27.00	40.00	0.000E+00	490.45	14.90	2.00	
		Coker 1 ESP								
POINT	STDK7	621820.01	626681.70	31.00	60.00	0.000E+00	521.25	23.40	0.90	
		Power 1 BF								
POINT	STDK8	621881.75	626681.72	31.00	70.00	0.000E+00	382.25	6.30	1.60	
		Coker 1 ESP								
POINT	STDK9	622070.72	626680.20	71.00	16.00	0.000E+00	260.00	12.00	0.60	
		Roof Top								
POINT	STDK10	621867.01	626721.45	31.00	60.00	12.1800E-03	438.00	8.70	3.30	
		ESP 2 ESP								
POINT	STDK11	621902.58	626686.92	107.00	40.00	0.000E+00	687.25	16.10	1.30	
		Dust 1 & 2 BF								
POINT	STDK12	621752.81	626682.46	31.00	77.00	1.7300E-03	538.25	10.10	1.60	
		KIND 3 RAHM								

Source Pathway - Source Inputs

Address

Source Type	Source ID	X Coordinate (m)	Y Coordinate (m)	Stack Diameter (m)	Stack Height (m)	Emission Rate (g/s)	Gas Exit Temp. (K)	Gas Exit Velocity (m/s)	Stack Inside Diameter (m)	
POINT	STDK13	621828.91	626680.58	30.00	30.00	3.000E-03	595.00	13.50	2.00	
		Coker 2 ESP								
POINT	STDK14	621900.20	626680.20	31.00	25.00	3.000E-03	528.00	10.50	0.90	
		Coker 2 ESP								
POINT	STDK15	621860.00	626682.15	31.00	67.00	3.000E-03	342.00	6.30	1.60	
		Coker 1 ESP								

NOx – Output Data

Results Summary									
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NOx Concentration - Station Group: All									
Averaging Period	Rank	Peak	Date	X (m)	Y (m)	Z1 (m)	Z2 (m)	Z3 (m)	Peak Conc. Start Time
24-HR	10T	15.8832	09/11/2024	822492.10	1046522.45	10.00	0.00	10.00	10-09-2024_24
24-HR	2ND	15.8900	09/11/2024	822492.10	1046522.45	10.00	0.00	10.00	10-09-2024_24
24-HR	3RD	15.89420	09/11/2024	822492.10	1046522.45	10.00	0.00	10.00	09-09-2024_24
24-HR	4TH	16.13400	09/11/2024	822492.10	1046522.45	10.00	0.00	10.00	02-09-2024_24
24-HR	5TH	14.10200	09/11/2024	822492.10	1046522.45	10.00	0.00	10.00	01-09-2024_24
24-HR	6TH	13.79347	09/11/2024	822492.10	1046522.45	10.00	0.00	10.00	26-09-2024_24
24-HR	7TH	12.36820	09/11/2024	822510.73	1046522.17	10.00	0.00	10.00	01-09-2024_24
24-HR	8TH	12.12888	09/11/2024	822510.73	1046522.55	10.00	0.00	10.00	09-07-2024_24
24-HR	9TH	11.72294	09/11/2024	822555.31	1046522.55	10.00	0.00	10.00	31-07-2024_24
24-HR	10TH	10.81198	09/11/2024	822581.71	1046522.13	10.00	0.00	10.00	23-09-2024_24
PERIOD		6.03000	09/11/2024	822492.10	1046522.45	10.00	0.00	10.00	

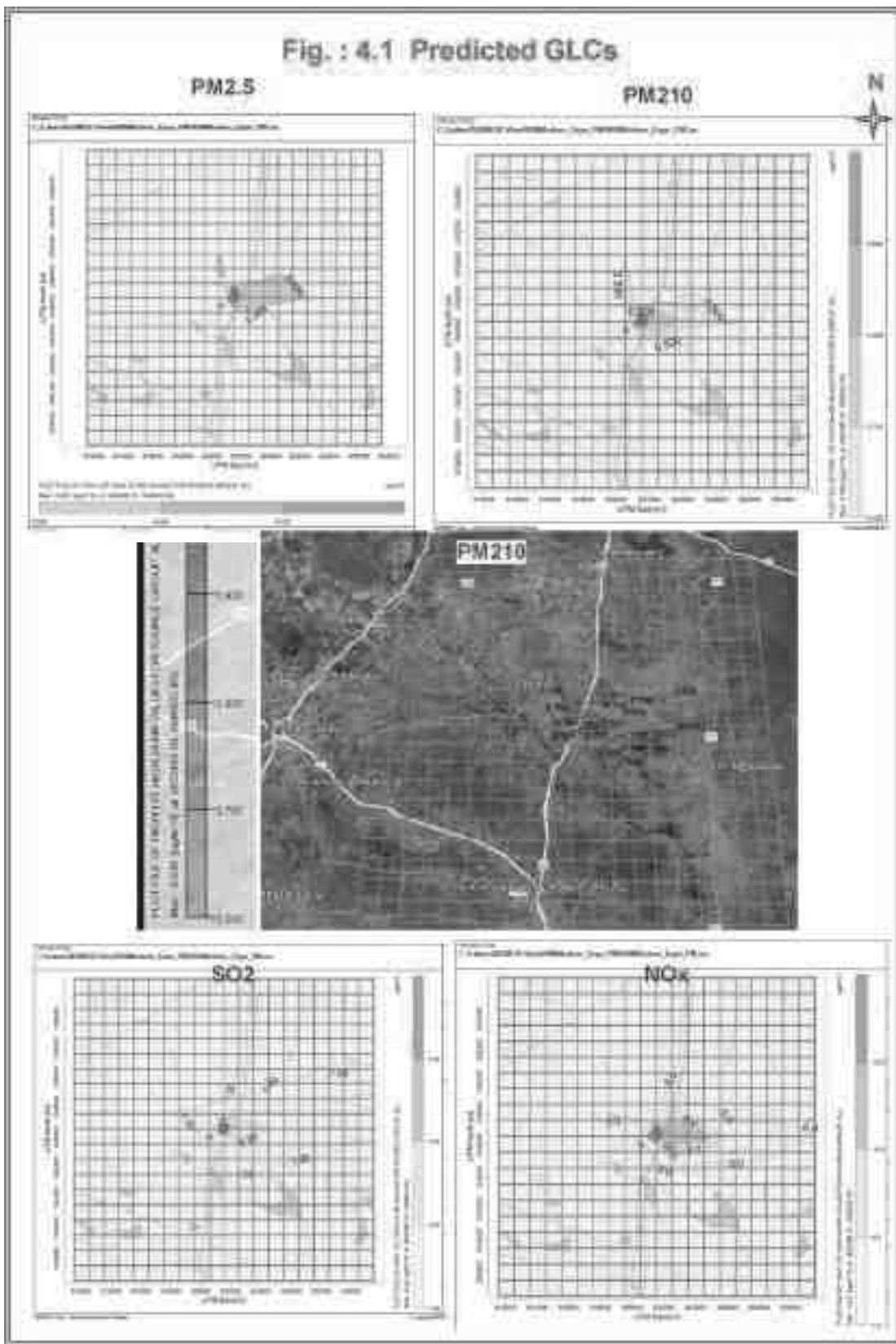
Table : 4.13 Predicted GLCs

Sl. No.	Pollutant	Background Concentration (24-hly.), ug/m ³		Predicted Ground Level Concentration, ug/m ³	Distance from Plant (max.), km	Total on Avg. Concentration, ug/m ³	NAAQ Norms, ug/m ³	Buffer Available in the Atmosphere
		Max.	Avg.					
1	PM2.5	38	21.7	0.42	1.0	22.12	60	63.13%
2	PM10	65	39.0	0.93	1.0	39.93	100	60.07%
3	SO ₂	24	12.0	5.39	1.0	17.39	80	78.26%
4	NO _x	27	14.5	15.87	1.0	30.37	80	62.04%

The **maximum incremental GLC** for PM2.5 is 0.42 ug/m³, PM10 - 0.93 ug/m³, SO₂ – 5.39 ug/m³ & NO_x 15.87 ug/m³. There will be **adequate Buffer (60.07%-78.26%)** in the Air Environment for proposed Expansion activities. The cumulative impacts were found to be confined locally i.e. within 1.0 km radius from the Plant boundaries.

Mitigating Measures : RCL has installed adequate air pollution control systems viz. Electro static precipitators, Bag house, bag filters, etc. are installed in the stacks to control the emissions. Also, adequate dust collection and extraction systems are installed at various transfer points raw mill handling (unloading, conveying, transporting, stacking), vehicle movement, bagging and packing areas, etc.

- ❖ All efforts shall be undertaken to maintain the PM emission levels from the main stacks of Old Line-II New Kiln as <30 mg/Nm³.



- ❖ NO_x emission levels from Line-II with New Kiln shall be <600 mg/Nm³.
- ❖ The periodical evaluation for the efficiency performance of ESPs and Bag Filters shall be carried out.
- ❖ Fugitive emissions due to storage, transportation, etc. and the leakages and spillages shall be continuously monitored and controlled.
- ❖ Thermal insulation is provided wherever necessary to minimize heat radiation from the equipment, piping etc, to ensure protection of personnel.
- ❖ Periodical Ambient Air Quality and Stack Emissions shall be undertaken and the Status Reports shall be submitted to the Authorities as required.

4.3.4 Impact on Ambient Noise Quality

The noise level within the plant at a distance of one meter from the source will be maintained at <85 db(A) level for 8-hours exposure. Noise level at nearest plant boundary will be <55 dB(A) during day times and <45 dB(A) during night times. Thus, the noise levels will be well within the permissible MoEF&CC Norms for Residential Areas.

Mitigating Measures :

- ❖ All rotating items are well lubricated and provided with enclosures as far as possible to reduce noise termination.
- ❖ Extensive vibration monitoring systems are provided to check and reduce vibrations.
- ❖ For all fans, compressors etc. vibration isolators are provided to reduce noise.
- ❖ Provision of silencers are made wherever possible.
- ❖ Proper lubrication and housekeeping are maintained.
- ❖ The operator provided with necessary safety and protection equipment like ear plugs, ear muffs etc.

4.3.5 Impact on Surface Waters Resource and Quality

Presently, the fresh water demand of the Cement Plant, CPP & Township is 1,000 KLD. The Unit has been **permitted for the drawl of 1,500 KLD** from the nearby Seasonal Arjuna River. There is an Intake Well in the River Basin for tapping the required water. **On Expansion, fresh water to the tune of 265 KLD is required** for WHRB Power Plant. Thus, total water demand will be **1,265 KLD which is well within the permitted drawl quantity of 1,500 KLD** from Arjuna River.

Also, treated sewage of 250 KLD, treated Effluent of 20 KLD from CPP and harvested Rainwater of 230 KLD, in total 500 KLD, are supplementing the raw water demand of the Complex.

4.3.6 Impact on Ground Waters Resource and Quality

There is **no ground water drawl for the Plant**. There is no trade effluent from the Cement Plant. Workshop washings of 4 KLD and 16 KLD Rejects from CPP are individually neutralized and the Treated Effluent of 20 KLD is taken to the Cement Plant for equipment cooling (where it is evaporated fully). **On Expansion**, DM/RO Rejects of 40 KLD, Boiler Bleed-offs of 8 KLD and Colling Tower Rejects of 12 KLD, total **60 KLD effluent will be generated** additionally which will be treated for pH Correction in a **100 KLD Neutralisation Pit separately** and **Treated Effluent of 60 KLD** will be utilized for Equipment Cooling of (old) Line-II machineries where it will be evaporated fully.

Domestic Sewage & Canteen wastewaters of 25 KLD from the Cement Plant, 9 KLD Domestic Sewage from CPP, 160 KLD Domestic Sewage from the Township and another 86 KLD Domestic Sewage from Labour Qtrs., thus, a total of 280 KLD is generated. All the Domestic Sewage is treated in a **400 KLD Sewage Treatment Plants (350+50 KLD STPs)**. The Treated Sewage of 250 KLD is fully used for the Green Belt development. There will be **no change to existing status on Expansion**. Thus, it will be a '**Zero Effluent Discharge**' Plant.

Mitigating Measures – Water :

- ❖ No ground water tapping for industrial use.
- ❖ Water consumption shall not be more than the consented quantity.
- ❖ No trade effluent shall be discharged from the Plant.
- ❖ Cooling water is put into closed circuit to minimize the evaporation losses.
- ❖ The domestic sewages from the Cement Plant, Power Plant and Township shall be treated effectively in the Sewage Treatment Plant so to meet the TNPCB Discharge Norms and the treated sewage shall be used for Green Belt.
- ❖ 'Zero Effluent Discharge' shall be practiced.
- ❖ No percolation of treated water to the deep ground water table is done.
- ❖ Periodical monitoring for specific parameters shall be done regularly.

4.3.7 Impact on Solid Wastes

The solid waste generated from the process and dust collected from various air pollution control equipment is being recycled in the process. Solid waste from the Sewage treatment plant 0.8 @ TPD is vermi-composted and used as manure for Green belt development. Fly ash (29.3 TPD) produced from CPP and Bottom ash (5.2 TPD) are transported pneumatically with the help of dense phase pneumatic pumps to the RCC storage silos. The ash is evacuated from silo and transported to Cement Plant for Portland Pozzolana Cement (PPC) manufacturing. There **will not be any change to the existing Status** of Solid Waste Generation, Treatment and Disposal from the Complex on Expansion.

Mitigating Measures :

- ❖ It should be ensured that there is no industrial solid waste from the Plants.
- ❖ The dust collected from APC Measures will be consumed in the Cement Plant fully.
- ❖ Solid wastes from STP Plant shall be vermi composted and used as manure for Green Belt.
- ❖ Waste Oil shall be collected and sold to the CPCB/TNPCB Authorised Agency for further treatment & disposal.
- ❖ The municipal wastes shall be collected, transported, treated in a landfill (composting) within the Plant vicinity to make use of it as manure for Green Belt.
- ❖ Redundant machinery or equipment scraps (1500 Tons/Annum) as and when generated, will be segregated, stored and sold to the authorised recyclers.

4.3.8 Impact on Terrestrial and Aquatic Habitat

The plant will not have any significant impact on surrounding ecology and biodiversity. About 33% green belt has been developed and maintained in the Complex. The approved **budget for Peafowl Conservation Plan @ Rs.1.00 Lakhs/annum** is being spent for Habitat improvement, Community participation in Conservation, etc. No waste water will be discharged outside Plant boundary as well as no natural water course will be disturbed. Therefore, impact on aquatic habitat is not envisaged.

RCL has contributed Rs.75.00 Lakhs to the Director, **Srivilliputtur-Megamalai Tiger Reserve**, Srivilliputtur vide (i) Indian Bank, RR Nagar Branch DD bearing No. 560840 dated 05.09.2023 for Rs.25,00,000/-, (ii) DD bearing No. 560847 dated 12.09.2023 for Rs.30,00,000/- & (iii) DD bearing No. No. 560848 dated 12.09.2023 for Rs.20,00,000/- and all their receipts were acknowledged by its Dy. Director, Srivilliputtur-Megamalai Tiger Reserve Letters dated 20.10.2023.

Mitigating Measures :

- ❖ Green Belt shall be maintained effectively.
- ❖ Local species and fruit bearing trees may also be developed to have a thick canopy cover.
- ❖ The treated sewage shall be used fully for the Green Belt development.
- ❖ There will be **ban on one time use and throw away Plastic usage** in the Plant in compliance with Tamil Nadu, Environment and Forests (EC-2) Department, G.O.(D) No. 84 dated 25.06.2018. RCL will encourage the use of eco friendly alternative such as banana leaf, areca nut palm plate, stainless steel glass, porcelain plates / cups, cloth bag, jute bag etc.

4.3.9 Impact on Socio-economic Environment

The plant is significantly contributing revenue to the State & Central Govt. exchequers. As per the Companies Act 2013, Companies should spend at least 2% of the Profit after Tax of the

previous year for the CSR activities but not lower than 2% of average of previous three years Profit after Tax. RCL is presently carrying out various Socio Measures for the local as well as regional populations. RCL **has implemented CER proposed** for addressing PH issues during 2021-22 to 2023-24 (I Half) at a cost of **Rs.24.00 Crores**. In addition, during the II Half of 2023-24, RCL has carried out various **CSR activities to the tune of Rs.2.18 Crores**.

As a CSR initiative, **RCL contributed Rs.66,40,000/-** vide Indian Bank, RR Nagar Branch DD bearing No. 560710 dated 03.05.2023 to the District Collector / Chairman, District Rural Development Agency for providing **1500 'Nutrition Kit' under 'Irumbu Penmani (Iron Lady) Scheme'** for Govt. School Girl Students in Virudhunagar District.

Mitigating Measures :

- ❖ As per the Companies Act 2013, Companies should spend at least 2% of the Profit after Tax of the previous year for the CSR activities but not lower than 2% of average of previous three years Profit after Tax.
- ❖ RCL is presently carrying out various Socio Measures for the local as well as regional populations which shall be continued as per existing CSR Norms.

4.3.10 Impact on Occupational Health

The Upgraded **Occupational Health Centre (OHC)** for In & Out Patients Treatment with Emergency Care, Ambulance, etc. (Medical Officer with MBBS, DIH qualification) has all the Facilities to take care any emergency. Periodic medical checkups are carried out to determine the employee's current health status. Any deviations are investigated and appropriate preventive and remedial measures are suggested. Records of these examinations are maintained at the OHC. Tie-ups with Tertiary Health Care Referral Centres ensure that the best possible care is provided in case of any emergency.

Mitigating Measures :

- ❖ RCL shall provide a safety & healthy working conditions and continually improve the occupational health and safety performance.
- ❖ Its objectives shall be to achieve zero accident and safe work environment, to improve moral and health of all employees and to maintain the emission levels below the norms.
- ❖ RCL shall provide ergonomic support in work comfortness with periodical review.

4.4 Impact Quantification

To quantify the assessed impacts which are qualitatively described in the EIA Matrix, they are assigned certain arbitrary weightages (**Table 4.14**), with **(+)** for **Positive Impacts** and **(-)** for **Negative Impacts**.

Table : 4.14 Coefficient Values

Sl. No.	Coefficient Criteria	Coefficient of Impact
1	No Impact	0
2	Insignificant impact-Short Term (I)	1
3	Significant impact-Short Term (S)	2
4	Significant Impact but Control Measures incorporated (P)	3
5	Significant Impact, Long Term & Permanent (R)	4
6	Significant Benefit (Z)	5

To sum up impact source, the coefficients impacts, ranging from 0 to 5 are used in quantification of total impact value for the proposed project (Table 4.15). The 'Plus' and 'Minus' values reported are cumulative value of the impact assigned for a particular Parameter under a particular Environmental Component as per EIA Matrix.

Table : 4.15 Impact Quantification – Operation Phase

Envl. Component	Import-ance Value	Project Activity & Coefficient Values									Impact Value
		Land Use	Transport	Air Pollution	Noise	Water Demand	Waste water	Solid Waste	Green Belt	CER & CSR	
Land Environment	150	+1	-	-	-	-	-	-	+4	-	750
Air Environment	200	-	-2	-2	-	-	-	-	+3	-	-200
Noise Levels	100	-	-2	-	-2	-	-	-	+3	-	-100
Water Environment	200	-	-	-	-	-2	-1	-	-	-	-600
Biological Environment	150	+1	-	-	-	-	-	-	+5	-	+900
Socio-economics	200	-	+2	-	-	-	-	-	+2	+10	+2800
Total	1000	-									+3550

Notes : - denotes 'No Impact/Impact Not Applicable'.

* : Positive impact due to Backfilling of mined out voids and Reclamation by Afforestation.

The total impact value is **+3,550** favours the implementation of the Proposal. The total impact source is an assertive, positive score. In other words, the **Spatial Impacts due to the Proposal will be low/insignificant and the Project can be implemented**. Also, all indicated mitigative measures for pollution control in **EMP shall be implemented in the Post-Project scenario by the Project Proponent to enhance the positive impacts**.

5.0 Analysis of Alternatives (Technology & Site)

5.1 Technology

Various cleaner production practices are initiated to control air emissions as well as fugitive emissions from various sources, etc. These practices are:

- ❖ For better housekeeping, '5S – Work Place Management' is implemented.
- ❖ Fuel required for the Plant is received through railway wagons and the Rail Transportation will be given importance.
- ❖ Fly ash generated from thermal power plant is being utilized totally in cement plant.
- ❖ Road sweepers, Vacuum Cleaner and water sprinklers are in operation to maintain clean environment in the Complex.
- ❖ Duoflex Burners for kiln firing and low NOx calciners are used to reduce NOx emission.
- ❖ Usage of treated effluent from Thermal Power Plant Effluent Treatment Plant and Treated Sewage from STP are gainfully utilized and 'zero effluent discharge' is being maintained.
- ❖ Internal roads are paved with concrete to arrest fugitive dusts.
- ❖ Telescopic chute and hatch for the wagon loading spout will be there for truck loading and wagon loading areas respectively to reduce the fugitive emission.

Energy Conservation:

- ❖ The available hot gases will be utilized for WHRBs.
- ❖ Pet coke is being used as fuel in the Cement Plant.
- ❖ The ordinary electrical bulbs are replaced with LED bulbs.
- ❖ Energy Management System (EnMS) is being implemented.

5.2 Alternative Sites Considered

The proposal is proposed within the Industrial Complex. Therefore, site selection is not warranted.

5.3 Co-Processing of Hazardous Waste

RCL has obtained Authorization No: **23HFC42009117** dated **07.06.2023** for the collection storage and disposal of the following hazardous wastes.

Details of Waste	Yearly Authorization Quantity	Activity for which Authorization is issued	Quantity generated / Received during the year 2023-2024	Quantity Disposed during the year 2023-2024
5.1-Used or Spent Oil	94.62 T/Annum	Generation, Collection, Storage, Transport and disposal to Authorized Recyclers	29.68 T	29.68 T
5.2- Wastes/ Residues containing Oil	9125 T/Annum	Reception Storage & disposal for co-processing in Cement Kiln	25.78 T	25.78 T
35.3-Chemical sludge from waste water treatment	6000 T/Annum	Reception, Storage & disposal for co-processing in Cement Kiln	268.16 MT	268.16 MT

Packing and Transportation of hazardous wastes : RCL is getting the above hazardous wastes from the different industries. The wastes are packed by the vendors in polythene bags or in closed drums. The transportation is done by the vendors and they deliver the material to RCL-RR Nagar factory.

Receipt and Storage of hazardous wastes : Hazardous wastes are received in packed condition or in closed drums and stored in covered shed.

Processing of hazardous wastes by Co-Processing in Cement Kilns :

1. The hazardous waste is first shredded in a shredder for easy feeding.
2. The shredded material is moved to the alternate fuel feeding system hopper.
3. The alternate fuel feeding system has an elevator, dump hopper, & a feeder belt. The shredded material is carried by an elevator and dumped in a hopper. Further the material is fed into the pre heater for Co-processing in the Kiln through a feeder belt and Pneumatic Gates. Detailed flow diagram is enclosed.

Generation of Spent oil (5.1) : RCL is using the following oils in the plant :

1. Lubricating oils – Used in all gear boxes, equipment and machineries
2. Engine Oil - Used in Earth moving equipment engines
3. Furnace Oil – Used as a fuel in the power generators
4. Greases – Used in all machineries and equipment



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The lubricating oils, engine oils & greases are used for the specified hours of operation in the equipment. Then these used oil/greases are removed from the equipment and stored in closed drums

The furnace oil is filtered and the sludge generated during the process is stored in a separate sludge tank in the generator area

The used oil and Furnace oil sludge's are disposed to the authorised recycler's approved by TNPCB

Arrangements for Co-processing	Shredder
	

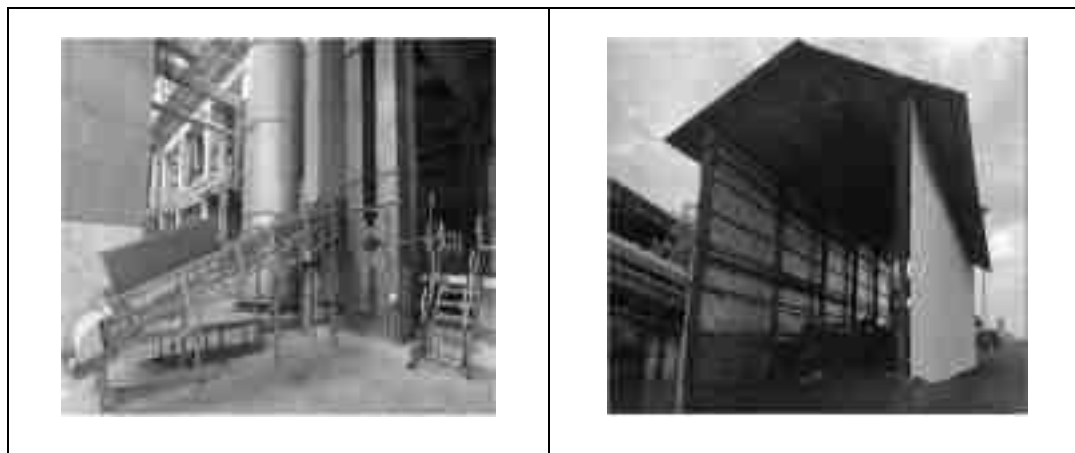
5.4 Alternate Fuel System & Plastic Waste Utilisation

The following alternative fuels are being received and being fed in the Kiln through Alternate Fuel Feeding System:

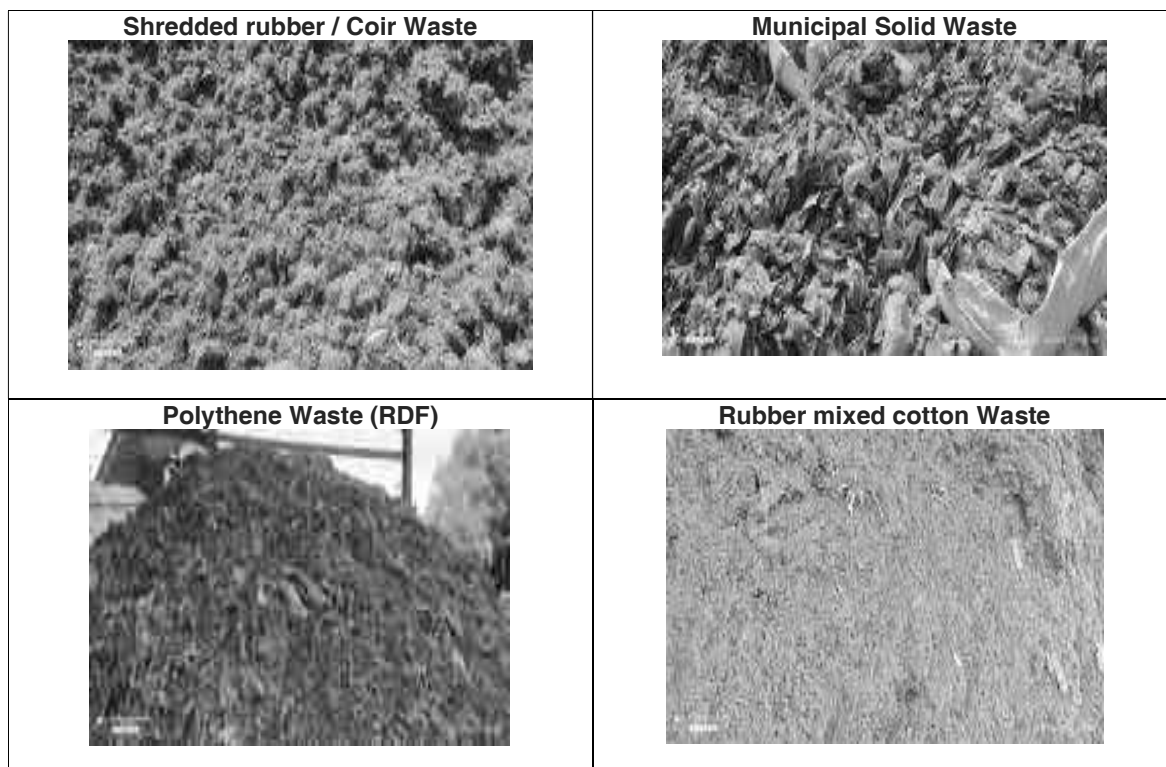
1. Municipal Solid Waste
2. Shredded rubber / Coir Waste
3. Rubber mixed cotton Waste
4. Polythene Waste

RCL is receiving the above materials and unloaded in alternate fuel storage shed. From the storage shed it was transported to the AFR feeding system by truck. The alternate fuel system consists of the following equipments;

1. Feed Hopper
2. Belt Conveyors
3. Belt Bucket Elevator
4. Calciner Chute with Double flap gate.



Presently we are feeding alternative fuel to the Calciner in Preheater. RCL is planned to install similar kind of system in all Kilns.



5.5 Solid Wastes Utilization

RCL has implemented proper waste management system for handling all domestic wastes generated from plant and colony premises. This process involves source and onsite segregation of waste and processing the same in the dedicated solid waste treatment facility. Wastes segregated at source are taken to onsite segregation for effective process of co-processing and composting.



Segregation : Source segregation for biodegradable and non-biodegradable wastes are done by two bin system.

Onsite Segregation : Partially Source segregated waste are sent to SWM facility. After that, the waste is segregated by two dedicated man power into the categories of combustibles, compostable, saleable and glass and metals.

Co-Processing : Combustible wastes such as plastics, paper and cloths are segregated separately and sent to kiln for co-processing. combustible wastes have the calorific value of up to 4000 kcal/kg.

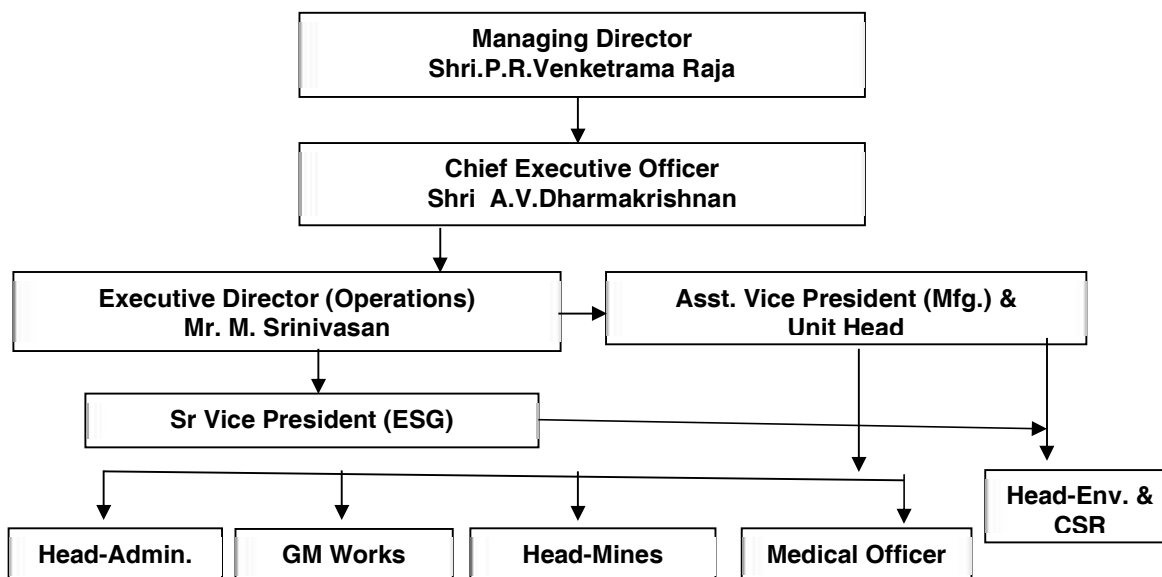
Composting : Leaves collected and sent to SWM facility area. The collected tree leaves and small branches are shredded in shredder and used for composting. Compostable wastes and tree leaves are sent to windrow composting and the compost used as a manure for plants

6.0 Environmental Monitoring Programme

6.1 Environment Cell and Compliances

The Unit has the well laid down Integrated Management System (IMS) Policy. The Environmental Management Plan (EMP) Cell is functioning under the Unit Head and Corporate Social Responsibility (CSR) Committee is functioning under the Corporate Office. The **Organisation Chart of RR Nagar Cement Plant** is appended.

Organization Chart



6.2 Ambient Air, Noise, Water & Soil Quality

Periodical monitoring of the ambient air quality as per Revised NAAQ Norms, fugitive emissions, stack emissions, noise levels (at boundaries), water (once in a season) and soil quality (once in a season) shall be undertaken. The periodical status reports shall be submitted to TNPCB monthly, and Integrated Regional Office, MoEF&CC-Chennai as Half Yearly Status Reports.

6.3 Noise Quality Management Plan

The noise level within the plant at a distance of one meter from the source will be maintained at <85 db(A) level for 8-hours exposure. Noise level at nearest plant boundary will be <55 dB(A) during day times and <45 dB(A) during night times. Thus, the noise levels will be well within the permissible MoEF&CC Norms for Residential Areas.

6.4 Emission & Discharge from the Plant

Continuous online stack monitoring equipment/systems for PM, SO₂ and NO_x are installed at all main stacks and the online real time monitoring data are being transmitted to SPCB & CPCB servers continuously. **Four (4 Nos.) Continuous Ambient Air Quality Monitoring Stations** are installed in the Plant for transmission of real time monitoring data to CPCB & SPCB Servers round-the-clock. Data on Stack Emissions and Ambient Levels of PM_{2.5}, PM₁₀, SO₂ & NO_x are also displayed at the Main Gate for general public view.

Further Online Continuous Effluent Monitoring (CEM) System is installed in the STP and it is connected to the TNPCB Water Watch Centre.

6.5 Green Belt

Green Belt has been developed with 33% coverage @2500 Trees/Ha. Survival rate of green belt developed shall be monitored on periodic basis to ensure that damaged plants are replaced with new plants in the subsequent years.

6.6 Social Parameters

RCL has estimated the demand of infrastructure (Physical & Social) in the nearby area of the plant site and appropriate developmental activities will be undertaken under for various rural developmental programmes and initiatives for the up-liftment of the nearby communities from time to time.

6.7 Performance Monitoring Schedule of APC Equipments

Pollution control equipment maintenance includes regular inspections, preventative maintenance and shutdown maintenance activities. Bag filters are one such air pollution control equipment which is one of the most efficient, reliable, and cost-effective methods of gas stream filtration. It functions through interception and the prevention of particle movement. Since the bag filter systems utilize mechanical forces for dust collection, sensitivity to dusts like lime powder, coal or ash properties is lower. This has made the bag filter / Bag House systems gain worldwide acceptance in boilers cleaning and reduction of air pollution. Factors causing separation include diffusion, electrostatic attraction, and gravity.

The efficiency of the systems is affected by various factors like.

- Air to cloth ratio
 - Air flow
 - Air suction
 - Velocity of air.
 - Correct filter media
-

Bag filter inspection has been carried out in well planned and scheduled manner at RR Nagar with a dedicated Team. The following check list (Table 6.1) is followed for inspection and routine maintenance of the bag filters. Records are maintained according to the activities carried out in various sections and bag filters.

Table : 6.1 Bag Filters Maintenance – Check List

Sl. No.	Check Points	Daily	Weekly	Monthly	Annually
1	Visually inspect baghouse /Bag filter.	✓			
2	Check the stack /visually inspect dust.	✓			
3	Check Differential pressure.	✓			
4	Check Hopper discharge/Level indication.	✓			
5	Check bag filter bags		✓		
6	Check Purging sequence.		✓		
7	Check fan running condition.		✓		
8	Inspect all purge valves and connecting hoses.			✓	
9	Check bag filter discharge RAL.			✓	
10	Check Bag filter tube sheets.				✓
11	Check Bag filter casing welding condition.				✓
12	Check connecting ducts				✓
13	Check for hopper and casing wear.				✓
14	Check drive condition.				✓
15	Check cages and purging pipe condition				✓

Bag House / Bag Filters Performance Monitoring: At RR Nagar Plant, a well-established central control room (CCR) exists with entire plant operation done from a centralized location. All the plant equipment's and their performance is monitored by an experienced and qualified team of operators. At central control room we have facilities for monitoring all major bag houses/bag filters with necessary instruments connected online, these include the followings :

- Differential pressure.
- Bag house inlet temperatures.
- Bag house outlet temperatures.
- Purging pressure.
- Discharge hopper levels.
- Discharge equipment's running status.
- Online emission data.

Electrostatic Precipitators (ESP): The cement process industries utilizing raw materials for the production of cement and these raw materials are burnt in the kiln at the temperature around

1400°C. During cement manufacturing process air gets pollute which includes particulate matter NO_x, SO_x, CO, CO₂, hydrocarbons and other substances are released to the atmosphere. The burning of organic material in kilns produces an exhaust gas. Without secondary purifying treatment, these gases cannot be released into the atmosphere due to environmental protection. This problem can be overcome from the device called electrostatic precipitation which is an efficient technique for removing entrained particulate contaminants from exhaust gases and is extensively used in these industries to limit particulate emanations.

An ESP is comprised of a series of parallel, vertical metallic plates (collecting electrodes) forming lanes through which the flue gas passes. Centered between the collecting electrodes are discharge electrodes which provide the particle charging and electric field. Regular inspections and maintenance are necessary to stabilize ESP performance and lifetime. An ESP is a filtration device used to remove fine particles like smoke and fine dust from flowing gas. They are commonly used in cement industries for dust control. ESP inspection has been carried out in well scheduled and safe manner at R R Nagar with a dedicated Team. The following check list (**Table 6.2**) is followed for inspection and routine maintenance of ESP.

Table : 6.2 ESP Maintenance – Check List

Sl. No.	Check Points	Daily	Weekly	Monthly	Annually
1	Visually inspect of ESP.	✓			
2	Check the stack /visually inspect dust.	✓			
3	Check transformer voltage/ milliamps.	✓			
4	Check Hopper discharge.	✓			
5	Check Rapping drive mechanism/running condition		✓		
6	Check RAL Running condition		✓		
7	Check ESP fan running conditions		✓		
8	Check oil levels of transformer			✓	
9	Check cold roof / insulation conditions.			✓	
10	Check and clean all high level probes in Discharge hoppers.			✓	
11	Lubricate all RAL bearings			✓	
12	Cleaning of collecting and emitting electrodes				✓
13	Cleaning of discharge hoppers				✓
14	Cleaning of rapping mechanism and insulators				✓
15	Check all shock bars condition				✓
16	Check casing and hot roof condition				✓
17	Check Transformer oil condition / Filtration.				✓
18	Check ESP fan condition				✓

ESP Performance Monitoring: At R R Nagar Plant, RCL has dedicated ESP installed for all Kilns and the following systems in place to monitor ESP performance online from the CCR:

- ESP inlet temperature.
- ESP outlet temperature.
- ESP inlet draft
- ESP outlet draft
- ESP transformer current.

6.8 Post Project Environmental Monitoring

The frequency of monitoring is given in **Table 6.3**. PM, SO₂, NO_x from Stacks shall be monitored continuously. HCl, HF, TOC, Metals and Dioxins and Furans shall be monitored once in a year.

Table : 6.3 Post-Project Monitoring

Activity	Aspect	Monitoring Parameter	Location	Frequency	Responsibility
Construction Phase					
Construction Activity	Ambient Air quality Monitoring	PM10, PM2.5, SO _x and NO _x / 12 parameters as per NAAQS, 2009	CCR building within Plant	Quarterly	Third Party
Operation Phase					
Manufacturing process, Storage, Handling, Loading-Unloading, Transportation, cleaning,	Ambient Air quality Monitoring	PM10, PM2.5, SO _x and NO _x / 12 parameters as per NAAQS, 2009	CCR building within Plant	Continuous Online Monitoring	Environmental Head
			Around the plant in 120° angle at dominant and predominant locations	24-hourly continuously for 2 days/week for 4 weeks in a month for whole year	Third Party
Stack Emission Monitoring	All Main Stacks of 3 Lines (Kiln RABH, Cooler ESP & Coal Mill, Cement Mills)	PM10, PM2.5, SO _x and NO _x	All Main Stacks of 3 Lines	Online Continuous Emission Monitoring	Work
	APC Equipment Efficiency	Performance of APC Equipments	All Main Stacks	Once in a Year	Environmental Head
Storage, Handling, Loading-Unloading, Packing plant	Fugitive emission	PM	All section of plants	Quarterly and As per CPCB Guide Line and Indian	Third Party

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Activity	Aspect	Monitoring Parameter	Location	Frequency	Responsibility
Transportation, cleaning,				Standard 11255 (1985).	
Water Quality	Water Quality	pH, Turbidity, Colour, Odour, Taste, TDS, Total Hardness, Calcium hardness, Magnesium hardness, Chloride, Fluoride, Sulphate, Nitrates, Alkalinity, Iron, Copper, Manganese	Nearby Ground/Surface water sources and as per CTO conditions	Quarterly	Third Party
Waste Water Monitoring					
Domestic uses	Waste Water Monitoring	pH, BOD, COD, Oil & Grease, Cl, TSS, Fecal coliforms, Free Ammonia	Sewage Treatment Plant	Monthly - as per CTO	Third Party
RO/ WHRS	Neutralisation tank	Temp, pH, TDS, TSS, BOD, COD, Dissolved Phosphate, Cl, Oil and Grease etc.	Neutralisation tank	Monthly - as per CTO	Third Party
Noise Level	Operation of machineries	Day & Night dB (A)	Plant Boundary, High noise generating areas within the project Boundary and as per CTO conditions	Monthly - as per EC / CTO	Third Party
Medical Checkup	Employees /workers	Spirometry, Audiometry, Biochemical Parameter (Urine, Blood), ECG, Vision Test and Chest X-ray	Health Centre / Dispensary	Yearly / Six Monthly or as per Factories Act	OHC

7.0 Additional Studies

7.1 Hazards Identification & Risk Assessment

Hazards Identification & Risk Assessment (**HIRA**) is the tool to identify the potential Hazards due to the industrial activities and assessment of the Risks to propose an Emergency Preparedness Plan (EPP). The major elements of the Risk Assessment include :

- ❖ **Hazard & Operability (HAZOP) Studies** for identification of hazards and vulnerable sections of the storage.
- ❖ **Consequence Analysis** for various release scenarios.
- ❖ Presentation of **Damage Contour** for worst damage from fire or explosion.
- ❖ Risk Assessment and
- ❖ Provision of guidelines for **Emergency Preparedness Plan** based on the findings.

The study includes :

1. Hazard Identification and Visualisation of Credible Accident Scenarios :

- ❖ Study of Plant Layouts and Process involved in the Hazardous Materials storage and handling.
- ❖ The inventory of stored materials.
- ❖ Identification of hazards.
- ❖ Analysis of past accident data to develop the credibility of worst accident scenarios and
- ❖ Visualization of Credible Accident scenarios (CAS).

2. Analysis of CAS

Analysis of identified CAS and quantification of effects pertaining to the cases of :

- ❖ Outflow and releases
- ❖ Heat radiation
- ❖ Explosion
- ❖ Application of damage criteria for heat radiation and explosion.
- ❖ Presentation of damage contours for worst damages from fire or explosion.
- ❖ Effect of the proposed project on neighboring areas (including cascade effects if any).

3. Risk Assessment based on the individual Risk Contour Plots and

4. Emergency Preparedness Plan and other safety recommendations based on the studies.

7.1.1 Plant Configuration

The existing and proposed Plant Configurations are given in **Table 7.1**.

Table : 7.1 Plant Configuration

Description	Existing	On Expansion
Cement Plant – Lines I & II	Clinker : 1.44 MTPA Cement : 2.70 MTPA	Clinker : 2.73 MTPA Cement : 4.00 MTPA
WHRB	Line-I WHRB	13 MW WHRB Plant
Power generation capacity	25 MW CPP with 110 TPH Boiler	No change in CPP

7.1.2 Fuel Storages

There is no handling of any hazardous chemicals in the Cement Plant as well as Captive Power Plant other than Fuel Oil Storages and Imported Coal & Petcoke. The Imported Coal/Petcoke received through Thoothukudi Port is reaching the Cement Plant by Road & Rail Modes. Coal/Fuel Stacker & Reclaimer of 45,000 Tonnes exists in the Cement Plant. There is a dedicated Coal Stacker & Reclaimer of 15,000 Tonnes in the CPP Campus.

RCL has obtained the License for Storage of Petroleum Products as detailed in **Table 7.2** from the Chief Controller of Explosives, Nagpur P/SC/TN/15/5259(P499385) dt. 30.06.2022, which is valid up to 31.12.2031.

Table : 7.2 Consented Storages of HSD & HFO

Materials	Hazardous Properties	Installed Capacity	License Valued Upto	No. of Tanks in the Plant	Design Capacity	Threshold quantity for MAH
High Speed Diesel (HSD)	Class B	63 KL	31.12.2022	2	1 x 50 KL	2500 Tonnes
		53.55 Tonnes				
Heavy Fuel Oil (HFO)	Class C	775 KL	31.12.2022	7	2 x 200 KL	
		689.85 Tonnes			1 x 50 KL 3 x 30 KL 1 x 5 KL	

* : MAH-Major accident hazards Installations which is defined as the isolated storage and industrial activity at a site handling (including transport through carrier or pipeline) of hazardous chemicals equal to or, in excess of the threshold quantities specified in Column 3 of Schedule 2 and 3 respectively.

The storage quantity of **Higly Flammable Liquids** viz. Diesel (Density-850 kg/m³) is 53.55 Tonnes and that of HFO (Density-890.13 kg/m³) is 689.85 and thus, the total storage quantity is **743.4 Tonnes** which is **verywell within the Theshold Quantity of 2,500 Tonnes** for application of Rules 5, 7-9 & 13-15 as under Column 3 of Part II of Schedule 3 of Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 (as amended). Hence, Onsite/Off-site Emergency Plan is not warranted for the fuel storage tanks. MSDS have been provided in the storage area. However, **an On-site Emergency Plan is in place** in compliance with Sec. 41 'B' of Factories Act 1948.

In case of fuel released in the area catching fire, a steady state fire will occur. Failures in pipeline may occur due to corrosion and mechanical defect. Failure of pipeline due to external interference is not considered as this area is **Licensed Area and all the work within this area is closely supervised with trained personnel.**

7.1.3 PHA Technique

Hazard is present in any system, plant or process that handles flammable materials. Screening and ranking methodologies based on **Preliminary Hazard Analysis (PHA)** technique is adopted at different stages of the Project before risk can be evaluated. The storages have been assessed for its potential to initiate and propagate an unintentional event or sequence of events that can lead to an accident or emergency. The study has covered the following sections :

- ❖ Storage Tank.
- ❖ Unloading and loading points and
- ❖ Road tanker transportation system.

7.1.4 Hazard Classification

Diesel is a petroleum product and is a highly flammable liquid having flash point at 51 °C. Fuel Oil is of similar characteristics having flash point above 66 °C. An inventory of the chemical stored is made and the chemical properties, including flammability and explosion characteristics, have been considered for hazard classification. The hazardous properties of HSD/HFO are :

CAS No. : 68476-30-2	UN No. 1202	
Chemical Name	Diesel Oil (Trade Name : HSD)	
Formula Range	C13-C18	
Specific Gravity	0.86-0.90 at 20 °C	
Specific Heat, kJ/kg. K	0.48	
Boiling point (°C)	215-376	
Flash point (°C)	32	
Heat of Evaporation, kJ/kg	244	
Heat of Combustion, kJ/kg	45586	
NFPA rating*	NH	1
	NF	2
	NR	0
	MF	10
Fire Explosion Index	74.00	(Medium)
Toxicity Index	2.52	(Low)
Threshold Quantity	2500 Tons (Rules 5, 7-15)	20000 Tons (Rules 10-12)

*NFPA classification for Health, Flammability & Reactivity of a chemical on a scale of 0-4 least to worst.

7.1.5 Hazard Identification

The extent of the consequences of an accident in a hydrocarbon installation depends on type and quantity of the product stored and handled, mode of containment and external factors like location, density of population in the surrounding area, etc. In many cases realisation of hazard and its potential also depend on prevailing meteorological conditions and availability of ignition source. Thus, the most serious consequence would arise from a large inventory of petroleum products located in a densely populated area.

Any petroleum product such as HSD requires interaction with air or oxygen and an ignition source for the hazard to be realised. Under certain circumstances vapours of the product when mixed with air may be explosive, especially in confined spaces. A scientific analysis of past chemical accidents has been made to establish the credibility of accident scenarios.

Based on Fire & Explosion Index : The hazard identification involves the estimation of **Fire & Explosion Index (F&EI)** for the unit in the facility to give the relative severity of the unit from the fire angle. These are evaluated from the knowledge of the Material Factor, General Process Hazard (GPH) and Special Process Hazard (SPH) factors. Material Factor (MF) is the measure of the energy potential of a particular chemical or its mixture with other chemicals. GPH and SPH are evaluated by taking into account the exotherm or endotherm of a reaction, material handling and transfer hazards, accessibility, severity of process conditions and possibilities, dust and other explosions, inventory level of flammable material, etc. The F&EI value is then calculated as the product of MF, GPH and SPH.

$$FEI = MF \times GPH \times SPH$$

The Toxicity Index (TI) is calculated using the Nh, Ts, GPH and SPH. TI is calculated by the following formula:

$$TI = \frac{(Nh + Ts) \times (1 + GPH + SPH)}{100}$$

7.1.6 MCA Analysis

Major Hazard from oil storage is fire. **Maximum Credible Accident (MCA)** from oil storage tank can be :

- ❖ Tank Fire and
- ❖ Pool / Dyke fire.

Tank Fire: Oil is stored in tanks. Leak or accumulation of vapour is a source of fire. Lighting can be a source of ignition and can cause tank fire. Overflow from tank leading to spillage may cause vapour cloud formation. This can catch fire and it can flash back to the tank to cause tank fire.

Pool / Dyke Fire: If there is outflow from the tank due to any leakage from tank or any failure of connecting pipes or valves, oil will flow outside and form a pool. Where the tank is surrounded by a dyke, the pool of oil will be restricted within that dyke. After sometime, the vapour from the pool can catch fire and can cause pool or dyke fire.

Heat Radiation and Thermal Damage Criteria: The level of damage caused by heat radiation due to fire is a function of duration of exposure as well as heat flux (i.e. radiation energy onto the object of concern). This is true both for the effect on building and plant equipment and for the effect on personnel. However, the variation of likely exposures times is more marked with personnel, due to possibility of finding shelter coupled with protection of the skin tissue (clothed or naked body). Further, it is assumed that everyone inside the area by the pool fire will be burned to death (100% lethality) or will asphyxiate. Radiation at various heat flux levels which are critical in risk analysis, are given in **Table 7.3**.

Table : 7.3 Effect of Heat Radiation

Sl. No.	Incident Radiation (kW/m ²)	Type of Damage Intensity	
		Damage to equipment	Damage to People
1	37.5	Damage to process equipment	100 % lethality in 1 min. 1% lethality in 10 sec.
2	25.0	Minimum energy required to ignite wood at indefinitely long exposure without a flame	100 % lethality in 1 min. Significant injury in 10 sec.
3	12.5	Minimum energy required for piloted ignition of wood, melting plastic tubing	1% lethality in 1 min. First degree burns in 10 sec.
4	4.5	-	Causes pain if duration is longer than 20 sec, however blistering is un-likely (first degree burns).
5	1.6	-	Causes no discomfort on long exposures.

Effect of Heat Radiation : The damage and fatality (percentage of the exposed people to be killed) due to the exposure time is very important in determining the degree of fatality and corresponding effect distance. It is observed that the exposed persons normally find shelter or protection from the heat radiation (e.g. against a wall) within 10 seconds. However, exposure time of 30 seconds is normally assumed for pessimistic calculation which applies if people do not run away immediately or when no protection is available. The variation of the effects on humans due to heat flux and duration of exposure have been developed in the form of a Probit Equation which gives following values for human fatality levels (**Table 7.4**).

Table : 7.4 Radiation Exposure and Lethality

Radiation Intensity, (KW/m ²)	Exposure Time (Seconds)	Lethality (%)	Degree of Burns
1.6	-	0	No discomfort even after long exposures
4.5	20	0	1 st
4.5	50	0	1 st
8.0	20	0	1 st
8.0	50	<1	3 rd
8.0	60	<1	3 rd
12.0	20	<1	2 nd
12.0	50	8	3 rd
12.5	Inst	10	-
25.0	Inst	50	-
37.5	Inst	100	-

The results of **MCA analysis** indicate that the maximum damage distances for 4.5 kw/m² thermal radiations extends upto **8.8 m in the case of one full tank is on fire** during worst meteorological conditions. As the fire resistant dyke walls are created, **no cumulative effect** of one tank form on fire to create fire on other tank farm is envisaged.

The source strength and threat zone for entire quantity of Fuel Oil have been calculated based on equations of USEPA's Computer Aided Management of Emergency Operations (**CAMEO**) Model (Version 3.1). **ALOHA (Areal Locations of Hazardous Atmospheres) Program** is used to estimate **Threat Zones** associated with hazardous chemical releases, including toxic gas clouds, fires, and explosions.

Protective Action Criteria (PAC) (Acute Exposure Guideline Levels-**AEGLs**, Emergency Response Planning Guidelines-**ERPGs** or Temporary Emergency Exposure Limits-**TEELs**) Levels. Acute Exposure Guideline Levels (AEGLs) represent threshold exposure limits for the general public and are applicable to emergency exposures ranging from 10 minutes to 8 hours. Three levels—AEGL-1, AEGL-2, AEGL-3—are developed for each of five exposure periods (10 minutes, 30 minutes, 1 hour, 4 hours, and 8 hours) and are distinguished by varying degrees of severity of toxic effects. The guidance is to use the 1 hour AEGL values. The three AEGLs are defined as follows:

AEGL-1 is the airborne concentration (expressed as ppm or mg/m³ of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic, nonsensory effects. However, these effects are not disabling and are transient and reversible upon cessation of exposure.

AEGL-2 is the airborne concentration (expressed as ppm or mg/m³) of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting, adverse health effects or an impaired ability to escape.

AEGL-3 is the airborne concentration (expressed as ppm or mg/m³) of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening adverse health effects or death.

Model Output :

SITE DATA:

Location: R R NAGAR VIRUDHUNAGAR, INDIA
Building Air Exchanges Per Hour: 0.50 (enclosed office)

CHEMICAL DATA:

Chemical Name: DIESEL Molecular Weight: 176.00 g/mol
PAC-1: 100 mg/(cu m) PAC-2: 100 mg/(cu m) PAC-3: 2400 mg/(cu m)
Ambient Boiling Point: 214.6° C
Vapor Pressure at Ambient Temperature: 2.70e-008 atm
Ambient Saturation Concentration: 0.027 ppm or 2.73e-006%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)

Wind: 1.4 meters/second from NE at 10 meters
Ground Roughness: urban or forest Cloud Cover: 3 tenths
Air Temperature: 29° C
Stability Class: C (user override)
No Inversion Height Relative Humidity: 60%

SOURCE STRENGTH:

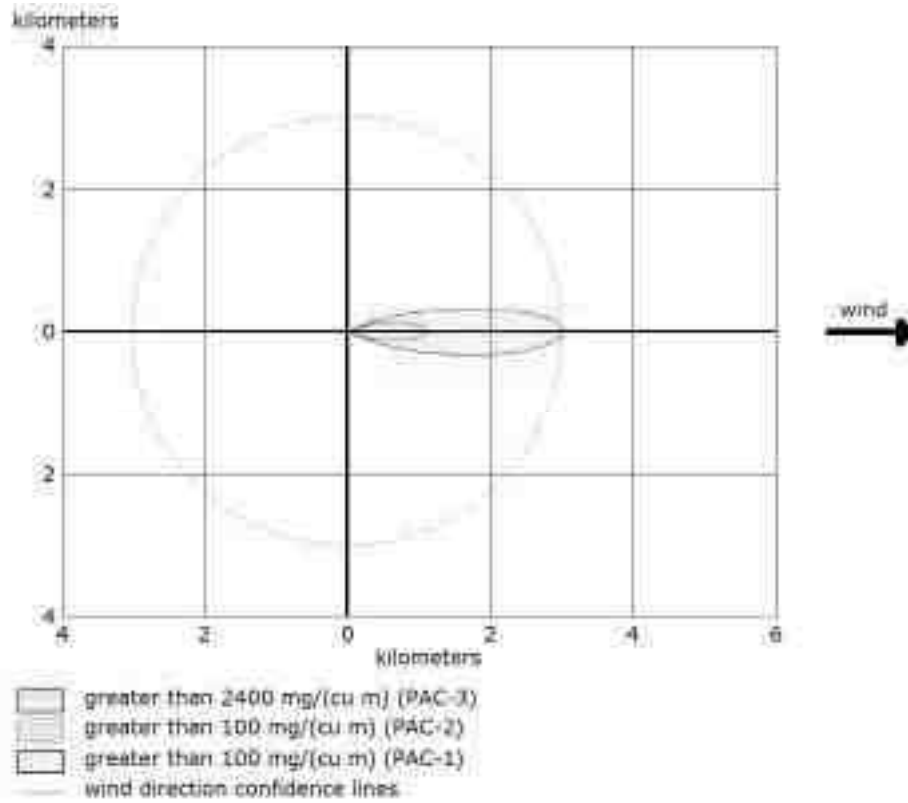
Direct Source: 53.55 tons Source Height: 0
Release Duration: 1 minute
Release Rate: 810 kilograms/sec
Total Amount Released: 48,580 kilograms

THREAT ZONE: (GAUSSIAN SELECTED)

Model Run: Gaussian
Red : 1.1 kilometers --- (2400 mg/(cu m) = PAC-3)
Orange: 3.0 kilometers --- (100 mg/(cu m) = PAC-2)
Yellow: 3.0 kilometers --- (100 mg/(cu m) = PAC-1)

AEGL-3 Threat Zone will be 1.1 km in the down wind direction i.e. SW direction within the Plant.

Probability of Occurrence : The overall probability of occurrence is found to be extremely low (10⁻⁷).



7.1.7 Fire Protection System in the Complex

Adequate and reliable arrangement is done for fighting the fire with water such as:

- ❖ Source of water equipped with diesel driven pumps.
- ❖ Arrangement of pipe lines along and around vulnerable areas.
- ❖ Alternative water supply arrangements.
- ❖ Provision of valves at appropriate points to enable supply of water at the required place/area or divert the same to another direction/pipe line.

Source of Water : Raw water Reservoir. Water source is equipped with one standby diesel driven pump to serve in case of power failure.

Water Line Arrangement : Water lines are provided at coal handling area along the conveyors and around the stockyards, transformers, oil tanks, crusher house, etc. Water lines are also provided around other infrastructures in the plant like administration building, canteen, stores and other plant equipment.

Hydrant System is feeding pressurized water to hydrant valves located through out the plant and also at strategic locations (**Table 7.5**). The water pressure is being maintained at 6 to 8 kg/cm² in these lines. By operating a few of the valves water pressure can be increased at one particular place. There are mainly two types of valves. Non-return valves are provided to allow on the unidirectional flow of water. Gate valves are provided for closing or opening the water supply. An adequate number of gate valves are provided at appropriate points to tap water to deal with fire if it breaks out at any point of the plant.

