



The Ramco Cements Limited

**Proposed Maravarperungudi Lime Kankar Quarry Lease-III for
Quarrying of Lime Kankar & Clay (Black Cotton Soil) over an Extent of
158.865 Ha for Production of 28,00,000 Tonnes Lime Kankar (ROM) @
Maximum 1.00 MTPA & 20,00,000 Tonnes Clay (BC Soil) @ Maximum 1.00
MTPA - Upto 3.0 m BGL - during Plan Period**

**S.F Nos. Parts of 100, 101, 103, 109, 119 to 132, 137 to 141, 404, 407 to 413, 415 to 416,
418, 429, 431 to 435, 437 to 440 & 442 to 457 of Maravarperungudi and
Parts of 468, 538 to 544, 683 & 684 of T.Koppuchithampatti Villages,
Aruppukottai Taluk, Virudhunagar District, Tamil Nadu**

Minor Minerals for Captive Consumption

**Precise Area Communication Letter 2171/MMC.2/2018-1 dated 02.04.2018
(Lease Period - 10 Years)**

**Modified Mining Plan Approval by Joint Director of Geology & Mining, Chennai vide
Letter Rc.No.583/MM7/2018 dated 07.01.2025 for initial 5 Years**

**Environmental Clearance under EIA Notification 2006
Schedule Sl. No. 1(a) & Category 'B1' (<250 Ha)**

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

**TOR Awarded vide Identification No. TO25B0108TN5802389N dated 07.04.2025
Baseline Data Collection : Dec. 2024-Feb. 2025 (Winter 2024-25 Season)**

May 2025

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)**

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

Content

<u>Sl. No.</u>	<u>Description</u>	<u>Page No.</u>
	Content	
	Land Extent – Survey Numbers	7
Plate-I	Lease Plan	8
Document-I	VAO Certificate-Maravarperungudi	9
Document-II	VAO Certificate-T.Koppuchithampatti	10
Document-III	DFO NOC	11
Document-IV	Cluster Certificate	13
	Project Proponent Declaration	14
	EIA Consultant Undertaking	15
	Project Proponent Undertaking / Affidavit	16
	Awarded TORs	17
	Awarded TORs & their Compliance in the EIA Report	48
1.0	Introduction	67
1.1	Purpose of the Report	67
1.2	Project Proponent	69
1.3	Environmental Policy	70
1.4	Identification of the Project	70
1.5	Need for the Project	75
1.6	Discussion of District Survey Report	75
1.7	Maravarperungudi Lime Kankar Quarry Lease (QL)-III	76
1.8	Site Profile	81
1.9	The Proposal	86
1.10	Environmental Setting	88
1.11	Project Schedule	93
1.12	EIA Study	93
2.0	Project Description	95
2.1	Type of the Project	95
2.2	Magnitude of Operation	95
2.3	Technology & Project Description	100
2.4	Quarrying Method	102
2.5	Yearwise Production	102
2.6	Machineries	102
2.7	Competent Mining Personnel	103
2.8	Other Facilities	103
2.9	Proposed Land use	104
2.10	Financial Assurance	105
2.11	Water Demand & Source	105
2.12	Power Demand & Source	105
3.0	Description of the Environment (Baseline Status)	106
3.1	Study Area	106
3.2	Environmental Components	111
3.3	Methodology Adopted	112
3.4	Micrometeorology	116
3.5	Ambient Air Quality	121
3.6	Ambient Noise Levels	137
3.7	Water Environment	138

<u>Sl. No.</u>	<u>Description</u>	<u>Page No.</u>
3.8	Land Environment	147
3.9	Flora & Fauna	151
3.10	Socioeconomic Environment	162
3.11	Summary of Baseline Status	178
4.0	Anticipated Environmental Impact and Mitigation Measures	179
4.1	Identification of Impacts	179
4.2	Construction Phase	179
4.3	Operation Phase	179
4.4	Evaluation of Impacts	192
5.0	Analysis of Alternatives (Technology & Site)	195
5.1	Technology	195
5.2	Alternative Sites Considered	195
6.0	Environmental Monitoring Programme	196
6.1	Environment Cell and Compliances	196
6.2	Post Project Monitoring	196
7.0	Additional Studies	197
7.1	Hazards Identification & Risk Assessment	197
7.2	Emergency Preparedness Plan	197
7.3	Disaster Management Plan	198
8.0	Project Benefits	200
9.0	Environmental Cost Benefit Analysis	200
10.0	Environmental Management Plan	201
11.0	Summary Environmental Impact Assessment	212
12.0	Disclosure of Consultants	228

Documents

Doc 1	Precise Area Communication	235
Doc 2	Initial MP Approval	242
Doc-3	Modified Mining Plan Approval	247
Doc-4	Patta Copies	250
Doc-5	DSRs for Lime Kankar & Clay (Others) - Excerpts	260

List of Figures

<u>Sl. No.</u>	<u>Description</u>	<u>Page No.</u>
Plate I	RR Nagar Cement Plant & its Captive Mines – Regional Setting	74
Fig. 1.1	Index Map	77
Plate II	QL-III in Google Earth Imagery	78
Plate III	ML Area Photographs	79
Plate IV	ML Area (Drone) Photographs	80
Fig. 1.2	Topo Map – 10 km Radius	89
Fig. 1.3	Environmental Setting	90
Plate VI	Area of 50m, 100m, 200m, 300m, 500m & 1 km Radius	92
Fig. 2.1	Surface & Geological Plans	96
Fig. 2.2	Geological Section & Yearly Production Plan	97
Fig. 2.3	Yearwise Kankar Production & End of V Year Plans	98
Fig. 2.4	Conceptual Plan & Environmental Plan	99
Fig. 2.5	Water Balance Diagram	105
Fig. 3.1	Environmental Quality Monitoring Stations	107
Plate VII	Monitoring Stations	108
Plate VIII	Monitoring Stations	109
Fig. 3.2	Drainage Pattern	110
Fig. 3.3	Seasonal Wind Rose	120
Fig. 3.4	Satellite Imagery	149
Fig. 3.5	Land Use Pattern	150
Fig. 4.1	Predicted GLCs	187

List of Tables

<u>Sl. No.</u>	<u>Description</u>	<u>Page No.</u>
Table 1.1	RR Nagar Cement Plant Production	71
Table 1.2	Captive Limestone Mines and their Production	72
Table 1.3	Captive Lime Kankar Leases and their Production	73
Table 1.4	Quarry Lease – Survey Numbers	82
Table 1.5	Quarry Particulars	87
Table 1.6	Boundary Coordinates	88
Table 1.7	Environmental Setting – 15 km Radius	91
Table 2.1	Production during Plan Period & Subsequent Period	95
Table 2.2	Estimated Resources	101
Table 2.3	Chemical Composition	101
Table 2.4	Proposed Machineries	103
Table 2.5	Mining Personnel	103
Table 2.6	Land Use Pattern	104
Table 2.7	Proposed Green Belt	104
Table 3.1	Baseline Data Collection - Monitoring Locations	111
Table 3.2	AAQ Parameters-Detectable Range	114
Table 3.3	Methodology Adopted for Water Analysis	115
Table 3.4	Micrometeorological Data – December 2024	117
Table 3.5	Micrometeorological Data – January 2025	118
Table 3.6	Micrometeorological Data – February 2025	119
Table 3.7	Ambient Air Quality Monitoring Stations – Location & Bearing	121
Table 3.8-3.17	Ambient Air Quality Data	123-132
Table 3.18	Abstract of Ambient Air Quality Data	133
Table 3.19	Ambient Air Quality Status	136
Table 3.20	Ambient Noise Level Data (Abstract)	137
Table 3.21	Ground Water Level Data	139
Table 3.22	CPCB Criteria for Designated Best Use of Water	142
Table 3.23	Surface Water Quality Data	143
Table 3.24	Ground Water Quality Data	145
Table 3.25	Water Quality Status	147
Table 3.26	Soil Status	148
Table 3.27	Land Use Pattern	148
Table 3.28	List of Flora in Core Zone	152
Table 3.29	List of Flora in Buffer Zone	153
Table 3.30	Cultivated Crops	156
Table 3.31	Distribution of Vegetation in the Study Area	157
Table 3.32	List of Fauna in the Study Area	159
Table 3.33	Other Fauna found in the Study Area	160
Table 3.34	Demographic Profile – 2011 Census	164
Table 3.35	Occupation of Population and Work Forces	166
Table 3.36	Educational Facilities in the Study Area	168
Table 3.37	Medical Facilities in the Study Area	170
Table 3.38	Communication & Transport Facilities in the Study Area	172
Table 3.39	Water & Drainage Facilities in the Study Area	174
Table 3.40	Other Facilities in the Study Area	176
Table 4.1	Industrial Activities Considered for Cumulative Impact	179
Table 4.2	Existing Traffic Volume – Baseline Status	181
Table 4.3	Maximum Mixing Height (meter) with Standard Deviation over Indian Region	184

<u>Sl. No.</u>	<u>Description</u>	<u>Page No.</u>
Table 4.4	Predicted GLCs – Cumulative (including Transportation)	184
Table 4.5	Proposed Green Belt	190
Table 4.6	EIA Matrix	193
Table 4.7	Coefficient Values	193
Table 4.8	Impact Quantification – Operation Phase	194
Table 6.1	Post Project Monitoring Schedule	196
Table 7.1	Potential Hazards due to Proposal	197
Table 7.2	Risk Matrix (R)	197
Table 7.3	DMP Measures	198
Table 10.1	Proposed EMP Measures	201

Lease Extent - Survey Numbers

Lease area of **158.865 Ha** falls in SF Nos. 100/9, 100/10, 101/1, 101/2, 101/3, 103/3, 103/4, 109/7, 109/8A, 109/8B, 109/9, 109/10A, 109/10B, 119/3(part), 120/1, 120/2A, 120/2B, 120/3, 120/4, 121/1A, 121/2, 121/3, 121/4, 121/5, 121/6, 121/7, 121/1B, 122/1, 122/2, 122/4, 123/1, 123/2, 124/1, 124/2, 124/3, 124/4, 124/5, 124/6, 124/7, 124/8, 124/9, 125/1A, 125/1B, 125/1C, 125/2, 125/5, 125/6, 126/1, 126/3, 126/4, 126/5, 126/7A, 126/7B, 126/8, 126/9, 126/10, 127/1, 127/2, 127/3, 127/5, 127/6, 127/7, 127/8, 127/9, 127/10, 127/11, 128/1A, 128/1B, 128/2A, 128/2B, 128/4, 128/5, 129/2, 129/4, 129/5A, 129/5B, 130/1, 130/2, 130/3, 130/4, 130/6, 130/7, 130/8, 130/9, 130/10, 130/11, 131/1B, 131/2B, 131/2C, 131/2D, 131/2E, 131/3, 132/1A, 132/1B, 132/1C, 132/2, 132/3, 132/4, 137/3, 137/4, 138/1, 138/2A, 138/3A, 138/4A, 138/5A, 139/1, 139/3A, 139/3B, 140/1, 140/3A, 140/3B, 140/3C, 140/4, 140/5, 141/1, 141/2, 404/1A, 404/1B, 407/2, 407/3, 407/4, 407/5, 407/6A, 407/6B, 408/3, 409/1B, 410/4, 410/5, 411/1A, 411/1B, 411/2A, 411/3, 411/4, 411/5, 412/1, 412/2, 413/3, 413/4, 415/1, 415/2, 415/3, 416/1, 416/2, 416/3, 416/4, 416/8, 416/9, 416/10, 418/1, 418/2, 418/6, 429/1, 429/2, 431/1, 431/4, 431/5, 431/6, 431/7A, 431/7B, 431/8, 431/9, 432/1, 432/2, 432/3, 432/4, 432/5, 432/6, 432/7, 432/8, 433/1A, 433/1B, 433/1C, 433/2, 433/3, 433/4, 433/5A, 433/5B, 433/6, 433/7A, 433/7B, 434/1, 434/2A, 434/2B, 434/2C, 434/2D, 434/2E, 434/4A, 434/4B, 434/4C, 434/5, 434/6, 435/1, 437/1A, 437/1B, 437/2, 438/2A, 438/2B, 438/3A, 438/3B, 438/4, 438/5A, 438/5B, 439/1A, 439/1B, 439/1C, 439/2A, 439/2B, 439/2C, 439/3A, 439/3B, 439/3C, 439/4A, 439/4B, 439/5A, 439/5B, 440/1A, 440/2A, 440/3A, 442/1A, 442/3B, 442/4B, 442/5, 443/1, 443/2, 443/3, 444/1A, 444/1B, 444/2, 445/1, 445/3, 445/4, 445/5, 445/7, 445/8, 445/9, 445/10, 445/11A, 445/11B, 446/1, 446/2A, 446/2B, 446/3, 446/4, 446/5, 446/6A, 446/6B, 446/8, 446/9A, 446/9B, 447/1, 447/2, 447/3, 447/5, 447/6, 448/1, 448/2, 448/3, 449/2, 449/3A, 449/3B, 449/4, 449/5, 449/6, 449/7, 449/8, 450/1, 450/2, 451/1, 451/2, 451/3, 451/4, 451/7, 452/1, 452/3, 453/1, 453/2, 453/3, 453/7, 453/8, 453/9, 454/1, 454/3, 454/4, 454/5, 454/6, 455/1, 455/3A, 455/3B, 456/3, 456/4, 456/5A, 456/5B, 457/1, 457/3A, 457/3B, 457/3C, 457/4A, 457/4B, 457/5A, 457/5B of **Maravarperungudi village (132.055 Ha)** & 468/1A, 468/1B1, 468/1B2, 468/2, 468/3, 468/4A, 468/4B, 468/5A, 468/5B, 538/3A, 538/3B, 539/1B1, 539/1B2, 540/2, 540/3, 540/4, 541/1, 541/2, 541/3A, 541/3B, 541/3C, 542/1, 542/2, 542/3, 543/1A1, 543/1A2, 543/1B1, 543/1B2, 543/2B, 543/3, 544/1A, 544/1B, 683/2, 683/3, 684/1, 684/2A, 684/2B, 684/3, 684/4, 684/5, 684/6, 684/7 of **T.Koppuchithampatti village (26.810 Ha)** in Aruppukottai Taluk, Virudhunagar District, Tamil Nadu.

Plate : 1 Lease Plan



Document-I : VAO Certificate-Maravarperungudi

சான்று

விருதுநகர் மாவட்டம், அருப்புக்கோட்டை வட்டம், மறவர்பெருங்குடி கிராம நிர்வாக அலுவலர் அளிக்கும் சான்று. திருவாளர்கள்.தி ராம்கோ சிமெண்ட்ஸ் லிமிடெட் நிறுவனம் விருதுநகர் மாவட்டம், அருப்புக்கோட்டை வட்டம், மறவர்பெருங்குடி கிராமம் சர்வே எண்கள்.100/9,10, etc ஆகிய பட்டா நிலங்களில் உள்ள மொத்த விஸ்தீரணம் 132.05.5 ஹெக்டேர் பரப்பளவில் சுண்ணாம்பு கங்கர் வெட்டி எடுக்க குவாரி குத்தகை செயல்பாடுகளுக்கான வரையறுக்கப்பட்ட பகுதிக்கான பரிந்துரைக்கப்பட்ட தொழில் துறை அறிவிப்பு கடித எண்.2171/MMC.2/2018-1, Dated:02.04.2018 மூலம் ஒப்புதல் பெறப்பட்டுள்ளது.

மேற்கண்ட குவாரி குத்தகை ஒப்புதல் பெறப்பட்ட இடத்தைச் சுற்றி சுமார் 300மீட்டர் சுற்றளவில் கிராம நத்த குடியிருப்பு பகுதிகள், அங்கீகரிக்கப்பட்ட வீட்டு மனைகள், கோயில்கள், புராதன வரலாற்று சின்னங்கள் மற்றும் மின்மயானங்கள் எதுவுமில்லை. குவாரி அனுமதி கோரி விண்ணப்பித்துள்ள புலத்திற்கு வண்டிகள் சென்றுவரும் கிராம சாலைகளுக்கு இடையூறுகள் எதுவும் இல்லை. மேலும் பொதுமக்களுக்கோ அருகில் உள்ள அரசுப் புறம்போக்கு மற்றும் பட்டாதாரர்களுக்கோ எந்தவித இடையூறுகள் இல்லை என தெரிவித்துக் கொள்கிறேன்.


கிராம நிர்வாக அலுவலர் கையொப்பம்
Village Administrative Officer
63 Maravarperungudi,
Aruppukkottai,
Virudhunagar District

Document-II : VAO Certificate-T.Koppuchithampatti

சான்று

விருதுநகர் மாவட்டம், அருப்புக்கோட்டை வட்டம், டி.கொப்புசித்தம்பட்டி கிராம நிர்வாக அலுவலர் அளிக்கும் சான்று. திருவாளர்கள்.தி ராம்கோ சிமெண்ட்ஸ் லிமிடெட் நிறுவனம் விருதுநகர் மாவட்டம், அருப்புக்கோட்டை வட்டம், டி.கொப்புசித்தம்பட்டி கிராமம் சர்வே எண்கள்.468/1A, 1B1, 1B2, etc ஆகிய பட்டா நிலங்களில் உள்ள மொத்த விஸ்தீரணம் 26.81.0 ஹெக்டேர் பரப்பளவில் சுண்ணாம்பு கங்கர் வெட்டி எடுக்க குவாரி குத்தகை செயல்பாடுகளுக்கான வரையறுக்கப்பட்ட பகுதிக்கான பரிந்துரைக்கப்பட்ட தொழில் துறை அறிவிப்பு கடித எண்.2171/MMC.2/2018-1, Dated:02.04.2018 மூலம் ஒப்புதல் பெறப்பட்டுள்ளது.

மேற்கண்ட குவாரி குத்தகை ஒப்புதல் பெறப்பட்ட இடத்தைச் சுற்றி சுமார் 300மீட்டர் சுற்றளவில் கிராம நத்த குடியிருப்பு பகுதிகள், அங்கீகரிக்கப்பட்ட வீட்டு மனைகள், கோயில்கள், புராதன வரலாற்று சின்னங்கள் மற்றும் மின்மயானங்கள் எதுவுமில்லை. குவாரி அனுமதி கோரி விண்ணப்பித்துள்ள புலத்திற்கு வண்டிகள் சென்றுவரும் கிராம சாலைகளுக்கு இடையூறுகள் எதுவும் இல்லை. மேலும் பொதுமக்களுக்கோ அருகில் உள்ள அரசுப் புறம்போக்கு மற்றும் பட்டாதாரர்களுக்கோ எந்தவித இடையூறுகள் இல்லை என தெரிவித்துக் கொள்கிறேன்.


 29/6/22
Village Administrative Officer
 T.KOPPUCHITHAMPATTI
 Aruppukottai Taluk
 Virudhunagar Dist.

Document-III : DFO NOC

Ref. No. WL5(A)/44455/2019 O/o. the Principal Chief Conservator of Forests,
Panagal Maaligai, Saidapet,
Chennai - 15.
Dated: 13-01-2021

Sub: Mines and Minerals - Quarry Lease - Limekankar and Clay (BCS) over an extent of 158.865 Ha in Maravarperungudi and T. Koppuchitampatti Villages of Aruppukottai Taluk of Virudhunagar District by RAMCO Cements Limited - Regarding.

Ref: 1) Standard ToR issued by the Member Secretary, State Level Environment Impact Assessment Authority - Tamil Nadu, Chennai.

2) The Vice President - Liaison & CSR, The RAMCO Cements Limited, Chennai letter dated 13-09-2019.

As requested in the reference 2nd cited, it informed that the proposed Limekankar and Clay (BCS) Mining area of RAMCO Cements Limited in Maravarperungudi and T. Koppuchitampatti Villages, Aruppukottai Taluk of Virudhunagar District over an extent of 158.865 Ha is not part of any Reserved Forests and Wildlife Sanctuary. The distance from the Protected Area is 55 Kms and distance from the Forest Area is 22 Kms.

2) Further it is informed that no National Park, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar Site, Tiger / Elephant Reserves (existing as well as proposed) does not lie within 10 Kms of the proposed mining lease area.

3) Peafowl Conservation Plan (Schedule - I species under Wildlife (Protection) Act, 1972) and list of Flora and Fauna submitted by the RAMCO Cements Limited, Chennai is hereby approved subject to following conditions:-

- Implementation of the peafowl conservation plan in consultation with the Wildlife Warden, Srivilliputhur.
- The project proponent should comply and implement all the proposals made in the conservation plan and submit annual progress to the Wildlife Warden, Srivilliputhur.
- In case of any violation noticed the plan will be liable to be cancelled.

4) This information is only for obtaining Environmental Clearance from the Competent Authority.

Sd/- Vijendra Singh Malik
for Principal Chief Conservator of Forests
and Chief Wildlife Warden

To

The Vice President - Liaison & CSR,
The Ramco Cements Limited, Auras Corporate Centre, V Floor,
98-A, Dr. Radhakrishnan Salai, Mylapore, Chennai - 600 004

Copy to the Wildlife Warden, Srivilliputhur for information.

Copy to the Conservator of Forests, Virudhunagar for information.

/True Copy / by Order/

Superintendent

13/01/20

Document-IV : Cluster Certificate

DEPARTMENT OF GEOLOGY AND MINING	
From	To
Shri A. Arumuganathan, M.Sc., Joint Director / Assistant Director (Vc), Geology and Mining, Virudhunagar District.	Mr. The Ramco Cements Limited, Ramasamy Raja Nagar, Virudhunagar District.
Ref: No.XVI/14547/2016, dated: 01.11.2016	
Re: Mines & Quarries - Minor Mineral - Quarry Lease (Lime Kankar & Clay (Others)) - Virudhunagar District - Aruppukottai Taluk - Maravarperungudi Village - over an extent of 23.29.0 hectares of patta lands in Survey Nos. 109(P), 110,111,113(P),114,115(P) and 119(P) in Maravarperungudi village, Aruppukottai Taluk, Virudhunagar District under rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 vide reference 1st cited. In the reference 2nd cited, the District Collector, Virudhunagar, had recommended and forwarded to Government through The Commissioner of Geology and Mining for grant of Quarry Lease over an extent of 23.29 Hs situated in Survey Nos. 109(P), 110,111,113(P),114,115(P) and 119(P) in Maravarperungudi village, Aruppukottai Taluk, Virudhunagar District. Further, in the reference 3rd cited, The Principal Secretary to Government issued Precise area Communication vide Letter No.14546/MMC.2/2016-1 dated 21.04.2017 for obtaining approval of Mining Plan and Environmental Clearance. The Director of Geology and Mining, Chennai has approved the Mining Plan submitted by the applicant company Mr. Ramco Cements Limited vide Letter under reference 4th cited. In the reference 5th cited above, the applicant company has requested to furnish a certificate stating the details of existing Mining Leases / Quarry lease within 500 meters from the subject quarry lease.	
Sub: Mines & Quarries - Minor Mineral - Quarry Lease (Lime Kankar & Clay (Others)) - Virudhunagar District - Aruppukottai Taluk - Maravarperungudi Village - over an extent of 23.29.0 hectares of patta lands in Survey Nos. 109(P), 110,111,113(P),114,115(P) and 119(P) - Area recommended for Quarry Lease - Precise area Communication - Mining Plan approved - Request for the details of other Quarry Leases within 500 meters from the periphery of the applied instant area - Cluster details furnished. Ref: 1. Quarry Lease application of Mr. The Ramco Cements Limited dated: 05.05.2016 2. The District Collector, Virudhunagar, Ir No.XVI/14547/2016, dated: 28.09.2016. 3. Precise area communication by Industries Dept, Govt. of Tamil Nadu vide Letter No.14546/MMC.2/2016-1 dated: 21.04.2017 4. The Director of Geology & Mining Letter No. 1011/MMC.0/2016/VC/Ver dated: 10.05.2018 5. MOP & CC Notification S.O.141(E) dated: 15.01.2016 - Amendment to Procedure for CC for Mining of Minor Mineral including Cluster 6. Letter No. VI dated: 30.10.2019 received from The Ramco Cements Limited *****	

Hence, the details of the area for which precise area communications are awarded within 500 m radial distance from the subject quarry lease are furnished below.

Details of the quarry leases within 500 m radius:

S.No	Name of the lessee/ applicant	Name of Mineral	Quarry Lease Grant Order/ Precise area Communication No & date	Extent (Ha)	Village & Taluk	Remarks
[1]	[2]	[3]	[4]	[5]	[6]	[7]
1	The Ramco Cements Limited	Lime Kankar & Clay (Others)	Ir.No. 14546/MMC.2/2016-1 dated: 21.04.2017	23.29.0	Maravar perungudi	Applied for Environmental Clearance
2	The Ramco Cements Limited	Lime Kankar & Clay (Black Cotton Soil)	Ir.No.2171/MMC.2/2018-1 dated: 02.04.2018	158.86.5	Maravar Perungudi & Koppuchthom patti Village, Aruppukottai	To be applied for Environmental Clearance


 Joint Director / Assistant Director (Vc),
 Geology and Mining,
 Virudhunagar.

s. B. elumalai



THE RAMCO CEMENTS LIMITED

(formerly Madras Cements Ltd.)

Corporate Office:
Auroa Corporate Centre, V Floor,
95-A, Dr. Radhakrishnan Salai, Mylapore,
Chennai - 600 004, India.
Tel: +91 44 2847 8666 Fax: +91 44 2847 8676
Website: www.ramcocements.in
Corporate Identity Number: L26941TN1957PLC003568

Project Proponent Declaration

[in compliance with MoEF Office Memorandum No. J-11013/41/2006-IA.II (I) dated 04.08.2009]

We, M/s. The Ramco Cements Limited (TRCL), have applied to the State Level EIA Authority (SEIAA)-Tamil Nadu for prior Environmental Clearance of 'Proposed Maravarperungudi Lime Kankar Quarry Lease-III for Quarrying of Lime Kankar & Clay (Black Cotton Soil) over an Extent of 158.865 Ha for Production of 28,00,000 Tonnes Lime Kankar (ROM) @ Maximum 1.00 MTPA & 20,00,000 Tonnes Clay (BC Soil) @ Maximum 1.00 MTPA - Upto 3.0 m BGL - during Plan Period at Maravarperungudi and T.Koppuchithampatti Villages, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu State' vide Parivesh Online proposal No. SIA/TN/MIN/522992/2025 dated 07.02.2025 and the File has been accepted by SEIAA under File No. 11826/2025 on 01.03.2025.

The Proposal was deliberated by the State Expert Appraisal Committee (SEAC)-Tamil Nadu in its 538th Meeting held on 01.03.2025 and SEIAA-TN in its Meeting held on 01.04.2025. Terms of Reference (ToR) has been awarded vide Identification No. TO25B0108TN5802389N dated 07.04.2025 with Public Hearing.

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 (NABET) vide Certificate NABET/EIA/2225/RA0290 dated 11.06.2023 with validity till 16.11.2025 (Sl. No. 4 of List). ABC Laboratory is accredited by the National Accreditation Board for Testing & Calibration Laboratories (NABL) vide Certificate No. TC-5770 dated 03.04.2024 - valid till 02.04.2026.

The Draft Environmental Impact Assessment (EIA) Report and Summary Environmental Impact Assessment Reports 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 Draft EIA Report are factually correct.

For The Ramco Cements Limited

C. Ravichandran

**Sr. Vice President (ESG-Corp.)
Authorised Signatory**

Date : 19.05.2025
Place : Chennai



EIA Consultant Undertaking

[in compliance with MoEF Office Memorandum No. J-11013/41/2006-IA.II (I) dated 04.08.2009]

M/s. The Ramco Cements Limited (RCL) have applied to the State Level EIA Authority (SEIAA)-Tamil Nadu for prior Environmental Clearance of 'Proposed Maravarperungudi Lime Kankar Quarry Lease-III for Quarrying of Lime Kankar & Clay (Black Cotton Soil) over an Extent of 158.865 Ha for Production of 28,00,000 Tonnes Lime Kankar (ROM) @ Maximum 1.00 MTPA & 20,00,000 Tonnes Clay (BC Soil) @ Maximum 1.00 MTPA - Upto 3.0 m BGL - during Plan Period at Maravarperungudi and T.Koppuchithampatti Villages, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu State' vide Parivesh Online proposal No. SIA/TN/MIN/522992/2025 dated 07.02.2025 and the File has been accepted by SEIAA under File No. 11826/2025 on 01.03.2025..

The Proposal was deliberated by the State Expert Appraisal Committee (SEAC)-Tamil Nadu in its 538th Meeting held on 01.03.2025 and SEIAA-TN in its Meeting held on 01.04.2025. TOR has been awarded vide Identification No. TO25B0108TN5802389N dated 07.04.2025 with Public Hearing.

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 (NABET) vide Certificate NABET/EIA/2225/RA0290 dated 11.06.2023 with validity till 16.11.2025 (Sl. No. 4 of List). ABC Laboratory is accredited by the National Accreditation Board for Testing & Calibration Laboratories (NABL) vide Certificate No. TC-5770 dated 03.04.2024 - valid till 02.04.2026.

The Environmental Impact Assessment (EIA) Report and Summary Environmental Impact Assessment Reports 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 ABC Techno Labs India Private Limited

Authorized Signatory

Date : 16.05.2025
Place : Chennai.



ABC TECHNO LABS INDIA PRIVATE LIMITED

(Accredited by NABL, NABET, Approved by FSSAI, APEDA & Agmark, Recognized by MoEF&CC, BIS)

(IN-903-1001, 903-14001, 903-40001 & 100-22000 Certified Company)

Corporate Office & Lab:

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THE RAMCO CEMENTS LIMITED

(formerly Madras Cements Ltd.)

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Auras Corporate Centre, V Floor,
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Chennai - 600 004, India.
Tel: +91 44 2847 8666 Fax: +91 44 2847 8676
Website: www.ramcocements.in
Corporate Identity Number: L26941TN1957PLC003566

Affidavit / Undertaking

We, M/s. The Ramco Cements Limited (TRCL), have applied to the State Level EIA Authority (SEIAA)-Tamil Nadu for prior Environmental Clearance of 'Proposed Maravarperungudi Lime Kankar Quarry Lease-III for Quarrying of Lime Kankar & Clay (Black Cotton Soil) over an Extent of 158.865 Ha for Production of 28,00,000 Tonnes Lime Kankar (ROM) @ Maximum 1.00 MTPA & 20,00,000 Tonnes Clay (BC Soil) @ Maximum 1.00 MTPA - Upto 3.0 m BGL - during Plan Period at Maravarperungudi and T.Koppuchithampatti Villages, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu State' vide Parivesh Online proposal No. SI/TN/MIN/522992/2025 dated 07.02.2025 and the File has been accepted by SEIAA under File No. 11826/2025 on 01.03.2025.

The Proposal was deliberated by the State Expert Appraisal Committee (SEAC)-Tamil Nadu in its 538th Meeting held on 01.03.2025 and SEIAA-TN in its Meeting held on 01.04.2025. Terms of Reference (ToR) has been awarded vide Identification No. TO25B0108TN5802389N dated 07.04.2025 with Public Hearing. In compliance with awarded ToR, I, on behalf of TRCL, sworn and submit the followings:

1. I undertake that there is no mining activity after 15.01.2016 and the Proposal is not falling under Violation Category.
2. I undertake that the Mining operation will be carried out with Rock Breakers and without any Drilling & Blasting.
3. I undertake that no contractual persons provided by the explosive suppliers will be employed in the Mine.
4. I declare that no highly sensitive structure such as fire-cracker manufacturing units, Gas godown/explosive Magazine, LPG Bottling Units, etc. are located within a radial distance of 300 m from the lease boundary.
5. As quarrying in nearby our own Maravarperungudi Lime Kankar Quarry Lease-II is at Conceptual Stage, Cluster approach/Cluster Committee, etc. are not applicable to this instant Project. Accordingly, ToR Conditions under SI. No. 4.1- 1 to 8 are not applicable.
6. Proposed EMP Budget is for the entire life of mine and we abide EMP for the entire life of mine.

For The Ramco Cements Limited

Sr. Vice President (ESG-Corp.)
Authorised Signatory

Date : 19.05.2025
Place : Chennai



File No: 11826
Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment Authority(SEIAA),
TAMIL NADU)



Dated 07/04/2025



To,

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

Subject: Grant of Terms of Reference along with Public Hearing under the provision of the EIA Notification 2006-as amended regarding.

Sir/Madam,

SEIAA - Tamil Nadu Proposed Lime Kankar & Clay (Black Cotton Soil) Quarry over an extent of 158.86.5 Ha in S.F.Nos. 100/9, 10 etc., (Annexure - I) at Maravarperungudi Village and S.F.Nos. 468/1A, 1B1, etc., (Annexure -I) at T.Koppuchithampatti Village, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu by M/s. The Ramco Cements Limited - under project category – “B1” and Schedule S.No.1(a) “Mining of Minerals Projects” of EIA Notification, 2006, as amended – ToR issued along with Public Hearing - preparation of EIA report – Regarding.

Ref:

1. Online proposal No SIA/TN/MIN/522992/2025 Dated 07/02/2025.
2. Your application submitted for Terms of Reference dated:01.03.2025.
3. Minutes of the 538th SEAC meeting held on 01.03.2025.
4. Minutes of the 803rd SEAC meeting held on 01.04.2025.

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO25B0108TN5802389N
(ii) File No.	11826
(iii) Clearance Type	TOR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals Proposed Maravarperungudi Lime Kankar Quarry Lease-III for Quarrying of Lime Kankar & Clay (Black Cotton Soil) over an Extent of 158.865 Ha for Production of 28,00,000 Tonnes Lime Kankar
(vii) Name of Project	

	(ROM) @ Maximum 1.00 MTPA & 20,00,000 Tonnes Clay (BC Soil) @ Maximum 1.00 MTPA - Upto 3.0 m BGL - during Plan Period at Maravarperungudi and T.Koppuchitampatti Villages, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu by M/s. The Ramco Cements Limited
(viii) Name of Company/Organization	THE RAMCO CEMENTS LIMITED
(ix) Location of Project (District, State)	VIRUDHUNAGAR, TAMIL NADU
(x) Issuing Authority	SEIAA
(xii) Applicability of General Conditions	no
(xiii) Applicability of Specific Conditions	no

1. In view of the particulars given in the Para 1 above, the project proposal interalia including Form-1 (Part A and B) were submitted to the SEIAA for an appraisal by the SEAC under the provision of EIA notification 2006 and its subsequent amendments.

2. The above-mentioned proposal has been considered by SEIAA in the meeting held on 01.04.2025. The minutes of the meeting and all the Application and documents submitted [(viz. Form-1 Part A, Part B,)] are available on PARIVESH portal which can be accessed by scanning the QR Code above.

3. The State Expert Appraisal Committee (SEAC), based on the information & clarifications provided by the project proponent and after detailed deliberations on all technical aspects recommended the proposal for grant of Terms of Reference with public hearing under the provision of EIA Notification, 2006 and as amended thereof subject to the stipulation of specific and general conditions as detailed in Annexure (2).

4. The SEIAA has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the SEAC hereby decided to issue the following Terms of Reference with public hearing for instant proposal M/s. The Ramco Cements Limited under the provisions of EIA Notification, 2006 and as amended thereof.

5. The Ministry/SEIAA-TN reserves the right to stipulate additional conditions, if found necessary.

6. The Terms of Reference with public hearing to the aforementioned project is under provisions of EIA Notification, 2006. 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.

7. This issues with the approval of the Competent Authority.

8. The TORs with public hearing prescribed shall be **valid for a period of three years** from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.

Copy To

1. The Additional Chief Secretary to Government, Environment & Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD Cum-Office Complex, East Arjun Nagar, New Delhi 110032.
3. The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-600 032.
4. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC, Paryavaran Bhavan, CGO Complex, New Delhi 110003
5. The District Collector, Virudhunagar District.
6. Stock File.

Annexure 1

Specific Terms of Reference for (Mining Of Minerals)

1. Seac Conditions - Site Specific

S. No	Terms of Reference
1.1	1. A Cluster Management Committee (CMC) shall be constituted including all the mines in the cluster as Committee Members for the effective management of the mining operation in the cluster through systematic & scientific approach with appointment of statutory personnel, appropriate environmental monitoring, good maintenance of haul roads and village/panchayat roads, authorized blasting operation etc. The PP shall submit the following details in the form of an Affidavit during the EIA appraisal: (i) Copy of the agreement forming CMC. (ii) The Organisation chart of the Committee with defining the role of the members (iii) The 'Standard Operating Procedures' (SoP) executing the planned activities. 2. The Boundary pillars to be erected as per the mine rules and the evidence should be submitted along with the EIA report. 3. Since waterbodies are situated nearby, the PP shall carry out the hydrological study including the details of waterflow pattern to determine the impacts of the mining operation in the waterbodies. 4. The details of enumeration of structures including schools, colleges, primary health centres should be submitted along with the EIA report. 5. The structures within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m & upto 1km shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc. and spell out the mitigation measures to be proposed for the protection of the above structures, if any during the quarrying operations. 6. The proponent shall furnish photographs of adequate fencing, garland drainage built with siltation tank & green belt along the periphery including replantation of existing trees; maintaining the safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan. 7. The Proponent shall carry out Bio diversity study as a part of EIA study and the same shall be included in the Report. 8. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine. 9. The PP shall carry out the comprehensive studies on the cumulative environmental impacts of the existing & proposed quarries which included rock breakage, loading & hauling on the surrounding village and structures. 10. The PP shall prepare a conceptual working plan accommodating the inclusion of haul road accessibility keeping the benches intact, by ensuring the slope stability of the working benches to be constructed and existing quarry wall. 11. The PP shall install the CCTV camera for the continuous surveillance of mining activity & furnish the photographic/videographic evidence along with the EIA report.

2. Seac Standard Conditions

S. No	Terms of Reference
2.1	1. In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following: (i) Original pit dimension (ii) Quantity achieved Vs EC Approved Quantity (iii) Balance Quantity as per Mineable Reserve calculated. (iv) Mined out Depth as on date Vs EC Permitted depth (v) Details of illegal/illicit mining

S. No	Terms of Reference
	(vi) Violation in the quarry during the past working. (vii) Quantity of material mined out outside the mine lease area (viii) Condition of Safety zone/benches (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m. 2. Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site. 3. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc. 4. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry. 5. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report. 6. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site. 7. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC. 8. However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level. 9. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent. 10. The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site. 11. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences. 12. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines, 13. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines? 14. Quantity of minerals mined out. · Highest production achieved in any one year · Detail of approved depth of mining. · Actual depth of the mining achieved earlier. · Name of the person already mined in that leases area. · If EC and CTO already obtained, the copy of the same shall be submitted. · Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.

S. No	Terms of Reference
	15. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone). 16. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc., 17. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan. 18. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same. 19. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment. 20. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. 21. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study. 22. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind. 23. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted. 24. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given. 25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided. 26. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered. 27. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided. 28. Impact on local transport infrastructure due to the Project should be indicated. 29. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.

S. No	Terms of Reference
	30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific. 31. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible. 32. The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner. 33. Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner 34. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period. 35. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period. 36. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed. 37. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations. 38. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation. 39. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given. 40. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc. 41. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCCB. 42. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine. 43. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.

3. Seiaa Specific Conditions:

S. No	Terms of Reference
3.1	The SEIAA noted that the subject was placed in the 538th meeting of SEAC held on 01.03.2025. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant

S. No	Terms of Reference
	Terms of Reference (ToR) along with Public Hearing for the quantity of 28,00,000 Ts of Lime Kankar and 20,00,000 Ts of Clay (BC soil) up to the depth of 3m BGL as per the approved mining plan, under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions & the conditions mentioned in Annexure of this minutes. 1. The PP should submit the original Land ownership document along with the EIA Report.

4. Seiaa Standard Conditions:

S. No	Terms of Reference
4.1	<u>Cluster Management Committee</u> - Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry. - The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc., - The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines. - Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network. - The committee shall deliberate on risk & emergency management plan, fire safety & evacuation plan and sustainable development goals pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan. - The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the Environmental policy devised shall be given in detail in the EIA Report. - The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner. - The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public in the vicinity. <u>Agriculture & Agro-Biodiversity</u> - Impact on surrounding agricultural fields around the proposed mining Area. - Impact on soil flora & vegetation around the project site. - Details of type of vegetation including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetation all along the boundary of the proposed mining area shall committed mentioned in EMP. - The Environmental Impact Assessment should study the agro-biodiversity, agro- forestry, horticultural plantations, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem. - Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services. - The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock. <u>Forests</u> - The project proponent shall detailed study on impact of mining on Reserve forests and free ranging wildlife. - The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.

S. No	Terms of Reference
	17. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection. 18. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site. <u>Water Environment</u> 19. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period. 20. Erosion Control measures. 21. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas. 22. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir. 23. The project proponent shall study and furnish the details on potential fragmentation impact on natural Environment, by the activities. 24. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts. 25. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components. 26. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites. 27. The EIA shall include the impact of mining activity on the following: - Hydrothermal/Geothermal effect due to destruction in the Environment. - Bio-geochemical processes and its foot prints including Environmental stress. - Sediment geochemistry in the surface streams. <u>Energy</u> 28. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished. <u>Climate Change</u> 29. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities. 30. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock, soil health and physical, chemical & biological soil features. 31. Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood. <u>Mine Closure Plan</u> 32. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued. <u>EMP</u> 33. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued and the scope for achieving SDGs. 34. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan. <u>Risk Assessment</u> 35. To furnish risk assessment and management plan including anticipated vulnerabilities during

S. No	Terms of Reference
	operational and post operational phases of Mining. <u>Disaster Management Plan</u> 36. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued. <u>Others</u> 37. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc. 38. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan. 39. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the Environment. The ecological risks and impacts of plastic & microplastics on aquatic Environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.

Standard Terms of Reference for (Mining of minerals)

1.

S. No	Terms of Reference
1.1	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994
1.2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given
1.3	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee
1.4	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/toposheet, topographic sheet, geomorphology and geology of the areashould be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone)
1.5	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics
1.6	Details about the land proposed for mining activities should be givenwith information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority
1.7	It should be clearly stated whether the proponent Company has a well laid down Environment

S. No	Terms of Reference
	Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report
1.8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided
1.9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period
1.10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given
1.11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given
1.12	A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the State Expert Appraisal Committees
1.13	Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished
1.14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated
1.15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given
1.16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted
1.17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically

S. No	Terms of Reference
	sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished
1.18	A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled- I fauna found in the study area, the necessary plan alongwith budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost
1.19	Proximity to Areas declared as Critically Polluted or the Project areas likely to come under the Aravali Range, (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered
1.20	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority)
1.21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report
1.22	One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given
1.23	Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map
1.24	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated

S. No	Terms of Reference
1.25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided
1.26	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided
1.27	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided
1.28	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from State Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished
1.29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out
1.30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same
1.31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution
1.32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines
1.33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report
1.34	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report
1.35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed

S. No	Terms of Reference
1.36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations
1.37	Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation
1.38	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project
1.39	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project
1.40	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given
1.41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out
1.42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report
1.43	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc
1.44	Besides the above, the below mentioned general points are also to be followed:- a) All documents to be properly referenced with index and continuous page numbering. b) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated. c) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project. d) Where the documents provided are in a language other than English, an English translation should be provided. e) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted. f) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed. g) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation. h) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable. i) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area

Annexure I – List of Survey Numbers**Village: MARAVARPERUNGUDI**

S.No	SF.No	Sub Div.No	Extent in Ha.	S.No	SF.No	Sub Div.No	Extent in Ha.
1	100	9	0.225	41	124	9	0.400
2	100	10	0.180	42	125	1A	0.420
3	101	1	0.485	43	125	1B	0.520
4	101	2	1.475	44	125	1C	0.910
5	101	3	0.430	45	125	2	0.190
6	103	3	1.330	46	125	5	0.300
7	103	4	2.610	47	125	6	0.105
8	109	7	0.010	48	126	1	0.070
9	109	8A	0.035	49	126	3	0.065
10	109	8B	0.120	50	126	4	0.055
11	109	9	0.270	51	126	5	0.035
12	109	10A	0.490	52	126	7A	0.750
13	109	10B	1.225	53	126	7B	0.760
14	119	3 (part)	1.820	54	126	8	0.005
15	120	1	0.560	55	126	9	0.025
16	120	2A	0.230	56	126	10	0.550
17	120	2B	0.270	57	127	1	0.005
18	120	3	0.370	58	127	2	0.055
19	120	4	1.030	59	127	3	0.160

20	121	1A	0.155	60	127	5	0.310
21	121	2	0.265	61	127	6	0.305
22	121	3	0.285	62	127	7	0.310
23	121	4	0.225	63	127	8	0.310
24	121	5	1.090	64	127	9	0.775
25	121	6	0.140	65	127	10	0.650
26	121	7	0.415	66	127	11	0.340
27	121	1B	0.070	67	128	1A	0.830
28	122	1	0.150	68	128	1B	0.830
29	122	2	0.165	69	128	2A	0.570
30	122	4	0.490	70	128	2B	0.510
31	123	1	0.595	71	128	4	0.030
32	123	2	0.800	72	128	5	0.865
33	124	1	0.585	73	129	2	0.080
34	124	2	0.135	74	129	4	0.440
35	124	3	0.280	75	129	5A	0.260
36	124	4	0.145	76	129	5B	1.075
37	124	5	0.290	77	130	1	0.170
38	124	6	0.310	78	130	2	0.140
39	124	7	0.445	79	130	3	0.190
40	124	8	0.430	80	130	4	0.145

S.No	SF.No	Sub Div.No	Extent in Ha.	S.No	SF.No	Sub Div.No	Extent in Ha.
81	130	6	0.020	121	407	4	0.040
82	130	7	0.090	122	407	5	0.145
83	130	8	0.395	123	407	6A	0.765
84	130	9	0.350	124	407	6B	0.070
85	130	10	0.230	125	408	3	0.755
86	130	11	0.105	126	409	1B	0.950
87	131	1B	2.185	127	410	4	0.740
88	131	2B	0.665	128	410	5	0.750
89	131	2C	0.760	129	411	1A	0.120
90	131	2D	0.745	130	411	1B	0.115
91	131	2E	0.180	131	411	2A	0.330
92	131	3	0.180	132	411	3	0.220
93	132	1A	0.030	133	411	4	0.200
94	132	1B	0.825	134	411	5	0.215
95	132	1C	0.740	135	412	1	2.475
96	132	2	0.135	136	412	2	0.590
97	132	3	0.160	137	413	3	0.820
98	132	4	0.875	138	413	4	0.895
99	137	3	0.395	139	415	1	0.900
100	137	4	0.420	140	415	2	0.300

101	138	1	1.215	141	415	3	0.330
102	138	2A	0.355	142	416	1	0.160
103	138	3A	0.205	143	416	2	0.145
104	138	4A	0.120	144	416	3	0.185
105	138	5A	0.470	145	416	4	0.170
106	139	1	0.295	146	416	8	0.170
107	139	3A	1.230	147	416	9	0.210
108	139	3B	0.150	148	416	10	0.480
109	140	1	0.585	149	418	1	0.500
110	140	3A	0.255	150	418	2	0.285
111	140	3B	0.205	151	418	6	0.220
112	140	3C	0.370	152	429	1	0.030
113	140	4	1.120	153	429	2	0.185
114	140	5	0.795	154	431	1	0.275
115	141	1	0.395	155	431	4	0.735
116	141	2	0.815	156	431	5	0.985
117	404	1A	0.880	157	431	6	0.245
118	404	1B	0.015	158	431	7A	0.690
119	407	2	0.740	159	431	7B	0.380
120	407	3	0.005	160	431	8	0.390

S.No	SF.No	Sub Div.No	Extent in Ha.	S.No	SF.No	Sub Div.No	Extent in Ha.
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161	431	9	0.200	201	438	5A	0.505
162	432	1	0.110	202	438	5B	0.315
163	432	2	0.720	203	439	1A	0.260
164	432	3	0.835	204	439	1B	0.035
165	432	4	0.265	205	439	1C	0.020
166	432	5	0.250	206	439	2A	0.130
167	432	6	0.425	207	439	2B	0.020
168	432	7	0.170	208	439	2C	0.005
169	432	8	0.195	209	439	3A	0.115
170	433	1A	0.110	210	439	3B	0.020
171	433	1B	0.115	211	439	3C	0.005
172	433	1C	0.230	212	439	4A	0.590
173	433	2	0.170	213	439	4B	0.065
174	433	3	0.310	214	439	5A	0.505
175	433	4	0.395	215	439	5B	0.030
176	433	5A	0.060	216	440	1A	0.340
177	433	5B	0.140	217	440	2A	0.465
178	433	6	0.550	218	440	3A	0.235
179	433	7A	0.410	219	442	1A	0.130
180	433	7B	0.450	220	442	3B	0.155
181	434	1	0.025	221	442	4B	1.090
182	434	2A	0.160	222	442	5	0.315

183	434	2B	0.095	223	443	1	0.100
184	434	2C	0.080	224	443	2	0.225
185	434	2D	0.180	225	443	3	0.365
186	434	2E	0.210	226	444	1A	0.790
187	434	4A	0.025	227	444	1B	0.690
188	434	4B	0.030	228	444	2	0.670
189	434	4C	0.170	229	445	1	0.005
190	434	5	0.255	230	445	3	0.285
191	434	6	0.285	231	445	4	0.370
192	435	1	1.910	232	445	5	0.115
193	437	1A	0.385	233	445	7	0.070
194	437	1B	0.325	234	445	8	0.745
195	437	2	1.550	235	445	9	0.695
196	438	2A	0.480	236	445	10	0.725
197	438	2B	0.495	237	445	11A	0.205
198	438	3A	0.280	238	445	11B	0.600
199	438	3B	0.285	239	446	1	0.115
200	438	4	0.880	240	446	2A	0.400

S.No	SF.No	Sub Div.No	Extent in Ha.	S.No	SF.No	Sub Div.No	Extent in Ha.
241	446	2B	0.285	281	454	1	0.010
242	446	3	0.275	282	454	3	0.375

243	446	4	0.830	283	454	4	0.455
244	446	5	0.455	284	454	5	0.425
245	446	6A	0.360	285	454	6	0.670
246	446	6B	0.215	286	455	1	0.755
247	446	8	0.115	287	455	3A	0.430
248	446	9A	0.140	288	455	3B	0.885
249	446	9B	0.240	289	456	3	0.510
250	447	1	0.710	290	456	4	0.230
251	447	2	1.210	291	456	5A	1.315
252	447	3	0.575	292	456	5B	0.130
253	447	5	0.005	293	457	1	0.040
254	447	6	0.065	294	457	3A	0.380
255	448	1	0.625	295	457	3B	0.470
256	448	2	0.810	296	457	3C	0.085
257	448	3	1.060	297	457	4A	0.430
258	449	2	0.460	298	457	4B	0.040
259	449	3A	0.465	299	457	5A	0.645
260	449	3B	0.495	300	457	5B	0.065
261	449	4	0.655			Total	132.005
262	449	5	0.520				
263	449	6	0.370				
264	449	7	0.150				

265	449	8	1.435				
266	450	1	1.555				
267	450	2	1.110				
268	451	1	0.680				
269	451	2	0.600				
270	451	3	0.990				
271	451	4	0.725				
272	451	7	0.120				
273	452	1	1.750				
274	452	3	0.370				
275	453	1	0.545				
276	453	2	0.405				
277	453	3	0.405				
278	453	7	0.095				
279	453	8	1.100				
280	453	9	0.935				

Village: T.Koppuchithampatti

S.No	SF.No	Sub Div.No	Extent in Ha.	S.No	SF.No	Sub Div.No	Extent in Ha.
1	468	1A	0.490	26	543	1A2	0.780
2	468	1B1	0.425	27	543	1B1	0.030
3	468	1B2	0.070	28	543	1B2	0.555

4	468	2	0.295	29	543	2B	0.260
5	468	3	0.135	30	543	3	1.625
6	468	4A	0.480	31	544	1A	0.060
7	468	4B	0.040	32	544	1B	2.785
8	468	5A	0.440	33	683	2	1.430
9	468	5B	0.015	34	683	3	1.360
10	538	3A	0.040	35	684	1	0.465
11	538	3B	0.810	36	684	2A	0.320
12	539	1B1	1.155	37	684	2B	0.620
13	539	1B2	0.010	38	684	3	0.255
14	540	2	1.180	39	684	4	0.425
15	540	3	0.605	40	684	5	0.465
16	540	4	1.585	41	684	6	0.235
17	541	1	1.37	42	684	7	0.240
18	541	2	1.240			Total	26.810
19	541	3A	1.480				
20	541	3B	0.375	Abstract			
21	541	3C	0.375				
22	542	1	0.370		Maravarperungudi		132.005
23	542	2	0.965		T.Koppuchithampatti		26.81
24	542	3	0.920		Grand Total		158.865
25	543	1A1	0.030				

A. STANDARD TERMS OF REFERENCE

- 1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.
- 2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.
- 3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.
- 4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
- 5) Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.
- 6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.
- 7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.
- 8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The

proposed safeguard measures in each case should also be provided.

- 9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.
- 10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
- 11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.
- 12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.
- 13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.
- 14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.
- 15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.
- 16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.
- 17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from

the Standing Committee of National Board of Wildlife and copy furnished.

- 18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.
- 19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.
- 20) Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).
- 21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.
- 22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The

location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.

- 23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.
- 24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.
- 25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.
- 26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
- 27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.
- 28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.
- 29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.
- 30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.

- 31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.
- 32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.
- 33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.
- 34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.
- 35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
- 36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
- 37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
- 38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the

proposed Project.

- 39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.
- 40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
- 41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
- 42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.
- 43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
- 44) Besides the above, the below mentioned general points are also to be followed:-
 - a) Executive Summary of the EIA/EMP Report
 - b) All documents to be properly referenced with index and continuous page numbering.
 - c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.
 - d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.
 - e) Where the documents provided are in a language other than English, an English translation should be provided.
 - f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.
 - g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.
 - h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.

- i) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environment Clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.
- j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

In addition to the above, the following shall be furnished:-

The Executive summary of the EIA/EMP report in about 8-10 pages should be prepared incorporating the information on following points:

1. Project name and location (Village, District, State, Industrial Estate (if applicable)).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
6. A detailed study of the lithology of the mining lease area shall be furnished.
7. Details of village map, "A" register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
12. The EIA study report shall include the surrounding mining activity, if any.
13. Modeling study for Air, Water and noise shall be carried out in this field and incremental

- increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
 15. A specific study on agriculture & livelihood shall be carried out and reported.
 16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
 17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of its acquisition, nearby (in 2-3 km.) water body, population, within 10km other industries, forest, eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
 18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
 19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
 20. Likely impact of the project on air, water, land, flora-fauna and nearby population
 21. Emergency preparedness plan in case of natural or in plant emergencies
 22. Issues raised during public hearing (if applicable) and response given
 23. CER plan with proposed expenditure.
 24. Occupational Health Measures
 25. Post project monitoring plan
 26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
 27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
 28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
 29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
 30. Reserve funds should be earmarked for proper closure plan.
 31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

Besides the above, the below mentioned general points should also be followed:-

- a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.
- b. All documents may be properly referenced with index, page numbers and continuous page numbering.
- c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.
- d. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF& CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.
- e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J -11013/77/2004-IA-II(I) dated 2nd December, 2009, 18th March 2010, 28th May 2010, 28th June 2010, 31st December 2010 & 30th September 2011 posted on the Ministry's website <http://www.moef.nic.in/> may be referred.
 - After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned points, the proponent will take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.
 - The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance.
 - The TORs with public hearing prescribed shall be **valid for a period of three years** from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.

Awarded TORs & their incorporation in EIA Report

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
I	Specific Terms of Reference for Mining of Minerals	
1	SEAC Conditions – Site Specific	
1.1	1. Cluster Management Committee (CMC) shall be constituted including all the mines in the cluster as Committee Members for the effective management of the mining operation in the cluster through systematic & scientific approach with appointment of statutory personnel, appropriate environmental monitoring, good maintenance of haul roads and village/panchayat roads, authorized blasting operation etc. The PP shall submit the following details in the form of an Affidavit during the EIA appraisal: (i) Copy of the agreement forming CMC. (ii) The Organisation chart of the Committee with defining the role of the members (iii) The 'Standard Operating Procedures' (SoP) executing the planned activities.	Not Applicable for this QL-III Lease.
	2. The Boundary pillars to be erected as per the mine rules and the evidence should be submitted along with the EIA report.	88
	3. Since waterbodies are situated nearby, the PP shall carry out the hydrological study including the details of waterflow pattern to determine the impacts of the mining operation in the waterbodies.	140-141
	4. The details of enumeration of structures including schools, colleges, primary health centres should be submitted along with the EIA report.	168-171
	5. The structures within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m & upto 1km shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc. and spell out the mitigation measures to be proposed for the protection of the above structures, if any during the quarrying operations.	91-92
	6. The proponent shall furnish photographs of adequate fencing, garland drainage built with siltation tank & green belt along the periphery including replantation of existing trees; maintaining the safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	85, 199
	7. The Proponent shall carry out Bio diversity study as a part of EIA study and the same shall be included in the Report.	151-162
	8. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.	201-211, 16

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
	9. The PP shall carry out the comprehensive studies on the cumulative environmental impacts of the existing & proposed quarries which included rock breakage, loading & hauling on the surrounding village and structures.	179
	10. The PP shall prepare a conceptual working plan accommodating the inclusion of haul road accessibility keeping the benches intact, by ensuring the slope stability of the working benches to be constructed and existing quarry wall.	The ultimate depth of mining is 3 m BGL with no Benches.. 99
	11. The PP shall install the CCTV camera for the continuous surveillance of mining activity & furnish the photographic/videographic evidence along with the EIA report.	Complied
2	SEAC Standard Conditions	
2.1	1. In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following: (i) Original pit dimension (ii) Quantity achieved Vs EC Approved Quantity (iii) Balance Quantity as per Mineable Reserve calculated. (iv) Mined out Depth as on date Vs EC Permitted depth (v) Details of illegal/illicit mining (vi) Violation in the quarry during the past working. (vii) Quantity of material mined out outside the mine lease area (viii) Condition of Safety zone/benches (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.	68 Fresh Lease 101 95 Nil Nil 95 85 96-99
	2. Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site.	91-92, 9-10
	3. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.	91-92
	4. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry.	140-141
	5. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be	151-162

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
	included in EIA Report.	
	6. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.	11-12
	7. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC.	Not Applicable; the ultimate depth of mining is 3 m BGL with no Benches.
	8. However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.	Not Applicable; the ultimate depth of mining is 3 m BGL.
	9. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent.	Not Applicable; no drilling & blasting is involved.
	10. The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.	Not Applicable; no drilling & blasting is involved.
	11. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.	73
	12. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines.	Not Applicable; new Quarry Lease
	13. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?	Not Applicable; new Quarry Lease
	14. Quantity of minerals mined out. · Highest production achieved in any one year · Detail of approved depth of mining. · Actual depth of the mining achieved earlier. · Name of the person already mined in that leases area.	Not Applicable; new Quarry Lease

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
	· If EC and CTO already obtained, the copy of the same shall be submitted. · Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.	
	15. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	78,88-89
	16. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.,	80
	17. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	79-80, 85
	18. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same.	95-105,180-194
	19. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.	73,196
	20. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.	Not Applicable Quarrying is proposed upto 3 m BGL and the working will not intersect groundwater.
	21. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.	106-178, 181-182
	22. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water	179-194,201-211

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
	pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	
	23. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	105
	24. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	104,150
	25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.	No OB/Waste Dumps. 85
	26. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable; Lease area is not falling in 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations.
	27. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	105, 188-189
	28. Impact on local transport infrastructure due to the Project should be indicated.	181-182
	29. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	152, 189-190
	30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	99
	31. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.	Complied.
	32. The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native	104

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
	origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.	
	33. Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner.	104, 189-190
	34. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	198-199
	35. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	197-199
	36. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	191-192
	37. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	191-192
	38. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	162-177, 190-191
	39. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation pending against the project.
	40. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	200
	41. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.	Not Applicable; new Lease proposed.

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
	42. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.	201-211, 16
	43. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.	No concealing any factual information or submission of false/fabricated data and failure to comply TOR conditions, as such.
3	SEIAA Specific Conditions	
3.1	The SEIAA noted that the subject was placed in the 538th meeting of SEAC held on 01.03.2025. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant Terms of Reference (ToR) along with Public Hearing for the quantity of 28,00,000 Ts of Lime Kankar and 20,00,000 Ts of Clay (BC soil) up to the depth of 3m BGL as per the approved mining plan, under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions & the conditions mentioned in Annexure of this minutes. 1. The PP should submit the original Land ownership document along with the EIA Report.	250-259
4	SEIAA Standard Conditions	
4.1	Cluster Management Committee - Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry. - The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc., - The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines. - Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network. - The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan. - The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in	Not Applicable for this QL-III Lease.-

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
	implementing the environmental policy devised shall be given in detail. 7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner. 8. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public in the vicinity.	
	Agriculture & Agro-Biodiversity 9. Impact on surrounding agricultural fields around the proposed mining Area. 10. Impact on soil flora & vegetation around the project site. 11. Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP. 12. The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem. 13. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services. 14. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.	189 180-181,189-190 190 No transplantation of any tree due to the Proposal. 189-190 201-202 189
	Forests 15. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife. 16. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna. 17. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection. 18. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.	No eco sensitive areas like National Parks, Wildlife Sanctuaries, Biosphere Reserves, Reserved Forests, Elephant Corridor, Mangroves, Archaeological/Historical Monuments, Heritage sites, etc. within 10 km from the site boundary. No transplantation of any tree due to the Proposal.
	Water Environment 19. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown	No ground water-table intersection.

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
	whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.	
	20. Erosion Control measures.	-
	21. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.	188-189
	22. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.	-
	23. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.	188
	24. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.	-
	25. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.	180-181
	26. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.	188-189
	27. The EIA shall include the impact of mining activity on the following: a) Hydrothermal/Geothermal effect due to destruction in the Environment. b) Bio-geochemical processes and its foot prints including environmental stress. c) Sediment geochemistry in the surface streams.	182
	Energy 28. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.	180-192
	Climate Change 29. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities. 30. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock, soil health and physical, chemical & biological soil features. 31. Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood.	182-183

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
	Mine Closure Plan 32. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.	99
	EMP 33. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued and the scope for achieving SDGs.. 34. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.	201-211 203
	Risk Assessment 35. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.	197-199
	Disaster Management Plan 36. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.	197-199
	Others 37. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc. 38. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan. 39. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.	9-10 To be complied after PH 202
I	Standard Terms of Reference for Mining of Minerals	
1.1	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into	Fresh Lease

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
	force, w.r.t. the highest production achieved prior to 1994.	
1.2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	Doc 4 250-259
1.3	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	Complied
1.4	All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/ Topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	78,88-89
1.5	Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	89-90
1.6	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	Docs-1-3; 235-249
1.7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.	70,73
1.8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	Quarrying is proposed upto 3 m BGL and the working will not intersect groundwater.
1.9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.	106-107
1.10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary,	104,150

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
	national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	
1.11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.	No OB/Waste Dumps. 85
1.12	A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	11-12
1.13	Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	Not Applicable
1.14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not Applicable
1.15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	Not Applicable
1.16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.	189 204-211
1.17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	No eco sensitive areas like National Parks, Wildlife Sanctuaries, Biosphere Reserves, Reserved Forests, Elephant Corridor, Mangroves, Archaeological/Historical Monuments, Heritage sites, etc. within 10 km from the site boundary.
1.18	A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the	151-162 204-211

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
	mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	
1.19	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable
1.20	Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not Applicable
1.21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need-based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.	No R&R.
1.22	One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and	Baseline Data Collection : Dec.2024-Feb.2025 (Winter 2024-25 Period) 106-178

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
	justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.	
1.23	Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	183-187
1.24	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.	105
1.25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Not Applicable
1.26	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	105,188-189
1.27	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	188-189
1.28	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.	No ground water intersection.
1.29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	85
1.30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.	68,96
1.31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear	190

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
	and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	
1.32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.	181-182
1.33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	103
1.34	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	96-99
1.35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	191-192
1.36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	191
1.37	Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	190-191
1.38	Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health	201-203

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
	impacts besides other impacts specific to the proposed Project.	
1.39	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	To be complied after PH
1.40	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation/pending case against the Proposal 85
1.41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	203
1.42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	198-199
1.43	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	200
1.44	Besides the above, the below mentioned general points are also to be followed:- a) Executive Summary of the EIA/EMP Report b) All documents to be properly referenced with index and continuous page numbering. c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated. d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project. e) Where the documents provided are in a language other than English, an English translation should be provided. f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted. g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed. h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised	212-227 Complied Complied Complied Complied Complied with. 14-15 Complied

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
	documentation. i) As per the circular no. J-11011/618/2010-IA.II (I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environment Clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable. j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.	Not Applicable Complied 96-99
I	In addition to the above, the following shall be furnished:- The Executive summary of the EIA/EMP report in about 8-10 pages should be prepared incorporating the information on following points: 1. Project name and location (Village, District, State, Industrial Estate (if applicable). 2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes. 3. Measures for mitigating the impact on the environment and mode of discharge or disposal. 4. Capital cost of the project, estimated time of completion. 5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity. 6. A detailed study of the lithology of the mining lease area shall be furnished. 7. Details of village map, "A" register and FMB sketch shall be furnished. 8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be shall be submitted along with EIA report. 9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report. 10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010. 11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas. 12. The EIA study report shall include the surrounding mining activity, if any.	212-227 212 222-224 222-227 227 221 217 214 216 216 Complied 212 220

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
	13. Modelling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.	222
	14. A study on the geological resources available shall be carried out and reported.	217
	15. A specific study on agriculture & livelihood shall be carried out and reported.	223
	16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.	223
	17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of is acquisition, nearby (in 2-3 km.) water body, population, with in 10km other industries, forest, eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)	212,217-220
	18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population	220
	19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.	224
	20. Likely impact of the project on air, water, land, flora-fauna and nearby population	222-224
	21. Emergency preparedness plan in case of natural or in plant emergencies	224
	22. Issues raised during public hearing (if applicable) and response given	To be complied after PH
	23. CER plan with proposed expenditure.	227
	24. Occupational Health Measures	226-227
	25. Post project monitoring plan	226
	26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.	Not Applicable. No Ground Water intersection
	27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.	224
	28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.	225-226
	29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.	226
	30. Reserve funds should be earmarked for proper closure plan.	227
	31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from	227

Sl. No.	Awarded TOR	Incorporation in EIA Report Page No.
	01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.	
II	Besides the above, the below mentioned general points should also be followed:- - A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided. - All documents may be properly referenced with index, page numbers and continuous page numbering. - Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated. - While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF & CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed. - The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J - 11013/77/2004- IA-II(I) dated 2nd December, 2009, 18th March 2010, 28th May 2010, 28th June 2010, 31st December 2010 & 30th September 2011 posted on the Ministry's website http://www.moef.nic.in/ may be referred. ➤ After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned points, the proponent will take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006. ➤ The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance. The TORs with public hearing prescribed shall be valid for a period of three years from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.	Complied 48-66 Complied Complied Complied 14-15 Complied 15

1.0 Introduction

1.1 Purpose of the Report

M/s. The Ramco Cements Limited (RCL) is operating their Ramasamy Raja Nagar (RR Nagar) Cement Plant with CPP & Township at Tulukkappatti, Thammanayakkanpatti & Vachchakkarappatti Villages, Virudhunagar Taluk & District, Tamil Nadu since Year 1961-62. The Plant is now being operated for Clinker production of 1.44 MTPA and Cement production of 2.70 MTPA of various grades. RCL is expanding RR Nagar Cement Plant with all 3 Lines and on expansion, Clinker production will be increased to 2.76 MTPA and Cement to 4.00 MTPA.

Cement Plant Limestone requirements are met from Captive Limestone Mines and Lime Kankar Quarries in Pandalgudi Region. Captive Limestone Mines are in operation since 1976 and Kankar Quarries since 2021-22. 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 Plant. **Lime Kankar Beneficiation Plant** (Throughput Capacity 2.0 MTPA) is also being operated at Pandalgudi. These Captive Mines and Pandalgudi Crusher & Beneficiation Plants are connected with **own Tar Road (40+10 km) for transportation of the Minerals.**

RCL has proposed Maravarperungudi Lime Kankar Quarry Lease-III for Quarrying of Lime Kankar & Clay (Black Cotton Soil) over an Extent of 158.865 Ha at Maravarperungudi and T.Koppuchithampatti Villages, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu. The entire area **is patta land owned by RCL.** As assessed, Mineable Reserves of Lime Kankar is 30,71,388 Tonnes and Mineable Reserves of Clay (Black Cotton Soil) is 23,45,385 Tonnes.

Precise Area Communication has been issued by Industries (MMC.2) Department, Govt. of Tamil Nadu vide Letter No. 2171/MMC.2/2018-1 dated 02.04.2018 for a period of 10 years. Initial Mining Plan was approved by the Additional Director of Mining & Geology, Chennai vide Letter No. 583/MM10/2018/LK/Vnr. dated 08.06.2018 for Kankar ROM production of 6,00,050 Tonnes per Annum (TPA) & Clay (Black Cotton-BC Soil) @ 30,000 TPA. **Modified Mining Plan approval** by the Joint Director of Geology & Mining, Chennai vide Letter Rc.No.583/MM7/2018 dated 07.01.2025 for initial 5 Years.

Mechanized **Non-Conventional Opencast Mining, without Drilling and Blasting**, will be adopted. The deposit will be quarried by a simple system using Excavators & Dozers-Tippers combination. The total depth of the quarrying will be to a maximum of **3.0 m BGL** only. **Ore:Waste Ratio works out to be 1:0.029. Life of the Lease is 10 Years.** As ground water-table fluctuates between 12-15 m BGL in the vicinity, **no ground water-table intersection** due to the quarrying. The quarried Lime Kankar will be transported by 25 T Tarus Tippers to Pandalgudi Lime Kankar Beneficiation Plant and Clay (BCS) to RR Nagar Plant for utilizing as corrective material in Cement manufacturing.

Quarry Lease Profile :

Mineable Reserves	:	Lime Kankar - 30,71,388 Tonnes Clay (BC Soil) - 23,45,385 Tonnes
Proposed Production	:	Lime Kankar - 1.00 MTPA (maximum) Clay (BC Soil) - 1.00 MTPA (maximum)
Ore : OB Ratio	:	1: 0.029
Bench Height & Width	:	- (No benches)
Life of the QL	:	10 years
No. of working days/annum	:	300 (2 shifts)
Ultimate Pit Limit-Conceptual	:	3.0 m (BGL)
Ground Water-table at	:	Pre monsoon - 15 m BGL & Post monsoon - 12 m BGL

Quarrying activities will not intersect the ground water-table.

Quarry Lease-III location falls in Survey of India Topo Sheet No.58K/3 and is located between North Latitudes **9°23'22.30" - 9°24'05.25"** and East Longitudes **78°09'06.02"E to 78°10'42.63"E**. There are **no eco sensitive areas** like National Parks, Wildlife Sanctuaries, Biosphere Reserves, Reserved Forests, Elephant Corridor, Mangroves, Archaeological/Historical Monuments, Heritage sites, etc. **within 10 km from the site boundary**.

The Lime Kankar & Clay to be mined out from this Quarry are **Minor Minerals over an extent of 158.865 Ha (<250 Ha)** and falls in **Category 'B1'** of Sl. No. 1(a) of EIA Notification 2006, as amended, for prior EC from State Level Environmental Impact Assessment Authority (SEIAA), Tamil Nadu. Accordingly, TOR Application has been submitted by RCL vide Parivesh Online proposal No. SIA/TN/MIN/522992/2025 dated 07.02.2025 and after paying Online Scrutiny Fees, the File has been accepted by SEIAA on 01.03.2025. The Proposal was deliberated by SEAC-TN in its 538th Meeting held on 01.03.2025 and SEIAA-TN in its Meeting held on 01.04.2025. TOR has been awarded vide Identification No. TO25B0108TN5802389N dated 07.04.2025 under **File No. 11826/2025**, with Public Hearing.