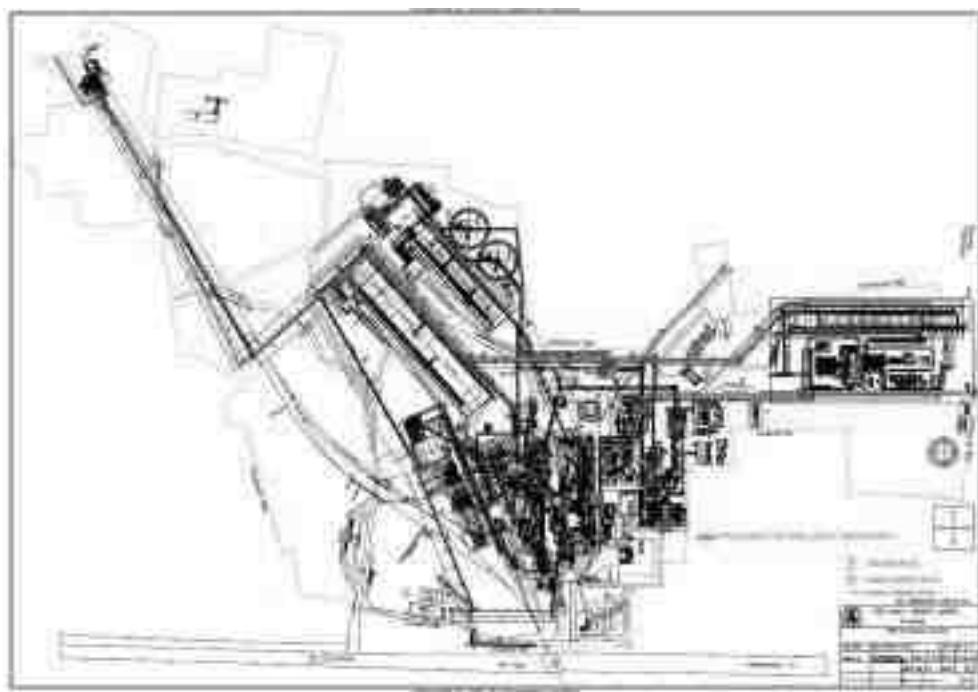


Table : 7.5 Fire Hydrants Location in RR Nagar Plant

Sl. No.	Fire Hydrant Points Location	Qty.
1	Value yard	1
2	For Long term storage yard	1
3	Engg office, Compr, DG	1
4	RM G.floor, Dg	1
5	RMVRM G.floor, Pump room	1
6	K-1 PH G.floor, Old WS	1
7	K1 Cooler, Store entr.	1
8	Store Cylidner storage area	1
9	Refractories / others storage area	1
10	Time off backside / Canteen	1
11	CCR backside	1
12	Coalmill-1 1st floor (Separator area)	1
13	D14 belt	2
14	D13 belt	2
15	Raw Coal steel hoppers	2
16	Raw coal hoppers feeding belt	1
17	D6 long belt from tunnel	6
18	Coal shed (10000t)	3
19	Coal shed (5000t)	2
20	Imp coal extraction belt	3
21	Packer godown wall	1
22	Cement mill miller room	1
23	Old CMVRM B/F fan	1
24	Cement mill pump house	1
25	Flyash transmitter area	1
26	Near old flyash unloading point	1
27	New flyash silo / Bulk loading area	1
28	Raw mill reclaim belt tunnel	1
29	Clinker extraction elev	1
30	LSSP hopper area	2
31	Raw mill / BF / Silo	9
32	Raw mill VRMP	4
33	Kiln1 PH	5
34	Kiln2 PH	5
35	Coalmill-1 Elevation + G.floor	10
36	Coalmill-2 Elevation + Raw coal hopper / D44 belt	6
37	Coal Stacker Reclaimer	8
38	Line III – Cooler Building	3
39	Line III - Preheater	8
40	Line III – Raw Mill	12
41	Line III – Fine coal bin area	5
42	Line III - Raw cool and outer area	20

Fire Extinguishers : Adequate numbers of 'Fire Stations' are established (**Table 7.6**) which would house and keep in readiness the following type of equipment and arrangements:

- ❖ Dry Powder Chemical Extinguishers
- ❖ CO₂ Extinguishers
- ❖ Water spray hoses upto 150 m length.
- ❖ Foam Extinguishers

Appropriate types of fire extinguishers are provided at conveyor drive heads, crusher house, control rooms, in machines like stacker & reclaimer, electrical yard, sub-station and other infrastructural facilities within the premises. In the transformer yard, automatic fire detecting and quenching system are provided for each transformer. This system will come into operation whenever the temperature of surrounding air exceeds 80 °C and spray water over the transformer to prevent spreading of fire and quench the same.

Table : 7.6 Fire Extinguishers Location in RR Nagar Plant

Zone No.	Fire Point Location	DCP	CO ₂	Water	Foam	Total
1	Line 01	27	8	-	1	36
2	Line 02	11	7	-	1	19
3	Line 03	53	37	-	2	92
4	Cement Line 01	19	3	-	-	22
5	Cement Line 02	18	18	-	-	36
6	Packing Plant	23	14	1	-	38
7	Wagon Tippler	13	9	-	1	23
8	Admin	9	9	4	-	22
8	HR	6	1	1	-	8
9	CCR	1	2	-	-	3
10	QC Lab	1	1	-	-	2
11	Store	6	1	-	-	7
12	O2 Plant	1	2	-	-	3
13	DG	8	1	-	1	10
14	Switch Yard	10	7	-	1	18
17	Workshop	2	-	-	-	2
18	Engineering Office	4	-	-	-	4
19	Crusher - CLSR & LSSR	2	5	-	-	7
20	CSR	26	8	-	-	34
21	LSSP	5	5	-	-	10
22	Auto	3	1	-	-	4
Total		248	139	6	7	400

7.1.8 Coal Handling & Coal Dust Explosion

Coal dust when dispersed in air and ignited would explode. Crusher house and conveyor systems are most susceptible to this hazard. To be explosive, the dust mixture should have:

Particles dispersed in the air with minimum size (about 400 microns).

Dust concentrations must be reasonably uniform.

Minimum explosive concentration for coal dust (33% volatiles) is 50 g/m³.

Failure of dust extraction and suppression systems may lead to abnormal conditions and may increase the concentration of coal dust to the explosive limits. Sources of ignition present are incandescent bulbs with the glasses of bulkhead fittings missing, electric equipment and cables, friction, spontaneous combustion in accumulated dust. **Dust explosions** may occur without any warnings with Maximum Explosion Pressure up to 6.4 bars. Another dangerous characteristic of dust explosions is that it sets off secondary explosions after the occurrence of the initial dust explosion. Many a times the secondary explosions are more damaging than primary ones. The dust explosions are powerful enough to destroy structures, kill or injure people and set dangerous fires which may cripple the lifeline of the Plant. The thermal radiation and shock waves in case of fire due to coal and explosion due to coal dust would be highest at the center and **starts falling down as one move away** from the seat of fire.

7.1.9 Hazard Mitigating Measures Provided

Thus, stockpile area is provided with **automatic water sprinklers** for dust suppression as well as to reduce spontaneous ignition of the coal stockpiles. Necessary **water distribution pipeline network** is also provided for distributing water at all transfer points, crusher house, control rooms, etc. Height of the coal stock pile is maintained the specified standard so as to avoid auto-ignition of coal in the storage (**Tables 7.7-7.8**).

Table : 7.7 Hazard Mitigating Measures - CPP

Sl. No.	Unit	Hazard	Hazard Potential	Hazard Identified	Safeguard Measures Provided
1	Coal storages	Fire may occur due to excessive heat during summer (if coal is not stacked properly)	Moderate	Fire, Spontaneous Combustion	Stacking is done adopting standard practice to avoid auto ignition. Fire hydrants are provided at suitable locations.
2	Coal handling plant (CHP) including Bunker area	Generation of coal dust and dust explosion	Moderate	Fire and/or Dust Explosions	The equipments and conveying system in the CHP are properly maintained to avoid fugitive emission. Adequate dust extraction systems are also provided.

Sl. No.	Unit	Hazard	Hazard Potential	Hazard Identified	Safeguard Measures Provided
3	Boilers	Fire (mainly near oil burners), Steam Explosion, Fuel Explosion	Major	Splinters of explosion may heat other equipments/ building & cause extensive damage	Burners are properly maintained and operated to avoid spillage of oil as well as to ensure proper fuel air ratio.
4	Steam Turbine Generator Buildings	Fires in – a) Lube oil systems b) Cable galleries c) Short circuits in: i) Control Rooms ii) Switch-gears .	Major	Fire may propagate and spread over to other areas	Lube oil system are made leak proof by preventive maintenance. Good housekeeping is ensured. The cable rakes are dedusted periodically and inspected for any leakage in the insulation
5	Switchyard Control room	Fire in cable galleries and Switchgear/ Control Room	Moderate	Fire may propagate due to electric sparks to other areas.	The cable rakes are dedusted periodically and inspected for any leakage in the insulation.
6	Fuel Storage Tanks	Pool Fire / Fire ball may occur in case of direct contact with flame	Major	Fire may propagate and spread over to other areas	Dyke wall is of adequate height. The inter tank distances in the tank farm is maintained as per design norms. The tank farm area is barricaded with sign board preventing use of naked fire. Adequate number of fire hydrant points are provided and static fire hydrant guns pointing towards the tanks provided.

Table : 7.8 Hazard Areas & Preventive Measures in the Cement Plant

Area	Hazards	Prevention Measures
Crusher area	Loading/ Unloading Truck movement (reversing) Load displacement Reversing into hopper Falling rocks during unloading Absence of reversing barrier crusher Operation Stacking of hopper Accidental start-up of crusher Hazards during unplanned maintenance Electrical hazards Work inside the crusher control room	Uniformly distributed load Worker movement segregation areas Existence of safety signage Implementation of approved codes of practice Install proper guards and barriers Guards to isolate mechanical hazards Maintenance by approved technicians under supervision Work inside the hopper only under supervision Concrete walls for the control room
Raw material Storage	Airborne dust	Use of the stacker and reclaiming system to collect dust Routine cleaning of the area Good housekeeping

Area	Hazards	Prevention Measures
Raw material Mills	Noise Dust Absence of protective barrier Absence of guards Electrocution Hot Material	Use of a tag in / tag out system during maintenance Use of a dust suction system (Disab)
The Clinker Production Process Preheating of Material	High temperatures Superheated material particles	Use of a safe system of work - no accidental operation (tag in/ tag out procedures)
Kiln Operation	Back firing of burner Working near hot surfaces Working in a hot environment	Use of a closed circuit surveillance system Use of a safe system of work - no accidental operation (tag in/ tag out procedures)
Cooling system	Dusty environment Accidental hurling of hot material Use of a high pressure pump to clean the area	Use of a dust suction system Use of a safe system of work - no accidental operation (tag in/tag out procedures)
Cement and Raw material Storage, Silo Cleaning	Noise during the cleaning operation Falling material from the silo walls Dusty environment Operator getting overcome by material at the base of the silo	Use of dust suction system Floor preparation Use of safety signage Use of tag in/ tag out procedures Use of blind flanges Continual supervision Provision of adequate lighting Provision of sufficient ventilation using bag filters
Packaging	Dusty environment Falling material Moving parts of packaging machinery Movement of heavy trucks Existence of third parties (truck drivers) in the area	Use of a dust suction system Use of appropriate PPEs Training of personnel Adequate machine guarding Use of safety signage
Loading and Unloading	Overhead loads Use of lifting equipment Falling of loads Dusty environment	Use of authorized personnel Provision of appropriate maintenance to the lifting equipment. Use of load limiting devices Routine cleaning of the area
Maintenance Department	Toxic fumes from welding operations Insufficient tag in/tag out procedures during maintenance Manual handling causing Musculoskeletal problems High temperatures Electricity Use of hand tools Bad housekeeping	Use of a fumes suction system Trained personnel Use of hoists Use of approved and maintained Protective devices RCD 's 30 mA Routine cleaning - good housekeeping practices Use of approved and well maintained hand tools
Fuel Storage	Use of naked flames near fuel storage The creation of hot spots during maintenance activities The hurling of hot material in the fuel area Electrical discharges (Thunderbolt, electrostatic charges during refueling, short circuits)	Existence of a work permit system for working near the fuel storage Maintenance and control of the anti-discharge system

Area	Hazards	Prevention Measures
Work Environment, Work areas and Passageways	Absence of safety signage obstructions in the passage ways Inadequate environmental conditions Insufficient protection from physiochemical factors	Use of appropriate safety signage indicating the passageways and emergency exits Good housekeeping of the area Assessment of the environmental conditions and provision of adequate protection
Use of work Vehicles (for lifts, Loaders & Unloaders)	Insufficient training Insufficient maintenance Inappropriate securing of the load Speeding Insufficient visibility	Authorization and training of personnel Routine maintenance of the work vehicles Provision of work instructions. Labeling of the vehicle movement area
Lifting Equipment	Crush of the load or the lifting mechanism onto operatives Fall of the load to be lifted due to the failure of the lifting gear Insufficient or inappropriate securing of the load Tilting of the load during its transportation Crashing of the load on the building Electrocution as a result of lifting mechanism contacting o/h lines	Use of authorized and trained personnel Existence and compliance with work instructions Safe operation of the stopping mechanism, the breaks and the lifting lines Check on a routine basis the hook mechanism Always secure the load using the approved straps Always avoid the lifting of loads overhead from working operatives.
Demineralised Water Plant	Poor quality feed water affecting the operation of the Demineralization plant resulting in increased regeneration Leakage of acid or caustic storage tank(s) Release of acid or caustic during truck unloading	Water supply quality control Demin plant control Guidelines for disposal of hazardous wastes Wastewater pond Site drainage /barriers & Bunding Regular inspections Separate containment for acid and caustic

7.2 Disaster Management Plan (DMP)

Disasters are off natural as well as man-made. **Natural Disasters** include Earthquakes, Floods, River Erosion, Cyclones, Tsunami, Landslides, Fires, etc. and the **Man Made Disasters** include Nuclear, Chemical, Mines, Biological, Cyber Terrorism, Environmental Disasters, etc. In order to better protect the Factory from any hazards, proactive approach has been applied in all operations of disaster preparedness, prevention and mitigation. To deal with an emergency, the arrangement for immediate deployment or appointment of key personnel and their specific duties are brought out.

Objectives : The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in the same order of priorities. In effect, it is to optimize operational efficiency to rescue rehabilitation

and render medical help and to restore normalcy. For effective implementation of the DMP, it should be widely circulated and personnel training through rehearsals/drills.

The objective of the Industrial DMP is to make use of the combined resources of the Plant and the outside Services to achieve the following:

- ❖ Effect the rescue and medical treatment of casualties
- ❖ Safeguard other people
- ❖ Minimize damage to property and the environment
- ❖ Initially contain and ultimately bring the incident under control
- ❖ Identify any dead
- ❖ Provide for the needs of relatives
- ❖ Provide authoritative information to the news media
- ❖ Secure the safe rehabilitation of affected area
- ❖ Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency.

7.2.1 Onsite Emergency Plan

Site Main Controller : **S. Lakshmanan (AVP - Mfg.),**
The Ramco Cements Limited,
Ramasamy Raja Nagar Post,
Virudhunagar Dt. -626 204.Mobile No. 7397773455.

Key personnel of the organization and their Responsibilities :

Sl. No.	Roles and Responsibility	Name	Contact Number
1	Plant Controller	Mr. Arvind R Shenoy (DGM - Mech)	8754041464
2	Incident Controller	Mr. J.Manikandan (AVP – Accounts)	99429 86003
3	Technical Officer	Mr. P. Kotraivel (GM-Power Plant)	9443249725
4	Technical Officer	Mr. S.M Mahesh (GM - E&I)	8754041454
5	Technical Officer	Mr. V.Suresh (SDGM-Process& QC)	8754041468
6	Communication Officer	Mr. V.Jayamuthumagesh (DGM- HR)	9677785610
7	Fire Fighting Officer	Mr. G. Ramachandran (DGM – A&L)	9400040300
8	Rescue Officer	Mr.D.Karthickumar (Manager-Safety)	9500871220
9	Rehabilitation Officer	Dr.R.Vijayanand (DGM-Medical &OHC)	87540 03559

Outside Organizations in assisting during Emergency :

1. Fire Station - Virudhunagar & Sattur.
2. Police Station - Vachakarapatti.
3. Government Hospital - Virudhunagar & Sattur

No Liaison arrangement with any Organization (Self -sufficient withown fire-fighting facilities).

Emergency Control Centre : Site Main Controller is normally seated in Admin Block. In case of an emergency, this office will function as the Emergency Control Centre. Also, Main security office is acting as alternate emergency control room. The Emergency Control Centre in CCR located in the CCR Building and alternate emergency control room is Main Security Office. The following **Emergency facilities** are available in the Emergency Control Centre:

- ❖ P & T Telephones
- ❖ Fax
- ❖ Intercoms
- ❖ Local Area Plan (Topographical Plan)
- ❖ Site Plan of the factory
- ❖ Predominant Wind Direction and Speed charts
- ❖ Fire Extinguishers as given in Annexure
- ❖ List of Key Personnel and their Telephone Number
- ❖ List of neighboring factories with the contact personnel and the telephone number
- ❖ List of Government Agencies and their contact telephone number
- ❖ Fire Suit
- ❖ Breathing Apparatus Set
- ❖ Face Masks
- ❖ Emergency Lights
- ❖ First Aid Items
- ❖ White Board with Marker Pens
- ❖ Sufficient numbers of Emergency Plan copies and
- ❖ Public Address System

Warning, alarm and safety and Security Systems : An Emergency siren is provided in the Time Office Building. This will be sounded on the instruction of the Site Controller or Incident Controller in the absence of Site Controller when any fire is noticed in any fire hazard area. The factory is surrounded by a compound wall and the security personnel sufficient in numbers shall be deployed for surveillance of the factory premises round the clock.

Suitable procedures have been devised for those personnel who remain behind for the critical plant operations; this critical plant shut-down will be shut down only in events where immediate emergency evacuation is required. To minimize damage from emergency, the Rescue Officer is assigned with the additional responsibility of shutting them down emergency.

Alarm and Hazard Control Plans : Alarm and Hazard control plans in line with disaster control and hazard control planning, ensuring the necessary technical and organizational precautions. The Electrical siren that is installed in the Pre-Heater top floor will be used for the emergency warning.

Emergency	:	Wailing sound for 3 minutes.
All Clear	:	Continuous blast for 3 minutes.

All department heads and designated personnel have inter-com phone connection for communication to aid in the accountability of the employees. Therefore, all the department heads must know the attendance of their employees on any given day to account accurately for their personnel.

Reliable measuring instruments, control units and servicing of such equipment:

- ❖ Safe instruments will be used
- ❖ Required instrument inter-locks are provided
- ❖ Redundant trips will also be provided
- ❖ Emergency push-button trips will be provided locally and in the control room
- ❖ All critical instruments will be provided with battery back-up

Precautions in designing of the Foundations and load-bearing parts of the Building :

Adequate factor of safety will be provided in designing the foundations of all the buildings as well as the equipments. The buildings and the structures will be periodically maintained in tidy condition as per the Building Code of practice and relevant acts.

Continuous surveillance of operations : Round the clock surveillance is established in the factory premises.

Maintenance and repair work according to the generally recognized rules of Good Engineering Practices

Electrical maintenance system will be streamlined through checklists covering preventive maintenance, half-yearly, yearly, turn-around and daily maintenance; this includes maintenance of equipment like motors, switch-gears, batteries, etc. The details of work to be done in each area are listed and codified. The records are computerized; all shut-down works are pre-planned and requirements of spares, etc. provisioned through the systemic coordination with the other service and operation departments. Predictive maintenance in the plant is highly evolved and job specific. The job history is computerized and the same is used in case of trouble-shooting also. The details about the equipments are maintained in the areas responsible for the maintenance activities. A Maintenance Engineer performs daily- LLF (Look, Listen and Feel) inspection to identify any abnormality. Process parameters are monitored by operating staff and logged in.

Communication facilities available during Emergency and those required for an Off-site Emergency :

- ❖ Mobile and Intercom phones within the factory premises
- ❖ P & T Telephone Lines
- ❖ Walkie-Talkie and
- ❖ Public Addressing System

Fire-Fighting and other Facilities available

- ❖ Fire Hydrant is provided throughout the Factory
- ❖ Fire Fighting Equipments fixed throughout the Factory
- ❖ Sprinkler system provided and automated.
- ❖ Emergency Alarm System provided throughout the Factory.
- ❖ Exclusive Fire Water Storage with the capacity of 450 KL within the Factory Premises.
- ❖ Separate Diesel Pump and Jockey pump is also provided to maintain pressure of 10 kg/sqcm throughout the entire line.

First Aid and Hospital Services available and their adequacy

- ❖ First - Aid Boxes with medicines to provide in various sections of the Factory
- ❖ Required Number of persons are train in the First - Aid by St. John Ambulance
- ❖ Round the Clock Ambulance service is available
- ❖ In case of serious emergency for further treatments the management has a tie-up with nearest hospital, name Thiruvencatam Hospital located at Virudunagar.
- ❖ Taken Mediclaim Insurance for all employees covering family also.

Main Stages of Emergency:-

Major Emergency goes through the following main stages :

- I. Communication during Emergency
- II. Declaration of Emergency by raising the Alarm
- III. Implementation of the Emergency Combat Procedure and
- IV. Rescue.

I. Communication during Emergency

The person first noting the emergency has to inform to shift-in-charge of the respective section. On assessing the situation, shift-in-charge will inform to all the concerned as per the guidelines given in the communication net-work.

II. Determination of Emergency

On receipt of information, Incident Controller rushes to the site, assess the situation and advises them to tackle the situation/emergency. Then he informs the Site Main Controller and on the instruction of the Site Main Controller he instructs the central control room to raise the siren. In case of emergency, the siren will be raised in short wailing tone. On hearing the siren, all personnel will assemble at assembly points. The personnel assigned with the emergency duty will report to the respective key personnel at the emergency control center and take orders.

III. Implementation of Emergency Combat Procedures

On hearing the siren/information over phone, all key personnel would assemble at emergency control centre and take orders from the site Main controller and play their roles as defined. In connection with the Emergency Operations to be carried out in an orderly and sequential manner, the following teams have been formed to assist the coordinators so as to restore the normalcy at the earliest.

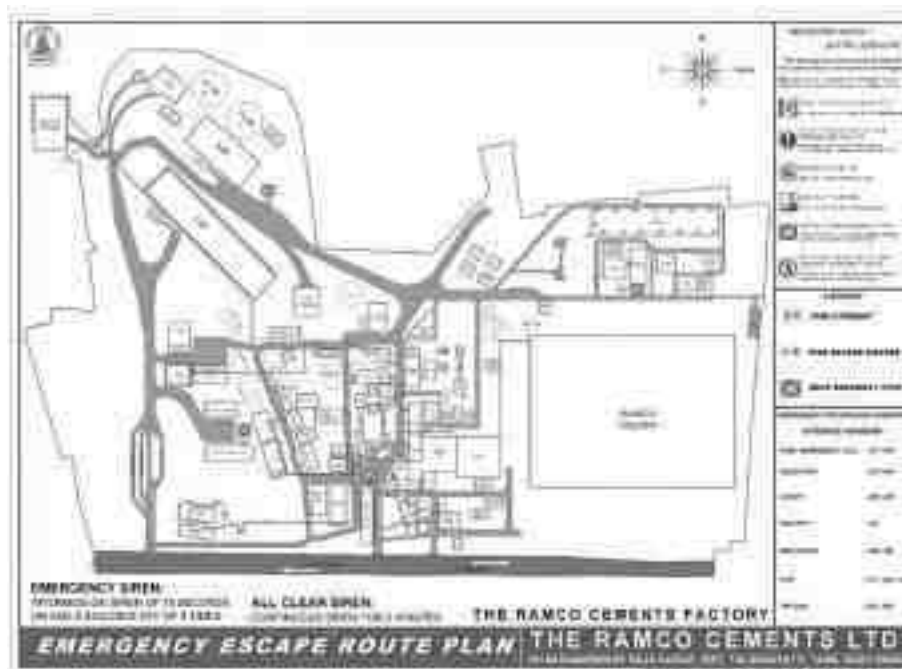
- ❖ Process & Engineering Team Leaders
- ❖ Fire Team Leader
- ❖ Communication Team Leaders
- ❖ Rescue, Evacuation and Welfare Team Leader
- ❖ First Aid Team Leader

All others will remain in the Assembly Points until the Emergency is over which is indicated by the long ALL CLEAR SIGNAL. Depending on the wind direction and incident spot, all employees (including company employees as well as contract employees) and visitors should choose the escape route to reach the Assembly Points. Head count would be taken at the Assembly Point to ascertain that no one is trapped/missing in the plant area.

I. Rescue and Rehabilitation

In order to ensure that all the persons are safe, Head Count will be taken. In case of any difference in the count, rescue team will be pressed into service to rescue the victims.

Head Count System : No. of persons assembled in the Emergency Assembly Point should be informed to the Site Controller by Communication Team Leaders. The number of company employees, contract employees and visitors inside the plant at that point of time will be informed to the Site Controller within 15 minutes by the Human Resources Manager and the Security Officer respectively. Site Main Controller will match the figures and if needed advice the Rescue, Evacuation and Welfare Team Leader to search for the trapped employees.



Emergency Call-Off : Site Emergency Controller will check-up the area along with Incident Controller and Process & Engineering Team and Fire Team Leader so as to declare Emergency Call Off by raising continuous long siren. Communication Team Leaders will arrange to make announcements with public address system.

Training : The company believes that any job or task can be performed efficiently through good training. Human Resources Department takes care of the training needs of the factory. The Emergency Control is also a task connected with the industrial activity, which requires training of connected persons for effective management of the task. Training and re-training are imparted in two stages. Induction training is given to the facilitators and other members of the Emergency team. The role of each and every facilitator and the team would be perfected by Mock-Drills on a given emergency situation.

Responsibilities and Duties

Duties of the Person noticing the Emergency : The primary responsibility of informing any Emergency situation to the Incident Controller shall be religiously followed by the person, who notices the Fire/emergency situations in the factory premises. In turn, the Incident Controller would consult with the Site main Controller after having assessed the Emergency Situation and declare Emergency without any further loss of time. The siren will be blown for a longer duration of 3 minutes, at intermission of 15 seconds "ON" and 5 seconds "OFF" for 5 times. The first responder shall be the vocal alerting system through voice audibility, pitch, volume and contents of the message. The person who notices the Emergency shall be determined to react and rise up to the occasion through periodical rehearsals and training. Since the response time to the Emergency Scenario is the most critical component of combating the emergencies, his reliable and specific communication about the nature, magnitude and severity of the incident shall be clearly shown by his action of carrying the Red Flag hoisted nearby.

Duties of Site Controller/Plant Controller/Incident Controller : The Site Controller/Plant Controller shall have the control options (in his absence) the Incident Controller shall have the Scenario Analysis to initiate the **Level I** (Minor Emergency managed by Department Level) or **Level II** (Possible Emergencies like Fire or toxic release that can be controlled by factory level) Emergencies.

- ❖ The Site Controller / Plant Controller/Incident Controller shall be able Carryout:
 - ❖ How to implement the On-Site Emergency Plan
 - ❖ How to implement the incident Control system
 - ❖ How to identify, to the extent possible, all credible Accident Scenarios or the conditions present
 - ❖ How to address the site analysis, use of Engineering Controls, hazardous material handling procedures and use of new techniques
-

-
- ❖ How to determine- through monitoring, when personal protective equipments or respiratory protection is required
 - ❖ How to provide training to the First Responders based on their duties and functions within the factory premises; the skill and training required for all new Responders shall be conveyed to them through training , before they are permitted to take part in the actual Emergency Situation
 - ❖ A First Responder Awareness Level employee is an individual who is likely to witness or discover a hazard and who, through training, is expected to initiate a response system by notifying the appropriate authorities of the Fire / hazardous chemical splashing. They are not expected to take further action
 - ❖ A First Responder Operation Level is an individual who is expected to respond to the fire scenario as part of initial action to protect nearby personnel, property or the environment from the effects of the fire. They are trained to respond defensively to the fire scenario without necessarily being expected to extinguish the fire
 - ❖ They shall have the knowledge of Hazards and the Risks associated with employees wearing in personal protective clothing
 - ❖ When to decide for termination procedures.

Duties of the Process & Engineering Team : The Process & Engineering Team Leaders shall be able to demonstrate the implementation of the Emergency Response Plan.

- ❖ The knowledge of the classification, identification and verification of known and unknown materials by using field survey instruments equipments shall be acquired.
- ❖ Ability to function within the assigned role in the incident command system shall be exercised
- ❖ The knowledge of the selecting and using the specialized personal protective equipments shall be acquired.
- ❖ The knowledge of the in-depth Hazard and Risk Assessment shall be possessed.
- ❖ Performance of advance control, containment and confinement operations within the capabilities of the resources available shall be secured.
- ❖ Understanding of the termination procedures shall also be propagated.

Duties of the Fire Team : Identification of the standard fire-fighting functions or evaluations expected of them based on the credible accident scenario to be assigned, including fire scenario assessment shall be performed simultaneously. The specific Fire-Safety Rules, Procedures and First-aid/Medical Attention services shall be performed according to the type of each credible accident scenario. Whenever hot work operations are essential in the course of any industrial activities, the following Six Step Rules shall be adhered in the interest of safety:

- ❖ Conduct safety meeting with other officers
 - ❖ Put up warning signs at the site
 - ❖ Move combustibles away from the hot work site
 - ❖ Shield combustibles with fire blankets or welder's blankets
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- ❖ Provide fire watch
 - ❖ Have nearby appropriate fire extinguisher and telephone
 - ❖ Evacuate the area, if fire cannot be extinguished immediately and
 - ❖ Protect stored materials with a thermal barrier such as half-an-inch gypsum sheet board as soon as possible.

Effective communication ensures that the fire-fighting crew understands their responsibilities during an assigned work. Effective coordination prevents conflicting activities and ensures that a proper sequence is followed, while conducting an assigned task. This becomes increasingly important as more agencies such as Tamil Nadu Fire & Rescue Service and Mutual Aid Member would be involved in fire-fighting operations. Written code of practice shall be observed during fire-fighting by each and every-one of the crew.

It is not necessary to develop standard operating procedures regarding every possible exposure to carbon-monoxide and carbon-di-oxide atmosphere in the course of fire- fighting activities. What is expected is that procedures would be followed by way of wearing personal protective equipments, which is mandatory for their own protection. Apart from the active fire-fighting crew, the Incident Controller and Fire Team Leader shall wear personal protective equipments invariably. Fit testing shall be conducted for one and all fire-fighting crew and equipment shall be made available in the correct size.

Duties of the Communication Team :

- ❖ Emergency communication and warning protocols, processes and procedures shall be developed, periodically tested and used to alert people potentially impacted by an actual or impending emergency;
 - ❖ The communication Team Leaders shall develop procedures to disseminate and respond to request for pre-disaster, disaster and post-disaster information including procedures to provide information to the media and other external audience and deal with their enquiries.
 - ❖ Effective communication shall be ensured in the interest of safety.
 - ❖ The channel shall be monitored before transmitting.
 - ❖ The message shall be planned suitably before pushing the transmitter switch.
 - ❖ The push-to talk button in the Radio shall be pressed first and then wait for one second before starting the message; otherwise the first part of the message would be cut off due to the transmitter to work at its full power.
 - ❖ The micro-phone shall be held two inches from the mouth.
 - ❖ The unit or person shall be first identified.
 - ❖ The message transmitted shall be acknowledged by saying "GO AHEAD". If long message could not be taken for some reasons, simply "STANDBY" shall be recorded until the problem is solved.
 - ❖ While transmitting a number with two or more digits, ; first the entire number shall be given and then each digit separately; for example, the number "sixty three" shall be recorded as "63" first and then "six" and "three" shall be followed.
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- ❖ Exclusive frequency shall be ensured for Emergency Management Services and the background noise shall be reduced as much as possible.
 - ❖ There shall be adequate proper communication from each stage of a plan to the next, so that the Hazard Management Decisions could be understood, recorded and audible. One way of achieving this by summarizing the key information of fire events in the factory premises.
 - ❖ The summary of the Key Information shall be a living document, which in its simplest form may be a compilation of entire details. It should convey information to all those who are responsible for operations in full, which is concise and easily read.

Duties of the Rescue, Evacuation & Welfare Team :

- ❖ Because air-way maintenance is one of the very important skills that has to be learnt by the Rescue Team Members and also the respiratory system shall be the first of the body systems to be reviewed in the course of an emergency.
- ❖ Unconscious persons who have not suffered trauma shall be placed in a side-laying or RECOVERY POSITION to help keeping air-way open.
- ❖ Improperly lifting or moving a person can result in injury to either the responder or to the injured person. By exercising good body mechanics, the possibility of injuring self as well as the injured will be reduced. Good Body Mechanics means using the strength in the large muscles from the legs to lift a person instead of applying back muscles.
- ❖ To lift safely, the Rescue Crew shall keep certain guide-lines in mind.
- ❖ Before attempting to move a person, check the weight of the patient; if required, another person may be called for the help. The rescue work shall be carried out in an effective and helpful manner. If the patient is on the floor or on the ground during an emergency situation, the rescue team member may have to drag the person away from the site.
- ❖ Instead of trying to lift them and carry. Every effort shall be made to pull the person in the direction of long axis of the body in order to provide as much spinal protection for the person as possible. This sort of CLOTHES DRAG is simplest way to move a person in an emergency.
- ❖ If the person is dressed in cloths that could tear away easily during clothes drag (for example, burnt partially) the person injured shall be moved by using a blanket or large bed sheet, which is termed as BLANKET DRAG.
- ❖ If any large sheet is not readily available, the injured person shall be carried by ARMS-TO-ARMS DRAG by placing the hands under the lying person's arm-pits from the back of the person and grasping the person's fore-arm.
- ❖ There shall be close coordination and effective communication between the Rescue Team and the First Aid team.
- ❖ Rescue, Evacuation & Welfare Team Leader shall also hold responsibility for shutting down the critical plants in the course of their emergency rescue operations in the factory premises.

Duties of the First - Aid Team : The First Aid Team Leader shall establish logical capability and the Procedures to locate, store, distribute, maintain, test and account for Services, personnel, resource materials and facilities procured for the Purpose of supporting the plan. The First Aid

Team Leader shall develop functional and administrative procedures to support the entire sequence of operations like pre-disaster, disaster and post-disaster scenarios. Procedures shall include, but not limited to, the following:

- ❖ Control of access to the area affected by the emergency.
- ❖ Identification of personnel engaged in emergency activities at the scene of incident.
- ❖ Accounting for the personnel engaged in various activities.
- ❖ Accounting for the personnel affected, displaced or injured by the incident.
- ❖ Mobilization and Demobilization of resources.
- ❖ Provision of temporary, short-term or long-term shelters, feeding and care of people displaced by the emergency.
- ❖ Recovery, identification and safe-guarding of human remains.
- ❖ Provision of mental health and physical well-being of the individuals affected by the emergency.
- ❖ Provision for managing the critical incident stress for responders.

Duties of the Employees :

- ❖ Employees in the factory including contractors and their contract workers shall, to the extent to which they are expected, that is, within their competency and skills, shall comply with all procedures and protection relating to the prevention and control of major accidents within the factory premises.
- ❖ They shall comply with all emergency procedures should a major accident or near miss occur
- ❖ They shall report promptly to the Incident Controller / shift-in-charge any matter of which they are aware that they may affect the facility compliance.
- ❖ They shall take, within the scope of their job, and without being placed at any disadvantage, corrective action and, if necessary, interrupt the operations / processes of the factory, where, on the basis of their training and skills, they have responsible jurisdiction to believe that there is an imminent danger of a major accident and notify to the Incident Controller / Shift-in-charge or raise an alarm, as appropriate, before or as far as possible, after taking such action.
- ❖ They shall discuss with the Emergency Coordinating Officers any potential hazards that they consider are capable of generating a major accident and they also have the right to notify the relevant District Administration Authorities of those hazards.
- ❖ They shall also be consulted through appropriate consultative Mechanism in order to provide the safe system of work in and around the factory premise. In particular, they shall invariably be consulted about the Hazard Identification, the maintenance and Implementation of the Safety Management Systems and also on the revision as well as updating periodically of the On-Site Emergency Plan.

Special Features of Emergency Plan for RCL RR Nagar Cement Plant : The major accidents possible in the plant are fire and explosion. These may be initiated by the physical explosion of the boiler and fires due to coal and firewood and agro waste used as fuel. The fire effects can

cause damage to the neighboring areas or persons working in the location. These scenarios are considered based on literature data and practical experiences.

Boiler explosions are possible only in case of negligence, mishandling and instrumentation failures. This need to be viewed seriously in the standard operating procedure and special care is to be taken during the emergency situations for each event and act accordingly the emergency plan lists the duties and responsibilities of the personnel.

7.2.2 Off - Site Emergency Preparedness Plan

The task of preparing the Off-Site Emergency Plan lies with the District Collector. However, the Off-Site Pplan is prepared with the help of the local District Authorities. Off-site emergency plan follows the on-site emergency plan. When the consequences of an emergency situation go beyond the plant boundaries, it becomes an off-site emergency. Off-site emergency is essentially the responsibility of the public administration. However, the factory management will provide the public administration with the technical information relating to the nature, quantum and probable consequences on the neighbouring population. The off-site plan in detail will be based on those events, which are most likely to occur, but other less likely events, which have severe consequence, will also be considered. Incidents which have very severe consequences yet have a small probability of occurrence should also be considered during the preparation of the plan. However, the key feature of a good off-site emergency plan is flexibility in its application to emergencies other than those specifically included in the formation of the plan.

The roles of the various parties who will be involved in the implementation of an off-site plan are described below. Depending on local arrangements, the responsibility for the off-site plan should be either rest with the works management or, with the local authority. Either way, the plan should identify an emergency co-ordinating officer, who would take the overall command of the off-site activities. As with the on-site plan, an emergency control centre should be set-up within which the emergency co-ordinating officer can operate. An early decision will be required in many cases on the advice to be given to people living "within range" of the accident - in particular whether they should be evacuated or told to go indoors. In the latter case, the decision can regularly be reviewed in the event of an escalation of the incident. Consideration of evacuation may include the following factors:

- ❖ In the case of a major fire but without explosion risk (e.g. an oil storage tank), only houses close to the fire are likely to need evacuation, although a severe smoke hazard may require this to be reviewed periodically
 - ❖ If a fire is escalating and, in turn, threatening a store of hazardous material, it might be necessary to evacuate people nearby, but only if there is time; if insufficient time exists, people should be advised to stay indoors and shield themselves from the fire.
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For release or potential release of toxic materials, limited evacuation may be appropriate downwind if there is time. The decision would depend partly on the type of housing "at risk". Conventional housing of solid construction with windows closed offers substantial protection from the effects of a toxic cloud, while shanty house, which can exist close to factories, offers little or no protection.

The major difference between releases of toxic and flammable materials is that toxic clouds are generally hazardous down to much lower concentrations and therefore hazardous over greater distances. Also, a toxic cloud drifting at, say 300 m per minute covers a large area of land very quickly. Any consideration of evacuation should take this into account. Although the plan will have sufficient flexibility built in to cover the consequences of the range of accidents identified for the on-site plan, it will cover in some detail the handling of the emergency to a particular distance from each major hazard works.

Aspects Proposed to be considered in the Off-Site Emergency Plan:-

Organization : Details of Command Structure, Warning Systems, Implementation Procedures, Emergency Control Centres. Names and appointments of Incident Controller, Site Main Controller, their deputies and other key personnel.

Communications : Identification of personnel involved, Communication Center, Call signs, Network, lists of Telephone numbers.

Specialized Knowledge : Details of specialist bodies, firms and people upon whom it may be necessary to call e.g. those with specialized chemical knowledge, laboratories.

Voluntary Organizations : Details of organizers, telephone numbers, resources etc.,

Chemical Information : Details of the hazardous substances stored or procedure on each site and a summary of the risk associated with them.

Meteorological Information : Arrangements for obtaining details of weather conditions prevailing at the time and weather forecasts.

Humanitarian Arrangements : Transport, Evacuation Centers, Emergency treatment of injured, First Aid, Ambulances, temporary Mortuaries.

Public Information : Arrangements for (i) Dealing with the media press office (ii) Informing relatives, etc.,

Assessment : Arrangements for (i) Collecting information on the causes of the emergency (ii) Reviewing the efficiency and effectiveness of all aspects of the emergency plan.

Role & Responsibilities

Emergency Co-ordinating Officer : The various emergency services should be co-ordinated by an emergency co-ordinating officer (ECO), who will be designated by the district collector. The ECO should liaise closely with the site controller. Again depending on local arrangements, for very severe incidents with major or prolonged off-site consequences, the external control should be passed to a senior local authority administrator or even an administrator appointed by the central or state government.

Local Authority : The duty to prepare the off-site plan lies with the local authorities. The emergency planning officer (EPO) appointed should carry out his duty in preparing for a whole range of different emergencies within the local authority area. The EPO should liaise with the works, to obtain the information to provide the basis for the plan. This liaison should ensure that the plan is continually kept upto date. It will be the responsibility of the EPO to ensure that all those organisations, which will be involved off site in, handling the emergency, know of their role and are able to accept it by having for example, sufficient staff and appropriate equipment to cover their particular responsibilities. Rehearsals for off-site plans should be organised by the EPO.

Police : Formal duties of the police during an emergency include protecting life and property and controlling traffic movements. Their functions should include controlling bystanders evacuating the public, identifying the dead and dealing with casualties, and informing relatives of death or injury.

Fire Authorities : The control of a fire should be normally the responsibility of the senior fire officer who would take over the handling of the fire from the site incident controller on arrival at the site. The senior fire officer should also have a similar responsibility for other events, such as explosions and toxic releases. Fire authorities in the region should be apprised about the location of all stores of flammable materials, water and foam supply points, and fire-fighting equipment. They should be involved in on-site emergency rehearsals both as participants and, on occasion, as observers of exercises involving only site personnel.

Health Authorities : Health authorities, including doctors, surgeons, hospitals, ambulances, and so on, should have a vital part to play following a major accident, and they should form an integral part of the emergency plan. For major fires, injuries should be the result of the effects of thermal radiation to a varying degree, and the knowledge and experience to handle this in all but extreme cases may be generally available in most hospitals. For major toxic releases, the effects vary

according to the chemical in question, and the health authorities should be apprised about the likely toxic releases from the plant which will be unable then in dealing with the aftermath of a toxic release with treatment appropriate to such casualties. Major off-site incidents are likely to require medical equipment and facilities additional to those available locally, and a medical "mutual aid" scheme should exist to enable the assistance of neighboring authorities to be obtained in the event of an emergency.

Government Safety Authority : This will be the factory inspectorate available in the region. Inspectors are likely to want to satisfy themselves that the organization responsible for producing the off-site plan has made adequate arrangements for handling emergencies of all types including major emergencies. They may wish to see well documented procedures and evidence of exercise undertaken to test the plan.

In the event of an accident, local arrangements regarding the role of the factory inspector will apply. These may vary from keeping a watching brief to a close involvement in advising on operations in case of involvement in advising on operations. In cases where toxic gases may have been released, the factory inspectorate may be the only external agency with equipment and resources to carry out tests.

Important Phone Nos.

District Collector	:	9444184000
Suptd. of Police	:	9498111112
District Revenue Officer	:	9445000927
District Fire Rescue Service	:	04562 252286 / 94450386288
Dy. Director-Health Services	:	9443193862
DEE, TNPCB	:	8056042281

8.0 Project Benefits

8.1 Environmental Benefits

Plant Modernization & Expansion is necessary to increase the plant efficiency by adopting the state-of-the-art technologies, machineries and operation of the Plant for optimum standards.

8.2 Social Benefits

There are 465 Direct Employees working in the Cement Complex. Indirect Employment to about 600 persons has been provided. Due to the Proposal, another 35 Direct Employees & 50 Indirect Employees will be added. Adequate Corporate Environmental Responsibility (CER) Budget will be allotted in compliance with MoEF&CC OM F. No. 22-65/2017.IA.III dated 01.05.2018.

8.3 Financial Benefits

The Project will bring **Rs.103.38 Crores** additional investment to the Region, improve the local and regional economy.

8.4 Tangible Benefits

GST : Incremental GST of Rs. 117 Crores to the Government on this expansion of Cement production from 2.70 MTPA to 4.00 MTPA.

Royalty : Rs.20.25 Crores will be paid additionally to the Government for Minerals consumption on this expansion.

8.5 Decarbonisation Programme

Project proponent shall submit a study report on Decarbonisation program, which would essentially consist of company's carbon emissions, carbon budgeting/ balancing, carbon sequestration activities and carbon capture, use and storage after offsetting strategies.

Further, the report shall also contain **time bound action plan** to reduce its carbon intensity of its **operations and supply chains**, energy transition pathway from fossil fuels to Renewable energy etc. All these activities/ assessments should be **measurable and monitor able** with defined **time frames**.

In Decarbonisation program the Carbon capture technology is evolving technology, pilot plant and the observation study is available in INDIA, based on the further improvement and viability of technology performance, the technology will be observed in the industrial level.

Details of adoption/ implementation status/plan to **achieve the goal** of Glasgow COP26 Climate Summit with regard to enhance the non-fossil energy, use of renewable energy, minimization of net carbon emission and carbon intensity with long-term target of “net Zero” emission.

India presented the following five commitments toward climate action in Glasgow COP26:

Commitment 1- Reach 500GW Non-fossil energy capacity by 2030.

Commitment 2- 50 per cent of its energy requirements from renewable energy by 2030.

Commitment 3- Reduction of total projected carbon emissions by one billion tonnes from now to 2030.

Commitment 4- Reduction of the carbon intensity of the economy by 45 per cent by 2030, over 2005 levels.

Commitment 5- Achieving the target of net zero emissions by 2070.

1. Action plan for commitment 1

RCL is consistently investing in non-fossil fuel energy sources and increase renewable energy generation capacity Year on Year. The Waste Heat Recovery System (WHRS) at Ramco Cements has a total capacity of 43 MW, with an additional 25 MW planned to be commissioned. 10 MW of the WHRS is scheduled to be operational in the financial year 2025-2026, while the remaining 15 MW will be commissioned following the expansion of the Kurnool Line-II. The total installed capacity of wind power is 166 MW. The average PLF of 25%, the generation of wind power for captive use is expected to be 42 MW.

2. Action plan for commitment 2

As part of the initiative to reach Net Zero emissions, the capacity of renewable energy is being progressively increased. Currently, the renewable energy generation capacity totals 85 MW, with 43 MW share from Waste Heat Recovery Systems (WHRS) and 42 MW from wind energy. On an annualised basis, the share of green power is expected to reach 45% of the total energy consumption.

3. Action plan for commitment 3 and 4

To achieve the ambitious reduction of carbon emissions as committed by India in COP26, we are progressively investing in renewable energy sources and improving energy efficiency to achieve a 10% reduction in carbon emissions by 2030. The carbon emission intensity during the FY 2023(baseline) was 591 kg /tonne of cement, we are continuously striving to reduce the emission intensity. The share of sustainable cementitious materials (SCMs) increased leading to reduction in clinker factor. In FY 24, the clinker factor stood at 0.77, indicating a reduction of 3% compared

to the baseline. The reduction in clinker factor plays a significant role in minimizing carbon emissions.

1. Energy efficiency is improved by implementing the following,

- Implementation of an upgraded version of OPTIMA fuzzy logic control system for kiln operation. This adjusts the input requirement accurately, ensuring the kiln operates at optimal efficiency.
- Installation of Variable Frequency Devices (VFDs) for precise control of process fans and pumps to match the actual demand, leading to substantial energy savings.
- Installation of energy-efficient vortex rectifiers to improve the efficiency in the process of regulating and stabilizing the airflow within the cement plant, particularly in areas like preheaters, kilns, and coolers.
- Adoption of the latest high-efficiency turbine rotor for captive power plant.
- Installation of high-efficiency IE3-type motors for driving equipment.

2. The carbon emission reduction action plan,

- Achieving 45% of the energy requirement from the captive Green energy generation capacity of 85 MW.
- Enhancing the blended cement share to 80% of total cement production.
- Improving the TSR to 10% by reducing the non-fossil fuel consumption.
- Increasing the green cover by implementing Miyawaki method of afforestation to improve the plantation density leading to carbon sequestration.
- Reducing the specific energy consumption by 15% from baseline by optimizing the energy efficiency of equipment.

4. Action plan for commitment 5

As part of the Net Zero emission pathway, we are continuously investing in green energy and alternate fuel usage. We are firmly aligned with the Global Cement and Concrete Association (GCCA) and The Energy and Resources Institute (TERI) roadmap for the Indian Cement and Concrete Industry, aiming for net zero carbon emissions by 2050.

9.0 Environmental Cost Benefit Analysis

Environmental Cost Benefit Analysis is not applicable for the proposal as there is no forest land is envisaged and also no tree cutting is proposed.

Project IRR is arrived as follows :

RAMASAMY RAJA NAGAR CAPACITY EXPANSION
PRESENT VALUE OF THE BENEFITS OVER THE 5-YEAR PERIOD

Rs. in Crores

Year	Cash flows	8% discounted rate	Present value
	Inflow		
1	37	0.9259	34
2	38	0.8573	33
3	42	0.7938	33
4	49	0.7350	36
5	54	0.6806	37
Present Value	220		173
Net Present value			70

At 8% discounted rate, NPV for 5 years is Rs.173 - Rs.103 = Rs 70 Cr. Hence, the Net Present value is Rs.70 Crores.

Benefit to Cost Ratio (in Rs Cr.)

Sum of present cash value of outflows	A	103
Sum of present cash value of Inflows	B	173
Benefit Cost Ratio		1.67

Internal Rate of Return and Payback Period

Sl. No.	Parameter	Rs. in Cr.
1	Investment	103
2	Cash inflows with present value after reducing interest	173
	Rate of Return	67%
	Pay back	4.08 Years

Assumptions

Project Cost	Rs. in Crores	103
Debt Funding	Rs. in Crores	70%
Discount Rate	%	8%
Interest Rate	%	8%
Tax Rate	%	25.17%

10.0 Environmental Management Plan

An Environmental Management Plan (EMP) is formulated for mitigation of adverse impacts and is based on present environmental status and impact appraisal. It is mandatory to comply with the various regulatory Norms for Prevention and Control of Pollution. The following environmental management plans are proposed for mitigation of impacts on the environment :

10.1 Construction Phase

The following EMP measures shall be undertaken during the Expansion :

- ❖ PPE shall be provided to the construction workers.
- ❖ Construction employees shall have access to safe drinking water and to existing Toilet facilities.
- ❖ Protection devices viz. ear plugs/ear muffs shall be provided to the workers during welding works.
- ❖ Smooth flow of traffic should be ensured on the internal roads to avoid idling of vehicles.
- ❖ All the debris resulting from the site shall be disposed off effectively as per existing Norms.
- ❖ EMP Cell ensure the periodical Monitoring of Environmental Parameters during the Construction Period and ensure its compliance with Norms.

10.2 Operation Phase

10.2.1 Impact on Traffic Volume

Adequate parkings are provided in the Plant. Facilities for **drivers (rest room, toilet, etc.)** are also provided. Other Measures are :

- ❖ Green Belt with thick foliage along the Plant/Ore Haulage/Transportation roads.
- ❖ Security Guards at the Road Junction to handle the inward and outward vehicles from the Plant to the Highway.
- ❖ All Trucks are to be fully covered with Tarpaulin to avoid any spillage on transportation.
- ❖ Restriction of over loading of Trucks/Tippers.
- ❖ Speed restrictions
- ❖ Restriction of Truck parking in the Highway and Public Roads.
- ❖ Regular and preventive maintenance of transport vehicles has to be ensured.
- ❖ Compliance to 'Pollution under Control' Certification has to be checked periodically.

10.2.2 Air Quality Management Plan

RCL has installed adequate air pollution control systems viz. Electro statistic precipitators, Bag house, bag filters, etc. are installed in the stacks to control the emissions. Also, adequate dust collection and extraction systems are installed at various transfer points raw mill handling

(unloading, conveying, transporting, stacking), vehicle movement, bagging and packing areas, etc.

- ❖ All efforts shall be undertaken to maintain the PM emission levels from the main stacks of Old Line-II New Kiln as $<30 \text{ mg/Nm}^3$.
- ❖ NO_x emission levels from Line-II with New Kiln shall be $<600 \text{ mg/Nm}^3$.
- ❖ The periodical evaluation for the efficiency performance of ESPs and Bag Filters shall be carried out.
- ❖ Fugitive emissions due to storage, transportation, etc. and the leakages and spillages shall be continuously monitored and controlled.
- ❖ Thermal insulation is provided wherever necessary to minimize heat radiation from the equipment, piping etc, to ensure protection of personnel.
- ❖ Periodical Ambient Air Quality and Stack Emissions shall be undertaken and the Status Reports shall be submitted to the Authorities as required.

10.2.3 Noise Quality Management Plan

- ❖ All rotating items are well lubricated and provided with enclosures as far as possible to reduce noise termination.
- ❖ Extensive vibration monitoring systems are provided to check and reduce vibrations.
- ❖ For all fans, compressors etc. vibration isolators are provided to reduce noise.
- ❖ Provision of silencers are made wherever possible.
- ❖ Proper lubrication and housekeeping are maintained.
- ❖ The operator provided with necessary safety and protection equipment like ear plugs, ear muffs etc.

10.2.4 Land - Solid & Hazardous Waste Management Plan

- ❖ It should be ensured that there is no industrial solid waste from the Plants.
- ❖ The dust collected from APC Measures will be consumed in the Cement Plant fully.
- ❖ Solid wastes from STP Plant shall be vermi composted and used as manure for Green Belt.
- ❖ Waste Oil shall be collected and sold to the CPCB/TNPCB Authorised Agency for further treatment & disposal.
- ❖ The municipal wastes shall be collected, transported, treated in a landfill (composting) within the Plant vicinity to make use of it as manure for Green Belt.
- ❖ Redundant machinery or equipment scraps (1500 Tons/Annum) as and when generated, will be segregated, stored and sold to the authorised recyclers.

10.2.5 Effluent Management Plan

- ❖ No ground water tapping for industrial use.
- ❖ Water consumption shall not be more than the consented quantity.

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- ❖ No trade effluent shall be discharged from the Plant.
 - ❖ Cooling water is put into closed circuit to minimize the evaporation losses.
 - ❖ The domestic sewages from the Cement Plant, Power Plant and Township shall be treated effectively in the Sewage Treatment Plants so to meet TNPCB Discharge Norms and the treated sewage shall be used for Green Belt.
 - ❖ 'Zero Effluent Discharge' shall be practiced.
 - ❖ No percolation of treated water to the deep ground water table is done.
 - ❖ Periodical monitoring for specific parameters shall be done regularly.

10.2.6 Storm Water Management Plan

- ❖ **Surface Drainage Network** has been developed in the Complex. Surface Drains created are connected to Rain Water Harvesting Ponds in the Plant.
- ❖ RCL is harvesting Rain Water through Roof Tops, RWH Ponds with Recharge Mechanism. Roof Top Collections shall be directly stored and used as Raw Water for the Plant.
- ❖ Harvested water by surface drain shall also be utilized for the industrial needs so as to conserve the fresh water demand.

10.2.7 Biodiversity Plan

- ❖ Green Belt shall be maintained effectively.
- ❖ Local species and fruit bearing trees may also be developed to have a thick canopy cover.
- ❖ The treated sewage shall be used fully for the Green Belt development.
- ❖ There will be **ban on one time use and throw away Plastic usage** in the Plant in compliance with Tamil Nadu, Environment and Forests (EC-2) Department, G.O.(D) No. 84 dated 25.06.2018. RCL will encourage the use of eco friendly alternative such as banana leaf, areca nut palm plate, stainless steel glass, porcelain plates / cups, cloth bag, jute bag etc.

10.2.8 Green Belt Development Plan

Total Green Belt extent is 64.50 Ha (33.69% Coverage) with 1,61,250 Trees @ 2,500 Trees/Ha with Survival Rate @ 90% average. Predominantly, native plant species are preferred for Green Belt like Azadirachta indigo (Neem), Cassia Siamea (Manjakondrai), Pongamia pinnata (Pungan), Albizia lebeck (Vagai), Samanea saman (Thoongumoonji), Holoptelia integrifolia (Arali), Tecoma stans (Thangarali), Cassia fistula (Sarakondrai), etc. Local women are engaged for the maintenance of Green Belt.

10.2.9 Occupational Health

- ❖ RCL shall provide a safety & healthy working conditions and continually improve the occupational health and safety performance.
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- ❖ Its objectives shall be to achieve zero accident and safe work environment, to improve moral and health of all employees and to maintain the emission levels below the norms.
- ❖ RCL shall provide ergonomic support in work comfortness with periodical review.

10.2.10 Socio-economic Management Plan

- ❖ As per the Companies Act 2013, Companies should spend at least 2% of the Profit after Tax of the previous year for the CSR activities but not lower than 2% of average of previous three years Profit after Tax.
- ❖ RCL is presently carrying out various Socio Measures for the local as well as regional populations which shall be continued as per existing CSR Norms.

10.3 EMP Budget

The Project Cost of the existing Cement Plant Complex is Rs.894.00 Crores. A budget Rs.14.20 Crores is presently the EMP Capital Cost and Rs.3.90 Crores/annum is the EMP Recurring Cost. **For proposed Expansion**, with existing Line-II infrastructures and facilities, the Project Cost will be **additional Rs.103.38 Crores**. Thus, total Project Cost on this Expansion will be Rs.997.38 Crores. A budget **Rs.1.00 Crores as EMP Capital Cost** and Rs.0.25 Crores/annum as EMP Recurring Cost are proposed additionally for the Expansion. Thus, total EMP Capital Budget will be Rs.15.20 Crores and EMP Operating Budget will be Rs.4.20 Crores per Annum (**Tables 10.1-10.2**). The proposed **budget for Peafowl Conservation Plan will be Rs.1.00 Lakhs/annum** for Habitat improvement, Community participation in Conservation, etc.

Table : 10.1 EMP Budget

Sl. No.	Description of Item	Total (Existing & Expansion)	
		Capital Cost, Rs. in Crores	Recurring Cost, Rs. Crores/Annum
1	Air Pollution Control/Noise	10.80	2.75
2	Water Pollution Control	3.90	1.00
3	Environmental Monitoring Works	-	0.24
4	Greenbelt Development	0.50	0.20
5	For Peafowl Conservation Plan	-	0.01
Total		15.20	4.20

Table : 10.2 EMP Recurring Cost - Breakup

Sl. No.	Proposed EMP Operational Budget	Amount per Annum in Rs.
1	Operation and Maintenance cost of APC measures ESP & Bag Filters	40,00,000
2	Bag Filters & ESP spares and consumables	1,20,00,000
3	Operation and Maintenance of STP	10,00,000
4	STP spares and consumables	1,60,000
5	Green belt development maintenance	96,00,000
6	Green belt development	30,00,000
7	Rain water pond and storm water gutters desilting works	10,00,000
8	Operation and maintenance of road sweeping machines	7,56,000
9	Spares and consumables of road sweeping machines	9,26,000
10	CAAQMS operation and Maintenance cost	6,00,000
11	OCEMS operation and Maintenance cost	3,00,000
12	Calibration of OCEMS & CAAQMS & WQW Systems	5,00,000
13	Spares and consumables of CAAQMS per Annum	4,00,000
14	Spares and consumables of OCEMS & WQW Systems	2,00,000
15	Others	75,58,000
Total per Annum		3,44,42,000

10.4 Authenticated Peafowl Conservation Plan

An extract from earlier Report, authenticated by the DFO, for the Plant is appended.