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 (**NABET**) vide Certificate NABET/EIA/2225/RA0290 dated 11.06.2023 with validity till 16.11.2025 (Sl. No. 4 of List). ABC Laboratory is accredited by the National Accreditation Board for Testing & Calibration Laboratories (**NABL**) vide Certificate No. TC-5770 dated 03.04.2024 - valid till 02.04.2026. Baseline Data (BLD) has been collected during **Dec. 2024-Feb. 2025 (Winter Season)** for Environmental Impact Assessment (EIA) Study in compliance with MoEF&CC Office Memorandum No. J-11013/41/2006-IA-II(I)(Part) dated 29.08.2017. Draft EIA Report has been prepared in compliance with awarded TORs and submitted along with Summary EIA Reports (both in English and Tamil versions) for Public Consultation & Public Hearing.

1.2 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), under RAMCO Group, 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.
- ❖ Mathod 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.

1.3 Environmental Policy

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

1.4 Identification of the Project

1.4.1 Ramasamy Raja Nagar Cement Plant

RCL is operating their Ramasamy Raja Nagar (RR Nagar) Cement Plant with CPP & Township over an extent of 191.434 Ha in Tulukkappatti, Thammanayakkanpatti and Vachchakkarappatti Villages, Virudhunagar Taluk & District, Tamil Nadu State since Year 1961-62. The Plant is now being operated for Clinker production of 1.44 MTPA and Cement production of 2.70 MTPA of various grades. RCL is operating a 25 MW Captive Thermal Power Plant (CPP) since 2012. 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.

RCL intends to expand RR Nagar Cement Plant with inclusion of revamped Old Line-II operations to existing Lines I & III. On expansion, production of Clinker will be from 1.44 MTPA to 2.76 MTPA and Cement from 2.70 MTPA to 4.00 MTPA (**Table 1.1**).

Table : 1.1 RR Nagar Cement Plant Production

Production of	Statutory Approvals	Production, MTPA		
		Existing	Proposed	Total
Clinker	MoEF&CC EC Identification No. EC21A009TN169325 dated 25.10.2021. TNPCB CTO-Renew Orders 2508165231273 (Water Act) & 2508265231273 (Air Act) dated 07.04.2025 - valid till 31.03.2030	1.44	1.32	2.76
Imported Clinker from RCL Sister Units		0.50	0	0.50
Cement		2.70	1.30	4.00

1.4.2 Captive Mines & Quarries

Cement Plant Limestone requirements are met from Captive Limestone Mines and Lime Kankar Quarries in Pandalgudi Region. Limestone Mines are in operation since 1976 and Kankar Quarries since 2021-22. EC & Consented production quantity from the Limestone Mines is about **2.721 MTPA** (Low to High Grade) and Lime Kankar production is **3.914 MTPA** (Tables 1.2 & 1.3).

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. The **Lime Kankar Beneficiation Plant** (Throughput Capacity 2.0 MTPA-EC vide EC22B007TN152869 dated 20.12.2022 & CTO 2304151092191 (Water Act) & 2304251092191 (Air Act) dated 10.08.2023 with validity till 31.03.2028 - is also being operated at Pandalgudi (adjacent to Crusher) which is now proposed to be expanded.

These Captive Mines and Pandalgudi Crusher & Beneficiation Plants are connected with **own Tar Road (40+10 km) for transportation of the Minerals (Plate-I)**. 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 traffic impact on Public Transport System. There are **465 Direct Employees & about 600 Contract Workers** are working in the Cement Complex. The **Organisation Chart of RR Nagar Cement Plant** is appended.



The Contact Information of RR Nagar Cement Plant is as follows :

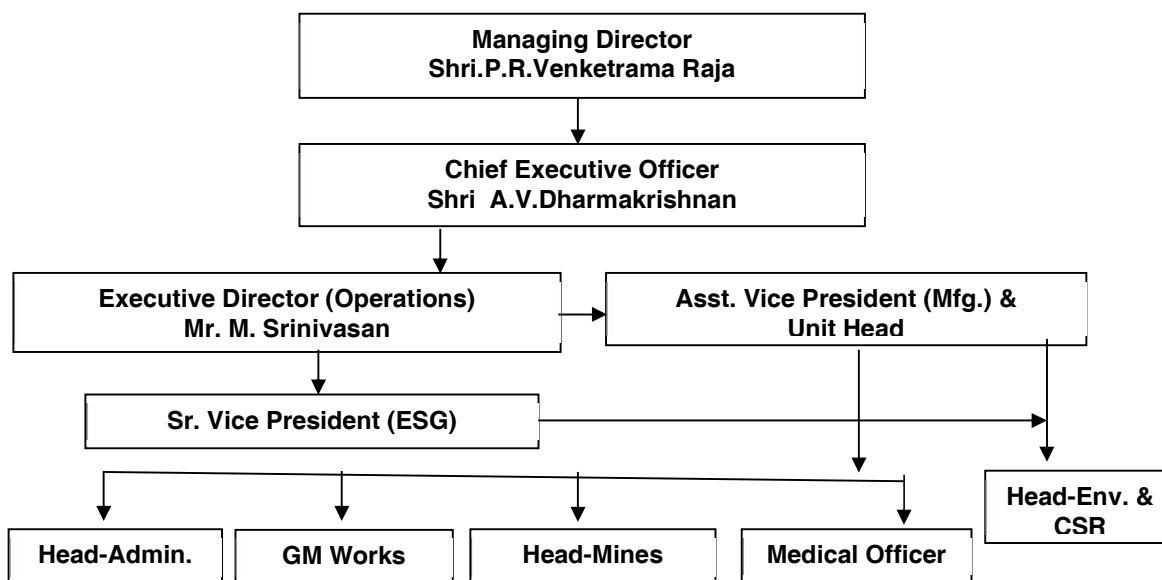
Mr.S.Lakshmanan,
Asst. Vice President (Mfg.),
 The Ramco Cements Limited,
 Ramasamy Raja Nagar Post,
 Virudhunagar District,
 Tamil Nadu-626 204.
 Tel. Nos. : 04562-256201 to 256203
 Fax : 04562-256268.

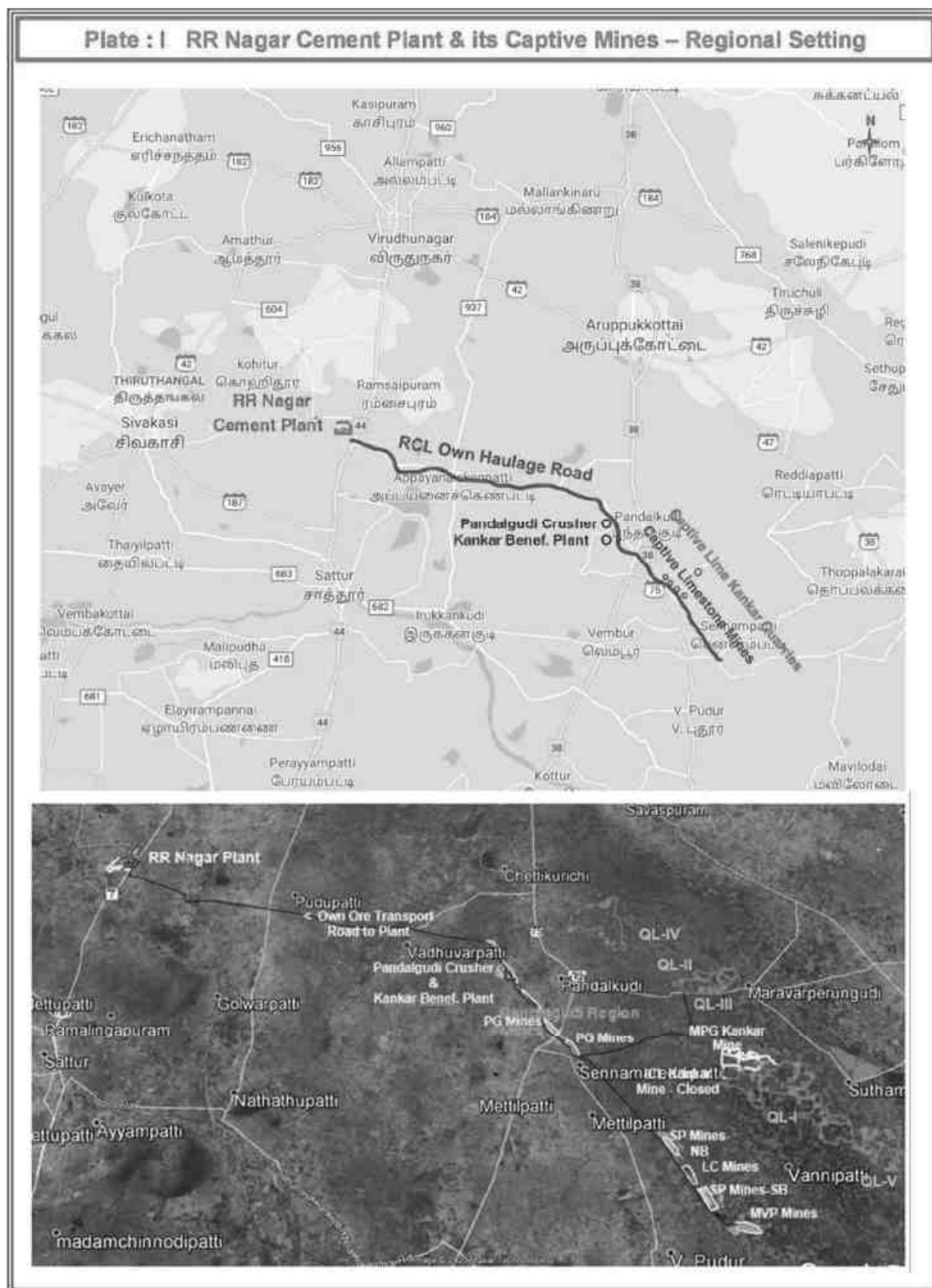
Table : 1.2 Captive Limestone Mines and their Production

Sl. No.	RCL Mines & (Mineral)	GO No. & Validity	Extent, Ha	Mineable Reserves as on 01.04.2024, Million Tonnes	Production Qty., MTPA	EC Reference	TNPCC 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	0.240	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	2.721	-	-

Table : 1.3 Captive Lime Kankar Quarry Leases and their Production

Sl. No.	RCL Quarry	GO No. & Validity	Extent, Ha	Mineable Reserves as on 01.04.2024, Million Tonnes	Prodn. Qty., MTPA	EC Reference	TNPCCB CTOs Order Reference
1	Maravar-perungudi QL-I	GO (2D) No. 4 dt. 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	Maravar-perungudi QL-II-Conc. Stage	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	Maravar-perungudi QL-III	-	158.865	3.071	(1.00 + Clay 1.00)	TOR awarded	Proposed now
4	Koppuchi-thampatti QL-IV	GO(2D)No. 6 dt 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	-	-

Organization Chart



1.5 Need for the Project

Lime Kankar is a corrective material to increase R_2O_3 content of total raw mix quality in Cement Plant. Kankar contains 68-72% Total Carbonate. Consequent to the use of pet coke/imported coal as fuel, the quality requirement by the Plant was brought down and provided avenue for adding more low-grade materials, particularly the Lime Kankar. Presently, RCL is using 40-45% of Lime Kankar in the Raw Mix. RCL has also proposed to increase the present clinker production capacity of RR Nagar Cement Plant from 1.44 MTPA to 2.76 MTPA for which, it is necessary to supply the required raw materials Limestone & Lime Kankar from the existing /proposed Leases.

Lime Kankar Beneficiation Plant has been established at Pandalgudi and ROM Lime Kankar from various Leases is being beneficiated and enhanced the quality of Lime Kankar material. However, the required content of $Al_2O_3\%$ & $Fe_2O_3\%$ in Lime Kankar is reduced due to the beneficiation. In order to meet the quality requirement of Clinkerisation process, it is proposed to utilize the chemical constituents of $Al_2O_3\%$ & $Fe_2O_3\%$ which is comparatively more in Clay (Black Cotton Soil) and hence it would act as an additive/ flux in Clinkerisation process. Accordingly, RCL has proposed **Maravarperungudi Lime Kankar Quarry Lease (QL)-III**.

1.6 Discussion of District Survey Report

District Survey Report (DSR) for Lime Kankar and Clay (Others) of Virudhunagar District are submitted to SEIAA-TN.

Demand-Supply Gap : As per DSR Report of Virudhunagar District, Lime Kankar production was 4.85 Lakh Tons against the demand of 7.90 Lakh Tons during 2015-16, 7.12 Lakh Tons against the demand of 8.80 Lakh Tons during 2016-17 and 10.3 Lakh Tons against the demand of 7.90 Lakh Tons during 2017-18. With closure of ICL Quarries, RCL is the only Lease Holder for the production of Lime Kankar in the District. Likewise, Clay production was 0.30 Lakh Tons against the demand of 0.47 Lakh Tons during 2015-16, 0.40 Lakh Tons against the demand of 0.47 Lakh Tons during 2016-17 and 0.20 Lakh Tons against the demand of 0.47 Lakh Tons during 2017-18. RCL is the only Lease Holder for the production of Clay (Others) in the District.

Import vs Indigenous Production : There is no import proposal for Lime Kankar & Clay minerals. Existing quarries will supply the required quantities as approved.

Export Possibility : There is no export proposal for Lime Kankar & Clay minerals.

Domestic /Export Markets : The minerals Lime Kankar & Clay (BCS) will be utilized for cement manufacture as a captive raw material source for all 3 cement plants located at RR Nagar in Virudhunagar District, Alathiyur & Govindapuram in Ariyalur District based on the requirement.

1.7 Maravarperungudi Lime Kankar Quarry Lease (QL)-III

RCL has proposed **Maravarperungudi Lime Kankar Quarry Lease (QL)-III** over an extent of **158.865 Ha** for quarrying the Minor Minerals **Lime Kankar & Clay (Black Cotton Soil)** at S.F Nos. Parts of 100, 101, 103, 109, 119 to 132, 137 to 141, 404, 407 to 413, 415 to 416, 418, 429, 431 to 435, 437 to 440 & 442 to 457 of Maravarperungudi and Parts of 468, 538 to 544, 683 & 684 of (Therku) T.Koppuchithampatti villages, Aruppukottai Taluk in Virudhunagar District, Tamil Nadu (**Fig. 1.1**). The entire area is **patta land owned by RCL**. There is no Forest/Govt. Land involved. Lease area superimposed in Google Earth Imagery is given as **Plate II** and QL Area Photographs & **Drone Video views** are given as **Plates III-IV**.

Statutory Approvals : Precise Area Communication has been issued by Industries (MMC.2) Department, Govt. of Tamil Nadu vide Letter No. 2171/MMC.2/2018-1 dated 02.04.2018 for a period of 10 years (**Document-1**).

Initial **Mining Plan** was approved by the Additional Director of Geology & Mining, Chennai vide Letter No. 583/MM10/2018/LK/Vnr. dated 08.06.2018 for Kankar ROM production of 6,00,050 Tonnes per Annum (TPA) & Clay (Black Cotton-BC Soil) @ 30,000 TPA (**Document-2**). Depending on raw materials quantity & quality required, it is proposed to quarry both Lime Kankar @ 1.00 Million Tonnes per Annum (MTPA) & Clay (BC Soil) @ 1.00 MTPA, maximum, from this Quarry. Accordingly, the **Modified Mining Plan approval** by the Joint Director of Geology & Mining, Chennai vide Letter Rc.No.583/MM7/2018 dated 07.01.2025 for initial 5 Years (**Document-3**).

RCL has own Patta Lands in Maravarperungudi Village vide Patta No. 1179 for 607.41.30 Ha & Patta No. 1317 for 25.64.50 Ha and in Therku (T) Koppuchithampatti Village vide Patta No. 2241 for 435.41.87 Ha, Patta No. 2870 for 81.10.00 Ha & Patta No. 4127 for 17.49.00 Ha. Also, some of ICL Lands are exchanged with RCL Lands and registered. Some of the Patta copies are annexed as **Document-4**. With Precise Area Notification and approved Mining Plan for the Lease, **RCL has to apply and obtain the Environmental Clearance** for Grant of Quarry Lease and its execution. On obtaining EC from SEIAA-TN, RCL will also apply and obtain the Consents to Establish (CTEs) and Consents to Operate (CTOs) from TNPCB for the Quarry operations. It will take one year from the date of award of ECs to comply these statutory requirements.

Cluster Approach : RCL's existing Maravarperungudi QL-II shares the southern and eastern boundaries with proposed Maravarperungudi QL-III. RCL is the Lessee for both QLs II & III, QL-III is now 'B1' Category Project going for **separate Public Hearing & EC**, thus, **no requirement of Cluster Committee**. As stated by the Joint Director/AD (i/c), Geology and Mining Department, Virudhunagar District in Letter Rc. No. KV1/14267/2016 dated 01.11.2019, **RCL has not started any activity in QL-III** and there is no violation of any Norms, as such. Excerpts of DSRs for Lime Kankar and Clay (Others) of Virudhunagar District are attached as **Document-5**.



Plate : II QL-III in Google Earth Imagery

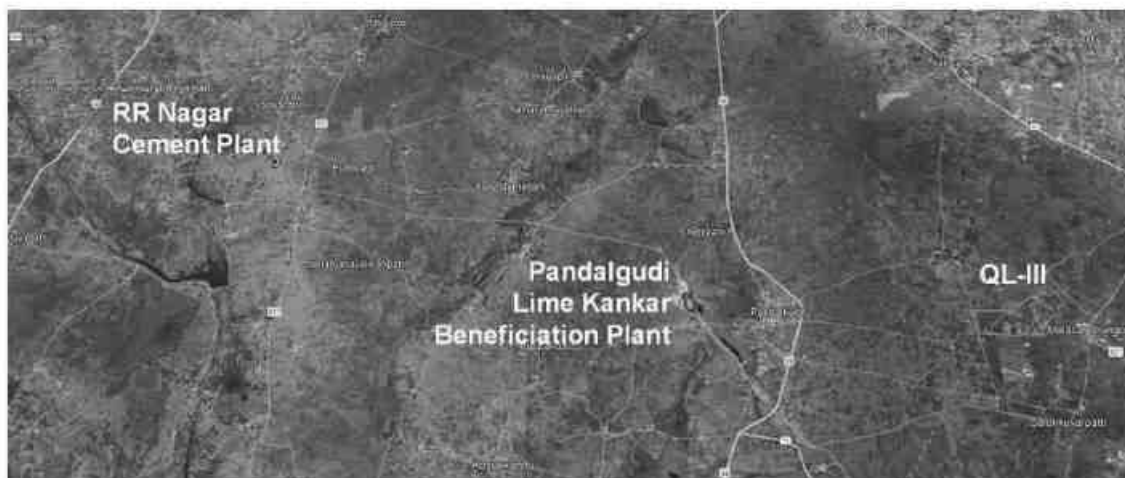




Plate : IV QL Area (Drone) Photographs



1.8 Site Profile

Lease FMB Sketch is given as **Plate-1**. QL-III Lease area of **158.865 Ha** falls in SF Nos. 100/9, 100/10, 101/1, 101/2, 101/3, 103/3, 103/4, 109/7, 109/8A, 109/8B, 109/9, 109/10A, 109/10B, 119/3(part), 120/1, 120/2A, 120/2B, 120/3, 120/4, 121/1A, 121/2, 121/3, 121/4, 121/5, 121/6, 121/7, 121/1B, 122/1, 122/2, 122/4, 123/1, 123/2, 124/1, 124/2, 124/3, 124/4, 124/5, 124/6, 124/7, 124/8, 124/9, 125/1A, 125/1B, 125/1C, 125/2, 125/5, 125/6, 126/1, 126/3, 126/4, 126/5, 126/7A, 126/7B, 126/8, 126/9, 126/10, 127/1, 127/2, 127/3, 127/5, 127/6, 127/7, 127/8, 127/9, 127/10, 127/11, 128/1A, 128/1B, 128/2A, 128/2B, 128/4, 128/5, 129/2, 129/4, 129/5A, 129/5B, 130/1, 130/2, 130/3, 130/4, 130/6, 130/7, 130/8, 130/9, 130/10, 130/11, 131/1B, 131/2B, 131/2C, 131/2D, 131/2E, 131/3, 132/1A, 132/1B, 132/1C, 132/2, 132/3, 132/4, 137/3, 137/4, 138/1, 138/2A, 138/3A, 138/4A, 138/5A, 139/1, 139/3A, 139/3B, 140/1, 140/3A, 140/3B, 140/3C, 140/4, 140/5, 141/1, 141/2, 404/1A, 404/1B, 407/2, 407/3, 407/4, 407/5, 407/6A, 407/6B, 408/3, 409/1B, 410/4, 410/5, 411/1A, 411/1B, 411/2A, 411/3, 411/4, 411/5, 412/1, 412/2, 413/3, 413/4, 415/1, 415/2, 415/3, 416/1, 416/2, 416/3, 416/4, 416/8, 416/9, 416/10, 418/1, 418/2, 418/6, 429/1, 429/2, 431/1, 431/4, 431/5, 431/6, 431/7A, 431/7B, 431/8, 431/9, 432/1, 432/2, 432/3, 432/4, 432/5, 432/6, 432/7, 432/8, 433/1A, 433/1B, 433/1C, 433/2, 433/3, 433/4, 433/5A, 433/5B, 433/6, 433/7A, 433/7B, 434/1, 434/2A, 434/2B, 434/2C, 434/2D, 434/2E, 434/4A, 434/4B, 434/4C, 434/5, 434/6, 435/1, 437/1A, 437/1B, 437/2, 438/2A, 438/2B, 438/3A, 438/3B, 438/4, 438/5A, 438/5B, 439/1A, 439/1B, 439/1C, 439/2A, 439/2B, 439/2C, 439/3A, 439/3B, 439/3C, 439/4A, 439/4B, 439/5A, 439/5B, 440/1A, 440/2A, 440/3A, 442/1A, 442/3B, 442/4B, 442/5, 443/1, 443/2, 443/3, 444/1A, 444/1B, 444/2, 445/1, 445/3, 445/4, 445/5, 445/7, 445/8, 445/9, 445/10, 445/11A, 445/11B, 446/1, 446/2A, 446/2B, 446/3, 446/4, 446/5, 466/6A, 446/6B, 446/8, 446/9A, 446/9B, 447/1, 447/2, 447/3, 447/5, 447/6, 448/1, 448/2, 448/3, 449/2, 449/3A, 449/3B, 449/4, 449/5, 449/6, 449/7, 449/8, 450/1, 450/2, 451/1, 451/2, 451/3, 451/4, 451/7, 452/1, 452/3, 453/1, 453/2, 453/3, 453/7, 453/8, 453/9, 454/1, 454/3, 454/4, 454/5, 454/6, 455/1, 455/3A, 455/3B, 456/3, 456/4, 456/5A, 456/5B, 457/1, 457/3A, 457/3B, 457/3C, 457/4A, 457/4B, 457/5A, 457/5B of **Maravarperungudi village (132.055 Ha)** & 468/1A, 468/1B1, 468/1B2, 468/2, 468/3, 468/4A, 468/4B, 468/5A, 468/5B, 538/3A, 538/3B, 539/1B1, 539/1B2, 540/2, 540/3, 540/4, 541/1, 541/2, 541/3A, 541/3B, 541/3C, 542/1, 542/2, 542/3, 543/1A1, 543/1A2, 543/1B1, 543/1B2, 543/2B, 543/3, 544/1A, 544/1B, 683/2, 683/3, 684/1, 684/2A, 684/2B, 684/3, 684/4, 684/5, 684/6, 684/7 of **T.Koppuchithampatti village (26.810 Ha)** in Aruppukottai Taluk, Virudhunagar District, Tamil Nadu (**Table 1.4**).

Accessibility : Pandalgudi is located at a distance of 4.3 km (W) from the Lease. A black top road from Pandalgudi connects the area by a road distance of 7.0 km. Madurai-Thoothukudi Section of NH-38 passes at a distance of 4.1 km in the West. Southern Railway Line of Virudhunagar-Aruppukottai-Manamathurai Section runs at 15.5 km distance in NNW from the Lease. Madurai Airport is at 48 km (NNW) & VOC Port-Thoothukudi is at 70 km (S).

QL-III is at 7 km from Pandalgudi Beneficiation Plant and 25 km from RR Nagar Cement Plant.

Survey No.	Sub Division	Extent, Ha	Survey No.	Sub Division	Extent, Ha	Survey No.	Sub Division	Extent, Ha
Maravarperungudi			124	8	0.430	130	4	0.145
100	9	0.225	124	9	0.400	130	6	0.020
100	10	0.180	125	1A	0.420	130	7	0.090
101	1	0.485	125	1B	0.520	130	8	0.395
101	2	1.475	125	1C	0.910	130	9	0.350
101	3	0.430	125	2	0.190	130	10	0.230
103	3	1.330	125	5	0.300	130	11	0.105
103	4	2.610	125	6	0.105	131	1B	2.185
109	7	0.010	126	1	0.070	131	2B	0.665
109	8A	0.035	126	3	0.065	131	2C	0.760
109	8B	0.120	126	4	0.055	131	2D	0.745
109	9	0.270	126	5	0.035	131	2E	0.180
109	10A	0.490	126	7A	0.750	131	3	0.180
109	10B	1.255	126	7B	0.760	132	1A	0.030
119	3 (part)	1.820	126	8	0.005	132	1B	0.825
120	1	0.560	126	9	0.025	132	1C	0.740
120	2A	0.230	126	10	0.550	132	2	0.135
120	2B	0.270	127	1	0.005	132	3	0.160
120	3	0.370	127	2	0.055	132	4	0.875
120	4	1.030	127	3	0.160	137	3	0.395
121	1A	0.155	127	5	0.310	137	4	0.420
121	2	0.265	127	6	0.305	138	1	1.215
121	3	0.285	127	7	0.310	138	2A	0.355
121	4	0.225	127	8	0.310	138	3A	0.205
121	5	1.090	127	9	0.775	138	4A	0.120
121	6	0.140	127	10	0.650	138	5A	0.470
121	7	0.415	127	11	0.340	139	1	0.295
121	1B	0.070	128	1A	0.830	139	3A	1.230
122	1	0.150	128	1B	0.830	139	3B	0.150
122	2	0.165	128	2A	0.570	140	1	0.585
122	4	0.490	128	2B	0.510	140	3A	0.255
123	1	0.595	128	4	0.030	140	3B	0.205
123	2	0.800	128	5	0.865	140	3C	0.370
124	1	0.585	129	2	0.080	140	4	1.120
124	2	0.135	129	4	0.440	140	5	0.795
124	3	0.280	129	5A	0.260	141	1	0.395
124	4	0.145	129	5B	1.075	141	2	0.815
124	5	0.290	130	1	0.170	404	1A	0.880
124	6	0.310	130	2	0.140	404	1B	0.015
124	7	0.445	130	3	0.190	407	2	0.740
Continued								

Survey No.	Sub Division	Extent, Ha	Survey No.	Sub Division	Extent, Ha	Survey No.	Sub Division	Extent, Ha
Maravarperungudi			431	7B	0.380	438	3B	0.285
407	3	0.005	431	8	0.390	438	4	0.880
407	4	0.040	431	9	0.200	438	5A	0.505
407	5	0.145	432	1	0.110	438	5B	0.315
407	6A	0.765	432	2	0.720	439	1A	0.260
407	6B	0.070	432	3	0.835	439	1B	0.035
408	3	0.755	432	4	0.265	439	1C	0.020
409	1B	0.950	432	5	0.250	439	2A	0.130
410	4	0.740	432	6	0.425	439	2B	0.020
410	5	0.750	432	7	0.170	439	2C	0.005
411	1A	0.120	432	8	0.195	439	3A	0.115
411	1B	0.115	433	1A	0.110	439	3B	0.020
411	2A	0.330	433	1B	0.115	439	3C	0.005
411	3	0.220	433	1C	0.230	439	4A	0.590
411	4	0.200	433	2	0.170	439	4B	0.065
411	5	0.215	433	3	0.310	439	5A	0.505
412	1	2.475	433	4	0.395	439	5B	0.030
412	2	0.590	433	5A	0.060	440	1A	0.340
413	3	0.820	433	5B	0.140	440	2A	0.465
413	4	0.895	433	6	0.550	440	3A	0.235
415	1	0.900	433	7A	0.410	442	1A	0.130
415	2	0.300	433	7B	0.450	442	3B	0.155
415	3	0.330	434	1	0.025	442	4B	1.090
416	1	0.160	434	2A	0.160	442	5	0.315
416	2	0.145	434	2B	0.095	443	1	0.100
416	3	0.185	434	2C	0.080	443	2	0.225
416	4	0.170	434	2D	0.180	443	3	0.365
416	8	0.170	434	2E	0.210	444	1A	0.790
416	9	0.210	434	4A	0.025	444	1B	0.690
416	10	0.480	434	4B	0.030	444	2	0.670
418	1	0.500	434	4C	0.170	445	1	0.005
418	2	0.285	434	5	0.255	445	3	0.285
418	6	0.220	434	6	0.285	445	4	0.370
429	1	0.030	435	1	1.910	445	5	0.115
429	2	0.185	437	1A	0.385	445	7	0.070
431	1	0.275	437	1B	0.325	445	8	0.745
431	4	0.735	437	2	1.550	445	9	0.695
431	5	0.985	438	2A	0.480	445	10	0.725
431	6	0.245	438	2B	0.495	445	11A	0.205
431	7A	0.690	438	3A	0.280	445	11B	0.600
Continued								

Survey No.	Sub Division	Extent, Ha	Survey No.	Sub Division	Extent, Ha	Survey No.	Sub Division	Extent, Ha	
Maravarperungudi									
446	1	0.115	453	7	0.095	540	3	0.605	
446	2A	0.400	453	8	1.100	540	4	1.585	
446	2B	0.285	453	9	0.935	541	1	1.37	
446	3	0.275	454	1	0.010	541	2	1.240	
446	4	0.830	454	3	0.375	541	3A	1.480	
446	5	0.455	454	4	0.455	541	3B	0.375	
446	6A	0.360	454	5	0.425	541	3C	0.375	
446	6B	0.215	454	6	0.670	542	1	0.370	
446	8	0.115	455	1	0.775	542	2	0.965	
446	9A	0.140	455	3A	0.430	542	3	0.920	
446	9B	0.240	455	3B	0.885	543	1A1	0.030	
447	1	0.710	456	3	0.510	543	1A2	0.780	
447	2	1.210	456	4	0.230	543	1B1	0.030	
447	3	0.575	456	5A	1.315	543	1B2	0.555	
447	5	0.005	456	5B	0.130	543	2B	0.260	
447	6	0.065	457	1	0.040	543	3	1.625	
448	1	0.625	457	3A	0.380	544	1A	0.060	
448	2	0.810	457	3B	0.470	544	1B	2.785	
448	3	1.060	457	3C	0.085	683	2	1.430	
449	2	0.460	457	4A	0.430	683	3	1.360	
449	3A	0.465	457	4B	0.040	684	1	0.465	
449	3B	0.495	457	5A	0.645	684	2A	0.320	
449	4	0.655	457	5B	0.065	684	2B	0.620	
449	5	0.520	Sub Total			132.055	684	3	0.255
449	6	0.370	T.Koppuchithampatti			684	4	0.425	
449	7	0.150	468	1A	0.490	684	5	0.465	
449	8	1.435	468	1B1	0.425	684	6	0.235	
450	1	1.555	468	1B2	0.070	684	7	0.240	
450	2	1.110	468	2	0.295	Sub Total		26.810	
451	1	0.680	468	3	0.135				
451	2	0.600	468	4A	0.480				
451	3	0.990	468	4B	0.040				
451	4	0.725	468	5A	0.440				
451	7	0.120	468	5B	0.015				
452	1	1.750	538	3A	0.040				
452	3	0.370	538	3B	0.810				
453	1	0.545	539	1B1	1.155				
453	2	0.405	539	1B2	0.010				
453	3	0.405	540	2	1.180				
Total Extent								158.865	

There is **no habitation within 300 m radius area** of the Leases. VAO Certificates are submitted as **Documents I & II**. There is **no Forest Land involved and no Reserved Forest (RF) exists within 1 km** of Lease Area and nearest Forest Area is at 22 km from QL-III. In this regard, the Principal Chief Conservator of Forests, Chennai Letters WL5(A)/44455/2019 dated 13.01.2021 and submitted as **Document-III**. Now, adjacent Maravarperungudi Quarry Lease-II was already quarried out and **there is no other Quarry within 500 m radius area. Cluster Approach & Cluster Committee are not applicable** to the Proposal (**Document-IV**).

As per DTCP, the site falls in '**Non-Planned Zone**'. The **current land use** of QL-III area is predominantly rainfed (seasonal) dry crop & undeveloped/barren land. There is **no Rehabilitation & Resettlement (R&R)** issue. Also, there is **no litigation/pending case** against the Proposal.

Water Courses : The area is almost flat and plain terrain with a gentle slope towards south east. The **seasonal Uppu Odai** drains the area. There are **3 Nos. Seasonal First & Second order streams flows** through the QL Area and join Uppu Odai in the east. Another Seasonal Nalla flows in the southern boundary of the Lease Area. As per PAC, **safety barrier of 50 meters on either side of streams/odais are provided** and their flows will be maintained as such till the **Conceptual Stage**.

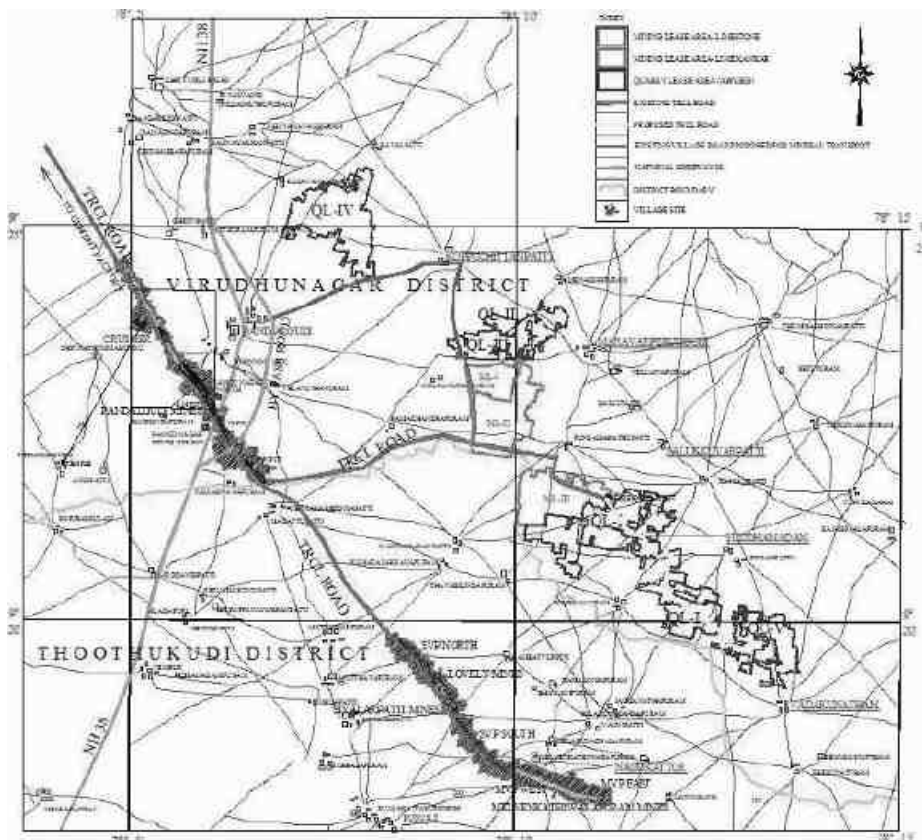
Non-Lease Lands : QL Area has been divided into 7 Blocks for effective Quarrying. There are **Non Lease Area Blocks** and **Access and right of way has been provided to these lands** through existing cart tracks/roads.

Safety barriers are also provided as per condition of PAC. In the total QL area of 158.865 Ha, about **111.685 Ha is only available for effective quarrying** after leaving the prescribed **safety barriers of about 47.180 Ha** as detailed below :

- ✓ A safety distance of 7.5 m provided to the adjoining patta lands situated in and around the area in order not to have any disturbance to the adjacent patta and agricultural lands. Approach to the intervening patta lands has been proposed and same shall be maintained till the life of the mine.
- ✓ Stipulated safety distance of 50 m on either side of water bodies like Odai, vari and 10 meters on either side of cart track and 50 meters on either sides of the LT Power line.

Other Minerals/Sand : It is proposed to quarry only Lime Kankar and Clay (Black Cotton Soil). If any mineral is discovered while quarrying, **RCL will not mine or dispose of such mineral and will intimate** to Government immediately about the discovery of such new mineral(s) as per Rule 36 (3) of the Tamil Nadu Minor Mineral Concession Rules, 1959.

Transport Route : RCL has already formed and maintained **own haulage (black topped) road** from Existing Kankar mine to Pandalgudi Beneficiation Plant. The same road will be extended to this lease area for transportation of minerals (**Plate V**).

Plate : V Minerals Transport Route

1.9 The Proposal

As assessed, Geological Reserves of Lime Kankar in the Lease is 43,68,788 Tonnes (4.369 Million Tonnes) and Mineable Reserves is 30,71,388 Tonnes (3.071 Million Tonnes). Geological Reserves of Clay (Black Cotton Soil) is 33,36,165 Tonnes (3.336 Million Tonnes) and Mineable Reserves is 23,45,385 Tonnes (2.345 Million Tonnes).

Mechanized **Non-Conventional Opencast Mining, without Drilling and Blasting** will be adopted. The deposit will be quarried by a simple system using Excavators & Dozers-Tippers combination. During the first Plan Period, 28,00,000 Tonnes of Lime Kankar as ROM @ 1.0 MTPA (max.) and 21,38,180 Tonnes of Clay (BC Soil) @ 1.0 MTPA (max.) will be quarried out from this Lease up to a maximum depth of **3.0 m BGL only**. The quarried Lime Kankar will be transported by 25 T Tarus Tippers through own haulage road to Pandalgudi Lime Kankar Beneficiation Plant for further process. Black Cotton Top Soil will be transported by 25 T Tarus Tippers to RR Nagar Cement Plant for utilizing as corrective material in Cement manufacturing. **Ore:Waste Ratio works out to be 1:0.029. Life of the Lease is 10 Years.** As ground water-table fluctuates between 12-15 m BGL in the vicinity, **no ground water-table intersection** due to the quarrying. Quarry Particulars are detailed in **Table 1.5**.

Table : 1.5 Quarry Particulars

Sl. No.	Details on	Particulars
1	Name of the Lease	Maravarperungudi Lime Kankar Quarry Lease-III
2	Lease Owner	The Ramco Cements Limited (RCL)
3	Extent of Lease	158.865 Ha
4	Deed Execution	New Lease; to be executed after obtaining EC
5	Lease Validity	10 Years from date of Lease Deed Execution
6	Lease Location	Maravarperungudi and T.Koppuchithampatti Villages, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu
7	Land Ownership	Own Land of RCL
8	Lithology	Black Cotton Top Soil : 0-1.5 m BGL (avg. depth of 1.25 m) Lime Kankar : 1.5-3.0 m BGL (avg. depth of 1.25 m).
9	Permitted Minerals	Lime Kankar & Clay (Black Cotton Soil)
10	Commencement on	New Lease; commencement will be after obtaining all statutory approvals.
11	Mining Plan / Scheme Approvals	Modified Mining Plan approval by the Joint Director of Geology & Mining, Chennai vide Letter Rc.No.583/MM7/2018 dated 07.01.2025 for initial 5 Years.
12	Past Production (since Commencement)	Not Applicable; New Lease
13	Assessed Reserves	Lime Kankar - 43,68,788 Tonnes & Clay (BC Soil) - 33,36,165 Tonnes
14	Mineable Reserves	Lime Kankar - 30,71,388 Tonnes & Clay (BC Soil) - 23,45,385 Tonnes
15	Production so far	Nil
16	Dispatch Quantity	Nil
17	Process Description	Mechanized Non-Conventional Opencast Mining, without Drilling and Blasting will be adopted. The deposit will be quarried by a simple system using Excavators & Dozers-Tippers combination. The quarried Lime Kankar will be transported by 25 T Tarus Tippers to Pandalgudi Lime Kankar Beneficiation Plant for further process. Clay (BC Soil) will be transported by 25 T Tarus Tippers to RR Nagar Cement Plant for Cement manufacturing-corrective material.
18	Proposed Production	During the Plan Period, 28,00,000 Tonnes of Lime Kankar as ROM @ 1.0 MTPA (max.) and 21,38,180 Tonnes of Clay (BC Soil) @ 1.0 MTPA (max.) will be quarried out from this Lease.
19	Ground water table intersection	The total depth of quarrying will be to a maximum of 3.0 m BGL only. As ground water-table fluctuates between 12-15 m BGL in the vicinity, thus, no ground water-table intersection .
20	Project Cost	Rs.4.75 Crores
21	Project Schedule	Life of the Lease is 10 Years.
22	R & R Issue	Nil
23	Litigation/Case Details	Nil
24	CER Budget	Rs.9.50 Lakhs
25	Financial Assurance	Not applicable now
26	Violation, if any	Nil

1.10 Environmental Setting

Quarry Lease-III location falls in Survey of India Topo Sheet No.58 K/3 and is located between North Latitudes **9°23'22.30" - 9°24'05.25"** and East Longitudes **78°09'06.02"E to 78°10'42.63"E** (Table 1.6). Topo Map is given as Fig. 1.2 and Environmental Setting Map as Fig. 1.3. Environmental Setting-15 km Radius is given in Table 1.7.

Table : 1.6 Boundary Coordinates

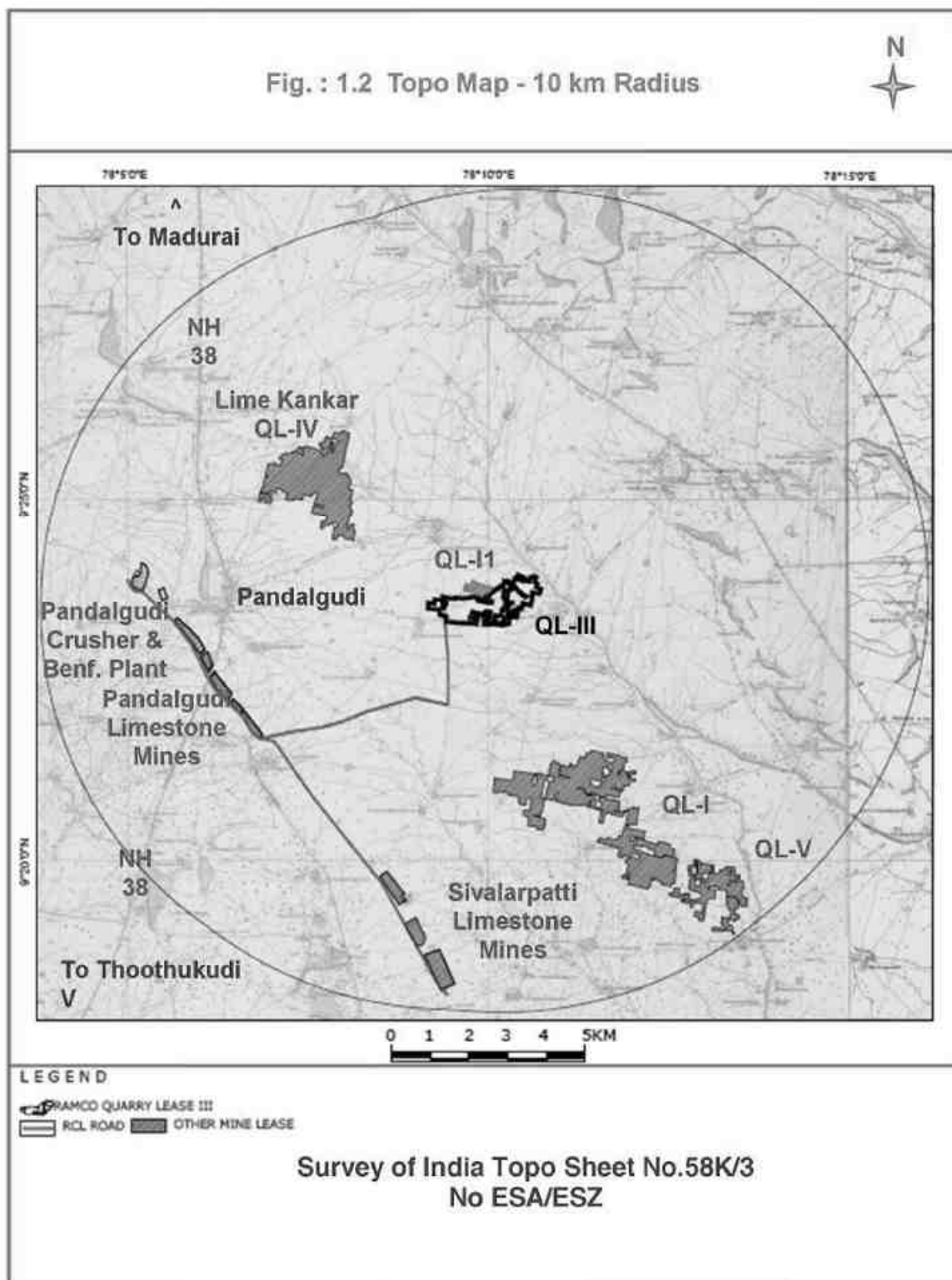
Boundary Pillar No.	Latitude	Longitude	Boundary Pillar No.	Latitude	Longitude
QL-III-1	9°23'36.305"N	78°09'06.021"E	QL-III-14	9°23'53.691"N	78°10'42.632"E
QL-III-2	9°23'41.620"N	78°09'06.637"E	QL-III-15	9°23'49.552"N	78°10'40.746"E
QL-III-3	9°23'43.844"N	78°09'12.796"E	QL-III-16	9°23'39.833"N	78°10'33.167"E
QL-III-4	9°23'46.164"N	78°09'19.427"E	QL-III-17	9°23'28.752"N	78°10'22.458"E
QL-III-5	9°23'46.372"N	78°09'32.858"E	QL-III-18	9°23'23.154"N	78°10'15.431"E
QL-III-6	9°23'45.033"N	78°09'50.134"E	QL-III-19	9°23'22.835"N	78°10'05.342"E
QL-III-7	9°23'45.314"N	78°09'56.596"E	QL-III-20	9°23'29.395"N	78°10'11.775"E
QL-III-8	9°23'58.409"N	78°10'11.699"E	QL-III-21	9°23'22.305"N	78°09'58.333"E
QL-III-9	9°24'02.543"N	78°10'20.213"E	QL-III-22	9°23'29.859"N	78°09'54.562"E
QL-III-10	9°24'05.256"N	78°10'23.398"E	QL-III-23	9°23'23.279"N	78°09'47.843"E
QL-III-11	9°24'03.486"N	78°10'35.058"E	QL-III-24	9°23'24.558"N	78°09'22.622"E
QL-III-12	9°24'02.049"N	78°10'37.574"E	QL-III-25	9°23'28.563"N	78°09'20.316"E
QL-III-13	9°23'58.366"N	78°10'39.352"E	-		

The site is free from seismic effects (Seismic Zone III). There is no environmental issue about the Quarry location. There are **no eco sensitive areas** like National Parks, Wildlife Sanctuaries, Biosphere Reserves, Reserved Forests, Elephant Corridor, Mangroves, Archaeological/Historical Monuments, Heritage sites, etc. **within 10 km from the site boundary**.

General Condition of EIA Notification 2006 (as amended) **is not attracted** for the Quarry Lease. None of the followings are located in the Study Area :

- ❖ **Protected areas** notified under the Wild life (Protection) Act, 1972.
- ❖ **Critically polluted area** as notified by CPCB .
- ❖ **Eco -Sensitive areas** as notified.
- ❖ **Interstate boundaries** within 5 km radius from the boundary of the proposed site.
- ❖ Coastal Regulation Zone (CRZ) Area.

Seasonal **Uppu Odai** drains the region (flows at 0.05 km in Northeast). Seasonal Vaippar River flows at a distance of 18 km (SW). Gulf of Mannar is at 40 km in SE and Gulf of Mannar Marine National Park is at 46 km distance (SE). Thus, the Quarry Lease **does not fall in CRZ Area**.



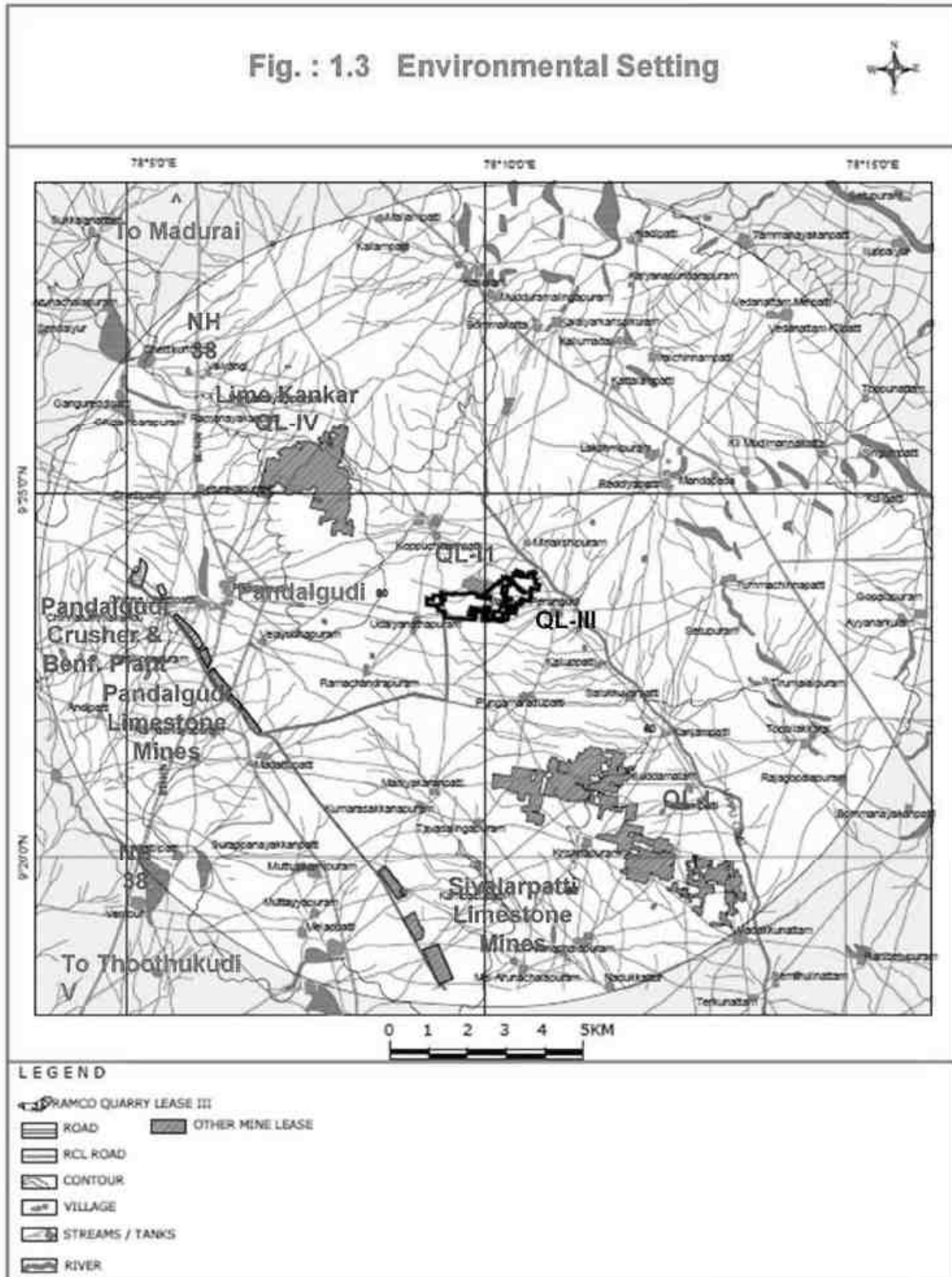


Table : 1.7 Environmental Setting – 15 km Radius

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 Uppu Odai – 50 m (NE)
5	State, National boundaries	Nil
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	NH-38 (Madurai-Thoothukudi-Tiruchendur Section) – 4.1 km (W)
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>)	Aruppukottai Town – 12 km (NW)
9	Areas containing important, high quality or scarce resources(<i>ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals</i>)	Limestone Mines & Lime Kankar Quarries in Pandalgudi Region – 0 to 9.8 km (North-South & West)
10	Areas already subjected to pollution or environmental damage (those where existing legal environmental standards are exceeded)	Nil
12	Areas susceptible to natural hazard which could cause the project to present environmental problems	The region falls in Seismic Zone III.

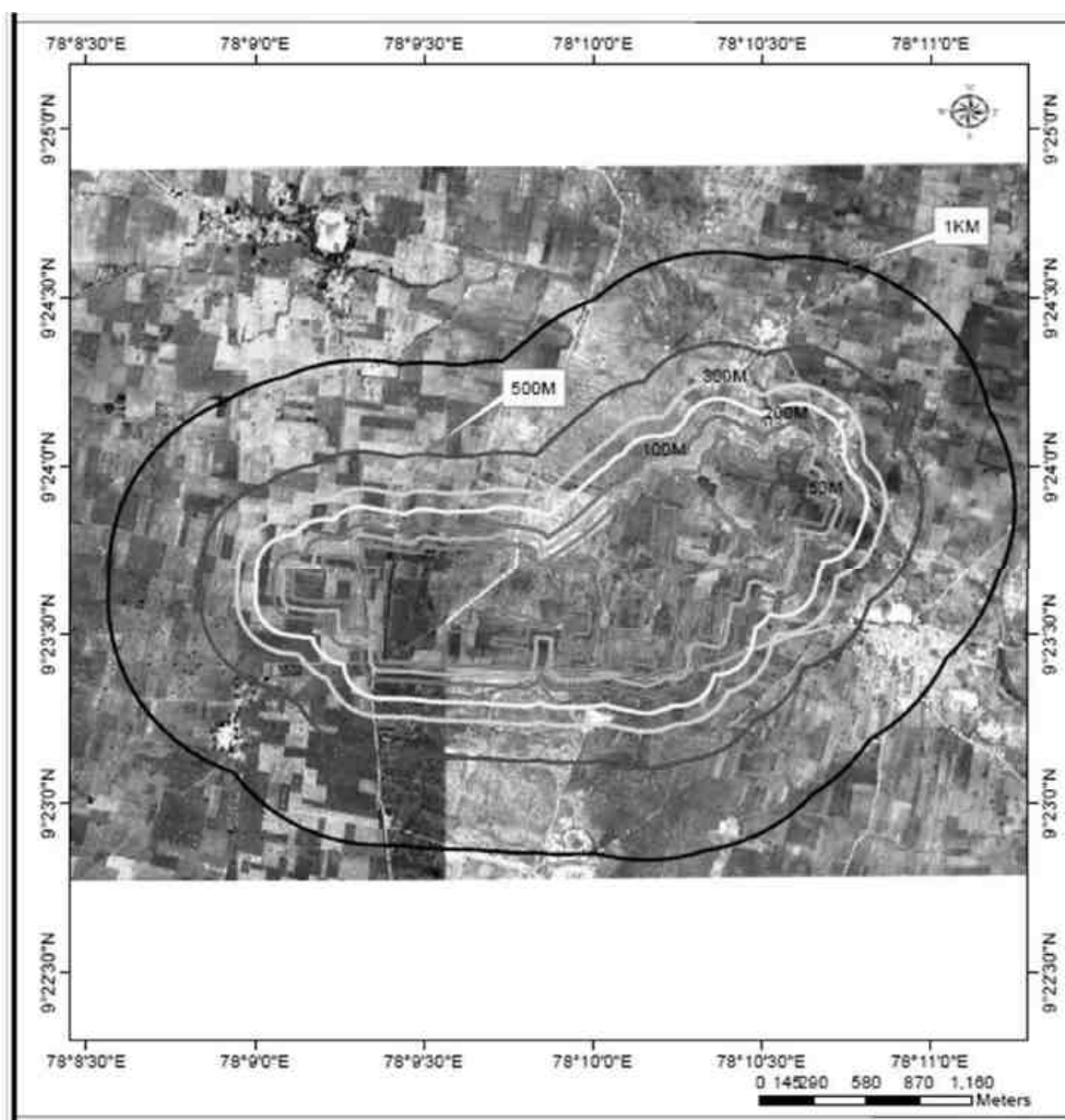
Madurai-Thoothukudi Section of NH-38 passes at a distance of 4.1 km in the West. A road from Pandalgudi is passing through the Lease Area to Koppuchithampatti and Maravarperungudi villages which is also connected to RCL dedicated Mine Haulage Road. Southern Railway Line of Virudhunagar-Aruppukottai-Manamathurai Section runs at 15.5 km distance in NNW from the Lease. Madurai Airport is at 48 km in NNW direction, Thoothukudi Airport is at 75 km in SSW and Chennai Airport is at 452 km in NE. VOC Port at Thoothukudi is at 70 km (S) from the Lease.

From Quarry Lease III, Maravarperungudi Quarry Lease I (498.87 Ha) is located at a distance of 3.7 km in SE, Maravarperungudi Quarry Lease II is adjacent, T.Koppuchithampatti Quarry Lease IV (294.18.5 Ha) is at 2.5 km in NW and Vadakkunatham Quarry Lease V (123.26.5 Ha) is at 7.8 km in SE direction.

From QL-III, Pandalgudi Limestone Mine is at 5.2-7.0 km distance (WSW-W), Sivalarpatti Mines at 6.9-8.5 (SSW) and Melvenkateswarapuram Mine at 9.8 km (S). Maravarperungudi Kankar Mining Lease-III is at 3.0 km in South direction. Pandalgudi Lime Kankar Beneficiation Plant is at 7 km (W), Pandalgudi Crusher at 7.2 km (W) and RR Nagar Cement Plant at 25 km (WNW).

Within 300 m radius, there is no human settlement (**Plate VI**). The distance of the nearest villages- Maravarperungudi is at 0.4 km (ESE), Koppuchithampatti is about 1.2 km (N) from the Lease boundary. Pandalgudi is at 4.3 km (W). Taluk Headquarters Aruppukottai is at 13.5 km (NNW) and District Headquarters Virudhunagar is at 27.5 km (NW) direction from the Lease Area.

Plate : VI Area of 50 m, 100 m, 200 m, 300 m, 500 m & 1 km Radius



1.11 Project Schedule

As assessed, Mineable Reserves of Lime Kankar is 30,71,388 Tonnes and Mineable Reserves of Clay (Black Cotton Soil) is 23,45,385 Tonnes. During the first Plan Period, 28,00,000 Tonnes of Lime Kankar as ROM @ 1.0 MTPA (max.) and 21,38,180 Tonnes of Clay (BC Soil) @ 1.0 MTPA (max.) will be quarried out from this Lease. **Balance Reserves will be quarried out in subsequent Plan/Scheme Period. Thus, Life of the Lease is 10 Years.**

1.12 EIA Study

The Lime Kankar & Clay to be mined out from this Quarry are **Minor Minerals over an extent of 158.865 Ha (<250 Ha)** and falls in **Category 'B1'** of Sl. No. 1(a) of EIA Notification 2006, as amended, for prior EC from State Level Environmental Impact Assessment Authority (SEIAA), Tamil Nadu. Accordingly, TOR Application/Form-1 (Form 1M is Not Applicable) has been submitted by RCL vide Parivesh Online proposal No. SIA/TN/MIN/522992/2025 dated 07.02.2025. After paying Online Scrutiny Fees, etc., the File has been accepted by SEIAA on 01.03.2025. The Proposal was deliberated by SEAC-TN in its 538th Meeting held on 01.03.2025 and SEIAA-TN in its Meeting held on 01.04.2025. TOR has been awarded vide Identification No. TO25B0108TN5802389N dated 07.04.2025 under **File No. 11826/2025**, with Public Hearing.

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 (**NABET**) vide Certificate NABET/EIA/2225/RA0290 dated 11.06.2023 with validity till 16.11.2025 (Sl. No. 4 of List). ABC Laboratory is accredited by the National Accreditation Board for Testing & Calibration Laboratories (**NABL**) vide Certificate No. TC-5770 dated 03.04.2024 - valid till 02.04.2026.

Baseline Data (BLD) has been collected during **Dec. 2024-Feb. 2025 (Winter Season)** for Environmental Impact Assessment (EIA) Study in compliance with MoEF&CC Office Memorandum No. J-11013/41/2006-IA-II(I)(Part) dated 29.08.2017.

EIA Report has been **prepared in compliance with awarded TORs** and submitted as per generic structure proposed in Appendix-III of EIA Notification 2006 with the following Chapters :

- Chapter-1 : Introduction with Need for the Project & Environmental Setting of the Project.
- Chapter-2 : Project Profile - an outline of the Project and allied activities.
- Chapter-3 : Description of Environment (Baseline Status).
- Chapter-4 : Anticipated Impacts along with Prediction of Impacts and Mitigation Measures.
- Chapter-5 : Analysis of Alternatives (Technology & Site).
- Chapter-6 : Environmental Quality Monitoring Programme.
- Chapter-7 : Additional Studies like Risk Assessment, DMP, Hydrogeological Study, etc.
- Chapter-8 : Project Benefits.

Chapter-9 : Cost-Benefit Analysis, if any.

Chapter-10 : Environmental Management Plan

Chapter-11 : Summary EIA.

Chapter-12 : Disclosure of Consultants engaged.

Draft EIA Report along with Summary EIA Reports (both in English and Tamil versions) are submitted for Public Consultation & Public Hearing.

2.0 Project Description

2.1 Type of the Project

The Lime Kankar & Clay to be mined out from this Quarry are **Minor Minerals over an extent of 158.865 Ha (<250 Ha)** and falls in **Category 'B1'** of Sl. No. 1(a) of EIA Notification 2006, as amended, for prior EC from SEIAA-Tamil Nadu. Accordingly, TOR Application has been filed vide Parivesh Online proposal No. SIA/TN/MIN/522992/2025 dated 07.02.2025. The Proposal was deliberated by SEAC-TN & SEIAA-TN and TOR has been awarded vide Identification No. TO25B0108TN5802389N dated 07.04.2025 for the EIA Study with Public Hearing.

2.2 Magnitude of Operation

Quarrying of Lime Kankar & Clay (Black Cotton Soil) over an Extent of 158.865 is proposed in QL-III. Mechanized **Non-Conventional Opencast Mining, without Drilling and Blasting**, will be adopted. The black cotton soil will be separately removed upto 1.5 m BGL (max.) followed by Lime Kankar for another 1.5 m BGL (max.). Thus, quarrying will be upto a depth of 3.0 m BGL (max.) only. As ground water-table fluctuates between 12-15 m BGL in the vicinity, **no ground water-table intersection** due to the quarrying. As assessed, Mineable Reserves of Lime Kankar is 30,71,388 Tonnes and Clay (Black Cotton Soil) is 23,45,385 Tonnes. During the first Plan Period, 28,00,000 Tonnes of Lime Kankar as ROM @ 1.0 MTPA (max.) and 21,38,180 Tonnes of Clay (BC Soil) @ 1.0 MTPA (max.) will be quarried out and transported. About 20,00,000 Tonnes of Clay (BC Soil) will be utilised for Cement manufacturing and balance 1,38,180 Tons will be utilised for backfilling the mined out voids of the Quarry in 5th Year. **Ore:Waste Ratio works out to be 1:0.029**. Balance quantities will be quarried in subsequent Plan/Scheme Period (**Table 2.1**). **Life of the Lease is 10 Years**. Surface Plan, Geological Plan with Sections, Yearwise Production Plan & Conceptual Plan from the approved Mining Plan are given as **Figs. 2.1-2.4**.

Table : 2.1 Production during Plan Period & Subsequent Period

Year	Clay (Black Cotton Soil) Removal, Tonnes	Clay (BC Soil) Consumption, Tonnes	Developmental Rejects (Black Cotton Soil), Tons	Lime Kankar (ROM) Production, Tonnes	Ore: Waste Ratio
I	10,00,000	10,00,000	0	4,50,000	1:0
II	2,50,000	2,50,000	0	10,00,000	1:0
III	2,50,000	2,50,000	0	4,50,000	1:0
IV	2,50,000	2,50,000	0	4,50,000	1:0
V	3,88,180	2,50,000	1,38,180	4,50,000	1:0.197
Total	21,38,180	20,00,000	1,38,180	28,00,000	1:0.029
VI-X	2,07,205	-	-	2,71,388	1:0.76
Total	23,45,385	-	-	30,71,388	-



2.3 Technology & Project Description

2.3.1 Geology

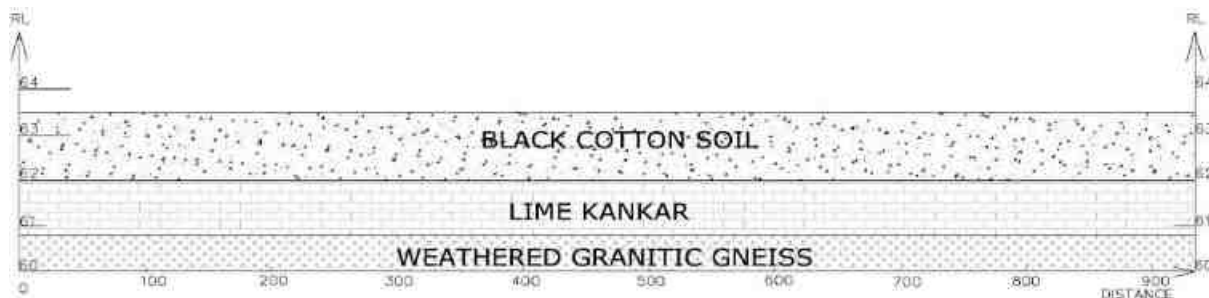
Regional Geology : The Precambrian of peninsular India has been classified into Cratons and mobile belts. The litho assemblage of Charnockite, Khondalite (Southern Granulite Complex) and Peninsular Gneissic Complex of Archaean to Palaeoproterozoic age besides Quaternary calcretes are exposed in the area. Quartzite, calc granulites associated with crystalline limestone bands and garnet-sillimanite gneiss belonging to Khondalite and Charnockite Group occur as enclaves within the country rock of hornblende-biotite gneiss. The general geological formations of the area are is appended,

Local Geology : Since this area is in continuation with the existing ML & QL areas, the same geology is continuing here also. The entire region is of Archaean metamorphic terrain covered with black cotton soil, but the Kankar bed has been exposed in the mine faces in existing leasehold area and in nallah cuttings. The Kankar bed of around 1.0 to 1.5 meter (1.25 m average) thick is overlain by 1.0 to 1.5 meter (1.25 m average) thick black cotton soil. The Lithological Succession is also appended.

Geological Formations

Recent and Sub-recent	Alluvium, of the Vaippar. Black soils, laterite, Kankar and tufa etc.
Pre-Cambrian Metamorphic Group	6. Younger granitic injections, pegmatite etc.
	5. Charnockites and associated hybrid types.
	4. Mixed Gneisses - Garnetiferous, granitoid and mica gneiss and other composite types.
	3. Crystalline limestone, calciphyre and calc-granulites.
	2. Quartzite.
	1. Basic metamorphic rocks such as amphibolites, epidiorites, pyroxene and biotite schist and pyroxene-granulite.

Lithological Succession



2.3.2 Assessed Reserves

No prospecting work has been done in the QL area. However, since the Kankar is seen exposed in stream cuttings and also in existing mines, it has become possible to decipher existence of Kankar beds below top soil. Due to the shallow occurrence of Kankar, it is proposed to carry out the exploration by means of trial pits at 200 x 200 m grid. It is estimated that about 45 Nos. of trial pits will have to be made, which spreads over on the entire deposit.

Kankar deposit is tabular and wide spread, average thickness method will be best suited the deposit for reserves calculation. Accordingly, the reserves were calculated for this. For reserves estimation, an average Kankar thickness of 1.25 m has been considered. Bulk density of 2.2 is considered to convert the volume into Tonnage. Geological reserves have been estimated for entire applied area and the mineable reserves are estimated considering the safety distance provided for mining lease boundary, road, Electric Line and Odai.

It is estimated that **30,71,388 Tonnes of Lime Kankar & 23,45,385 Tonnes of Clay (BC Soil)** are mineable from this Quarry. (Table 2.2).

Table : 2.2 Estimated Resources

Sl. No.	Particulars	Lime Kankar Reserves, Tonnes	Clay (BC Soil) Reserves, Tonnes
1	In-situ Geological Reserves	43,68,788	33,36,165
2	Mineable Reserves	30,71,388	23,45,385

2.3.3 Ore Quality

The chemical analysis of Lime Kankar and Top Soil are given in Table 2.3.

Table : 2.3 Chemical Composition

Material	LOI, %	SiO ₂ %	Al ₂ O ₃ %	Fe ₂ O ₃ %	CaO %	MgO %	Na ₂ O %	K ₂ O %
Lime Kankar	30.70	19.92	4.31	1.96	38.85	2.86	0.16	1.31
Beneficiated Lime Kankar	36.39	10.31	1.77	0.85	46.02	2.75	0.11	0.02
Clay (Black Cotton Soil)	7.65	48.43	14.32	9.02	16.58	2.27	0.05	0.16

The cut of grade is a grade below which ore will not be economical. The cut of grade for Lime Kankar is fixed as **+34% CaO**.

2.4 Quarrying Method

Clay (BCS) & Kankar beds are less consolidated and can be removed by Excavators. These Minerals will be quarried with deployment of heavy earth moving machineries of low HP. Mechanized **Non-Conventional Opencast Mining, without Drilling and Blasting**, will be adopted. The quarrying will be upto a depth of 3.0 m BGL (max.) only. As ground water-table fluctuates between 12-15 m BGL in the vicinity, **no ground water-table intersection** due to the quarrying.

Slope Stability: Kankar is medium hard and compact mineral bed and will not slide at the maximum depth of 3.0 m BGL.

There is no beneficiation or screening is proposed within Lease area. The Clay (Black Cotton Soil) will also be used for production. Hence, there will be **no dump** within the Lease.

The quarried Lime Kankar will be transported by 25 T Tarus Tippers to Pandalgudi Lime Kankar Beneficiation Plant for further process. Black Cotton Top Soil will be transported by 25 T Tarus Tippers to RR Nagar Cement Plant for utilizing as corrective material in Cement manufacturing.

2.5 Yearwise Production

During the first Plan Period, 28,00,000 Tonnes of Lime Kankar as ROM @ 1.0 MTPA (max.) and 21,38,180 Tonnes of Clay (BC Soil) @ 1.0 MTPA (max.) will be quarried out from this Lease up to a maximum depth of **3.0 m BGL only**. About 20,00,000 Tonnes of Clay (BC Soil) will be utilised for Cement manufacturing and balance 1,38,180 Tons will be utilised for backfilling the mined out voids of the Quarry in 5th Year

The normal production from this mine will be 4,50,000 Tonnes per Annum ROM Kankar & 2,50,000 Tonnes per Annum of Clay (Black Cotton Soil). The maximum annual production would be 10,00,000 Tonnes of ROM Kankar in the Second year and 10,00,000 Tonnes of Clay (Black Cotton Soil) in the first year of the Plan Period. **Ore:Waste Ratio works out to be 1:0.029**. Balance quantities will be quarried in subsequent Plan/Scheme Period. **Life of the Lease is 10 Years**.