CONCLUSION

Based on the study, peafowls were encountered in the buffer zone only for feeding and in the core zone there is no suitable habitat for peafowl. Based on this it is very clear that project operations are not affecting the peafowl population, habitat and other activities. But still it is necessary to take some conservation measure like habitat restoration in the buffer zone to ensure the future of Indian peafowl.

The Ramco Cements Limited is very active in related to biodiversity and conservation. The company is working very closely to address conservation issues; in past also they worked in the area of green belt development, habitat restoration and biodiversity assessment for various projects and programs.

This report on Conservation Plan for Peafowl recommends several prevention and mitigation measures as well as habitat improvement programs planned to protect biodiversity in the study area. This plan has covered important aspects such as habitat restoration, biodiversity conservation and conservation measures and eco-development to address social and conservation issues. It also provides financial outlay of its implementation cost. All these measures will be strictly enforced and the conservation of the Peafowl will be ensured.

Apart from the peafowl conservation, RAMCO cements Limited understand the prevailing Act and Rules such as Wild Life (Protection) Act 1972, Environment (Protection) Act 1986, The Water (Prevention and control of pollution) act 1974, The Air (Prevention and control of Pollution) act 1981, Tamil Nadu Forest Act 1952 etc. and will ensure the strict adherence of all such related acts and rules.

The report of adherence of Peafowl conservation plan shall be submitted annually to The District Forest officer Thoothukudi; the report also contain the Forest Range Officer's inspection note.

As the Peafowl and other wild animals spread all over the district the necessary monetary assistance will be extended to Forest department under corporate social responsibility (CSR) Fund/ other available funds for the activities such as habitat improvement programs, water conservation & retention works and other welfare programmes.


Forest Range Officer,
Thoothukudi.

For RAMCO Cements Limited



Sr. Dy. General Manager (Ops)
THE Ramco Cements Limited
Pandalai (Pal), Aruppukottai (Tn)
Virudhunagar (D)-626 112.

11.0 Summary & Conclusion

M/s. The Ramco Cements Limited (RCL) of Ramco Group is operating their Ramasamy Raja Nagar (RR Nagar) Cement Plant with CPP & Township over an extent of **191.434 Ha own patta lands** in SF Nos. Parts of 1-14, 16, 22, 24, 30-32, 34-39, 49-52, 56-60, 65-66, 210, 212, 214, 221, 222, 225-230 of Tulukkappatti, 192, 194-212, 215, 216 & 287 of Thammanayakkanpatti and 100-103, 108, 109, 112 & 113 Vachchakkarappatti Villages, Taluk & District Virudhunagar, Tamil Nadu State. The Plant is in operation since 1961-62.

RCL had established the recent expansion activities with New Kiln Line of 3000 TPD in compliance with EC from MoEF&CC awarded vide EC Identification No. EC21A009TN169325 dated **25.10.2021**. After obtaining CTEs & CTOs from TNPCB, the Plant is now being operated for production of 1.44 MTPA Clinker & 2.70 MTPA Cement from **1st March 2023**. Present **CTO-Renew Orders** are obtained from TNPCB vide 2408157290712 (Water Act) & 2408257290712 (Air Act) dated 13.09.2024 with **validity till 31.03.2025**. Certified Compliance Report (**CCR**) for earlier EC has been issued by Integrated Regional Office (IRO), MoEF&CC, Chennai on 18.03.2024 and there is **no Non-Compliance / no Partial Compliance** reported.

With revamping measures proposed by Engineering Consultant FLSmidth, RCL intends to expand RR Nagar Cement Plant with inclusion of revamped Old Line-II operations to existing Lines I & III i.e. **operations of all 3 existing Lines-as Upgraded** and also by increasing operational days from **320 to 345 days**.

Proposal : ‘Expansion of RR Nagar Cement Plant with inclusion of revamped Old Line-II operations to existing Lines I & III i.e. operations of all 3 existing Lines-as Upgraded and also by increasing operational days from 320 to 345 days - production enhancement of Clinker from 1.44 MTPA to 2.76 MTPA and Cement from 2.70 MTPA to 4.00 MTPA along with associated Waste Heat Recovery System of 13 MW’ at Tulukkappatti, Thammanayakkanpatti & Vachchakkarappatti Villages, Taluk & District Virudhunagar, Tamil Nadu. The additional Project Cost is Rs.103.38 Crores. On proposed Expansion, the details of Products & By-products are given in **Table 1.1**.

Table : 1.1 Details of Products & By-Products on Expansion

Production of	Product / By-product	Production, MTPA			Mode of Transportation
		Existing	Proposed	Total	
Clinker	By-product	1.44	1.32	2.76	By Conveyor
Imported Clinker from RCL Sister Units	-	0.50	0	0.50	Rail
Cement	Product	2.70	1.30	4.00	Both Road & Rail
WHRB Power Generation from all 3 Lines @ 13.0 MW					

Salient features of Proposal are given in **Table 1.2**.

Table : 1.2 Salient features of Expansion Proposal

S. No.	Details	Project Details as per Latest EC		Project Details on Expansion now	
1	Plant Extent in Ha	191.434		191.434	
2	Clinker Production, MTPA	Line	Capacity,	Line	Capacity
		I	0.48	I	0.69
		II	-	II	0.69
		III	0.96	III	1.38
		Total	1.44	Total	2.76
3	Import Clinker from Sister Units, MTPA	-	0.50	-	0.50
4	Cement Production, MTPA	Total	2.70	Total	4.00
5	WHRS	Line-I	PH&AQC Boiler	Lines I, II & III	13 MW
6	Raw Materials Demand, TPA	Limestone (& Kankar)	2.16 @ 6740 TPD	Limestone	1.794 @ 5200 TPD
		-	-	Lime Kankar	2.085 @ 6050 TPD
		-	-	Clay, Chips, Roughstone	0.209 @ 605 TPD
		Copper Slag / Laterite / Iron Ore	0.022 @ 63 TPD	Copper Slag / Laterite / Iron Ore	0.083 @ 242 TPD
		Fuel : Petcoke	0.128 @ 423 TPD	Fuel : Petcoke	0.246 @ 715 TPD
		Gypsum	0.108 @ 290 TPD	Gypsum	0.136 @ 395 TPD
		Fly Ash	0.677 @ 2050 TPD	Dry Fly Ash	1.120 @ 3246 TPD
		-	-	Wet Fly Ash	0.080 @ 232 TPD
		Slag	63 TPD	Slag	2.200 @ 6377 TPD
		-	-	Limestone Powder as PI	0.040 @ 115 TPD
7	Power, MW	32.85		40.50	
8	Water requirement in KLD & Source	1000 Ground & Surface Water		1265 Surface Water only	
9(i)	Sewage generation in KLD	280		280 (No Change)	
9(ii)	Trade Effluent generation in KLD	20		(20+60=) 80	
10	Air Pollution Control Limits	PM - <20 mg/Nm ³ SO ₂ - <100 mg/Nm ³ NO _x - <600 mg/Nm ³		PM - <30 mg/Nm ³ SO ₂ - <100 mg/Nm ³ NO _x - <600 mg/Nm ³	
11	Hazardous waste generation	Used/Spent Oil (Category 5.1) - 94.62 TPA		Used/Spent Oil (Category 5.1) - 94.62 TPA	
12	Project Cost	CP & CPP	Rs.894 Cr.	Addition	Rs.103.38 Cr.
	EMP-Capital	Rs.14.20 Cr.		Rs.1.00 Cr.	
	EMP-Operation	Rs.3.90 Cr./annum		Rs.0.25 Crores/annum	

All activities are **proposed within the Industry premises** and no additional land is required. Also, there is **no Rehabilitation & Resettlement (R&R)** involved. There is **no Litigation or Pending Case** against the Project.

Well established **Dry Process** utilising the Precalciner technology along with the technological advances in the area of grinding and homogenisation has been incorporated. Presently, there are 465 Direct Employees working in the Cement Complex. Indirect Employment to about 600 persons has been provided. Due to the Expansion Proposal, **another 35 Direct Employees & 50 Indirect Employees will be added.**

Plant area falls in Survey of India Topo Sheet No. **58 G/15** (Open Series Map-C43R15. Plant Coordinates are:

North Latitude	:	09°26'26.80" to 09°27'55.00"
East Longitude	:	77°54'38.00" to 77°56'00.10"

There are **no Eco Sensitive Areas** like National Parks, Wildlife Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar Sites, Tiger/Elephant Reserves, Reserved Forests, Archaeological / Historical Monuments etc. (existing as well as proposed), within 10 km Study Area. **Seasonal Arjuna River** (0.3 km in south), Plant raw water source, is flowing near the Plant. There is **no major Industry** in the Study Area other than RR Nagar Cement Plant & CPP and Fire Cracker Units.

The Project Cost of the existing Cement Plant Complex is Rs.894.00 Crores. A budget Rs.14.20 Crores is presently the EMP Capital Cost and Rs.3.90 Crores/annum is the EMP Recurring Cost. **For proposed Expansion**, with existing Line-II infrastructures and facilities, the Project Cost will be **additional Rs.103.38 Crores**. Thus, total Project Cost on this Expansion will be Rs.997.38 Crores. A budget **Rs.1.00 Crores as EMP Capital Cost** and Rs.0.25 Crores/annum as EMP Recurring Cost are proposed additionally for the Expansion. Thus, total EMP Capital Budget will be Rs.15.20 Crores and EMP Operating Budget will be Rs.4.20 Crores per Annum. The **Conservation Plan for Peafowl** duly approved with the Budget Provision of **Rs.1.00 Lakh/Annum** by the Wildlife Warden, Srivilliputhur is being implemented and continued.

The proposed Expansion of Cement Plant (≥ 1.0 MTPA) falls under SI. No. 3(b) - Category 'A' of EIA Notification 2006 and requires prior EC from MoEF&CC. As per Notification SO 1599 (E) dated 25.06.2014 and OM F. No. 22-24/2018-IA.III dated 22.01.2019, prior EC for installation of WHRB is exempt and is excluded for prior EC under SI. No. 1(d). Accordingly, RCL filed TOR Application vide Parivesh Online Proposal No. IA/TN/IND1/498318/2024 on 26.09.2024. MoEF&CC granted Standard Terms of Reference (Standard TOR) for the Project with **TOR Identification No. TO24A1102TN5995426N dated 12.11.2024** under File No. J-11011/119/2009.IA.II(I).

As permitted, Baseline Data was collected during Jul.-Sep. 2024 in Premonsoon Season for this Region in compliance with MoEF&CC Office Memorandum No. J-11013/41/2006-IA-II(I)(Part) dated 29.08.2017. The summary of baseline status is given in Table 1.3. There is adequate buffer for the proposed Project in the physical, biological and edaphic environments of the study area.

Table : 1.3 Environmental Baseline Status

Envl. Component	Main Parameters	Minimum	Maximum	Mean	Desirable Norms
Ambient Air Quality, ug/m ³	PM2.5	10	38	21.7	60
	PM10	13	65	39.0	100
	SO ₂	6	24	12.0	80
	NOx	7	27	14.5	80
Ambient Noise, dB(A)	Leq-Day	41.5	48.1	43.5	55
	Leq-Night	40.1	44.7	41.4	45
Surface Waters	TDS, mg/l	310	560	-	500/2100
Ground Waters	TDS, mg/l	360	520	-	500-2000
Soil Status	EC, mmhos/cm	0.92	1.45	-	0.2-0.5
	SAR	2.16	5.51	-	<5

Legend : PM2.5-Particulate Matter size less than 2.5 um; PM10- Particulate Matter size less than 10 um; SO₂-Sulphur dioxide; NOx-Oxides of Nitrogen; Leq-Day & Leq-Night - Equivalent Noise Levels during Day & Night Times; TDS-Total Dissolved Solids; EC-Electrical Conductivity & SAR-Sodium Absorption Ratio.

Draft Environmental Impact Assessment (EIA) Report and Summary EIA Reports in English & Tamil languages, prepared in compliance with awarded TORs by accredited EIA Consultant - M/s. ABC Techno Labs India Private Limited (Certificate NABET/EIA/2225/RA0290 dated 11.06.2023 with validity till 16.11.2025), has been submitted now for Public Consultation & Public Hearing.

Adequate Budget will be allotted in EMP Budget for addressing Public Hearing issues for execution in 2 years period, in compliance with MoEF&CC OM F. No. 22-65/2017.IA.III dated 01.05.2018.

12.0 Disclosure of Consultants

EIA Consultant, M/s. ABC Techno Labs India Private Limited, Chennai has been accredited for various Sectors including **Sector-9 (Cement Plants) for Category 'A'** by the National Accreditation Board for Education & Training (**NABET**) vide Certificate NABET/EIA/2225/RA0290 dated 11.06.2023 with validity till 16.11.2025 (Sl. No. 4 of List dated 29.10.2024). ABC Laboratory is accredited by the National Accreditation Board for Testing and Calibration Laboratories (**NABL**) vide Certificate No. TC-5770 dated 03.04.2024 with validity till 02.04.2026.

ABC comprises a team of highly talented professionals, who work in sync with clients ensuring that the defined assessment and survey or reporting is executed with high level of efficiency. The proficient team consists of Environmentalists, Policy makers, Geologists, Chemists, Engineers, Industrial hygienists, Technicians, Research Associates, Sociologists and others with expertise in various key areas.

ABC has a proven successful track record of working with industry & institutions and in executing multi faceted projects funded by organizations like World Bank, UNDP, MoEF&CC, amongst others. ABC Techno labs India Private Ltd. has laid down new benchmarks in all its areas of strategic operations by the dedicated team of outstanding professionals and client-centric approach, clearly evident by our accomplishments/ clients list. The accredited/approved Experts of ABC are appended.



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Certificate of Accreditation

ABC Techno Labs India Private Limited, Chennai
ABC Tower, 400, 13th Street, SIDCO Industrial Estate, North Phase, Ambattur, Chennai 600058

The organization is accredited as **Category-A** under the **QC-NABET Scheme for Accreditation of EA Consultant Organization, Version 3** for preparing EIA-EMP reports in the following sectors -

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	River valley projects	3	1 (c)	A
4	Thermal power plants	4	1 (d)	A
5	Mineral beneficiation including pelletisation	7	2 (b)	A
6	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	A
7	Cement Plants	9	3 (b)	A
8	Petroleum refining industry	10	4 (a)	A
9	Leather /Skin/Hide processing industry	15	4 (b)	A
10	Chemical fertilizers	18	5 (a)	A
11	Petro-chemical complex	19	5 (c)	A
12	Petrochemical based processing	20	5 (d)	A
13	Synthetic organic chemicals industry	21	5 (f)	A
14	Outlines	22	5 (g)	A
15	Integrated pulp industry	23	5 (j)	B
16	Sugar industry	25	5 (k)	B
17	Oil & gas transportation pipeline, passing through national parks/ sanctuaries/total reefs / ecologically sensitive areas including LNG terminal	27	6 (k)	A
18	Airports	29	7 (k)	A
19	Industrial estates/ parks/ complexes/ Areas, export processing zones (EPZs), Special economic zones (SEZs), IT parks, SEZ complexes	31	7 (c)	A
20	Ports, harbours, break waters and dredging	33	7 (h)	A
21	Highway	34	7 (f)	A
22	Common Effluent Treatment Plants (CETPs)	36	7 (b)	B
23	Common Municipal Solid Waste Management Facility (CMSWAF)	57	7 (i)	B
24	Building and construction projects	58	8 (a)	B
25	Townships and Area development projects	59	8 (c)	B

Note: Names of approved EIA Consultancy and Functional Area Experts are mentioned in RAAC website dated June 06, 2023 posted on QC-NABET website.

The Accreditation shall remain in force subject to continual compliance to the terms and conditions mentioned in QC-NABET's list of consultants bearing no QC/NABET/IN/NC/23-2180 dated July 11, 2023. The accreditation needs to be renewed before the expiry date by ABC Techno Labs India Private Limited, Chennai following due process of assessment.

Sr. Director, NABET
Dated: July 11, 2023

Certificate No.
NABET/EA/2225/RA 0290

Valid up to
Nov 16, 2025

For the updated List of Accredited EA Consultant Organizations with approved sectors please refer to the QC-NABET website.

		National Accreditation Board for Testing and Calibration Laboratories
		CERTIFICATE OF ACCREDITATION
ABC TECHNO LABS INDIA PRIVATE LIMITED		
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		
ABC TOWER, NO 406, 13TH STREET, SIDCO INDUSTRIAL ESTATE-NORTH PHASE, AMBATTUR, CHENNAI, TAMIL NADU, INDIA		
in the field of		
TESTING		
Certificate Number:	TC-5770	
Issue Date:	03/04/2024	Valid Until: 03/04/2026
<p>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 this laboratory, you may also visit NABL website www.nabl-india.org)</p>		
Name of Legal Entity: ABC Techno Labs India Private Limited		
Signed for and on behalf of NABL		
	 N. Venkateswaran Chief Executive Officer	

List of Experts



SCHEME FOR ACCREDITATION OF EIA
CONSULTANT ORGANIZATIONS

NATIONAL ACCREDITATION BOARD FOR EDUCATION AND TRAINING



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ABC Techno Labs India Private Limited (formerly known as ABC Environ Solutions Pvt. Ltd.)

S. No	Name	Type	Designation	Sector	FA
1	Rabranumar V Mudiar	Empanelled	EC,FAE	2(A),21(A),32(A),37(B),39(B)	SHW(A),SC(A),V
2	Abhis Satia	In House	EC,FAE	2(A),9(A),10(A),21(B),22(A)	WP(A),EB(A),AP
3	Dr. R. K Jiyaseelan	In House	EC,FAE	1(B),31(B),39(B),21(A),37(B)	LU(A),WP(A),HG
4	Dr. R. Paramasivam	In House	EC,FAE	31(A),36(A)	WP(A),HG(A)
5	Dr.Mohit Kumar Ray	Empanelled	EC	10(A), 18(A), 4a), 20(A), 27(A)	

RCL

EC for Expansion of RR Nagar Cement Plant (with all 3 Existing Lines), Virudhunagar, TN

S No	Name	Type	Designation	Sector	FA
6	Geetha S	In House	FAE		SE(B)
7	Hansraj Panikar	Empanelled	EC,FAE	34(B),36(B),37(B),38(B),39(B)	AP(B),WP(B),NV
8	K Sekar	Empanelled	EC	1(A),7(A),9(A),31(A),33(A)	
9	Kavitha Zog	Empanelled	EC,FAE	3(A),4(B),22(A),25(B),28(B)	SHW(B),WP(B),I
10	M.S Bhaskar	Empanelled	EC,FAE	1(A),2(A),7(B),21(A)	Geo(A),HG(A),LI
11	Muthiah Marlappan	Empanelled	EC,FAE	4(A),10(A),15(A),16(A),29(A)	SHW(A),AP(A),V
12	P Swaminaj	Empanelled	EC	34(A)	
13	R Rajendran	Empanelled	EC,FAE	8(B),38(B),39(B),29(A)	SHW(B),AP(B),A

S No	Name	Type	Designation	Sector	FA
14	Shankar N Gajbhiye	Empanelled	EC	27(A),33(A)	
15	Sushil Mahram	In House	,FAE		SE(A)
16	Vishnavi Dhinakaran	In House	,FAA		SHW,WP
17	Vijayalakshmi K	Empanelled	EC,FAE	29(B),39(B),49),21(A)	NV(A),RH(A),AQ
18	Vinod Kumar Gautam	Empanelled	EC,FAE	29(A),39(B),28(B),21(A),34(A)	SHW(A),AQ(A),F
19	Vivek P Nixare	Empanelled	EC,FAE	1(A)	NV(A)

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Detail
 (1) (1) (1)

Kindly refer your proposal for terms of Reference (ToR) along with Form-CAP, A&E. The proposal has been examined in the Ministry. It is noted that the Form-CAP, A&E and PFR has been filed without providing requisite information/documents and has also not provided required scientific/technical details of the project.

In view of the same, you are requested to revise the Form-CAP, A&E with correct details, follow the PFR in line with the EA/Regulatory, 2009 and upload the requisite documents, in addition to the details listed as below:

- (i) On perusal of the site file, it is observed that ground is not uniformly distributed all along the project boundary of the existing project. PF shall submit the justification and complete details of the ground developed so far along with the photographs.
- (ii) It is observed that land above multiple patches of the proposed project area. PF shall clarify whether the existing project is a part of interlinked/interconnected project.
- (iii) As reported, there are sensitive areas within the study area of the project site. PF shall submit the mitigation measures undertaken to minimise the impact of project activities on these sensitive areas.
- (iv) Details of all the rain water and faecal sludge sent to mitigation measure during transportation needs to be submitted under section (F) in 2.3 for registration of interests involved in the project.
- (v) PF needs to submit the details of activities/ECs/CEs/CFO in tabular form showing its details of EDS/CEs/CFO via wire transmission capacity emergence of CE/CTC to check the violation, if any. All said CE/CTCs/ EW Authorisation to be uploaded to verify the violation, if any.
- (vi) Details of last self-compliance report of EC, which was submitted to the TRO needs to be submitted.
- (vii) Details of land involved in the project (Total area of the land, type of land, details of possession of land in the name of PF, Copy of proof of land with area of the land, Conversion of land for industrial purpose from the State Government) needs to be submitted and uploaded the data accordingly.
- (viii) Details of court cases, directions issued by SPCE, if any, pending needs to be submitted.
- (ix) PF shall clarify whether the project falls under CPA/IMT if yes, then compliance to the CEP guidelines shall be submitted.
- (x) Project proponent shall prepare layout plan showing all internal roads maximum 5m width and 5m bearing radius for smooth traffic flow inside including fire tender access per block. Road network shall connect all service areas in layout. This drawing shall include area statement showing plot area, area under road, parking, green belt with cut-stations and its with respect to plot area of project site and proper indexing.
- (xi) Project proponent shall submit contour map of project site along with drainage disposal system with cut-stations bed drawings supported with proper indexing including minimise harvesting details with calculations mentioning about GW recharge along with relevant drawing.
- (xii) PF shall also upload proposed prescriptions, water permission, DOA/typhoon, etc. which are essential for consideration of proposal.
- (xiii) The application form has not been correctly. PF shall revise the complete application and resubmit the proposal.
- (xiv) It is mentioned that the processing of EC proposal in the Ministry is through Forest/Para only. Therefore providing the requisite information/documents shall be in accordance to par Form and accordingly the PF are kindly requested to revise the application in the Form and resubmit the same.



THE RAMCO CEMENTS LIMITED

(Formerly Madhav Cement Ltd.)

Corporate Office:
 Alagar Kovvada, Dindigul, V. Thiruvai
 61-A, Dr. Padiyakkottai Road, Mysore
 Chennai - 600 004, India
 Tel: +91 44 2947 2888 Fax: +91 44 2947 8079
 Website: www.ramcocements.in
 Corporate Identity Number: L26941TN1957PL000360

Our Ref. : RCL/RRN Expn.-3 Lines/03.25

Date : 5th November 2024

The Member Secretary,
IA Division Industry-1,
 Ministry of Environment, Forest & Climate Change,
 Indira Paryavaran Bhawan,
 Jorbagh Road, Ali Ganj,
New Delhi-110 003.

Respected Sir,

Sub : Expansion of Ramasamy Raja Nagar Cement Plant by inclusion of Revamped Old Line-II operations to existing Lines I & III (operations of all 3 existing Lines, as Upgraded) & and Increasing the Operational Days from 320 days to 345 days - Production Enhancement of Clinker from 1.44 MTPA to 2.76 MTPA & Cement from 2.70 MTPA to 4.00 MTPA at Villages Tulukkappatti, Thammanayakkanpatti & Vachchakarapatti, Taluk & District-Virudhunagar, Tamil Nadu by M/s.The Ramco Cement Limited – Prior EC for proposed Expansion activities under EIA Notification 2006; Sl. No. 3(b) & Category 'A' - **Submission of EDS Reply** - reg.

- Ref. : 1. File No. J-11011/119/2009.IA.II(I).
 2. Earlier Expn. EC Identification No. EC21A009TN169325 dated 25.10.2021.
 3. TOR Application vide Proposal No. IA/TN/IND1/498318/2024 on 26.09.2024.
 4. EDS Raised on 08.10.2024.

We have received the EDS message raised on 08.10.2024 for our above TOR Proposal in PARIVESH Portal. We are pleased to submit herewith Pointwise Reply for the EDS raised for your kind perusal.

EDS (i) : On perusal of the kml file, it is observed that greenbelt is not uniformly distributed all along the project boundary of the existing project. PP shall submit the justification and complete details of the greenbelt developed so far along with the photographs.

Submission : The total extent of RR Nagar Complex is 191.434 Ha. As informed in Para 2.5 & 6.4 of PFR, Green Belt was maintained in the Complex over an extent of 33.00 Ha with 62,910 Trees @ 1,906 Trees/Ha before 2021 Expansion. During last EIA Stage, it was submitted that additional Green Belt to an extent of 31.50 Ha with 78,750 Nos. to be raised in the vacant areas of western & southern parts (**Plate E1**). On Expansion, **additional Plantations were done over an extent of 31.50 Ha with 98,340 Trees** in the western & southern sides (**where recent Expansion activities took place**). Now, total Green Belt extent is **64.50 Ha (33.69% Coverage)** with 1,61,250 Trees @ **2,500 Trees/Ha**, as detailed below :

Period	GB Extent, Ha	No. of Trees
Expn. EIA Stage	33.00	62,910
End of 2021-22	12.00	28,624
2022-23	18.00	64,865
2023-24 till Jan. 24	1.50	4,851
Total	64.50	1,61,250

/2/

Green Belt Layout, as on date, is attached as **Plate E2**. In addition to the Geotagged Photographs shown in Plate-II of PFR, recent Geotagged Green Belt all along the boundaries of the Complex are attached as **Plate E3**.

As shown in the Photographs, **recently planted trees are 1-2 years old which are yet to be reflected in Google Earth KML file**. However, recent Certified Compliance Report (CCR) issued by the Integrated Regional Office (IRO), MoEF&CC, Chennai vide Letter EP 12.1/867/TN/353 dated 18.03.2024 captured the Green Belt developed in the Complex.

EDS (ii) : It is observed that kml shows multiple patches of the proposed project area. PP shall clarify whether the instant project is a part of interlinked/ interdependent project.

Submission : It is an Interdependent Project i.e. Expansion of the Cement Plant located in a overall extent of **191.434 Ha** which includes Cement Plant, Captive Power Plant, Township, Schools, Labour Quarters located in other side of NH-44, etc. There is no additional land requirement for the Expansion as all activities are proposed within the industrial premises as shown in Fig. 1.2 & PFR Page No. 7.

EDS (iii) : As reported, there are sensitive areas within the study area of the project site. PP shall submit the mitigation measures undertaken to minimise the impact of project activities on these sensitive areas.

Submission : This is existing Plant since 1959. There are **no Eco Sensitive Areas** like National Parks, Wildlife Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar Sites, Tiger/Elephant Reserves, Reserved Forests, etc. (existing as well as proposed), within 10 km from the Plant (PFR Page No. 19 & Fig. 1.4-Environmental Setting in Page No. 68). Mitigation Measures are given in PFR Page Nos. 89-92, Sectionwise for Water, Air & Solid Wastes which included the followings EMP measures:

- ✓ The (old) Line-II Kiln is already provided with Reverse Air Bag House, Cooler with ESP, Coal Mill with Bag Filters so as to control the Particulate Emissions from the Line-II <20 mg/Nm³.
- ✓ All the Material conveyors are fully covered and provided with Bagfilters at Transfer Points.
- ✓ Dry Fly ash is pneumatically transferred to the RCC storage silo and pumped to the cement grinding section through pneumatic pipelines.
- ✓ Bag filters are provided in the material loading hoppers, transporting conveyors, feeding area, cement grinding, storage & packing areas to control the fugitive emissions from the unit.
- ✓ Thus, fugitive emissions during loading and unloading operations are controlled effectively in compliance with CREP Guideline Norms.
- ✓ There is no trade effluent generation from the Cement Plant.
- ✓ On Expansion, DM/RO Rejects of 40 KLD, Boiler Bleed-offs of 8 KLD and Colling Tower Rejects of 12 KLD, total 60 KLD effluent will be generated additionally which will be treated for pH Correction in a 100 KLD Neutralisation Pit separately and Treated Effluent of 60 KLD will be utilized for Equipment Cooling of (old) Line-II machineries where it will be evaporated fully.
- ✓ Domestic Sewage & Canteen wastewaters of 25 KLD from the Cement Plant, 9 KLD Domestic Sewage from CPP, 160 KLD Domestic Sewage from the Township and another 86 KLD Domestic Sewage from Labour Qtrs., thus, a total of 280 KLD is generated. All the Domestic Sewage is treated in a 400 KLD Sewage Treatment Plants (350+50 KLD STPs). The Treated Sewage of 250

KLD is fully used for the Green Belt development. There will be no change to existing status on Expansion.

- ✓ Thus, it will be a 'Zero Effluent Discharge'.
- ✓ The solid waste generated from the process and dust collected from various air pollution control equipment is being recycled in the process. Solid waste from the Sewage treatment plant 0.8 @ TPD is vermi-composted and used as manure for Green belt development. Fly ash (29.3 TPD) produced from CPP and Bottom ash (5.2 TPD) are transported pneumatically with the help of dense phase pneumatic pumps to the RCC storage silos. The ash is evacuated from silo and transported to Cement Plant for Portland Pozzolana Cement (PPC) manufacturing.
- ✓ Spent Oil (Category 5.1) generation is 94.62 TPA and is being sold to TNPCB/CPCB Authorised Recyclers for further processing & recycling.

Thus, all EMP measures will be in place to control the pollution levels within the Plant premises and there will not be any impact on the nearby environment including the sensitive man-made land uses.

EDS (iv) : Details of all the Raw material and its linkage and its mitigation measure during transportation needs to be submitted under section (Part B, 2.3) for requirement of minerals involved in the project.

Submission : Raw material and its linkage details are provided in Para 3.5, Table 3.2 in Page No. 70 which are also addressed as directed in Part-B Section 2.3. **Now, there was no provision in Parivesh Portal for Uploading the Linkage Documents at the time of Application.** Linkage Documents are given in PFR.

Traffic Load (Baseline) (PCU/day)	14,318 PCU/day
Additional Traffic Load during Operation	675 PCU/day
Total Traffic Load during Operation	14,993 PCU/day
Traffic capacity	624.7 PCU/hr.
IRC 106-1990 Recommended <u>Design Service Volume</u>	3600 PCU/hr
LOS Factor	0.17 (A)

Adequate parkings are also provided in the Plant. Facilities for **drivers (rest room, toilet, etc.)** are also provided. EMP Measures are :

- ❖ Green Belt with thick foliage along the Plant/Ore Haulage/Transportation roads.
- ❖ Security Guards at the Road Junction to handle the inward and outward vehicles from the Plant to the Highway.
- ❖ All Trucks are to be fully covered with Tarpaulin to avoid any spillage on transportation.
- ❖ Restriction of over loading of Trucks/Tippers.
- ❖ Speed restrictions
- ❖ Restriction of Truck parking in the Highway and Public Roads.
- ❖ Regular and preventive maintenance of transport vehicles has to be ensured.
- ❖ Compliance to 'Pollution under Control' Certification has to be ensured and to be checked periodically.

EDS (v) : PP needs to submit the details of activities/ECs/CTEs/CTOs in tabular form showing its details of ECs/CTEs/CTO vis-à-vis production capacity since grant of CTE/CTO to check the violation, if any. All old CTEs/CTOs/ HW Authorization to be uploaded to verify the violation, if any.

Submission : As directed, all Statutory Approvals since first EC, are given as **Docs-1&2** and detailed below:

RR Nagar Cement Plant EC Details :

- (i) RR Nagar Plant Modernisation & Expansion vide F. No. J-11011/119/2009 IA.II (I) dated 06.07.2009 for Cement production from 1.0 MTPA to 2.0 MTPA.
- (ii) Addition of 3rd Packer vide F. No. J-11011/119/2009 IA.II (I) dated 29.11.2017.
- (iii) Expansion with New Kiln Line of 3000 TPD (upto Clinkerisation) vide EC Identification No. EC21A009TN169325 dated 25.10.2021-Clinker 1.44 MTPA & Cement 2.70 MTPA

Consents to Establish:

- (i) CTE-Cement production of 6,200 T/day (or) 2.0 MTPA (with addition of 0.3 MTPA Cement Mill) vide TNPCB Order No. 5145 (Expansion) (Air Act) and 5204 (Expansion) (Water Act) dated 03.12.2009 – validity 2 years.
- (ii) CTE for Expansion (Cement) vide TNPCB Order No. 2206141656739 (Water Act) & 2206241656739 (Air Act) dated 17.02.2022 - validity 2 years.

Consents to Operate:

- (i) Initial CTO-Cement production of 6,200 T/day (or) 2.0 MTPA vide TNPCB Order No. 18354 (Air Act) and 22318 (Water Act) dated 03.01.2011- Valid till 31.03.2011
- (ii) Renewal CTOs: Order No. 16831 (Air) and 20796 (Water) dated 09.05.2011- Valid till 31.03.2012.
- (iii) Order No. 16831 (Air) and 20796 (Water) dated 29.01.2013- Valid till 31.03.2013.
- (iv) Order No. 16831 (Air) and 20796 (Water) dated 21.06.2013- Valid till 31.03.2014.
- (v) Order No. 18354 (Air) and 22318 (Water) dated 11.09.2014- Valid till 31.03.2015.
- (vi) Order No. 15082294874 (Air) and 15081294874 (Water) dated 10.08.2015- Valid till 31.03.2016.
- (vii) Order No. 160824725855 (Air) and 160814725855 (Water) dated 02.08.2016- Valid till 31.03.2017.
- (viii) Order No. 180828260593 (Air) and 180818260593 (Water) dated 28.02.2018-Valid from 01.04.2017 to 31.03.2019.
- (ix) Order No. 1908221827195 (Air) and 1908121827195 (Water) dated 18.09.2019- Valid till 31.03.2022.
- (x) CTO-Expn. Order No. 2307249733843 (Air Act) and 2307149733843 (Water Act) dated 27.02.2023- Valid till 31.03.2024.
- (xi) CTO-Renew Order No. 2408157290712 (Water Act) & 2408257290712 (Air Act) dated 13.09.2024- Valid till 31.03.2025.

Hazardous Wastes Authorisation vide Order No. 23HPC42009117 dated 07.06.2023- Validity till 31.03.2028.

EDS (vi) : Details of last self-compliance report of EC which was submitted to the IRO needs to be submitted.

Submission : Self Compliance Report for the Period Apr.-Sep. 2023 is attached as **Annex. Doc-1**.

Certified Compliance Report (CCR) for the Expansion EC has been issued by Integrated Regional Office (IRO), MoEF&CC, Chennai vide Letter EP 12.1/867/TN/353 dated 18.03.2024 and attached as Document-4 in PFR.

EDS (vii) : Details of land involved in the project [Total area of the land; Type of land; Details of possession of land in the name of PP; Copy of proof of land with area of the land; Conversion of land for industrial purpose from the State Government] needs to be submitted and uploaded the data accordingly.

Submission : As stated in Para 2.1-Page No.21, this is an existing Plant in operation since 1961-62. Entire land of 191.434 Ha, own Patta Lands of PP, is under the Industrial Use. The Village

Administrative Officers of Thulukkapatti, Thammanaickenpatti & Vacchakarapatti villages under TN Revenue Department have issued the Certificates for possession of the Lands in the name of PP with Survey Nos. & Land extent. The Certificates are attached as **Annex. Doc-2**. All the lands are falling under the Industrial Use. Recent Industry License issued by the State Government is attached as **Annex. Doc-3**.

All Expansion activities are proposed within the existing Premises and no additional land is required. No establishment is required for the Proposal. No change in Land Use, as stated in 2.6 PFR Page No. 59.

EDS (viii) : Details of court case, directions issued by SPCB, if any, pending needs to be submitted.

Submission : There is no Litigation/Pending Case against the Proposal, as submitted.

EDS (ix) : PP shall clarify whether the project falls under CPA/SPA? If yes, then compliance to the CEPI guidelines shall be submitted..

Submission : Project area does not fall in Critically Polluted Area (CP) or Severely Pollution Area (SPA) listed by CPCB (PFR Page No. 9). Thus, no compliance as per CEPI is required.

EDS (x) : Project proponent shall prepare layout plan showing all internal roads minimum 6m width and 9 m turning radius for smooth traffic flow inside including fire tender as per NBC. Road network shall connect all service areas in layout. This drawing shall include area statement showing plot area, area under roads, parking, green belt with calculations and % with respect to plot area of project site and proper indexing.

Submission : All internal roads are designed for minimum 6 m width and 9 m turning radius for smooth traffic flow inside the Unit including fire tender, as per NBC Norms. Road network is connecting all service areas. Layout with internal Roads is attached as **Plate E4**.

EDS (xi) : Project proponent shall submit contour map of project site along with drainage disposal system with calculations and drawings supported with proper indexing including rainwater harvesting details with calculations mentioning about GW recharge along with relevant drawing.

Submission : The elevation of the Plant area ranges from 73 m to 89 m above MSL. Plant Layout with Elevation Contours & existing Drainage Pattern are attached as **Plate E5**.

The 70 year **Normal Rainfall** of the Plant Area (Sattur Rain Gauge Station) is **835 mm**. Pre-Project and Post Project Surface Runoffs from the Plant Area is estimated as per Manual of Artificial Recharge of Ground Water (CGWB, 2007).

Pre-Project Runoff	:	3,42,666 KL/Year
Post Project Runoff	:	5,55,193 KL/Year

Estimation of Quantum of Runoff available through RWH

Land Use	Area, sq.m	Rainfall, m	Runoff Coeff.*	Quantum of Runoff, KL/Annum
Pre-Project Runoff				
Total Area	1914340	0.895	0.20	130417.61
Post-Project Runoff				
Roof Top of building/Sheds	275700	0.895	0.85	209738.775
Road/Paved area	170120	0.895	0.65	98967.31
Open Land	728590	0.895	0.20	130417.61
Green Belt & Lawns	715000	0.895	0.15	95988.75

RWH Ponds & Canals	24930	0.895	0.90	20081.115
Total	19,14,340	-	-	55,51,93.56

* Ref: Manual of Artificial Recharge of Ground Water (CGWB, 2007).

Existing wells and created Ponds in the Plant vicinity are utilised for harvesting the Rain Water in the Plant vicinity. The Roof Top Collection of 2,09,738 KL/Year will be directly collected and used @ 575 KLD in supplementing the Raw Water Demand. Additionally, 20,081 KL/Year will be collected in RWH Ponds and utilized for Green Belt development. The balance 3,25,373 KL/Year Rain waters reach the natural Drains to discharge into the Arjuna River.

EDS (xii) : PP shall also upload proposal presentation, water permission, SOI Toposheet, etc. which are essential for consideration of proposal.

Submission : TOR Presentation in the Template devised by EAC (Ind-1), Survey of India Topo Sheet and Water NOC are already uploaded in Parivesh Portal.

Water Drawl Agreement – Total water demand on Expansion is **1,000 KLD**. The required water is drawn from Arjuna River source as permitted by State PWD vide GO 1446/PWD dated 04.10.1975. There is no ground water drawl (Page No. 30 & Document-6)- Water Agreement is attached as **Annex. Doc-4**.

EDS (xiii) : The application form has not been correctly. PP shall revise the complete application and resubmit the proposal.

Submission : The Application has been now submitted with updated data/details, as directed.

EDS (xiv) : It is mentioned that the processing of EC proposal, in the Ministry, is through Parivesh Portal only, therefore providing the requisite information/documents shall be in compliance as per Form and accordingly the PP are kindly requested to revise the application in the Form and resubmit the same.

Submission : Forms CAF, Part A/B (TOR Application Form-1) are reviewed and updated in the online Application, as directed.

We shall be very thankful to you, if you could kindly pursue the Proposal and **award AUTOMATIC TOR** at the earliest.

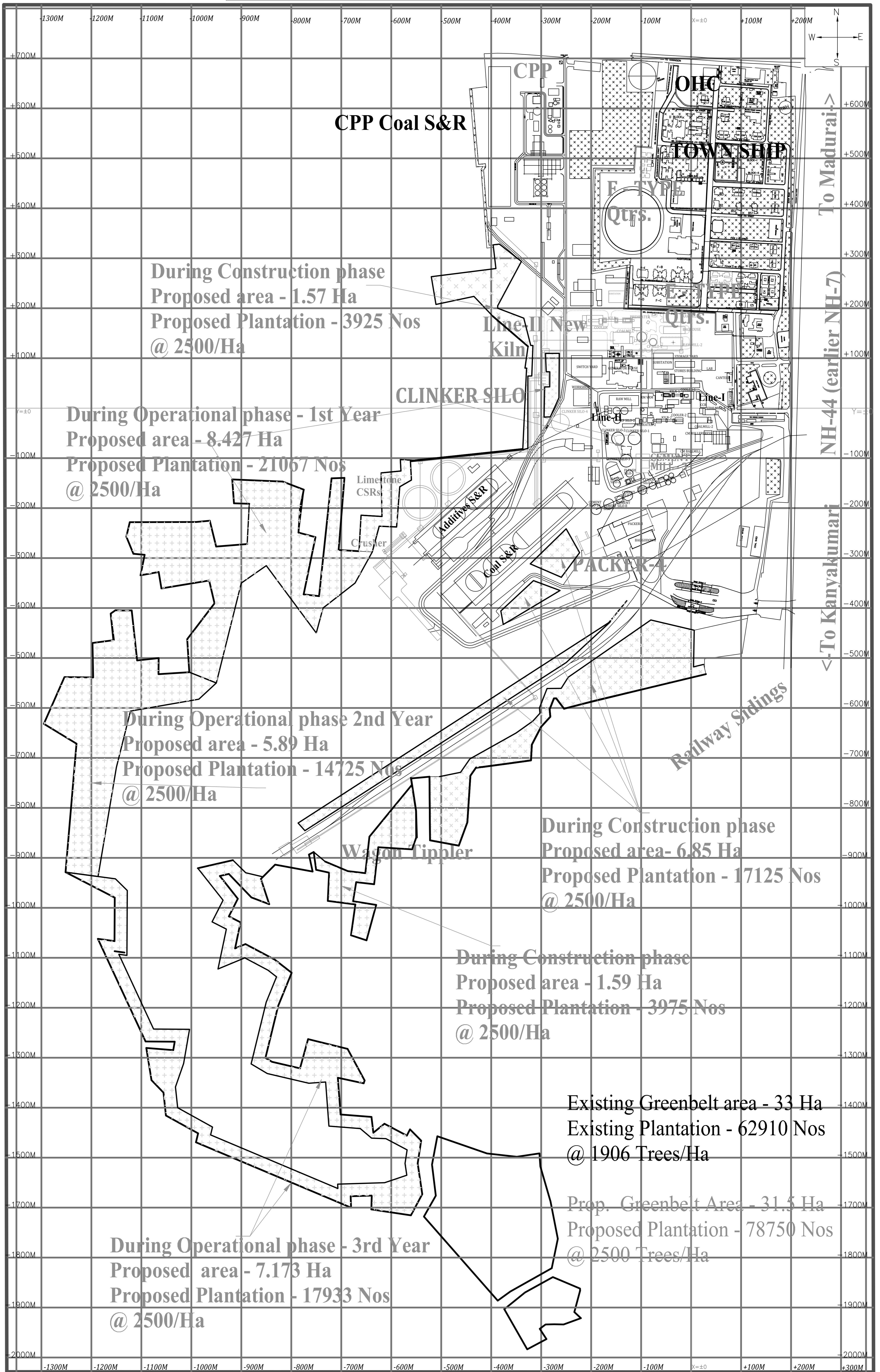
Thanking you,

Yours faithfully,
For **The Ramco Cements Limited**



C.Ravichandran
Sr. Vice President (ESG)

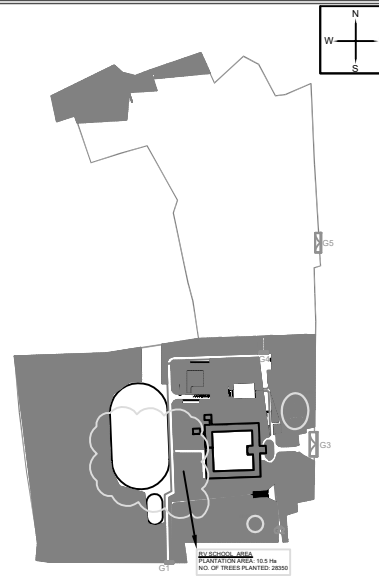
Encl : as stated above.



RR NAGAR PLANT COMPLEX

Plate : E2 Green Belt Layout

TOTAL GREEN BELT AREA: 64.50Ha
NO.OF TREES PLANTED: 1,61,250



LEGEND PLANTATION DURING RECENT EXPANSION
 (YEAR 2021-22 TO 2023-24)

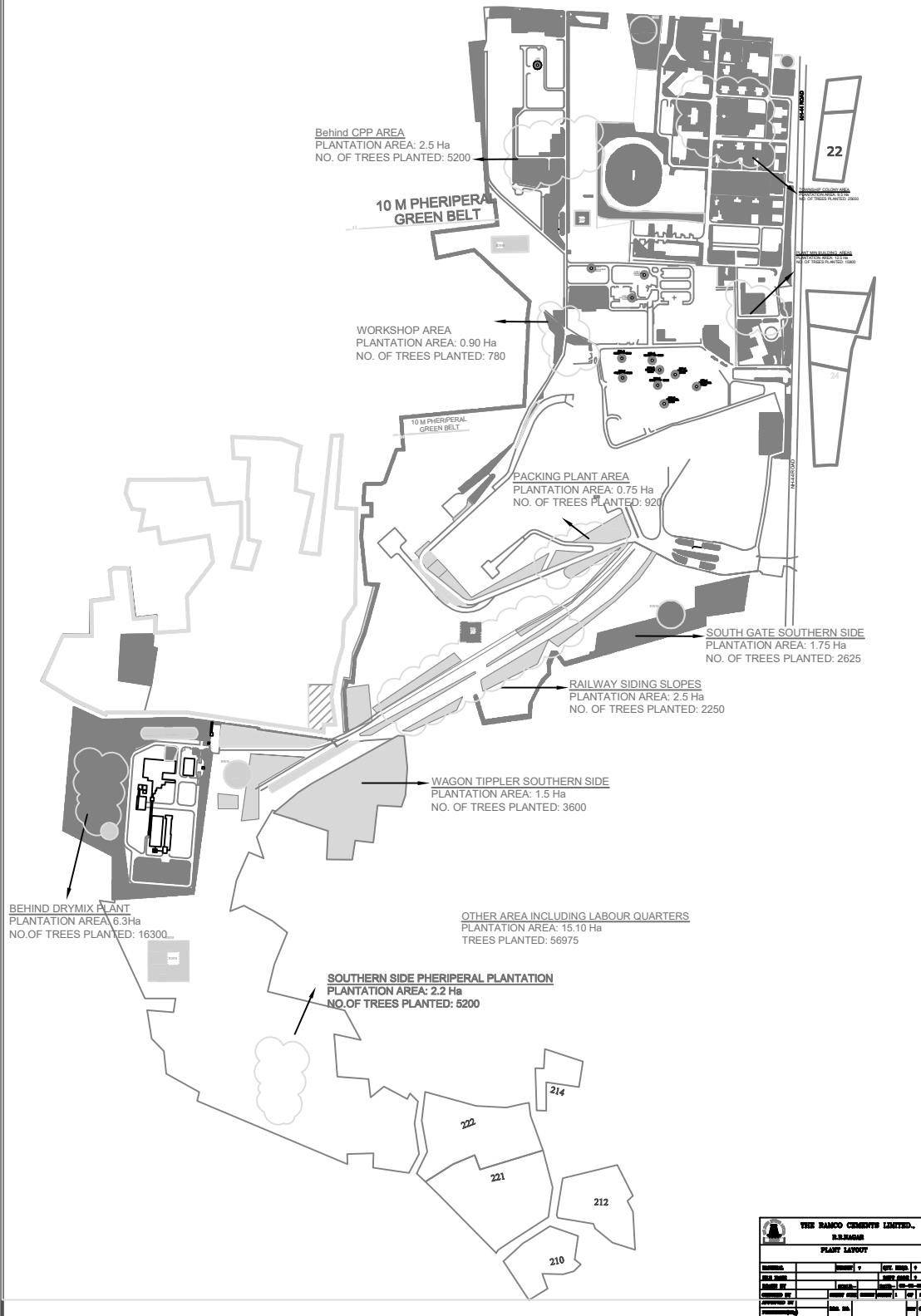


Plate : E3 RCL RR Nagar Plant – Green Belt Photographs (Geotagged-26.10.2024)



 <p>FVMU+FTW, Ramaswamy Raja Nagar, Thammamayakkanpatti, Tutukudi (p), Tamil Nadu 626204, India</p> <table border="0"> <tr> <td>Latitude</td> <td>Longitude</td> </tr> <tr> <td>9° 27' 21.896" N</td> <td>77° 53' 40.685" E</td> </tr> <tr> <td>Local 10.56.56</td> <td>Altitude 80 m</td> </tr> <tr> <td>GMT 05:06:36</td> <td>Saturday, 25.10.2024</td> </tr> </table>	Latitude	Longitude	9° 27' 21.896" N	77° 53' 40.685" E	Local 10.56.56	Altitude 80 m	GMT 05:06:36	Saturday, 25.10.2024	 <p>FVMU+FTW, Ramaswamy Raja Nagar, Thammamayakkanpatti, Tutukudi (p), Tamil Nadu 626204, India</p> <table border="0"> <tr> <td>Latitude</td> <td>Longitude</td> </tr> <tr> <td>9° 27' 21.822" N</td> <td>77° 53' 49.86" E</td> </tr> <tr> <td>Local 10.57.36</td> <td>Altitude 80 m</td> </tr> <tr> <td>GMT 05:07:56</td> <td>Saturday, 25.10.2024</td> </tr> </table>	Latitude	Longitude	9° 27' 21.822" N	77° 53' 49.86" E	Local 10.57.36	Altitude 80 m	GMT 05:07:56	Saturday, 25.10.2024
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Ministry of Environment and Forests
(I.A. Division)

Handwritten signature and initials

Paryavaran Bhawan
CGO Complex, Lodhi Road
New Delhi – 110 003

E-mail : pb.rastogi@nic.in
Telefax : 011: 2436 7668
Dated 6th July, 2009

To, ✓
Vice President (Mfg.)
M/s Madras Cements Ltd
Ramasamy Raja Nagar Post
District Virudhunagar-626 204, Tamil Nadu

E-mail : nrs@madrascements.co.in / mcl_rm@yahoo.com ; Fax No. : 04562-256268 ;

Subject : Modernization and expansion of Ramasamy Raja Nagar Cement Plant (1 MTPA to 2 MTPA) at S.F. Nos. 4-16 Parts, Village Tulukkappatti, Taluk & District Virudhunagar, Tamil Nadu by M/s Madras Cements Ltd. – Environment clearance reg.

Ref. : Your letter no. nil dated 3rd February, 2009.

Sir,

Kindly refer your letter no. nil dated 3rd February, 2009 alongwith project documents including Form I, draft TOR and Pre-feasibility Report and subsequent clarifications furnished vide communications dated 13th March, 2009 regarding above mentioned cement project.

2.0 The Ministry of Environment and Forests has examined the application. It is noted that the proposal is for modernization and expansion of Ramasamy Raja Nagar Cement Plant (1 MTPA to 2 MTPA) at S.F. Nos. 4-16 Parts, Village Tulukkappatti, Taluk & District Virudhunagar, Tamil Nadu by M/s Madras Cements Ltd. Existing cement plant is located in 37.47 ha. and no additional land will be required for the expansion. No national Park/wild life sanctuary/reserve forest is located within 10 km radius of the project site. Total cost of the proposed expansion and modernization is Rs. 177.00 Crores. Existing and proposed production capacities will be as given below:

Line	Existing			Proposed		
	Kiln Capacity (TPD)	Clinker (MTPA)	Cement (MTPA)	Kiln Capacity (TPD)	Clinker (MTPA)	Cement (MTPA)
Line-I	1200	0.39	0.55	1800	0.61	0.90
Line-II	1000	0.32	0.45	1400	0.48	0.70
					0.28*	0.40
Total		0.71	1.00		1.37	2.00

* Clinker from other units of M/s Madras Cements Ltd. or imported.

3.0 Proposed modernization and expansion will involve:

- i. Replacement/up gradation of old line-I by replacing 1,200 TPD kiln with 1,800 TPD kiln.
- ii. Modernization of line-II by up gradation of pre-heater cyclone and cooler ESP and replacement of kiln ESP with Reverse Air Bag House.
- iii. Cement production enhancement (1.0 MTPA to 2.0 MTPA) by addition of a 0.30 MTPA cement mill and concrete clinker silos to control fugitive emissions.
- iv. Raw mill VRM pre-grinder introduction.
- v. VRMP optimization measures.
- vi. Truck unloading facility with truck tippler arrangement.
- vii. Packers and wagon loading improvement measures and cement bulk loading arrangements.
- viii. Addition of cement mill (0.3 MTPA) for cement grinding enhancement.
- ix. Increasing the plant operational hours from 322 days to 345 days to achieve 2.0 MTPA Cement production.
- x. Enhancement of cement production to 2.0 MTPA by increasing the blended cements in the total production.
- xi. Installation of captive DG set (1x7 MW) for stand-by usage.

4.0 Electrostatic precipitators (ESPs) to clinker cooler, bag house to kiln/raw mill, coal mill, cement mill etc. shall be provided to control air emissions < 50 mg/m³. Bag filters and dust suppression measures will be provided to control fugitive emissions. Total water requirement from Arjuna River will be 900 KLD and permission for the drawl of 1,500 KLD water has been accorded vide Tamil Nadu State Government's G.O. No. 1445/PWD dated 04.10.1975. The water will also be sourced from MCL's mine pits in Pandalgudi region. All the treated effluent from the cement plant will be recycled/reused for cooling, dust suppression and green belt development. Dust collected from the various air pollution control devices shall be recycled in the process.

5.0 Public hearing / consultation is exempted u/s 7(ii) of EIA Notification, 2006.

6.0 The Ministry of Environment and Forests hereby accords environmental clearance to the above project under the provisions of EIA Notification dated 14th September, 2006 subject to strict compliance of the following specific and general conditions:

A. SPECIFIC CONDITIONS:

- i) Continuous stack monitoring facilities to monitor gaseous emissions from all the stacks shall be provided. After expansion, limit of SPM shall be controlled within 50 mg/Nm³ by installing adequate air pollution control system. Electrostatic precipitators (ESPs) to clinker cooler, bag house to kiln/raw mill, coal mill, cement mill etc. shall be provided to control air emissions < 50 mg/m³. Monitoring of ambient air quality and stack emissions shall be carried out regularly in consultation with TNPCB and data submitted to the Ministry's Regional Office at Bangalore, CPCB and Tamil Nadu Pollution Control Board (TNPCB) regularly.
- ii) Possibilities shall be explored for the proper and full utilization of gases generated from the kiln in waste heat recovery boiler (WHRB) and a feasibility report shall be prepared and submitted to the Ministry and its Regional Office at Bangalore within 3 months from the date of issue of the letter.
- iii) Data on ambient air quality, stack emissions and fugitive emissions shall be uploaded on the Company's website and also regularly submitted on-line to the

Ministry's Regional Office at Bangalore, Karnataka Pollution Control Board (KPCB) and Central Pollution Control Board (CPCB) as well as hard copy once in six months. Data on SPM, SO₂ and NO_x shall also be displayed prominently outside the premises at the appropriate place for the information of general public.

- iv) The company shall install adequate dust collection and extraction system to control fugitive dust emissions. Bag filters shall be provided at all the transfer points. The fugitive emissions during loading and unloading shall be suitably controlled. Fugitive emissions from raw material handling areas, loading/unloading points, hoppers, storage silos, weigh feeders, grinding mill and packing machines shall be controlled by providing silos and covered sheds for storage of raw materials, fully covered conveyors for transportation of materials etc. Water sprinklers shall also be provided to control fugitive emissions.
- v) Secondary fugitive emissions shall be controlled and shall be within the prescribed limits and regularly monitored. Guidelines / Code of Practice issued by the CPCB in this regard shall be followed.
- vi) Efforts shall be made to reduce impact of the transport of the raw materials and end products on the surrounding environment including agricultural land. All the raw materials including fly ash shall be transported in the closed containers only and shall not be overloaded. Vehicular emissions shall be regularly monitored.
- vii) Total water requirement from Arjuna River and mine pit after expansion shall not exceed 900 m³/day as per permission accorded vide Tamil Nadu State Government's GO 1446/PWD dated 04.10.1975 for the drawl of water and shall be renewed time to time as deemed fit. Permission of drawl of water from MCL's mine pits in Pandalgudi region shall be obtained from the concerned department, if necessary. No ground water shall be used. The liquid effluent from workshop and reverse osmosis (RO) plant shall be neutralized in neutralization tank and the treated effluent shall be used in cement plant for cooling, dust suppression and green belt development. No liquid effluent shall be discharged outside the premises and 'Zero' discharge shall be strictly followed. Domestic effluent shall be treated in sewage treatment plant (STP) and utilized for green belt development.
- viii) Solid waste viz. dust collected from the air pollution control equipments (ESP, bag house, bag filters etc.) shall be properly recycled and reutilized in the process itself for cement manufacturing. No solid waste shall be disposed off outside the factory premises. As proposed, solid waste from sewage treatment plant (STP) shall be vermin-composted and used as manure for green belt. Spent oil shall be used in the kilns as recommended by the Tamil Nadu Pollution Control Board (TNPCB) vide Authorization No. 2906/HWM/VNR/07 dated 04.07.2007.
- ix) An effort shall be made to use of high calorific hazardous waste in the cement kiln and necessary provision shall be made accordingly.
- x) Efforts shall be made to use low-grade lime, more fly ash and solid waste in the cement manufacturing.

- xi) All the fly ash shall be utilized as per Fly Ash Notification, 1999 subsequently amended in 2003. Efforts shall be made to use fly ash maximum in making Pozzolona Portland Cement (PPC).
- xii) As proposed, green belt shall be developed in 22 ha (34.67%) out of the total 63.45 ha. plant and township area to mitigate the effects of air emissions as per the CPCB guidelines in consultation of local DFO in a time bound manner.
- xiii) All the recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for the Cement plants shall be implemented.
- xiv) The company shall provide housing for construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

6. GENERAL CONDITIONS:

- i. The project authority shall adhere to the stipulations made by T.N. Pollution Control Board (TNPCB) and State Government.
- ii. No further expansion or modification of the plant shall be carried out without prior approval of this Ministry.
- iii. The gaseous and particulate matter emissions from various units shall conform to the standards prescribed by the T. N. Pollution Control Board. Continuous on-line monitors for particulate emissions shall be installed in stacks. Interlocking facility shall be provided in the pollution control equipment so that in the event of the pollution control equipment not working, the respective unit (s) is shut down automatically.
- iv. Ambient air quality monitoring stations (AAQM) stations shall be set up as per statutory requirement in consultation with the TNPCB. Ambient air quality including ambient noise levels shall not exceed the standards stipulated under EPA or by the State authorities. Monitoring of ambient air quality and shall be carried out regularly in consultation with TNPCB and data submitted to the Ministry's Regional Office at Bangalore, CPCB and TNPCB regularly. The instruments used for ambient air quality monitoring shall be calibrated time to time.
- v. The overall noise levels in and around the plant area shall be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under Environmental (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).
- vi. Rainwater harvesting measures shall be adopted. The company must also harvest the rainwater from the rooftops and storm water drains to recharge the ground water and use the same water for the various activities of the project to conserve fresh water.

- vii. The company shall undertake eco-development measures including community welfare measures in the project area.
- viii. Proper house keeping and adequate occupational health programmes shall be taken up.
- ix. A separate environmental management cell to carry out various management and monitoring functions shall be set up under the control of Senior Executive.
- x. As proposed, Rs. 1.50 Crores for the air pollution control measures; Rs. 2.50 Crores towards recurring cost/annum for environmental pollution control measures, Rs. 30.00 Lakhs and Rs. 25.00 Lakhs/annum for EMP/green belt development and occupational health measures and Rs. 50.00 Lakhs shall be earmarked for corporate social responsibility and used judiciously to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government. The funds so provided shall not be diverted for any other purpose.
- xi. The Regional Office of this Ministry at Bangalore / CPCB / TNPCE shall monitor the stipulated conditions. A six monthly compliance report and the monitored data alongwith statistical interpretation shall be submitted to them regularly.
- xii. The Project Authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.
- xiii. The project proponent shall submit six monthly report on the status of the implementation of the stipulated environmental safeguards including results of monitored data (both in hard copies as well as by e-mail) to the Ministry of Environment and Forests, its Regional Office, Bhubaneswar, Central Pollution Control Board and State Pollution Control Board. The project proponent shall upload the status of compliance of the environment clearance conditions including the results of monitored data on their website and update the same periodically.
- xiv. The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the T.N. Pollution Control Board and may also be seen at Website of the Ministry of Environment and Forests at <http://envfor.nic.in>. This should be advertised within seven days from the date of issue of the clearance letter at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the Regional office at Bangalore.
- xv. A copy of clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parishad / Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestions / representations, if any, were received while processing the proposal. The clearance letter shall also be put on the web site of the company by the proponent.
- xvi. The State Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industry Centre and the Collector's Office / Tehsildar's Office for 30 days.

7.0 The Ministry or any other competent authority may stipulate any further condition(s) on receiving reports from the project authorities. The above conditions shall be monitored by the Regional Office of this Ministry located at Bangalore.

8.0 The Ministry may revoke or suspend the clearance if implementation of any of the above conditions is not satisfactory.

9.0 Any other conditions or alteration in the above conditions shall have to be implemented by the project authorities in a time bound manner.

10.0 Any appeal against this environmental clearance shall lie with the National Environment Appellate Authority, if preferred within a period of 30 days as prescribed under Section 11 of the National Environment Appellate Act, 1997.

11.0 The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention and Control of Pollution) Act, 1974 the Air (Prevention and Control of Pollution) Act, 1981 the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules.


(Dr. P. B. Rastogi)
Director

Copy to:

1. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD-cum-Office Complex, East Arjun Nagar, Delhi-110 032.
2. The Chairman, Tamil Nadu Pollution Control Board, 100, Anna Salai, Guindy, Chennai - 600 032, Tamil Nadu.
3. The Chief Conservator of Forests (Central), Regional Office (SZ), Kendriya Sadan, IVth Floor, E & F Wings, 7th Main Road, IInd Block, Koramangala, Bangalore- 560 034, Karnataka.
4. The Secretary (Environment), Govt. of Tamil Nadu, Fort. St. George, Chennai- 560 560, Tamil Nadu.
5. Monitoring Cell, Ministry of Environment and Forests, Paryavaran Bhavan, CGO Complex, New Delhi.
6. Guard File.
7. Monitoring File.
8. Record File.


(Dr. P. B. Rastogi) *et al*
Director

F. No. J-11011/119/2009-IA-II(I)

Government of India

Ministry of Environment, Forest and Climate Change
(Impact Assessment Division)Indira Paryavaran Bhawan
Jor Bagh Road, Aliganj,
New Delhi - 110003
E-mail: sharath.kr@gov.in
Tel: 011-24695319Dated: 29th November, 2017

To

✓ M/s The Ramco Cements Limited
(Formerly Madras Cement Ltd.)
Village Tulukkapatti, Taluk & District Virudhunagar,
Tamil Nadu.

Subject: Addition of 3rd Packer Proposal in RCL Ramasamyraja Nagar Cement Plant Located at Village Tulukkapatti, Taluk & District Virudhunagar, Tamil Nadu by M/s The Ramco Cements Limited – **Environmental Clearance under clause 7(ii) of EIA Notification, 2006 regarding.**

Sir,

This has reference to your online application vide proposal no. IA/TN/IND/67801/2017, dated 31st August 2017 seeking environmental clearance under the provisions of Clause 7(ii) of the EIA Notification, 2006 for the proposed addition of 3rd Packer without increase in Clinker or Cement Production capacity for improving the Despatch Schedule at above mentioned project. The proposed project activity is listed at Sl. No. 3(b) Cement Plants under category 'A' of the Schedule of EIA Notification, 2006 and the proposal is appraised at the Central Level.

2.0 M/s The Ramco Cements Limited has expanded Cement Plant during 2009-10 and obtained Environmental Clearance vide F. No. J-11011/119/2009 IA.II(I) dated 06.07.2009 for a Clinker production of 1.097 MTPA and the Cement production of 2.00 MTPA. The certificate of compliance of earlier EC was obtained vide MoEF&CC, Regional Office Letter EP 12.1/867/TN/0591 dated 12.04.2017. No non-compliances were reported by Regional officer.

3.0 It was reported that the Consents to Operate (CTOs) from the Tamil Nadu Pollution Control Board (TNPCB) are obtained and renewed (RCTOs) periodically. RCTOs for the Cement Plant are 160824725855 (Air Act) & 160814725855 (Water Act) dated 02.08.2016 and for CPP are 160824727889 (Air Act) & 160814727889 (Water Act) dated 06.09.2016.

4.0 It was reported that RCL is manufacturing OPC and PPC cements at RR Nagar and dispatching by two double discharge packers with the capacity of 180 TPH each. There are 4 RCC Silos for storing the cement. The existing wagon loading system for cement is sufficient for load only 5 wagons at a time and it consumes more time for loading full racks. As per new Railway Loading Norms, the full rack (40 boxes) shall be loaded within 9 hours or otherwise it attracts heavy demerger charges and hampers future allotment of wagons by the Railway. The existing packers (2 Nos.) capacity is not sufficient to load full rack within 9 hours' time and thus, it requires to add 3rd Packer of 120 TPH capacity. The addition of 3rd packer will help to manage efficiently to load different grades of Cement with different

types of packing material at a time which will also reduce the Trucks' Turnaround time and improve the dispatch logistics. Therefore, RCL is establishing a modernized Ware House at Tamil Nadu-Kerala Border to distribute cement in time to dealers in Kerala. Thus, it needs a Palletizing Unit with loading facility along with 3rd Packer proposal.

5.0 As such, RCL is proposing the addition of 3rd Packer of 120 TPH capacity, a dedicated 1000 Tons Steel Silo for Cement storage in addition to the existing 4 Nos. RCC Silos, the modification of extraction system in such a way that any packer can get cement from any silo, extending the existing wagon loading platform and loading shed for 700 m and a Palletizing Unit.

6.0 There is no increase in Clinker or Cement Production capacity; no additional water demand; no additional effluent generation; and no solid waste generation due to proposed addition of 3rd Packer. Air Pollution Control Devices has been installed and particulate matter levels will be <30 mg/Nm³ from the Plant.

7.0 In the total extent of 70.96 Ha, an effective Green Belt has been developed in 25.00 Ha (35.23% Coverage) and maintained within the Plant and Township. Rain water is being harvested as Roof Top Collection in sumps and used as a raw water source. Surface Runoffs from Plant and Township are connected to a Storage Ponds and used for Green Belt development.

8.0 The proposal was considered by the Expert Appraisal Committee (Industry-I) during its 23rd meeting held on 9th to 10th October 2017. After detailed deliberations, the committee recommended the proposal for grant of Environmental Clearance subject to specific conditions along with other environmental conditions while considering for accord of Environmental Clearance by the ministry.

9.0 The Ministry of Environment, Forest and Climate Change has considered the application based on the recommendations of the Expert Appraisal Committee (Industry-I) and hereby decided to grant Environmental Clearance for Addition of 3rd Packer Proposal in RCL Ramasamyraja Nagar Cement Plant located at Village Tulukkapatti, Taluk & District Virudhunagar, Tamil Nadu by M/s The Ramco Cements Limited under clause 7(ii) of EIA Notification, 2006, as amended, subject to strict compliance of the following Specific conditions:

- i. The proposed Filter bag house for the 3rd packer shall be designed for 150% of the air flow rate. The filter bag shall be PTFE dipped PPS type
- ii. The project proponent shall carry out plantation on an additional area of 8 Ha with native species *inter alia* including plantation covering entire boundary.
- iii. The PP shall take suitable measures for control of fugitive dust.
- iv. No change in the scope of the project shall be made without prior approval of the ministry.
- v. All the conditions prescribed in the environmental clearance letter No F, No. J-11011/119/2009 IA.II(I) dated 06.07.2009 shall be strictly complied with.

10.0 The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.

11.0 The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.

12.0 The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report and that during their presentation to the EAC.


13.0 The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and rules.

This issues with the approval of Competent Authority.


(Sharath Kumar Pallerla)
Scientist 'F' / Director

Copy to:-

1. **The Secretary**, Department of Environment, Government of Tamil Nadu, Chennai.
2. **The Additional Principal Chief Conservator of Forests(C)**, Ministry of Environment, Forest and Climate Change, Regional Office (SEZ), 1st and 11th Floor, Handloom Export Promotion Council, 34, Cathedral Garden Road, Nungambakkam, Chennai - 34.
3. **The Chairman**, Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar, Delhi-110032.
4. **The Chairman**, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai- 600 032, Tamil Nadu.
5. **The Member Secretary**, Central Ground Water Authority, A-2, W3, Curzon Road Barracks, K.G. Marg, New Delhi-110001.
6. **The District Collector**, Virudhunagar District, Tamil Nadu.
7. **Guard File / Record file / Monitoring file.**
8. **MOEF&CC Website.**


(Sharath Kumar Pallerla)
Scientist 'F'/Director

ENVIRONMENTAL
CLEARANCE

**Government of India
Ministry of Environment, Forest and Climate Change
(Impact Assessment Division)**

To,

The President

RAMCO CEMENTS ENVIRONMENT

The Ramco Cements Limited 5th Floor Auras Corporate Centre 98A Dr
Radhakrishnan Road Mylapore Chennai 60004,,Chennai,Tamil Nadu-
600004

Subject: Grant of Environmental Clearance (EC) to the proposed Project Activity
under the provision of EIA Notification 2006-regarding

Sir/Madam,

This is in reference to your application for Environmental Clearance (EC)
in respect of project submitted to the Ministry vide proposal number
IA/TN/IND/220866/2020 dated 15 Sep 2021. The particulars of the environmental
clearance granted to the project are as below.

- | | |
|---|--|
| 1. EC Identification No. | EC21A009TN169325 |
| 2. File No. | J-11011/119/2009.IA.II(I) |
| 3. Project Type | Modernization |
| 4. Category | A |
| 5. Project/Activity including
Schedule No. | 3(b) Cement plants |
| 6. Name of Project | Proposed Modernization & Expansion of
Ramasamy Raja Nagar Cement Plant
(proposed production Clinker 1.44 MTPA
& Cement 2.70 MTPA) |
| 7. Name of Company/Organization | RAMCO CEMENTS ENVIRONMENT |
| 8. Location of Project | Tamil Nadu |
| 9. TOR Date | 11 Nov 2020 |

The project details along with terms and conditions are appended herewith from page
no 2 onwards.

Date: 25/10/2021

(e-signed)
Sundar Ramanathan
Scientist E
IA - (Industrial Projects - 1 sector)

*Note: A valid environmental clearance shall be one that has EC identification
number & E-Sign generated from PARIVESH. Please quote identification
number in all future correspondence.*

This is a computer generated cover page.



This refers to your proposal no. **IA/TN/IND/220866/2020** dated **15/09/2021** through Parivesh Portal for grant of **Environmental Clearance (EC)** for the project mentioned above.

2. As per the provisions of the Environment Impact Assessment (EIA) Notification, 2006, the above-mentioned project/activity is listed at schedule no. 3 (b) Cement Plants under Category "A" of the schedule of the EIA notification, 2006 and appraised at Central level.
3. Accordingly, the above-mentioned proposal has been considered by the **Re-constituted EAC (Industry-I)** in its **45th meeting held on 28th-29th September, 2021**. The minutes of the meeting and all the project documents are available on PARIVESH portal which can be accessed at <https://parivesh.nic.in/>.
4. The details of the proposal are as per the EIA report submitted by the proponent. The salient features of the expansion proposal as presented during the above-mentioned meeting of EAC (Industry: I) are as under: -

S.No.	Particulars	Details
a.	Terms of Reference for undertaking EIA study	11/11/2020
b.	Period of baseline data collection	December 2019 - February 2020
c.	Date of Public Consultation	16/06/2021
d.	Action plan to address the PH issues	In addition to EMP budget of Rs. 14.2 Crores (capital cost), an amount of Rs. 1277.84 lakhs have been earmarked to address the issues raised during public consultation and the issues based on Social Impact Assessment (SIA) conducted.
e.	Location of the project	Tulukkappatti, Thammanayakkanpatti & Vachchakarapatti Villages Taluk & District Virudhunagar, Tamil Nadu.
f.	Latitude and Longitude of the project site	Latitude : 09°26'57" to 09°27'47" North Longitude : 77°55'05" to 77°55'56" East
g.	Total land	191.434 ha (Existing Land: 191.434 ha + expansion Land: 0.00 ha)
h.	Land acquisition details as per MoEF&CC O.M. dated 7/10/2014	Proposed expansion will be carried out within the existing project area of 191.434 ha. No additional land is required for the proposed expansion and modification.
i.	Existence of habitation & involvement of R&R, if any	No R&R involved.
j.	Elevation of the project site	73-89 m AMSL
k.	Involvement of Forest land if any.	No Forest Land is involved
l.	Water body exists within the project site as well as study area	Project area: Nil Study Area: Seasonal Arjuna River: 0.3 km in WSW) and Mannarkottai River: 2.0 km in Northeast)
m.	Existence of ESZ / ESA / national park / wildlife Sanctuary /	NIL

S.No.	Particulars	Details
	biosphere Reserve / tiger reserve / elephant reserve etc. if any within the study area	
n.	Project cost	INR 300 Crores
o.	EMP cost	INR 14.2 Crores [INR 9.20 Crores (existing) and INR 5.00 Crores (proposed expansion)]
p.	Employment opportunity	465 Nos
q.	Water and Power requirement	Water – 1180 m ³ /day (Existing), 1000 m ³ /day (Proposed) Power – 22.34 MW (Existing), 33 MW (Proposed)

Unit configuration and capacity:

S No	Name	Existing Units		Proposed Units		Total (Existing + Proposed)	
		Configuration	Production, MTPA	Configuration	Production, MTPA	Configuration	Production, MTPA
1	Clinker	Lines I&II	1.09	Lines I&II	0.35	Lines I&II	1.44
2	Cement	Lines I&II	2.00	Lines I&II	0.70	Lines I&II	2.70

5. The Re-constituted EAC (Industry-I) EAC in its 45th meeting held on 28-29th September, 2021, based on information & clarifications provided by the project proponent and after detailed deliberations recommended the proposal for grant of Environment Clearance subject to stipulation of specific and general conditions as detailed in the paragraph given below.

6. The MoEF&CC has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the Expert Appraisal Committee (Industry-I) hereby decided to grant Environment Clearance for instant proposal of **M/s. The Ramco Cements Limited** under the provisions of EIA Notification, 2006 subject to the following specific conditions and general conditions:

A. Specific conditions

- i. Project proponent shall obtain Environment Clearance from the Competent Authority for proposed township expansion.
- ii. The 800 KLD water requirement for the project shall be met from ground water resource and 1000 KLD of water shall be met from Arjuna River. In the next three years from the date of issue of this EC, PP shall switch over to use of treated sewage and harvested rain water to meet 100 % of its ground water requirement as committed. Thereafter, no groundwater withdrawal will be permitted.
- iii. Waste oil generated from the existing and proposed cement plant expansion shall not be used as fuel in the kiln. It shall be handed over to the authorized recyclers in compliance to the provisions specified in Hazardous and Other Waste (M&TM) Rules, 2016.
- iv. 64.50 ha of land shall be developed into green belt with a tree density of 2500 trees per ha in a time frame of three years from date of grant of EC. This shall also include (i) land scape development without disturbing the natural stream and green belt development in southern part of the project site wherein two blocks are discontinued by a natural stream and (ii) green belt development with a width of

30 meters within the project site towards the villages namely Thammanaickenpatti (0.2 km in N), Vachchakampatti (0.2 km in NNE) and Tulukkappatti (0.5 km in SE). In addition to this, gap filling shall be done in existing green belt developed area where tree density is only 1906 trees per ha.

- v. Particulate matter emissions from the existing and revamped production units shall be less than 20 mg/Nm^3 as committed by proponent.
- vi. Petcoke dosing shall be controlled automatically to control SO_2 emission from chimney within the prescribed limits.
- vii. Co-processing of paint sludge and Oily sludge as done presently shall be continued. Dioxin and furans shall be monitored twice a year and report shall be submitted to the Regional Office of the MoEF&CC.
- viii. Project proponent shall develop rainwater harvesting system as per the action plan submitted in order to achieve the gradual shifting of ground water usage in next three years from the date of issue of this EC.

B. General conditions

I. Statutory compliance:

- i. The Environment Clearance (EC) granted to the project/ activity is strictly under the provisions of the EIA Notification, 2006 and its amendments issued from time to time. It does not tantamount/ construe to approvals/ consent/ permissions etc., required to be obtained or standards/conditions to be followed under any other Acts/Rules/Subordinate legislations, etc., as may be applicable to the project.

II. Air quality monitoring and preservation

- ii. The project proponent shall install 24x7 Continuous Emission Monitoring System (CEMS) at process stacks to monitor stack emission as well as 4 Nos. Continuous Ambient Air Quality Station (CAAQS) for monitoring AAQ parameters with respect to standards prescribed in Environment (Protection) Rules 1986 as amended from time to time. The CEMS and CAAQMS shall be connected to SPCB and CPCB online servers and calibrate these systems from time to time according to equipment supplier specification through labs recognized under Environment (Protection) Act, 1986 or NABL accredited laboratories.
- iii. The project proponent shall monitor fugitive emissions in the plant premises at least once in every quarter through labs recognized under Environment (Protection) Act, 1986.
- iv. The project proponent shall provide leakage detection and mechanized bag cleaning facilities for better maintenance of bags.
- v. The project proponent shall ensure covered transportation and conveying of ore, coal and other raw material to prevent spillage and dust generation; Use closed bulkers for carrying fly ash;
- vi. The project proponent shall provide wind shelter fence and chemical spraying on the raw material stock piles;
- vii. Ventilation system shall be designed for adequate air changes as per the prevailing norms for all tunnels, motor houses, and cement bagging plants.

III. Water quality monitoring and preservation

- i. The project proponent shall install 24x7 continuous effluent monitoring system with respect to standards prescribed in Environment (Protection) Rules 1986 vide G.S.R. No. 612 (E) dated 25th August, 2014 (Cement) and subsequent amendment dated 9th May, 2016 (Cement) and 10th May, 2016 (in case of Co-processing Cement) as

amended from time to time, S.O. 3305 (E) dated 7th December 2015 (Thermal Power Plants) as amended from time to time) and connected to SPCB and CPCB online servers and calibrate these system from time to time according to equipment supplier specification through labs recognized under Environment (Protection) Act, 1986 or NABL accredited laboratories.

- ii. The project proponent shall regularly monitor ground water quality at least twice a year (pre- and post-monsoon) at sufficient numbers of piezometers/sampling wells in the plant and adjacent areas through labs recognized under Environment (Protection) Act, 1986 and NABL accredited laboratories.
- iii. Sewage Treatment Plant shall be provided for treatment of domestic wastewater to meet the prescribed standards.
- iv. Garland drains and collection pits shall be provided for each stock pile to arrest the run-off in the event of heavy rains and to check the water pollution due to surface run off.
- v. Water meters shall be provided at the inlet to all unit processes in the cement plant.
- vi. The project proponent shall make efforts to minimize water consumption in the cement plant complex by segregation of used water, practicing cascade use and by recycling treated water.

IV. Noise monitoring and prevention

- i. Noise quality shall be monitored as per the prescribed Noise Pollution (Regulation and Control) Rules, 2000 and report in this regard shall be submitted to Regional Officer of the Ministry as a part of six-monthly compliance report.

V. Energy Conservation measures

- i. Waste heat recovery system shall be provided for kiln and cooler.
- ii. The project proponent makes efforts to achieve power consumption less than 65 units/ton for Portland Pozzolona Cement (PPC) and 85 units/ton for Ordinary Portland Cement (OPC) production and thermal energy consumption of 670 Kcal/Kg of clinker.
- iii. Provide solar power generation on roof tops of buildings, for solar light system for all common areas, street lights, parking around project area and maintain the same regularly.
- iv. Provide the project proponent for LED lights in their offices and residential areas.

VI. Waste management

- i. Used refractories shall be recycled as far as possible.

VII. Green Belt

- i. The project proponent shall prepare GHG emissions inventory for the plant and shall submit the program for reduction of the same including carbon sequestration by trees in the plant premises.

VIII. Public hearing and Human health issues

- i. Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.
- ii. The project proponent shall carry out heat stress analysis for the workmen who work in high temperature work zone and provide Personal Protection Equipment (PPE) as per the norms.

- iii. Occupational health surveillance of the workers shall be done on a regular basis and records maintained.

IX. Environment Management

- i. The project proponent shall comply with the provisions contained in this Ministry's OM vide F.No. 22-65/2017-IA.III dated 30/09/2020.
- ii. The company shall have a well laid down environmental policy duly approved by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest / wildlife norms / conditions. The company shall have defined system of reporting infringements / deviation / violation of the environmental / forest / wildlife norms / conditions and / or shareholders / stake holders. The copy of the board resolution in this regard shall be submitted to the MoEF&CC as a part of six-monthly report.
- iii. A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly report to the head of the organization.

X. Miscellaneous

- i. The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently.
- ii. The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.
- iii. The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.
- iv. The project proponent shall monitor the criteria pollutants level namely: PM₁₀, SO₂, NO_x (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects and display the same at a convenient location for disclosure to the public and put on the website of the company.
- v. The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the ministry of Environment, Forest and Climate Change at environment clearance portal.
- vi. The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.
- vii. The project proponent shall inform the Integrated Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.
- viii. The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during public hearing and also that during their presentation to the Expert Appraisal Committee.

- ix. No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change (MoEF&CC).
- x. Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.
- xi. The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.
- xii. The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.
- xiii. The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.
- xiv. Any appeal against this EC shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

7. This issues with the approval of the Competent Authority.


(Sundar Ramanathan)
Scientist 'E'

Copy to:-

1. Secretary, Department of Environment, Government of Tamil Nadu Secretariat, Chennai.
2. Regional Officer, Ministry of Environment, Forest and Climate Change, Regional Office (SEZ), Ist and IInd Floor, Handloom Export Promotion Council, 34, Cathedral Garden Road, Nungambakkam, Chennai - 34.
3. Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
4. Chairman, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai- 600 032, Tamil Nadu.
5. Member Secretary, Central Ground Water Authority, West Block -II, Wing -3, Sector I, R.K.Puram, New Delhi - 110086.
6. District Collector, District Virudhunagar, Government of Tamil Nadu.
7. Guard File/Record File/Monitoring File.
8. MoEF&CC Website


(Sundar Ramanathan)
Scientist 'E'

Signature Not Verified

Digitally signed by Sundar
Ramanathan
Scientist E

Date: 10/25/2021 5:42:03 PM



TAMILNADU POLLUTION CONTROL BOARD
CONSENT ORDER No: 5204 (Expansion)/DATED:03.12.2009

PROCEEDINGS NO: T6/TNPCB/F-38120/VDR/RL/W/2009 DATED : 03.12.2009

Sub: TNPC Board-Consent for Establishment – **M/s. Madras Cements Limited.,**
S.F. No.6.9 & 10 Thulukkappatti Village, Virudhunagar Taluk, Virudhunagar
District– for establishment or take steps to establish the industry under Section
25 of the Water (Prevention and Control of Pollution) Act, 1974, as
amended in 1988 (Central Act 53 of 1988) **(For enhanced capacity).**

Ref: 1. Your Application No: 0922 dated: 29.07.2009.
2. IR No: F.VDR0001/RL/DEE/VDR/2009 dt: 10.09.2009.
3. Sub Committee meeting held on 24.11.2009 vide TSC Item No: 47-07

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

The Vice President (Mfg),
M/s. Madras Cements Limited

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

S. F. No.6,9 & 10 Thulukkappatti Village,
Virudhunagar Taluk,
Virudhunagar District



TAMILNADU POLLUTION CONTROL BOARD

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

Sd /-xxxxxx,
MEMBER SECRETARY.

To

✓ The Vice President (Mfg),
M/s.Madras Cements Limited,
Ramasamyraja Nagar,
Virudunagar District
Pin: 626 204.

Copy to:

1. The District Environmental Engineer,
Tamil Nadu Pollution Control Board,
Virudunagar District.
2. The Commissioner,
Virudunagar Panchayat Union,
Virudunagar District.
3. BMS
4. Technical File.

//Forwarded By Order//

[Handwritten Signature]
for MEMBER SECRETARY.

L.G.8.12.09



TAMILNADU POLLUTION CONTROL BOARD
SPECIAL CONDITIONS

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

Sl No	Description	Quantity /Month
	Products : Cement	6200 T/day(or) 2.0 MTPA
	Byproduct	(With addition of 0.30 MTPA Cement Mill)

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

Outlet No.	Description of Outlet	Maximum daily discharge in KLD	Point of disposal
01.	Sewage	100.00	On Industry's own land for gardening
02.	Trade effluent	10.00	Reused for equipment cooling

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

Sl No.	Name of the treatment unit	Dimension in M	No. of units
01.	STP: Bar screen FAB Reactors Tube Settler Chlorine Contact Tank Sludge Drying beds	- 1.3 m dia x 6.0m 1.90x1.90x3.84m 1.30x3.90x1.0m 5.0 x 5.0m	1 No 2 Nos 1 No 1 No 2 Nos
02.	ETP: Neutralization tank	Adequate size	



TAMILNADU POLLUTION CONTROL BOARD

CONSENT ORDER NO:5145/(Expansion)DATED:03.12.2009

PROCEEDINGS NO: T6/TNPCB/F-38120/VDR/RL/A/2009 DATED : 03.12.2009

Sub: TNPC Board-Consent for Establishment – **M/s. Madras Cements Limited.,**
S.F. No.6,9 & 10 Thulukkapatti Village, Virudhunagar Taluk, Virudhunagar
District - for the establishment or take steps to establish the industry under
Section 21 of the Air (Prevention and Control of Pollution) Act, 1981, as
amended in 1987. **(for enhanced capacity).**

Ref: 1. Your Application No: 1922 dated: 29.07.2009.
2. IR No: F.VDR0001/RL/DEE/VDR/2009 dated: 10.09.2009.
3. Sub Committee meeting held on 24.11.2009 vide TSC Item No: 47-07.

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

The Vice President (Mfg),
M/s. Madras Cements Limited

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

S. F. No.6,9 & 10 Thulukkapatti Village,
Virudhunagar Taluk,
Virudhunagar District



TAMILNADU POLLUTION CONTROL BOARD

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

Sd /-xxxxxx,
MEMBER SECRETARY.

To

The Vice President (Mfg),
M/s.Madras Cements Limited,
Ramasamyraja Nagar,
Virudunagar District
Pin: 626 204.

Copy to:

1. The District Environmental Engineer,
Tamil Nadu Pollution Control Board,
Virudunagar District.
2. The Commissioner,
Virudunagar Panchayat Union,
Virudunagar District.
3. BMS
4. Technical File.

//Forwarded By Order//

[Signature]
for MEMBER SECRETARY.

[Signature]
10/12

IG.R.12.09



TAMILNADU POLLUTION CONTROL BOARD
SPECIAL CONDITIONS

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

Sl. No	Description	Quantity /Month
	Products : Cement	6200 T/day (or) 2.0 MTPA
	Byproduct	(With addition of 0.30 MTPA Cement Mill)

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

Sl. No	Source	Air pollution Control measures	Stack height in m	Additional facilities to be provided	Maximum discharge in m ³ /Hr
01.	Point source]	Enclosed in Annexure			
02.	Fugitive]				
03.	Noise	Adequate acoustic measures to be provided in the Industrial plant.			

3. **Additional conditions:**

1. The unit shall provide adequate Air Pollution Control measures to all the sources of emission as reported before commissioning of expansion so as to achieve the Ambient Air Quality / Emission standards prescribed by the Board.



TAMILNADU POLLUTION CONTROL BOARD

CONSENT ORDER No.18354 DATED 03.01.2011

Proceedings No.T6/TNPCB/F-5747/VDR/RL/A/2011 Dated 03.01.2011

Consent for New operation of the plant under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended (Expansion)

Sub: TAMIL NADU POLLUTION CONTROL BOARD – CONSENT – M/s. **MADRAS CEMENTS LIMITED**, Cement Plant, S.F. No.6,9 & 10, Thulukkapatti Village, Virudhunagar Taluk, Virudhunagar District - for the New operation of the plant under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended.

- Ref:** 1. Your Application No.0922 Dated 29.07.2009.
2. Proc. No.T6/TNPCB/F-38120/VDR/RL/A/2009 Dated 03.12.2009.
3. I.R. No.F-VDR-0001/URL/DEE/VDR/2010 Dated 20.10.2010.
4. CCC Item No.107-14 Dated 28.12.2010.

CONSENT is hereby granted under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended. (Central Act, 14 of 1981) as amended (hereinafter referred to as 'The Act') and the rules and orders made there under to

The Vice President (Manufacturing),
M/s. **Madras Cements Limited**,
Cement Plant,
S.F. No.6,9 & 10, Thulukkapatti Village,
Virudhunagar Taluk,
Virudhunagar District.

(hereinafter referred to as 'The Applicant') authorising him to operate his industrial plant in the Air Pollution Control Area as notified by the Government and to make new discharge of emission from the stacks/chimneys.



TAMILNADU POLLUTION CONTROL BOARD

This is subject to the provision of the Act and the rules and orders made there under and further subject to the terms and conditions incorporated in the Special and General Conditions annexed.

This **CONSENT** is valid for a period ending with the **31.03.2011**

Sd./- xxxxx
Member Secretary.

To/

✓ The Vice President (Manufacturing),
M/s. Madras Cements Limited,
Ramasamyraja Nagar,
Virudhunagar District,
Pincode: 626 204.

Copy to:

1. The District Environmental Engineer,
Tamil Nadu Pollution Control Board,
Virudhunagar District.
2. The Commissioner,
Virudhunagar Panchayat Union,
Virudhunagar District.
3. BMS.
4. Technical File.

/Forwarded by Order/


for Member Secretary.

2
19/01



TAMILNADU POLLUTION CONTROL BOARD

SPECIAL CONDITIONS

1. Details of the products manufactured

Sl. No	Description	Quantity/Month
	Products: Cement	6200 T/day (or) 2.00 MTPA (with addition of 0.30 MTPA Cement Mill)
	By-product:	---

This consent is valid for the manufacture of Products and the rate of production mentioned above. Any change in the quantity or quality of the products has to be brought to the notice of the Board and fresh Consent has to be obtained.

2. Emission is permitted through the following chimneys / stacks and shall not exceed the figures indicated:

Chimney / stack Number	Description of chimney / stack	Maximum discharge (in m ³ /hour)	Point of Discharge (Height) in metres
Enclosed in Annexure - I			

3. (a) The emissions shall not contain constituents in excess of the tolerance limits as laid down hereunder:

Sl. No.	Parameter	Unit	Tolerance limit for Chimney / Stack Number						
			1	2	3	4	5	6	
1	SO ₂	The unit shall comply with the standards prescribed by the Board from time to time.							
2	CO								
3	NO _x								
4	PM ₁₀								
			50 mg/Nm ³						



TAMILNADU POLLUTION CONTROL BOARD

CONSENT ORDER No.22318 DATED 03.01.2011

Proceedings No.T6/TNPCB/F-5747/VDR/RL/W/2011 Dated 03.01.2011

Consent for New discharge of sewage under section 25 of the Water (Prevention and Control of Pollution) Act, 1974, as amended

Sub: TAMIL NADU POLLUTION CONTROL BOARD – CONSENT – M/s. **MADRAS CEMENTS LIMITED**, Cement Plant, S.F. No.6,9 & 10, Thulukkapatti Village, Virudhunagar Taluk, Virudhunagar District - for the discharge of sewage under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 (Central Act, 6 of 1974) as amended.

Ref: 1. Your Application No.0922 Dated 29.07.2009.
2. Proc. No.T6/TNPCB/F-38120/VDR/RL/W/2009 Dated 03.12.2009,
3. I.R. No.F-VDR-0001/URL/DEE/VDR/2010 Dated 20.10.2010,
4. CCC Item No 107-14 Dated 28.12.2010.

CONSENT is hereby granted under Section 25 of the Water (Prevention and Control of Pollution Act, 1974 (Central Act 6 of 1974) as amended (hereinafter referred to as 'The Act') and the rules and orders made there under to

The Vice President (Manufacturing),
M/s. Madras Cements Limited,
Cement Plant,
S.F. No.6,9 & 10, Thulukkapatti Village,
Virudhunagar Taluk,
Virudhunagar District.

(hereinafter referred to as 'The Applicant') Authorizing him to make new discharge of sewage and trade effluent

I

POLLUTION PREVENTION PAYS

அகம் தூய்மை வாய்மைக்கு! புறம் தூய்மை வாழ்வுக்கு!



TAMILNADU POLLUTION CONTROL BOARD

This is subject to the provisions of the Act and the rules and orders made thereunder and further subject to the terms and conditions incorporated in the Special and General Conditions annexed.

This **CONSENT** is valid for a period ending with the **31.03.2011**

Sd./- xxxxx
Member Secretary.


To

The Vice President (Manufacturing),
M/s. Madras Cements Limited,
Ramasamyraja Nagar,
Virudhunagar District,
Pincode: 626 204.

Copy to:

1. The District Environmental Engineer,
Tamil Nadu Pollution Control Board,
Virudhunagar District.
2. The Commissioner,
Virudhunagar Panchayat Union,
Virudhunagar District.
3. BMS.
4. Technical File.

/Forwarded by Order/


for Member Secretary,





TAMILNADU POLLUTION CONTROL BOARD

SPECIAL CONDITIONS

1. Details of the products manufactured

Sl. No	Description	Quantity/Month
	Products: Cement	6200 T/day (or) 2.0 MTPA (with addition of 0.30 MTPA Cement Mill)
	By-product:	---

This consent is valid for the manufacture of Products and the rate of production mentioned above. Any change in the quantity or quality of the products has to be brought to the notice of the Board and fresh Consent has to be obtained.

2. Discharge of effluent is permitted from the following outlets. The quantity of effluent discharged shall not exceed the figures mentioned below:

Outlet Number	Description of Outlet	Maximum Discharge (in litres/day)	Point of Disposal
1.	Sewage	100000	On Industry's own land for gardening and cooling purposes
2.	Trade Effluent.	Nil	Does not arise

3. The effluent discharge shall not contain constituents in excess of the tolerance limits as laid down hereunder.

Serial Number	Characteristics	Unit	Tolerance Limits	
			Outlet No.	
1	2	3	4	
			1	
1.	pH	Number	5.5 - 9.0	
2.	Temperature	°C		
3.	Particles size of Total Suspended solids	mm/micron		
4.	Total Suspended Solids	mg/l	30	



TAMILNADU POLLUTION CONTROL BOARD

RENEWAL OF CONSENT ORDER No.16831

Proceeding No.T6/TNPCB/F-5747/VNR/RL/A/2011 Dated 09.05.2011

Consent for Existing operation of the plant under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981

Sub: TAMIL NADU POLLUTION CONTROL BOARD - RENEWAL OF CONSENT - M/s. **MADRAS CEMENTS LIMITED**, Ramasamy Raja Nagar, R.S. No.4,5,6,9,10,etc of Thulukkapatti Village, Virudunagar Taluk, Virudunagar District - for the existing Operation of the plant under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981.

- Ref:** 1 Proc. No.T6/TNPCB/F-5747/VNR/A/2009 Dated 23.04.2009.
2. Proc. No.T6/TNPCB/F-5747/VNR/A/2010 Dated 10.05.2010.
3. I.R. No F-VDR-0001/RL/DEE/VDR/2011 Dated 12.04.2011

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

The Senior General Manager,
M/s. **Madras Cements Limited**,
Ramasamy Raja Nagar
R.S.No. 4,5,6,9,10,etc of Thulukkapatti Village,
Virudunagar Taluk,
Virudunagar District.

(herein after referred to as "The Applicant") authorizing him /them to operate his/her, their industrial plant in the air pollution control area as notified by the Government and to continue to make existing discharge emissions from the stacks / chimneys.

This is subject to the provisions of the Act, And the rules and order made there under and further subject to the terms and conditions incorporated under the Special and General conditions stipulated in the Consent Order issued in this Office Proceedings cited above and subject to the following conditions:

1

POLLUTION PREVENTION PAYS

அகம் தூய்மை வாய்மைக்கு! புறம் தூய்மை வாய்மைக்கு!



TAMILNADU POLLUTION CONTROL BOARD

1. The unit shall operate all the Air Pollution Control measures efficiently and continuously so as to achieve the revised emission Ambient Air Quality standards as per Ministry of Environment and Forest.
2. The unit shall connect the online stack monitoring system to CARE AIR CENTRE before 31.05.2011 and report to the Board.
3. The unit shall store the raw materials in a closed shed.
4. The unit shall improve the Air Pollution Control measures to arrest the fugitive emission in the coal, clinker and cement handling area.
5. The unit shall improve the house keeping.

The **CONSENT** is valid for the period ending **31.03.2012**

(Thirty First March Two Thousand and Twelve)

தமிழ்நாடு

Sd./- xxxxx
Chairman.

To

✓
The Senior General Manager,
M/s. Madras Cements Limited,
Ramasamyraja Nagar Post,
Virudunagar District – 626 204

Copy to:

1. The District Environmental Engineer,
Tamil Nadu Pollution Control Board,
Virudunagar District.
2. The Commissioner,
Thulukkapatti Panchayat Union,
Virudunagar District.
3. BMS.
4. Technical File.

/Forwarded by Order/

for Chairman.

ET/18.05.11



TAMILNADU POLLUTION CONTROL BOARD

RENEWAL OF CONSENT ORDER No.20796

Proceeding No.T6/TNPCB/F-5747/VNR/RL/W/2011 Dated 09.05.2011

Consent for Existing discharge of sewage and trade effluents under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974.

Sub: TAMIL NADU POLLUTION CONTROL BOARD - RENEWAL OF CONSENT - M/s. **MADRAS CEMENTS LIMITED**, Ramasamy Raja Nagar, R.S. No 4,5,6,9,10,etc of Thulukkapatti Village, Virudunagar Taluk, Virudunagar District - Discharge of sewage and trade effluent under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 (Central Act, 6 of 1974).

Ref: 1 Proc. No.T6/TNPCB/F-5747/VNR/W/2009 Dated 23.04.2009
2 Proc. No.T6/TNPCB/F-5747/VNR/W/2010 Dated 10.05.2010.
3 I.R. No.F-VDR-0001/RL/DEE/VDR/2011 Dated 12.04.2011.

CONSENT is hereby granted under Section 25 of the Water (Prevention and control of Pollution) Act, 1974 (Central Act 6 of 1974) (herein after referred to as "The Act") and the rules and orders made there under to

The Senior General Manager,
M/s. **Madras Cements Limited**,
Ramasamy Raja Nagar,
R.S.No. 4,5,6,9,10,etc of Thulukkapatti Village,
Virudunagar Taluk,
Virudunagar District,

(herein after referred to as "The Applicant") authorizing him to continue to discharge of sewage and / or trade effluent.



TAMILNADU POLLUTION CONTROL BOARD

This is subject to the provisions of the Act. And the rules and order made there under and further subject to the terms and conditions incorporated under the Special and General conditions stipulated in the Consent Order issued in this Office Proceedings cited above and subject to the following conditions:

1. The unit shall ensure that no trade effluent is generated at any stage of the manufacturing process.
2. The unit shall improve house keeping.

The **CONSENT** is valid for the period ending **31.03.2012**

(Thirty First March Two Thousand and Twelve)

Sd./- xxxxx
Chairman.

To

The Senior General Manager,
M/s. Madras Cements Limited,
Ramasamyraja Nagar Post,
Virudunagar District - 826 204.

Copy to:

1. The District Environmental Engineer,
Tamil Nadu Pollution Control Board,
Virudunagar District.
2. The Commissioner,
Thulukkappatti Panchayat Union,
Virudunagar District.
3. BMS.
4. Technical File.

/Forwarded by Order/

for Chairman.

ET/18.05.11



TAMILNADU POLLUTION CONTROL BOARD

RENEWAL OF CONSENT ORDER No 20796

Proceeding No. T10/TNPCB/F-5747/VDR/URL/W/2013 Dated: 29.01.2013

Consent for Existing discharge of sewage and trade effluents under Section 25 of the Act 1974, Water (P & CP) Act, 1974 (Central Act. 6 of 1974)

**Sub: TAMIL NADU POLLUTION CONTROL BOARD - RENEWAL OF CONSENT -
M/s. Madras Cements Limited, Ramasamy Raja Nagar, R.S.No. 4, 5, 6, 9,
10, etc of Thulukkapatti Village, Virudunagar Taluk, Virudunagar District
- Discharge of sewage and trade effluent under Section 25 of the Water
(Prevention and Control of Pollution) Act, 1974 (Central Act. 6 of 1974).**

Ref: 1) Proc No.T6 /TNPCB/F-5747 /VNR/W/2010 Dt. 10.05.2010
2) Proc No.T6 /TNPCB/F-5747 /VNR/RL/W/2011 Dt. 09.05.2011
3) Proc No.T6 /TNPCB/F-5747 /VNR/URL/W/2012 Dt.29.06.2012

CONSENT is hereby granted under Section 25 of the Water (Prevention and control of Pollution) Act, 1974 (Central Act 6 of 1974) (herein after referred to as "The Act") and the rules and orders made there under to

**The Senior General Manager,
M/s. Madras Cements Limited,
Ramasamy Raja Nagar,
R.S.No. 4,5,6,9,10,etc of Thulukkapatti Village,
Virudunagar Taluk,
Virudunagar District**

(herein after referred to as "The Applicant") authorizing him to continue to discharge of sewage and trade effluent.

POLLUTION PREVENTION PAYS

அகம் தூய்மை வாய்மைக்கு! புறம் தூய்மை வாழ்வுக்கு!



TAMILNADU POLLUTION CONTROL BOARD

This is subject to the provisions of the Act. And the rules and order made there under and further subject to the terms and conditions incorporated under the Special and General conditions stipulated in the Consent Order issued in this Office Proceedings cited above

The **CONSENT** is valid for the period ending **31.03.2013**

(Thirty First March Two Thousand Thirteen)

Sd./-xxxxxxx;
Chairman

To

The Senior General Manager,
M/s. Madras Cements Limited,
Ramasamyraja Nagar Post,
Virudunagar District -626 1204

Copy to :-

1. The District Environmental Engineer,
Tamilnadu Pollution Control Board
Virudunagar District
2. The Commissioner,
Thulukkapatti Panchayat Union,
Virudunagar District.
3. BMS
4. Technical File.

//Forwarded By Order//

alys
for Chairman.

11/2/13

LG.31.1.2013

POLLUTION PREVENTION PAYS

அகம் தூய்மை வாய்மைக்கு | புறம் தூய்மை வாழ்வுக்கு |



TAMILNADU POLLUTION CONTROL BOARD

RENEWAL OF CONSENT ORDER No. 16831

Proceeding No. T10/TNPCB/F-5747/VDR/URL/A/2013 Dated: 29.01.2013

Consent for Existing operation of the plant under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981.

**Sub : TAMIL NADU POLLUTION CONTROL BOARD - RENEWAL OF
CONSENT - M/s. Madras Cements Limited, Ramasamy Raja Nagar,
R.S.No. 4,5,6,9,10,etc of Thulukkapatti Village, Virudunagar
Taluk, Virudunagar District -for the existing Operation of the plant under
Section 21 of the Air (Prevention and Control of Pollution) Act, 1981**

- Ref:** 1) Proc No.T6 /TNPCB/F-5747 /VNR/A/2010 Dt. 10.05.2010
2) Proc No.T6 /TNPCB/F-5747 /VNR/RL/A/2011 Dt. 09.05.2011
3) Proc No.T6 /TNPCB/F-5747 /VNR/URL/A/2012 Dt.29.06.2012

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

**The Senior General Manager,
M/s. Madras Cements Limited,
Ramasamy Raja Nagar,
R.S.No. 4,5,6,9,10,etc of Thulukkapatti Village,
Virudunagar Taluk,
Virudunagar District**

(herein after referred to as "The Applicant") authorizing him to operate his industrial plant in the air pollution control area as notified by the Government and to continue to make existing discharge emissions from the stacks / chimneys.

POLLUTION PREVENTION PAYS

அகம் தூய்மை வாய்மைக்கு! புறம் தூய்மை வாழ்வுக்கு!



TAMILNADU POLLUTION CONTROL BOARD

This is subject to the provisions of the Act. And the rules and order made there under and further subject to the terms and conditions incorporated under the Special and General conditions stipulated in the Consent Order issued in this Office Proceedings cited above and subject to the following conditions.

1. The unit shall operate and maintain the Air Pollution Control measures efficiently and continuously so as to achieve the revised Ambient Air Quality/Emission standards as per Ministry of Environment and Forest Notification dated 16.11.2009

The **CONSENT** is valid for the period ending **31.03.2013**

(Thirty First March Two Thousand Thirteen)

Sd./-xxxxxxx,
Chairman

To

The Senior General Manager,
M/s. Madras Cements Limited,
Ramasamyraja Nagar Post,
Virudunagar District -626204

Copy to :-

1. The District Environmental Engineer,
Tamilnadu Pollution Control Board,
Virudunagar District
2. The Commissioner,
Thulukkapatni Panchayat Union,
Virudunagar District.
3. BMS
4. Technical File

//Forwarded By Order//

[Handwritten Signature]
for Chairman

[Handwritten Signature]
1/2/13

POLLUTION PREVENTION PAYS

சுத்தம் தூய்மை வாய்மைக்கு! புறம் தூய்மை வாழ்வுக்கு!



TAMILNADU POLLUTION CONTROL BOARD

RENEWAL OF CONSENT ORDER No 20796

Proceeding No. T10/TNPCB/F-5747/VDR/URL/W/2013 Dated: 21.06.2013

Consent for Existing discharge of sewage under Section 25 of the Act 1974, **Water (P & CP)**

**Sub: TAMIL NADU POLLUTION CONTROL BOARD - RENEWAL OF CONSENT -
M/S. MADRAS CEMENTS LIMITED, Ramasamy Raja Nagar, R.S. No. 4, 5, 6,
9, 10, etc of Thulukkapatti Village, Virudunagar Taluk, Virudunagar District
Discharge of sewage under Section 25 of the Water (Prevention and Control of
Pollution) Act, 1974 (Central Act, 6 of 1974)**

**Ref: 1) Proc No. T10/TNPCB/F-5747/VDR/URL/W/2013 Dated: 29.01.2013
2) RIR No. F. VDR0001/UL/JCEE (M)/MDU/2013 Dated: 16.04.2013.**

CONSENT is hereby granted under Section 25 of the Water (Prevention and control of Pollution) Act, 1974 (Central Act 6 of 1974) (herein after referred to as "The Act") and the rules and orders made there under to

**The Senior General Manager,
M/S. MADRAS CEMENTS LIMITED,
Ramasamy Raja Nagar,
R.S.No. 4, 5, 6, 9, 10, etc of Thulukkapatti Village,
Virudunagar Taluk,
Virudunagar District.**

(herein after referred to as "The Applicant") authorizing him to continue to discharge of sewage.

POLLUTION PREVENTION PAYS

அகம் தூய்மை வாய்மைக்கு! புறம் தூய்மை வாழ்வுக்கு!



TAMILNADU POLLUTION CONTROL BOARD

This is subject to the provisions of the Act. And the rules and order made there under and further subject to the terms and conditions incorporated under the Special and General conditions stipulated in the Consent Order issued in this Office Proceedings cited above and subject to the following conditions.

1. The unit shall operate and maintain the sewage treatment plant to achieve the standards prescribed by Board.

The **CONSENT** is valid for the period ending **31.03.2014**
(Thirty First March Two Thousand and Fourteen)

Dated: 21.06.2013

Sd-xxxxx
Chairman

To

✓ The Senior General Manager,
M/s. Madras Cements Limited,
Ramasamyraja Nagar Post,
Virudunagar District - 626204.

Copy to

1. The District Environmental Engineer,
Tamil Nadu Pollution control Board,
Virudunagar District.
2. The Commissioner,
Thulukkapatti Panchayat Union,
Virudunagar District.
3. BMS.
4. Technical File.

//Forwarded by Order//


For Chairman

21/6/13

S.No 27.06.2013

POLLUTION PREVENTION PAYS

அகம் தூய்மை வாய்மைக்கு | புறம் தூய்மை வாழ்வுக்கு |



TAMILNADU POLLUTION CONTROL BOARD

RENEWAL OF CONSENT ORDER No. 16831

Proceeding No. T10/TNPCB/F-5747/VDR/URL/A/2013 Dated: 21.06.2013

Consent for Existing operation of the plant under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981.

Sub: TAMIL NADU POLLUTION CONTROL BOARD - RENEWAL OF CONSENT -
M/S. MADRAS CEMENTS LIMITED, Ramasamy Raja Nagar, R.S.No.
4,5,6,9,10,etc of Thulukkapatti Village, Virudunagar Taluk, Virudunagar
District for the existing Operation of the plant under Section 21 of the Air
(Prevention and Control of Pollution) Act, 1981.

Ref: 1) Proc No. T10/TNPCB/F-5747/VDR/URL/A/2013 Dated: 29.01.2013
2) RIR No.F. VDR0001/JUL/JCEE (M)/MDU/2013 Dated: 16.04.2013.

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

The Senior General Manager,
M/S. MADRAS CEMENTS LIMITED,
Ramasamy Raja Nagar,
R.S.No. 4, 5, 6, 9, 10, etc of Thulukkapatti Village,
Virudunagar Taluk,
Virudunagar District.

(herein after referred to as "The Applicant") authorizing him to operate his industrial plant in the air pollution control area as notified by the Government and to continue to make existing discharge emissions from the stacks / chimneys.

POLLUTION PREVENTION PAYS

அகம் தூய்மை வாய்மைக்கு! புறம் தூய்மை வாழ்வுக்கு!



TAMILNADU POLLUTION CONTROL BOARD

This is subject to the provisions of the Act. And the rules and order made there under and further subject to the terms and conditions incorporated under the Special and General conditions stipulated in the Consent Order issued in this Office Proceedings cited above and subject to the following conditions.

1. The unit shall operate and maintain the Air Pollution Control measures efficiently and continuously so as to achieve the Ambient Air Quality/Emission standards prescribed by Board.
2. The unit shall maintain the online stack monitoring system connected with CARE Air Centre and online display board installed in the main entrance of the unit efficiently
3. The unit shall install a continuous Ambient Air Quality Monitoring station covering the predominant wind direction and connect it with Care Air Centre.
4. The unit shall continue to develop green belt more in and around the premises.

The **CONSENT** is valid for the period ending **31.03.2014**
(Thirty First March Two Thousand and Fourteen)

Dated: 21.06.2013.

Sd-xxxxx
Chairman

To

✓ The Senior General Manager,
M/s. Madras Cements Limited,
Ramasamyraja Nagar Post,
Virudunagar District - 626204.

Copy to

1. The District Environmental Engineer,
Tamil Nadu Pollution control Board,
Virudunagar District
2. The Commissioner,
Thulukkapatti Panchayat Union,
Virudunagar District.
3. BMS.
4. Technical File.

//Forwarded by Order//

[Handwritten Signature]
For Chairman
21/6/13

S.N/ 27.06.2013

POLLUTION PREVENTION PAYS

அகம் தூய்மை வாய்மைக்கு! புறம் தூய்மை வாழ்வுக்கு!



Gm (W) / Sr Manager
[Signature]

TAMILNADU POLLUTION CONTROL BOARD

RENEWAL OF CONSENT ORDER No. 18354

Proceeding No. T10/TNPCB/F-5747/VDR/URL/A/2014 Dated: 11.09.2014

Consent for Existing operation of the plant under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981.

Sub: TAMIL NADU POLLUTION CONTROL BOARD - RENEWAL OF CONSENT - M/S. THE RAMCO CEMENTS LIMITED, Ramasamy Raja Nagar, R.S.No. 4,5,6,9,10,etc of Thulukkapatti Village, Virudunagar Taluk, Virudunagar District -for the existing Operation of the plant under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981

- Ref:** 1. Proceeding No. T10/TNPCB/F-5747/VDR/URL/A/2013 Dated: 29.01.2013
2. IR No.F.VDR0001/ULJCEE(M)/MDU/2014 Dated:28.03.2014
3. Unit's Letter Dated:02.09.2014
4. Proceeding No. T10/TNPCB/F-5747/VDR/URL/A/2014-1 Dated: 11.09.2014

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

The Director,
M/S. THE RAMCO CEMENTS LIMITED,
Ramasamy Raja Nagar,
R.S.No. 4,5,6,9,10,etc of Thulukkapatti Village,
Virudunagar Taluk,
Virudunagar District

(herein after referred to as "The Applicant") authorizing him to operate his industrial plant in the air pollution control area as notified by the Government and to continue to make existing discharge emissions from the stacks / chimneys.



TAMILNADU POLLUTION CONTROL BOARD

This is subject to the provisions of the Act. And the rules and order made there under and further subject to the terms and conditions incorporated under the Special and General conditions stipulated in the Consent Order issued in this Office Proceedings cited above and subject to the following conditions.

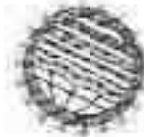
- 1) The unit shall operate and maintain the APC measures efficiently and continuously so as to achieve the Ambient Air Quality/Emission standards prescribed by Board. The unit shall maintain the online stack monitoring system connected with CARE Air Centre and online display board installed in the main entrance of the unit efficiently.
- 2) The unit shall provide online monitors for emission parameters NO_x and SO₂ and effluent parameters pH, BOD and TSS and connect to CARE AIR Centre, TNPCB, Chennai.
- 3) Performance evolution of Effluent Treatment Plant (APC measures) will be based on the report of analysis of TNPC Board Lab.
- 4) The unit shall furnish Bank Guarantee of Rs. 10 Lakhs (Rupees Ten Lakhs only) for one year favoring Tamil Nadu Pollution Control Board, Chennai for the compliance of condition No. 3, 4, 5 of Water Act of compliances of condition no. 2 of Air Act.

The CONSENT is valid for the period ending 31.03.2015
(Thirty First March Two Thousand Fifteen)

Sd/xxxx
Chairman

To

✓ The Director,
M/S. THE RAMCO CEMENTS LIMITED,
Ramasamyraja Nagar Post,
Virudunagar District -626 1204



TAMILNADU POLLUTION CONTROL BOARD

RENEWAL OF CONSENT ORDER No 22318

Proceeding No. T10/TNPCB/F-5747/VDR/URL/W/2014 Dated: 11.09.2014

Consent for Existing discharge of sewage and trade effluents under Section 25 of the Act 1974, Water (P & CP) Act, 1974 (Central Act. 6 of 1974)

Sub: TAMIL NADU POLLUTION CONTROL BOARD - RENEWAL OF CONSENT - M/S. THE RAMCO CEMENTS LIMITED, Ramasamy Raja Nagar, R. S. No. 4, 5, 6, 9, 10, etc of Thulukkapatti Village, Virudunagar Taluk, Virudunagar District - Discharge of sewage and trade effluent under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 (Central Act. 6 of 1974)

- Ref:**
1. Proceeding No. T10/TNPCB/F-5747/VDR/URL/W/2013 Dated: 29.01.2013
 2. IR No.F.VDR0001/UL/JCEE(M)/MDU/2014 Dated: 28.03.2014
 3. Unit's Letter Dated: 02.09.2014
 4. Proceeding No. T10/TNPCB/F-5747/VDR/URL/W/2014-1 Dated: 11.09.2014

CONSENT is hereby granted under Section 25 of the Water (Prevention and control of Pollution) Act, 1974 (Central Act 6 of 1974) (herein after referred to as "The Act") and the rules and orders made there under to

The Director,
M/S. THE RAMCO CEMENTS LIMITED,
Ramasamy Raja Nagar,
R.S.No. 4,5,6,9,10,etc of Thulukkapatti Village,
Virudunagar Taluk,
Virudunagar District

(herein after referred to as "The Applicant") authorizing him to continue to discharge of sewage and trade effluent.

POLLUTION PREVENTION PAYS

அகம் தூய்மை வாய்மைக்கு! புறம் தூய்மை வாழ்வுக்கு!



TAMILNADU POLLUTION CONTROL BOARD

This is subject to the provisions of the Act. And the rules and order made there under and further subject to the terms and conditions incorporated under the Special and General conditions stipulated in the Consent Order issued in this Office Proceedings cited above and subject to the following conditions.

- 1) The unit shall operate and maintain the STP efficiently and continuously to achieve the standards prescribed by Board.
- 2) The unit shall furnish the ROA of treated sewage samples through Boards lab.
- 3) Sludge drying bed to be replaced with Mechanical filter press within three months.
- 4) Chlorine contact filter in STP is to be replaced with UV / Ozonation within 3 months.
- 5) EMFM (s) at the inlet and outlet of STP with computer recording to be provided within 3 months.
- 6) Performance evolution of ETP /APC measures will be based on the report of analysis of TNPC Board Lab.
- 7) The unit shall furnish Bank Guarantee of Rs. 10 Lakhs (Rupees Ten Lakhs only) valid for one year favouring Tamil Nadu Pollution Control Board, Chennai for the compliance of condition No 3,4,5 of Water Act. And complaint of condition No. 2 of Air Act.