2.6 Machineries

The quarrying will be carried out in 2 shifts for 300 days in a year. The List of Machineries proposed are given in **Table 2.4**. 4 Nos. of TATA-HITACHI EX 200 hydraulic excavators will be used for loading. 25 Nos. of Taurus Tippers of 25 Tons capacity will be used for transporting the Minerals from the Lease. The QL will not have permanent installations of machines, but only mobile quarrying equipments. All the machineries will be disposed-off or shifted to other operating Leases on need based.

Table : 2.4 Proposed Machineries

Sl. No.	Name of the Machine	Capacity	Nos.
1	TATA Hitachi EX 200	1.80 m ³	4
2	ZL 50 G Wheel Loader	3.2 M ³	1
3	Taurus Tippers	25 Tons	25
4	Water Tanker	10 KL	1

2.7 Competent Mining Personnel

The Mine will be operated with the required Statutory Officials and Competent Persons mandatorily appointed as per the provisions of Mines Act 1952 and Metalliferous Mines Regulations 1961 (Table 2.5).

Table : 2.5 Mining Personnel

Sl. No.	Designation	Qualification	Nos.	Category
1	Mines Manager	I Cass Manager's Certificate Holder	1	Skilled
2	Foreman	Foreman's Certificate Holder	2	Skilled
3	Mining Mates	Mate Certificate	2	Skilled
4	Mechanical Engineer	Diploma in Mech. Engg.	1	Skilled
5	Mechanics	ITI	1	Skilled
6	Time Keeper	Graduate	1	Skilled
7	Mechanical helpers	-	2	Semi-Skilled
8	Operators	Having heavy vehicles license holders	62	Skilled
		Sub Total	72	

2.8 Other Facilities

All the services like site office, First Aid Room, Rest shelters, potable water and other necessary amenities will be provided.

Mine Office: A mine site office for overall management of total operations will be established at the entrance the area applied for Quarry Lease.

Workshop: Hired machineries will be used for all the mining activities hence, maintenance will be done outside the Quarry Lease area.

Stores: Central stores are located at centralized location at Pandalgudi Mines area to facilitate storage and issue of materials along with lifting, loading and unloading facilities. A licensed fuel storage tanks is established at our Pandalgudi Mine premises and the daily requirement of HSD and other lubricants will be met by a licensed mobile browser.

Fire Fighting: Fire tending arrangement will be provided at the mines site office with different types of extinguishers to deal with all kinds of fire like electrical, maintenance workshop and HEMM operations. The vulnerable areas will be provided with fire alarms. Key persons are trained in firefighting.

First Aid: First aid room at the site office, first aid boxes at rest shelter and close to the workings will be provided. All the personnel engaged are trained in first aid. Occupational Health Center is established at Pandalgudi Mines with required Paramedical staffs.

2.9 Proposed Land Use

In the total Lease Area of 158.865 Ha, effective quarry area is 111.685 Ha. Out of 47.180 Ha covered under safety barrier, about 22.18 Ha will be under Green Belt at Conceptual Stage (Table 2.6). About 4.872 Ha will be backfilled and reclaimed. **Green Belt Coverage will be 29.70%**. About, 11,250 local tree species like Neem, Pungan, Teak, etc. will be planted @ 500 Trees/Ha with a Survival Rate of about 90% (Table 2.7).

Table : 2.6 Land Use Pattern

Activities	Existing Land Use, Ha	At the End of Plan Period, Ha	At Conceptual Stage, Ha
Area of excavation	0	96.946	106.813
Quarried out voids backfilled & reclaimed	0	4.872	4.872
Storage of Top soil	0	0	0
Overburden Dump	0	0	0
Mineral Storage	0	0	0
Infrastructure (Workshop/Building)	0	0.500	0
Roads	0	0.500	0
Green belt / Afforestation	0	25.000	47.180
Others (Safety Barrier)	47.180	22.180	0
Unused	111.685	8.867	0
Total	158.865	158.865	158.865

Table : 2.7 Proposed Green Belt

Year	Location	Extent, Ha	No. of Plants
I	Safety Barrier Zone all Along the Quarry Lease Local tree species like Neem, Pungan, Teak, etc. will be planted and maintained with a Survival Rate of about 90%	5.0	2,250
II		5.0	2,250
III		5.0	2,250
IV		5.0	2,250
V		5.0	2,250
	Total	25.0	11,250

2.10 Financial Assurance

The available Reserves will last for about 5 years. Activities like Afforestation programme will be continued till end of the Lease Period and hence, the Permanent Closure will arise only thereafter. The abandonment cost will be discussed in the final closure plan and is not applicable now.

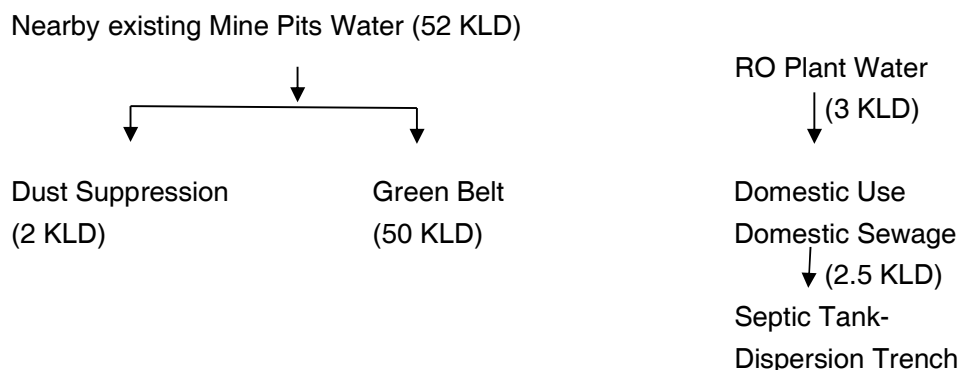
2.11 Water Demand & Source

The Quarry requires about 3 KLD drinking water for domestic consumption which will be supplied from the RO Plant at Pandalgudi Mine. The Quarry will also require about 2 KLD for Dust suppression measures and another 50 KLD for the development and maintenance of Green Belt. The required water will be sourced from existing Captive Mine Pits in Pandalgudi Region.

Domestic sewage generation will be about 2.5 KLD which will be biologically treated in a Septic Tank followed by a Dispersion Trench. **No workshop** is proposed and thus, **no effluent generation** from the Quarry. As it is a shallow mining upto a depth of 3.0 m BGL, **there will not be any water seepage in the Pit and its discharge**. Ground Water-table in the vicinity is at 12 m BGL (Postmonsoon) & 15 m BGL (Premonsoon). Since the quarry is shallow in nature and the **Quarrying will not intersect the water table**. The Water Balance Diagram is given as **Fig. 2.5**.

Fig. : 2.5 Water Balance Diagram

(Unit : KLD)



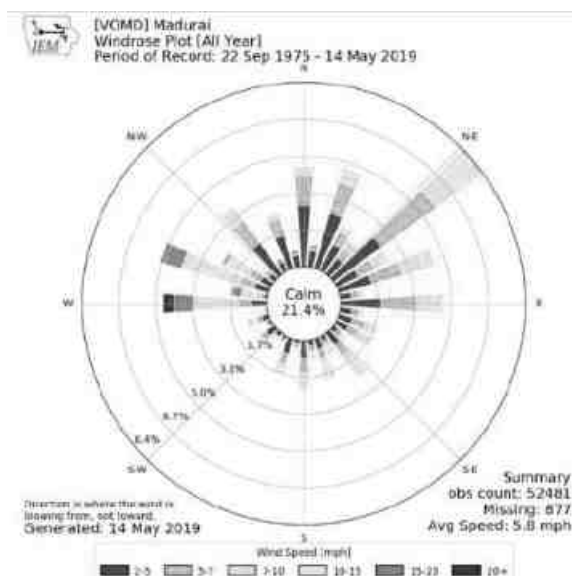
2.12 Power Demand & Source

About 50 KVA industrial supply for lighting is required which will be met from TANGEDCO Grid. For operating the mining equipments, High Speed Diesel (HSD) is required @ 2,000 Liters/day. A licensed fuel storage tanks is established at the Factory and the daily requirement of HSD and other lubricants will be met by a licensed mobile bowser. There will be **a standby DG set of 380 KVA** with acoustic enclosures and stack as per CPCB/TNPCB Norms.

3.0 Description of the Environment (Baseline Status)

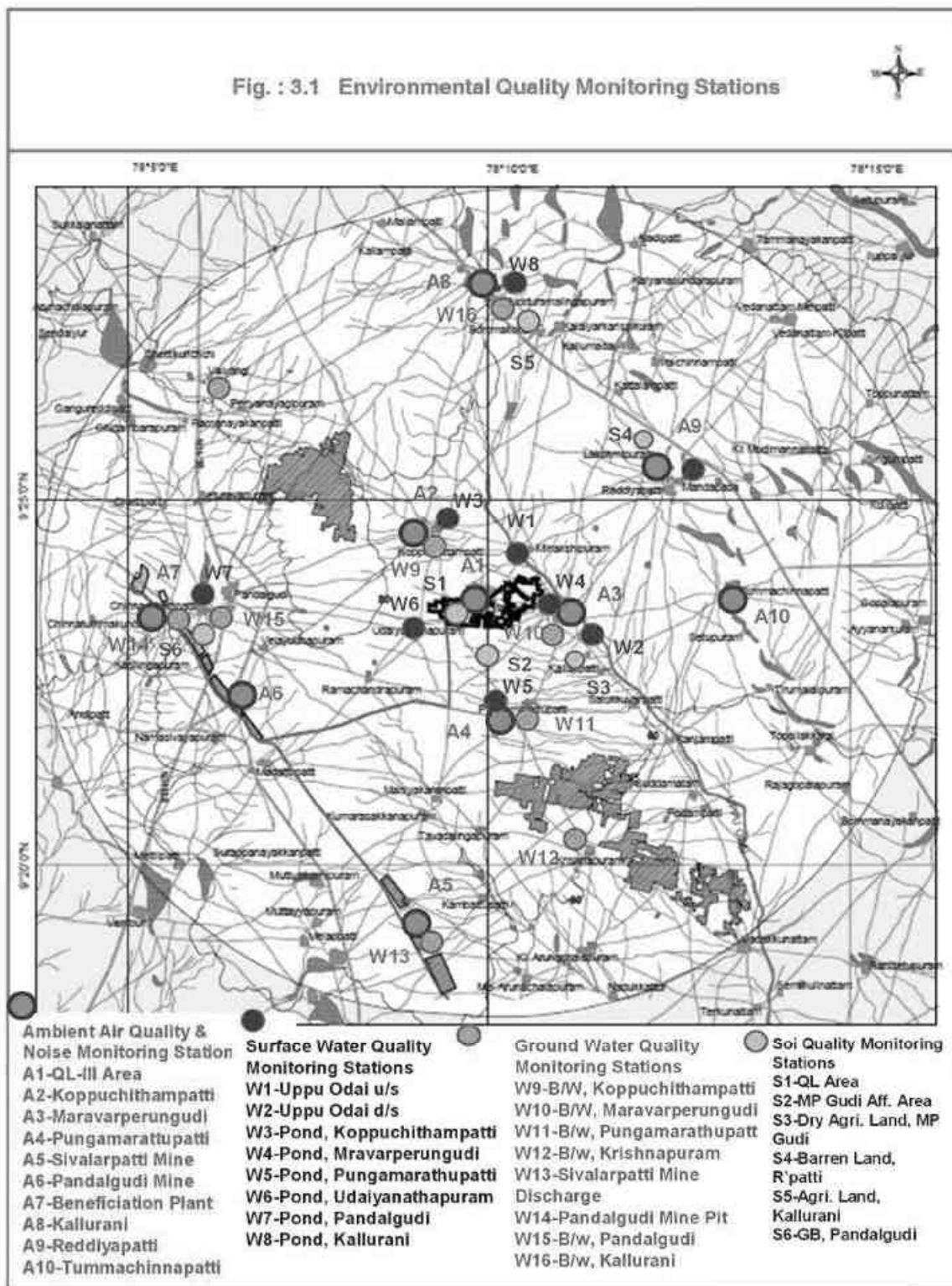
3.1 Study Area

The study area of **10 km radius** (from boundary) (**Fig. 3.1**) 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 40 km from the Lease, Coastal Regulation Zone (**CRZ**) **applicability is not there**. Baseline Data (BLD) has been commissioned during **Dec. 2024-Feb. 2025 months (Winter Season)** for the EIA Study. The nearest IMD Station is Madurai Airport. Annual Wind Rose of Madurai (Source IEM Site) is referred while fixing the Monitoring Stations (appended). The monitoring stations were selected in such a way that the baseline environmental data reflects the **Cumulative Impact of existing Mines and Quarries** in the Study area. Some of the Monitoring Stations are shown in **Plates VII-VIII**.



Physiography : The general elevation of the Study Area ranges from 25 m to 97 m above MSL (aMSL). The general elevation of the QL area is 63-65 m aMSL. The elevation contour indicates the area is sloping towards southeast. It falls in Seismic Zone-III.

Drainage Pattern : There is no perennial river in the study area. Seasonal **Uppu Odai** drains the region (flows at 0.05 km in Northeast). Seasonal Vaippar River flows at a distance of 18 km (SW). Gulf of Mannar is at 40 km in SE and Gulf of Mannar Marine National Park is at 46 km distance (SE). The overall drainage pattern of the region appears to be dendritic (**Fig. 3.2**). There are also rainfed irrigation tanks and ponds in the study area.



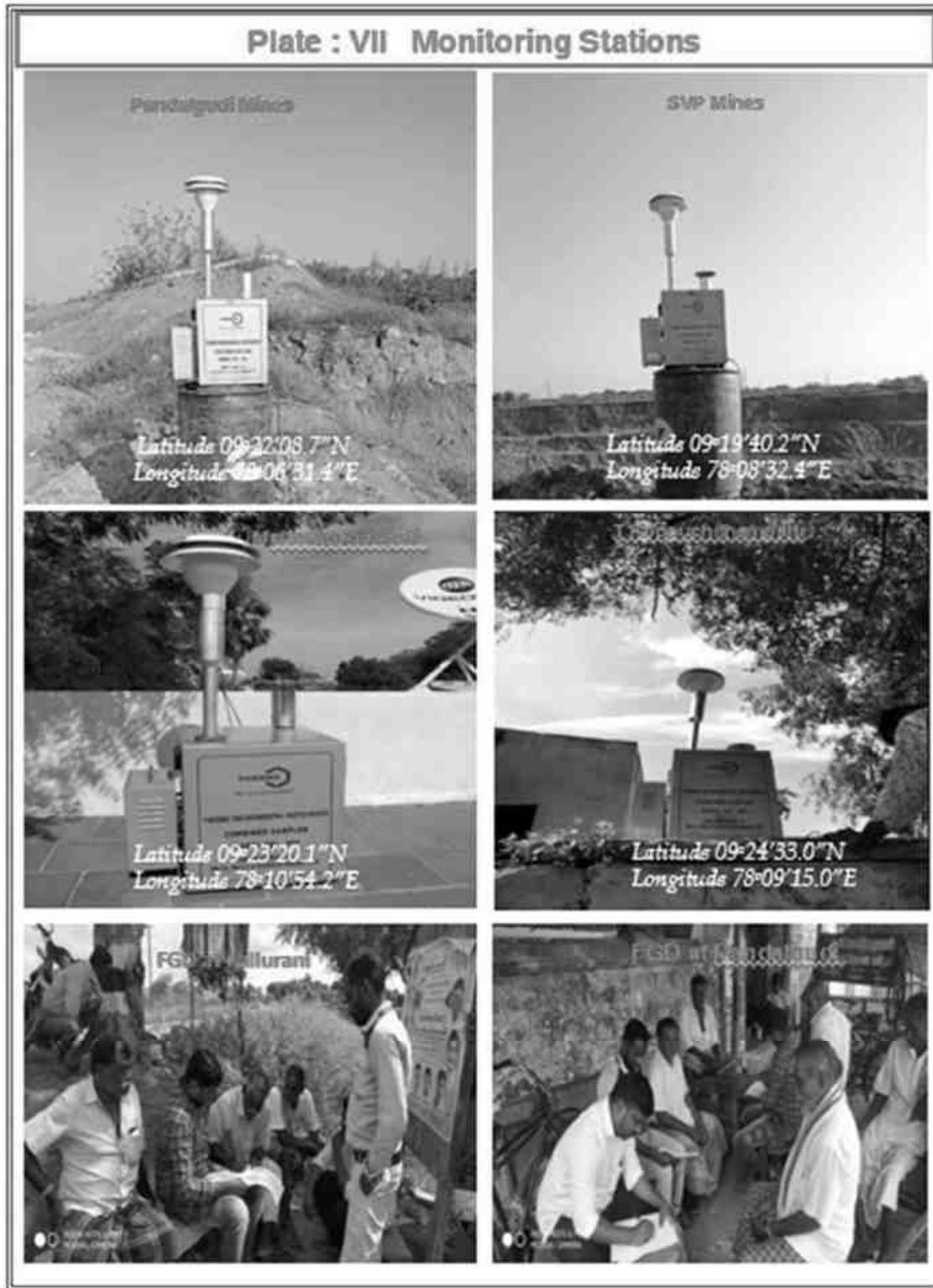
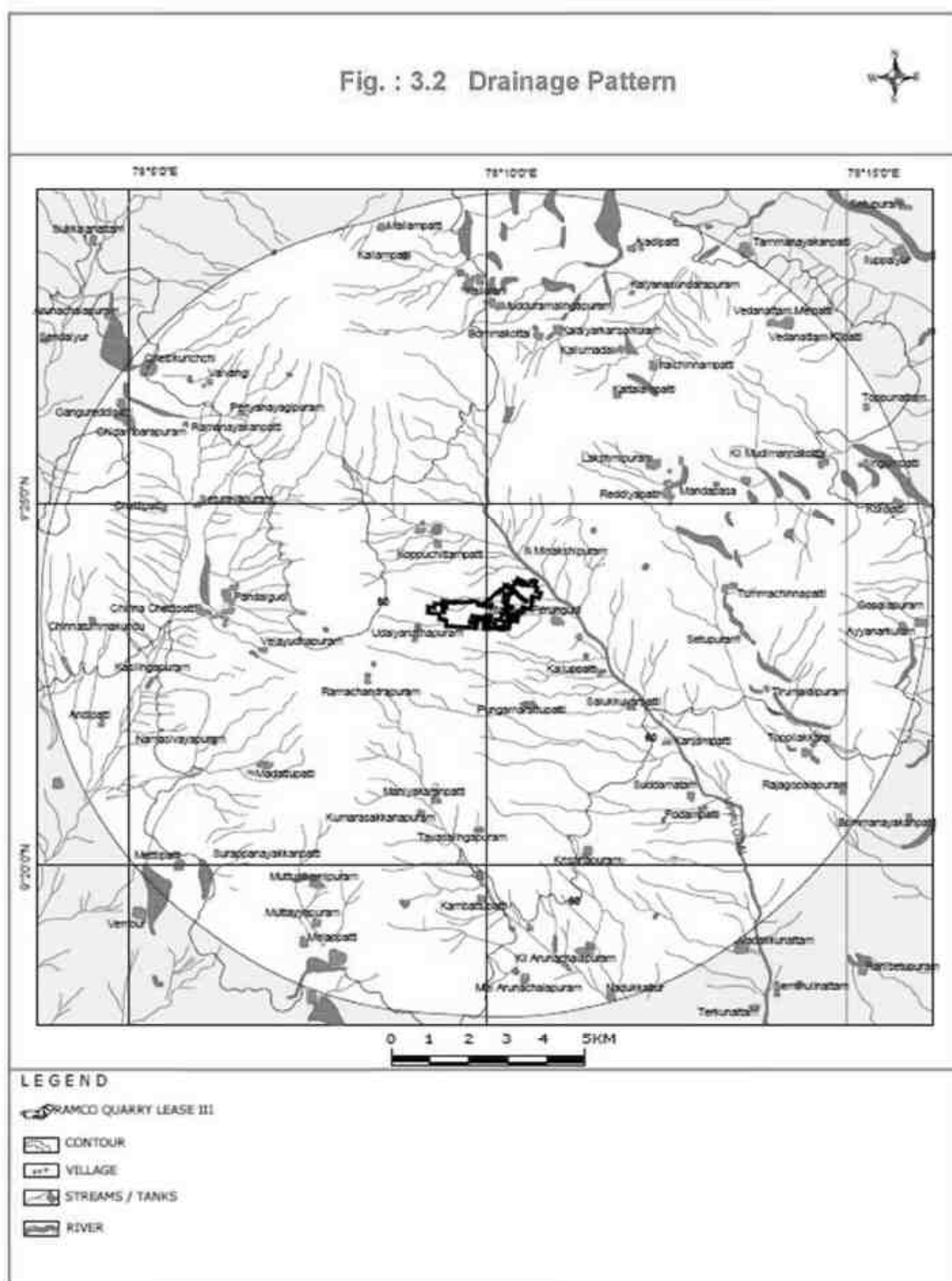


Plate : VIII Monitoring Stations



3.2 Environmental Components

Considering the environmental setting of the project, project activities and their interaction, environmental regulations and standards, the Environmental Attributes covered for the EIA Study is 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
	Ground Water Quality Parameters	8		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	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.

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) near the Lease 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 $\pm$ 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**). 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. 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.

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 (Phenonthroline)
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.

3.4 Micrometeorology

Regional Status :-

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. 3.3**.

During the monitoring month of **December 2024** : The predominant winds were from E & NE direction (93.4°). The mean Wind velocity was 9.4 kmph. The temperature values were ranging from 22.3 °C to 35.2 °C with a mean value of 22.8 °C. The mean maximum relative humidity value was 77.9%. Clear and Partly Cloudy skies was observed most of the times (2.9 oktas). The mean atmospheric pressure value was computed as 760.0 mm of mercury. There were 3 rainy days with total rainfall of 4.0 mm in this month.

During the monitoring month of **January 2025** : The predominant winds were from NE/ENE direction (83.7°). The mean Wind velocity was 12.4 kmph. The temperature values were ranging from 24.5 °C to 32.8 °C with a mean value of 21.4 °C. The mean maximum relative humidity value was 73.3%. Clear and Partly Cloudy skies was observed most of the times (3.0 oktas). The mean atmospheric pressure value was computed as 759.8 mm of mercury. There were 2 rainy days with total rainfall of 1.0 mm in this month.

During the monitoring month of **February 2025** : The predominant winds were from NE/ENE directions (67.0°). The mean Wind velocity was 11.8 kmph. The temperature values were ranging from 26.4 °C to 36.0 °C with a mean value of 21.4 °C. The mean maximum relative humidity value was 64.6%. Clear skies was observed most of the times (2.9 oktas). The mean atmospheric pressure value was computed as 759.3 mm of mercury. There was no rainy day in this month.

Interpretation :

During the **Winter (2024-25) Season** : The predominant winds were from E, ENE & NE directions. The mean Wind velocity was 11.2 kmph. Calm condition was about 1.06%. The temperature values were ranging from 18.0 °C to 35.0 °C with a mean value of 21.9 °C. The mean maximum relative humidity value was 71.9%. Partly cloudy skies was observed most of the times (2.4 oktas). The mean atmospheric pressure value was computed to be 759.7 mm of mercury. There were 5 rainy days during the Season which accounted 5.0 mm of rainfall.

The monitored meteorological data were found to be **in compliance with local weather phenomena**. With the available data of Environmental Lapse Rate (ELR), Dry Adiabatic Lapse Rate will continue to rise and **no inversion** in the Study Area will take place. **Mixing height (IMD Data) for Chennai Region** is utilized for Modelling Studies.

Table : 3.4 Micrometeorological Data – December 2024

Location : Pandalgudi Colony

Date	Mean Wind Velocity, kmph	Pred. Wind Direction, ° (from)	Temperature, °C			Relative Humidity (Mean), %	Cloud Cover, oktas	Atm. Pressure (Mean), mm of Hg	Rain-fall, mm
			Min.	Max.	Mean				
01.12.2024	8.6	61	27.0	32.5	23.5	81	3.2	759.5	0
02.12.2024	7.2	55	27.8	34.0	23.7	77	3.0	759.4	0
03.12.2024	9.6	64	28.1	32.0	24.7	80	2.8	760.0	0
04.12.2024	10.2	63	28.0	32.8	24.0	78	3.3	760.5	0
05.12.2024	7.2	95	27.7	33.0	24.0	79	3.0	760.7	0
06.12.2024	8.7	85	27.9	33.0	23.1	77	2.7	760.5	0
07.12.2024	10.6	110	27.4	32.6	23.5	78	3.1	760.3	0
08.12.2024	8.0	78	27.2	32.8	22.9	75	2.8	760.5	0
09.12.2024	9.1	82	27.4	32.2	22.7	76	3.3	760.2	0
10.12.2024	10.7	98	28.2	34.2	23.5	70	3.5	759.7	0
12.12.2024	13.7	110	26.4	34.2	23.0	72	3.1	759.8	0
12.12.2024	14.4	124	24.6	30.0	22.9	92	2.9	759.3	0
13.12.2024	13.7	95	24.4	27.2	22.0	94	2.6	759.2	2.5
14.12.2024	11.3	80	22.3	26.2	20.1	90	2.7	758.5	0.5
15.12.2024	11.3	95	25.8	30.0	20.0	73	2.6	759.6	0
16.12.2024	12.2	98	26.2	31.0	21.2	71	3.0	759.9	0
17.12.2024	6.7	106	26.9	32.0	22.1	76	3.2	760.3	0
18.12.2024	5.9	124	27.3	33.0	22.5	80	3.4	760.5	0
19.12.2024	5.6	118	28.4	35.0	24.0	78	3.1	760.2	0
20.12.2024	7.8	120	28.4	34.1	23.5	78	2.9	759.6	0
21.12.2024	7.0	110	27.8	35.2	24.0	77	3.0	759.9	0
22.12.2024	8.7	108	27.6	34.6	23.4	79	2.7	760.4	0
23.12.2024	5.2	112	25.8	34.2	22.7	86	2.9	760.5	1.0
24.12.2024	5.4	110	27.3	32.0	22.6	75	2.2	761.2	0
25.12.2024	5.7	95	27.6	34.6	22.6	75	2.7	760.5	0
26.12.2024	7.4	67	27.4	34.2	24.1	80	2.3	759.9	0
27.12.2024	12.0	82	26.4	32.0	23.0	80	2.5	759.1	0
28.12.2024	11.1	75	26.2	32.0	22.1	79	2.6	760.0	0
29.12.2024	12.0	84	27.3	31.2	22.1	72	3.3	760.5	0
30.12.2024	11.8	100	26.8	31.5	22.4	68	3.1	760.4	0
31.12.2024	12.1	90	26.4	31.0	22.3	70	2.9	760.1	0
Monthly Abstract	9.4	93.4	22.3	35.2	22.8	77.9	2.9	760.0	4.0

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 – January 2025

Location : Pandalgudi Colony

Date	Mean Wind Velocity, kmph	Pred. Wind Direction, ° (from)	Temperature, °C			Relative Humidity (Mean), %	Cloud Cover, oktas	Atm. Pressure (Mean), mm of Hg	Rain-fall, mm
			Min.	Max.	Mean				
01.01.2025	12.4	85	26.3	31.4	21.6	72	2.8	760.0	0
02.01.2025	10.6	94	25.8	31.2	21.0	71	2.5	760.0	0
03.01.2025	14.1	90	25.3	30.4	19.5	69	3.2	759.7	0
04.01.2025	11.3	88	25.2	30.5	19.0	70	3.0	759.5	0
05.01.2025	10.6	66	24.5	30.5	20.0	73	3.3	760.0	0
06.01.2025	8.3	83	24.9	30.5	19.4	70	3.2	760.0	0
07.01.2025	11.5	62	26.2	31.0	20.1	74	3.4	760.5	0
08.01.2025	13.0	80	26.2	31.6	22.	72	2.7	760.0	0
09.01.2025	13.0	88	25.9	31.0	21.1	69	3.0	759.5	0
10.01.2025	14.3	92	26.1	31.2	20.6	74	3.1	760.0	0
11.01.2025	14.8	66	26.1	31.4	22.1	76	2.8	760.5	0
12.01.2025	12.6	65	26.0	30.2	22.5	73	2.9	759.5	0
13.01.2025	13.3	84	26.9	32.0	22.6	77	2.6	759.0	0
14.01.2025	13.0	97	25.9	31.4	23.0	79	2.4	759.3	0
15.01.2025	12.0	77	25.3	30.4	22.6	83	2.7	759.0	0
16.01.2025	15.4	90	25.9	30.0	21.7	73	3.0	759.5	0
17.01.2025	16.1	75	25.9	31.0	22.0	70	2.9	760.0	0
18.01.2025	14.8	80	25.7	31.4	22.5	73	3.3	759.5	0
19.01.2025	13.1	105	25.8	30.0	23.0	84	3.2	759.5	0.5
20.01.2025	14.3	112	25.9	30.0	22.0	73	3.4	760.0	0.5
21.01.2025	12.0	106	25.7	31.0	20.6	69	3.2	760.0	0
22.01.2025	11.1	108	26.2	31.0	22.0	76	3.0	761.0	0
23.01.2025	10.4	110	25.7	30.4	22.1	77	2.6	760.5	0
24.01.2025	12.4	116	25.9	31.5	21.5	71	3.3	760.5	0
25.01.2025	12.2	85	26.3	31.0	22.0	74	2.9	760.0	0
26.01.2025	14.6	60	25.8	32.0	20.7	70	3.3	759.5	0
27.01.2025	12.6	66	25.7	32.5	18.6	68	3.2	760.0	0
28.01.2025	9.4	65	25.2	32.5	19.3	72	2.8	759.5	0
29.01.2025	12.0	58	25.6	32.5	22.1	75	3.0	760.0	0
30.01.2025	8.7	65	26.1	32.0	22.3	71	2.7	759.5	0
31.01.2025	9.6	78	26.5	32.8	22.8	73	3.1	759.0	0
Monthly Abstract	12.4	83.7	24.5	32.8	21.4	73.3	3.0	759.8	1.0

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 – February 2025

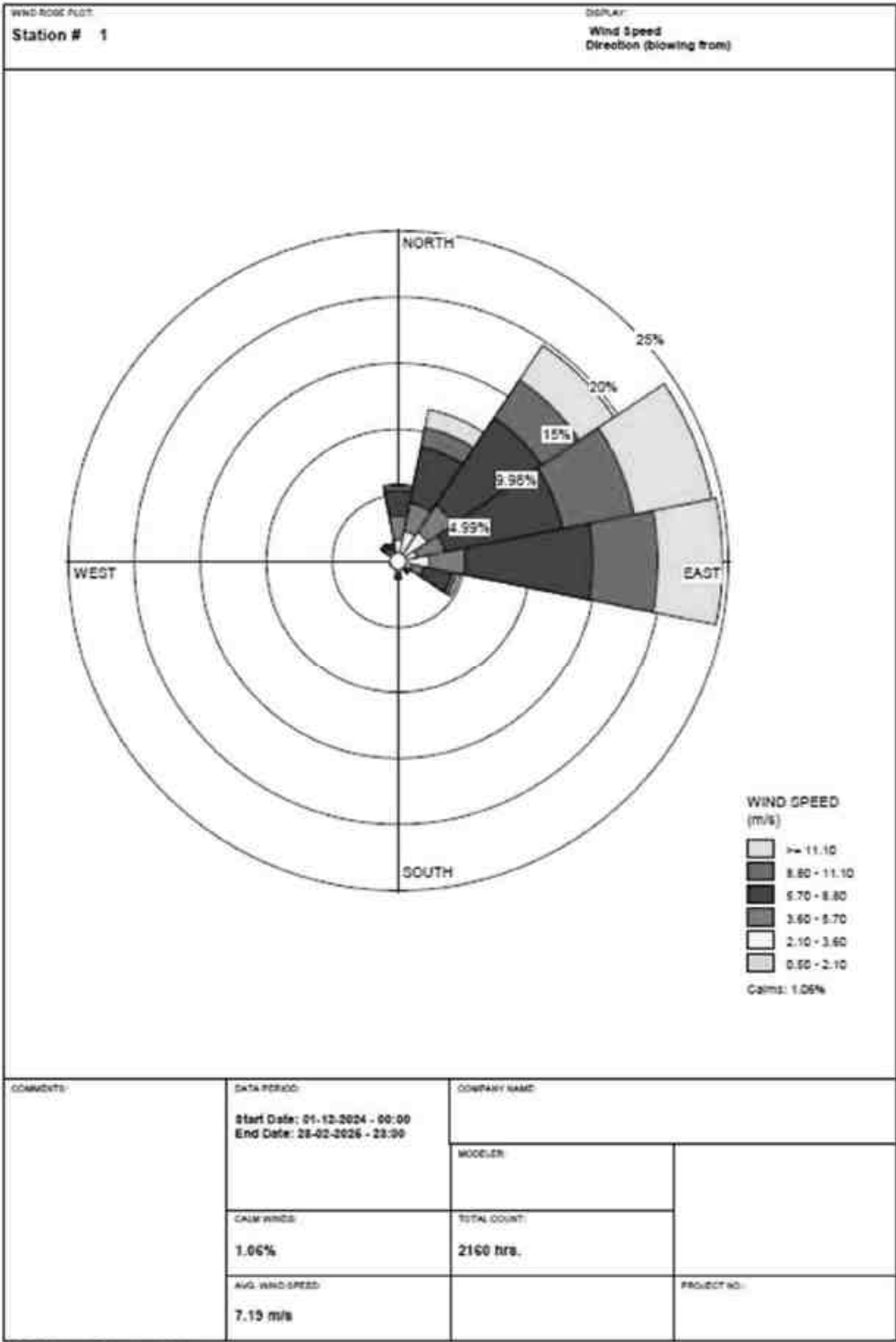
Location : Pandalgudi Colony

Date	Mean Wind Velocity, kmph	Pred. Wind Direction, ° (from)	Temperature, °C			Relative Humidity (Mean), %	Cloud Cover, oktas	Atm. Pressure (Mean), mm of Hg	Rain-fall, mm
			Min.	Max.	Mean				
01.02.2025	9.8	66	27.0	34.0	23.1	75	3.3	759.0	0
02.02.2025	11.7	62	27.7	35.5	23.0	70	3.5	759.0	0
03.02.2025	9.3	74	27.4	34.4	22.0	66	3.3	759.0	0
04.02.2025	10.7	75	26.8	34.0	20.1	60	3.0	758.5	0
05.02.2025	12.2	80	26.9	33.9	20.4	65	2.8	758.7	0
06.02.2025	12.2	60	26.8	34.0	20.7	66	3.1	759.7	0
07.02.2025	11.5	58	26.4	33.5	20.0	66	2.7	759.0	0
08.02.2025	11.1	61	26.6	34.0	19.1	66	2.9	759.7	0
09.02.2025	11.9	80	26.9	33.5	20.1	64	3.3	760.5	0
10.02.2025	13.1	75	26.8	34.0	21.6	64	2.8	760.5	0
11.02.2025	11.7	74	27.5	34.0	21.1	61	3.0	760.0	0
12.02.2025	10.0	68	27.6	34.6	22.0	68	2.7	760.4	0
13.02.2025	11.5	82	26.8	35.0	21.0	61	2.4	760.6	0
14.02.2025	8.3	71	26.7	35.0	19.1	54	2.6	759.7	0
15.02.2025	11.1	60	26.9	36.0	18.6	60	3.3	759.0	0
16.02.2025	11.9	68	27.4	36.0	21.0	59	3.1	759.0	0
17.02.2025	12.6	72	27.2	36.0	21.6	64	2.7	759.3	0
18.02.2025	10.0	88	26.9	34.5	20.6	60	2.6	759.0	0
19.02.2025	10.4	69	27.5	35.0	21.1	66	3.0	759.2	0
20.02.2025	11.7	65	27.9	35.0	21.1	62	2.4	759.5	0
21.02.2025	13.0	58	27.8	35.0	21.4	66	2.6	759.1	0
22.02.2025	11.5	74	27.8	35.4	22.6	65	1.8	759.3	0
23.02.2025	12.6	65	28.4	35.1	22.6	61	2.5	759.0	0
24.02.2025	15.2	52	28.2	36.0	22.1	62	2.7	759.4	0
25.02.2025	14.6	55	26.8	36.0	23.1	74	2.4	759.0	0
26.02.2025	15.7	48	28.1	34.0	23.1	64	1.6	758.8	0
27.02.2025	12.4	55	29.2	34.0	23.7	66	2.0	758.5	0
28.02.2025	13.1	61	28.6	35.4	24.4	73	1.9	758.3	0
Monthly Abstract	11.8	67	26.4	36.0	21.4	64.6	2.7	759.3	0

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

Fig. : 3.3 Seasonal Wind Rose

Period : Dec. 2024-Feb. 2025
(Winter Season)



3.5 Ambient Air Quality

3.5.1 Monitoring Locations

AAQ Monitoring Stations were selected based on **Upwind & Downwind directions** (Table 3.7) and covering existing Mines & Quarries. Mobile Stations were also deployed for the monitoring. 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**. Abstract of those monitored data is given as **Table 3.18** and ambient air quality status in **Table 3.19**.