The CONSENT is valid for the period ending 31.03.2015

(Thirty First March Two Thousand Fifteen)

Sd/xxxx
Chairman

To

✓ The Director,
M/S. THE RAMCO CEMENTS LIMITED,
Ramasamyraja Nagar Post,
Virudunagar District -626 204.



TAMILNADU POLLUTION CONTROL BOARD



CONSENT ORDER NO. 15082294874

DATED: 10/08/2015.

PROCEEDINGS NO.T3/TNPCB/F.0052VDR/RL/VDR/A/2015 DATED: 10/08/2015

SUB: Tamil Nadu Pollution Control Board - RENEWAL OF CONSENT -M/s. THE RAMCO CEMENTS LIMITED , S.F.No. 6, 9 & 10, TULUKAPATTI village, Virudhunagar Taluk and Virudhunagar District - Renewal of Consent for the operation of the plant and discharge of emissions - under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987 (Central Act 14 of 1981) -Issued- Reg.

REF: 1. Proceedings No.:T10/TNPCB/F-5747/VDR/ URL/ W &A/ 2014 dt. 11.09.2014
2. Units application dt. 13.04.2015
3. FIR.No : F.0052VDR/R/L/JCEE-M/VDR/2015 dated 17/04/2015

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

The Vice Chairman

M/s.THE RAMCO CEMENTS LIMITED,

S.F.No. 6, 9 & 10,

TULUKAPATTI village,

Virudhunagar Taluk,

Virudhunagar District.

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

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

This RENEWAL OF CONSENT is valid for the period ending March 31, 2016.

Ed
12/8/15
Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai
12/8/15



TAMILNADU POLLUTION CONTROL BOARD

SPECIAL CONDITIONS

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

Sl. No.	Description	Quantity	Unit
Product Details			
1.	Cement	2	MTPA

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



TAMILNADU POLLUTION CONTROL BOARD



CONSENT ORDER NO. 15081294874

DATED: 10/08/2015.

PROCEEDINGS NO.T3/TNPCB/F.0052VDR/RL/VDR/W/2015 DATED: 10/08/2015

SUB: Tamil Nadu Pollution Control Board - RENEWAL OF CONSENT - M/s. THE RAMCO CEMENTS LIMITED , S.F.No. 6, 9 & 10, TULUKAPATTI village, Virudhunagar Taluk and Virudhunagar District - Renewal of Consent for the operation of the plant and discharge of sewage and/or trade effluent under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act 6 of 1974) - Issued- Reg.

REF: 1. Proceedings No.:T10/TNPCB/F-5747/VDR/ URL/ W &A/ 2014 dt. 11.09.2014
2. Units application dt. 13.04.2015
3. FIR.No : F.0052VDR/R/L/JCEE-M/VDR/2015 dated 17/04/2015

RENEWAL OF CONSENT is hereby granted under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act, 6 of 1974) (hereinafter referred to as "The Act") and the rules and orders made there under to

The Vice Chairman

M/s. THE RAMCO CEMENTS LIMITED,

S.F.No. 6, 9 & 10

, TULUKAPATTI Village,

Virudhunagar Taluk,

Virudhunagar District.

Authorizing the occupier to make discharge of sewage and/or trade effluent.

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

This RENEWAL OF CONSENT is valid for the period ending March 31, 2016

Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai

12/8/15



TAMILNADU POLLUTION CONTROL BOARD

SPECIAL CONDITIONS

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

Sl. No.	Description	Quantity	Unit
Product Details			
1.	Cement	2	MTPA

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

Outlet No.	Description of Outlet	Maximum daily discharge in KLD	Point of disposal
Effluent Type : Sewage			
1.	Common STP at Factory	100.0	On land for gardening
Effluent Type : Trade Effluent			

Additional Conditions:

1. The unit shall operate and maintain the STP efficiently and continuously to achieve the standards prescribed by Board.
2. The unit shall continue to develop green belt inside the premises.

Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai
12/18/15

To
Vice Chairman,
M/s. THE RAMCO CEMENTS LIMITED,
Ramassmy Raja Nagar,
Pin: 626204

Copy to:

1. The Commissioner, VIRUDHUNAGAR-Panchayat Union, Virudhunagar Taluk, Virudhunagar District.
2. The District Environmental Engineer, Tamil Nadu Pollution Control Board, VIRUDHUNAGAR.
3. The JCEE-Monitoring, Tamil Nadu Pollution Control Board, Madurai.
4. File

POLLUTION PREVENTION PAYS

அளவ் தாமிரை பாதிக்காதது! புதுத் தாமிரை பாதுகாத்து!



TAMILNADU POLLUTION CONTROL BOARD

CONSENT ORDER NO. 160824725855

DATED: 02/08/2016.



PROCEEDINGS NO.T9/TNPCB/F.0052VDR/RL/VDR/A/2016 DATED: 02/08/2016

SUB: Tamil Nadu Pollution Control Board - RENEWAL OF CONSENT -M/s. THE RAMCO CEMENTS LIMITED , S.F.No. Survey No. 4,5,6,9,10 etc, TULUKAPATTI village, Virudhunagar Taluk and Virudhunagar District - Renewal of Consent for the operation of the plant and discharge of emissions under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987 (Central Act 14 of 1981) -Issued- Reg.

REF: 1. Bd's Proc. No T3/TNPCB/F.0052VDR/RL/VDR/A&W/2015, dated:10.08.2015
 2. Unit's Application for CTO renewal dated 16.03.2016
 3. IR.No..F.0052VDR/RL/JCEE-M/VDR/2016, dated 11.07.2016

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

Vice Chairman
 M/s. THE RAMCO CEMENTS LIMITED,
 S.F.No. Survey No. 4,5,6,9,10 etc,
 TULUKAPATTI village,
 Virudhunagar Taluk,
 Virudhunagar District.

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

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

This RENEWAL OF CONSENT is valid for the period ending March 31, 2017

Member Secretary, 3/8/16
 Tamil Nadu Pollution Control Board,
 Chennai

02/08/2016



TAMILNADU POLLUTION CONTROL BOARD
SPECIAL CONDITIONS

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

Sl. No.	Description	Quantity	Unit
Product Details			
1.	Cement (6200 TPD or 2 MTPA - with addition of 0.3 MTPA Cement Mill)	2	MTPA

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



POLLUTION PREVENTION PAYS

அகம் தூய்மை வாய்மைக்கு ! புறம் தூய்மை வாழ்வுக்கு !



TAMILNADU POLLUTION CONTROL BOARD

Additional Conditions:

1. The unit shall operate and maintain the APC measures efficiently and continuously so as to achieve the AAQ/ Emission standards prescribed by the Board.
2. The unit shall maintain the online monitors attached to the APC measures so as to get quality data and continuous connectivity to CAC, Chennai and online display board installed in the entrance of the unit efficiently.
3. The unit shall comply with the new emission standards issued by MoEF & CC vide Notification dated 25.08.2014, 09.05.2016 & 10.05.2016.
4. The unit shall comply with the fugitive emission guidelines prescribed by CPCB vide PROBES/118/2007, dated 06.07.2007.
5. The unit shall ensure that the noise generated by the unit shall adhere to the Ambient Noise level standards prescribed by the Board.

Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai

To
Vice Chairman,
M/s.THE RAMCO CEMENTS LIMITED,
Ramasamy Raja Nagar,
Pin: 626204

Copy to:

1. The Commissioner, VIRUDHUNAGAR-Panchayat Union, Virudhunagar Taluk, Virudhunagar District .
2. The District Environmental Engineer, Tamil Nadu Pollution Control Board, VIRUDHUNAGAR.
3. The JCEE-Monitoring, Tamil Nadu Pollution Control Board, Madurai.
4. File



TAMILNADU POLLUTION CONTROL BOARD

CONSENT ORDER NO. 160814725855

DATED: 02/08/2016.

PROCEEDINGS NO. T9/TNPCB/F.0052VDR/RL/VDR/W/2016 DATED: 02/08/2016

SUB: Tamil Nadu Pollution Control Board - RENEWAL OF CONSENT - M/s. THE RAMCO CEMENTS LIMITED, S.F.No. Survey No. 4,5,6,9,10 etc, TULUKAPATTI village, Virudhunagar Taluk and Virudhunagar District - Renewal of Consent for the operation of the plant and discharge of sewage and/or trade effluent under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act 6 of 1974) - Issued- Reg.

REF: 1. Bd's Proc. No T3/TNPCB/F.0052VDR/RL/VDR/A&W/2015, dated:10.08.2015
2. Unit's Application for CTO renewal dated 16.03.2016
3. IR.No..F.0052VDR/RL/JCEE-M/VDR/2016, dated 11.07.2016

RENEWAL OF CONSENT is hereby granted under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act, 6 of 1974) (hereinafter referred to as "The Act") and the rules and orders made there under to

Vice Chairman
M/s. THE RAMCO CEMENTS LIMITED,
S.F.No. Survey No. 4,5,6,9,10 etc,
TULUKAPATTI Village,
Virudhunagar Taluk,
Virudhunagar District.

Authorising the occupier to make discharge of sewage and /or trade effluent.

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

This RENEWAL OF CONSENT is valid for the period ending March 31, 2017

Member Secretary
Tamil Nadu Pollution Control Board,
Chennai

02/08/2016



TAMILNADU POLLUTION CONTROL BOARD
SPECIAL CONDITIONS

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

Sl. No.	Description	Quantity	Unit
Product Details			
1.	Cement (6200 TPD or 2 MTPA - with addition of 0.3 MTPA Cement Mill)	2	MTPA

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

Outlet No.	Description of Outlet	Maximum daily discharge in KLD	Point of disposal
Effluent Type : Sewage			
1.	Common STP at Factory	100.0	Gardening and Cooling purpose
Effluent Type : Trade Effluent			



POLLUTION PREVENTION PAYS

அகம் தூய்மை வாய்மைக்கு ! புறம் தூய்மை வாழ்வுக்கு !



TAMILNADU POLLUTION CONTROL BOARD

Additional Conditions:

1. The unit shall operate and maintain STP efficiently and continuously so as to achieve the standards prescribed by the Board.
2. The unit shall continue to develop greenbelt in and around the premises of the unit.

Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai

15/11/16
15/11/16

To
Vice Chairman,
M/s THE RAMCO CEMENTS LIMITED,
Ramasamy Raja Nagar,
Pin: 626204

Copy to:

1. The Commissioner, VIRUDHUNAGAR-Panchayat Union, Virudhunagar Taluk, Virudhunagar District.
2. The District Environmental Engineer, Tamil Nadu Pollution Control Board, VIRUDHUNAGAR.
3. The JCEE-Monitoring, Tamil Nadu Pollution Control Board, Madurai.
4. File



TAMILNADU POLLUTION CONTROL BOARD



CONSENT ORDER NO. 180828260593 DATED: 28/02/2018.

PROCEEDINGS NO.T2/TNPCB/F.0052VDR/RL/VDR/A/2018 DATED: 28/02/2018

SUB: Tamil Nadu Pollution Control Board - RENEWAL OF CONSENT - M/s THE RAMCO CEMENTS LIMITED S.F.No. Survey No. 4,5,6,9,10 etc, TULLUKAPATTI village, Virudhunagar Taluk and Virudhunagar District - Renewal of Consent for the operation of the plant and discharge of emissions under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987 (Central Act 14 of 1981) -Issued- Reg.

REF: 1. Board Proceedings No.T9/TNPCB/F.0052VDR/RL/VDR/A&W/2016 dated: 02/08/2016
2. Unit's application on 27-02-2017 and resubmitted on 02.01.2018.
3. DEF's IR.No F.0052VDR/RL/MCEE-M/VDR/2017 dated 28/06/2017.

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

Vice Chairman
M/s THE RAMCO CEMENTS LIMITED,
S.F.No. Survey No. 4,5,6,9,10 etc,
TULLUKAPATTI village,
Virudhunagar Taluk,
Virudhunagar District

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

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

This RENEWAL OF CONSENT is valid for the period ending March 31, 2019

S. CHARLES
RODRIGUEZ

For Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai

POLLUTION PREVENTION PAYS

சுற்றுச்சூழல் பாதுகாப்புக்குத் தகுந்த கட்டுப்பாடுகள் மேற்கொள்ளப்படும்.



TAMILNADU POLLUTION CONTROL BOARD

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

Sl. No.	Description	Quantity	Unit
Product Details			
1	Cement	2	MTPA

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



TAMILNADU POLLUTION CONTROL BOARD



CONSENT ORDER NO. 180818260593

DATED: 28/02/2018.

PROCEEDINGS NO.T2/TNPCB/F.0052VDR/RL/VDR/W/2018 DATED: 28/02/2018

SUB: Tamil Nadu Pollution Control Board - RENEWAL OF CONSENT - M/s. THE RAMCO CEMENTS LIMITED, S.F.No. Survey No. 4,5,6,9,10 etc, TULUKAPATTI village, Virudhanagar Taluk and Virudhanagar District - Renewal of Consent for the operation of the plant and discharge of sewage and/or trade effluent under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act 6 of 1974) - Issued- Reg.

REF: 1. Board Proceedings No. T9/TNPCB/F.0052VDR/RL/VDR/A&W/2016 dated: 02/08/2016
2. Unit's application on 27-02-2017 and resubmitted on 02.07.2018.
3. DEE's (R.No : F.0052VDR/RL/JCEE-M/VDR/2017 dated 28/06/2017.

RENEWAL OF CONSENT is hereby granted under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act, 6 of 1974) (hereinafter referred to as "The Act") and the rules and orders made there under to

Vice Chairman
M/s. THE RAMCO CEMENTS LIMITED,
S.F.No. Survey No. 4,5,6,9,10 etc,
TULUKAPATTI Village,
Virudhanagar Taluk,
Virudhanagar District

Authorising the owner to make discharge of sewage and /or trade effluent.

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

This RENEWAL OF CONSENT is valid for the period ending March 31, 2019

S. CHARLES
RODRIGUEZ

For Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai

POLLUTION PREVENTION PAYS

சுரம் துயிலை சுரிலைக்கு! துயம் துயிலை சுர்துயக்கு!



TAMILNADU POLLUTION CONTROL BOARD

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

Sl. No.	Description	Quantity	Unit
Product Details			
1.	Cement	2	MTPA

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

Outlet No.	Description of Outlet	Maximum daily discharge in KLD	Point of disposal
Effluent Type : Sewage			
1.	Sewage	100.0	On industry's own land for gardening and cooling purposes
Effluent Type : Trade Effluent			



TAMILNADU POLLUTION CONTROL BOARD

Additional Conditions:

1. The unit shall operate and maintain the STP efficiently and continuously to achieve the standards prescribed by the Board.
2. The unit shall maintain good housekeeping.
3. The unit shall continue to develop green belt in and around the premises.

S. CHARLES
RODRIGUEZ

For Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai

To
Vice Chairman,
M/s. THE RAMCO CEMENTS LIMITED,
Ramassery Raja Nagar,
Pin: 626204

Copy to:

1. The Commissioner, VIRUDHUNAGAR-Panchayat Union, Virudhunagar Taluk, Virudhunagar District.
2. The District Environmental Engineer, Tamil Nadu Pollution Control Board, VIRUDHUNAGAR.
3. The JCEI-Monitoring, Tamil Nadu Pollution Control Board, TIRUNELVELI.
4. File.



TAMILNADU POLLUTION CONTROL BOARD

Category of the Industry :

RED

CONSENT ORDER NO. 1908221827195 DATED: 18/09/2019.

PROCEEDINGS NO.T2/TNPCB/F.0052VDR/RL/VDR/A/2019 DATED: 18/09/2019



SUB: Tamil Nadu Pollution Control Board - RENEWAL OF CONSENT -M/s. THE RAMCO CEMENTS LIMITED , S.F.No. Survey No. 4,5,6,9,10 etc, TULUKAPATTI village, Virudhunagar Taluk and Virudhunagar District - Renewal of Consent for the operation of the plant and discharge of emissions under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987 (Central Act 14 of 1981) -Issued- Reg.

REF: 1) Board Proceedings No. T2/TNPCB/F.0052VDR/RL/VDR/W&A/2018 DATED: 28/02/2018
2) Unit's application for CTO-Renew submitted through OCMMS on 29/03/2019 and resubmitted in full shape on 17/07/2019.
3) JCEE's IR.No : F.0052VDR/RL/ICEE-M/VDR/2019 dated 23/07/2019.

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

Chairman & Managing Director
M/s. THE RAMCO CEMENTS LIMITED,
S.F.No. Survey No. 4,5,6,9,10 etc,
TULUKAPATTI village,
Virudhunagar Taluk,
Virudhunagar District.

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

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

This RENEWAL OF CONSENT is valid for the period ending March 31, 2022

K.
Gokuladas
For Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai

Digitally signed by
K. Gokuladas
Date: 2019.09.18
14:08:03 +05'30'

POLLUTION PREVENTION PAYS



**TAMILNADU POLLUTION CONTROL BOARD
SPECIAL CONDITIONS**

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

Sl. No.	Description	Quantity	Unit
Product Details			
1.	Cement	2	MTPA

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


TAMILNADU POLLUTION CONTROL BOARD


Category of the Industry :

RED
CONSENT ORDER NO. 1908121827195 DATED: 18/09/2019.
PROCEEDINGS NO.T2/TNPCB/F.0052VDR/RL/VDR/W/2019 DATED: 18/09/2019

SUB: Tamil Nadu Pollution Control Board - RENEWAL OF CONSENT – M/s. THE RAMCO CEMENTS LIMITED , S.F.No. Survey No. 4,5,6,9,10 etc, TULUKAPATTI village, Virudhunagar Taluk and Virudhunagar District - Renewal of Consent for the operation of the plant and discharge of sewage and/or trade effluent under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act 6 of 1974) – Issued- Reg.

REF: 1) Board Proceedings No. T2/TNPCB/F.0052VDR/RL/VDR/W&A/2018 DATED: 28/02/2018
 2) Unit's application for CTO-Renew submitted through OCMMS on 29/03/2019 and resubmitted in full shape on 17/07/2019.
 3) JCEE's IR.No : F.0052VDR/RL/JCEE-M/VDR/2019 dated 23/07/2019.

RENEWAL OF CONSENT is hereby granted under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act, 6 of 1974) (hereinafter referred to as "The Act") and the rules and orders made there under to

Chairman & Managing Director
 M/s THE RAMCO CEMENTS LIMITED,
 S.F.No. Survey No. 4,5,6,9,10 etc,
 TULUKAPATTI Village ,
 Virudhunagar Taluk ,
 Virudhunagar District.

Authorising the occupier to make discharge of sewage and /or trade effluent.

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

This RENEWAL OF CONSENT is valid for the period ending March 31, 2022.

K.
 Gokuladas
 For Member Secretary,
 Tamil Nadu Pollution Control Board,
 Chennai

Digitally signed by K.
 Gokuladas
 Date: 2019.09.18
 14:09:27 +05'30'

POLLUTION PREVENTION PAYS



**TAMILNADU POLLUTION CONTROL BOARD
SPECIAL CONDITIONS**

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

Sl. No.	Description	Quantity	Unit
Product Details			
1.	Cement	2	MTPA

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

Outlet No.	Description of Outlet	Maximum daily discharge in KLD	Point of disposal
Effluent Type : Sewage			
1.	Sewage	100.0	On industry's own land for gardening and cooling purposes
Effluent Type : Trade Effluent			

Category of the Industry :

RED



CONSENT ORDER NO. 2208243746933 DATED: 13/06/2022.

PROCEEDINGS NO.T4/TNPCB/F.0052VDR/RL/VDR/A/2022 DATED: 13/06/2022

SUB: Tamil Nadu Pollution Control Board - RENEWAL OF CONSENT –M/s. THE RAMCO CEMENTS LIMITED , S.F.No. Survey No. 4,5,6,9,10 etc, TULUKAPATTI village, Virudhunagar Taluk and Virudhunagar District - Renewal of Consent for the operation of the plant and discharge of emissions under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987 (Central Act 14 of 1981) –Issued- Reg.

REF: 1. Unit's application no. 43746933 DATED:03.03.2022
2. IR.No : F.0052VDR/RL/JCEE-M/VDR/2022 dated 11/05/2022.

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

Chairman & Managing Director
M/s.THE RAMCO CEMENTS LIMITED,
S.F.No. Survey No. 4,5,6,9,10 etc,
TULUKAPATTI village,
Virudhunagar Taluk,
Virudhunagar District.

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

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

This RENEWAL OF CONSENT is valid for the period ending March 31, 2023

RATNAM VIJAYABASKARAN Digitally signed by RATNAM
VIJAYABASKARAN
Date: 2022.06.16 13:47:23 +05'30'

**For Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai**

SPECIAL CONDITIONS

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

Sl. No.	Description	Quantity	Unit
Product Details			
1.	Cement	2	MTPA

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

RATNAM
VIJAYABASKARAN

Digitally signed by RATNAM
VIJAYABASKARAN
Date: 2022.06.16 13:48:09 +05'30'

**For Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai**

To
Chairman & Managing Director,
M/s.THE RAMCO CEMENTS LIMITED,
Ramasamy Raja Nagar, Virudhunagar,
Pin: 626204

Copy to:

- 1.The Commissioner, VIRUDHUNAGAR-Panchayat Union, Virudhunagar Taluk, Virudhunagar District .
 2. The District Environmental Engineer, Tamil Nadu Pollution Control Board, VIRUDHUNAGAR.
 3. The JCEE-Monitoring, Tamil Nadu Pollution Control Board, TIRUNELVELI.
 4. File
-

Category of the Industry :

RED



CONSENT ORDER NO. 2208143746933 DATED: 13/06/2022.

PROCEEDINGS NO.T4/TNPCB/F.0052VDR/RL/VDR/W/2022 DATED: 13/06/2022

SUB: Tamil Nadu Pollution Control Board - RENEWAL OF CONSENT – M/s. THE RAMCO CEMENTS LIMITED , S.F.No. Survey No. 4,5,6,9,10 etc, TULUKAPATTI village, Virudhunagar Taluk and Virudhunagar District - Renewal of Consent for the operation of the plant and discharge of sewage and/or trade effluent under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act 6 of 1974) – Issued- Reg.

REF: 1. Unit's application no. 43746933 DATED:03.03.2022
2. IR.No : F.0052VDR/RL/JCEE-M/VDR/2022 dated 11/05/2022.

RENEWAL OF CONSENT is hereby granted under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act, 6 of 1974) (hereinafter referred to as "The Act") and the rules and orders made there under to

Chairman & Managing Director
M/s.THE RAMCO CEMENTS LIMITED,
S.F.No. Survey No. 4,5,6,9,10 etc,
TULUKAPATTI Village ,
Virudhunagar Taluk ,
Virudhunagar District .

Authorising the occupier to make discharge of sewage and /or trade effluent.

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

This RENEWAL OF CONSENT is valid for the period ending March 31, 2023

RATNAM VIJAYABASKARAN Digitally signed by RATNAM
VIJAYABASKARAN
Date: 2022.06.16 13:48:50 +05'30'

**For Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai**

SPECIAL CONDITIONS

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

Sl. No.	Description	Quantity	Unit
Product Details			
1.	Cement	2	MTPA

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

Outlet No.	Description of Outlet	Maximum daily discharge in KLD	Point of disposal
Effluent Type : Sewage			
1.	Sewage	100.0	On Industrys own land
Effluent Type : Trade Effluent			



TAMILNADU POLLUTION CONTROL BOARD

Category of the Industry :

RED



CONSENT ORDER NO. 2307249733843 DATED: 27/02/2023.

PROCEEDINGS NO.T1/TNPCB/F.0052VDR/RL/VDR/A/2023 DATED: 27/02/2023

SUB: Tamil Nadu Pollution Control Board – CONSENT TO OPERATE FOR EXPANSION-I -M/s. THE RAMCO CEMENTS LIMITED , S.F.No. Survey No. 1/6, 4/1B, 5/2, 5/5B, 5/6, 5/7, 5/8, 5/9, 5/10, 6/2, 6/3, 6/4, 6/5, 6/6, 6/7, 7/1, 7/2, 8/1, 8/2, 8/3, 8/4, 9/2, 9/3, 9/4, 9/5, 9/6, 9/7, 10/1, 10/2, 10/3, 10/4, 10/5, 10/6, 10/7, 11/1, 11/2, 11/3, 11/4, 11/5, 12/2, 12/3, 12/4, 12/5, 12/6, 12/7, 12/8, 12/9, 12/10, 13/2, 13/3, 13/4, 13/5, 13/6, 13/7, 13/8, 14/1, 14/2, 14/3, 14/4, 14/5, 14/6, 14/7, 16/1, 16/2, 16/3, 16/4, 22/1, 22/2A, 24/1, 24/2, 24/3A, 24/4, 30/1C, 30/2, 30/3, 31/1, 31/2, 31/3A, 31/5, 31/6, 32/2, 32/3, 32/4, 32/5, 32/6, 32/7, 32/8, 32/9A, 34/4, 35/3, 36/2, 37/2, 38/5B, 38/6, 39/4, 39/6, 39/7, 49/5, 50/1A, 50/2A, 50/2C, 51/1, 51/2, 52/1, 52/2, 58/1A, 58/1B, 58/1C, 58/2, 59/2, 59/3, 59/4, 59/5, 59/6A, 59/7A, 59/6B, 59/6C, 59/6D, 59/6E, 59/7B, 59/7C, 59/8A, 59/8B, 59/8D, 60/1, 60/2, 60/3, 57/3A, 57/3B, 57/4, 56/1, 56/5, 65/2, 66/1, 210/1, 210/2, 210/3, 210/4, 210/5, 210/6, 212/1, 212/2, 214/1, 214/4, 214/6, 214/7, 221/1A, 221/1B, 221/2, 221/3, 221/4, 221/5, 221/6, 222/1, 222/2, 222/3, 222/4A, 222/4B, 222/5, 221/7, 221/8, 226/1, 226/5, 227/1, 227/2A, 227/2B, 227/2C, 227/3, 228/1, 228/2, 228/3C, 228/3B, 228/3D, 228/3A, 228/3E, 228/4, 229/1, 229/2, 229/3A, 229/3B, 229/4, 230/1, 230/2A, 230/2B, 230/3, 230/4, 230/6, 230/7, 230/8, 230/9, 230/10, 230/11 in Tulukkapatti, 196/3, 196/4, 196/7, 197/5, 197/6B, 197/6C, 198/7, 198/8, 199/2, 199/3, 199/4, 200/2, 200/3, 200/4, 200/5, 201/2A, 201/2B, 201/3, 201/4, 202/1, 202/2, 202/4, 202/5, 203/1, 203/2, 203/4, 203/5, 204/2A, 204/2B, 204/3, 204/4, 205/2, 205/4, 210/1, 210/2, 210/5A, 210/5B, 216/8, 197/8, 198/2, 198/4, 205/1, 205/3A, 206/1, 206/2, 206/3A, 206/4A, 206/5A, 206/6, 206/7A, 207/1B, 207/2B, 209/1, 209/6, 209/7, 210/3, 210/4A, 210/4B, 211/4, 211/5, 211/7, 212/1, 212/2, 212/3, 215/4, 215/5B, 216/3, 216/4, 216/9, 287/1B, 287/2 in Thurmannajekapatti, 112/1, 113/1A1, 100/1A2, 100/2, 100/3A, 100/4A, 100/5A, 100/5B1, 100/6A, 101/1, 101/2, 101/3, 101/4, 101/5, 102/1, 102/2, 103/2, 108/1, 108/2, 108/3, 108/4A, 109/1A, 109/2A1A in Vachakarapatti, TULUKAPATTI village Virudhunagar Taluk and Virudhunagar District - Consent for operation of the plant and discharge of emissions under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987 (Central Act 14 of 1981) - Issued- Reg.

REF: 1. Unit's application no. 49733843 dated 23.01.2023
2. IR.No : F.0052VDR/RL/JCEE-M/VDR/2023, dated 07/02/2023
3. Minutes of the 211th TSC meeting vide item no. 211-07 dated: 22.02.2023.

CONSENT TO OPERATE FOR EXPANSION is hereby granted under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987 (Central Act 14 of 1981) (hereinafter referred to as 'The Act') and the rules and orders made there under to

The Managing Director,

M/s. THE RAMCO CEMENTS LIMITED

S.F.No.Survey No. 1/6, 4/1B, 5/2, 5/5B, 5/6, 5/7, 5/8, 5/9, 5/10, 6/2, 6/3, 6/4, 6/5, 6/6, 6/7, 7/1, 7/2, 8/1, 8/2, 8/3, 8/4, 9/2, 9/3, 9/4, 9/5, 9/6, 9/7, 10/1, 10/2, 10/3, 10/4, 10/5, 10/6, 10/7, 11/1, 11/2, 11/3, 11/4, 11/5, 12/2, 12/3, 12/4, 12/5, 12/6, 12/7, 12/8, 12/9, 12/10, 13/2, 13/3, 13/4, 13/5, 13/6, 13/7, 13/8, 14/1, 14/2, 14/3, 14/4, 14/5, 14/6, 14/7, 16/1, 16/2, 16/3, 16/4, 22/1, 22/2A, 24/1, 24/2, 24/3A, 24/4, 30/1C, 30/2, 30/3, 31/1, 31/2, 31/3A, 31/5, 31/6, 32/2, 32/3, 32/4, 32/5, 32/6, 32/7, 32/8, 32/9A, 34/4, 35/3, 36/2, 37/2, 38/5B, 38/6, 39/4, 39/6, 39/7, 49/5, 50/1A, 50/2A, 50/2C, 51/1, 51/2, 52/1, 52/2, 58/1A, 58/1B, 58/1C, 58/2, 59/2, 59/3, 59/4, 59/5, 59/6A, 59/7A, 59/6B, 59/6C, 59/6D, 59/6E, 59/7B, 59/7C, 59/8A, 59/8B, 59/8D, 60/1, 60/2, 60/3, 57/3A, 57/3B, 57/4, 56/1, 56/5, 65/2, 66/1, 210/1, 210/2, 210/3, 210/4, 210/5, 210/6, 212/1, 212/2, 214/1, 214/4, 214/6, 214/7, 221/1A, 221/1B, 221/2, 221/3, 221/4, 221/5, 221/6, 222/1, 222/2, 222/3, 222/4A, 222/4B, 222/5, 221/7, 221/8, 226/1, 226/5, 227/1, 227/2A, 227/2B, 227/2C, 227/3, 228/1, 228/2, 228/3C, 228/3B, 228/3D, 228/3A, 228/3E, 228/4, 229/1, 229/2, 229/3A, 229/3B, 229/4, 230/1, 230/2A, 230/2B, 230/3,



TAMILNADU POLLUTION CONTROL BOARD

230/4, 230/6, 230/7, 230/8, 230/9, 230/10, 230/11 in Tullukkapatti, 196/3, 196/4, 196/7, 197/5, 197/5B, 197/6C, 198/7, 198/8, 199/2, 199/3, 199/4, 200/2, 200/3, 200/4, 200/5, 201/2A, 201/2B, 201/3, 201/4, 202/1, 202/2, 202/4, 202/5, 203/1, 203/2, 203/4, 203/5, 204/2A, 204/2B, 204/3, 204/4, 205/2, 205/4, 210/1, 210/2, 210/5A, 210/5B, 216/8, 197/8, 198/2, 198/4, 205/1, 205/3A, 206/1, 206/2, 206/3A, 206/4A, 206/5A, 206/6, 206/7A, 207/1B, 207/2B, 209/1, 209/6, 209/7, 210/3, 210/3A, 210/4B, 211/4, 211/5, 211/7, 212/1, 212/2, 212/3, 215/4, 215/5B, 216/3, 216/4, 216/9, 207/1B, 207/2 in Thammannaickampatti, 112/1, 113/1A1, 100/1A2, 100/2, 100/3A, 100/4A, 100/5A, 100/5B1, 100/5A, 101/1, 101/2, 101/3, 101/4, 101/5, 102/1, 102/2, 103/2, 108/1, 108/2, 108/3, 108/4A, 109/1A, 109/2A1A in Vaehakampatti.

TULLUKAPATTI Village,
Virudhunagar Taluk,
Virudhunagar District.

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

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

This CONSENT is valid for the period ending March 31, 2024.

RAMASAMY
RAJAMANICKAM

For Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai

To
The Managing Director,
M/s. THE RAMCO CEMENTS LIMITED,
Ramasamy Raja Nagar, Virudhunagar,
Pin: 625204

Copy to:

1. The Commissioner, VIRUDHUNAGAR-Panchayat Union, Virudhunagar Taluk, Virudhunagar District
2. The District Environmental Engineer, Tamil Nadu Pollution Control Board, VIRUDHUNAGAR.
3. The JCEE-Monitoring, Tamil Nadu Pollution Control Board, TIRUNELVELL.
4. File



TAMILNADU POLLUTION CONTROL BOARD

SPECIAL CONDITIONS

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

Sl. No.	Description	Quantity	Unit
Product Details			
1.	Cement	2.7	Million Tonnes Per Annum
Intermediate Product Details			
1.	Clinker	1.44	Million Tonnes Per Annum

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



TAMILNADU POLLUTION CONTROL BOARD

Category of the Industry :

RED



CONSENT ORDER NO. 2307149733843 DATED: 27/02/2023.

PROCEEDINGS NO.T1/TNPCB/F.0052VDR/RL/VDR/W/2023 DATED: 27/02/2023

SUB: Tamil Nadu Pollution Control Board –CONSENT TO OPERATE FOR EXPANSION-I -M/s. THE RAMCO CEMENTS LIMITED , S.F.No. Survey No. 1/6, 4/1B, 5/2, 5/5B, 5/6, 5/7, 5/8, 5/9, 5/10, 6/2, 6/3, 6/4, 6/5, 6/6, 6/7, 7/1, 7/2, 8/1, 8/2, 8/3, 8/4, 9/2, 9/3, 9/4, 9/5, 9/6, 9/7, 10/1, 10/2, 10/3, 10/4, 10/5, 10/6, 10/7, 11/1, 11/2, 11/3, 11/4, 11/5, 12/2, 12/3, 12/4, 12/5, 12/6, 12/7, 12/8, 12/9, 12/10, 13/2, 13/3, 13/4, 13/5, 13/6, 13/7, 13/8, 14/1, 14/2, 14/3, 14/4, 14/5, 14/6, 14/7, 16/1, 16/2, 16/3, 16/4, 22/1, 22/2A, 24/1, 24/2,24/3A, 24/4, 30/1C, 30/2, 30/3, 31/1, 31/2,31/3A, 31/5, 31/6, 32/2, 32/3, 32/4, 32/5, 32/6, 32/7, 32/8, 32/9A, 34/4, 35/3, 36/2, 37/2, 38/5B, 38/6, 39/4, 39/6, 39/7, 49/5, 50/1A, 50/2A, 50/2C, 51/1, 51/2, 52/1, 52/2, 58/1A, 58/1B, 58/1C, 58/2, 59/2, 59/3, 59/4, 59/5, 59/6A, 59/7A, 59/6B, 59/6C, 59/6D, 59/6E, 59/7B, 59/7C, 59/8A, 59/8B, 59/8D, 60/1, 60/2, 60/3, 57/3A, 57/3B, 57/4, 56/1, 56/5, 65/2, 66/1, 210/1, 210/2, 210/3, 210/4, 210/5, 210/6, 212/1, 212/2, 214/1, 214/4, 214/6, 214/7, 221/1A, 221/1B, 221/2, 221/3, 221/4, 221/5, 221/6, 222/1, 222/2, 222/3, 222/4A, 222/4B, 222/5, 221/7, 221/8, 226/1, 226/5, 227/1, 227/2A, 227/2B, 227/2C, 227/3, 228/1, 228/2, 228/3C, 228/3B, 228/3D, 228/3A, 228/3E, 228/4, 229/1, 229/2, 229/3A, 229/3B, 229/4, 230/1, 230/2A, 230/2B, 230/3, 230/4,230/6, 230/7, 230/8, 230/9, 230/10, 230/11 in Tulukkapatti, 196/3, 196/4, 196/7, 197/5, 197/6B, 197/6C, 198/7, 198/8, 199/2, 199/3, 199/4, 200/2, 200/3, 200/4, 200/5, 201/2A, 201/2B, 201/3, 201/4, 202/1, 202/2, 202/4, 202/5, 203/1, 203/2, 203/4, 203/5, 204/2A, 204/2B, 204/3, 204/4, 205/2, 205/4, 210/1, 210/2, 210/5A, 210/5B, 216/8, 197/8, 198/2, 198/4, 205/1, 205/3A, 206/1, 206/2, 206/3A, 206/4A, 206/5A, 206/6, 206/7A, 207/1B, 207/2B, 209/1, 209/6, 209/7, 210/3, 210/4A, 210/4B, 211/4, 211/5, 211/7, 212/1, 212/2, 212/3, 215/4, 215/5B, 216/3, 216/4, 216/9, 287/1B, 287/2 in Thammanickampatti, 112/1, 113/1A1, 100/1A2, 100/2, 100/3A, 100/4A, 100/5A, 100/5B1, 100/6A, 101/1, 101/2, 101/3, 101/4, 101/5, 102/1, 102/2, 103/2, 108/1, 108/2, 108/3, 108/4A, 109/1A, 109/2A1A in Vachakarapatti. TULUKAPATTI village Virudhunagar Taluk and Virudhunagar District - Consent for the operation of the plant and discharge of sewage and/or trade effluent under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act 6 of 1974) – Issued- Reg.

- REF:** 1. Unit's application no. 49733843 dated 23.01.2023
2. IR.No : F.0052VDR/RL/JCEE-M/VDR/2023, dated 07/02/2023
3. Minutes of the 211th TSC meeting vide item no. 211-07 dated: 22.02.2023.

CONSENT TO OPERATE FOR EXPANSION is hereby granted under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act, 6 of 1974) (hereinafter referred to as "The Act") and the rules and orders made there under to

The Managing Director,

M/s. THE RAMCO CEMENTS LIMITED

S.F.No.Survey No. 1/6, 4/1B, 5/2, 5/5B, 5/6, 5/7, 5/8, 5/9, 5/10, 6/2, 6/3, 6/4, 6/5, 6/6, 6/7, 7/1, 7/2, 8/1, 8/2, 8/3, 8/4, 9/2, 9/3, 9/4, 9/5, 9/6, 9/7, 10/1, 10/2, 10/3, 10/4, 10/5, 10/6, 10/7, 11/1, 11/2, 11/3, 11/4, 11/5, 12/2, 12/3, 12/4, 12/5, 12/6, 12/7, 12/8, 12/9, 12/10, 13/2, 13/3, 13/4, 13/5, 13/6, 13/7, 13/8, 14/1, 14/2, 14/3, 14/4, 14/5, 14/6, 14/7, 16/1, 16/2, 16/3, 16/4, 22/1, 22/2A, 24/1, 24/2,24/3A, 24/4, 30/1C, 30/2, 30/3, 31/1, 31/2,31/3A, 31/5, 31/6, 32/2, 32/3, 32/4, 32/5, 32/6, 32/7, 32/8, 32/9A, 34/4, 35/3, 36/2, 37/2, 38/5B, 38/6, 39/4, 39/6, 39/7, 49/5, 50/1A, 50/2A, 50/2C, 51/1, 51/2, 52/1, 52/2, 58/1A, 58/1B, 58/1C, 58/2, 59/2, 59/3, 59/4, 59/5, 59/6A, 59/7A, 59/6B, 59/6C, 59/6D, 59/6E, 59/7B, 59/7C, 59/8A, 59/8B, 59/8D, 60/1, 60/2, 60/3, 57/3A, 57/3B, 57/4, 56/1, 56/5, 65/2, 66/1, 210/1, 210/2, 210/3, 210/4, 210/5, 210/6, 212/1, 212/2, 214/1, 214/4, 214/6, 214/7, 221/1A, 221/1B, 221/2, 221/3, 221/4, 221/5, 221/6, 222/1, 222/2, 222/3, 222/4A, 222/4B, 222/5, 221/7, 221/8, 226/1, 226/5, 227/1, 227/2A, 227/2B, 227/2C, 227/3.



TAMILNADU POLLUTION CONTROL BOARD

228/1, 228/2, 228/3C, 228/3B, 228/3D, 228/3A, 228/3E, 228/4, 229/1, 229/2, 229/3A, 229/3B, 229/4, 230/1, 230/2A, 230/2B, 230/3, 230/4, 230/6, 230/7, 230/8, 230/9, 230/10, 230/11 in Tulukapatti, 196/3, 196/4, 196/7, 197/5, 197/6B, 197/6C, 198/7, 198/8, 199/2, 199/3, 199/4, 200/2, 200/3, 200/4, 200/5, 201/2A, 201/2B, 201/3, 201/4, 202/1, 202/2, 202/4, 202/5, 203/1, 203/2, 203/4, 203/5, 204/2A, 204/2B, 204/3, 204/4, 205/2, 205/4, 210/1, 210/2, 210/5A, 210/5B, 216/8, 197/8, 198/2, 198/4, 205/1, 205/3A, 206/1, 206/2, 206/3A, 206/4A, 206/5A, 206/6, 206/7A, 207/1B, 207/2B, 209/1, 209/6, 209/7, 210/3, 210/4A, 210/4B, 211/4, 211/5, 211/7, 212/1, 212/2, 212/3, 215/4, 215/5B, 216/3, 216/4, 216/9, 287/1B, 287/2 in Thammannaickanpatti, 112/1, 113/1A1, 100/1A2, 100/2, 100/3A, 100/4A, 100/5A, 100/5B1, 100/6A, 101/1, 101/2, 101/3, 101/4, 101/5, 102/1, 102/2, 103/2, 108/1, 108/2, 108/3, 108/4A, 109/1A, 109/2A1A in Vachakanpatti,

TULUKAPATTI Village,

Virudhunagar Taluk,

Virudhunagar District.

Authorising the occupier to make discharge of sewage and /or trade effluent.

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

This CONSENT is valid for the period ending March 31, 2024

RAMASAMY
RAJAMANICKAM

For Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai

To
The Managing Director,
M/s THE RAMCO CEMENTS LIMITED,
Ramasamy Raja Nagar, Virudhunagar,
Pin: 626204

Copy to:

1. The Commissioner, VIRUDHUNAGAR-Panchayat Union, Virudhunagar Taluk, Virudhunagar District.
2. The District Environmental Engineer, Tamil Nadu Pollution Control Board, VIRUDHUNAGAR.
3. The JCEE-Monitoring, Tamil Nadu Pollution Control Board, TIRUNELVELL.
4. File



TAMILNADU POLLUTION CONTROL BOARD

SPECIAL CONDITIONS

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

Sl. No.	Description	Quantity	Unit
Product Details			
1.	Cement	2.7	Million Tonnes Per Annum
Intermediate Product Details			
1.	Clinker	1.44	Million Tonnes Per Annum

2. This consent to operate for Expansion is valid for operating the facility with the below mentioned permitted outlets for the discharge of sewage/trade effluent. Any change in the outlets and the quantity has to be brought to the notice of the Board and fresh consent has to be obtained.

Outlet No.	Description of Outlet	Maximum daily discharge in KLD	Point of disposal
Effluent Type : Sewage			
1.	Sewage	280.0	On land for gardening
Effluent Type : Trade Effluent			

3. The effluent discharge shall not contain constituents in excess of the tolerance Limits as laid down hereunder.

Category of the Industry :

RED



CONSENT ORDER NO. 2408257290712 DATED: 13/09/2024.

PROCEEDINGS NO.T3/TNPCB/F.0052VDR/RL/VDR/A/2024 DATED: 13/09/2024

SUB: Tamil Nadu Pollution Control Board - RENEWAL OF CONSENT –M/s. THE RAMCO CEMENTS LIMITED , S.F.No. Survey No. 1/6, 4/1B, 5/2, 5/5B, 5/6, 5/7, 5/8, 5/9, 5/10, 6/2, 6/3, 6/4, 6/5, 6/6, 6/7, 7/1, 7/2, 8/1, 8/2, 8/3, 8/4, 9/2, 9/3, 9/4, 9/5, 9/6, 9/7, 10/1, 10/2, 10/3, 10/4, 10/5, 10/6, 10/7, 11/1, 11/2, 11/3, 11/4, 11/5, 12/2, 12/3, 12/4, 12/5, 12/6, 12/7, 12/8, 12/9, 12/10, 13/2, 13/3, 13/4, 13/5, 13/6, 13/7, 13/8, 14/1, 14/2, 14/3, 14/4, 14/5, 14/6, 14/7, 16/1, 16/2, 16/3, 16/4, 22/1, 22/2A, 24/1, 24/2,24/3A, 24/4, 30/1C, 30/2, 30/3, 31/1, 31/2,31/3A, 31/5, 31/6, 32/2, 32/3, 32/4, 32/5, 32/6, 32/7, 32/8, 32/9A, 34/4, 35/3, 36/2, 37/2, 38/5B, 38/6, 39/4, 39/6, 39/7, 49/5, 50/1A, 50/2A, 50/2C, 51/1, 51/2, 52/1, 52/2, 58/1A, 58/1B, 58/1C, 58/2, 59/2, 59/3, 59/4, 59/5, 59/6A, 59/7A, 59/6B, 59/6C, 59/6D, 59/6E, 59/7B, 59/7C, 59/8A, 59/8B, 59/8D, 60/1, 60/2, 60/3, 57/3A, 57/3B, 57/4, 56/1, 56/5, 65/2, 66/1, 210/1, 210/2, 210/3, 210/4, 210/5, 210/6, 212/1, 212/2, 214/1, 214/4, 214/6, 214/7, 221/1A, 221/1B, 221/2, 221/3, 221/4, 221/5, 221/6, 222/1, 222/2, 222/3, 222/4A, 222/4B, 222/5, 221/7, 221/8, 226/1, 226/5, 227/1, 227/2A, 227/2B, 227/2C, 227/3, 228/1, 228/2, 228/3C, 228/3B, 228/3D, 228/3A, 228/3E, 228/4, 229/1, 229/2, 229/3A, 229/3B, 229/4, 230/1, 230/2A, 230/2B, 230/3, 230/4,230/6, 230/7, 230/8, 230/9, 230/10, 230/11 in Tulukkapatti, 196/3, 196/4, 196/7, 197/5, 197/6B, 197/6C, 198/7, 198/8, 199/2, 199/3, 199/4, 200/2, 200/3, 200/4, 200/5, 201/2A, 201/2B, 201/3, 201/4, 202/1, 202/2, 202/4, 202/5, 203/1, 203/2, 203/4, 203/5, 204/2A, 204/2B, 204/3, 204/4, 205/2, 205/4, 210/1, 210/2, 210/5A, 210/5B, 216/8, 197/8, 198/2, 198/4, 205/1, 205/3A, 206/1, 206/2, 206/3A, 206/4A, 206/5A, 206/6, 206/7A, 207/1B, 207/2B, 209/1, 209/6, 209/7, 210/3, 210/4A, 210/4B, 211/4, 211/5, 211/7, 212/1, 212/2, 212/3, 215/4, 215/5B, 216/3, 216/4, 216/9, 287/1B, 287/2 in Thammanaickanpatti, 112/1, 113/1A1, 100/1A2, 100/2, 100/3A, 100/4A, 100/5A, 100/5B1, 100/6A, 101/1, 101/2, 101/3, 101/4, 101/5, 102/1, 102/2, 103/2, 108/1, 108/2, 108/3, 108/4A, 109/1A, 109/2A1A in Vachakarapatti, TULUKAPATTI village, Virudhunagar Taluk and Virudhunagar District - Renewal of Consent for the operation of the plant and discharge of emissions under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987 (Central Act 14 of 1981) –Issued- Reg. (Industry User ID-R15VDR293809)

REF: 1) Board Proceedings No. T1/TNPCB/F.0052VDR/RL//VDR/A&W/2023 dated: 27/02/2023
 2) Unit's Application Number: 57290712 dated: 15/03/2024
 3) JCEE's IR.No : F.0052VDR/RL/JCEE-M/VDR/2024 dated 19/07/2024

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

The Managing Director
 M/s . THE RAMCO CEMENTS LIMITED

S.F No. Survey No. 1/6, 4/1B, 5/2, 5/5B, 5/6, 5/7, 5/8, 5/9, 5/10, 6/2, 6/3, 6/4, 6/5, 6/6, 6/7, 7/1, 7/2, 8/1, 8/2, 8/3, 8/4, 9/2, 9/3, 9/4, 9/5, 9/6, 9/7, 10/1, 10/2, 10/3, 10/4, 10/5, 10/6, 10/7, 11/1, 11/2, 11/3, 11/4, 11/5, 12/2, 12/3, 12/4, 12/5, 12/6, 12/7, 12/8, 12/9, 12/10, 13/2, 13/3, 13/4, 13/5, 13/6, 13/7, 13/8, 14/1, 14/2, 14/3, 14/4, 14/5, 14/6, 14/7, 16/1, 16/2, 16/3, 16/4, 22/1, 22/2A, 24/1, 24/2, 24/3A, 24/4, 30/1C, 30/2, 30/3, 31/1, 31/2, 31/3A, 31/5, 31/6, 32/2, 32/3, 32/4, 32/5, 32/6, 32/7, 32/8, 32/9A, 34/4, 35/3, 36/2, 37/2, 38/5B, 38/6, 39/4, 39/6, 39/7, 49/5, 50/1A, 50/2A, 50/2C, 51/1, 51/2, 52/1, 52/2, 58/1A, 58/1B, 58/1C, 58/2, 59/2, 59/3, 59/4, 59/5, 59/6A, 59/7A, 59/6B, 59/6C, 59/6D, 59/6E, 59/7B, 59/7C, 59/8A, 59/8B, 59/8D, 60/1, 60/2, 60/3, 57/3A, 57/3B, 57/4, 56/1, 56/5, 65/2, 66/1, 210/1, 210/2, 210/3, 210/4, 210/5, 210/6, 212/1, 212/2, 214/1, 214/4, 214/6, 214/7, 221/1A, 221/1B, 221/2, 221/3, 221/4, 221/5, 221/6, 222/1, 222/2, 222/3, 222/4A, 222/4B, 222/5, 221/7, 221/8, 226/1, 226/5, 227/1, 227/2A, 227/2B, 227/2C, 227/3, 228/1, 228/2, 228/3C, 228/3B, 228/3D, 228/3A, 228/3E, 228/4, 229/1, 229/2, 229/3A, 229/3B, 229/4, 230/1, 230/2A, 230/2B, 230/3, 230/4, 230/6, 230/7, 230/8, 230/9, 230/10, 230/11 in Tulukkapatti, 196/3, 196/4, 196/7, 197/5, 197/6B, 197/6C, 198/7, 198/8, 199/2, 199/3, 199/4, 200/2, 200/3, 200/4, 200/5, 201/2A, 201/2B, 201/3, 201/4, 202/1, 202/2, 202/4, 202/5, 203/1, 203/2, 203/4, 203/5, 204/2A, 204/2B, 204/3, 204/4, 205/2, 205/4, 210/1, 210/2, 210/5A, 210/5B, 216/8, 197/8, 198/2, 198/4, 205/1, 205/3A, 206/1, 206/2, 206/3A, 206/4A, 206/5A, 206/6, 206/7A, 207/1B, 207/2B, 209/1, 209/6, 209/7, 210/3, 210/4A, 210/4B, 211/4, 211/5, 211/7, 212/1, 212/2, 212/3, 215/4, 215/5B, 216/3, 216/4, 216/9, 287/1B, 287/2 in Thammanaickanpatti, 112/1, 113/1A1, 100/1A2, 100/2, 100/3A, 100/4A, 100/5A, 100/5B1, 100/6A, 101/1, 101/2, 101/3, 101/4, 101/5, 102/1, 102/2, 103/2, 108/1, 108/2, 108/3, 108/4A, 109/1A, 109/2A1A in Vachakarapatti

TULUKAPATTI Village

Virudhunagar Taluk

Virudhunagar District.

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

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

This RENEWAL OF CONSENT is valid for the period ending **March 31, 2025**

NALINI Digitally signed by NALINI
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**For Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai**

SPECIAL CONDITIONS

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

Sl. No.	Description	Quantity	Unit
Product Details			
1.	Cement	2.7	Million Tonnes Per Annum
Intermediate Product Details			
1.	Clinker	1.44	Million Tons / Annum

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

Category of the Industry :

RED



CONSENT ORDER NO. 2408157290712 DATED: 13/09/2024.

PROCEEDINGS NO.T3/TNPCB/F.0052VDR/RL/VDR/W/2024 DATED: 13/09/2024

SUB: Tamil Nadu Pollution Control Board - RENEWAL OF CONSENT – M/s. THE RAMCO CEMENTS LIMITED , S.F.No. Survey No. 1/6, 4/1B, 5/2, 5/5B, 5/6, 5/7, 5/8, 5/9, 5/10, 6/2, 6/3, 6/4, 6/5, 6/6, 6/7, 7/1, 7/2, 8/1, 8/2, 8/3, 8/4, 9/2, 9/3, 9/4, 9/5, 9/6, 9/7, 10/1, 10/2, 10/3, 10/4, 10/5, 10/6, 10/7, 11/1, 11/2, 11/3, 11/4, 11/5, 12/2, 12/3, 12/4, 12/5, 12/6, 12/7, 12/8, 12/9, 12/10, 13/2, 13/3, 13/4, 13/5, 13/6, 13/7, 13/8, 14/1, 14/2, 14/3, 14/4, 14/5, 14/6, 14/7, 16/1, 16/2, 16/3, 16/4, 22/1, 22/2A, 24/1, 24/2,24/3A, 24/4, 30/1C, 30/2, 30/3, 31/1, 31/2,31/3A, 31/5, 31/6, 32/2, 32/3, 32/4, 32/5, 32/6, 32/7, 32/8, 32/9A, 34/4, 35/3, 36/2, 37/2, 38/5B, 38/6, 39/4, 39/6, 39/7, 49/5, 50/1A, 50/2A, 50/2C, 51/1, 51/2, 52/1, 52/2, 58/1A, 58/1B, 58/1C, 58/2, 59/2, 59/3, 59/4, 59/5, 59/6A, 59/7A, 59/6B, 59/6C, 59/6D, 59/6E, 59/7B, 59/7C, 59/8A, 59/8B, 59/8D, 60/1, 60/2, 60/3, 57/3A, 57/3B, 57/4, 56/1, 56/5, 65/2, 66/1, 210/1, 210/2, 210/3, 210/4, 210/5, 210/6, 212/1, 212/2, 214/1, 214/4, 214/6, 214/7, 221/1A, 221/1B, 221/2, 221/3, 221/4, 221/5, 221/6, 222/1, 222/2, 222/3, 222/4A, 222/4B, 222/5, 221/7, 221/8, 226/1, 226/5, 227/1, 227/2A, 227/2B, 227/2C, 227/3, 228/1, 228/2, 228/3C, 228/3B, 228/3D, 228/3A, 228/3E, 228/4, 229/1, 229/2, 229/3A, 229/3B, 229/4, 230/1, 230/2A, 230/2B, 230/3, 230/4,230/6, 230/7, 230/8, 230/9, 230/10, 230/11 in Tulukkapatti, 196/3, 196/4, 196/7, 197/5, 197/6B, 197/6C, 198/7, 198/8, 199/2, 199/3, 199/4, 200/2, 200/3, 200/4, 200/5, 201/2A, 201/2B, 201/3, 201/4, 202/1, 202/2, 202/4, 202/5, 203/1, 203/2, 203/4, 203/5, 204/2A, 204/2B, 204/3, 204/4, 205/2, 205/4, 210/1, 210/2, 210/5A, 210/5B, 216/8, 197/8, 198/2, 198/4, 205/1, 205/3A, 206/1, 206/2, 206/3A, 206/4A, 206/5A, 206/6, 206/7A, 207/1B, 207/2B, 209/1, 209/6, 209/7, 210/3, 210/4A, 210/4B, 211/4, 211/5, 211/7, 212/1, 212/2, 212/3, 215/4, 215/5B, 216/3, 216/4, 216/9, 287/1B, 287/2 in Thammanaickanpatti, 112/1, 113/1A1, 100/1A2, 100/2, 100/3A, 100/4A, 100/5A, 100/5B1, 100/6A, 101/1, 101/2, 101/3, 101/4, 101/5, 102/1, 102/2, 103/2, 108/1, 108/2, 108/3, 108/4A, 109/1A, 109/2A1A in Vachakarapatti, TULUKAPATTI village, Virudhunagar Taluk and Virudhunagar District - Renewal of Consent for the operation of the plant and discharge of sewage and/or trade effluent under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act 6 of 1974) – Issued- Reg. (Industry User ID- R15VDR293809)

REF: 1) Board Proceedings No. T1/TNPCB/F.0052VDR/RL//VDR/A&W/2023 dated: 27/02/2023
 2) Unit's Application Number: 57290712 dated: 15/03/2024
 3) JCEE's IR.No : F.0052VDR/RL/JCEE-M/VDR/2024 dated 19/07/2024

RENEWAL OF CONSENT is hereby granted under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act, 6 of 1974) (hereinafter referred to as "The Act") and the rules and orders made there under to

The Managing Director
 M/s . THE RAMCO CEMENTS LIMITED

S.F No. Survey No. 1/6, 4/1B, 5/2, 5/5B, 5/6, 5/7, 5/8, 5/9, 5/10, 6/2, 6/3, 6/4, 6/5, 6/6, 6/7, 7/1, 7/2, 8/1, 8/2, 8/3, 8/4, 9/2, 9/3, 9/4, 9/5, 9/6, 9/7, 10/1, 10/2, 10/3, 10/4, 10/5, 10/6, 10/7, 11/1, 11/2, 11/3, 11/4, 11/5, 12/2, 12/3, 12/4, 12/5, 12/6, 12/7, 12/8, 12/9, 12/10, 13/2, 13/3, 13/4, 13/5, 13/6, 13/7, 13/8, 14/1, 14/2, 14/3, 14/4, 14/5, 14/6, 14/7, 16/1, 16/2, 16/3, 16/4, 22/1, 22/2A, 24/1, 24/2, 24/3A, 24/4, 30/1C, 30/2, 30/3, 31/1, 31/2, 31/3A, 31/5, 31/6, 32/2, 32/3, 32/4, 32/5, 32/6, 32/7, 32/8, 32/9A, 34/4, 35/3, 36/2, 37/2, 38/5B, 38/6, 39/4, 39/6, 39/7, 49/5, 50/1A, 50/2A, 50/2C, 51/1, 51/2, 52/1, 52/2, 58/1A, 58/1B, 58/1C, 58/2, 59/2, 59/3, 59/4, 59/5, 59/6A, 59/7A, 59/6B, 59/6C, 59/6D, 59/6E, 59/7B, 59/7C, 59/8A, 59/8B, 59/8D, 60/1, 60/2, 60/3, 57/3A, 57/3B, 57/4, 56/1, 56/5, 65/2, 66/1, 210/1, 210/2, 210/3, 210/4, 210/5, 210/6, 212/1, 212/2, 214/1, 214/4, 214/6, 214/7, 221/1A, 221/1B, 221/2, 221/3, 221/4, 221/5, 221/6, 222/1, 222/2, 222/3, 222/4A, 222/4B, 222/5, 221/7, 221/8, 226/1, 226/5, 227/1, 227/2A, 227/2B, 227/2C, 227/3, 228/1, 228/2, 228/3C, 228/3B, 228/3D, 228/3A, 228/3E, 228/4, 229/1, 229/2, 229/3A, 229/3B, 229/4, 230/1, 230/2A, 230/2B, 230/3, 230/4, 230/6, 230/7, 230/8, 230/9, 230/10, 230/11 in Tulukpatti, 196/3, 196/4, 196/7, 197/5, 197/6B, 197/6C, 198/7, 198/8, 199/2, 199/3, 199/4, 200/2, 200/3, 200/4, 200/5, 201/2A, 201/2B, 201/3, 201/4, 202/1, 202/2, 202/4, 202/5, 203/1, 203/2, 203/4, 203/5, 204/2A, 204/2B, 204/3, 204/4, 205/2, 205/4, 210/1, 210/2, 210/5A, 210/5B, 216/8, 197/8, 198/2, 198/4, 205/1, 205/3A, 206/1, 206/2, 206/3A, 206/4A, 206/5A, 206/6, 206/7A, 207/1B, 207/2B, 209/1, 209/6, 209/7, 210/3, 210/4A, 210/4B, 211/4, 211/5, 211/7, 212/1, 212/2, 212/3, 215/4, 215/5B, 216/3, 216/4, 216/9, 287/1B, 287/2 in Thammanaickanpatti, 112/1, 113/1A1, 100/1A2, 100/2, 100/3A, 100/4A, 100/5A, 100/5B1, 100/6A, 101/1, 101/2, 101/3, 101/4, 101/5, 102/1, 102/2, 103/2, 108/1, 108/2, 108/3, 108/4A, 109/1A, 109/2A1A in Vachakarapatti

TULUKAPATTI Village

Virudhunagar Taluk

Virudhunagar District.