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

Sl. No.	Location	North Latitude	East Longitude	Direction from QL	Distance from QL, km	Location Scenario
1	A1-QL-III Area	09°23'45.4"	78° 9'46.5"	-	-	Core zone
2	A2-Koppuchithampatti	09°24'33.0"	78°09'15.0"	N	1.5	Upwind
3	A3-Maravarperungudi	09°23'20.1"	78°10'54.2"	E/ENE	0.5	Upwind
4	A4-Pungamarattupatti	09°22'23.8"	78°10'34.6"	SE	2.0	Crosswind
5	A5-Sivalarpatti Mine	09°19'40.2"	78°08'32.4"	SSW	7.7	Downwind
6	A6-Pandalgudi Mine	09°22'08.7"	78°06'31.4"	WSW	5.7	Downwind
7	A7-Beneficiation Plant	09°23'47.1"	78°05'18.6"	W	7.0	Downwind
8	A8-Kallurani	09°28'18.2"	78°09'42.4"	NNW	7.5	Upwind
9	A9-Reddiyapatti	09°25'49.3"	78°12'35.0"	NE	4.8	Upwind
10	A10-Tummachinnapatti	09°23'56.2"	78°14'5.5"	E	6.2	Upwind

3.5.2 AAQ Status

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 10-44 microgram/cu.m (**ug/m³**) in the Study Area with **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 17-66 ug/m³ with **mean value of 36.8 ug/m³** against NAAQ Norm value of **100 ug/m³** (24 hours Time Weighted).

SO₂ values were monitored in the range between 6-23 ug/m³ with **mean value of 13.2 ug/m³** against NAAQ limit value of **80 ug/m³** (24 hours Time Weighted).

NO_x values were monitored in the range between 6-25 ug/m³ with **mean value of 15.4 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 <10-18.2 ug/m³ with **mean value of 12.4 ug/m³** against NAAQ limit value of 100 ug/m³ (8 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).

CO : Monitored CO 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.

Exceedance Factor (EF) : (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 Level.**

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	36.8	100	0.37	Low
SO ₂ , ug/m ³	13.2	80	0.17	Low
NO ₂ , ug/m ³	15.4	80	0.19	Low

Table : 3.8 Ambient Air Quality Data at A1-QL-III Area

Season : Winter 2024-25

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	NO _x	O ₃ (8-hly.)	NH ₃	CO (8-hly.)	Pb, ug/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , ug/m ³	BaP, ng/m ³
02-03.12.2024	06:00-06:00	10	21	7	7	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.12.2024	06:00-06:00	10	19	7	8	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
10-11.12.2024	06:00-06:00	18	31	6	7	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.12.2024	06:00-06:00	15	27	8	9	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
18-19.12.2024	06:00-06:00	13	22	7	8	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
19-20.12.2024	06:00-06:00	16	28	6	7	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
26-27.12.2024	06:00-06:00	12	22	6	6	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.12.2024	06:00-06:00	14	25	7	8	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.01.2025	06:00-06:00	12	21	7	7	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
04-05.01.2025	06:00-06:00	14	22	6	6	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.01.2025	06:00-06:00	11	20	6	7	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.01.2025	06:00-06:00	10	18	8	9	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
19-20.01.2025	06:00-06:00	13	21	6	7	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
20-21.01.2025	06:00-06:00	15	26	7	8	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.01.2025	06:00-06:00	11	22	6	7	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.01.2025	06:00-06:00	13	21	6	6	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
01-02.02.2025	06:00-06:00	10	18	7	8	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
02-03.02.2025	06:00-06:00	11	17	7	8	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
09-10.02.2025	06:00-06:00	13	20	8	10	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
10-11.02.2025	06:00-06:00	10	18	6	7	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
17-18.02.2025	06:00-06:00	12	21	6	7	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
18-19.02.2025	06:00-06:00	11	20	6	8	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
25-26.02.2025	06:00-06:00	13	23	7	8	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
26-27.02.2025	06:00-06:00	10	21	6	7	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
Range (Minimum-Maximum)		10-18	17-31	6-8	6-10	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
Mean Value		12.4	21.8	6.6	7.5	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	100 (8 hrs.)	400 (24 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; **NO_x**-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-Koppuchithampatti

Monitoring		Particulates, ug/m ³		Gaseous Pollutants, ug/m ³					Other Pollutants (Particulate Phase)				
Date	Period, hrs.	PM2.5	PM10	SO ₂	NO _x	O ₃ (8-hly.)	NH ₃	CO (8-hly.)	Pb, ug/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , ug/m ³	BaP, ng/m ³
02-03.12.2024	06:00-06:00	16	31	10	11	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.12.2024	06:00-06:00	13	24	8	9	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
10-11.12.2024	06:00-06:00	17	26	10	12	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.12.2024	06:00-06:00	14	27	9	10	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
18-19.12.2024	06:00-06:00	13	23	8	10	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
19-20.12.2024	06:00-06:00	15	28	9	11	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
26-27.12.2024	06:00-06:00	14	23	11	13	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.12.2024	06:00-06:00	11	20	10	11	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.01.2025	06:00-06:00	15	26	8	9	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
04-05.01.2025	06:00-06:00	13	21	9	11	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.01.2025	06:00-06:00	16	28	10	11	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.01.2025	06:00-06:00	12	20	9	10	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
19-20.01.2025	06:00-06:00	10	18	11	12	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
20-21.01.2025	06:00-06:00	14	22	10	11	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.01.2025	06:00-06:00	12	22	10	12	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.01.2025	06:00-06:00	13	25	12	14	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
01-02.02.2025	06:00-06:00	11	20	11	13	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
02-03.02.2025	06:00-06:00	14	26	9	11	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
09-10.02.2025	06:00-06:00	14	27	10	12	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
10-11.02.2025	06:00-06:00	11	20	12	13	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
17-18.02.2025	06:00-06:00	13	23	11	13	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
18-19.02.2025	06:00-06:00	15	26	13	14	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
25-26.02.2025	06:00-06:00	18	31	11	13	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
26-27.02.2025	06:00-06:00	16	29	10	12	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
Range (Minimum-Maximum)		10-18	18-31	8-13	9-14	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
Mean Value		13.8	24.4	10.0	11.6	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	100 (8 hrs.)	400 (24 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; **NO_x**-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-Maravarperungudi

Monitoring		Particulates, ug/m ³		Gaseous Pollutants, ug/m ³					Other Pollutants (Particulate Phase)				
Date	Period, hrs.	PM2.5	PM10	SO ₂	NO _x	O ₃ (8-hly.)	NH ₃	CO (8-hly.)	Pb, ug/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , ug/m ³	BaP, ng/m ³
02-03.12.2024	06:00-06:00	17	27	9	11	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.12.2024	06:00-06:00	14	25	10	12	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
10-11.12.2024	06:00-06:00	16	28	8	10	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.12.2024	06:00-06:00	17	30	11	12	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
18-19.12.2024	06:00-06:00	15	27	8	10	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
19-20.12.2024	06:00-06:00	15	29	11	12	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
26-27.12.2024	06:00-06:00	18	32	10	12	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.12.2024	06:00-06:00	18	28	9	10	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.01.2025	06:00-06:00	17	28	11	12	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
04-05.01.2025	06:00-06:00	14	22	11	13	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.01.2025	06:00-06:00	18	28	10	12	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.01.2025	06:00-06:00	17	30	11	14	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
19-20.01.2025	06:00-06:00	19	31	9	10	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
20-21.01.2025	06:00-06:00	15	27	11	12	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.01.2025	06:00-06:00	20	33	8	9	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.01.2025	06:00-06:00	14	24	10	12	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
01-02.02.2025	06:00-06:00	12	21	9	10	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
02-03.02.2025	06:00-06:00	16	25	11	11	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
09-10.02.2025	06:00-06:00	17	29	10	11	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
10-11.02.2025	06:00-06:00	20	33	8	9	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
17-18.02.2025	06:00-06:00	19	30	9	11	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
18-19.02.2025	06:00-06:00	21	30	10	12	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
25-26.02.2025	06:00-06:00	15	28	10	12	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
26-27.02.2025	06:00-06:00	18	31	9	11	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
Range (Minimum-Maximum)		12-21	21-33	8-11	9-14	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
Mean Value		16.8	28.2	9.7	11.3	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	100 (8 hrs.)	400 (24 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; **NO_x**-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-Pungamarattupatti

Monitoring		Particulates, ug/m ³		Gaseous Pollutants, ug/m ³					Other Pollutants (Particulate Phase)				
Date	Period, hrs.	PM2.5	PM10	SO ₂	NO _x	O ₃ (8-hly.)	NH ₃	CO (8-hly.)	Pb, ug/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , ug/m ³	BaP, ng/m ³
02-03.12.2024	06:00-06:00	13	22	8	9	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.12.2024	06:00-06:00	14	25	10	11	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
10-11.12.2024	06:00-06:00	12	21	7	8	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.12.2024	06:00-06:00	15	26	9	10	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
18-19.12.2024	06:00-06:00	11	20	8	10	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
19-20.12.2024	06:00-06:00	13	24	10	12	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
26-27.12.2024	06:00-06:00	15	27	11	13	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.12.2024	06:00-06:00	12	23	8	10	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.01.2025	06:00-06:00	13	25	10	13	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
04-05.01.2025	06:00-06:00	14	27	9	11	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.01.2025	06:00-06:00	11	20	11	13	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.01.2025	06:00-06:00	13	24	8	10	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
19-20.01.2025	06:00-06:00	12	21	8	9	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
20-21.01.2025	06:00-06:00	10	19	10	12	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.01.2025	06:00-06:00	12	21	9	12	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.01.2025	06:00-06:00	15	24	9	11	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
01-02.02.2025	06:00-06:00	13	22	11	13	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
02-03.02.2025	06:00-06:00	16	27	8	9	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
09-10.02.2025	06:00-06:00	12	20	9	11	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
10-11.02.2025	06:00-06:00	14	23	10	12	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
17-18.02.2025	06:00-06:00	14	26	8	10	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
18-19.02.2025	06:00-06:00	15	27	7	9	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
25-26.02.2025	06:00-06:00	17	30	8	10	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
26-27.02.2025	06:00-06:00	15	26	9	11	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
Range (Minimum-Maximum)		10-17	19-30	7-11	8-13	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
Mean Value		13.4	23.8	9.0	10.8	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	100 (8 hrs.)	400 (24 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; **NO_x**-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-Sivalarpatti Mine

Monitoring		Particulates, ug/m ³		Gaseous Pollutants, ug/m ³					Other Pollutants (Particulate Phase)				
Date	Period, hrs.	PM2.5	PM10	SO ₂	NO _x	O ₃ (8-hly.)	NH ₃	CO (8-hly.)	Pb, ug/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , ug/m ³	BaP, ng/m ³
02-03.12.2024	06:00-06:00	30	51	14	17	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.12.2024	06:00-06:00	22	38	12	15	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
10-11.12.2024	06:00-06:00	25	41	10	13	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.12.2024	06:00-06:00	21	36	12	14	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
18-19.12.2024	06:00-06:00	26	43	13	16	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
19-20.12.2024	06:00-06:00	24	41	11	14	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
26-27.12.2024	06:00-06:00	26	47	14	18	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.12.2024	06:00-06:00	27	50	12	15	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.01.2025	06:00-06:00	32	53	13	16	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
04-05.01.2025	06:00-06:00	28	48	12	15	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.01.2025	06:00-06:00	25	43	15	18	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.01.2025	06:00-06:00	26	47	12	16	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
19-20.01.2025	06:00-06:00	22	37	11	14	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
20-21.01.2025	06:00-06:00	24	39	13	15	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.01.2025	06:00-06:00	23	38	15	18	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.01.2025	06:00-06:00	21	34	16	20	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
01-02.02.2025	06:00-06:00	23	36	12	15	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
02-03.02.2025	06:00-06:00	24	39	14	17	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
09-10.02.2025	06:00-06:00	27	42	11	14	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
10-11.02.2025	06:00-06:00	35	56	13	15	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
17-18.02.2025	06:00-06:00	39	63	15	18	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
18-19.02.2025	06:00-06:00	41	66	18	21	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
25-26.02.2025	06:00-06:00	36	55	16	18	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
26-27.02.2025	06:00-06:00	38	59	14	17	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
Range (Minimum-Maximum)		21-41	34-66	10-18	13-21	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
Mean Value		27.7	45.9	13.3	16.2	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	100 (8 hrs.)	400 (24 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; **NO_x**-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-Pandalgudi Mine

Monitoring		Particulates, ug/m ³		Gaseous Pollutants, ug/m ³					Other Pollutants (Particulate Phase)				
Date	Period, hrs.	PM2.5	PM10	SO ₂	NO _x	O ₃ (8-hly.)	NH ₃	CO (8-hly.)	Pb, ug/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , ug/m ³	BaP, ng/m ³
02-03.12.2024	06:00-06:00	26	49	12	15	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.12.2024	06:00-06:00	24	45	14	16	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
10-11.12.2024	06:00-06:00	27	51	11	15	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.12.2024	06:00-06:00	23	43	13	16	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
18-19.12.2024	06:00-06:00	30	54	15	18	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
19-20.12.2024	06:00-06:00	26	43	16	19	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
26-27.12.2024	06:00-06:00	22	40	14	17	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.12.2024	06:00-06:00	25	45	13	15	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.01.2025	06:00-06:00	27	48	15	17	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
04-05.01.2025	06:00-06:00	34	53	18	20	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.01.2025	06:00-06:00	37	60	14	18	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.01.2025	06:00-06:00	30	54	16	20	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
19-20.01.2025	06:00-06:00	32	57	12	16	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
20-21.01.2025	06:00-06:00	35	59	15	18	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.01.2025	06:00-06:00	38	61	17	19	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.01.2025	06:00-06:00	44	63	20	22	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
01-02.02.2025	06:00-06:00	42	60	18	20	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
02-03.02.2025	06:00-06:00	40	62	14	18	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
09-10.02.2025	06:00-06:00	43	65	21	24	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
10-11.02.2025	06:00-06:00	30	55	23	25	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
17-18.02.2025	06:00-06:00	38	62	20	23	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
18-19.02.2025	06:00-06:00	32	56	22	24	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
25-26.02.2025	06:00-06:00	41	63	18	20	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
26-27.02.2025	06:00-06:00	38	58	21	23	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
Range (Minimum-Maximum)		22-44	40-65	11-23	15-25	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
Mean Value		32.7	54.4	16.3	19.1	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	100 (8 hrs.)	400 (24 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; **NO_x**-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-Beneficiation Plant

Monitoring		Particulates, ug/m ³		Gaseous Pollutants, ug/m ³					Other Pollutants (Particulate Phase)				
Date	Period, hrs.	PM2.5	PM10	SO ₂	NO _x	O ₃ (8-hly.)	NH ₃	CO (8-hly.)	Pb, ug/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , ug/m ³	BaP, ng/m ³
02-03.12.2024	06:00-06:00	27	51	16	18	18.4	<5	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.12.2024	06:00-06:00	34	63	14	17	21.2	<5	<1000	<0.1	<1	<1	<0.01	<0.1
10-11.12.2024	06:00-06:00	32	57	15	18	16.3	<5	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.12.2024	06:00-06:00	28	52	15	17	20.7	<5	<1000	<0.1	<1	<1	<0.01	<0.1
18-19.12.2024	06:00-06:00	31	55	17	20	22.3	<5	<1000	<0.1	<1	<1	<0.01	<0.1
19-20.12.2024	06:00-06:00	35	66	19	21	18.1	<5	<1000	<0.1	<1	<1	<0.01	<0.1
26-27.12.2024	06:00-06:00	33	58	20	23	17.6	<5	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.12.2024	06:00-06:00	27	45	18	21	15.8	<5	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.01.2025	06:00-06:00	35	62	22	24	18.4	<5	<1000	<0.1	<1	<1	<0.01	<0.1
04-05.01.2025	06:00-06:00	24	41	19	22	20.7	<5	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.01.2025	06:00-06:00	30	58	21	24	21.3	<5	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.01.2025	06:00-06:00	25	48	23	25	18.8	<5	<1000	<0.1	<1	<1	<0.01	<0.1
19-20.01.2025	06:00-06:00	28	47	22	24	17.9	<5	<1000	<0.1	<1	<1	<0.01	<0.1
20-21.01.2025	06:00-06:00	33	55	20	22	20.6	<5	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.01.2025	06:00-06:00	27	45	18	21	21.3	<5	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.01.2025	06:00-06:00	34	58	22	24	20.4	<5	<1000	<0.1	<1	<1	<0.01	<0.1
01-02.02.2025	06:00-06:00	31	53	17	20	16.9	<5	<1000	<0.1	<1	<1	<0.01	<0.1
02-03.02.2025	06:00-06:00	33	57	20	23	18.4	<5	<1000	<0.1	<1	<1	<0.01	<0.1
09-10.02.2025	06:00-06:00	35	62	21	24	20.2	<5	<1000	<0.1	<1	<1	<0.01	<0.1
10-11.02.2025	06:00-06:00	31	57	20	23	21.6	<5	<1000	<0.1	<1	<1	<0.01	<0.1
17-18.02.2025	06:00-06:00	34	59	18	21	22.7	<5	<1000	<0.1	<1	<1	<0.01	<0.1
18-19.02.2025	06:00-06:00	34	60	22	24	24.1	<5	<1000	<0.1	<1	<1	<0.01	<0.1
25-26.02.2025	06:00-06:00	37	62	18	20	18.7	<5	<1000	<0.1	<1	<1	<0.01	<0.1
26-27.02.2025	06:00-06:00	33	56	20	23	19.3	<5	<1000	<0.1	<1	<1	<0.01	<0.1
Range (Minimum-Maximum)		24-37	41-66	14-23	17-25	15.8-24.1	<5	<1000	<0.1	<1	<1	<0.01	<0.1
Mean Value		31.3	55.3	19.0	21.6	19.7	<5	<1000	<0.1	<1	<1	<0.01	<0.1
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	100 (8 hrs.)	400 (24 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; **NO_x**-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-Kallurani

Monitoring		Particulates, ug/m ³		Gaseous Pollutants, ug/m ³					Other Pollutants (Particulate Phase)				
Date	Period, hrs.	PM2.5	PM10	SO ₂	NO _x	O ₃ (8-hly.)	NH ₃	CO (8-hly.)	Pb, ug/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , ug/m ³	BaP, ng/m ³
02-03.12.2024	06:00-06:00	26	41	18	21	10.7	<5	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.12.2024	06:00-06:00	32	47	15	18	12.6	<5	<1000	<0.1	<1	<1	<0.01	<0.1
10-11.12.2024	06:00-06:00	28	40	21	23	14.1	<5	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.12.2024	06:00-06:00	29	42	18	20	15.2	<5	<1000	<0.1	<1	<1	<0.01	<0.1
18-19.12.2024	06:00-06:00	31	44	17	21	11.3	<5	<1000	<0.1	<1	<1	<0.01	<0.1
19-20.12.2024	06:00-06:00	28	38	18	21	14.7	<5	<1000	<0.1	<1	<1	<0.01	<0.1
26-27.12.2024	06:00-06:00	30	46	20	23	12.5	<5	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.12.2024	06:00-06:00	32	48	15	19	14.0	<5	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.01.2025	06:00-06:00	23	40	21	24	15.1	<5	<1000	<0.1	<1	<1	<0.01	<0.1
04-05.01.2025	06:00-06:00	25	42	18	21	13.8	<5	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.01.2025	06:00-06:00	27	44	16	20	12.7	<5	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.01.2025	06:00-06:00	23	37	15	18	14.0	<5	<1000	<0.1	<1	<1	<0.01	<0.1
19-20.01.2025	06:00-06:00	26	39	17	21	10.8	<5	<1000	<0.1	<1	<1	<0.01	<0.1
20-21.01.2025	06:00-06:00	30	46	14	18	13.2	<5	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.01.2025	06:00-06:00	24	41	17	20	16.2	<5	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.01.2025	06:00-06:00	25	41	15	18	15.2	<5	<1000	<0.1	<1	<1	<0.01	<0.1
01-02.02.2025	06:00-06:00	24	37	17	20	14.1	<5	<1000	<0.1	<1	<1	<0.01	<0.1
02-03.02.2025	06:00-06:00	22	38	18	21	10.7	<5	<1000	<0.1	<1	<1	<0.01	<0.1
09-10.02.2025	06:00-06:00	26	45	20	23	18.2	<5	<1000	<0.1	<1	<1	<0.01	<0.1
10-11.02.2025	06:00-06:00	32	48	18	21	13.5	<5	<1000	<0.1	<1	<1	<0.01	<0.1
17-18.02.2025	06:00-06:00	31	51	20	23	12.7	<5	<1000	<0.1	<1	<1	<0.01	<0.1
18-19.02.2025	06:00-06:00	25	42	22	24	11.8	<5	<1000	<0.1	<1	<1	<0.01	<0.1
25-26.02.2025	06:00-06:00	27	45	19	21	13.0	<5	<1000	<0.1	<1	<1	<0.01	<0.1
26-27.02.2025	06:00-06:00	28	48	21	24	12.4	<5	<1000	<0.1	<1	<1	<0.01	<0.1
Range (Minimum-Maximum)		22-32	37-51	14-22	18-24	10.7-18.2	<5	<1000	<0.1	<1	<1	<0.01	<0.1
Mean Value		27.3	42.9	17.9	21.0	13.4	<5	<1000	<0.1	<1	<1	<0.01	<0.1
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	100 (8 hrs.)	400 (24 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; **NO_x**-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-Reddiyapatti

Monitoring		Particulates, ug/m ³		Gaseous Pollutants, ug/m ³					Other Pollutants (Particulate Phase)				
Date	Period, hrs.	PM2.5	PM10	SO ₂	NO _x	O ₃ (8-hly.)	NH ₃	CO (8-hly.)	Pb, ug/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , ug/m ³	BaP, ng/m ³
02-03.12.2024	06:00-06:00	24	39	13	15	10.6	<5	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.12.2024	06:00-06:00	27	42	16	17	11.2	<5	<1000	<0.1	<1	<1	<0.01	<0.1
10-11.12.2024	06:00-06:00	31	52	12	15	10.4	<5	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.12.2024	06:00-06:00	26	40	14	17	11.3	<5	<1000	<0.1	<1	<1	<0.01	<0.1
18-19.12.2024	06:00-06:00	30	55	15	18	10.7	<5	<1000	<0.1	<1	<1	<0.01	<0.1
19-20.12.2024	06:00-06:00	22	40	17	20	10.3	<5	<1000	<0.1	<1	<1	<0.01	<0.1
26-27.12.2024	06:00-06:00	24	43	14	16	11.0	<5	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.12.2024	06:00-06:00	27	46	17	19	10.6	<5	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.01.2025	06:00-06:00	30	49	18	21	10.2	<5	<1000	<0.1	<1	<1	<0.01	<0.1
04-05.01.2025	06:00-06:00	26	42	20	23	12.0	<5	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.01.2025	06:00-06:00	33	51	16	18	11.5	<5	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.01.2025	06:00-06:00	27	44	19	21	12.7	<5	<1000	<0.1	<1	<1	<0.01	<0.1
19-20.01.2025	06:00-06:00	20	37	20	24	10.6	<5	<1000	<0.1	<1	<1	<0.01	<0.1
20-21.01.2025	06:00-06:00	27	43	17	19	13.1	<5	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.01.2025	06:00-06:00	31	45	15	18	12.4	<5	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.01.2025	06:00-06:00	24	38	18	20	11.8	<5	<1000	<0.1	<1	<1	<0.01	<0.1
01-02.02.2025	06:00-06:00	28	43	19	21	10.5	<5	<1000	<0.1	<1	<1	<0.01	<0.1
02-03.02.2025	06:00-06:00	27	40	21	23	11.3	<5	<1000	<0.1	<1	<1	<0.01	<0.1
09-10.02.2025	06:00-06:00	22	36	17	20	10.7	<5	<1000	<0.1	<1	<1	<0.01	<0.1
10-11.02.2025	06:00-06:00	20	35	19	21	12.2	<5	<1000	<0.1	<1	<1	<0.01	<0.1
17-18.02.2025	06:00-06:00	23	38	20	23	11.0	<5	<1000	<0.1	<1	<1	<0.01	<0.1
18-19.02.2025	06:00-06:00	30	52	22	25	12.1	<5	<1000	<0.1	<1	<1	<0.01	<0.1
25-26.02.2025	06:00-06:00	26	40	18	20	10.6	<5	<1000	<0.1	<1	<1	<0.01	<0.1
26-27.02.2025	06:00-06:00	24	44	21	23	12.4	<5	<1000	<0.1	<1	<1	<0.01	<0.1
Range (Minimum-Maximum)		20-33	35-55	12-22	15-25	10.2-13.1	<5	<1000	<0.1	<1	<1	<0.01	<0.1
Mean Value		26.2	43.1	17.4	19.9	11.3	<5	<1000	<0.1	<1	<1	<0.01	<0.1
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	100 (8 hrs.)	400 (24 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; **NO_x**-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-Tummachinnapatti

Monitoring		Particulates, ug/m ³		Gaseous Pollutants, ug/m ³					Other Pollutants (Particulate Phase)				
Date	Period, hrs.	PM2.5	PM10	SO ₂	NO _x	O ₃ (8-hly.)	NH ₃	CO (8-hly.)	Pb, ug/m ³	As, ng/m ³	Ni, ng/m ³	C ₆ H ₆ , ug/m ³	BaP, ng/m ³
02-03.12.2024	06:00-06:00	15	26	13	15	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.12.2024	06:00-06:00	12	25	12	14	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
10-11.12.2024	06:00-06:00	14	28	10	12	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.12.2024	06:00-06:00	17	31	13	15	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
18-19.12.2024	06:00-06:00	12	22	11	13	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
19-20.12.2024	06:00-06:00	16	30	12	15	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
26-27.12.2024	06:00-06:00	14	24	14	17	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.12.2024	06:00-06:00	13	25	12	14	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
03-04.01.2025	06:00-06:00	12	23	15	16	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
04-05.01.2025	06:00-06:00	13	25	13	15	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
11-12.01.2025	06:00-06:00	15	28	15	18	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
12-13.01.2025	06:00-06:00	15	26	12	14	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
19-20.01.2025	06:00-06:00	10	21	14	17	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
20-21.01.2025	06:00-06:00	14	26	11	13	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
27-28.01.2025	06:00-06:00	12	22	10	13	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
28-29.01.2025	06:00-06:00	14	26	12	15	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
01-02.02.2025	06:00-06:00	13	23	13	16	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
02-03.02.2025	06:00-06:00	19	34	15	18	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
09-10.02.2025	06:00-06:00	21	37	14	17	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
10-11.02.2025	06:00-06:00	22	38	12	15	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
17-18.02.2025	06:00-06:00	15	28	13	16	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
18-19.02.2025	06:00-06:00	22	38	15	17	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
25-26.02.2025	06:00-06:00	19	34	17	20	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
26-27.02.2025	06:00-06:00	21	38	14	17	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
Range (Minimum-Maximum)		10-22	21-38	10-17	12-20	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
Mean Value		15.4	28.3	13.0	15.5	<10	<5	<1000	<0.1	<1	<1	<0.01	<0.1
NAAQ Norms*		60 (24 hrs.)	100 (24 hrs.)	80 (24 hrs.)	80 (24 hrs.)	100 (8 hrs.)	400 (24 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; **NO_x**-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	NOx	PM2.5	PM10	SO ₂	NOx
		A1-QL-III Area				A2-Koppuchithampatti			
1	No. of Observations	24	24	24	24	24	24	24	24
2	Minimum	10	17	6	6	10	18	8	9
3	10 th Percentile Value	10	18	6	6	11	20	8	10
4	20 th Percentile Value	10	20	6	7	12	21	9	11
5	30 th Percentile Value	11	20	6	7	13	22	9	11
6	40 th Percentile Value	11	21	6	7	13	23	10	11
7	50 th Percentile Value	12	21	7	7	14	25	10	12
8	60 th Percentile Value	13	22	7	8	14	26	10	12
9	70 th Percentile Value	13	22	7	8	15	26	11	12
10	80 th Percentile Value	14	24	7	8	15	27	11	13
11	90 th Percentile Value	15	27	8	9	16	29	12	13
12	95 th Percentile Value	16	28	8	9	17	31	12	14
13	98 th Percentile Value	17	30	8	10	18	31	13	14
14	Maximum	18	31	8	10	18	31	13	14
15	Arithmetic Mean	12.4	21.8	6.6	7.5	13.8	24.4	10.0	11.6
16	Geometric Mean	12.2	21.6	6.6	7.4	13.6	24.2	10.0	11.5
17	Standard Deviation	2.2	3.4	0.7	1.0	2.0	3.6	1.3	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
		A3-Maravarperungudi				A4-Pungamarattupatti			
1	No. of Observations	24	24	24	24	24	24	24	24
2	Minimum	12	21	8	9	10	19	7	8
3	10 th Percentile Value	14	24	8	10	11	20	8	9
4	20 th Percentile Value	15	26	9	10	12	21	8	10
5	30 th Percentile Value	15	27	9	11	12	22	8	10
6	40 th Percentile Value	16	28	9	11	13	23	8	10
7	50 th Percentile Value	17	28	10	12	13	24	9	11
8	60 th Percentile Value	17	29	10	12	14	25	9	11
9	70 th Percentile Value	18	30	10	12	14	26	10	12
10	80 th Percentile Value	18	30	11	12	15	26	10	12
11	90 th Percentile Value	20	32	11	12	15	27	11	13
12	95 th Percentile Value	20	33	11	13	16	27	11	13
13	98 th Percentile Value	21	33	11	14	17	29	11	13
14	Maximum	21	33	11	14	17	30	11	13
15	Arithmetic Mean	16.8	28.2	9.7	11.3	13.4	23.8	9.0	10.8
16	Geometric Mean	16.6	28.0	9.6	11.2	13.3	23.6	8.9	10.7
17	Standard Deviation	2.2	3.1	1.1	1.2	1.7	2.9	1.2	1.5
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. ug-microgram. O₃-Ozone values are reported locationwise.

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-Sivalarpatti Mine				A6-Pandalgudi Mine			
1	No. of Observations	24	24	24	24	24	24	24	24
2	Minimum	21	34	10	13	22	40	11	15
3	10 th Percentile Value	22	36	11	14	24	44	12	15
4	20 th Percentile Value	23	38	12	15	26	47	14	16
5	30 th Percentile Value	24	39	12	15	27	51	14	17
6	40 th Percentile Value	25	41	12	15	30	54	15	18
7	50 th Percentile Value	26	43	13	16	32	56	16	19
8	60 th Percentile Value	27	47	14	17	35	58	17	20
9	70 th Percentile Value	28	50	14	17	38	60	18	20
10	80 th Percentile Value	33	54	15	18	39	61	20	22
11	90 th Percentile Value	37	58	16	18	42	63	21	24
12	95 th Percentile Value	39	62	16	20	43	63	22	24
13	98 th Percentile Value	40	65	17	21	44	64	23	25
14	Maximum	41	66	18	21	44	65	23	25
15	Arithmetic Mean	27.7	45.9	13.3	16.2	32.7	54.4	16.3	19.1
16	Geometric Mean	27.1	45.1	13.1	16.1	32.0	53.9	16.0	18.9
17	Standard Deviation	6.0	9.0	1.9	2.0	6.8	7.4	3.4	3.1
18	NAAQ Norms*	60	100	80	80	60	100	80	80
19	% Values exceeding Norms*	0	0	0	0	0	0	0	0
		A7-Beneficiation Plant				A8-Kallurani			
1	No. of Observations	24	24	24	24	24	24	24	24
2	Minimum	24	41	14	17	22	37	14	18
3	10 th Percentile Value	27	46	15	18	23	38	15	18
4	20 th Percentile Value	28	50	17	20	25	40	16	20
5	30 th Percentile Value	30	53	18	21	25	41	17	20
6	40 th Percentile Value	31	55	18	21	26	41	17	21
7	50 th Percentile Value	33	57	20	22	27	42	18	21
8	60 th Percentile Value	33	58	20	23	28	44	18	21
9	70 th Percentile Value	34	58	20	23	29	45	19	21
10	80 th Percentile Value	34	61	21	24	30	46	20	23
11	90 th Percentile Value	35	62	22	24	32	48	21	24
12	95 th Percentile Value	35	63	22	24	32	48	21	24
13	98 th Percentile Value	36	65	23	25	32	50	22	24
14	Maximum	37	66	23	25	32	51	22	24
15	Arithmetic Mean	31.3	55.3	19.0	21.6	27.3	42.9	17.9	21.0
16	Geometric Mean	31.1	54.9	18.9	21.5	27.1	42.7	17.8	20.9
17	Standard Deviation	3.5	6.4	2.5	2.4	3.1	3.9	2.2	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 dioxide; NOx-Oxides of Nitrogen. ug-microgram. O₃-Ozone values are reported locationwise.

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-Reddiyapatti				A10-Tummachinnapatti			
1	No. of Observations	24	24	24	24	24	24	24	24
2	Minimum	20	35	12	15	10	21	10	12
3	10 th Percentile Value	22	37	14	16	12	22	11	13
4	20 th Percentile Value	24	39	15	18	13	24	12	14
5	30 th Percentile Value	24	40	16	18	13	25	12	15
6	40 th Percentile Value	26	40	17	19	14	26	12	15
7	50 th Percentile Value	27	43	18	20	15	26	13	15
8	60 th Percentile Value	27	43	18	21	15	28	13	16
9	70 th Percentile Value	27	44	19	21	16	30	14	17
10	80 th Percentile Value	30	47	20	23	19	34	14	17
11	90 th Percentile Value	31	52	21	23	21	38	15	18
12	95 th Percentile Value	31	52	21	24	22	38	15	18
13	98 th Percentile Value	32	54	22	25	22	38	16	19
14	Maximum	33	55	22	25	22	38	17	20
15	Arithmetic Mean	26.2	43.1	17.4	19.9	15.4	28.3	13.0	15.5
16	Geometric Mean	26.0	42.8	17.2	19.7	15.1	27.8	12.9	15.4
17	Standard Deviation	3.5	5.4	2.7	2.8	3.5	5.5	1.7	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 dioxide; NOx-Oxides of Nitrogen. ug-microgram. O₃-Ozone values are reported locationwise.

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 : Winter 2024-25

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	17	6	6
3	10 th Percentile Value	12	21	8	9
4	20 th Percentile Value	13	24	9	11
5	30 th Percentile Value	15	26	10	12
6	40 th Percentile Value	17	29	11	13
7	50 th Percentile Value	21	36	13	15
8	60 th Percentile Value	24	40	14	17
9	70 th Percentile Value	27	44	16	18
10	80 th Percentile Value	30	50	18	21
11	90 th Percentile Value	33	57	20	23
12	95 th Percentile Value	37	61	21	24
13	98 th Percentile Value	40	63	22	24
14	Maximum	44	66	23	25
15	Arithmetic Mean	21.7	36.8	13.2	15.4
16	Geometric Mean	20.0	34.4	12.4	14.5
17	Standard Deviation	8.5	13.4	4.6	5.1
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. ug-microgram. O₃-Ozone values are reported location-wise.

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.

National Ambient Air Quality Standard : 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. 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 2.3% of RSPM that monitored in the Study Area.

Free Respirable Silica Content (FTIR Method) : 2.3%.

3.6 Ambient Noise Levels

Study area represents Industrial, Commercial & Residential Areas to compare with the MoEF&CC Ambient Noise Norms. The abstract of monitored noise data are presented in **Table 3.20**.

Table : 3.20 Ambient Noise Level Data (Abstract)

Monitoring Dates : 18-19.01.2025

Sl. No.	Location	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-QL-III Area	Industrial	30.1	81.4	38.9	28.9	75.6	38.2
2	A2-Koppuchithampatti	Residential	33.4	88.7	41.2	30.8	81.2	40.1
3	A3-Maravarperungudi	Residential	33.8	90.2	41.5	31.1	83.0	40.4
4	A4-Pungamarattupatti	Residential	32.6	87.0	40.6	30.2	80.1	38.9
5	A5-Sivalarpatti Mine	Industrial	33.9	92.1	45.7	33.5	94.0	43.8
6	A6-Pandalgudi Mine	Industrial	34.2	98.7	46.1	33.8	95.2	44.5
7	A7-Beneficiation Plant	Industrial	33.8	100.4	46.5	33.2	101.5	44.8
8	A8-Kallurani	Commercial	33.0	102.2	47.0	32.9	103.0	44.5
9	A9-Reddiyapatti	Residential	32.9	95.7	45.4	32.4	98.2	43.7
10	A10-Tummachinnapatti	Residential	32.5	90.7	43.8	32.0	94.4	42.0
Study Area			30.1	102.2	43.7	28.9	103.0	42.1
MoEF&CC Norms* for Residential Areas			-		55	-		45
MoEF&CC Norms for Commercial Areas			-		65	-		55
MoEF&CC Norms for Industrial Areas			-		75	-		70

* : 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 30.1 dB(A) to 102.2 dB(A) during day times and from 28.9 dB(A) to 103.0 dB(A) during night times on the monitoring days. Day Equivalent Noise (Leq-d) level was found to be 43.7 dB(A) and Night Equivalent Noise (Leq-n) level was 42.1 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.

Working Mine Areas Day Equivalent Noise (Leq-d) levels were in the range 46.5-47.2 dB(A) and Night Equivalent Noise (Leq-n) levels were in the range 43.9-44.8 dB(A).

3.7 Water Environment

3.7.1 Hydrogeology

The climate of the study area is arid to semi - arid and receives rainfall from north east and south west monsoons. The area falls in two major river basins namely Vaippar and Gundar. Mines areas falls within the Senkottaiyar river basin which is one of the sub basins of Vaippar River. The structural features mostly control the drainage of the study area. There is no perennial river in the study area. The seasonal nallas confluence into River Vaippar. There are no major lakes or irrigation tanks. Few multi utility bigger ponds exist in the villages.

Block cotton soil occur in the area. Kankar is associated with the top soil. The soil, **clay in nature and hence has low permeability**. Rain fed agriculture prevails in the study area. There are small scrubs and trees in the area. The lands are well ploughed and evenly levelled and boundary compartments are made by the farmers. Dry land agriculture crops such as local Jawar, Makka Cholan, Cholan, dry land Chillies, Red gram and food Malli are mainly raised.

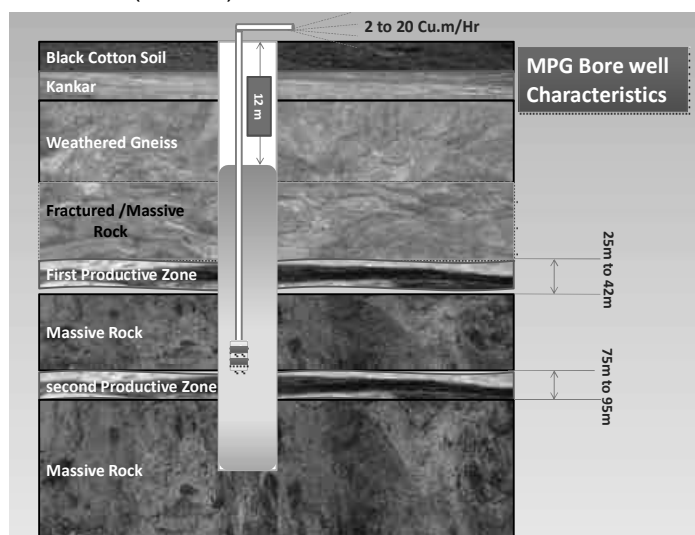
Geologically, the region is comprised by Archaean age group of formations like charnockite, hornblende biotite-gneisses with minor isolated patches of pyroxene granulites, quartzite's, granites, calc-granulites, ultramatic rocks and crystalline limestone. The limestone occurs as intrusive amid the Gneisses and the strike direction is NW-SE. Alluvium of recent to sub recent age is observed mainly along the river courses and coastal alluvium along the coastal belts.

The **study area is located in the fringe zone border of sedimentary and hard rock formations**. The major aquifer systems in the area are constituted by weathered and fractured crystalline rocks consisting mainly granitic gneisses. Groundwater occurs under unconfined conditions and occurs in the form of fissures, fractures, faults and lineaments in hard rock areas, whereas semi confined nature are found to be in sedimentary formations.

The water-bearing properties of crystalline formations, which lack primary porosity, depend on the extent of development of secondary inter granular porosity. The occurrence and movement of ground water in these rocks are generally confined to such spaces. These aquifers are highly heterogeneous in nature due to variation in lithology, texture and structural features even within short distances. In particular, groundwater occurrences in hard formations are mainly controlled by the lineaments corresponding to fractures, joints and faults. In the area there are several minor streams cut across the lands. These streams or nalla carry runoff water along its course and finally take the load to the nearby Nallas.

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 yield characteristics of wells vary

considerably depending on the topographic set-up, lithology and nature of weathering. The lithology of the drilled wells indicated that the weathering depth ranges from 20 m to 40 m and in few locations fractures are encountered at about 50-65 m depth. However, the weathered part of the formation has low transmitting capacity and mainly the fractured formation provides sufficient yield to sustain pumping continuously by submersible pumps. The yield of bore wells drilled down to a depth of 40 - 70 m mainly for domestic purposes, ranged from 10 lpm to 250 lpm. Successful bore wells ranged up to 6 lps for the drawdown varying between 5.76 and 17.56 m and drilled down to a depth of 200 m BGL during the ground water exploration programme of Central Ground Water Board (CGWB).



The ground water zones in the limestone beds are not homogeneous and non-isotropic with limited aerial extent. Their vertical and horizontal continuity is also limited to the size, scale, length and width of the cracks. This has a limited aerial extent and thickness and its lateral continuity is also restricted to the width of limestone bed up to its contact with hard rock at the lease boundary.

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 3.21**. The Data for the Period 2020-2024 is also appended.

Table : 3.21 Ground Water Level Data

Monitored Month & Ground Water Level, m BGL									
Jan. 2020	May 2020	Jan. 2021	May 2021	Jan. 2022	May 2022	Jan. 2023	May 2023	Jan. 2024	May 2024
4.95	9.6	4.3	7.7	2.9	4.8	3.5	5.5	2.17	4.00
5-Years Pre-monsoon Average – 6.32 m BGL 5-Years Post-monsoon Average – 3.56 m BGL									

Source : TWAD Data for Virudunagar District.

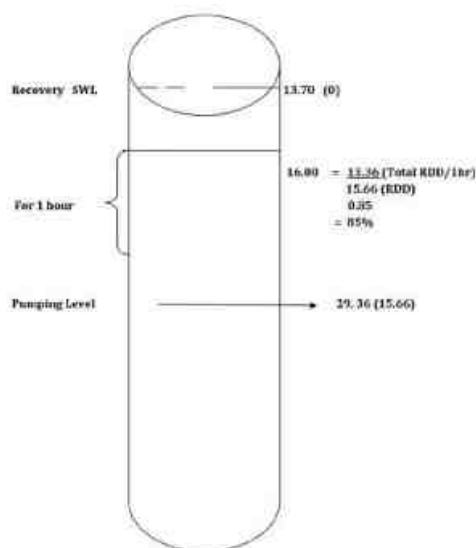
Pumping Test was carried out during the Study Period at a Borewell at Maravarperungudi (Screening Plant). Well details are :

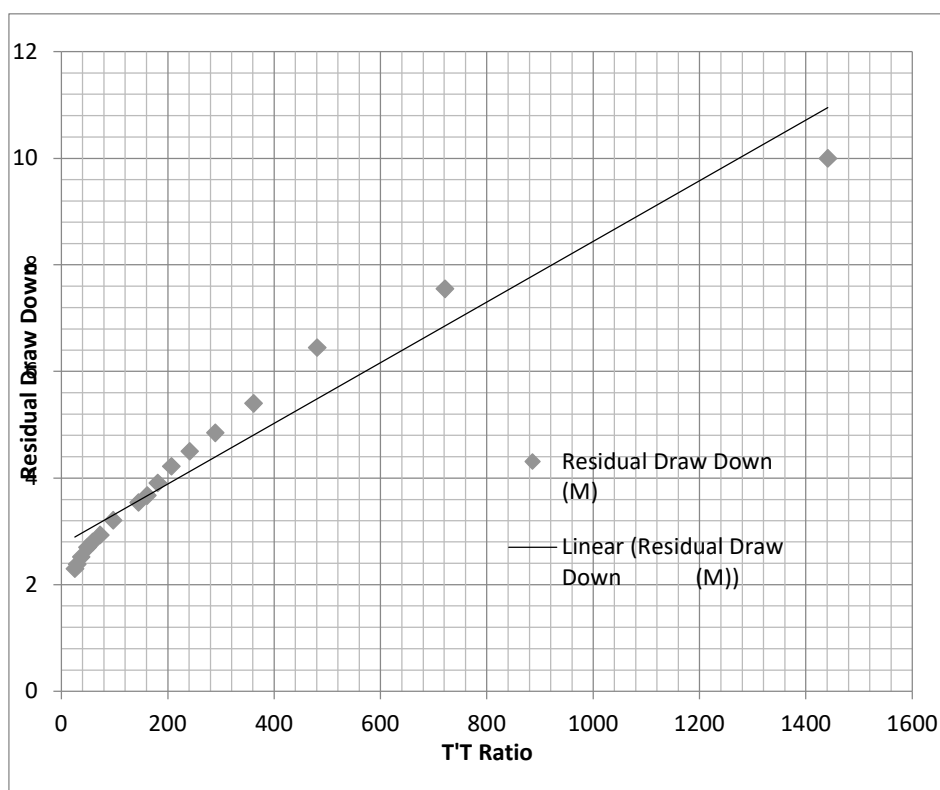
Location Coordinates	:	09° 21' 43.4" N & 78° 10' 59.70" E
Measuring point details	:	0.40 m above GL
Depth of the bore well	:	162 m
Diameter of the bore well	:	6.5"
Static Water Level	:	13.70 m
Water bearing formation /		
Fracture Zone	:	27 m & 56 m
Pump size / Capacity	:	7.5HP/12 stage
Pump Installation Depth	:	78 m
Static Water Level	:	13.70 m
Discharge	:	6600 LPH
Duration	:	1440 min (24hrs)
Drawdown	:	15.66 m (PWL 29.36 m)
Drawdown stabilization	:	started from 60 Minutes onwards
Recovery	:	85% for one hour

From Residual Drawdown Semilogarithmic Graphs :

Transmissivity (T) Value : **16.5 m²/day**

Poor Transmissivity was observed.





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	:	Safe Category

As per PWD TN GO No. 43, the ground water Stage of Development of Site Area is in **Safe Category**.

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 3.22**).

Table : 3.22 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 3.23-3.24** and the abstract of those data is given as **Table 3.25**.

The **surface water** samples were monitored with pH in the range 7.39-7.68 against Limit value of 6.5-8.5. DO levels were in the range 5.0-5.6 mg/l against minimum requirement value of 4.0-6.0 mg/l for Surface Waters. While EC values were in the range 420-580, TDS values were monitored in the range of 260-370 mg/l against Limit values of 500/2100 mg/l. Chloride values ranging from 60 mg/l to 86 mg/l. Iron content was found to be in the range 0.05-0.08 mg/l. Oil and grease, phenolic compounds, cyanides, sulphides and insecticides were found to be absent. Trace metals were found to be less than traceable levels. BOD and COD values were found to be <2 mg/l and <5-8 mg/l respectively. The surface water quality was found to be within CPCB Norms Class-C.

Being shallow quarrying upto 3 m BGL (Max.), there is no pit discharges from RCL Kankar Quarries. The pH of the **ground water including Mine Pits water** samples were ranging from 7.43-7.98 against BIS Norm of 6.5-8.5. While EC values were in the range 450-1850, TDS values were monitored in the range 290-1120 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 68-286 mg/l (Norm 250/1000 mg/l). Iron content was found to be in the range 0.05-0.08 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 was found to be within the prescribed IS:10500-2012 Norms for Drinking in the absence of an alternative source.

Table : 3.23 Surface Water Quality Data

Monitoring Date : 23.01.2025
(Worst case & Mean values are reported)

Sl. No.	Parameter	W1 Uppu Odai U/s	W2 Uppu Odai D/s	W3 Pond, Koppuchitham patti	W4 Pond, MP Gudi	CPCB Norms*
1	pH	7.39	7.58	7.65	7.49	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	27.0	26.8	26.5	26.2	-
4	Turbidity, NTU	1.1	1.3	2.3	2.2	-
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	5.6	5.2	5.0	5.4	4.0-6.0
7	Total Suspended Solids, mg/l	16	18	28	26	-
8	Electrical Conductivity, umhos/cm	420	480	550	520	-
9	Total Dissolved Solids, mg/l	260	300	350	330	500-2100
10	Total Hardness (as CaCO ₃), mg/l	100	130	150	150	-
11	Calcium Hardness, mg/l	60	80	90	80	-
12	Magnesium Hardness, mg/l	40	50	60	70	-
13	Calcium (as Ca), mg/l	24	32	36	32	-
14	Magnesium (as Mg), mg/l	10	12	14	17	-
15	Sodium (as Na), mg/l	20	24	31	29	-
16	Potassium (as K), mg/l	2	3	2	4	-
17	Chlorides (as Cl), mg/l	60	67	80	76	250-600
18	Sulphates (as SO ₄), mg/l	15	21	29	25	400-1000
19	Total Alkalinity (as CaCO ₃), mg/l	60	80	90	80	-
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	<5	<5	6	8	-
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	0.05	0.06	0.08	0.05	0.3-5.0
24	Fluorides (as F), mg/l	0.05	0.07	0.10	0.10	1.5
25	Nitrates (as NO ₃), mg/l	0.50	0.52	0.53	0.52	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, %	29.8	28.0	30.6	28.9	-
42	Total Coliforms, MPN/100 ml	20	25	34	27	50-5000
43	Faecal Coliforms, MPN/100 ml	11	14	21	11	-
44	E. Coli, MPN/100 ml	4	8	12	6	-

* : CPCB Norms-Central Pollution Control Board Norms for Surface Waters-**Class C**.

- : Not included/Not available.

Table : 3.23 (Contn.) Surface Water Quality Data

Monitoring Date : 23.01.2025

(Worst case & Mean values are reported)

Sl. No.	Parameter	W5 Pond, Pungamarathupatti	W6 Pond, Udaiyanathapuram	W7 Pond, Pandalgudi	W8 Pond, Kallurani	CPCB Norms*
1	pH	7.53	7.59	7.68	7.55	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	26.3	26.1	26.7	26.3	-
4	Turbidity, NTU	1.4	1.3	2.0	2.1	-
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	5.3	5.4	5.2	5.3	4.0-6.0
7	Total Suspended Solids, mg/l	17	15	24	24	-
8	Electrical Conductivity, umhos/cm	440	510	580	470	-
9	Total Dissolved Solids, mg/l	280	320	370	300	500-2100
10	Total Hardness (as CaCO ₃), mg/l	120	150	170	130	-
11	Calcium Hardness, mg/l	70	90	90	70	-
12	Magnesium Hardness, mg/l	50	60	80	60	-
13	Calcium (as Ca), mg/l	28	36	36	28	-
14	Magnesium (as Mg), mg/l	12	14	19	14	-
15	Sodium (as Na), mg/l	23	31	34	25	-
16	Potassium (as K), mg/l	2	3	4	2	-
17	Chlorides (as Cl), mg/l	68	76	86	70	250-600
18	Sulphates (as SO ₄), mg/l	20	24	29	23	400-1000
19	Total Alkalinity (as CaCO ₃), mg/l	60	70	90	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	<5	<5	<5	<5	-
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	0.06	0.08	0.06	0.08	0.3-5.0
24	Fluorides (as F), mg/l	0.11	0.10	0.11	0.10	1.5
25	Nitrates (as NO ₃), mg/l	0.54	0.58	0.54	0.53	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, %	29.0	30.5	29.7	29.1	-
42	Total Coliforms, MPN/100 ml	20	32	58	40	50-5000
43	Faecal Coliforms, MPN/100 ml	11	17	31	25	-
44	E. Coli, MPN/100 ml	8	11	17	11	-

* : CPCB Norms-Central Pollution Control Board Norms for Surface Waters-**Class C**.

- : Not included/Not available.

Table : 3.24 Ground Water Quality Data

Monitoring Date : 23.01.2025
(Worst case & Mean values are reported)

Sl. No.	Parameter	W9 BW, Koppuchitha mpatti	W10 BW, MP Gudi	W11 BW, Pungamarat hupatti	W12 BW, Krishna puram	IS:10500 Norms*
1	pH	7.59	7.63	7.68	7.61	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	26.2	26.9	26.4	26.2	-
4	Turbidity, NTU	0.6	0.9	1.0	0.7	1/5
5	Residual Chlorine, mg/l	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	0.2/1.0
6	Dissolved Oxygen, mg/l	4.8	4.6	4.8	4.7	-
7	Total Suspended Solids, mg/l	9	11	13	9	-
8	Electrical Conductivity, umhos/cm	460	570	510	490	-
9	Total Dissolved Solids, mg/l	290	360	320	310	500/2000
10	Total Hardness (as CaCO ₃), mg/l	120	170	150	130	200/600
11	Calcium Hardness, mg/l	70	80	80	70	-
12	Magnesium Hardness, mg/l	50	90	70	60	-
13	Calcium (as Ca), mg/l	28	32	32	28	75/200
14	Magnesium (as Mg), mg/l	12	22	17	14	30/100
15	Sodium (as Na), mg/l	25	37	33	29	-
16	Potassium (as K), mg/l	1	3	2	2	-
17	Chlorides (as Cl), mg/l	71	88	81	68	250/1000
18	Sulphates (as SO ₄), mg/l	17	24	21	23	200/400
19	Total Alkalinity (as CaCO ₃), mg/l	70	90	70	80	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	<5	<5	<5	<5	-
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	0.05	0.08	0.06	0.05	0.3
24	Fluorides (as F), mg/l	0.06	0.11	0.07	0.06	1.0/1.5
25	Nitrates (as NO ₃), mg/l	<0.50	0.52	0.54	0.54	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, %	30.9	31.6	32.0	32.2	-
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 : 3.24 (Contn.) Ground Water Quality Data

Monitoring Date : 23.01.2025
(Worst case & Mean values are reported)

Sl. No.	Parameter	W13 Sivalarpatti Mine Discharge	W14 Pandalgudi Mine Pit	W15 BW, Pandalgudi	W16 BW, Kallurani	IS:10500 Norms*
1	pH	7.98	7.81	7.58	7.43	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	26.4	26.3	26.7	26.4	-
4	Turbidity, NTU	1.3	1.6	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:1.0)	0.2/1.0
6	Dissolved Oxygen, mg/l	4.0	5.1	4.5	4.8	-
7	Total Suspended Solids, mg/l	15	18	14	10	-
8	Electrical Conductivity, umhos/cm	1650	1340	510	450	-
9	Total Dissolved Solids, mg/l	1120	880	320	290	500/2000
10	Total Hardness (as CaCO ₃), mg/l	380	350	140	120	200/600
11	Calcium Hardness, mg/l	200	180	70	70	-
12	Magnesium Hardness, mg/l	180	170	70	50	-
13	Calcium (as Ca), mg/l	80	72	28	28	75/200
14	Magnesium (as Mg), mg/l	43	41	17	12	30/100
15	Sodium (as Na), mg/l	124	102	26	23	-
16	Potassium (as K), mg/l	8	3	2	1	-
17	Chlorides (as Cl), mg/l	286	206	79	73	250/1000
18	Sulphates (as SO ₄), mg/l	106	88	23	20	200/400
19	Total Alkalinity (as CaCO ₃), mg/l	210	170	80	60	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	<5	<5	<5	<5	-
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	0.05	0.06	0.07	0.05	0.3
24	Fluorides (as F), mg/l	0.08	0.07	0.08	0.05	1.0/1.5
25	Nitrates (as NO ₃), mg/l	0.53	0.51	0.52	0.51	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, %	40.9	38.5	28.4	29.2	-
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 : 3.25 Water Quality Status

Monitoring Date : 23.01.2025

Sl. No.	Parameter	Concentration Range & Norms			
		Surface Waters	CPCB Norms* for Surface Waters	Ground Waters	IS:10500 Norms** for Drinking Waters
1	pH	7.39-7.68	6.5-8.5	7.43-7.98	6.5-8.5
2	Total Dissolved Solids, mg/l	260-370	500-2100	290-1120	500-2000*
3	Dissolved Oxygen, mg/l	5.0-5.6	4.0-6.0	4.0-5.1	-
4	BOD (3 days @ 27 °C), mg/l	BDL(DL:2.0)	<3	BDL(DL:2.0)	-
5	COD, mg/l	<5-8	-	<6	-
6	Oil & Grease, mg/l	BDL(DL:1.0)	-	BDL(DL:1.0)	-
7	Chlorides (as Cl), mg/l	60-86	250-600	68-286	250-1000
8	Iron (as Fe), mg/l	0.05-0.08	0.3-5.0	0.05-0.08	0.3
9	Trace Metals, mg/l	<0.01	-	<0.01	<0.001-<0.01
10	Total Coliforms, MPN/100 ml	20-58	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.

3.8 Land Environment

3.8.1 Soil Status

The monitored soil quality data are given as **Table 3.26**. Soils with medium compaction and Silty loam texture are dominant in the study area. Soil pH values were found to be in alkaline range (7.68-7.86) and Electrical Conductivity values were in the range 1.48-1.77 mmhos/cm. Insignificant levels of Nitrogen, Phosphorous and Potassium (NPK) values were monitored at all locations. Sodium Absorption Ratio was in the range 2.19-3.28 (desirable value being <5). 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 03.07.2023 Satellite Digital Data of NRSA, Hyderabad was used (**Fig. 3.4**). Visual interpretation technique has been adopted for land use classification based on the interpretation keys suggested in guidelines of NNRMS, Bangalore. Level-3 Classification with 1:50,000 scale was made for the preparation of land use mapping (**Fig. 3.5**). Land Use Pattern of the Study Area is given in **Table 3.27**.

Agriculture Plantation occupies 24.62% and Fallow Land occupies about 47.16%. Barren/Scrub Land occupies another 23.06%. Mines & Industrial Areas occupy 2.90%. Built-up Land occupies only 1.62% of the Study Area. Water body occupies about 0.64% of the Area.

Table : 3.26 Soil Status

Monitoring Date : 23.01.2025

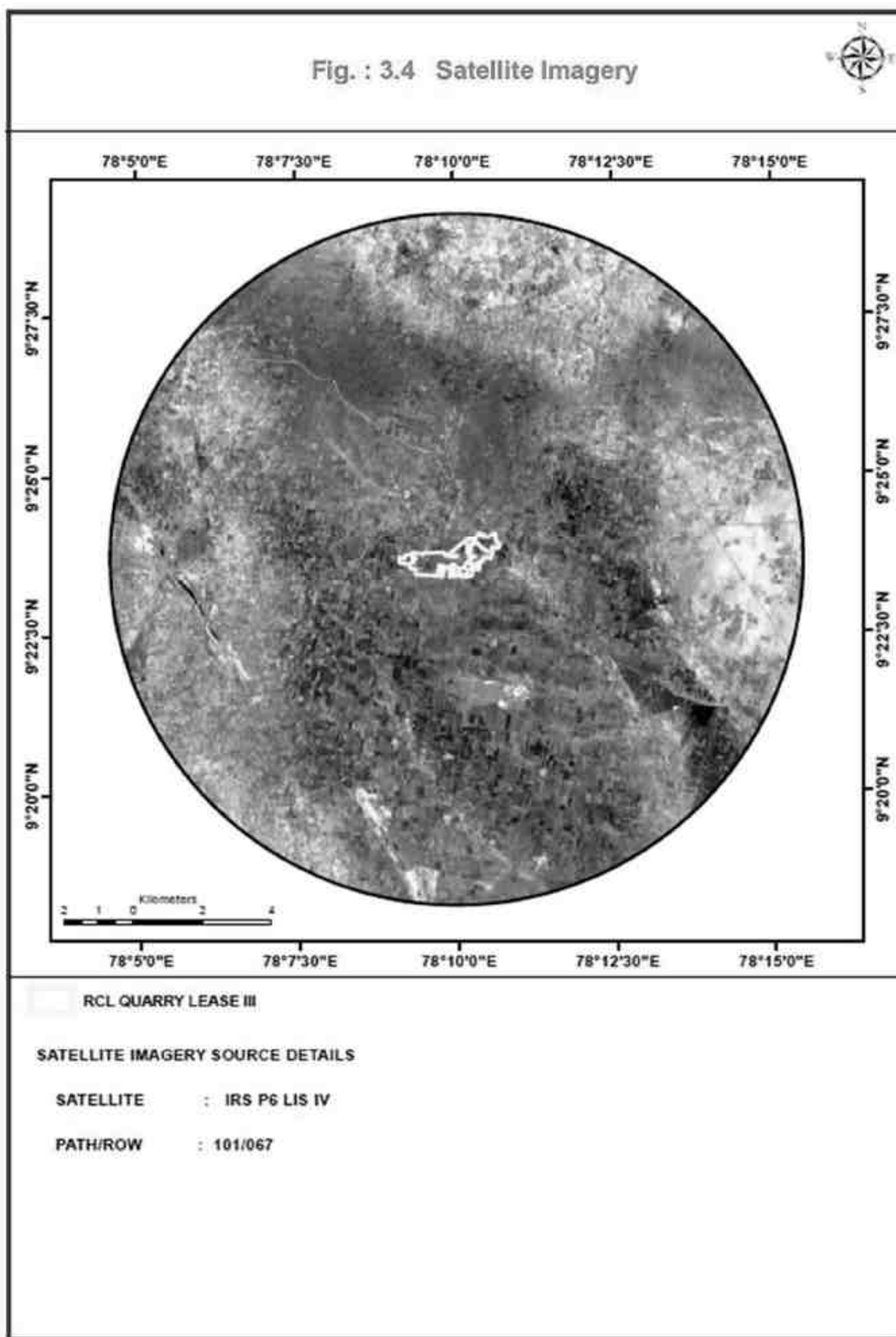
Sl. No.	Parameter	S1	S2	S3	S4	S5	S6	Desirable Range*
i	Colour	Brown	Brown	Grey	Brown	Brown	Brown	-
ii	Compaction	Medium	Medium	Low	Medium	Medium	Medium	-
1	pH (10% Solution)	7.79	7.71	7.81	7.86	7.75	7.68	5.5-9.0
2	Electrical Conductivity, mmhos/cm	1.50	1.66	1.48	1.74	1.77	1.56	0.2-0.5
3	Natural Moisture Content, %	10.5	11.2	10.2	9.4	12.3	11.6	-
4	Organic Carbon, %	1.13	1.06	1.02	0.95	1.16	1.05	>0.75
5	Nitrogen (as N), %	0.011	0.014	0.012	0.006	0.016	0.014	0.01-0.02
6	Phosphorus (as P), %	0.008	0.006	0.006	0.004	0.008	0.004	0.002-0.004
7	Potassium (as K), %	0.005	0.007	0.004	0.003	0.008	0.002	>0.01
8	Sodium (as Na), ppm	110	120	120	130	160	130	-
9	Calcium (as Ca), ppm	90	80	80	100	80	80	-
10	Magnesium (as Mg), ppm	60	70	60	80	60	70	-
11	Chlorides (as Cl), ppm	190	220	170	190	230	200	-
12	Sulphates (as SO ₄), ppm	100	120	80	80	160	120	-
13	Cation Exchange Capacity, meq/100 g	20.8	22.3	22.9	19.6	26.5	24.1	10-30
14	Grain Size Distribution :- Sand, %	26.1	28.1	28.4	30.8	25.9	27.4	-
15	Silt, %	64.8	66.2	59.7	62.1	65.6	63.7	-
16	Clay, %	9.1	5.7	11.9	7.1	8.5	8.9	-
17	Textural Class	Silty loam	Silty loam	Silty loam	Silty loam	Silty loam	Silty loam	Loam
18	Bulk Density, g/cc	1.33	1.34	1.32	1.33	1.33	1.35	-
19	Infiltration Rate, cm/hr	3.6	3.3	3.7	4.3	3.4	3.5	-
20	Field Capacity, %	24.1	22.5	24.7	19.7	26.2	23.4	-
21	Wilting Coefficient, %	1.4	1.2	1.3	0.6	1.6	1.4	>0.4
22	Available Water Storage Capacity, %	22.7	21.3	23.1	19.1	24.6	22.0	-
23	Sodium Absorbing Ratio	2.19	2.35	2.46	2.34	3.28	2.55	<5

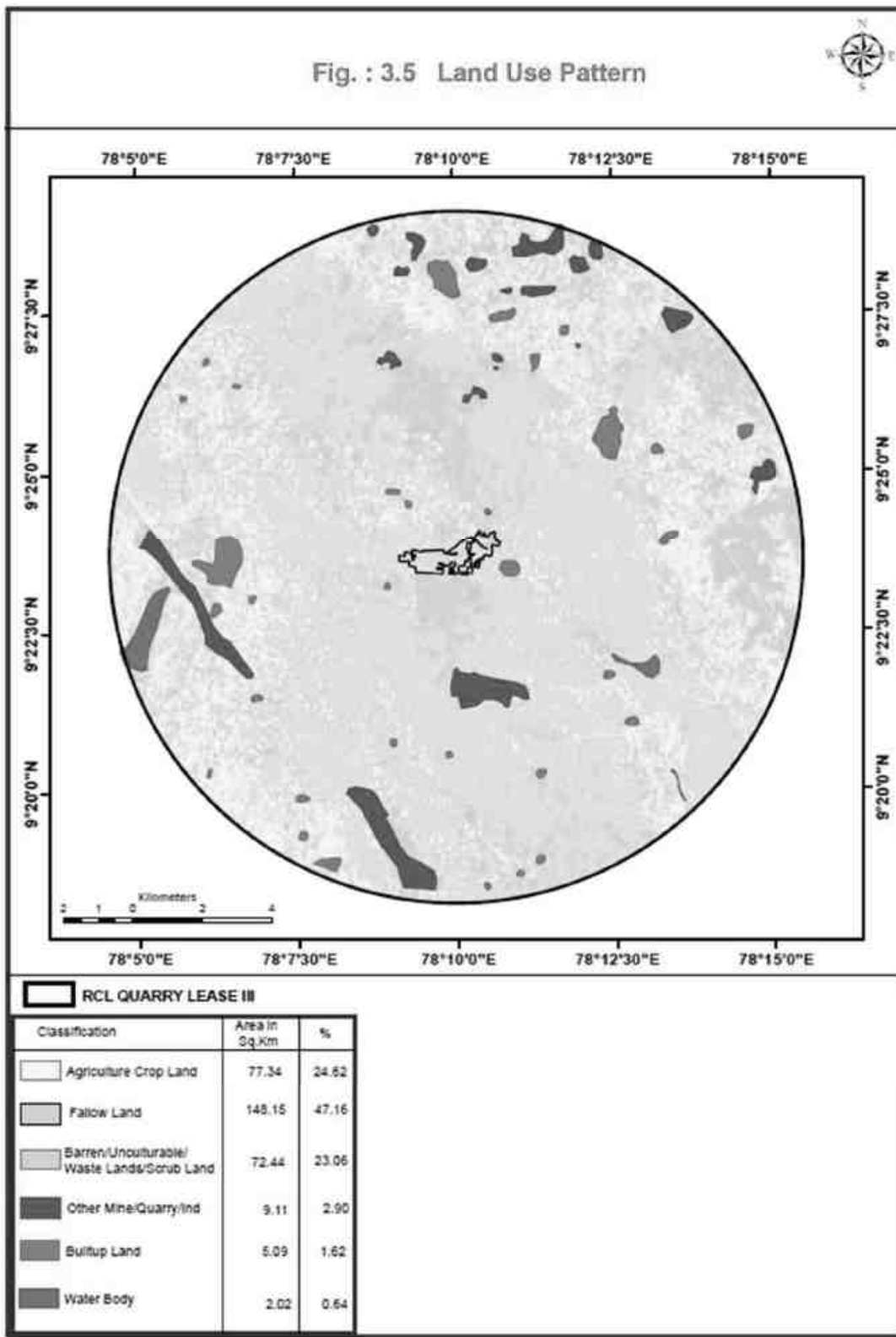
Legend : S1-QL Area; S2-MP Gudi Afforestation Area; S3-Dry Agri. Land, MP Gudi; S4-Barren Land, Reddiyapatti; S5- Agri. Land, Kallurani & S6-Green Belt, Pandalgudi.

* :Desirable Range for High Production Soil.

Table : 3.27 Land Use Pattern

Land Use	Area, sq.km	Percentage
Agriculture Crop Land	67.18	21.38
Fallow Land	155.32	49.44
Barren/Unculturable/Waste/Scrub Lands	68.28	21.74
Other Mines/Quarry/Industry	7.18	2.29
Built-up Land	12.61	4.01
Water Body	3.58	1.14
Total	314.15	100.00





3.9 Flora and Fauna

A general ecological survey was carried out in the entire study area of 10 km radius area to identify the likely impacts of the proposed project activity on the ecological environment of the study area and to suggest suitable mitigative measures. The ecological survey of the study area was conducted particularly with reference to listing of species and assessment of the existing baseline ecological (terrestrial and aquatic ecosystem) conditions in the study area. Apart from the details observed and recorded during the field survey, information of the Flora and Fauna of the study area had also been gathered by interacting with the local residents and also by reviewing the secondary data sources like published data and literatures.

The Objectives of the ecological survey of terrestrial and aquatic habitats of the study are:

- To assess the nature, distribution and species diversity of Flora, Fauna and Planktonic Population in the important habitats of the study area and to ascertain their economic importance, degree of Protection, etc.
- To ascertain the presence of forests, protected areas, migratory routes of fauna, presence of breeding grounds, sensitive habitats, etc. in the study area.
- To review and interpret the information collected from the primary and secondary sources and discuss the issues of concern with the stakeholders, if any.
- To identify and predict the impacts due to the project on the biological environment, on the basis of the collected primary and secondary data and to formulate suitable mitigation measures.
- To formulate and propose a suitable green belt development plan predominantly with native species in and around the Project site.

No ecologically sensitive areas viz. **National Parks, Sanctuary, Biosphere Reserve, Tiger Reserve, Elephant Reserve, Reserved Forests, Community Reserve or Conservation Reserve available within 10 km radius of the QL Boundary.** There are no permanent aquatic habitats available within the study area. Only temporary rainfed ponds are available which are dry most of the times.

3.9.1 Flora

The Floral Survey includes :

- ❖ Preparing a general checklist of all plants encountered in the study area by undertaking systematic ecological studies.
- ❖ Random Sampling method had been followed during field visit and all the observed vegetations within the study area were recorded for estimation of Floral inventory. Quadrate size of 1m x 1m, 5m x 5m and 10m x 10m were taken for herbs, shrubs and trees respectively. In each of quadrate, species, their number and basal areas of trees and shrubs Girth at Breast Height (GBH) [132 cm from ground or above buttresses] were measured. In the same quadrate the shrubs were also enlisted and enumerated. At each location, 3 plots (quadrates) were examined and the average was computed. The quadrats were laid randomly to cover

the area to maximise the sampling efforts and minimise the species homogeneity, such a small stream area, trees in agricultural bunds, tank bunds, farm forestry plantations, house backyards, etc.