Authorising the occupier to make discharge of sewage and /or trade effluent.

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

This RENEWAL OF CONSENT is valid for the period ending **March 31, 2025**

NALINI

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Date: 2024.09.18 20:23:59
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**For Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai**

SPECIAL CONDITIONS

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

Sl. No.	Description	Quantity	Unit
Product Details			
1.	Cement	2.7	Million Tonnes Per Annum
Intermediate Product Details			
1.	Clinker	1.44	Million Tons / Annum

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

Outlet No.	Description of Outlet	Maximum daily discharge in KLD	Point of disposal
Effluent Type : Sewage			
1.	Treated Sewage water	280.0	On land for gardening
Effluent Type : Trade Effluent - NIL			

Special Additional Conditions:

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

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

Additional Conditions:

1. The unit shall operate and maintain the Sewage Treatment Plant efficiently and continuously so as to achieve the standards prescribed by the Board.
2. The unit shall utilize the treated sewage for gardening and industrial cooling purposes.
3. The unit shall develop rainwater harvesting system as per the action plan submitted in order to achieve the gradual shifting of ground water usage within the time frame fixed in the EC condition.
4. The unit shall comply with conditions mentioned in the environmental clearance issued by MoEF&CC, GoI vide proceeding No. J-11011/119/2009.IA.II(I) dt. 25.10.2021.

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Date: 2024.09.18 20:24:27
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**For Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai**

To
The Managing Director,
M/s.THE RAMCO CEMENTS LIMITED,
Ramasamy Raja Nagar, Virudhunagar
Pin: 626204

Copy to:

(S.M.E)
SR



TAMILNADU POLLUTION CONTROL BOARD



AUTHORISATION No. 23HFC42009117 dated 07/06/2023

Proceeding No. TL/TNPCB/F.0052VDR/HWA/RI/VDR/2023 dated 07/06/2023

Sub: Tamil Nadu Pollution Control Board – Hazardous Waste Authorization–Fresh- M/s. THE RAMCO CEMENTS LIMITED, S.F.No. Survey No. 1/6, 4/1B, 5/2, 5/5B, 5/6, 5/7, 5/8, 5/9, 5/10, 6/2, 6/3, 6/4, 6/5, 6/6, 6/7, 7/1, 7/2, 8/1, 8/2, 8/3, 8/4, 9/2, 9/3, 9/4, 9/5, 9/6, 9/7, 10/1, 10/2, 10/3, 10/4, 10/5, 10/6, 10/7, 11/1, 11/2, 11/3, 11/4, 11/5, 12/2, 12/3, 12/4, 12/5, 12/6, 12/7, 12/8, 12/9, 12/10, 13/2, 13/3, 13/4, 13/5, 13/6, 13/7, 13/8, 14/1, 14/2, 14/3, 14/4, 14/5, 14/6, 14/7, 16/1, 16/2, 16/3, 16/4, 22/1, 22/2A, 24/1, 24/2, 24/3A, 24/4, 30/1C, 30/2, 30/3, 31/1, 31/2, 31/3A, 31/5, 31/6, 32/2, 32/3, 32/4, 32/5, 32/6, 32/7, 32/8, 32/9A, 34/4, 35/3, 36/2, 37/2, 38/3B, 38/6, 39/4, 39/6, 39/7, 49/5, 50/1A, 50/2A, 50/2C, 51/1, 51/2, 52/1, 52/2, 58/1A, 58/1B, 58/1C, 58/2, 59/2, 59/3, 59/4, 59/5, 59/6A, 59/7A, 59/6B, 59/6C, 59/6D, 59/6E, 59/7B, 59/7C, 59/8A, 59/8B, 59/8D, 60/1, 60/2, 60/3, 57/3A, 57/3B, 57/4, 56/1, 56/5, 65/2, 66/1, 210/1, 210/2, 210/3, 210/4, 210/5, 210/6, 212/1, 212/2, 214/1, 214/4, 214/6, 214/7, 221/1A, 221/1B, 221/2, 221/3, 221/4, 221/5, 221/6, 222/1, 222/2, 222/3, 222/4A, 222/4B, 222/5, 221/7, 221/8, 226/1, 226/5, 227/1, 227/2A, 227/2B, 227/2C, 227/3, 228/1, 228/2, 228/3C, 228/3B, 228/3D, 228/3A, 228/3E, 228/4, 229/1, 229/2, 229/3A, 229/3B, 229/4, 230/1, 230/2A, 230/2B, 230/3, 230/4, 230/6, 230/7, 230/8, 230/9, 230/10, 230/11 in Tulakuppatti, 196/3, 196/4, 196/7, 197/5, 197/6B, 197/6C, 198/7, 198/8, 199/2, 199/3, 199/4, 200/2, 200/3, 200/4, 200/5, 201/2A, 201/2B, 201/3, 201/4, 202/1, 202/2, 202/4, 202/5, 203/1, 203/2, 203/4, 203/5, 204/2A, 204/2B, 204/3, 204/4, 205/2, 205/4, 210/1, 210/2, 210/3A, 210/5B, 216/8, 197/8, 198/2, 198/4, 205/1, 205/3A, 206/1, 206/2, 206/3A, 206/4A, 206/5A, 206/6, 206/7A, 207/1B, 207/2B, 209/1, 209/3, 209/7, 210/3, 210/4A, 210/4B, 211/4, 211/5, 211/7, 212/1, 212/2, 212/3, 215/4, 215/5B, 216/3, 216/4, 216/9, 287/1B, 287/2 in Thammankampatti, 112/1, 113/1A1, 100/1A2, 100/2, 100/3A, 100/4A, 100/5A, 100/5B1, 100/6A, 101/1, 101/2, 101/3, 101/4, 101/5, 102/1, 102/2, 103/2, 108/1, 108/2, 108/3, 108/4A, 109/1A, 109/2A1A in Vachakampatti, TULUKAPATTI Village, VIRUDHUNAGAR Taluk, Virudhunagar District - Authorization under Rule 6 (2) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 enacted under Environment (Protection) Act, 1986 – Issued-Reg.

Ref: 1. Unit's application No. 42009117, dated 25-11-2021/ 11-04-2023.
2. HWA-IR.No.0052VDR/HWA/RI/JCEE-M/VDR/2023 dated 21/04/2023

FORM 2

[See rule 6 (2)]

FORM FOR GRANT OR RENEWAL OF AUTHORISATION TO THE OCCUPIERS, RECYCLERS, REPROCESSORS, REUSERS, USER AND OPERATORS OF DISPOSAL FACILITIES

1. Number of authorization: 23HFC42009117 and dated : 07/06/2023



TAMILNADU POLLUTION CONTROL BOARD

2. The Managing Director of M/s. THE RAMCO CEMENTS LIMITED is hereby granted an Authorization based on the enclosed signed inspection report for Generation and handling of hazardous or other wastes or both on the premises situated at S.F.No, Survey No. 1/6, 4/1B, 5/2, 5/5B, 5/6, 5/7, 5/8, 5/9, 5/10, 6/2, 6/3, 6/4, 6/5, 6/6, 6/7, 7/1, 7/2, 8/1, 8/2, 8/3, 8/4, 9/2, 9/3, 9/4, 9/5, 9/6, 9/7, 10/1, 10/2, 10/3, 10/4, 10/5, 10/6, 10/7, 11/1, 11/2, 11/3, 11/4, 11/5, 12/2, 12/3, 12/4, 12/5, 12/6, 12/7, 12/8, 12/9, 12/10, 13/2, 13/3, 13/4, 13/5, 13/6, 13/7, 13/8, 14/1, 14/2, 14/3, 14/4, 14/5, 14/6, 14/7, 16/1, 16/2, 16/3, 16/4, 22/1, 22/2A, 24/1, 24/2, 24/3A, 24/4, 30/1C, 30/2, 30/3, 31/1, 31/2, 31/3A, 31/5, 31/6, 32/2, 32/3, 32/4, 32/5, 32/6, 32/7, 32/8, 32/9A, 34/4, 35/3, 36/2, 37/2, 38/5B, 38/6, 39/4, 39/6, 39/7, 49/5, 50/1A, 50/2A, 50/2C, 51/1, 51/2, 52/1, 52/2, 58/1A, 58/1B, 58/1C, 58/2, 59/2, 59/3, 59/4, 59/5, 59/6A, 59/7A, 59/6B, 59/6C, 59/6D, 59/6E, 59/7B, 59/7C, 59/8A, 59/8B, 59/8D, 60/1, 60/2, 60/3, 57/3A, 57/3B, 57/4, 56/1, 56/5, 65/2, 66/1, 210/1, 210/2, 210/3, 210/4, 210/5, 210/6, 212/1, 212/2, 214/1, 214/4, 214/6, 214/7, 221/1A, 221/1B, 221/2, 221/3, 221/4, 221/5, 221/6, 222/1, 222/2, 222/3, 222/4A, 222/4B, 222/5, 221/7, 221/8, 226/1, 226/5, 227/1, 227/2A, 227/2B, 227/2C, 227/3, 228/1, 228/2, 228/3C, 228/3B, 228/3D, 228/3A, 228/3E, 228/4, 229/1, 229/2, 229/3A, 229/3B, 229/4, 230/1, 230/2A, 230/2B, 230/3, 230/4, 230/6, 230/7, 230/8, 230/9, 230/10, 230/11 in Tuluakapatti, 196/3, 196/4, 196/7, 197/5, 197/6B, 197/6C, 198/7, 198/8, 199/2, 199/3, 199/4, 200/2, 200/3, 200/4, 200/5, 201/2A, 201/2B, 201/3, 201/4, 202/1, 202/2, 202/4, 202/5, 203/1, 203/2, 203/4, 203/5, 204/2A, 204/2B, 204/3, 204/4, 205/2, 205/4, 210/1, 210/2, 210/5A, 210/5B, 216/8, 197/8, 198/2, 198/4, 205/1, 205/3A, 206/1, 206/2, 206/3A, 206/4A, 206/5A, 206/6, 206/7A, 207/1B, 207/2B, 209/1, 209/6, 209/7, 210/3, 210/4A, 210/4B, 211/4, 211/5, 211/7, 212/1, 212/2, 212/3, 215/4, 215/5B, 216/3, 216/4, 216/9, 287/1B, 287/2 in Thirumanickanpatti, 112/1, 113/1A, 100/1A2, 100/2, 100/3A, 100/4A, 100/5A, 100/5B, 100/6A, 101/1, 101/2, 101/3, 101/4, 101/5, 102/1, 102/2, 103/2, 108/1, 108/2, 108/3, 108/4A, 109/1A, 109/2A1A in Vachukrapatti, TULUKAPATTI Village, VIRUDHUNAGAR Taluk, Virudhunagar District.

Sl No	Schedule / Name of the Processes	Name of Hazardous Waste (with category No)	Quantity	Activities for which Authorization is issued
1	Schedule I / 2. Industrial operations using mineral or synthetic oil as lubricant in hydraulic systems or other applications	3.1-Used or spent oil	94.62 T/Annun	Generation, Collection, Storage, Transportation and send to Authorized Recyclers for Recovery and Reuse. (Recyclable)
2	Schedule I / 3. Industrial operations using mineral or synthetic oil as lubricant in hydraulic systems or other applications	3.2-Wastes or residues containing oil	100 T/Annun	Generation, Collection, Storage, Transportation and send to Authorized Recyclers for Recovery and Reuse. (Recyclable)
3	Schedule I / 33. Handling of hazardous chemicals and wastes	33.1-Empty tins/containers/tines contaminated with hazardous chemicals/wastes	100 T/Annun	Generation, Collection, Storage, Transportation and send to Authorized Recyclers for Recovery and Reuse. (Utilizable)

3. This authorization shall be valid for a period upto 31/03/2028.

The Authorization is issued subject to the following general and special conditions annexed.

B RAJAMANICAM
Secretary to the Board

For Member Secretary
 Tamil Nadu Pollution Control Board
 Chennai

A. GENERAL CONDITIONS OF AUTHORIZATION

- The authorized person shall comply with the provisions of the Environment (Protection) Act, 1986 and the rules made there under.
- The authorization or its renewal shall be produced for inspection at the request of an officer authorized by Tamil Nadu Pollution Control Board.
- The person authorized shall not rent, lend, sell, transfer or otherwise transport the hazardous and other wastes except what is permitted through this Authorization.
- Any unauthorized change in personnel, equipment or working conditions as mentioned in the application by the person authorized shall constitute a breach of his authorization.

CERTIFICATE21st October 2024

This is to certify that the Land over an Extent of 112.899 Ha in the following survey numbers of Thulukapatti Village, Virudhunagar Taluk in Virudhunagar District belongs to 'The Ramco Cements Limited', Ramasamy Raja Nagar and having Patta Nos 381, 1104, 1105, 1378, 1381, 1382, 1383, 1384 and 1394

Sl No	Survey Number	Extent in Hectares
1	1/1	0.580
2	1/2	0.565
3	1/3	0.555
4	1/4	0.565
5	1/5	0.470
6	1/6	0.480
7	1/7	0.965
8	2/1	0.820
9	2/2	3.325
10	3/1	1.070
11	3/2	1.140
12	3/3	0.140
13	3/4	0.350
14	3/5	0.695
15	4/1B	1.005
16	4/2A2B	1.315
17	4/2B	0.075
18	4/3	0.640
19	5/1	0.415
20	5/2	0.395
21	5/3B	0.500
22	5/4B	0.465
23	5/5B	0.500
24	5/6	0.495
25	5/7	0.375
26	5/8	0.140
27	5/9	0.565
28	5/10	0.455
29	6/2	1.670
30	6/3	0.705
31	6/4	0.330
32	6/5	0.625
33	6/8	0.590
34	6/7	0.350
35	7/1	0.380
36	7/2	0.615
37	8/1	0.415
38	8/2	0.530


 அரசு இறப்பு பதிவாளர் மற்றும்
 கிராம நிர்வாக அலுவலர்
 துருவையூர்

39	8/3	0.350
40	8/4	0.250
41	9/2	0.860
42	9/3	0.545
43	9/4	0.550
44	9/5	0.630
45	9/6	0.380
46	9/7	1.210
47	10/1	0.725
48	10/2	0.775
49	10/3	0.710
50	10/4	0.435
51	10/5	0.330
52	10/6	0.255
53	10/7	0.175
54	11/1	1.365
56	11/2	0.945
57	11/3	0.565
58	11/4	0.300
59	11/5	0.480
60	12/2	0.465
61	12/3	0.415
62	12/4	0.310
63	12/5	0.730
64	12/6	0.235
65	12/7	0.685
66	12/8	0.785
67	12/9	0.260
68	12/10	0.225
69	13/2	0.115
70	13/3	0.125
71	13/4	0.535
72	13/5	0.250
73	13/6	1.000
74	13/7	0.605
75	13/8	0.325
76	14/1	0.350
77	14/2	0.370
78	14/3	0.275
79	14/4	0.345
80	14/5	1.155
81	14/6	0.555
82	14/7	0.315
83	16/1	0.585
84	16/2	0.795
85	16/3	0.550


 அறப்பு கிராம நிர்வாக அலுவலர் மற்றும்
 கிராம நிர்வாக அலுவலர்
 கிருஷ்ணபட்டி

86	16/4	0.325
87	22/1	0.335
88	22/2A	0.545
89	24/1	0.590
90	24/2	0.600
91	24/3A	0.712
92	24/4	1.117
93	30/1C	0.055
94	30/2	0.215
95	30/3	0.830
96	31/1	0.315
97	31/2	0.310
98	31/3A	0.600
99	31/5	0.545
100	31/6	0.340
101	32/2	0.100
102	32/3	0.095
103	32/4	0.140
104	32/5	0.525
105	32/6	0.575
106	32/7	0.350
107	32/8	0.335
108	32/9A	0.725
109	34/4	0.235
110	34/5	1.130
111	35/2	0.600
112	35/3	0.550
113	36/2	1.430
114	37/2	0.405
115	38/5B	0.985
116	38/6	0.165
117	38/7	0.340
118	39/4	0.415
119	39/6	0.190
120	39/7	0.385
121	49/5	1.390
122	50/1A	0.505
123	50/2A	0.200
124	50/2C	0.245
125	51/1	0.655
126	51/2	0.260
127	52/1	0.335
128	52/2	0.270
129	56/1	0.245
130	56/5	0.275
131	57/3A	0.050


 அறப்பு இறப்பு பதிவுகள் மற்றும்
 கிராம நிர்வாக அலுவலர்
 துறைமுகம்

132	57/3B	0.670
133	57/4	0.315
134	58/1A	0.035
135	58/1B	0.825
136	58/1C	0.565
137	58/2	0.555
138	59/2	0.480
139	59/3	0.095
140	59/4	0.225
141	59/5	0.300
142	59/6A	0.015
143	59/7A	0.020
144	59/6B	0.435
145	59/6C	0.160
146	59/6D	0.160
147	59/6E	0.100
148	59/7B	0.130
149	59/7C	0.160
150	59/8A	0.060
151	59/8B	0.055
152	59/8D	0.295
153	60/1	0.455
154	60/2	0.345
155	60/3	0.520
156	65	2.430
157	65	2.830
158	65	2.695
159	65/1	0.845
160	210/1	0.420
161	210/2	0.010
162	210/3	0.290
163	210/4	0.001
164	210/5	0.325
165	210/6	0.160
166	212/1	0.170
167	212/2	0.325
168	214/1A	0.070
169	214/4	0.410
170	214/5	0.410
171	214/7	0.310
172	221/1A	0.330
173	221/1B	0.130
174	221/2	0.290
175	221/3	0.465
176	221/4	0.420
177	221/5	0.245
178	221/6	0.150


 அப்படி கிறப்பு பதிவாளர் மற்றும்
 கிராம நிர்வாக அலுவலர்
 தலைவரே

179	222/1	1.010
180	222/2	0.415
181	222/3	0.420
182	222/4A	0.385
183	222/4B	0.370
184	222/5	0.210
185	221/7	0.105
186	221/8	0.910
187	226/1	1.110
188	226/5	0.640
189	227/1	0.995
190	227/2A	2.025
191	227/2B	1.215
192	227/2C	1.050
193	227/3	0.535
194	228/1	0.805
195	228/2	0.685
196	228/3C	0.430
197	228/3B	0.175
198	228/3D	0.205
199	228/3A	0.260
200	228/3E	0.225
201	228/4	0.390
202	229/1	0.420
203	229/2	1.095
204	229/3A	0.510
205	229/3B	0.380
206	229/4	0.625
207	230/1	0.080
208	230/2A	0.180
209	230/2B	0.250
210	230/3	0.340
211	230/4	0.220
212	230/6	0.200
213	230/7	0.205
214	230/8	0.495
215	230/9	0.009
216	230/10	0.325
217	230/11	0.255
	TOTAL	112.899


 Administrative Officer
 Thulakapathy Village
 Vinadhurayal
 595411

CERTIFICATE21st October 2024

This is to certify that the Land over an Extent of 57.677 Ha in the following survey numbers of Thammanaickenpatti Village, Virudhunagar Taluk in Virudhunagar District belongs to "The Ramco Cements Limited", Ramasamy Raja Nagar and having Patta Nos. 939, 1176, 1252, 1311, 1365, 1367, 1368, 1369, 1503, 1504, 1505, 1506, 1507, 1508, 1509, 1513, 1514, 1515 & 1516.

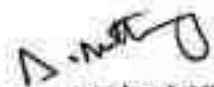
Sl. No.	Survey Number	Extent In Hectares
1	192/3B	0.265
2	192/6	0.565
3	192/7	0.010
4	192/8	0.010
5	194/1	0.330
6	194/2	0.325
7	194/3	0.295
8	194/4	0.130
9	194/5	0.725
10	194/6	0.115
11	194/7	0.310
12	194/8	0.225
13	194/9	0.055
14	194/10	0.530
15	194/11	0.395
16	195/7	1.605
17	195/8	0.615
18	196/2	0.180
19	196/3A	0.005
20	196/3B	0.175
21	196/4	0.285
22	196/5	0.280
23	196/6	0.595
24	196/7	1.720
25	197/5	0.345
26	197/6B	0.130
27	197/6C	0.060
28	197/8	1.045
29	198/2	0.300
30	198/4	0.030
31	198/7	0.545
32	198/8	0.555
33	199/2	0.540
34	199/3	0.595
35	199/4	0.550
36	200/2	1.020


 Village Administrative Office
 Thammanaickenpatti
 Virudhunagar Taluk

37	200/3	1.040
38	200/4	0.985
39	200/5	0.965
40	201/2A	2.685
41	201/2B	0.370
42	201/3	0.315
43	201/4	0.545
44	202/1	0.695
45	202/2	0.095
46	202/4	0.975
47	202/5	0.875
48	203/1	0.830
49	203/2	0.115
50	203/4	0.995
51	203/5	1.285
52	204/2A	0.345
53	204/2B	0.215
54	204/3	0.795
55	204/4	1.305
56	205/1	0.410
57	205/2	0.425
58	205/3A	0.480
59	205/4	1.330
60	206/1	0.945
61	206/2	0.370
62	206/3A	0.300
63	206/4A	1.070
64	206/5A	0.645
65	206/6	0.350
66	206/7A	0.575
67	207/1B	0.860
68	207/2B	1.380
69	209/1	0.795
70	209/6	1.050
71	209/7	0.675
72	210/1	1.185
73	210/2	0.405
74	210/3	0.420
75	210/4A	0.335
76	210/4B	0.365
77	210/5A	0.360
78	210/5B	0.755
79	211/4	0.500
80	211/5	0.310
81	211/7	0.720
82	212/1	0.085


 Village Administrative Office
 P. Thammanickan @atu
 Panchunagar Folan

83	212/2	2.140
84	212/3	1.050
85	215/4	0.630
86	215/5B	0.810
87	216/3	0.515
88	216/4	0.225
89	216/8	1.265
90	216/9	0.075
91	287/1B	1.205
92	287/2	1.965
	Total	57.677

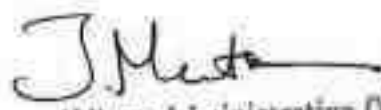

 Village Administrative Office
 Thammisaekkan Pattu
 Gudhunagar Taluk
 Thammisaekkan Pattu
 Gudhunagar Taluk

CERTIFICATE21st October 2024

This is to certify that the Land over an Extent of 20.865 Ha in the following survey numbers of Vachchkarapatti Village, Virudhunagar Taluk in Virudhunagar District belongs to "The Ramco Cements Limited", Ramasamy Raja Nagar and having Patta Nos. 994,1016 & 1325.

Sl. No.	Survey Number	Extent In Hectares
1.	100/1A2	0.675
2.	100/2	0.305
3.	100/3A	0.247
4.	100/4A	0.096
5.	100/5A	1.395
6.	100/5B1	0.075
7.	100/6A	0.064
8.	101/1	0.615
9.	101/2	0.595
10.	101/3	1.025
11.	101/4	0.570
12.	101/5	0.525
13.	102/1	1.010
14.	102/2	2.146
15.	103/2	1.020
16.	108/1	0.975
17.	108/2	0.840
18.	108/3	0.960
19.	108/4A	0.215
20.	109/1A	0.590
21.	109/2A1A	0.102
22.	112/1	0.245
23.	112/2	1.500
24.	112/3	0.455
25.	112/4	0.355
26.	112/5	1.425
27.	113/1A1	0.585
28.	113/1B1	0.040
29.	113/1C1	0.030
30.	113/2	0.500
31.	113/3A	1.285
32.	113/3B	0.175
33.	113/3C2	0.225
34.	TOTAL	20.865

Village Administrative Officer
Vachchkarapatti Village
Virudhunagar Taluk and District


Village Administrative Officer
Vachchkarapatti,
Virudhunagar Taluk.

Annex.Doc-3 Factory License

434

தமிழ்நாடு தொழிலாளர் பாதுகாப்பு மற்றும் சுகாதார இயக்கம்
Directorate of Industrial Safety and Health

Form No.4 - Registration and Licence to work a factory (Prescribed under Rule 4 (6) of the Tamil Nadu Factories Rules 1950)



Registration Number : **VNR00615**

Licence Fee : **₹ 1,800,000**

Licence is hereby granted / renewed to Mr. P.R VENKETRAMA RAJA valid only for the premises detailed below for use as a factory employing not more than 2000 workers on any one day during the year and using installed horse power inclusive of mobile equipment above 10000 horse power subject to the provisions of the Factories Act, 1948 and the Rules made thereunder.

This licence shall remain in force till the 31st day of December 2025 unless such licence is cancelled before that date under rule 109.

Name of the factory : **THE RAMCO CEMENTS LIMITED**

Description of Licensed Premises

The licensed premises shown on Plan No. - dated - are situated in Survey No.: 4/12, Door No. / Plot No.: 180,181/W4, RAMASAMY RAJA NAGAR, THULUKUPATTI, Virudhunagar Taluk, Virudhunagar District - 626204.

This License renewal is auto Generated through Portal. Hence no signature required.

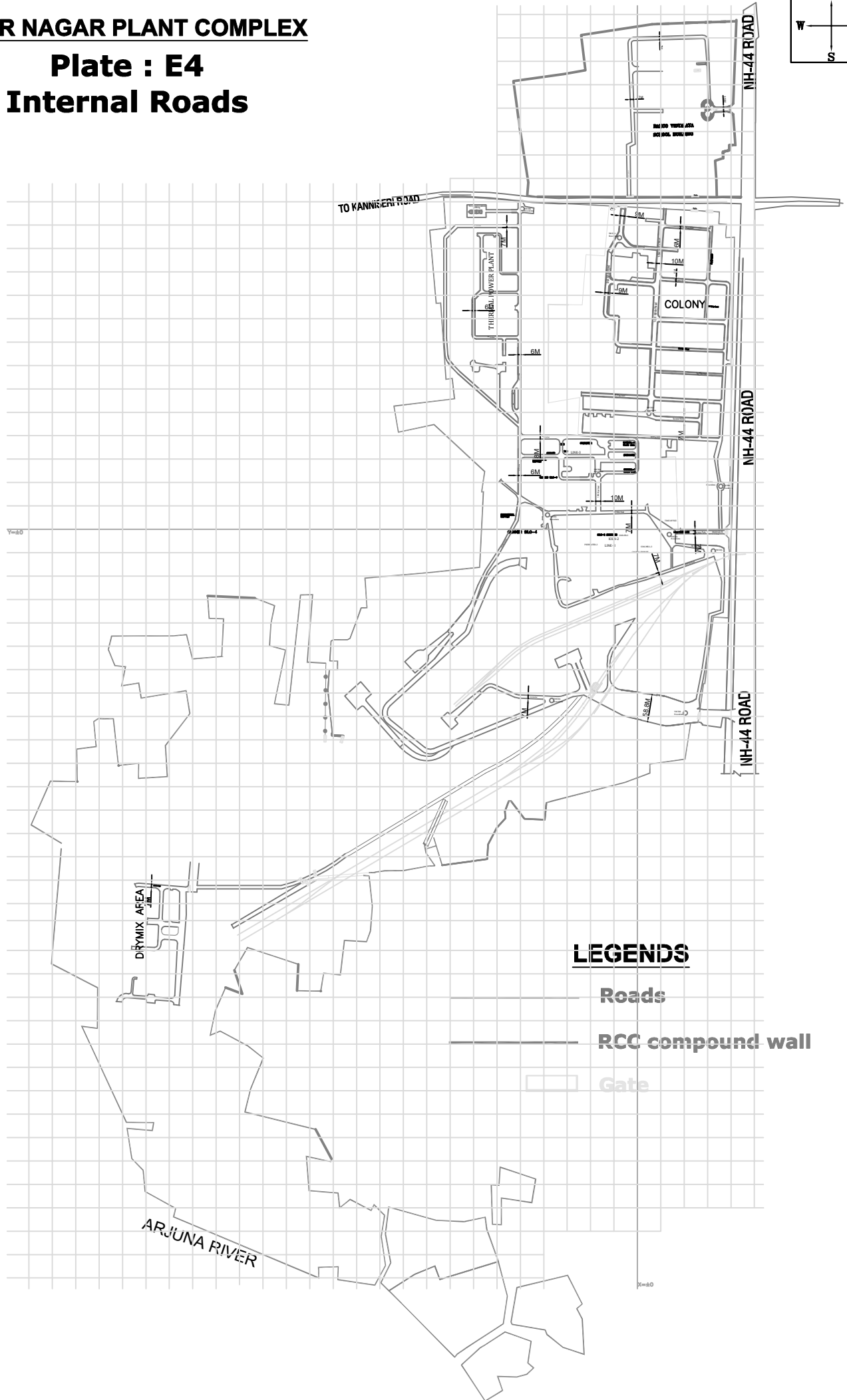
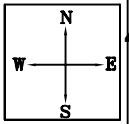
Date : 02/09/2024

Joint Director of Industrial Safety and Health, Virudhunagar

Renewals				
Sl.No.	Date of Renewal	Fee for Renewal	Date of Expiry	Signature of Joint Director
1	02/09/2024	1,800,000/-	31/12/2029	
Amendments				
Sl.No.	Amended to Install horse power	Amended to Employ maximum number of workers	Additional fee	Signature of Joint Director
1.				
2.				
Transfers				
Sl.No.	Name of the person to whom transferred	Name of the factory	Signature of Joint Director	
1.				
2.				

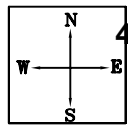
RR NAGAR PLANT COMPLEX

Plate : E4 Internal Roads








RR NAGAR PLANT COMPLEX

Plate : E5 ELEVATION CONTOURS & DRAINAGE PATTERN



LEGENDS

-  Drainage line
-  RCC compound wall
-  RWTH Storage Ponds
-  Recharge pits
-  RWTH-Roof top storage tank

Obtained in person of
Manager - E.E.I Office to day
9/3/81
6 copies

GOVERNMENT OF TAMILNADU.

Abstract.

Irrigation -Charges for Water drawn for Industrial purposes
revision amendment to para 258(a) of Tamilnadu Public Works
Account Code -Issued.

PUBLIC WORKS DEPARTMENT.

G.O.No.No.1446.

Dated: 4--10--1975
Mad:

1. G.O.No.No.434/PW.Dt.22-2-1966.
2. From the Chief Engineer (Irrigo) Ir.No. N2/268/72-27,
Dt. 8--2--1973.
3. From the Board of Revenue Ir.No.N3/1464/73-9/77/1-12-75.

ORDER

The Govt approve the following amendments to the Tamilnadu
Public Works Account Code:

AMENDMENT.

In the said code Under para 258(a) for the items (i) and (ii)
under the heading "By hand" and "By mechanical contrivances" the
following shall be substituted; viz.,

258(a) The charges for water drawn for Industrial purposes
directly from Govt. either by hand or by mechanical
contrivances will be as follows:

i) For consumptive use for Non-agricultural purpose other than
domestic water supply:-

At Rs.30/- per 1000 cubic metres subject to a minimum of
Rs. 5,000/- per annum.

ii) FOR COOLING PURPOSES: Water taken for cooling purposes
and returned undiminished to Govt. sources shall be charged at
Rs.10/- per 1000 cubic metres subject to a minimum of Rs. 300/-
per annum. For the rest of water consumed full charge of Rs.30/-
per 1000 cubic metres subject to a minimum of Rs.3,000/- per annum.

iii) If water is supplied from special Govt. schemes, for
the purposes mentioned in (i) and (ii) above, the cost of
operation of such schemes such as pumping, capital charges towards
depreciation and interest on the cost of installation will be
charged in addition.

The amendments indicated in para 1 above, will take effect
from 1-4-75.

/By order of the Government

B. Vijayasthovan,
Secretary to Govt.

True copy
J.V. [Signature]
9/3/81
EXECUTIVE ENGINEER, P.W.D.
CHENNAI

9/3/81



518
 4.25

15/2/50
 Madras Cements Ltd.,
 R. L. Nagar

RE. A. 10. 10. 10. 10. 10. 10.
 STAMP VENDOR, THE GOVERNMENT
 PRINTING OFFICE

THIS INDENTURE made this 15th day of
October 1984 BETWEEN THE GOVERNOR OF TAMIL NADU
 (hereinafter called "THE GOVERNOR" which expression
 shall where the context admits include his successors-
 in-office and assigns) of the one part AND Messrs.
 Madras Cements Ltd., a Company incorporated under the
 Companies Act 1956 and having its Registered Office
 at 'Ramanandiram', Rajapalayam, (hereinafter called
 "THE LICENSEE" which expression shall where the
 context admits include its executors, administrators,
 legal representatives and permitted assigns) of the
 other part.

WHEREAS the canal known as Arjuna River in
 Tulukkapatti village, virudhunagar Taluk, Sattur
 Sub District in the District of Ramanathapuram vests
 in the Government and whereas the Licensee is the
 owner of the Factory and premises situate at Ranasamy-
 Raja Nagar within the limits of Tulukkapatti village
 and known as Madras Cements Ltd., hereinafter called
 'The said Factory'.

FOR MADRAS CEMENTS LTD.,
 ADMINISTRATIVE MANAGER.

12/23

S. G. [Signature]
 COLLECTOR,
 Ramanathapuram of Madras.

- 2 -

AND WHEREAS the Licensee has applied to the Government of Tamil Nadu (hereinafter called "the Government") to grant him such rights of taking water from the said canal for the purposes of the said factory and such other rights of access and incidental rights as are hereinafter described for the term of ten years hereinafter mentioned which the Governor has agreed to do upon the terms and conditions hereinafter expressed.

NOW THIS INDENTURE WITNESSETH as follows:-

1. In pursuance of the said agreement and in consideration of the yearly sums hereinafter made payable to the Government and of the covenants on the part of the Licensee hereinafter contained the Governor hereby grants unto the Licensee the rights and liberties following namely,

(a) The right to take from the said canal at the point marked 'A' on the plan annexed hereto or at such other point as the Collector of Ramenathapuram (hereinafter called the 'Collector') shall determine and to convey a cross the lands of Government (hereinafter called 'the said lands') by means of pipes and/or sluices and/or channels and/or by hand such quantity of water as the licensee shall require (and shall be available) for the purposes of the said factory and shall have paid for in advance not exceeding the maximum quantity hereinafter mentioned or such lesser quantity as in the opinion of the Collector of Ramenathapuram (hereinafter called 'the collector') cannot be exceeded without interfering with irrigation or navigation or the ordinary use of the said canal by the public.

(b) The right for the purpose of taking such water and for the purpose of restoring such water if the Licensee shall think fit so to restore the same where such water is intended to be taken and discharged by means of pipes, to lay and maintain in the said lands a line of intake pipes and a line of discharge pipes of cast iron or RCC of the gauge of about 8 to 12 inches

FOR MADRAS CEMENTS LTD.

M. S. S. S. S.
ADMINISTRATIVE MANAGER,

13
12
S. S. S.
COLLECTOR,
COLLECTOR

(Signature of Collector)

- 3 -

in the respective courses shown by dotted lines on the said plan so however that the same shall be laid not less than about 3 to 10 feet below the surface of the soil in covered trenches and for the same purpose to cut, construct and maintain sluices in the said lands of the dimensions and following the course specified and indicated ¹⁵ ~~the~~ the said plan the said works to be executed so that no unnecessary damage shall be done to the said lands and that upon the completion of the works the surface shall at the cost of the Licensee be restored to its present condition or as near thereto as shall be reasonably possible.

(c) The liberty from time to time during the continuance of this licence to enter on the said lands for the purpose of exercising the rights and liberties hereby granted and with the previous permission in writing of the Revenue Divisional Officer or Tahsildar for the time being in charge of the said canal but not otherwise to open up the said pipes and sluices for the purposes of removing repairing and cleaning the same as occasion may require, doing no unnecessary damage to the said lands and restoring the surface at the cost of the Licensee whenever opened up as soon as may be.

To hold and enjoy the said rights and liberties hereby granted unto the Licensee for the term of ten years from the first day of November 1979, subject to determination as hereinafter mentioned.

2. The Licensee shall and will yield and pay to the Government in advance before the 10th day of April in each year the charges for water estimated to be required by the Licensee during the year ending on the 31st day of March following at the following rates:

The charges for water drawn for Industrial purposes directly from Government either by hand or by mechanical contrivance will be as follows:

FOR MADRAS CEMENTS LTD.,

M. S. S. S.
ADMINISTRATIVE MANAGER.

S. S. S.
COLLECTOR,

CHENNAI.

1) For consumptive use for non-agricultural purpose other than domestic water supply:

At Rs. 30/= per 1000 cubic metres subject to a minimum of Rs. 3,000/= per annum.

ii) For Cooling Purpose : Water taken for cooling purposes and returned undiminished to Government sources shall be charged @ Rs. 10/= per 1000 cubic metres subject to a minimum of Rs. 300/= per annum. For the rest of water consumed full charges of Rs. 30/= per 1000 cubic metres subject to a minimum of Rs. 3,000/= per annum.

iii) If water is supplied from special Government Schemes, for the purposes mentioned in (i) and (ii) above, the cost of operation of such schemes such as pumping, capital charges towards depreciation and interest on the cost of installation will be charged in addition.

If in any year the Licensee shall require any water in excess of the quantity paid for in advance and if the Government agree to supply such excess water, the Licensee shall and will also yield and pay to the Government the charges at the rate of Rs. 30/= for every 1000 cubic metres of water to be removed by pipes or sluices or otherwise. The charges for the excess water shall be paid before the excess water is actually removed by the Licensee subject to adjustment of accounts when the actual quantities of supply are ascertained, provided that the Government shall be at liberty to revise the above rate periodically and the Licensee is bound to pay at the revised rate from the date of revision.

2.5. The Licensee shall pay to the Government in advance, before the 10th day of April in each year, an annual rent as fixed by the Superintending Engineer for Water Meters or other measuring device to measure the quantity of water taken from the canal through pipes, plumes, sluices, channels or in any other manner except by hand.

FOR MADRAS CEMENTS LTD.,

ADMINISTRATIVE MANAGER.

COLLECTOR,
TAMIL NADU GOVT. ENGINEERING COLLEGE,
SRI LAKSHMI NARAYANA PURAM,
MADRAS.

2.C. The Licensee shall also deposit a sum specified by the Superintending Engineer as a Security Deposit which may be reduced or increased during the currency of the License at the discretion of the Executive Engineer. This security deposit may be drawn upon to meet the cost of repairing or replacing any damage to the Meter or measuring device. After the repairs are carried out and the cost determined, the Superintending Engineer may call upon the Licensee to make up the deposit to the original or an increased amount. The opinion of the Executive Engineer in regard to the nature of the damage and the cost recoverable shall be final and binding on the Licensee.

3. The Licensee covenants with the Governor as follows, namely, that the Licensee -

(a) will pay the said yearly sums hereinbefore stipulated to be so paid without any deduction and within the periods hereinbefore appointed for payment thereof respectively.

(b) will do all works and things hereby authorised to be done by him upon or affecting the said lands or the said canal in a good and workman like manner and so as to cause no unnecessary damage or disturbance to the said lands or the said canal or the bed or banks thereof.

(c) in case such water shall be taken by means of such pipes or sluices or otherwise except by hand at the Licensee's own cost, suitable Meters will be installed by Government and maintained at Government cost at or near the point of intake. The said Meters or gauges shall be opened at all times to the inspection of any officer of the P.W.D. or Revenue Department of the Government for correctly measuring the quantity of water taken from the said canal to the said pipes or sluices or otherwise as aforesaid. The Licensee will pay an annual rent hereinbefore stipulated to be so paid and within the periods hereinbefore mentioned for the payment thereof and will be responsible for

FOR MADRAS CEMENTS LTD.

M. S. S. S.
ADMINISTRATIVE MANAGER.

S. S. S.
COLLECTOR.

Sanctified by the Government.

- 6 -

the proper housing, watch and safe custody of the meter or other measuring device installed and should report without avoidable delay to the Revenue Divisional Officer or the Collector concerned any defect in the working of the meter or its efficiency that might occur and immediately such a defect is observed.

(d) will not take from the said canal in any period of 24 hours measured from midnight to midnight a greater quantity of water than as hereinafter mentioned namely.

1500 cubic metres and will not take from the said canal any water in excess of the amounts paid for in advance of the current year except with the previous permission in writing of the Collector to be applied for when the Licensee is about to exhaust the quantity so paid for in advance.

(e) will maintain and keep at the said factory proper books of account in which shall be entered daily the quantities of water removed from the said canal under the rights and liberties hereby granted distinguishing such as shall be removed by pipes or sluices or otherwise (except by hand) from such as shall be removed by hand and shall whenever required allow such books to be inspected and the entries thereon to be copied by any officer of the Public Works or Revenue Department aforesaid of the Government of Tamil Nadu.

(f) will not discharge or suffer to be discharged into the canal any water of less purity than the water in the said canal for the time being or any substance or matter (fluid or solid) which shall prejudicially affect the said canal or the water therein or render such water in any way unfit for domestic purposes or which shall be or cause a nuisance or annoyance to the Government or to any person.

FOR MAHARAJA CEMENTS LTD.

 ADMINISTRATIVE MANAGER.

15/12/54

 COLLECTOR
 (Administrative Department of Madurai)

- 7 -

(g) will keep the Government indemnified against all actions, claims and demands that may be brought or made against them by reasons of anything done by the Licensee in exercise or in purported exercise of the rights and liberties hereby granted.

(h) will keep the pipes and sluices and other works of the Licensee which shall be laid or constructed on the said lands in good repair.

(i) will at the expiry of the term of these presents or sooner determination of the said term or within thirty days thereafter at the cost of the Licensee remove the said pipes and works and restore the said lands or such part thereof as may have been opened disturbed or damaged by the Licensee to the same or as good a state and condition as they were immediately before the date hereof;

(j) will use such water for the purposes of the said factory alone and for no other purposes.

(k) will at all reasonable times allow the officers of the Public Works and Revenue Department aforesaid to inspect the said factory and surrounding premises of the Licensee.

4. In case any sum hereby made payable shall be in arrears and unpaid for the space of thirty days after the same shall have become payable, or if there shall be any breach or non-observance of any of the covenants on the part of the Licensee other than the Government for payment of said sums or of the conditions herein contained, then and in any such case it shall be lawful for the Government by notice in writing under the hand of the Collector served on or posted to the Licensee, at his factory address, to determine these presents and the Licence hereby granted shall immediately upon such service cease and determine but without prejudice to any claim or right or action or remedy of the Government in respect of any previous breach of any covenant on the part of the Licensee herein contained or in the alternative to cut off the

FOR MADRAS CEMENTS LTD.

M. S. S. S.
ADMINISTRATIVE MANAGER

18/11/54
S. S. S.
COLLECTOR,

Revenue Department of Madras

supply of water to the Licensee until such time as the arrears shall have been paid in full together with the expenses that may be incurred by the Government on account of such cutting off or as the case may be, until such time as the breach or non-observance of the covenants on the part of the licensee shall have been made good by paying to the Government such sum as the Collector may fix as compensation for the loss or damage caused to the Government by such breach of or non observance together with the expenses that may be incurred by the Government on account of such cutting off and the Licensee shall not be entitled to the refund of any portion of the said annual sum paid in advance or to claim any damages from the Government.

5. All sums due to the Government from the Licensee shall be recovered from him as if they are arrears of land Revenue.

6. The Governor covenants with the Licensee that the Licensee paying the said annual sums and performing and observing the covenants and conditions on his part to be performed and observed may peaceably exercise and enjoy the rights and liberties hereby granted during the said term without any interruption save as herein provided on the part of the Government or any person claiming through under or in trust for the Government.

7. Provided always and it is hereby agreed and declared as follows:

(a) That in case water shall be taken by the Licensee from the said canal by means of a pipe or masonry sluice no portion of such pipe or sluice shall project into the water way of the said canal and that the head of each pipe or sluice shall be built in a small masonry wall to be approved by the Executive Engineer and to be constructed at the cost of the Licensee and that no pump shall be erected on the said lands.

(b) That it shall be lawful for the Collector at any time on giving one month's previous notice in

FOR MADRAS CEMENTS LTD.

ADMINISTRATIVE MANAGER

COLLECTOR,

Government of Madras

- 9 -

writing and in cases of emergencies as to which the decision of the Collector shall be final and conclusive without any notice at all to cut off the supply of such water to the said factory for any length of time and in the later case only such part of the said annual sum as shall exceed the value at the rate hereinbefore mentioned of the water removed during the year in which the supply shall have been so cut off, shall be repaid to the Licensee but the Licensee shall not be entitled to any further or other compensation in respect thereof.

(c) That the Licensee shall not be entitled to the refund of any portion of the said annual sum paid in advance or to claim damage either on the ground that the Licensee has not taken the maximum quantity of water hereinbefore mentioned or on the ground that the Licensee has not been able to take such maximum quantity owing to deficient water in the said canal consequent on early or sudden closure of the said canal for repairs or otherwise.

(d) That the Licensee may be exempted by the Collector from payment of the said annual sum in respect of any one or more complete years during the term of the License if he intimates in advance to the Collector that he does not propose to take water during such year or years.

(e) That in addition to any rights and remedies reserved unto the Government under this agreement and without prejudice thereto the Licensee shall if he fails to comply with any one or more of the provisions of this agreement be liable for and pay to the Government, in respect of all water taken by him after such failure charges at such increased rates as the Collector may deem fit and reasonable.

FOR MAGRAS. COMMENTS. ATON.

M. S. L.
ADMINISTRATIVE MANAGER.

20/2/57
S. S. S.
COLLECTOR
MADRAS STATE
Kannathapuram at Madras-13

1. The consumer should instal separate meters/ measuring devices at their cost for measuring the water consumed and should maintain the same in good working condition always and should send the consumption report yearly both to the Dist. Collector and to Exe. Engineer, P.W.D., Virudhunagar Division, Virudhunagar every year promptly. They should always keep with them spare meters in ready stock.
2. The present rate of recovery of water charges as per G.O. Ms. No. 1446, dated 4-10-1975 (with effect from 1-4-75) is Rs. 30/- per 1000 cubic meters subject to a minimum of Rs. 3,000/- per annum which should be remitted in advance every year. The levy of water charges is subject to variation from time to time according to the rate fixed by Government then and there and hence the consumer should be prepared to pay the rate fixed by Government from time to time.
3. The Dist. Collector at his discretion on behalf of the Govt. at any time if need be, due to unavoidable circumstances, may issue orders for cancellation of Agt. either temporarily or permanently, after giving notice to the consumer.

INWITNESS WHEREOF THE Collector Ramanathapuram acting on behalf of and by the order and direction of the Governor of Tamil Nadu and the Licensee have hereunto set their respective signature and seals the day month and year first above written.

SIGNED, Sealed and delivered by
the Collector of Ramanathapuram

21/23
S. S. Srinivasan
COLLECTOR,
Ramanathapuram at Madurai

In the presence of

- 1) *A. S. Srinivasan* (P.W.D. R.C.O. Madurai)
- 2) *T. P. Srinivasan* (T.P. R.C.O. Madurai)

SIGNED, Sealed and delivered
by the Licensee

FOR MADRAS CEMENTS LTD.,

M. S. Srinivasan
ADMINISTRATIVE MANAGER

In the presence of

- 1) *C. Arumugam* Estate Officer, Madras Cement Works Ltd.
- 2) *P. Ranganatha Raja* P/O P.S. Palku Raja
St. Peter's Road, Madras Cement Works Ltd.



भारत सरकार
GOVERNMENT OF INDIA
पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE
एकीकृत क्षेत्रीय कार्यालय/Integrated Regional Office
1st Floor, Additional Office Block for GPOA, Shastri Bhawan, Haddows Road
Nungambakkam, Chennai – 600034; Email: ro.moefccc@gov.in



F.No. EP/12.1/867/TN/353

Dated: 18.03.2024

To

The Senior Vice President,
The Ramco Cements Limited,
5th Floor Auras Corporate Centre,
98 A Dr Radhakrishnan Road,
Mylapore,
Chennai – 60004.

Subject: Modernisation & Expansion of Ramasamy Raja Nagar Cement Plant (Proposed Production Clinker 1.44 MTPA & Cement 2.70 MTPA) by M/s The Ramco Cements Limited, Ramasamy Raja Nagar, Virudhunagar Taluk & District- Issuance of CCR - Regarding.

Ref: MoEF F. No. J-11011/119/2009. IA. II (1) dated 25.10.2021 (EC Identification No. EC21A009TN169325 dated 25.10.2021)

Sir,

With reference to the subject and letter under reference, undersigned is directed to submit that MoEF&CC accorded environmental Clearance to M/s: The Ramco Cements Limited for Proposed Modernisation & Expansion of Ramasamy Raja Nagar Cement Plant (Proposed Production Clinker 1.44 MTPA & Cement 2.70 MTPA) Virudhunagar Taluk & District, Tamil Nadu. Project Authority letter no. RCL/MoEF&CC/06/2023-24 dated 15.11.2023 requested the Regional Office to issue certified compliance report for the existing EC. This project was monitored by undersigned during 20.02.2024. Monitoring Report is submitted herewith for further necessary action.

This has the approval of the Competent Authority vide diary No. E-234182 dated 11.03.2024.


(Dr. E. Arockia Lenin)
Scientist 'D'

SUMMARY NOTE

PART-II

Subject	: Proposed Modernization & Expansion of Ramasamy Raja Nagar Cement Plant (Proposed Production Clinker 1.44 MTPA & Cement 2.70 MTPA)
Reference	: F. No. J-11011/119/2009.IA.II(I) dated 25.10.2021 (EC Identification No. EC21A009TN169325 dated 25.10.2021)
Monitoring Date:	: 20.02.2024
Present Status of the Project	: Plant is in operation



Environmental Clearance: Project Authority (PA) obtained Environmental clearance from MoEF&CC for Proposed Modernization & Expansion of Ramasamy Raja Nagar Cement Plant (Proposed Production Clinker 1.44 MTPA & Cement 2.70 MTPA) vide letter no. J-11011/119/2009.IA.II(I) dated 25.10.2021.

CTE & CTO: PA obtained Consent to Establish for present Expansion vide Tamil Nadu Pollution Control Board (TNPCB) vide order no. 2206241656739 (Air Act) and 2206141656739 (Water Act) dated 17.02.2022 and Consent to Operate vide order no. 2307249733843 (Air Act) and 2307149733843 (Water Act) dated 27.02.2023 which are valid till 31.03.2024.

Present status of project: The Project Authority (PA) established the expansion activities of their Ramasamy Raja Nagar Cement Plant and operating for Clinker production of 1.44 MTPA & Cement production of 2.70 MTPA from 1st March 2023. The production of Line-I and Line-3 were in operation during the site visit. Line-2 was not in operation. Captive Power Plant of 25 MW was in operation. Railway Wagon Tippler was established.

Manufacturing products & Process: The Plant is producing Ordinary Portland Cement, Portland Pozzolana Cement, Composite Cement, etc., by Dry Process. The manufacturing process included stages such as quarry, raw material preparation, clinkerisation, finish grinding and packing. Raw grinding Crushed limestone brought from the Mines crushing plant by wagon tippler and unloaded in to the receiving hopper, then it has been transported by Samson feeder and stored in the stock pile. The piled limestone and additives are reclaimed from the stockpile and transported to the feed hoppers from where they are fed to the raw mill through weigh feeders in the required proportion. The grinding is carried out in raw grinding section and stored in raw meal silos. Clinkerisation (Pyro Process) is the sintering or fusing of the calcined raw meal at high temperatures around 1450 °C. Calcination of raw meal is the removal of CO₂ from raw meal and converting it into free lime. Raw meal powder is extracted from raw meal silos in a systematic way for a uniform quality, stored in kiln feed bin and fed to the pre heater. Coal/Pet coke used as a fuel for the burning process in the kiln. In the kiln system, the raw meal is calcined, and combines with iron and alumina and converted into clinker and then quickly cooled to about 120 °C, before sending to clinker storage. Clinker is stored in silos.

Coal mill Coal/Pet coke received from port has been unloaded by wagon tippler in to the receiving hopper, transported and stored in the stock pile. Raw coal/pet coke transferred from coal yard to intermediate hoppers by belt conveyor, extracted from intermediate hoppers and stored in mill feed hopper for grinding. Coal is pulverized by coal mills and stored in fine coal bins separately for each kiln. Pulverized coal from fine coal bins is pumped to kiln and precalciner by FK pumps. The hot air required for drying is met from cooler exit gases.

Cement Grinding Cement mills are used to grind Clinker, gypsum and fly ash. The ground materials transported to high efficiency dynamic separator to separate fine, intermediate and coarse materials. The coarse material and intermediate material are fed back to the mill for further grinding. The fines were collected in bag filter and conveyed to the cement silos by mean of air slides and elevator. Packing Cement is packed in bags of 50 kg capacity by means of electronic packing machines and dispatched by trucks and bulkers.

Implementation of Environmental Protection Measures: The pollution control equipment and online monitoring equipment are installed in Main Stacks. Real time emissions of PM, SO₂ & NO_x from Kilns 1 & 3, PM from Coal Mills, Coolers & Cement Mill are connected to Online Care Air Centre of TNPCB & CPCB Servers. Details of pollution control systems attached online monitoring are given under.

- Raw Mill/Kiln-1: Reverse Air Bag House
- Coal Mill-1: Bag Filters
- Cooler-1: ESP
- Cement Mills 1 & 2: Bag Filters
- Raw Mill/Kiln-3: Reverse Air Bag House
- Coal Mill-3: Bag Filters
- Cooler-3: ESP
- Low NO_x burners are provided to Kilns 1 & 3 to control NO_x emissions.

All material transportations are carried out by fully closed/covered conveyors. PA has installed dust collection and extraction systems at all material transfer points to control the fugitive emissions. Pneumatic system is in place for transporting fly ash from bulkers/tankers to silos and mechanical dosing for adding fly ash to the cement mill.

Periodical monitoring of stack emissions (from all 7 main stacks), ambient air quality (8 locations), fugitive emissions (3 locations), Noise Levels (10 locations) etc. are being carried out once in a month by third party Laboratory approved by NABL. The fugitive emissions at raw material storage areas viz limestone, coal yard, gypsum yard, etc. were found to be in compliance with CREP guidelines/Norms. A separate lorry yard is allocated for the vehicle parking and is concretized.

Fresh water demand is about 1000 KLD being met from Arjuna River source with the approval from local body. No ground water is withdrawn for project activities. There is no trade effluent from the Cement Plant. Trade Effluents of 20 KLD from CPP & Workshop are treated in a neutralization tank and the treated effluent is pumped to the Cement Plant for equipment cooling (where it is evaporated fully).

STP of 350 KLD capacity is in operation to treat the domestic effluents generated from the Cement Plant (25KLD), CPP (9 KLD), Township(221 KLD) and canteen (25KLD). The treated Sewage has been used for Green Belt. Zero Effluent Discharge is adopted. In addition, 50 KLD of STP is provided in the Labour Colony.

The total Green Belt Area over 64.50 Ha in the total extent of 191.434 Ha with 33.69% coverage. Totally 1,61,250 Tree saplings planted with a density of 2500 trees per hectare with a survival rate of 95-98%. Adequate Green Belt was noticed in the eastern, northern and northwestern boundaries of the Plants and also in the Colony. Green Belt is being raised in the vacant areas of southern parts. Housekeeping was maintained and it requires some improvement in Line-I areas and southern parts of the Plant.

Rain water harvesting ponds of 6 Nos. are developed with a total capacity to store 9700 m³ of rain water and one abandoned mines pit in Thammanaickkanpatti village was utilized as a rainwater storage reservoir with a capacity to store 3,28,680 m³ of rain water and two ground water recharge pits are developed.

Occupational Health Centre with all required facilities are made available for labours in the Campus. Ambulance and Fire Tenders were in place. Inspection Photographs are given in (Plates A-H, page 27). Point wise compliance status of EC conditions is given in Part III.

No court cases and show cause notices are pending against M/s. Ramco Cements Limited


(Dr. E. Arockia Lenin)
Scientist 'D'

PART-III**A. Specific Conditions**

Sl. No.	EC Conditions	Compliance Status
i.	Project proponent shall obtain Environmental Clearance from the Competent Authority for proposed township expansion.	Complied PA dropped the expansion proposal of the township.
ii.	The 800 KLD water requirement for the project shall be met from ground water resource and 1000 KLD of water shall be met from Arjuna river. In the next three years from the date of issues of this EC, PP shall switch over to use of treated sewage and harvested rain water to meet 100% of its ground water requirement as committed. Thereafter, no ground water withdrawal will be permitted.	Complied. Before the Expansion, they were permitted to draw 800 KLD ground water for industrial use with permitted borewells and dugwells within the premises. They stopped the drawl of ground water from the Plant premises. Expanded Plant raw water demand is 1000 KLD. The raw water demand of the Complex is met with Arjuna River source as permitted by State PWD vide GO 1446/PWD dated 04.10.1975. Also, treated sewage of 350 KLD with harvested Rainwater of 230 KLD (total 300 KLD) are supplementing the raw water demand of the Complex.
iii.	Waste oil generated from the existing and proposed cement plant expansion shall not be used as fuel in Kiln. It shall be handed over to the authorized recyclers in compliance to the provisions specified in Hazardous and Other Waste (M&TM) Rules, 2016.	Complied. The Plant is authorized vide TNPCB Authorization No. 23HPC42009117 dated 07.06.2023 with validity till 31.03.2028 to handle 94.62 TPA used/Spent Oil (Category 5.1) from the Old Line-1 & New Line-3 (Annexure 1). The used oil is not used as fuel in the Kilns. The Plant generated 15.90 Tons Used/Waste Oil and the entire quantity was sold to TNPCB authorized recycler M/s Shri Saihya Sai Lubricants, Coimbatore vide Form-10 dated 21.07.2023 (Annexure-2).

Sl. No.	EC Conditions	Compliance Status																		
iv.	<p>64.50 ha of land shall be developed into green belt with a tree density of 2500 trees per ha in a time frame of three years from date of grant of EC. This shall also include (i) land scape development without disturbing the natural stream and green belt development in southern part of the project site wherein two blocks are discontinued by a natural stream and (ii) green belt development with a width of 30 meters within the project site towards the villages namely Thammanaickenpatti (0.2 km in N), Vaechakarapatti (0.2 km in NNE) and Tulukkappatti (0.5 km in SE). In addition to this, gap filling shall be done in existing green belt developed area where tree density is only 1906 trees per ha.</p>	<p>Complied</p> <p>It was observed that before the Expansion, Green Belt was maintained over an extent of 33.00 Ha with 62,910 Trees @ 1,906 Trees/Ha & Survival Rate of 85-90%. On Expansion, additional Green Belt has been developed as detailed below :</p> <table border="1"> <thead> <tr> <th>Period</th> <th>GB Extent, Ha</th> <th>No. of Trees</th> </tr> </thead> <tbody> <tr> <td>ELA Stage</td> <td>33.00</td> <td>62,910</td> </tr> <tr> <td>End of 2021-22</td> <td>12.00</td> <td>28,624</td> </tr> <tr> <td>2022-23</td> <td>18.00</td> <td>64,865</td> </tr> <tr> <td>2023-24 till Jan. 24</td> <td>1.50</td> <td>4,851</td> </tr> <tr> <td>Total</td> <td>64.50</td> <td>1,61,250</td> </tr> </tbody> </table> <p>Plant Area : 191,434 Green Belt Coverage : 33.69% Green Belt Density : 2500 Trees/Ha</p> <p>As on date, survival rate is in the range 95-98%. Green Belt development includes land scape development without disturbing the natural stream in southern part of the project, as well as Green Belt with a width of 30 meters towards the villages namely Thammanaickenpatti, Vaechakarapatti and Tulukkappatti. Gap filling in existing Green Belt was also carried out.</p>	Period	GB Extent, Ha	No. of Trees	ELA Stage	33.00	62,910	End of 2021-22	12.00	28,624	2022-23	18.00	64,865	2023-24 till Jan. 24	1.50	4,851	Total	64.50	1,61,250
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v.	<p>Particulate matter emissions from the existing and revamped production units shall be less than 20 mg/Nm³ as committed by proponent</p>	<p>Complied.</p> <p>Particulate matter (PM) emissions from the existing and revamped production units are maintained within 20 mg/Nm³, as reported. Continuous Emission Monitors are provided to all main Stacks and the real time data are</p>																		

Sl. No.	EC Conditions	Compliance Status																					
		transmitted to CARE Air Centre of TNPCB as well as CPCB Servers. Trend Charts are attached as Annexure-3 .																					
vi.	Pet coke dosing shall be controlled automatically to control SO ₂ emission from chimney within the prescribed limits	Complied Line-3 is commissioned on 01.02.2023 and Petcoke used was 124342 Tonnes in both Kilns. Pet coke dosing is controlled automatically by Solid Flow Feeder in Line-1 & Loss on Weigh System in Line-3 installed at a cost of Rs.10.00 Lakhs. SO ₂ emission was ensured less than 100 mg/Nm ³ .																					
vii.	Co-processing of paint sludge and Oily sludge as done presently shall be continued. Dioxin and furans shall be monitored twice a year and report shall be submitted to the Regional Office of the MoEF&CC.	Complied. No Paint sludge and Oily sludge were used during the Period 01.03.2023-31.01.2024 and monitoring of Dioxin and Furans was not required.																					
viii.	Project proponent shall develop rainwater harvesting system as per the action plan submitted in order to achieve the gradual shifting of ground water usage in next three years from the date of issue of this EC	Complied. Six Rain water harvesting ponds are created in the Complex as detailed below : <table border="1"> <thead> <tr> <th>Location</th> <th>Dimension (Dia. X Depth) in m</th> <th>Holding Capacity, KL</th> </tr> </thead> <tbody> <tr> <td>Near Materials Gate</td> <td>50 x 2</td> <td>3,930</td> </tr> <tr> <td>Near STP</td> <td>30 x 2</td> <td>1,410</td> </tr> <tr> <td>Near CPP</td> <td>30 x 2</td> <td>1,410</td> </tr> <tr> <td>Near Ramco Vidyalaya School South</td> <td>24 x 2</td> <td>900</td> </tr> <tr> <td>Near Ramco Vidyalaya School North</td> <td>24 x 2</td> <td>900</td> </tr> <tr> <td>Near Sriram School in</td> <td>27 x 2</td> <td>1,150</td> </tr> </tbody> </table>	Location	Dimension (Dia. X Depth) in m	Holding Capacity, KL	Near Materials Gate	50 x 2	3,930	Near STP	30 x 2	1,410	Near CPP	30 x 2	1,410	Near Ramco Vidyalaya School South	24 x 2	900	Near Ramco Vidyalaya School North	24 x 2	900	Near Sriram School in	27 x 2	1,150
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		<table border="1"> <tr> <td>Colony</td> <td></td> <td></td> </tr> <tr> <td>Total Capacity</td> <td></td> <td>9,700</td> </tr> </table> <p>Also, abandoned Mine Pit in Thammanaickkanpatti village was also utilized to harvest the rainwater which has the water holding capacity of 3,28,680 Kl. per Annum. RWH Ponds are shown in Photographs. The normal rainfall is 895 mm. About 230 KLD harvested Rainwater from these RWH Structures is supplementing the raw water demand of the Complex.</p>	Colony			Total Capacity		9,700
Colony								
Total Capacity		9,700						
B. General Conditions:-								
I. Statutory Compliance								
i.	The Environment Clearance (EC) granted to the project/ activity is strictly under the provisions of the EIA Notification, 2006 and its amendments issued from time to time. It does not tantamount/ construe to approvals/ consent/ permissions etc., required to be obtained or standards/conditions to be followed under any other Acts/Rules/Subordinate legislations, etc., as may be applicable to the project.	Complied. PA has obtained Consent to Establish from TNPCB vide order no. 2206241656739 (Air Act) and 2206141656739 (Water Act) dated 17.02.2022 and Consent to Operate vide order no. 2307249733843 (Air Act) and 2307149733843 (Water Act) dated 27.02.2023 which are valid till 31.03.2024.						
II. Air quality monitoring and preservation								
ii.	The project proponent shall install 24x7 Continuous Emission Monitoring System (CEMS) at process stacks to monitor stack emission as well as 4 Nos. Continuous	Complied Continuous Emission Monitoring System (CEMS) are installed in all main process stacks. Parameters of PM, SO ₂ & NO _x were monitored for Kilns 1 & 3. Particulate						

Sl. No.	EC Conditions	Compliance Status
	<p>Ambient Air Quality Station (CAAQS) for monitoring AAQ parameters with respect to standards prescribed in Environment (Protection) Rules 1986 as amended from time to time. The CEMS and CAAQMS shall be connected to SPCB and CPCB online servers and calibrate these systems from time to time according to equipment supplier specification through labs recognized under Environment (Protection) Act, 1986 or NABL accredited laboratories.</p>	<p>emissions were monitored for Coolers 1&3, Cement Mills 1&2. All CEMS Real time data were connected to TNPCB Care Air Centre & CPCB Servers. All CEMS are recently calibrated by NABL Approved Laboratory on 25-11-2023. Four numbers Continuous Ambient Air Quality Stations (CAAQMS) were installed at (i) Laboratory building near Main Gate (ii) Ramco Vidhyalaya School (iii) Near River Bed & (iv) Plant South side near Wagon Tippler Area. The real time data are being transmitted to TNPCB Care Air Centre & CPCB Server. CAAQMS are calibrated on 20.09.2023. In addition, Ambient Air Quality Monitoring were monitored at 8 locations (Annexure -5) once in a month by engaging a NABL Accredited Laboratory. The latest submitted to RO, MoEF&CC, Chennai is 01.12.2023.</p>
iii.	<p>The project proponent shall monitor fugitive emissions in the plant premises at least once in every quarter through labs recognized under Environment (Protection) Act, 1986.</p>	<p>Complied. Fugitive emissions in the raw materials storage areas are being regularly monitored once in a month by engaging a NABL Accredited Laboratory and status reports are being submitted to TNPCB & RO, MoEF&CC, Chennai periodically. The Unit has complied with the fugitive emissions guidelines prescribed by CPCB vide PROBES/118/2007 dated 06.07.2007 (Annexure-6)</p>

Sl. No.	EC Conditions	Compliance Status
iv.	The project proponent shall provide leakage detection and mechanized bag cleaning facilities for better maintenance of bags.	Complied. All Bag Houses & Bag Filters are with in-built Leakage detection & mechanized bag cleaning systems.
v.	The project proponent shall ensure covered transportation and conveying of ore, coal and other raw material to prevent spillage and dust generation. Use closed bulkers for carrying fly ash.	Complied. All inward raw materials, additives and fuels were received through rail and road networks. All wagons and trucks were covered with tarpaulin during transportation. Lime stone from captive mines are covered with tarpaulin. Fly ash is transported through fully covered Bowsers and pumped to silos pneumatically.
vi.	The project proponent shall provide wind shelter fence and chemical spraying on the raw material stock piles.	Complied. Wind shelter is erected along the eastern boundary at 10 m above the compound wall. Water sprinklers are provided at coal stock piles to control the fugitive emissions.
vii.	Ventilation system shall be designed for adequate air changes as per the prevailing norms for all tunnels, motor houses, and cement bagging plants.	Complied. All tunnels, motor houses, and cement bagging operations are provided with suitable ventilation systems.
III. Water quality monitoring and preservation		
I.	The project proponent shall install 24*7 continuous effluent monitoring system with respect to standards prescribed in Environment (Protection) Rules 1986 vide G.S.R. No. 612 (E) dated 25 th August, 2014 (Cement) and subsequent amendment dated 9 th May, 2016 (Cement) and 10 th	Complied. There is no trade effluent generation from the Cement Plant. Online Continuous Effluent Monitoring System is installed in the STP and it is connected to the TNPCB Water Watch Centre. The OCEMS is lastly calibrated on 20.09.2023. The treated sewage quality was complying with TNPCB Norma

Sl. No.	EC Conditions	Compliance Status
	<p>May, 2016 (in case of Co-processing Cement) as amended from time to time; S.O. 3305 (E) dated 7th December 2015 (Thermal Power Plants) as amended from time to time) and connected to SPCB and CPCB online servers and calibrate these system from time to time according to equipment supplier specification through labs recognized under Environment (Protection) Act, 1986 or NABL accredited laboratories</p>	<p>for On-land Irrigation. Raw and Treated Sewage samples are analyzed once in a month by a NABL Laboratory and monthly reports are submitted to TNPCB regularly (Annexure-7).</p>
ii.	<p>The project proponent shall regularly monitor ground water quality at least twice a year (pre- and post-monsoon) at sufficient numbers of piezometers/sampling wells in the plant and adjacent areas through labs recognized under Environment (Protection) Act, 1986 and NABL accredited laboratories</p>	<p>Complied. Ground water quality is monitored at 3 locations in the Plant vicinity once in six months by engaging NABL accredited Laboratory. Monitored parameters were within prescribed limits (Annexure-8). One piezometer has been installed in the Plant vicinity to monitor the water level (Annexure-9).</p>
iii.	<p>Sewage Treatment Plant shall be provided for treatment of domestic wastewater to meet the prescribed standards</p>	<p>Complied. STP of 350 KLD capacity is in operation to treat the domestic effluents generated from the Cement Plant (25KLD), CPP (9 KLD), Township(221 KLD) and canteen (25KLD). The treated Sewage has been used for Green Belt. Zero Effluent Discharge is adopted. In addition, 50 KLD of STP is provided in the Labour Colony.</p>

Sl. No.	EC Conditions	Compliance Status
iv.	Garland drains and collection pits shall be provided for each stock pile to arrest the run-off in the event of heavy rains and to check the water pollution due to surface run off.	Complied. All stock piles are stored in the elevated areas and garland drains are also provided to collect the surface runoffs.
v.	Water meters shall be provided at the inlet to all unit processes in the cement plant.	Complied. Flow meters are installed in Preheater, Cooler and Cement mill sections in the Process.
vi.	The project proponent shall make efforts to minimize water consumption in the cement plant complex by segregation of used water, practicing cascade use and by recycling treated water	Complied. The project proponent taken efforts to minimize water consumption in the cement plant complex by segregation of used water, practicing minimal use and by recycling treated water. All the treated effluent from the cement plant is recycled and reused for cooling, dust suppression and green development
IV. Noise monitoring and prevention		
i.	Noise quality shall be monitored as per the prescribed Noise Pollution (Regulation and Control) Rules, 2000 and report in this regard shall be submitted to Regional Officer of the Ministry as a part of six-monthly compliance report	Complied. Noise levels are being monitored at 10 locations on monthly basis. Monitored parameters were within prescribed limits. The latest report submitted to RO, MoEF&CC, Chennai on 21.12.2023 (Annexure-10).
V. Energy Conservation measures		
i.	Waste heat recovery system shall be provided for kiln and cooler	Complied. PH Boiler HP steam generation of 7.5 TPH (28 kg/cm ² , 320 °C) & LP steam generation of 4.05 TPH (5.5 kg/cm ² , 220 °C) and AQC Boiler HP steam generation of 4.3 TPH (28

Sl. No.	EC Conditions	Compliance Status
		<p>kg/cm², 320 °C) & LP steam generation of 2.25 TPH (5.5 kg/cm², 220 °C) are utilized in Line-1. The steam being generated is connected to existing CPP.</p> <p>The existing WHR from Line-1 & proposed WHR from Line-3 will be combined for producing about 10 MW by a dedicated Turbine Generator. Order has already been placed on M/s.ISGIES, Noida for Rs.81.81 Crores on 04.01.2024 (Annexure-11).</p>
ii.	The project proponent makes efforts to achieve power consumption less than 85 units/ton for Portland Pozzolona Cement (PPC) and 85 units/ton for Ordinary Portland Cement (OPC) production and thermal energy consumption of 670 Kcal/Kg. of clinker	<p>Complied.</p> <p>Power consumption achieved for both PPC and OPC for the year 2022-23 is 83.6 units/ton. The thermal energy for the production of cement achieved is 667 Kcal/Kg of clinker for the same period.</p>
iii.	Provide solar power generation on roof tops of buildings, for solar light system for all common areas, street lights, parking around project area and maintain the same regularly	<p>Complied.</p> <p>Totally 72 Nos. of solar lights have been installed in the colony premises and nearby Villages and one 30 KW solar panel installed in Ramco Vidyalaya school premises. The installed lights are maintained regularly.</p>
iv.	Provide the project proponent for LED lights in their offices and residential areas	<p>Complied.</p> <p>LED lights are provided in the office and residential areas.</p>
VI. Waste management		
i.	Used refractories shall be recycled as far as possible	<p>Complied.</p> <p>There was no generation of refractories in the new and existing kiln so far. PA assured that it will be recycled at the time of</p>

Sl. No.	EC Conditions	Compliance Status
		generation.
VII. Green Belt		
i.	The project proponent shall prepare GHG emissions inventory for the plant and shall submit the program for reduction of the same including carbon sequestration by trees in the plant premises	<p>Complied.</p> <p>PA submitted plan for reduce the GHG emission from the plant.</p> <p>CO₂ emission due to 1.44 MTPA clinker manufacturing is about 5,76,000 TPA. The PA is utilizing 5 MW wind power generated through their wind mills, CO₂ reduction due to wind power generation is about 42,120 TPA and through 30 KW solar panel it is 40 TPA. There are 1,61,281 trees in the campus with CO₂ absorption to the extent of 2956 TPA. This is the existing scenario in this complex.</p>
VIII. Public hearing and Human health issues		
i.	Emergency preparedness plan based on the Hazard Identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented	<p>Complied.</p> <p>PA is implementing an Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan (Annexure-12).</p>
ii.	The project proponent shall carry out heat stress analysis for the workmen who work in high temperature work zones and provide personal protection equipment (PPE) as per the norms	<p>Complied.</p> <p>Heat stress analysis is being covered under occupational health surveillance program and necessary personal protection equipment (PPE) are provided to all employees as per the norms.</p>
iii.	Occupational health surveillance of the workers shall be done on a regular basis and records maintained	<p>Complied.</p> <p>Occupational health surveillance for the employees including contract workers are being done on regular basis and records</p>

Sl. No.	EC Conditions	Compliance Status
		maintained in the OHC.
IX. Environment Management		
i.	The project proponent shall comply with the provisions contained in this Ministry's OM vide F. No. 22-65/2017-IA.III dated 30/09/2020	Complied. A budget of Rs.35.00 Lakhs was allotted as Capital Cost for addressing the issues raised in the Public Hearing and Rs.23.84 as Recurring Cost additionally (Annexure-13). All the commitments made are being implemented.
ii.	The company shall have a well laid down environmental policy duly approve by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements /deviation/ violation of the environmental / forest / wildlife norms / conditions. The company shall have defined system of reporting infringements / deviation / violation of the environmental / forest / wildlife norms / conditions and / or shareholders / stake holders. The copy of the board resolution in this regard shall be submitted to the MoEF&CC as a part of six-monthly report	Complied. PA has the well laid down Safety, Health and Environmental (SHE) Policy approved by the CMD. The units are having their Integrated Management System (IMS) Policy. The Environmental Management Plan (EMP) Cell is functioning under the Unit Head and Corporate Social Responsibility (CSR) Committee is functioning under the Corporate Office (Annexure-14). There is a Hierarchical System in the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions. Any non-compliance/violations of environmental norms and the corrective actions taken are reported by the Unit Heads to CEO and by CEO to the Chairman, the Board and the Shareholders. Periodic Internal Audits were done to identify the non-compliances as part of Environmental Management System.

Sl. No.	EC Conditions	Compliance Status
iii.	A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization	Complied. A separate Environmental Cell has been established with qualified personnel under the control of senior executive, who is directly reporting to unit head Apart from this, IRCL is also having a Corporate Environmental Cell at Chennai.
X. Miscellaneous		
i.	The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently.	Complied. Advertisements were made in the local newspapers about issuance of Environmental Clearance i.e., (a) The New Indian Express' (English), (b) Dinamani (Tamil) Newspapers on 01.11.2021 (Annexure-15).
ii.	The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt	Complied. Copy of the EC was submitted to Panchayats of Tulukkapatti, Thammanaickenpatti and Vachakampatti (Annexure-16).
iii.	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions.	Complied. The status of compliance of the stipulated environmental conditions including results of

Sl. No.	EC Conditions	Compliance Status
	including results of monitored data on their website and update the same on half-yearly basis	monitored data were uploaded in the company website www.rameocements.in .
iv.	The project proponent shall monitor the criteria pollutants level namely; PM ₁₀ , SO ₂ , NO _x (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects and display the same at a convenient location for disclosure to the public and put on the website of the company	Complied. PM ₁₀ , SO ₂ and NO _x levels (in ambient as well as in stack) were regularly monitored manually as well as by CEMS & CAAQMS. Monitored parameters of CEMS and CAAQMS were displayed through electronic display board at the main entrance for the public and reports were uploaded in the website of the company along with half yearly compliance report.
v.	The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the ministry of Environment, Forest and Climate Change, at environment clearance portal	Complied. The latest six monthly report submitted by PA on 01.12.2023. PA is submitting the six-monthly reports on the status of the compliance of the stipulated environmental conditions in the Ministry's Parivesh Portal.
vi.	The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company	Complied. Form-V Environment statement for each financial year were submitted to the TNPCB regularly (Annexure-17) and the Environment statement was uploaded in the Company's website:
vii.	The project proponent shall inform the Integrated Regional Office as well as the Ministry, the date of financial	Complied. The financial closure of the project to Regional Office of the Ministry on

Sl. No.	EC Conditions	Compliance Status
	closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.	28.02.2023 and the production commenced on 01.03.2023.
viii.	The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during public hearing and also that during their presentation to the Expert Appraisal Committee	Complied. All commitments and recommendations made in the EIA/EMP report and commitments made in the public hearing are being implemented.
ix.	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change (MoEF&CC).	Complied. PA is proposing to increase the Plant operational days so as to increase the Clinker production from 1.44 MTPA to 1.92 MTPA and by retaining Line-II after its Modernization.
x.	Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986	Informed to PA during site visit as stipulated.
xi.	The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory	Informed to PA during site visit as stipulated.
xii.	The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these	Informed to PA during site visit as stipulated.

Sl. No.	EC Conditions	Compliance Status
	conditions	
xiii.	The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.	Informed to PA during site visit as stipulated.
xiv.	Any appeal against this EC shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010	There was no appeal against this EC within the stipulated period of 30 days.

This has the approval of the Competent Authority vide diary No. E-234182 dated 11.03.2024.


 (Dr. E. Arockia Lenin)
 Scientist 'D'



TAMILNADU POLLUTION CONTROL BOARD
Advanced Environmental Laboratory, Madurai

STACK MONITORING SURVEY – REPORT OF ANALYSIS

Report F.No.VDR - 01/AEL/TNPCB/MDU/AAQS/2024-25, Dated:09.12.2024


1. Name of the Industry	:	M/s. Ramco Cements Limited.,
2. Address of the Industry	:	SF.No.231/2,233/7,234/8,241/2, 228/1,2,3,229/1,3,4,5,etc., R.R.Nagar, Thulupatti, Virudhunagar District.
3. Date of survey	:	26.11.2024 & 27.11.2024
4. Type of Industry	:	Cement

Stack Monitoring Survey Results

Sl. No.	Stack attached to	Stack Temp. °C	Velocity in (m/sec)	Discharge rate in (Nm ³ /Hr)	Pollutants Concentration (mg/Nm ³)		
					PM	SO ₂	NO _x
1	Kiln - 3	126	11.02	470932	19.4	2.6	148
2	Coal Mill - 3	60	8.04	58534	16.0	-	-
3	Cooler - 3	231	12.09	141803	16.4	-	-
4	Kiln - 1 ESP	165	11.12	119049	16.4	4.8	152
5	Cement Mill 1 & 2	65	8.00	179266	14.0	-	-
6	Electronic Packer 1 & 2	60	11.00	26685	20.4	-	-
7	Cooler - 1 ESP	260	10.00	110903	20.0	-	-

Test Performed	Test Method
PM ₁₀	IS 5132: (Part 23) – 2006
SO ₂	Modified west – Graeke / IS 5182 : (Part 2) – 2001 RA: 2012
NO _x	Jacobs – Hochheiser / IS 5182: (Part 6) – 2006 RA : 2012


 Environmental Scientist


 Deputy Chief Scientific Officer (a/c),
 AEL, TNPCB, Madurai.



TAMILNADU POLLUTION CONTROL BOARD
Advanced Environmental Laboratory, Madurai

Report F.No.VDR - 01/AEL/TNPCB/MDU/AAQS/2024-25, Dated:09.12.2024

1.	Name of the Industry	:	M/s. Ramco Cements Limited.,
2.	Address of the Industry	:	SF.No.231/2,233/7,234/8,241/2, 228/1,2,3,229/1,3,4,5,etc., R.R.Nagar, Thulukkappatti, Virudhunagar District.
3.	Pollution Category	:	Red/Large
4.	Date of survey	:	26.11.2024 & 27.11.2024
5.	Predominant Wind Direction	:	NE to SW

STATUS OF POLLUTANTS LEVEL

I. AMBIENT AIR QUALITY:-


1. Total No. of AAQ stations monitored : (6x3)=18 (24 Hours)
2. No. of AAQ stations in which Pollutants Level exceeded the Boards standards : NIL


Maximum and minimum value of Pollutants Level observed:

Sl. No.	Pollutant	Values in microgram/m ³		Board's Standard (as per consent order)
		Minimum	Maximum	
1.	Respirable Suspended Particulate Matter: PM ₁₀	35.7	75.7	100
2.	<u>Gaseous Pollutants:-</u>			
	(i) SO ₂	6.4	10.3	80
	(ii) NO ₂	8.3	14.5	80

II. STACK MONITORING:

1. Total No. of Stacks Monitored : 07
2. No. of Stacks in which Pollutants Level exceeded the Boards standards : NIL


Environmental Scientist


Deputy Chief Scientific Officer (a/c),
AEL, TNPCB, Madurai.



TAMILNADU POLLUTION CONTROL BOARD
Advanced Environmental Laboratory, Madurai

AMBIENT AIR QUALITY SURVEY – REPORT OF ANALYSIS

Report F.No.VDR - 01/AEL/TNPCB/MDU/AAQS/2024-25, Dated: 09.12.2024

1.	Name of the Industry	: M/s. Ramco Cements Limited.,
2.	Address of the Industry	: SE.No.231/2,233/7,234/8,241/2, 228/1,2,3,229/1,3,4,5,etc., R.R.Nagar, Tnulukapatti, Virudh nagar District.
3.	Date of survey	: 26.11.2024 & 27.11.2024
4.	Duration of survey	: 24 Hours
5.	Category/Classification	: Red/ Large
6.	Land use Classification	: Industry

Meteorological Conditions

Ambient Temperature (°C)	Min	Max	Relative Humidity (%)	Min	Max
	23.3	27.1		64.2	76.8
Weather Condition	Clear Sky		Rainfall (mm)	NIL	
Predominant Wind Direction	NE to SW		Mean Wind Speed (Km/hr)	7.05	

Ambient Air Quality Survey Results

Sl. No	Location	Direction *	Approximate Distance * (m)	Height from GL (m)	Concentration in $\mu\text{g}/\text{m}^3$ PM ₁₀			
					I	II	III	AVG.
1	On house top of Mr.Selvam, Mukku Road, R.R.Nagar	NE	330	5	88	90	49	75.7
2	On house top of Mr.Ramar, Subbiayapuram	E	950	5	63	66	40	56.3
3	On house top of Mr.Ganesan, Rajiv Gandhi Nagar	SE	750	5	69	44	34	49.0
4	On house top of Mr.Suresh, Karuppanasari patti	SW	500	5	61	56	36	51.0
5	On top of Community Hall, Ethilappanaickam patti	W	380	5	62	24	21	35.7
6	On house top of Mr.Palraj, R.R.Nagar	NW	530	5	94	83	21	66.0

Note: * with respect to major emission sources.

The analytical results are restricted to the sampling period only.

Test Performed	Test Method
PM ₁₀	IS 5182: (Part 23) – 2006
SO ₂	Modified west – Graeche / IS 5182 : (Part 2) – 2001 RA: 2012
NO ₂	Jacobs – Hochheiser / IS 5182: (Part 6) – 2006 RA : 2012

Environmental Scientist

Deputy Chief Scientific Officer (a/c),
AEL, TNPCB, Madurai.



TAMILNADU POLLUTION CONTROL BOARD
Advanced Environmental Laboratory, Madurai

AMBIENT AIR QUALITY SURVEY – REPORT OF ANALYSIS

Report F.No.VDR - GI/AEL/TNPCB/MDU/AAQS/2024-25, Dated: 09.12.2024

1.	Name of the Industry	:	M/s. Ramco Cements Limited.,
2.	Address of the Industry	:	SF.No.231/2,233/7,234/8,241/2, 228/1,2,3,229/1,3,4,5,etc., R.R.Nagar, Thulukkappatti, Vrudhunagar District.
3.	Date of survey	:	26.11.2024 & 27.11.2024
4.	Duration of survey	:	24 Hours
5.	Category/Classification	:	Red/Large
6.	Land use Classification	:	Industry

Meteorological Conditions

Ambient Temperature (°C)	Min	Max	Relative Humidity (%)	Min	Max
	23.3	27.1		64.2	76.8
Weather Condition	Clear Sky		Rainfall (mm)	NIL	
Predominant Wind Direction	NE to SW		Mean Wind Speed (Km/hr)	7.05	

Ambient Air Quality Survey Results

Sl. No.	Location	Direction *	Approximate Distance * (m)	Height from (GL) (m)	Concentration in $\mu\text{g}/\text{m}^3$ SO ₂			
					I	II	III	AVG.
1	On house top of Mr.Selvam, Mucku Road,R.R.Nagar	NE	330	5	7.4	8.4	4.8	6.9
2	On house top of Mr.Ramar,Subbiyapuram	E	950	5	6.2	6.5	<2.0	6.4
3	On house top of Mr.Ganesan,Rajiv Gandhi Nagar	SE	750	5	6.5	10.0	7.0	7.8
4	On house top of Mr.Suresh,Karuppanasari patti	SW	500	5	12.4	11.0	4.4	9.3
5	On top of Community Hall,Ethilappannickam patti	W	380	5	9.3	5.6	11	8.6
6	On house top of Mr.Palraj,R.R.Nagar	NW	530	5	14.6	12.2	4.0	10.3

Note: *with respect to major emission sources.

The analytical results are restricted to the sampling period only.

Test Performed	Test Method
PM ₁₀	IS 5182: (Part23) – 2006
SO ₂	Modified west – Graeke / IS 5182 : (Part 2) – 2001 RA: 2012
NO ₂	Jacobs – Hochheiser / IS 5182: (Part 6) – 2006 RA : 2012

Environmental Scientist

Deputy Chief Scientific Officer (a/c),
AEL, TNPCB, Madurai.

**TAMILNADU POLLUTION CONTROL BOARD**

Advanced Environmental Laboratory, Madurai

AMBIENT AIR QUALITY SURVEY – REPORT OF ANALYSIS**Report F.No.VDR - 01/AEL/TNPCB/MDU/AAQS/2024-25, Dated: 09.12.2024**

1.	Name of the Industry	:	M's. Ramco Cements Limited.,
2.	Address of the Industry	:	SF.No. 231/2,233/7,234/8,241/2, 228/1,2,3,229/1,3,4,5,etc., R.R.Nagar, Thulusapatti, Virudhunagar District.
3.	Date of survey	:	26.11.2024 & 27.11.2024
4.	Duration of survey	:	24 Hours
5.	Category/Classification	:	Red/Large
6.	Land use Classification	:	Industry

Meteorological Conditions

Ambient Temperature (°C)	Min	Max	Relative Humidity (%)	Min	Max
	23.3	27.1		64.2	76.8
Weather Condition	Clear Sky		Rainfall (mm)	NIL	
Predominant Wind Direction	NE to SW		Mean Wind Speed (Km/hr)	7.05	

Ambient Air Quality Survey Results


Sl. No	Location	Direction *	Approximate Distance * (m)	Height from G.L. (m)	Concentration in $\mu\text{g}/\text{m}^3$ NO ₂			
					I	II	III	AVG.
1	On house top of Mr.Selvam,Mukka Road,R.R.Nagar	NE	330	5	12.6	14.6	6.9	11.4
2	On house top of Mr.Ramar,Subbiyapuram	E	950	5	10.6	11.4	3	8.3
3	On house top of Mr.Ganesan,Rajiv Gandhi Nagar	SE	750	5	10.6	14.0	8.6	11.1
4	On house top of Mr.Suresh,Karuppanasari patti	SW	500	5	18.6	14.7	8.1	13.8
5	On top of Community Hall,Ethilappanaickam patti	W	380	5	14.4	7.4	15	12.3
6	On house top of Mr.Palraj,R.R.Nagar	NW	530	5	22.4	14.0	7.2	14.5

Note: *with respect to major emission sources.

The analytical results are restricted to the sampling period only.

Test Performed	Test Method
PM ₁₀	IS 5182: (Part 23) – 2006
SO ₂	Modified west – Graeke / IS 5182 : (Part 2) – 2001 RA: 2012
NO ₂	Jacobs – Hochheiser * IS 5182: (Part 6) – 2006 RA : 2012


 Environmental Scientist


 Deputy Chief Scientific Officer (a/c),
 AEL, TNPCB, Madurai.



TEST REPORT

Report No. : EN24070528

ULR NO: TCR5823400005278F

Name of the Client : The Ramco Cement Limited
 Address of the Client : Ramasamy Raja Nagar, Virudhunagar - 626204
 Sample Name : Stack Emission Sampling Date : 09-Jul-2024
 Sample Description : Stack Emission Received Date : 11-Jul-2024
 Sampling Location : Cooler-03 Commenced On : 11-Jul-2024
 Sample Submission Type : Collected by Lab Representative Completed On : 15-Jul-2024
 Sample Condition : Fit for Analysis Report Date : 17-Jul-2024
 Sampling Plan and Method : GL/EN/SOP/111




Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per ECCTO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Stack Temperature	K	302.0	IS 11355 (Part 3): 2018	NA
2	Velocity	m/sec	15.00	EPA method 1-3	NA
3	Gaseous Discharge	Nm ³ /hr	188547.0	IS 11355 (Part 3): 2018	NA
4	Oxygen as O ₂	%	20.7	GL/EN/SOP/140	NA
5	Carbon Monoxide as CO	mg/m ³	BCU(LOQ : 3.14)	GL/EN/SOP/141	NA
6	Carbon Dioxide as CO ₂	%	0.2	GL/EN/SOP/141	NA
7	Particulate Matter	mg/Nm ³	14.90	GL/EN/SOP/111	20
8	Moisture Content	%	1.9	EPA Method 1-3	NA

Note: - BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report


 Authorized Signature
E. PRITHIVIRAJAN
 LAB MANAGER

GLENS INNOVATION LABS PVT LTD, (P) LTD Floor, No. 10/4, Durgam Changanassery Road, Ramasamy Raja Nagar, Arundikottai, Chennai-600036

Terms and Conditions:

- * The test results related only to the items tested.
- * The test report shall not be reproduced in full or part without the written approval of Glens.
- * The test items will not be retained for more than 15 days from the date of issue of test report except in the case as required by the applicable regulations.
- * The Laboratory's responsibility under this report is limited to proven willful negligence and will in no case be more than the invoiced amount.
- * A Satisfactory test report in no way implies that the product tested is approved by NABL.
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TEST REPORT

Report No. : EN24070529

ULR NO: TCR58224000005279F

Name of the Client : The Ramco Cement Limited
 Address of the Client : Ramnany Raja Nagar, Virudhunagar - 626204
 Sample Name : Stack Emission Sampling Date : 09-Jul-2024
 Sample Description : Stack Emission Received Date : 11-Jul-2024
 Sampling Location : Coal Mill-03 Commenced On : 11-Jul-2024
 Sample Submission Type : Collected by Lab Representative Completed On : 15-Jul-2024
 Sample Condition : Fit for Analysis Report Date : 17-Jul-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/CTO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Stack Temperature	K	345.0	IS 11255 (Part 3) : 2018	NA
2	Velocity	m/sec	8.70	EPA method 1-5	NA
3	Quartz Discharge	Nm3/hr	60615.0	IS 11255 (Part 3) : 2018	NA
4	Oxygen as O2	%	20.8	GL/EN/SOP/109	NA
5	Carbon Monoxide as CO	mg/Nm3	6.6	GL/EN/SOP/109	NA
6	Carbon Dioxide as CO2	%	11.4	GL/EN/SOP/109	NA
7	Particulate Matter	mg/Nm3	6.14	GL/EN/SOP/111	20
8	Moisture Content	%	2.9	EPA Method 13.1	NA

Note--BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report


 Authorized Signature
E. PRITHIVIRAJAN
 LAB MANAGER

GL/EN/INNOVATION LABS Pvt Ltd, #5/113A Road, 5th Floor Complex, Managastri Dindim, Ramnany Raja Nagar, Virudhunagar, Tamil Nadu, India. Contact: 04562240000

Terms and Conditions:

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TEST REPORT

Report No. : EN24070530

ULR NO: TC058224000005280F

Name of the Client : The Ramco Cement Limited
 Address of the Client : Ramakrishna Raja Nagar, Vizadhinagar - 626204
 Sample Name : Stack Emission Sampling Date : 10-Jul-2024
 Sample Description : Stack Emission Received Date : 11-Jul-2024
 Sampling Location : Cement Mill-01 & 02 Commenced On : 11-Jul-2024
 Sample Submission Type : Collected by Lab Representative Completed On : 15-Jul-2024
 Sample Condition : Fit for Analysis Report Date : 07-08-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per ECCTO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Stack Temperature	K	354.0	IS 11233 (Part 3): 2018	NA
2	Velocity	m/sec	6.40	EPA Method 1-3	NA
3	Gasous Discharge	Nm3/hr	135637.0	IS 11233 (Part 3): 2018	NA
4	Oxygen as O2	%	20.8	GL/EN/SOP/140	NA
5	Carbon Monoxide as CO	mg/m3	BLQ(LOQ) 1.14	GL/EN/SOP/149	NA
6	Carbon Dioxide as CO2	%	0.1	GL/EN/SOP/149	NA
7	Particulate Matter	ug/Nm3	11.30	GL/EN/SOP/112	30
8	Moisture Content	%	2.9	EPA Method 1-3	NA

Note:- BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report


 Authorized Signature:
E. PRITHIVIRAJAN
 LAB MANAGER

GL Innovation Labs Pvt Ltd (REG), 2nd Floor, Sri Jai Complex, Mangalocherry Street, Ramakrishna Raja Nagar, Avudhinagar Chennai-626204

Terms and Conditions:

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Report No. : EN24070532

ULR NO: TC858224000005282F

Name of the Client : The Ramco Cement Limited
 Address of the Client : Ramasamy Raja Nagar, Virudhunagar - 626204
 Sample Name : Stack Emission Sampling Date : 10-Jul-2024
 Sample Description : Stack Emission Received Date : 11-Jul-2024
 Sampling Location : Cement Mill-03 Commenced On : 11-Jul-2024
 Sample Submission Type : Collected by Lab Representative Completed On : 15-Jul-2024
 Sample Condition : Fit for Analysis Report Date : 07-08-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/CTO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Stack Temperature	K	348.0	IE 11215 (Part 3) / 2018	NA
2	Velocity	m/sec	9.10	IS 11215 (Part 3) / 2018	NA
3	Gaseous Discharge	Nm ³ /hr	35893.0	IE 11215 (Part 3) / 2018	NA
4	Oxygen at O ₂	%	20.8	GL/EN/SOP/149	NA
5	Carbon Monoxide as CO	mg/m ³	BLQ (LOQ : 1.16)	GL/EN/SOP/149	NA
6	Carbon Dioxide as CO ₂	%	0.2	GL/EN/SOP/149	NA
7	Particulate Matter	mg/Nm ³	10.30	GL/EN/SOP/111	30
8	Moisture Content	%	2.8	IS 11215 (Part 3) / 2018	NA

Note: - BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report


 Authorized Signature
E. PRITHIVIRAJAN
 LAB MANAGER

GLens Innovation Labs Pvt Ltd, 85/2, 1st Floor, BPO/01/Chinnai, Nungambur Street, Ramasamy Raja Nagar, Avinashilingam District, Tamil Nadu

Terms and Conditions:

- * The test results related only to the items tested.
- * The test report shall not be reproduced in full or part without the written approval of GLens.
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- * A satisfactory test report in no way implies that the product tested is approved by NABL.
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TEST REPORT

Report No. : EN24070531

TLR NO: TC858224000005281F

Name of the Client : The Ramco Cement Limited
 Address of the Client : Kammany Raja Nagar, Virudhunagar - 626704.
 Sample Name : Stack Emission Sampling Date : 10-Jul-2024
 Sample Description : Stack Emission Received Date : 11-Jul-2024
 Sampling Location : Packer stack Commenced On : 11-Jul-2024
 Sample Submission Type : Collected by Lab Representative Completed On : 15-Jul-2024
 Sample Condition : Fit for Analysis Report Date : 17-Jul-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/TO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Stack Temperature	K	319.0	IS 11255 (Part 3) - 2018	NA
2	Velocity	m/sec	22.10	EPA Method 1-3	NA
3	Gaseous Discharge	Nm ³ /hr	55301.0	IS 11255 (Part 3) - 2018	NA
4	Oxygen as O ₂	%	20.6	GL/EN/SOP/149	NA
5	Carbon Monoxide as CO	mg/m ³	BLQ (LOQ: 1.14)	GL/EN/SOP/149	NA
6	Carbon Dioxide as CO ₂	%	0.2	GL/EN/SOP/149	NA
7	Particulate Matter	mg/Nm ³	6.85	GL/EN/SOP/113	20
8	Moisture Content	%	BLQ (LOQ: 1.0)	EPA Method 1-3	NA

Note:- BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report


 Authorized Signature
E. PRITHIVIRAJAN
 LAB MANAGER

GL/EN/INNOVATION LABS PRIVATE LIMITED, 5th Floor, Sri Lanka Computer Management Board, Puthukkottai Nagar, Arundhaty Road, Chennai-600006

Terms and Conditions:

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- * Laboratory is not responsible for the authenticity of the photocopied test reports.

TEST REPORT

Report No. : EN24070533

U/R NO: TC858224000005283F

Name of the Client : The Ramco Cements Limited
 Address of the Client : Ramasamy Raja Nagar, Vinudhinagar - 636204
 Sample Name : Stack Emission Sampling Date : 10-Jul-2024
 Sample Description : Stack Emission Received Date : 11-Jul-2024
 Sampling Location : Cooler-01 Commenced On : 11-Jul-2024
 Sample Submission Type : Collected by Lab Representative Completed On : 15-Jul-2024
 Sample Condition : Fit for Analysis Report Date : 17-Jul-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/CTO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Stack Temperature	K	456.0	IS 11255 (Part 3): 2014	NA
2	Velocity	m/sec	15.10	EPA method 1-3	NA
3	Gaseous Discharge	Nm ³ /hr	89557.0	IS 11255 (Part 3): 2014	NA
4	Oxygen at O ₂	%	20.7	GL/EN/SOP/149	NA
5	Carbon Monoxide as CO	mg/m ³	BLQ (LOQ - 1.54)	GL/EN/SOP/149	NA
6	Carbon Dioxide as CO ₂	%	0.2	GL/EN/SOP/149	NA
7	Particulate Matter	mg/Nm ³	10.80	GL/EN/SOP/113	20
8	Moisture Content	%	1.5	EPA Method 1-3	NA

Note: BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report

Authorized Signature

E. PRITHVIRAJAN
LAB MANAGER

GL/EN/SOP/111/2024/Rev.02, 01/11/2024, 8/11/2024, 10/11/2024, 12/11/2024, 14/11/2024, 16/11/2024, 18/11/2024, 20/11/2024, 22/11/2024, 24/11/2024, 26/11/2024, 28/11/2024, 30/11/2024, 02/12/2024, 04/12/2024, 06/12/2024, 08/12/2024, 10/12/2024, 12/12/2024, 14/12/2024, 16/12/2024, 18/12/2024, 20/12/2024, 22/12/2024, 24/12/2024, 26/12/2024, 28/12/2024, 30/12/2024, 01/01/2025, 03/01/2025, 05/01/2025, 07/01/2025, 09/01/2025, 11/01/2025, 13/01/2025, 15/01/2025, 17/01/2025, 19/01/2025, 21/01/2025, 23/01/2025, 25/01/2025, 27/01/2025, 29/01/2025, 31/01/2025, 02/02/2025, 04/02/2025, 06/02/2025, 08/02/2025, 10/02/2025, 12/02/2025, 14/02/2025, 16/02/2025, 18/02/2025, 20/02/2025, 22/02/2025, 24/02/2025, 26/02/2025, 28/02/2025, 01/03/2025, 03/03/2025, 05/03/2025, 07/03/2025, 09/03/2025, 11/03/2025, 13/03/2025, 15/03/2025, 17/03/2025, 19/03/2025, 21/03/2025, 23/03/2025, 25/03/2025, 27/03/2025, 29/03/2025, 31/03/2025, 02/04/2025, 04/04/2025, 06/04/2025, 08/04/2025, 10/04/2025, 12/04/2025, 14/04/2025, 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26/08/2026, 28/08/2026, 30/08/2026, 01/09/2026, 03/09/2026, 05/09/2026, 07/09/2026, 09/09/2026, 11/09/2026, 13/09/2026, 15/09/2026, 17/09/2026, 19/09/2026, 21/09/2026, 23/09/2026, 25/09/2026, 27/09/2026, 29/09/2026, 01/10/2026, 03/10/2026, 05/10/2026, 07/10/2026, 09/10/2026, 11/10/2026, 13/10/2026, 15/10/2026, 17/10/2026, 19/10/2026, 21/10/2026, 23/10/2026, 25/10/2026, 27/10/2026, 29/10/2026, 01/11/2026, 03/11/2026, 05/11/2026, 07/11/2026, 09/11/2026, 11/11/2026, 13/11/2026, 15/11/2026, 17/11/2026, 19/11/2026, 21/11/2026, 23/11/2026, 25/11/2026, 27/11/2026, 29/11/2026, 01/12/2026, 03/12/2026, 05/12/2026, 07/12/2026, 09/12/2026, 11/12/2026, 13/12/2026, 15/12/2026, 17/12/2026, 19/12/2026, 21/12/2026, 23/12/2026, 25/12/2026, 27/12/2026, 29/12/2026, 01/01/2027, 03/01/2027, 05/01/2027, 07/01/2027, 09/01/2027, 11/01/2027, 13/01/2027, 15/01/2027, 17/01/2027, 19/01/2027, 21/01/2027, 23/01/2027, 25/01/2027, 27/01/2027, 29/01/2027, 01/02/2027, 03/02/2027, 05/02/2027, 07/02/2027, 09/02/2027, 11/02/2027, 13/02/2027, 15/02/2027, 17/02/2027, 19/02/2027, 21/02/2027, 23/02/2027, 25/02/2027, 27/02/2027, 29/02/2027, 01/03/2027, 03/03/2027, 05/03/2027, 07/03/2027, 09/03/2027, 11/03/2027, 13/03/2027, 15/03/2027, 17/03/2027, 19/03/2027, 21/03/2027, 23/03/2027, 25/03/2027, 27/03/2027, 29/03/2027, 01/04/2027, 03/04/2027, 05/04/2027, 07/04/2027, 09/04/2027, 11/04/2027, 13/04/2027, 15/04/2027, 17/04/2027, 19/04/2027, 21/04/2027, 23/04/2027, 25/04/2027, 27/04/2027, 29/04/2027, 01/05/2027, 03/05/2027, 05/05/2027, 07/05/2027, 09/05/2027, 11/05/2027, 13/05/2027, 15/05/2027, 17/05/2027, 19/05/2027, 21/05/2027, 23/05/2027, 25/05/2027, 27/05/2027, 29/05/2027, 01/06/2027, 03/06/2027, 05/06/2027, 07/06/2027, 09/06/2027, 11/06/2027, 13/06/2027, 15/06/2027, 17/06/2027, 19/06/2027, 21/06/2027, 23/06/2027, 25/06/2027, 27/06/2027, 29/06/2027, 01/07/2027, 03/07/2027, 05/07/2027, 07/07/2027, 09/07/2027, 11/07/2027, 13/07/2027, 15/07/2027, 17/07/2027, 19/07/2027, 21/07/2027, 23/07/2027, 25/07/2027, 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01/06/2029, 03/06/2029, 05/06/2029, 07/06/2029, 09/06/2029, 11/06/2029, 13/06/2029, 15/06/2029, 17/06/2029, 19/06/2029, 21/06/2029, 23/06/2029, 25/06/2029, 27/06/2029, 29/06/2029, 01/07/2029, 03/07/2029, 05/07/2029, 07/07/2029, 09/07/2029, 11/07/2029, 13/07/2029, 15/07/2029, 17/07/2029, 19/07/2029, 21/07/2029, 23/07/2029, 25/07/2029, 27/07/2029, 29/07/2029, 01/08/2029, 03/08/2029, 05/08/2029, 07/08/2029, 09/08/2029, 11/08/2029, 13/08/2029, 15/08/2029, 17/08/2029, 19/08/2029, 21/08/2029, 23/08/2029, 25/08/2029, 27/08/2029, 29/08/2029, 01/09/2029, 03/09/2029, 05/09/2029, 07/09/2029, 09/09/2029, 11/09/2029, 13/09/2029, 15/09/2029, 17/09/2029, 19/09/2029, 21/09/2029, 23/09/2029, 25/09/2029, 27/09/2029, 29/09/2029, 01/10/2029, 03/10/2029, 05/10/2029, 07/10/202

TEST REPORT

Report No. : EN24070534

ULR NO: TC858224080005284F

Name of the Client : The Ramco Cements Limited
 Address of the Client : Rammany Raja Nagar, Virudhunagar - 626204
 Sample Name : Stack Emission Sampling Date : 10-Jul-2024
 Sample Description : Stack Emission Received Date : 11-Jul-2024
 Sampling Location : Kiln Stack#01 Commenced On : 11-Jul-2024
 Sample Submission Type : Collected by Lab Representative Completed On : 15-Jul-2024
 Sample Condition : Fit for Analysis Report Date : 17-Jul-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/CTO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Stack Temperature	K	409.0	IS 11255 (Part 2): 2018	NA
2	Velocity	m/sec	13.99	EPA method 1-3	NA
3	Gaseous Discharge	Nm ³ /hr	157036.0	IS 11255 (Part 2): 2018	NA
4	Oxygen as O ₂	%	10.4	GL/EN/SOP/148	NA
5	Carbon Monoxide as CO	mg/Nm ³	19.6	GL/EN/SOP/149	NA
6	Carbon Dioxide as CO ₂	%	19.0	GL/EN/SOP/149	NA
7	Particulate Matter	mg/Nm ³	11.30	GL/EN/SOP/113	20
8	Oxides of Nitrogen as NOx	mg/Nm ³	536.0	GL/EN/SOP/149	600
9	Sulphur Dioxide as SO ₂	mg/Nm ³	W (LOQ: 3.0)	EPA Method 6	100
10	Molasses Content	%	3.8	EPA Method 13	NA

Note: BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report


 Authorized Signature
E. PRITHIVIRAJAN
 LAB MANAGER

GLENS INNOVATION LABS Private Limited, Regd. Office: Srirajalakshmi Complex, Munagudi Post, Rammany Raja Nagar, Virudhunagar District-626204

Terms and Conditions:

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- * The test report shall not be reproduced in full or part without the written approval of GLens.
- * The test items will not be retained for more than 15 days from the date of issue of test report except in the case as required by the applicable regulations.
- * The Laboratory's responsibility under this report is limited to proven willful negligence and will in no case be more than the involved amount.
- * A Satisfactory test report in no way implies that the product tested is approved by NABL.
- * Laboratory is not responsible for the authenticity of the photocopied test reports.

TEST REPORT

Report No. : EN24070535

ULR NO: TC858224000005285F

Name of the Client : The Ramco Cements Limited
 Address of the Client : Ramasamy Raja Nagar, Virudhunagar - 626204
 Sample Name : Stack Emission Sampling Date : 09-Jul-2024
 Sample Description : Stack Emission Received Date : 11-Jul-2024
 Sampling Location : Kiln Stack-03 Commenced On : 11-Jul-2024
 Sample Submission Type : Collected by Lab Representative Completed On : 15-Jul-2024
 Sample Condition : Fit for Analysis Report Date : 17-Jul-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/CTO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Stack Temperature	K	416.0	IS 11235 (Part 1), 2018	NA
2	Velocity	m/sec	10.46	EPA method 1-1	NA
3	Gross Discharge	Nm ³ /hr	416913.0	IS 11235 (Part 1), 2018	NA
4	Oxygen as O ₂	%	13.39	GL/EN/SOP/149	NA
5	Carbon Monoxide as CO	mg/m ³	2.2	GL/EN/SOP/149	NA
6	Carbon Dioxide as CO ₂	%	13.8	GL/EN/SOP/149	NA
7	Particulate Matter	mg/m ³	9.03	GL/EN/SOP/113	20
8	Oxides of Nitrogen as NO _x	mg/Nm ³	571.0	GL/DI/SOP/149	600
9	Sulphur Dioxide as SO ₂	mg/Nm ³	BL (X-CO ₂ -7.7)	EPA Method 6	100
10	Moisture Content	%	3.8	EPA Method 1-1	NA

Note: -BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report


 Authorized Signature

E. PRITHIVIRAJAN
 LAB MANAGER

QUALIFICATION LABS Private Limited, 85/11 B Floor, Sri Lakshmi Complex, Mangalam Cross, Ramasamy Raja Nagar, Virudhunagar, Tamil Nadu - 626204

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TEST REPORT

ULR NO: TC85K234060005286F

Report No. : EN24070530

Name of the Client : The Ramco Cements Limited-Thermal Powerplant

Address of the Client : Ramasamy Raja Nagar, Virudhunagar - 626704

Sample Name : Stack Emission Sampling Date : 10-Jul-2024

Sample Description : Stack Emission Received Date : 11-Jul-2024

Sampling Location : Boiler 110 TPH Stack Commenced On : 11-Jul-2024

Sample Submission Type : Collected by Lab Representative Completed On : 15-Jul-2024

Sample Condition : Fit for Analysis Report Date : 17-Jul-2024

Sampling Plan and Method : GLEN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as per CPCB Standard
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Stack Temperature	K	414.0	IS 11255 (Part 7):2018	NA
2	Velocity	m/sec	13.10	EPA method 1-d	NA
3	Gaseous Discharge	Nm ³ /hr	101286.0	IS 11255 (Part 7): 2018	NA
4	Oxygen as O ₂	%	16.43	GLEN/SOP/149	NA
5	Carbon Monoxide as CO	mg/m ³	168.0	GLEN/SOP/149	NA
6	Carbon Dioxide as CO ₂	%	4.0	GLEN/SOP/149	NA
7	Particulate Matter	mg/m ³	40.30	GL/EN/SOP/111	50
8	Oxide of Nitrogen as NO _x	mg/m ³	412.0	GLEN/SOP/149	450
9	Sulphur Dioxide as SO ₂	mg/Nm ³	566.0	EPA Method 6	600
10	Moisture Content	%	2.9	EPA Method 1-3	NA
11	Mercury in Hg	mg/m ³	BLQ (LOQ: 0.05)	EPA method-20	0.03

Note: - BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report


 Authorized Signature
E. PRITHIVIRAJAN
 LAB MANAGER

GLens INNOVATION LABS Pvt Ltd, 40/12 B Floor, Sri Lanka Consulate Complex, Ramasamy Raja Nagar, Avinatturai, Chennai 600095

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TEST REPORT

ULR NO: TC858224000006078F

Report No.: EN24080839

Name of the Client : The Ramco Cements Limited
 Address of the Client : Ramasamy Raja Nagar, Virudhunagar - 626204.
 Sample Name : Stack Emission
 Sampling Date : 20-Aug-2024
 Sample Description : Stack Emission
 Received Date : 23-Aug-2024
 Sampling Location : Kila Stack-3
 Commenced On : 23-Aug-2024
 Sample Submission Type : Collected by Lab Representative
 Completed On : 30-Aug-2024
 Sample Condition : Fit for Analysis
 Report Date : 31-Aug-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/CTO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Carbon Monoxide as CO	mg/Nm ³	0.0	GL/EN/SOP/149	NA
2	Carbon Dioxide as CO ₂	%	15.3	GL/EN/SOP/149	NA
3	Gaseous Discharge	Nm ^{3/hr}	363219.0	IS 11215 (Part 3) - 2014	NA
4	Oxides of Nitrogen as NO ₂	mg/Nm ³	252.0	GL/EN/SOP/149	600
5	Oxygen as O ₂	%	12.27	GL/EN/SOP/149	NA
6	Stack Temperature	K	419	IS 11215 (Part 3) - 2014	NA
7	Velocity	m/sec	9.6	EPA Method 1.3	NA
8	Moisture Content	%	3.8	EPA Method 1.3	NA
9	Sulphur Dioxide as SO ₂	mg/Nm ³	BLQ (LOQ - 1.0)	EPA Method 6	100
10	Particulate Matter	mg/Nm ³	BLQ (LOQ - 1.0)	GL/EN/SOP/111	20

Note: BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report

Authorized Signature

E. PRITHIVIRAJAN,
LAB MANAGER

REGISTRATION NUMBER: HE 40/13 & Part 2, Virudhunagar, Virudhunagar District, Virudhunagar, Tamil Nadu, India. Accredited as per ISO 17025:2017

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TEST REPORT

ULR NO: TC858224000006079F

Report No.: EN24000840

Name of the Client : The Ramco Cement Limited
 Address of the Client : Ramaswamy Raja Nagar, Virudhunagar - 626204.
 Sample Name : Stack Emission Sampling Date : 21-Aug-2024
 Sample Description : Stack Emission Received Date : 23-Aug-2024
 Sampling Location : Kiln Stack - 01 Commenced On : 23-Aug-2024
 Sample Submission Type : Collected by Lab Representative Completed On : 30-Aug-2024
 Sample Condition : Fit for Analysis Report Date : 31-Aug-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/CTO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Carbon Monoxide as CO	mg/Nm ³	96.3	GL/EN/SOP/149	NA
2	Carbon Dioxide as CO ₂	%	17.77	GL/EN/SOP/149	NA
3	Gaseous Discharge	Nm ³ /hr	188058.0	IS 11225 (Part 3) : 2018	NA
4	Oxides of Nitrogen as NO ₂	mg/Nm ³	545.0	GL/EN/SOP/149	600
5	Oxygen as O ₂	%	10.25	GL/EN/SOP/149	NA
6	Stack Temperature	K	406	IS 11225 (Part 3) : 2018	NA
7	Velocity	m/sec	16.6	EPA method 1-3	NA
8	Moisture Content	%	3.79	EPA Method 1-3	NA
9	Sulphur Dioxide as SO ₂	mg/Nm ³	Below LOQ (5.0)	EPA Method 8	100
10	Particulate Matter	mg/Nm ³	3.56	GL/EN/SOP/113	30

Note: - BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report


 Authorized Signature
E. PRITHIVIRAJAN
 LAB MANAGER

GLS INNOVATION LABS PVT LTD, 10/21 B Street, 2F, 626204 Virudhunagar, Tamil Nadu, India. (Contact: 94422 40000, 94422 40001)

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TEST REPORT

ULR NO: TC858224000006080F

Report No.: EN24080841

Name of the Client : The Ramco Cements Limited
 Address of the Client : Ramnagar Raja Nagar, Virudhunagar - 626204.
 Sample Name : Stack Monitoring
 Sampling Date : 20-Aug-2024
 Sample Description : Stack Monitoring
 Received Date : 23-Aug-2024
 Sampling Location : Coal Mill-3
 Commenced On : 23-Aug-2024
 Sample Submission Type : Collected by Lab Representative
 Completed On : 30-Aug-2024
 Sample Condition : Fit for Analysis
 Report Date : 31-Aug-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/CTO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Carbon Monoxide as CO	mg/Nm ³	28.4	GL/EN/SOP/149	NA
2	Carbon Dioxide as CO ₂	%	0.3	GL/EN/SOP/149	NA
3	Carbon Discharge	kg/hr	67887.0	IS 11255 (Part 3) : 2018	NA
4	Oxygen as O ₂	%	20.8	GL/EN/SOP/149	NA
5	Particulate Matter	mg/Nm ³	3.20	GL/EN/SOP/111	20
6	Stack Temperature	K	342	IS 11255 (Part 3) : 2018	NA
7	Velocity	m/sec	9.6	EPA method 1-1	NA
8	Moisture Content	%	3.8	EPA Method 1-1	NA

Note: BLQ - Below the Limit of Qualification, LOQ - Limit of Qualification.

End of Report

Authorized Signature

E. PRITHIVIRAJAN
LAB MANAGER

GLens Innovation Labs Pvt Ltd, NABL Certified, SH (W) Centre, Mangalagiri Street, Virudhunagar Nagar, Virudhunagar, Tamil Nadu, India. 626204

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TEST REPORT

ULR NO: TC858224000006081F

Report No. : EN24080642

Name of the Client : The Ramco Cement Limited
 Address of the Client : Ramnagar Raja Nagar, Virudhnamagar - 626204.
 Sample Name : Stack Emission
 Sampling Date : 20-Aug-2024
 Sample Description : Stack Emission
 Received Date : 23-Aug-2024
 Sampling Location : Cooler Stack-3
 Commenced On : 23-Aug-2024
 Sample Submission Type : Collected by Lab Representative
 Completed On : 30-Aug-2024
 Sample Condition : Fit for Analysis
 Report Date : 31-Aug-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/CIO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Carbon Monoxide as CO	mg/m3	BLQ (CO: 1.14)	GL/EN/SOP/149	NA
2	Carbon Dioxide as CO2	%	0.1	GL/EN/SOP/149	NA
3	Gaseous DSO (Total)	Nm3/hr	184728.0	IS 11157 (Part 3): 2018	NA
4	Oxygen as O2	%	20.8	GL/EN/SOP/149	NA
5	Particulate Matter	mg/Nm3	11.80	GL/EN/SOP/111	20
6	Stack Temperature	K	490	IS 11157 (Part 3): 2018	NA
7	Velocity	m/sec	14.9	EPA Method 4-1	NA
8	Moisture Content	%	1.9	EPA Method 4-1	NA

Note: BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report

Authorized Signature

E. PRITHVIRAJAN
LAB MANAGER

GLENS INNOVATION LABS PVT LTD, 95/11 B Floor, Sri Sarai Complex, Marudhavan Street, East Guindy, Chennai - 600025

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TEST REPORT

ULR NO: TC858224000006082F

Report No. : EN24080844

Name of the Client : The Ramco Cements Limited
 Address of the Client : Ramasamy Raja Nagar, Virudhunagar - 626204
 Sample Name : Stack Emission
 Sampling Date : 21-Aug-2024
 Sample Description : Stack Emission
 Received Date : 23-Aug-2024
 Sampling Location : Cooler Stack-1
 Commenced On : 23-Aug-2024
 Sample Submission Type : Collected by Lab Representative
 Completed On : 30-Aug-2024
 Sample Condition : FH for Analysis
 Report Date : 31-Aug-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/CTO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Carbon Monoxide as CO	mg/m3	BLQ (CO: 1.14)	GL/EN/SOP/149	NA
2	Carbon Dioxide as CO2	%	0.2	GL/EN/SOP/149	NA
3	Gasous Discharge	Nm3/hr	89250.0	IS 11255 (Part 3) - 2018	NA
4	Oxygen as O2	%	20.7	GL/EN/SOP/149	NA
5	Particulate Matter	mg/m3	11.50	GL/EN/SOP/111	20
6	Stack Temperature	K	459	IS 11255 (Part 3) - 2018	NA
7	Wind Velocity	m/sec	15.2	EPA Method 1-3	NA
8	Moisture Content	%	1.9	EPA Method 1-3	NA

Note:- BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report

Authorized Signature

E. PRITHIVIRAJAN
LAB MANAGER

REGISTRATION NO: 10022/2017, NABL-10022/2017, 30/08/2017, Director, Government of India, New Delhi, India. Accredited as per ISO 17025:2017

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TEST REPORT

ULR NO: TC85822400006083F

Report No. : EN24050845

Name of the Client : The Ramco Cement Limited
 Address of the Client : Ramnany Raja Nagar, Virodhnagar - 626204.
 Sample Name : Stack Emission
 Sampling Date : 21-Aug-2024
 Sample Description : Stack Emission
 Received Date : 23-Aug-2024
 Sampling Location : Cement Mill - 1 & 2
 Commenced On : 23-Aug-2024
 Sample Submission Type : Collected by Lab Representative
 Completed On : 30-Aug-2024
 Sample Condition : Fit for Analysis
 Report Date : 31-Aug-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/CTO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Carbon Monoxide as CO	mg/m ³	BLQ (LOQ: 1.14)	GL/EN/SOP/111	NA
2	Carbon Dioxide as CO ₂	%	11.2	GL/EN/SOP/111	NA
3	Gaseous Discharge	Nm ³ /hr	174058.0	IS 11295 (Part 3): 2018	NA
4	Oxygen as O ₂	%	20.8	GL/EN/SOP/111	NA
5	Particulate Matter	mg/m ³	9.26	GL/EN/SOP/111	20
6	Stack Temperature	K	353	IS 11295 (Part 3): 2018	NA
7	Velocity	m/sec	8.4	IS 11295 (Part 3): 2018	NA
8	Moisture Content	%	3.8	EPA Method 3-3	NA

Note: BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report


 Authorized Signature

E. PRITHVIRAJAN
 LAB MANAGER

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TEST REPORT

ULR NO: TC858224000006084F

Report No.: EN24090846

Name of the Client : The Ramco Cements Limited
 Address of the Client : Rammany Raja Nagar, Virudhunagar - 626204
 Sample Name : Stack Emission Sampling Date : 21-Aug-2024
 Sample Description : Stack Emission Received Date : 23-Aug-2024
 Sampling Location : Cement Mill - 3 Commenced On : 23-Aug-2024
 Sample Submission Type : Collected by Lab Representative Completed On : 30-Aug-2024
 Sample Condition : Fit for Analysis Report Date : 31-Aug-2024
 Sampling Plan and Method : GL/EN/SCP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/CTO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Carbon Monoxide as CO	mg/m ³	BLQ (LOQ: 1.14)	GL/EN/SC/149	NA
2	Carbon Dioxide as CO ₂	%	0.1	GL/EN/SC/149	NA
3	Gaseous Discharge	Nm ³ /hr	56244.0	IS 11257 (Part 2): 2018	NA
4	Oxygen as O ₂	%	20.8	GL/EN/SC/149	NA
5	Particulate Matter	mg/Nm ³	9.41	GL/EN/SC/111E	20
6	Stack Temperature	K	352	IS 11257 (Part 2): 2018	NA
7	Velocity	m/sec	9.3	EPA method 1-5	NA
8	Moisture Content	%	3.8	EPA Method 1-5	NA

Notes- BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification

End of Report


 Authorized Signature
E. PRITHVIRAJ
 LAB MANAGER

GLens Innovation Labs Pvt Ltd, PG-2, 1st Floor, Sankaradesika Manjappa Street, Rammany Raja Nagar, Virudhunagar, Tamil Nadu, Chennai-626204

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TEST REPORT

ULR NO: TC858224000006086F

Report No. : EN24080850

Name of the Client : The Ramco Cements Limited - TPP
 Address of the Client : Ramasamy Raja Nagar, Virudhunagar - 626204
 Sample Name : Stack Emission Sampling Date : 21-Aug-2024
 Sample Description : Stack Emission Received Date : 23-Aug-2024
 Sampling Location : Boiler 110 TPH Stack Commenced On : 23-Aug-2024
 Sample Submission Type : Collected by Lab Representative Completed On : 31-Aug-2024
 Sample Condition : Fit for Analysis Report Date : 31-Aug-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as per CPCB Standard
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Carbon Monoxide as CO	mg/m ³	97.5	GL/EN/SOP/149	NA
2	Carbon Dioxide as CO ₂	%	9.6	GL/EN/SOP/149	NA
3	Oxides of Nitrogen	ppm	112261.0	IS 11235 (Part 3) : 2018	NA
4	Oxides of Nitrogen as NO ₂	mg/m ³	433.0	GL/EN/SOP/149	450
5	Oxygen as O ₂	%	9.92	GL/EN/SOP/149	NA
6	Particulate Matter	mg/m ³	26.90	GL/EN/SOP/111	50
7	Stack Temperature	K	407	IS 11255 (Part 3) : 2018	NA
8	Velocity	m/sec	14.2	EPA Method 1-5	NA
9	Mercury as Hg	ng/m ³	BLQ (LOQ: 0.02)	EPA Method 29	0.03
10	Moisture Content	%	2.8	EPA Method 1-8	NA
11	Sulphur Dioxide as SO ₂	mg/m ³	555.000	EPA Method 6	600

Note:-BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report


 Authorized Signature
E. PRITHVIRAJAN
 LAB MANAGER

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TEST REPORT

ULR NO: TC8S8224000006575F

Report No.: EN24090688

Name of the Client : The Ramco Cements Limited
 Address of the Client : Ramasamy Raja Nagar, Virudhunagar - 626204.
 Sample Name : Stack emission Sampling Date : 20-Sep-2024
 Sample Description : Stack Emission Received Date : 27-Sep-2024
 Sampling Location : Kiln Stack-3 Commenced On : 27-Sep-2024
 Sample Submission Type : Collected by Lab Representative Completed On : 07-Oct-2024
 Sample Condition : Fit for Analysis Report Date : 07-Oct-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/CTO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Carbon Monoxide as CO	mg/Nm ³	3.7	GL/EN/SOP/140	NA
2	Carbon Dioxide as CO ₂	%	15.1	GL/EN/SOP/140	NA
3	Gaseous Discharge	Nm ³ /hr	424797.0	IS 11255 (Part 3) : 2018	NA
4	Oxides of Nitrogen as NO ₂	mg/Nm ³	475.0	GL/EN/SOP/149	600
5	Oxygen as O ₂	%	12.60	GL/EN/SOP/149	NA
6	Stack Temperature	K	410	IS 11255 (Part 3) : 2018	NA
7	Velocity	m/sec	10.7	EPA method 1.2	NA
8	Mixture Content	%	3.8	EPA Method 1.1	NA
9	Sulphur Dioxide as SO ₂	mg/Nm ³	BL-93.0Q (3.0)	EPA Method 6	100
10	Particulate Matter	mg/Nm ³	6.00	GL/EN/SOP/133	20

Note: BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report

Authorized Signature

S. Sankar
Senior Chemist

GLENS INNOVATION LABS PVT LTD, RA2133, RAJFILA, SRI RAM COLONY, MURUGAY STREET, VIRUDHUNAGAR, ANANDAPURAM DISTRICT, TAMIL NADU

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TEST REPORT

ULR NO: TC858224000006576F

Report No.: EN24090659

Name of the Client : The Ramco Cements Limited
 Address of the Client : Ramasamy Raja Nagar, Virudhunagar - 626294
 Sample Name : Stack Emission Sampling Date : 21-Sep-2024
 Sample Description : Stack Emission Received Date : 27-Sep-2024
 Sampling Location : Kiln Stack - 01 Commenced On : 27-Sep-2024
 Sample Submission Type : Collected by Lab Representative Completed On : 07-Oct-2024
 Sample Condition : Fit for Analysis Report Date : 07-Oct-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/CTO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Carbon Monoxide as CO	mg/Nm ³	86.5	GL/EN/SOP/149	NA
2	Carbon Dioxide as CO ₂	%	17.2	GL/EN/SOP/149	NA
3	Gaseous Discharge	litre/hr	196358.0	IS 11255 (Part 3) - 2018	NA
4	Oxides of Nitrogen as NO ₂	mg/Nm ³	520.0	GL/EN/SOP/149	600
5	Oxygen as O ₂	%	10.6	GL/EN/SOP/149	NA
6	Stack Temperature	K	402	IS 11255 (Part 3) - 2018	NA
7	Velocity	m/sec	17.09	EPA Method 1-3	NA
8	Moisture Content	%	3.8	EPA Method 1-3	NA
9	Sulphur Dioxide as SO ₂	mg/Nm ³	BLQ (LOQ) 2.0	EPA Method 6	100
10	Particulate Matter	mg/Nm ³	8.96	GL/EN/SOP/113	20

Note: BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report

Authorized Signature

S. Sankar
Senior Chemist

GL/EN/INNOVATION LABS PVT LTD, 8th Floor, 33/44/1000, Virudhunagar District, Virudhunagar, Tamil Nadu - 626294. Website: www.glenlabs.com

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TEST REPORT

ULR NO: TC858224000006577F

Report No.: EFG24090690

Name of the Client : The Ramco Cements Limited
 Address of the Client : Rameswary Raja Nagar, Virudhunagar - 626204
 Sample Name : Stack Monitoring Sampling Date : 29-Sep-2024
 Sample Description : Stack Monitoring Received Date : 27-Sep-2024
 Sampling Location : Coal Mill-3 Commenced On : 27-Sep-2024
 Sample Submission Type : Collected by Lab Representative Completed On : 07-Oct-2024
 Sample Condition : Fit for Analysis Report Date : 07-Oct-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/CTO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Carbon Monoxide as CO	mg/Nm ³	31.7	GL/EN/SOP/149	NA
2	Carbon Dioxide as CO ₂	%	0.3	GL/EN/SOP/149	NA
3	Gaseous Discharge	Nm ³ /hr	65403.0	IS 11225 (Part 3) - 2018	NA
4	Oxygen as O ₂	%	20.8	GL/EN/SOP/149	NA
5	Particulate Matter	mg/Nm ³	7.50	GL/EN/SOP/133	20
6	Stack Temperature	K	344	IS 11225 (Part 3) - 2018	NA
7	Velocity	m/sec	9.36	EPA Method 1-3	NA
8	Moisture Content	%	3.8	EPA Method 1-3	NA

NA= BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report

S. Sankar
Authorized Signature

S. Sankar
Senior Chemist

GLENS INNOVATION LABS PRIVATE LIMITED, 5th Floor, Sri Jaitri Complex, Rajmangalam Street, Kanchipuram, Tamil Nadu, India. Website: www.glenslabs.com

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TEST REPORT

ULR NO: TC858224000006578F

Report No.: EN24090691

Name of the Client : The Ramco Cements Limited
 Address of the Client : Ramasamy Raja Nagar, Virudhunagar - 626204
 Sample Name : Stack Emission Sampling Date : 20-Sep-2024
 Sample Description : Stack Emission Received Date : 27-Sep-2024
 Sampling Location : Cooler Stack-3 Commenced On : 27-Sep-2024
 Sample Submission Type : Collected by Lab Representative Completed On : 07-Oct-2024
 Sample Condition : Fit for Analysis Report Date : 07-Oct-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/CTO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Carbon Monoxide as CO	mg/m ³	BLQ(LOQ: 1.14)	GL/EN/SOP/149	NA
2	Carbon Dioxide as CO ₂	%	0.2	GL/EN/SOP/149	NA
3	Gaseous Discharge	Nm ³ /hr	134495.0	IS 11253 (Part 3) : 2018	NA
4	Oxygen as O ₂	%	20.7	GL/EN/SOP/149	NA
5	Particulate Matter	mg/Nm ³	13.10	GL/EN/SOP/112	20
6	Stack Temperature	K	494	IS 11253 (Part 3) : 2018	NA
7	Velocity	m/sec	15.05	EPA Method 1-1	NA
8	Mixture Content	%	1.9	EPA Method 1-7	NA

Note: BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report

Authorized Signature

S. Sankar
Senior Chemist

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TEST REPORT

ULR NO: TC858224000006579F

Report No.: EN24090692

Name of the Client : The Ramco Cements Limited
 Address of the Client : Ramasamy Raja Nagar, Virudhanagar - 626204
 Sample Name : Stack Emission Sampling Date : 21-Sep-2024
 Sample Description : Stack Emission Received Date : 27-Sep-2024
 Sampling Location : Cooler Stack-1 Commenced On : 27-Sep-2024
 Sample Submission Type : Collected by Lab Representative Completed On : 07-Oct-2024
 Sample Condition : FB for Analysis Report Date : 07-Oct-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/CTD Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Carbon Monoxide as CO	mg/m ³	MOI, LOQ: 1.14	GL/EN/SOP/149	NA
2	Carbon Dioxide as CO ₂	%	0.1	GL/EN/SOP/149	NA
3	Gaseous Discharge	Nm ³ /hr	94026.0	IS 11255 (Part 3) : 2018	NA
4	Oxygen as O ₂	%	20.7	GL/EN/SOP/149	NA
5	Particulate Matter	mg/Nm ³	12.40	GL/EN/SOP/113	20
6	Stack Temperature	K	457	IS 11255 (Part 3) : 2018	NA
7	Velocity	m/sec	15.89	IS 26 Method 1-3	NA
8	Moisture Content	%	1.5	IS 26 Method 1-3	NA

Note: - BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report


 Authorized Signature

S. Sankar
 Senior Chemist

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TEST REPORT

ULR NO: TC858224000006580F

Report No. : EN24090693

Name of the Client : The Ramco Cements Limited
 Address of the Client : Ramasamy Raja Nagar, Virudhunagar - 626204
 Sample Name : Stack Emission Sampling Date : 21-Sep-2024
 Sample Description : Stack Emission Received Date : 27-Sep-2024
 Sampling Location : Cement Mill - 1 & 2 Commenced On : 27-Sep-2024
 Sample Submission Type : Collected by Lab Representative Completed On : 07-Oct-2024
 Sample Condition : Fit for Analysis Report Date : 07-Oct-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/CTO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Carbon Monoxide as CO	mg/m ³	BLQ (LOQ: 1.34)	GL/EN/SOP/149	NA
2	Carbon Dioxide as CO ₂	%	0.1	GL/EN/SOP/149	NA
3	Oxygen Discharge	Nm ³ /hr	190547.0	IS 11255 (Part 3) : 2018	NA
4	Oxygen as O ₂	%	20.0	GL/EN/SOP/149	NA
5	Particulate Matter	mg/Nm ³	10.10	GL/EN/SOP/113	20
6	Stack Temperature	K	363	IS 11255 (Part 3) : 2018	NA
7	Velocity	m/sec	9.28	EPA method 1-3	NA
8	Moisture Content	%	2.0	EPA Method 1-3	NA

Note: BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report

Authorized Signature

S. Sankar
Senior Chemist

GLens Innovation Labs Pvt Ltd, 12th Floor, Sri Sri Venkateswara Complex, Ramasamy Raja Nagar, Virudhunagar District 626204

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TEST REPORT

ULR NO: TC8582240000065811

Report No.: EN24090694

Name of the Client : The Ramco Cements Limited
 Address of the Client : Ramasamy Raja Nagar, Virudhunagar - 626204.
 Sample Name : Stack Emission Sampling Date : 23-Sep-2024
 Sample Description : Stack Emission Received Date : 27-Sep-2024
 Sampling Location : Cement Mill - 3 Commenced On : 27-Sep-2024
 Sample Submission Type : Collected by Lab Representative Completed On : 07-Oct-2024
 Sample Condition : Fit for Analysis Report Date : 07-Oct-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/CTO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Carbon Monoxide as CO	mg/m3	BLQ (CO: 1.10)	GL/EN/SOP/149	NA
2	Carbon Dioxide as CO2	%	0.1	GL/EN/SOP/149	NA
3	Oxycous Discharge	Nm3/hr	61695.0	IS 11255 (Part 5) - 2018	NA
4	Oxygen as O2	%	20.8	GL/EN/SOP/149	NA
5	Particulate Matter	mg/Nm3	11.30	GL/EN/SOP/115	20
6	Stack Temperature	K	352	IS 11255 (Part 5) - 2018	NA
7	Velocity	m/sec	10.16	EPA method 1-3	NA
8	Moisture Content	%	3.8	EPA Method 1-5	NA

Note: BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification.

End of Report

Authorized Signature

S. Sankar
Senior Chemist

GLENS INNOVATION LABS PRIVATE LIMITED, 4th Floor, 5th Cross, Connaught Place, Ferozshahpur Road, Adambakkam, Chennai - 600026

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- * The test results related only to the items tested.
 - * The test report shall not be reproduced in full or part without the written approval of GLens.
 - * The test items will not be retained for more than 15 days from the date of issue of test report except in the case as required by the applicable regulations.
 - * The laboratory's responsibility under this report is limited to proven willful negligence and will in no case be more than the invoiced amount.
 - * A Satisfactory test report in no way implies that the product tested is approved by NABL.
 - * Laboratory is not responsible for the authenticity of the photocopied test reports.



TEST REPORT

ULR NO: TC85822400006582F

Report No.: EN24090695

Name of the Client : The Ramco Cements Limited
 Address of the Client : Ramasamy Raja Nagar, Virudhunagar - 626204
 Sample Name : Stack Emission Sampling Date : 23-Sep-2024
 Sample Description : Stack Emission Received Date : 27-Sep-2024
 Sampling Location : Packer Stack Commenced On : 27-Sep-2024
 Sample Submission Type : Collected by Lab Representative Completed On : 07-Oct-2024
 Sample Condition : Fit for Analysis Report Date : 07-Oct-2024
 Sampling Plan and Method : GL/EN/SOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as Per EC/CTO Norms
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Carbon Monoxide as CO	mg/m3	BLQ (LOQ: 1.14)	GL/EN/SOP/149	NA
2	Carbon Dioxide as CO2	%	0.1	GL/EN/SOP/149	NA
3	Gaseous Discharge	Nm3/hr	58306.0	IS 11255 (Part 3) : 2018	NA
4	Oxygen as O2	%	20.9	GL/EN/SOP/149	NA
5	Particulate Matter	mg/Nm3	6.20	GL/EN/SOP/113	20
6	Stack Temperature	K	322	IS 11255 (Part 3) : 2018	NA
7	Velocity	m/sec	23.68	EPA Method 1-3	NA
8	Moisture Content	%	BLQ (LOQ: 1.0)	EPA Method 1-3	NA

Note: BLQ - Below the Limit of Quantification, LOQ - Limit of Quantification

End of Report

Authorized Signature

S. Sankar
Senior Chemist

GL/EN/SOP/001/01/2024, 01/11/2024, 01/11/2024, 01/11/2024, 01/11/2024, 01/11/2024, 01/11/2024, 01/11/2024, 01/11/2024, 01/11/2024

- Terms and Conditions:**
- The test results related only to the items tested.
 - The test report shall not be reproduced in full or part without the written approval of GLens.
 - The test items will not be retained for more than 15 days from the date of issue of test report except in the case as required by the applicable regulations.
 - The Laboratory's responsibility under this report is limited to proven willful negligence and will in no case be more than the invoiced amount.
 - A satisfactory test report in no way implies that the product tested is approved by NABL.
 - Laboratory is not responsible for the authenticity of the photocopied test reports.



TEST REPORT

ULR NO: TC858224000006583F

Report No.: EN24090696

Name of the Client : The Ramco Cements Limited - TPP
 Address of the Client : Ramasamy Raja Nagar, Virudhionagar - 626204
 Sample Name : Stack Emission Sampling Date : 21-Sep-2024
 Sample Description : Stack Emission Received Date : 27-Sep-2024
 Sampling Location : Boiler 110 TPH Stack Commenced On : 27-Sep-2024
 Sample Submission Type : Collected by Lab Representative Completed On : 07-Oct-2024
 Sample Condition : Fit for Analysis Report Date : 07-Oct-2024
 Sampling Plan and Method : GL/ENSOP/111



Test Results

S. No.	Parameters	Units	Results Obtained	Test Method	Limit as per CPCB Standard
Discipline: Chemical					
Group: Atmospheric Pollution					
1	Carbon Monoxide as CO	mg/Nm ³	100.0	GL/ENSOP/149	NA
2	Carbon Dioxide as CO ₂	%	9.7	GL/ENSOP/149	NA
3	Oxide Sulfur Discharge	Nm ³ /hr	115441.0	IS 11235 (Part 2) - 2018	NA
4	Oxides of Nitrogen as NO _x	mg/Nm ³	395.0	GL/ENSOP/149	450
5	Oxygen as O ₂	%	8.92	GL/ENSOP/149	NA
6	Particulate Matter	mg/Nm ³	25.10	GL/ENSOP/111	50
7	Stack Temperature	K	414	IS 11235 (Part 2) - 2018	NA
8	Velocity	m/sec	14.80	EPA method 1-3	NA
9	Moisture as H ₂ O	mg/m ³	BLQ (LOQ: 0.03)	EPA method-29	0.03
10	Mulchert Content	%	3.5	EPA Method 1-3	NA
11	Sulphur Dioxide as SO ₂	mg/Nm ³	482.0	EPA Method-6	600

Note- BLQ - Below the Limit of Qualification, LOQ - Limit of Qualification.

End of Report

Authorized Signature

S. Sankar
Senior Chemist

GL/ENSOP/111 ULR No: TC858224000006583F, SCL/111 Complex Virudhionagar District, Virudhionagar, Tamil Nadu, India

Terms and Conditions:

- * The test results related only to the items tested.
- * The test report shall not be reproduced in full or part without the written approval of GLens.
- * The test items will not be retained for more than 15 days from the date of issue of test report except in the case as required by the applicable regulations.
- * The Laboratory's responsibility under this report is limited to proven without negligence and will in no case be more than the invoiced amount.
- * A satisfactory test report in no way implies that the product tested is approved by NABL.
- * Laboratory is not responsible for the authenticity of the photocopied test reports.

Document-IV Linkage Documents Petcoke : Sale Agreement (Excerpts)



THE RAMCO CEMENTS LIMITED
AND **SEABULK INTERNATIONAL TRADING LLC**
PURCHASE AND SALE AGREEMENT No: 20240627 DATED: 27.06.2024

PURCHASE AND SALE AGREEMENT

This Agreement No: 20240627 is made the day of 27th June 2024 and between:

THE RAMCO CEMENTS LIMITED,
"Auras Corporate Centre",
V Floor, 98-A, Dr. Radhakrishnan
Road, Mysapore,
Chennai – 600 004, India.
(Hereinafter called the "Buyer")

And

SEABULK INTERNATIONAL TRADING LLC
161, BUILDING NO R364, PLOT NO 697-0,
AL KARAMA, DUBAI, UAE
(Herein after called the "Seller")

Each of the Buyer and the Seller shall be referred to herein individually as a "Party" and together as the "Parties".

The Seller herewith agrees to sell and deliver to the Buyer and the Buyer herewith agrees to purchase and take delivery from the Seller subject to the following terms and conditions:

- DESCRIPTION AND QUANTITY**
DESCRIPTION: Venezuela Origin Green Delayed Petroleum Coke (Non – Caked) in bulk
QUANTITY: One shipment of 55,000 MT ± 10 percent at Seller's option.
No Part shipment or Co-Shipment is allowed in the contract.
- DELIVERY**
Load Port / Disport location: Loading location shall be within June 24, 8h. Date shall not be later than 30.06.2024. The vessel shall arrive at Karaikal port by 15th Aug 2024. No deviation is allowed in the contract.
- SPECIFICATION**
The goods will have the following typical specifications and rejection limits, in accordance with ASTM standards:

Description	Basis	UOM	Guaranteed	Penalty / Rejection
Total Moisture (including free water compensation)	ARB	PCT	8.50%	Above 8.5%, penalty applicable as per Clause 5 (A)
Ash	DR	PCT	0.2% - 0.85%	
Volatile Matter	DR	PCT	11% - 14%	
Sulphur	DR	PCT	5%	>5.5%, penalty applicable as per Clause 5 (B)
Net Calorific Value	ARB	Kcal/kg	7500	Below 7200; Cargo is under Rejection
HGI	Index Point	-	55-70	
Size 0-30MM	-	PCT	90%	





THE RAMCO CEMENTS LIMITED

vs SEABULK INTERNATIONAL TRADING LLC

PURCHASE AND SALE AGREEMENT No: 20240627 dated 27.06.2024

otherwise transferred by either the Buyer or the Seller to any third party without the other Party's prior written consent, which consent shall not be unreasonably withheld. Despite the foregoing, either Party is allowed in principle to assign its rights and obligations to an affiliated company, provided the creditworthiness of the affiliated company is acceptable to the other party. Also, Seller is allowed to transfer the receivable(s) arising under this Agreement to a financial institution.

23. LANGUAGE

All communications between the Buyer and the Seller with regard to this Agreement shall be in the English language.

24. DOMICILIUM

All communications and/or notices under this Agreement shall be deemed to have been duly given in terms of this Agreement if they are sent by mail, email, facsimile or telex transmission to either Party at their following addresses:

THE BUYER:

THE RAMCO CEMENTS LIMITED,
"Auras Corporate Centre",
V Floor, 98-A, Or. Radhakrishnan Road,
Mylapore, Chennai — 600 004
Contact Person: Mr. V.
Muralidharan Tel. +91 44
28478666 Fax + 91
4426478676
Email: mural@ramcocements.co.in

THE SELLER:

SEABULK INTERNATIONAL TRADING LLC
161, BUILDING NO K364, PLOT NO 697-Q, AL
KARAMA, DUBAII/AE

Or at such other addresses as either Party may from time to time designate in writing.

THE BUYER:
THE RAMCO CEMENTS LIMITED

Name: S. VAITHYANATHAN
Title: CHIEF FINANCIAL OFFICER

Name: V. MURALIDHARAN
Title: SGM - MATERIALS



THE SELLER:
SEABULK INTERNATIONAL TRADING
LLC

Name: NISHANT KHETAN
Title: Director





THE RAMCO CEMENTS LIMITED,

RAMASAMY RAJA NAGAR, THELLUKKAPATTI, VIRUDHUNAGAR DIST.,
 VIRUDHUNAGAR - 626204, TAMIL NADU, INDIA.
 CN : 125H17R157PLCR0356

Phone : 21-45225020
 Fax : 21-45225028

Purchase Order

BHARAT PETROLEUM CORPORATION LTD KUOCH REFINERY POST BOX NO 2 AMBALAUGAL, ERNAKULAM 562002 KERALA - INDIA Phone : 37544 67367 Vendor Code : 603119 Vendor GST No : 32AAAC2923M102	Purchase Order No: CORNPO0607262024 Date: 02/12/2024 Tracking and Shipping Address: THE RAMCO CEMENTS LIMITED, RAMASAMY RAJA NAGAR, THELLUKKAPATTI, VIRUDHUNAGAR DIST, VIRUDHUNAGAR - 626204, TAMIL NADU. GST No: 32AAAC2923M102
---	---

Please supply the following materials in accordance with the terms and conditions specified below.

S.No	HSN	Description	Qty	UOM	Rate / Unit (INR)	Total
1	251210	PORTLAND CEMENT - 42.5	10000	MT	3980.00	39800000.00
TOTAL INVOICE VALUE						39800000.00
GST 18%						7164000.00
Amount in Words: Twenty Two Crores Ten Lakhs Sixty One Thousand Two Hundred Only						Total (INR)
						46964000.00

Price Terms : FOR DESTINATION

Transport Agent : OTHERS

Delivery Period : 21-12-2024 Payment Terms : Credit - 100% ADVANCE

Mode of Transport : RAIL

Please acknowledge receipt of this order and send your acceptance by Email/Courier address mentioned.
T&A INVOICE MUST BE SENT IN DUPLICATE FOR EFFECTING PAYMENT IN TIME
 Please include our purchase order, VCH Code in your delivery challan and invoice without fail.
 All shipping items are covered under open cover policy.
 Do not book your consignments under cover charges.
 Our nearest Destination for booking is - VIRUDHUNAGAR, TAMIL NADU.
 Please book all your consignments through our Nominated Transport.
 (For Change in Transporter's name prior approval should be obtained.)

For THE RAMCO CEMENTS LIMITED

Authorized Signatory

Prices should be kept firm till completion of Order.
ALL YOUR INVOICES SHOULD BE IN THE NAME OF "THE RAMCO CEMENTS LIMITED"
 The Payment shall be made only through RTGS/Check. Hence, please provide us your Bank AC details, bankers confirmation of your A/C No and a way of
 For getting Form IEC Sugandh Way Bill and any queries related to this purchase order contact Mr. KETHRABALAN S
 or post your details to Email ID: kethrabalan@ramcocements.co.in /kurod@ramcocements.co.in

Validity unknown

Date: 02/12/2024
 Time: 11:45:21 AM
 Region: North
 User: Suresh

Imported Coal : Sale Agreement (Excerpts)


THE RAMCO CEMENTS LIMITED
 AND **VISA RESOURCES PTE LTD, SINGAPORE**
PURCHASE AND SALE AGREEMENT NO: 20240403 DTD 03.04.24

PURCHASE AND SALE AGREEMENT

The Agreement No. 20240403 is made this day of 03rd April 2024 and between

THE RAMCO CEMENTS LIMITED,
 "Auras Corporate Centre",
 V Floor, 98 A, Dr. Radhakrishnan
 Road, Mysore,
 Chennai – 600 004,India.
 Hereinafter called the "Buyer"

And

VISA RESOURCES PTE LTD,
 6 Shenton Way, #20-09 OUE Downtown 2,
 Singapore 068809
 Hereinafter called the "Seller"

Each of the Buyer and the Seller shall be referred to herein individually as a "Party" and together as the "Parties".

The Seller herewith agrees to sell and deliver to the Buyer and the Buyer herewith agrees to purchase and take delivery from the Seller subject to the following terms and conditions:

- QUANTITY**
 One shipment of 55,000 MT (± 30 percent at Seller's option) Steam (Wet) Coking Coal of Indonesian Origin is Bulk. No Part shipment or Co-Shipment is allowed in the contract.
- DELIVERY**
 Load Port by 24h - Between 01st May 2024 and 10th May 2024. Deviations in the Loadport strictly not allowable.
- SPECIFICATION**
 The goods will have the following typical specifications and rejection limits, on an "as dried" basis, except for total moisture, GCV determined in accordance with ASTM standards.

Description	Basis	UNIT	Typical Specification	Rejection Limits(Basis Load port receipt only)
Total Moisture	ADB ✓	PCT	40% ✓	No Rejection
Inherent Moisture	ADB	PCT	18% Approx ✓	No Rejection
Ash	ADB	PCT	7% ✓	Above 10%
Volatile Matter	ADB	PCT	41% ✓	No Rejection
Fixed Carbon	ADB	PCT	By difference ✓	No Rejection
Sulphur	ADB	PCT	1.0% ✓	Above 1.5%
Gross Calorific Value	ADB ✓	Kcal/kg	3400 ✓	Below 3100 ✓
HGI	Index Test	-	55 Approx ✓	No Rejection
Size 0-50 MM	-	PCT	90% ✓	No Rejection






AND VISA RESOURCES PTE LTD, SINGAPORE
PURCHASE AND SALE AGREEMENT NO: 20240403 BY 03.04.24

The Buyer and the Seller shall jointly seek an arrangement having a valid legal and economic effect which will be as similar as possible to the ineffective provision and will cover the scope of any missing provision in a manner reasonably directed to the purpose of this Agreement. Except as provided otherwise herein, provisions of law from 2010 shall apply.

25 ASSIGNMENT

Neither this Agreement nor the rights and obligations arising out of it may be assigned, delegated or otherwise transferred by either the Buyer or the Seller to any third party without the other Party's prior written consent, which consent shall not be unreasonably withheld. Despite the foregoing, either Party is allowed in principle to assign its rights and obligations to an affiliated company, provided the creditworthiness of the affiliated company is acceptable to the other party. Also, Seller is allowed to transfer the monies due under this Agreement to a financial institution.

26 LANGUAGE

All communications between the Buyer and the Seller with regard to this Agreement shall be in the English language.

27 CONCLUSION

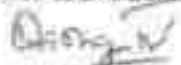
All communications and/or notices under this Agreement shall be deemed to have been duly given in terms of this Agreement if they are sent by mail, email, facsimile or video transmission to either Party at the following addresses:

THE BUYER:
THE RAMCO CEMENTS LIMITED,
 "Aurix Corporate Centre",
 V Floor, 98A, Dr. Rajahmundry Road, Mylapore,
 Chennai – 600 004
 Contact Person: M. V. Marudhwan
 Tel: +91 44 2847886 Fax: + 91 44
 2847826
 Email: marud@ramcocemltd.com

THE SELLER:
VISA RESOURCES PTE LTD,
 6 SHENTON WAY, #29-09 ONE DOWNTOWN 2,
 SINGAPORE 068809
 CONTACT PERSON:
 TEL: +65 64250000 FAX: +65 6425 9001

Or at such other addresses as either Party may from time to time designate in writing:

THE BUYER:
THE RAMCO CEMENTS LIMITED


 Name: S. VATHYANATHAN
 Title: CHIEF FINANCIAL OFFICER


 Name: V. MARUDHWAN
 Title: SGM - MATERIALS



THE SELLER:
VISA RESOURCES PTE LTD


 Name: Gung Joon
 Title: divisional manager

Name:
 Title:



RCL

EC for Expansion of RR Nagar Cement Plant (with all 3 Existing Lines), Virudhunagar, TN

Gypsum : Purchase Order**THE RAMCO CEMENTS LIMITED,**

RAMASAMY RAJA NAGAR, THULLUKKAPATTI, VIRUDHUNAGAR DIST.

VIRUDHUNAGAR - 625004, TAMIL NADU, INDIA.

CIN : L29941TN1987PLC000568

Purchase Order

Phone : 01450238201

Fax : 01450238208

GREENSTAR FERTILIZERS LIMITED SPEC HOUSE NO.68, MOUNT ROAD GUNDIY CHEMNAL, 303 002 TAMIL NADU - INDIA Tel : 0451235334 Phone : 240321887 Vendor Code : 000478 Vendor GST No : 33AADC0481D1ZT	Purchase Order No : RRM1,50500750224 - 8 Date : 30/07/2024
	Invoicing and Shipping Address: THE RAMCO CEMENTS LIMITED, RAMASAMY RAJA NAGAR, THULLUKKAPATTI, VIRUDHUNAGAR DIST, VIRUDHUNAGAR - 625004, TAMIL NADU. GST No : 33AADC0481ZJZ

Customer No:

Please supply the following materials in accordance with the terms and conditions specified below.

S.No	HSN	Description	Qty	UOM	Rate / Unit (INR)	Total
1	304607	GYPSUM FERTIFER	29500.00	MT	181.00	2301000.00
TOTAL BASIC VALUE						2301000.00

DISCOUNT AFTER TAX

CGST 9%

SGST 9%

Amount in Words: Two Crores Sixty Five Laths Sixty One Thousand Eight Hundred Only

Price Terms : FOR TUICORW

Transport Agent : OWN ARRANGEMENT

Delivery Period : 30/04/2025 Payment Terms : Cheque - 7 DAYS CREDIT

Mode of Transport : ROAD

Please acknowledge receipt of this order and send your acceptance by Email/Outlet address mentioned.

TAX INVOICE MUST BE SENT IN DUPLICATE FOR EFFECTING PAYMENT IN TIME

Please indicate our purchase order / HDN Code in your delivery challan and invoice without fail.

All freighting terms are covered under open cover policy.

Do not book your consignments under cover Charges.

Our Nearest Destination for booking is : KRIPPUNITTAI / SATTUR / VIRUDHUNAGAR, TAMILNADU

Please book all your Parcels through our Nominated Transport.

(For Change in Transporter's name prior approval should be obtained.)

for THE RAMCO CEMENTS LIMITED

Authorized Signatory

Prices should be kept firm till completion of Order.

ALL YOUR INVOICES SHOULD BE IN THE NAME OF "THE RAMCO CEMENTS LIMITED"

The Payment shall be made only through RTGS/Chq. Hence, please provide us your Bank A/C details, bankers confirmation of your A/C No and a copy of

For getting Form/AE-Suppl/E-Way Bill and any queries related to this purchase order contact Mr.

or post your details in Email to

Slag : Purchase Order



THE RAMCO CEMENTS LIMITED,

KATTUPUTHUR VILLAGE,OLAYUR POST, SALAVAKKAM VIA, UTHIRAMERUR T.K, KANACEEPURAM DISTRICT,

CHENGALPATTU - 603107, TAMIL NADU, INDIA
 CIN : L26241TN1907PLC000566

Phone : 029873018

Purchase Order

ELECTROSTEEL CASTINGS LTD PLOT NO. ASAF AND AS, 299 VA, APAC INDUSTRIAL PARK, RACHAGUNNERI, SRILAKSHASTI-517541 ANDHRA PRADESH - INDIA Pin: Phone : 0852826631 Vendor Code : EL00021 Vendor GST No : JTAACD6437B QZR	Purchase Order No: COFNP0900020204 Date : 25/06/2024 Invoicing and Shipping Address: THE RAMCO CEMENTS LIMITED KATTUPUTHUR VILLAGE,OLAYUR POST, SALAVAKKAM, VIA, UTHIRAMERUR T.K, KANACEEPURAM DISTRICT, CHENGALPATTU - 603107, TAMIL NADU. GST No: 33AABCMS75L222 Quotation No:
---	---

Please supply the following materials in accordance with the terms and conditions specified below:

S.No	MSM	Description	Qty	UOM	Rate / Unit (INR)	Total
1	D180000-SLAG		1000.00	MT	1000.00	1000000.00
TOTAL BASIC VALUE						1000000.00
GST 5%						50000.00
Amount in Words: Ten Lakhs Fifty Thousand Only						Total (INR)
						1050000.00

Price Terms : EXWORKS SRILAKSHASTI
 Transport Agent : OWN ARRANGEMENT
 Delivery Period : 31-07-2024 Payment Terms : Cheque - 100% ADVANCE
 Mode of Transport : ROAD

Please acknowledge receipt of this order and send your acceptance by Email/Courier address mentioned.
TAX INVOICE MUST BE SENT IN DUPLICATE FOR EFFECTING PAYMENT IN TIME
 Please indicate our purchase order, HSN Code in your delivery challan and invoice without fail.
 All incoming items are covered under open cover policy.
 Do not touch your consignments under cover Charges.
 Our Nearest Destination for booking is CHENGALPATTU, TAMIL NADU.
 Please book all your Parcels through our Nominated Transport.
 (For Change in Transporter's name prior approval should be obtained.)

for THE RAMCO CEMENTS LIMITED

 Authorized Signatory

Prices should be kept firm till completion of Order.
ALL YOUR INVOICES SHOULD BE IN THE NAME OF "THE RAMCO CEMENTS LIMITED"
 The Payment shall be made only through RTGS/Cheque. Hence, please provide us your Bank A/C details, Bankers confirmation of your A/C No and a copy of
 For getting FormLITE-Regeneril-way Bill and any queries related to this purchase order contact Mr. NATARAJAN T
 or post your details to Email id - natara@ramcocementsltd.co.in , nataraj@ramcocementsltd.co.in

Validity unknown
 Digitally signed by Natarajan T
 Date: 2024.06.25 14:46:58 +05'30'
 Reason: Purchase Order Generation
 Location: Chennai, India

RCL

EC for Expansion of RR Nagar Cement Plant (with all 3 Existing Lines), Virudhunagar, TN

Fly Ash : Purchase Order**THE RAMCO CEMENTS LIMITED,**

RAMASAMY RAJA NAGAR, THELLIKAPATTI, VIRUDHUNAGAR DIST.

VIRUDHUNAGAR - 626004, TAMIL NADU, INDIA.

CIN : L20341TN1987PLC003886

Phone : 8149028021

Fax : 8149028036

Purchase Order

NTPC-AUCION SUPPLY: NCC TAMILNADU POWER LTD HARBOUR ESTATE TUTICORIN- 628004 TAMIL NADU - IN Fax : Fax Phone : 8401232844 Vendor Code : 1000143 Vendor GST No : 83AACN2828N120	Purchase Order No : 8RNMLS/0008S0024 - B Date : 26/08/2024 Invoicing and Shipping Address THE RAMCO CEMENTS LIMITED; RAMASAMY RAJA NAGAR, THELLIKAPATTI, VIRUDHUNAGAR DIST, VIRUDHUNAGAR - 626004, TAMIL NADU GST No : 33AA8CMB375L222
---	--

Quotation No:

Please supply the following materials in accordance with the terms and conditions specified below

S.No	HSN	Description	Qty	UOM	Rate / Unit (INR)	Total
1	30199949	FLY ASH DRY	8400.00	MT	450.00	3780000.00
TOTAL BASIC VALUE						3780000.00
GST 2.8%						105840.00
GST 2.8%						105840.00

Amount in Words: Thirty Two Lakh Ninety Six Thousand Four Hundred Seventy Five Only

3296475.00

Price Terms : FOR TUTICORIN

Transport Agent : OWN ARRANGEMENT

Delivery Period : 31/10/2024 Payment Terms : Cheque - 100% ADVANCE

Mode of Transport : ROAD

Please acknowledge receipt of the order and send your acceptance by Email/Courier address mentioned

TAX INVOICE MUST BE SENT IN DUPLICATE FOR EFFECTING PAYMENT IN TIME

Please indicate our purchase order, HSN Code in your delivery challan and invoice without fail.

All Importing items are covered under open cover policy.

Do not mark your consignments under lower Charges.

Our Nearest Destination for loading is : ANIPPURATTAI / SATTAR / VIRUDHUNAGAR, TAMILNADU.

Please book all your Parcels through our Nominated Transport.

(For Change in Transporter's name prior approval should be obtained)

for THE RAMCO CEMENTS LIMITED

Authorized Signatory

Prices should be kept firm till completion of Order.

ALL YOUR INVOICES SHOULD BE IN THE NAME OF "THE RAMCO CEMENTS LIMITED"

The Payment shall be made only through RTGS/Cheque. Hence, please provide us your Bank A/C details, Bankers confirmation of your A/C No and a copy of

For getting Form ITC-Sugarcane-Way Bill and any queries related to this purchase order, contact Mr.

or post your details to Email Id. -



THE RAMCO CEMENTS LIMITED

RAMASAMYRAJA NAGAR.

Occupational Health Centre

2024 PME RECORD

PME EMPLOYEE'S DETAILS	
Employee No	M01963
Name of Employee	NAGARAJAN C
Age	57 Yrs
Designation	Machinery Attendant
Department	Cement Mill

Factory Medical Officer : Dr.Maj.VIJAY ANAND.R, M.B.B.S., AFH, FDM (Diabetology)
DGM - M&OHS

Record Maintain By : S.SUBBIAH,
Asst. Manager - Paramedical



Primex Healthcare and Research Pvt. Ltd.,
30/1, Bazuliah Road, T.Nagar,
Chennai - 600 017.
www.primexhealthcare.in



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Health Summary

Name	NAGARAJAN C	Height	165
Age	57	Weight	74
Gender	Male	BMI	27.18
Emp ID	M01963	BP	140/90
Date	04.04.2024	SPO2	99
Corporate	The Ramco Cements Ltd.,	Location	R.R.Nagar.

Laboratory Investigations

Haemoglobin 13.1 Within Normal Limits	Platelet Count 3.17 Within Normal Limits	Glucose Fasting 87 Within Normal Limits
Urea 18.4 Within Normal Limits	Creatinine 0.8 Within Normal Limits	Cholesterol (Total) 236 Borderline

Other Modalities

ECG WITHIN NORMAL LIMITS	PFT WITHIN NORMAL LIMITS	Audiometry NORMAL HEARING IN BOTH EARS.
------------------------------------	------------------------------------	---

Category	BMI (kg/m ²)	
	From	To
Very severely underweight revert		15
Severely underweight	15	16
Underweight	16	18.5
Normal (Healthy weight)	18.5	25
Overweight	25	30
Obese Class I (Moderately obese)	30	35
Obese Class II (Severely obese)	35	40
Obese Class III (Very severely obese)	40	

BMI Advice

A BMI of 25 - 30 indicates that you are slightly overweight. You may be advised to lose some weight for health reasons. You are recommended to talk to your Doctor or a dietician for advice

Recommendation / Advice (To be filled by consulting physician)

END OF REPORT

(Signature)
DR. VIVEKANANDHARAJAN
Reg. No. 16004

The Summary & advice and any other content included in this report is a clinical advice. The responsible doctor/physician is to be consulted for any further consultation and diagnosis advice.

For Ambulance / Home collection ☎ 9600 1919 44





Primex Healthcare and Research Pvt. Ltd.,
30/1, Bazullah Road, T.Nagar,
Chennai - 600 017.
www.primexhealthcare.in



• MRI • CT SCAN • DIGITAL X-RAY • 4D ULTRASOUND • ECG • ROUTINE & SPECIALIZED BLOOD TESTS

PERFORMA FOR MEDICAL FITNESS CERTIFICATE

(FOR THE YEAR 2024)

It is to certify that Shri/Smt/Miss **NAGARAJAN C** employed with **The Ramco Cements Ltd., R.R.Nagar.** Had undergone medical tests; on 04.04.2024. His / Her vision was found normal and was found free of tuberculosis; skin and other communicable and contagious disease on clinical examination with the investigations listed herein, and the person is Fit for work in the above mentioned establishment.

Dr. BALU ANAND MBBS., AFIH,
TMC : 90784
AFIH : 01990

*Medical Examinations conducted:

1. BMI & Blood Pressure
2. Oxygen Saturation (Spo2)
3. Complete Blood Count
4. Glucose Fasting
5. Urea
6. Creatinine
7. Cholesterol (Total)
8. Bilirubin Total
9. ECG
10. PFT
11. Audiometry
12. Eye Examination.



For Ambulance / Home collection ☎ 9600 1919 44





Primex Healthcare and Research Pvt. Ltd.,
30/1, Bazulah Road, T.Nagar,
Chennai - 600 017.
www.primexhealthcare.in



* MRI * CT SCAN * DIGITAL X-RAY * 4D ULTRASOUND * ECG * ROUTINE & SPECIALIZED BLOOD TESTS

Name	: NAGARAJAN C	Id	: T38370E
Age / Gender	: 57 years / M	Lab Ref	: 52477
Referred By	: THE RAMCO CEMENTS LTD.	Ordered On	: 04/04/2024
		Sample Collected On	: 04/04/2024
		Reported On	: 17/04/2024



SPECIMEN	TEST NAME	RESULT	REFERENCE RANGE
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RAMCO CEMENTS - FACTORY - ANNUAL CHECK-UP - FASTING

DEPARTMENT OF HAEMATOLOGY

COMPLETE BLOOD COUNT

WHOLE BLOOD (EDTA)	Hemoglobin - HB (Photometric)	13.1	13.0 - 17.0 gm%
WHOLE BLOOD (EDTA)	Hematocrit - HCT (Calculated)	40.4	40.0 - 50.0 %
WHOLE BLOOD (EDTA)	Red Blood Cells Count (RBC) (Electrical Impedance)	4.03	4.5 - 5.5 Millions/cumm
WHOLE BLOOD (EDTA)	Mean Corpuscular Volume (MCV) (Electrical Impedance)	106.7	83.0 - 101.0 fl
WHOLE BLOOD (EDTA)	Mean Corpuscular Haemoglobin (MCH) (Calculated)	20.4	27.0 - 32.0 pg
WHOLE BLOOD (EDTA)	Mean Corpuscular Haemoglobin Concentration (MCHC) (Calculated)	26.8	32.0 - 36.0 %
WHOLE BLOOD (EDTA)	RDW CV (Calculated)	16.4	11.6 - 14.0
WHOLE BLOOD (EDTA)	Total WBC Count - TC (Electrical Impedance)	5520	4000 - 10000 Cells/cumm
	Differential Count - DC (Light Scattering)		
WHOLE BLOOD (EDTA)	Polymorphs	48.3	37.0 - 70.0 %
WHOLE BLOOD (EDTA)	Lymphocytes	38.1	20.0 - 45.0 %
WHOLE BLOOD (EDTA)	Eosinophils	8.9	2.0 - 6.0 %
WHOLE BLOOD (EDTA)	Monocytes	6.5	2.0 - 10.0 %
WHOLE BLOOD (EDTA)	Basophils	0.2	< 1.0 %
WHOLE BLOOD (EDTA)	Platelet count (Electrical Impedance)	3.17	1.5 - 4.1 lakhs/cumm

DEPARTMENT OF BIOCHEMISTRY

PLASMA	Glucose Fasting (GOD-POD)	87	70 - 115 mg/dl
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= MRI = CT SCAN = DIGITAL X-RAY = 4D ULTRASOUND = ECG = ROUTINE & SPECIALIZED BLOOD TESTS

Name	: NAGARAJAN C	Id	: T283706
Age/Gender	: 57 years /M	Lab Ref	: 52477
Referred By	: THE RAMCO CEMENTS LTD.	Ordered On	: 04/04/2024
		Sample Collected On	: 04/04/2024
		Reported On	: 17/04/2024



SPECIMEN	TEST NAME	RESULT	REFERENCE RANGE
SERUM	Urea (Urea-BUN)	18.4	16.8 - 43.2 mg/dl
SERUM	Creatinine (Serum Creatinine)	0.8	0.8 - 1.3 mg/dL
SERUM	Cholesterol (Total) (CHOL-TOTAL)	235	Normal: <200 mg/dL Borderline: 201 - 239 mg/dL High: >240 mg/dL
	Bilirubin Total (Bilirubin Total)		
SERUM	Bilirubin Total	0.5	0.1 - 1.2 mg/dL
SERUM	Bilirubin Direct	0.2	< 0.3 mg/dL
SERUM	Bilirubin Indirect	0.3	< 1.0 mg/dL

— End of the Report —

Dr. Divya Bhavani, B.M.Sc. Ph.D
Quality Manager & Biochemist

Dr. Srikanth K M.B.B.S M.D (Pathology)
Pathologist
Lab Director



PRIMEX SCANS AND LABS
30/1 BAZULLAH ROAD T NAGAR
CHENNAI-500017

Name : NAGARAJAN C

Age: 57

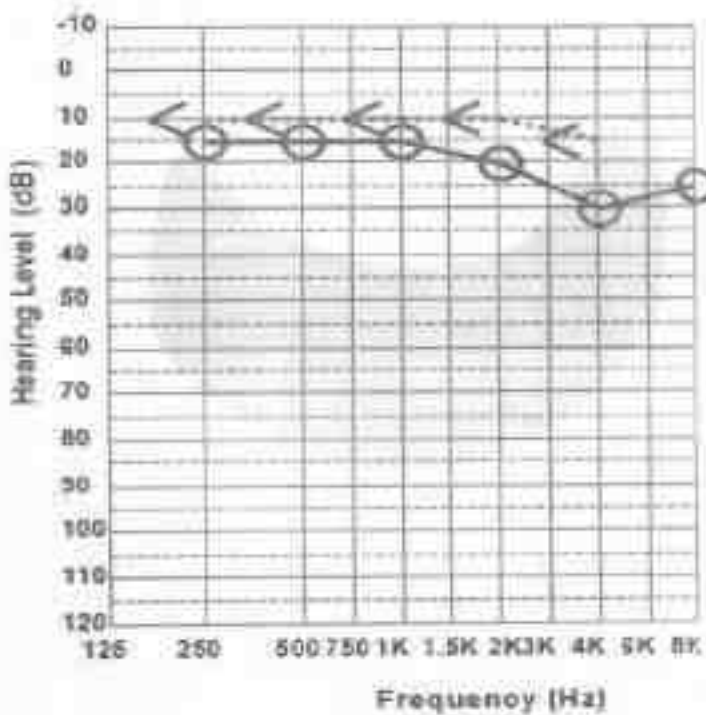
SEX: MALE

Date : 04.04.2024

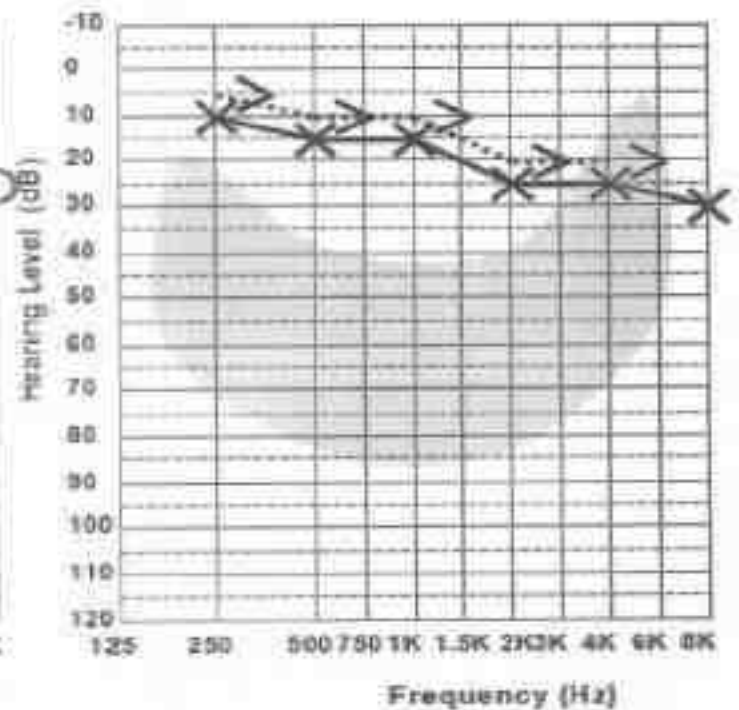
LIS ID : 52477

REPORT NO: 1122

RIGHT EAR



LEFT EAR



Freq	125	250	500	750	1000	1.5K	2K	3K	4K	6K	8K
HL		10	15		15		20		25		20
LIML											
DCL		5	10		10		20		20		

PTA (L) = 18dB PTA-M(L) = PTA-BCM(L) = (500,1K,2K)

Freq	125	250	500	750	1000	1.5K	2K	3K	4K	6K	8K
HL		15	15		15		20		20		25
RIML											
DCL		10	10		10		15		15		

PTA (R) = 18dB PTA-M(R) = PTA-BCM(R) = (500,1K,2K)

Legend	R	L
Air	○	×
Air/Masked	△	□
Bone	<	>
Bone/Masked	[]
MCL	m	m
UCL	m	m
Free Field	⊙	⊗
FF:Prosthes	A	A
Binaural	B	
No Response	↓	

AUDIOLOGICAL DIAGNOSIS:

◊ NORMAL HEARING IN BOTH EARS.



K. R. RAMESH (AUDIOLOGIST)



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EYE SCREENING

Name	NAGARAJAN C	EMP ID	M01963	Age	57
Date	04.04.2024	LIS ID	52477	Gender	Male

VISION CHECKUP	RIGHT EYE	DV	NV
		6/6 with PG	N6 with PG
	LEFT EYE	DV	NV
		6/6 with PG	N6 with PG

ANTERIOR SEGMENT EVALUATION	Normal	Abnormal	Not able to Assess
Color Vision	Normal		
Diagnosis	Continue the same PG		
Impression	Continue the same PG		

M. Ch

M. Clement, (Consultant Optometrist),
Reg No: 159330016.

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52477 NAGARAJAN C
57 Yrs M Kg/ Ht cms Ref. No.:
Date: 04-04-2024 Time: 07:00 AM

Gain: 10 mm/mV
Sweep: 25 mm/s
Filter: 0.1 - 30 Hz
ECG: ✓ - mmHg
Notch: On

HR: 74 QRS Int.: 130 P Axis: 47 Ref. By:
P Int: 88 QT Int.: 372 QRS Axis: 99 Tech.:
PR Int: 140 QTc Int.: 413 T Axis: 37



Comments:

DR. ASHOK VICTOR
CONSULTANT CARDIOLOGIST
Regd. No. 52552

within normal limits

Vijay K