- ❖ The dominant trees, shrubs, herbs, climbers, palm, grasses, etc. were enumerated in the forest as well as non-forest areas. Apart from this, medicinal plants, horticultural plants, agricultural crops, etc. found in the study area were also recorded.
- ❖ Secondary source information were collected from published Literatures, government records, discussion with forest officials, Agriculture officials and also by Participatory Rural Appraisal method ie. Interacting with the nearby local villagers and other stakeholders to gain the traditional knowledge about the flora and fauna of the area.

The entire lease area is Patta-dry land owned by the company. The core zone of the lease area is mostly barren interspersed with thorny bushes and few plantations. No forest land is involved in the quarry lease area. The plant species predominantly found in the quarry lease area are *Prosopis juliflora* (Seemai karuvel), *Cassia auriculata* (Aavarampoo) and *Morinda coreia* (Nuna). During the survey, the study area does not record the presence of any Rare, Endangered or Threatened (RET) Species of Flora.

The detailed list of Flora in Core Zone is given in **Table 3.28**.

Table : 3.28 List of Flora in Core Zone

Sl. No.	Species	Family	Local Name	Category
1	<i>Acacia nilotica</i>	Fabaceae	Karuvelan	Tree
2	<i>Abutilon indicum</i>	Malvaceae	Thuthi	Herb
3	<i>Achyranthes aspera</i>	Amaranthaceae	Prickly chaff-flower	Herb
4	<i>Agave americana</i>	Agavaceae	Kathalai	Cactus
5	<i>Azadirachta indica</i>	Meliaceae	Vembu	Tree
6	<i>Calotropis gigantea</i>	Apocynaceae	Erukku	Shrub
7	<i>Cassia auriculata</i>	Fabaceae	Aavarampoo	Shrub
8	<i>Cissus quadrangularis</i>	Vitaceae	Pirandai	Climber
9	<i>Cynodon dactylon</i>	Poaceae	Arugampillu	Grass
10	<i>Cyperus rotundus</i>	Cyperaceae	Koraipullu	Grass
11	<i>Datura metel</i>	Solanaceae	Oomathai, Datura Triple Yellow	Shrub
12	<i>Kyllinga nemoralis</i>	Cyperaceae	Veluttanirbasi	Grass
13	<i>Leucas aspera</i>	Lamiaceae	Thumbai, Common Leucas	Herb
14	<i>Mimosa pudica</i>	Mimosaceae	Thottal surungi, Touch Me Not	Herb
15	<i>Morinda coreia</i>	Rubiaceae	Nuna	Tree
16	<i>Opuntia stricta</i>	Cactaceae	Sappathikalli	Cactus
17	<i>Passiflora foetida</i>	Passifloraceae	Mosukkattan,	Climber
18	<i>Prosopis juliflora</i>	Fabaceae	Seemai karuvel	Tree
19	<i>Tecoma stans</i>	Bignoniaceae	Yellow trumpet	Shrub
20	<i>Tridax procumbens</i>	Asteraceae	Vettukayappoond	Herb

Sl. No.	Species	Family	Local Name	Category
21	Vernonia cinerea	Asteraceae	Mukuthi Poo, Little Ironweed	Herb

The detailed list of Flora in Buffer Zone is given in Table 3.29.

Table : 3.29 List of Flora in Buffer Zone

Sl. No.	Species	Family	Local Name	Category
1	Abrus precatorius	Fabaceae	Kundumani	Climber
2	Abutilon indicum	Malvaceae	Country Mallow, Tutti	Herb
3	Acacia leucophloea	Fabaceae	Valvelam	Tree
4	Acacia arabica	Mimosoideae	Green Amaranth	Herb
5	Acacia auriculiformis	Mimosaceae	Karuvelan	Tree
6	Acacia latronum	Mimosaceae	Kakka odai	Tree
7	Acacia leucophloea	Mimosaceae	Velvelam, White babool	Tree
8	Acalypha indica	Euphorbiaceae	Kuppaimeni	Herb
9	Acanthospermum hispidum	Asteraceae	Gokulkanta	Herb
10	Achyranthes aspera	Amaranthaceae	Nayuruvi	Herb
11	Adathoda vasica	Acanthaceae	Vasaka	Shrub
12	Adina cordifolia	Rubiaceae	Manjakadambai	Tree
13	Aegle marmelos	Rutaceae	Vilvamaran	Tree
14	Agave americana	Agavaceae	Kathalzhai	Cactus
15	Agave sisalana	Agavaceae	Kathalai	Herb
16	Ailanthus excelsa	Simaroubaceae	Pinari, Indian Tree of Heaven	Tree
17	Alangium salvifolium	Alangiaceae	Alingi, Sage-leaved alangium	Climber
18	Albizia lebbeck	Fabaceae	Vagai	Tree
19	Aloe vera	Asphodelaceae	Chothukattalai	Shrub
20	Amaranthus spinosus	Amaranthaceae	Mullukkirai, Prickly	Herb
21	Amaranthus viridis	Amaranthaceae	Kuppaikirai	Herb
22	Andrographis echinoides	Acanthaceae	False waterwillow	Herb
23	Andrographis paniculata	Acanthaceae	Siriyangai	Herb
24	Anisomeles indica	Lamiaceae	Marutti	Herb
25	Anisomeles malabarica	Lamiaceae	Peyimarutli	Herb
26	Annona squamosa	Annonaceae	Siththa	Tree
27	Argemone mexicana	Papaveraceae	Mexican poppy	Herb
28	Aristolochia bracteolata	Aristolochiaceae	Aduthinnarppalai	Herb
29	Asparagus racemosas	Asparagaceae	Tannir-vittan	Climber
30	Atalantia monophylla	Rutaceae	Kattu Elumeachi	Tree
31	Azadirachta indica	Meliaceae	Vembu	Tree
32	Biophytum sensitivum	Oxalidaceae	Telegraph plant	Creeper
33	Boerheavia diffusa	Nyctaginaceae	Kagithapoo	Shrub
34	Boerheavia erecta	Nyctaginaceae	Erect spiderling	Herb
35	Borassus flabelliformis	Arecaceae	Panaimaram	Tree

Sl. No.	Species	Family	Local Name	Category
36	Bougainvillea spectabilis	Nyctaginaceae	Kaakithapoo	Climber
37	Butea monspersma	Fabaceae	Flame of the Forest	Tree
38	Cadiospermum	Sapindaceae	Mudakattan	Creeper
39	Caesalpinia pulcherima	Caesalpinaceae	Mayilkondrai, Peacock Flower	Tree
40	Calotropis gigantea	Asclepiadeceae	Erukku, Crown Flower	Shrub
41	Capparis divaricata	Capparaceae	Turatti	Climber
42	Capparis rotundifolia	Capparaceae	Thoralti	Climber
43	Capparis sepiaria	Capparaceae	Kattukathiri, Wild Caper	Herb
44	Cassia auriculata	Fabaceae	Aavarampoo	Shrub
45	Cassia fistula	Fabaceae	Kondrai	Tree
46	Casuarina equisetifolia	Casuarinaceae	Savukku	Tree
47	Chloris barbata	Poaceae	Kodaipullu	Grass
48	Chloroxylon sweitenia	Flindersiaceae	Porasu	Tree
49	Chrozophora rottleri	Euphorbiaceae	Puraprakkai	Herb
50	Chrysanthemum indicum	Asteraceae	Chrysanthemum	Herb
51	Cissus quadrangularis	Vitaceae	Pirandai	Climber
52	Cleome viscosa	Cleomaceae	Dog mustard	Herb
53	Clitoria ternatea	Fabaceae	Sankupushpam, Butterfly Pea	Climber
54	Coccinia indica	Cucubitateae	Kovai	Climber
55	Commiphora candata	Burseraceae	Kiluvai	Tree
56	Convolvulus arvensis	Covolvulaceae	Bhoomi Chakra poondur	Climber
57	Croton sparsiflorus	Euphorbiaceae	Reilpoondur	Herb
58	Cynodon dactylon	Poaceae	Arugampul	Herb
59	Cynodon dactylon	Poaceae	Arugampillu	Grass
60	Cyperus rotundus	Cyperaceae	Koraipullu	Grass
61	Datura metel	Solanaceae	Oomathai, Datura Triple Yellow	Shrub
62	Delonix elata	Caesalpinaceae	Vadanarayan, Vadamudaki	Tree
63	Delonix regia	Fabaceae	Gulmohar	Tree
64	Desmoslachie bipinnata	Poaceae	Darbhaipul	Grass
65	Dodonaea viscosa	Sapindaceae	Virali	Shrub
66	Emblica officinalis	Phyllanthaceae	Nelli, Amla	Tree
67	Erythrina indica	Fabaceae	Mullu murungai, Indian Coral Tree	Tree
68	Erythrina variegata	Fabaceae	Kalyana murungai	Tree
69	Eucalyptus tereticomis	Myrtaceae	Thailamaram	Tree
70	Euphorbia antiquorum	Euphorbiaceae	Kalli, Triangular Spurge	Shrub
71	Euphorbia thymifolia	Euphorbiaceae	Amman pacharisi	Herb
72	Euphorbia tirucalli	Euphorbiaceae	Tirucalli	Shrub
73	Ficus benghalensis	Moraceae	Aalamaram	Tree
74	Ficus hispida	Moraceae	Peyathi	Tree
75	Ficus religiosa	Moraceae	Arasamaram	Tree

Sl. No.	Species	Family	Local Name	Category
76	Gmelina arborea	Verbinaceae	Kumalaamaram	Tree
77	Gomphrena globosa	Amaranthaceae	Vaadamalli	Herb
78	Grevia disperma	Tiliaceae	Narathai	Tree
79	Hibiscus rosasinensis	Malvaceae	Sembaruthi, China Rose	Shrub
80	Holoptelea integrifolia	Ulmaceae	Avi or Aaya	Tree
81	Ipomea carnea	Convolvulaceae	Pink morning glory	Shrub
82	Ixora coccinea	Rubiaceae	Idlipoo	Shrub
83	Jasminum angustifolium	Oleaceae	Uccimalligai	Climber
84	Jatropha glandulifera	Euphorbiaceae	Vellaikattukottai, Kattamanakku	Shrub
85	Justicia adhatoda	Acanthaceae	Adathoda	Shrub
86	Kedrostis foetidissima	Cucurbitaceae	Appakovai	Climber
87	Lannea coromandelica	Anacardiaceae	Odiya maram, Indian Ash Tree	Tree
88	Lawsonia inermis	Lythraceae	Maruthani	Shrub
89	Lepidagathis cuspidata	Acanthaceae	Karappanpoondur	Herb
90	Leucaena leucocephala	Fabaceae	Subabul	Tree
91	Leucas aspera	Lamiaceae	Thumbai	Herb
92	Madhuca longifolia	Sapotaceae	Iluppai	Tree
93	Melia dubia	Meliaceae	MalaiVembu	Tree
94	Mimosa pudica	Mimosaceae	Thottal surungi, Touch Me Not	Herb
95	Mimusops elengi	Sapotaceae	Magizhamboo	Tree
96	Mitragyna parvifolia .	Rubiaceae	Nirkadambai	Tree
97	Morinda coreia	Rubiaceae	Nuna	Tree
98	Morinda tinctoria	Rubiaceae	Nuna, Manjanathi	Tree
99	Nerium indicum	Apocynaceae	Sevvarali	Shrub
100	Ocimum americanum	Lamiaceae	Nai Thulasi	Herb
101	Ocimum tenuiflorum	Lamiaceae	Thulasi	Herb
102	Odina wodier	Anacardiaceae	Odiyan	Tree
103	Opuntia dillineii	Cactaceae	Nagatali, Chappathikalli	Shrub
104	Opuntia stricta	Cactaceae	Sappathikalli	Cactus
105	Pandanus odoratissimus	Pandanaceae	Thazhai, Kewda	Shrub
106	Parthenium hysterophorus	Asteraceae	Parthenium, Carrot Grass	Herb
107	Passiflora foetida	Passifloraceae	Mosukkattan	Climber
108	Peltophorum pterocarpum	Fabaceae	Perungondrai	Tree
109	Phoenix sylvestris	Arecaceae	Eeachamaram	Tree
110	Phyllanthus emblica	Euphorbiaceae	Nelli	Tree
111	Phyllanthus niruri	Phyllanthaceae	Keelzhanelli	Herb
112	Pithecellobium dulce	Fabaceae	Kodukkaapuli	Tree
113	Plectranthus amboinicus	Lamiaceae	Indian borage	Herb
114	Plumeria acuminata	Apocyanaceae	Frangipani	Shrub
115	Polyalthia longifolia	Anonaceae	Asoka, Nettiinagam	Tree
116	Pongamia pinnata	Fabaceae	Pungam	Tree

Sl. No.	Species	Family	Local Name	Category
117	<i>Prosopis juliflora</i>	Fabaceae	Seemaikaruvel	Tree
118	<i>Prosopis spicigera</i> Torrey.	Fabaceae	Vaelikkaruvai	Shrub
119	<i>Pterocarpus marsupium</i>	Fabaceae	Vengai, Indian kino tree	Tree
120	<i>Salvadora persica</i>	Salvadoraceae	Peruvila, Ukaa	Tree
121	<i>Samanea saman</i>	Fabaceae	Rain Tree, Thoongumoonji Maram	Tree
122	<i>Sapindus emarginatus</i>	Sapindaceae	Bunthikottai	Tree
123	<i>Senna siamea</i>	Fabaceae	Manjalkondrai	Tree
124	<i>Sida acuta</i>	Malvaceae	Common Wire Weed	Herb
125	<i>Sida cordifolia</i>	Malvaceae	Kurunthotti, Arivalmanaipoondur	Shrub
126	<i>Sida rhombifolia</i>	Malvaceae	Kurundotti	Herb
127	<i>Solanum incanum</i>	Solanaceae	Karimulli	Herb
128	<i>Solanum xanthocarpum</i>	Solanaceae	Kandangkattari	Herb
129	<i>Syzygium cumini</i>	Myrtaceae	Jamun, Naval	Tree
130	<i>Tamarindus indica</i>	Fabaceae	Puliyamaram	Tree
131	<i>Tecoma stans</i>	Bignoniaceae	Yellow trumpet	Shrub
132	<i>Tectona grandis</i>	Verbenaceae	Tekku	Tree
133	<i>Tephrosia purpurea</i>	Fabaceae	Vayalpoondur, Wild Indigo	Herb
134	<i>Terminalia arjuna</i>	Combretaceae	MarudhaMaram	Tree
135	<i>Terminalia catappa</i>	Combretaceae	BadamTree	Tree
136	<i>Thespesia populnea</i>	Malvaceae	Puvarasu, Indian Tulip Tree	Tree
137	<i>Tragia involucrata</i>	Euphorbiaceae	Kanchori	Herb
138	<i>Tridax procumbens</i>	Asteraceae	Vettukaipoondur	Herb
139	<i>Typha angustata</i> L.	Typhaceae	Korai, Reed	Shrub
140	<i>Verbena bipinnatifida</i>	Verbenaceae	Purple prairie	Herb
141	<i>Vernonia cinerea</i>	Asteraceae	Mukuthi Poo, Little Ironweed	Herb
142	<i>Vinca rosea</i>	Apocynaceae	Nithiyakalyani	Herb
143	<i>Vitex negundo</i>	Verbenaceae	Nochi	Shrub
144	<i>Wedelia calendulacea</i>	Asteraceae	Ponniraichi	Herb
145	<i>Wrightia tinctoria</i>	Apocynaceae	Palai	Shrub
146	<i>Zizyphus mauritiana</i>	Rhamnaceae	Ber, Elandai	Tree

The list of Cultivated Crops in the Study Area is given in Table 3.30.

Table : 3.30 Cultivated Crops

Sl. No.	Species	Family	Local Name
1	<i>Arachis hypogaea</i>	Fabaceae	Groundnut
2	<i>Cajanus cajan</i>	Fabaceae	Pigeon pea
3	<i>Capsicum annum</i>	Solanaceae	Red chilli
4	<i>Gossypium arboreum</i>	Malvaceae	Paruththi
5	<i>Helianthus annuus</i>	Asteraceae	Sunflower

Sl. No.	Species	Family	Local Name
6	<i>Hibiscus esculentus</i>	Malvaceae	Lady's finger, Vendai
7	<i>Jasminum officinale</i>	Oleaceae	Malli
8	<i>Musa paradisiaca</i>	Musaceae	Vazhai
9	<i>Oryza sativa</i> Linn.	Poaceae	Rice
10	<i>Pennisetum glaucum</i>	Poaceae	Kambu
11	<i>Phaseolus Mungo</i>	Leguminosae	Black Gram
12	<i>Ricinus communis</i>	Euphorbiaceae	Aamanakku
13	<i>Sesamum indicum</i>	Pedaliaceae	Ellu
14	<i>Sesbania grandiflora</i>	Fabaceae	Agati
15	<i>Solanum lycopersicum</i>	Solanaceae	Tomato
16	<i>Solanum melongena</i>	Solanaceae	Kaththarii
17	<i>Sorghum vulgare</i>	Poaceae	Maize, Cholan

The plant species are classified into Agricultural crops, commercial crops, plantation, natural vegetation, Endangered and endemic plants and medicinal plants. There were no endangered and endemic plants in both core and buffer zones. Since there are no perennial rivers in the study area, most of the agriculture activities depends on the monsoon rains. The details of natural vegetation and medicinal plants are given in **Table 3.31**.

Table : 3.31 Distribution of Vegetation in the study area

Agricultural Crops	<i>Sorghum vulgare</i> , <i>Capsicum annum</i> , <i>Sesamum indicum</i> , <i>Arachis hypogea</i> , <i>Phaseolus Mungo</i> , <i>Cajanus cajan</i>
Commercial Crops	<i>Gossypium</i> sp., <i>Helianthus annuus</i> ,
Plantation	Nil
Natural Vegetation	<i>Acacia Arabica</i> , <i>Abrus precatorius</i> , <i>Abutilon indicum</i> , <i>Acacia auriculiformis</i> , <i>Acacia latronum</i> , <i>Acacia leucophloea</i> , <i>Acalypha indica</i> , <i>Achyranthes aspera</i> , <i>Adathoda vasica</i> , <i>Adina cordifolia</i> , <i>Agave sisalana</i> , <i>Ailanthus excels</i> , <i>Alangium salvifolium</i> , <i>Albizzia amara</i> , <i>Albizzia lebbek</i> , <i>Albizzia odoratissima</i> , <i>Aloe vera</i> , <i>Amaranthus spinosus</i> , <i>Amaranthus viridis</i> , <i>Arachis hypogea</i> , <i>Azadirachta indica</i> , <i>Biophytum sensitivum</i> , <i>Borassus flabellifer</i> , <i>Bougainvillea spectabilis</i> , <i>Butea monspesia</i> , <i>Caesalpinia pulcherrima</i> , <i>Cajanus cajan</i> , <i>Calendula officinalis</i> , <i>Calotropis gigantea</i> , <i>Capparis sepiaria</i> , <i>Capsicum frutescens</i> , <i>Carica papaya</i> , <i>Cassia auriculata</i> , <i>Casuarina equisetifolia</i> , <i>Chloroxylon swietenia</i> , <i>Chrysanthemum indicum</i> , <i>Cissus quadrangularis</i> , <i>Citrus limon</i> , <i>Cleome viscosa</i> , <i>Clitoria ternatea</i> , <i>Cocos nucifera</i> , <i>Commiphora candata</i> , <i>Croton sparsiflorus</i> , <i>Cynodon dactylon</i> , <i>Datura metel</i> , <i>Delonix elata</i> , <i>Delonix regia</i> , <i>Embllica officinalis</i> , <i>Erythrina indica</i> , <i>Erythrina variegata</i> , <i>Eucalyptus camaldulensis</i> , <i>Euphorbia antiquorum</i> , <i>Euphorbia thymifolia</i> , <i>Euphorbia tirucalli</i> , <i>Ficus benghalensis</i> L., <i>Ficus religiosa</i> L., <i>Gomphrena globosa</i> , <i>Gossypium</i> sp., <i>Grevia disperma</i> , <i>Helianthus annuus</i> ,

	Hibiscus esculentus , Hibiscus rosasinensis, Jasminum officinale, Jatropa glanduliflora, Lannea coromandelica, Lantana camara , Lawsonia inermis , Leucas aspera, Lippia nodiflora, Lycopersicon esculentum, Madhuca indica, Mangifera indica, Mimosa pudica, Mitragnya parvifolia ., Morinda tinctoria, Moringa oleifera, Murraya koenigii, Musa paradisiacal, Nerium indicum, Opuntia dillineii, Oryza sativa Linn., Pandanus odoraltissimus, Parthenium hysterophorus, Passiflora foetida, Phasleolus Mungo, Phoenix sylvestris, Phyllanthus maderaspatensis, Pithecellobium dulce, Polyalthia longifolia, Pongamia pinnata , Prospohis juliflora, Pterocarpus marsupium , Ricinus cummunis, Samanea saman, Sapindus emarginatus, Sesamum indicum, Sida acuta , Solanum pubescens, Sorghum bicolor, Syzyguim cumini, Tamarindus indica, Tephrosia purpurea, Terminalia catappa, Thespesia populnea, Tridax procumbens, Typha angustata L., Vernonia cinerea, Vitus negundo , Wrightia tinctoria, Ziziphis jujube, Zizyphus mauritiana, Zizyphus rugosa
Medicinal Plants	Acacia leuopholoea, Agave americanas, Azadirachta indica, Cassia auriculata, Cissus quandrangularis, Emblica officinalis, Erythrina suberosa, Erythrina variegata, Madhuca indica, Moringa pterygosperma, Pongamia pinnata, Vitus negundo
Endangered Species	Nil
Endemic Species	Nil

There are many avenue trees present along the road sides, within the homestead lands and bunds of agricultural lands in the study area. The study area is predominantly infested with Prosopis sp. which are cut by rural people directly and used as domestic firewood and the charcoal for commercial usage.

3.9.2 Fauna

The methodology adopted for faunal survey includes faunal habitat assessment, opportunistic observation, diurnal bird observation, observation of call, droppings, burrows, pugmarks, nestings, active search for reptiles and amphibians, observation of feathers, scats, tracks, foot prints, pellets, excreta, etc. Both direct and indirect observation methods were used to survey the fauna. Additionally, survey of relevant literature was also done to consolidate the list of vertebrate fauna distributed in the area. **Peafowl placed under Schedule-I** as per Wild Life (Protection) Act, 1972 is found in the study area and its surroundings. Among the fauna recorded, **most of them are common resident population and no endangered species encountered** in the study area. There is no Wild life Sanctuary or National Park within the 10 km radius of the study area. The details of fauna found in the study area are given in **Tables 3.32-3.33**.

Table : 3.32 List of Fauna in the Study Area

Sl. No.	Scientific Name	Common Name	Schedule as per WP(A) Act, 2022	IUCN Status
Insects				
1	<i>Apis indica</i>	Honey bee	II	LC
Butterflies				
1	<i>Pachliopta hector</i>	Crimson rose	II	LC
2	<i>Papilio polytes</i>	Common mormon	II	LC
3	<i>Triodes minos</i>	Southern birdwing	II	LC
Amphibians				
1	<i>Bufo melanrostictus</i>	Common Indian Toad	II	LC
2	<i>Euphlyctis cyanophlyctis</i>	Skittering frog	II	LC
3	<i>Phrynoderma hexadactylum</i>	Indian Pond frog	II	LC
4	<i>Hoplobatrachus tigerinus</i>	Indian Bull frog	II	LC
Reptiles				
1	<i>Ahaetulla nasuta</i>	Common Green Whip Snake	II	LC
2	<i>Amphiesma stolatum</i>	Stripped Keelback	II	LC
3	<i>Passerita mycterizaris</i>	Common Green Snake	II	LC
Birds				
1	<i>Acridotheres tristis</i>	Common myna	II	LC
2	<i>Alcedo atthis</i>	Common kingfisher	II	LC
3	<i>Apus affinis</i>	Indian House swift	II	LC
4	<i>Apus nipalensis</i>	House swift	II	LC
5	<i>Ardea alba</i>	Large Egret	II	LC
6	<i>Ardeola grayii</i>	Pond Heron or Paddy Bird	II	LC
7	<i>Athene brama</i>	Spotted Owlet	II	LC
8	<i>Bubulcus ibis</i>	Cattle Egret	II	LC
9	<i>Cinnyris asiaticus</i>	Purple sunbird	II	LC
10	<i>Cinnyris lotenius</i>	Loten's sunbird	II	LC
11	<i>Clamator jacobinus</i>	Pied Cuckoo	II	LC
12	<i>Copsychus saularis</i>	Magpie robin	II	LC
13	<i>Coracias benghalensis</i>	Indian Roller	II	LC
14	<i>Corvus macrohynchos</i>	Large billed Crow	II	LC
15	<i>Coturnix coturnix</i>	Common quail	II	LC
16	<i>Cuculus canorus</i>	Common Cuckoo	II	LC
17	<i>Cuculus micropterus</i>	Indian cuckoo	II	LC
18	<i>Cypsiurus balasiensis</i>	Asian Palm Swift	II	LC
19	<i>Dicaeum erythrorhynchos</i>	Tickell's Flowerpecker	II	LC
20	<i>Dicrurus macrocerus</i>	Black Drongo	II	LC
21	<i>Egretta garzetta</i>	Little egret	II	LC
22	<i>Eudynamis scolopacea</i>	Asian Koel	II	LC
23	<i>Gallus gallus</i>	Red jungle fowl	II	LC
24	<i>Halcyon smyrnensis</i>	White throated Kingfisher	II	LC

Sl. No.	Scientific Name	Common Name	Schedule as per WP(A) Act, 2022	IUCN Status
25	Hierococys varius	Common hawk cuckoo	II	LC
26	Hirundo rustica	Barn Swallow	II	LC
27	Milvus migrans	Black kite	II	LC
28	Mirafra erythroptera	Indian Bushlark	II	LC
29	Motacilla maderaspatensis	White browed wagtail	II	LC
30	Nectarina asiatica	Purple Sunbird	II	LC
31	Passer domesticus	House Sparrow	II	LC
32	Pavo cristatus	Pea Fowl	I	LC
33	Picus canus	Grey headed Woodpecker	II	LC
34	Ploceus philippinus	Weaver bird	II	LC
35	Prinia socialis	Ashy Wren Warbler	II	LC
36	Psittacula krameri	Rose Ringed Parakeet	II	LC
37	Pycnonotus cafer	Red vented Bulbul	II	LC
38	Saxicoloides fulicata	Indian Robin	II	LC
39	Streptopelia chinensis	Spotted Dove	II	LC
40	Tephrodornis pondicerianus	Common Wood shrike	II	LC
41	Vanellus indicus	Red Wattled Lapwing	II	LC
Mammals				
1	Funambulus palmarum	Indian Palm squirrel	II	LC
2	Lepus nigricollis	Indian Hare	II	LC
3	Pteropus giganteus	Bat, Indian Flying Fox	II	LC

LC-Least Concern

Note: Other than Peafowl there is no Schedule-I species in the study area.**Table : 3.33 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	Damselfly
6	Eumenes 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	Myremeleon sp.	Ant lion larva
13	Palamnaeus swammerdam	Scorpion
14	Petalura sp.	Dragonfly
15	Pseudagrion indicum	Yellow striped dart damselfly
16	Scolopendra sp.	Centipede

Sl. No.	Scientific Name	Common Name
Butterflies		
1	<i>Acraea terpsicore</i>	Tawny coster
2	<i>Catopsilla pomona</i>	Common emigrant
3	<i>Colotis danae</i>	Tip Crimson
4	<i>Danaus chiysippus</i>	Plain tiger
5	<i>Danaus plexippus</i>	Striped tiger
6	<i>Euploea core</i>	Common crow
7	<i>Eurema hecabe</i>	Common Grass Yellow
8	<i>Euthalia nais</i>	Baronet
9	<i>Graphium agamemnon</i>	Tailed jay
10	<i>Ixias Marianne</i>	White orange tip
11	<i>Junonia almana</i>	Peacock pansey
12	<i>Junonia atlites</i>	Grey pansey
13	<i>Junonia hierta</i>	Yellow Pansy
14	<i>Neptis hylas</i>	Common sailor
15	<i>Papilio demoleus</i>	Lime butterfly
16	<i>Parantica aglea</i>	Glassy tiger
Fish		
1	<i>Catla catla</i>	Catla
2	<i>Chela sp</i>	Trout
3	<i>Cirrhinus mrigala</i>	Mrigal
4	<i>Cyprinus carpio</i>	Common Carp
5	<i>Labeo rohita</i>	Rohu
6	<i>Ophiocephalus punctatus</i>	Kuravai
7	<i>Oreochromis mossambicus</i>	Tilapia
Reptiles		
1	<i>Calotes versicolor</i>	Common Garden lizard
2	<i>Eumeces taeniolatus</i>	Yellow bellied mole skink
3	<i>Gongylophis conicus</i>	Rough tailed Sand boa, Pudaiyan
4	<i>Hemidactylus flaviviridis</i>	House gecko
5	<i>Mabuya carinata</i>	Brahminy Skink
6	<i>Sauria lacertidae</i>	Lizard
Birds		
1	<i>Centropus sinensis</i>	Crow-Pheasant or coucal
2	<i>Corvus splendens</i>	House Crow
3	<i>Columba pallumbus</i>	Common Wood Pigeon
4	<i>Francolinus pondicerianus</i>	Grey Partridge
5	<i>Orthotomus sutorius</i>	Tailor Bird
6	<i>Phalacrocorax carbo</i>	Large Commorant
Mammals		
1	<i>Bandicota bengalensis</i>	Indian mole rat
2	<i>Bandicota indica</i>	Bandicoot
3	<i>Bos indicus</i>	Cow
4	<i>Bubalus bubalis</i>	Buffalo
5	<i>Canis familiaris</i>	Dog

Sl. No.	Scientific Name	Common Name
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 caerulescens	Common mush shrew

3.10 Socio-economic Environment

The socio-economic and health environment surveys were carried out for assessing the baseline status. There are 40 Census villages 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 3.34-3.40**.

There are about 17,499 Households (HHs) in the study area. The total population was 63,239 with a male population of 31,522 (49.85 %) and a female population of 31,717 (50.15 %). A marginal difference in the sex-ratio is observed in the general population. As far as the population of Scheduled Castes and Scheduled Tribes are concerned, there are 6,685 Scheduled Castes Population (with 3,295 males and 3,390 females) and 21 Scheduled Tribes (with 9 males and 12 females) in the study area.

In the total population, the Literate population is 74.02 % whereas the illiterate population is 25.98 %. The literacy rate is not very much varying from the national average.

As educational facilities are available in almost all villages at least with a primary school leading to easy access to education, a good percentage of people attain the literacy status. The awareness among the general population regarding education is reasonably high.

Occupational Structure : The major parameters such as main workers, marginal workers, Cultivators, Agricultural labourers, workers in household Industries, other services, Non-workers etc., have been identified with the number of persons engaged in. As per 2011 census, in the total population, 34,314 persons (54.26 %) were Workers and 28,925 persons (45.74 %) were non-workers. About 8.11 % were cultivators and 27.76 % were agricultural labourers.

Educational Facilities : Schools are available in almost all villages. However, college education is available at Aruppukkottai, Virudhunagar, Madurai, etc.

Medical Facilities : Medical facilities are available in many of the villages either in the form of primary health centers / primary health sub centers. However, it was observed that in some villages, no medical facility is available. But most of the villages have private medical practitioners located at villages. For major treatments, people has to go Madurai, Tuticorin, etc. Highest proportion of the study area population goes to Government hospital and Government health centre 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 : Bore-Wells and hand pumps are the major source of drinking water. As there is no perennial rivers in this area, People depend on tubewells and tankirrigation for the agriculture. In some villages, public water supply is also available.

Communication : There are good approach roads passing through the major villages and metal roads link all the smaller villages. People use different modes of transportation for commuting.

Marketing : The villages situated on the main road have marketing 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.

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.

Economic Activities : Major Agricultural Commodities in the study area includes Pulses, Chillies, Cotton, Maize, Black gram, Tomato, Jasmine, Bajra, Whole green gram, Ragi, etc. and Manufacturer Commodities includes Cement, Spinning, etc. Due to occupational shift of most of the people for several reasons in the study area, the cultivable lands are left uncultivated and fallow which are being infested with *Prosopis juliflora*. Because of the excellent burning qualities of this plant species, most of the people in the study area engaged themselves in cutting the wood and convert it into charcoal using traditional earth kilns which gives significant employment to the local people. Limestone and multi-coloured granites are the minerals found in this area. A sizable percentage of households in each village are engaged in cattle rearing, which fetches them a reasonable income. Most of the villagers are employed in various industrial units like Ginning, Weaving and Spinning mills and mines located in the study area.

Perception : All the villagers were known about the Mining & Quarrying operations by RCL in the Region and also about the Eco Park at Pandalgudi abandoned Mine. Most of them supported the Project.

Table : 3.34 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
0-5 km Radius																	
1	Maravarperungudi	430	1971	988	983	46	20	26	0	0	0	1395	807	588	576	181	395
2	Ramachandrapuram	277	918	461	457	96	45	51	0	0	0	628	349	279	290	112	178
3	Salukkuvarpatti	230	896	475	421	114	58	56	0	0	0	645	370	275	251	105	146
4	T.Koppuchithampatti	225	837	416	421	8	5	3	0	0	0	699	365	334	138	51	87
5	T.Meenakshipuram	226	727	360	367	120	61	59	0	0	0	576	305	271	151	55	96
6	Vadakkukoppuchithampatti	107	456	231	225	0	0	0	0	0	0	362	210	152	94	21	73
Sub-total		1495	5805	2931	2874	384	189	195	0	0	0	4305	2406	1899	1500	525	975
5-10 km Radius																	
7	Aladipatti	708	2811	1433	1378	40	25	15	0	0	0	1913	1085	828	898	348	550
8	Bommakottai	252	815	399	416	17	6	11	0	0	0	642	322	320	173	77	96
9	Chettikurichi	1487	4958	2458	2500	805	399	406	0	0	0	3658	1983	1675	1300	475	825
10	Chettipatti	235	742	363	379	101	48	53	0	0	0	598	309	289	144	54	90
11	Erasinnampatti	98	373	176	197	1	0	1	0	0	0	276	141	135	97	35	62
12	Kalayarkarisalkulam	603	1971	947	1024	299	148	151	0	0	0	1537	792	745	434	155	279
13	Kallorani	865	2798	1416	1382	427	213	214	0	0	0	2225	1203	1022	573	213	360
14	Kallumadam	338	1934	987	947	47	24	23	0	0	0	1430	799	631	504	188	316
15	Kalyanasundarapuram	63	240	108	132	0	0	0	0	0	0	166	79	87	74	29	45
16	Kullampatti	196	855	431	424	11	5	6	0	0	0	676	369	307	179	62	117
17	Kumaralingapuram-Keela Arunachalapuram	40	181	89	92	0	0	0	0	0	0	110	65	45	71	24	47
18	Kumarasakkanapuram	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	Lakshmiapuram	265	890	440	450	384	181	203	0	0	0	671	369	302	219	71	148
20	Mandapasalai	1358	4691	2313	2378	9	4	5	3	1	2	3764	1977	1787	927	336	591
21	Maniakaranpatti	325	1028	505	523	73	31	42	0	0	0	658	376	282	370	129	241
22	Muthiahpuram	90	269	130	139	50	24	26	0	0	0	187	102	85	82	28	54
23	Muthuramalingapuram	458	1591	820	771	2	2	0	0	0	0	1412	745	667	179	75	104
24	Muthusamypuram	496	1645	808	837	461	233	228	0	0	0	1126	618	508	519	190	329

Table : 3.34 (Contn.) 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
25	Nadukattur-Keela Arunachalapuram	461	1565	769	796	187	91	96	0	0	0	1084	603	481	481	166	315
26	Namasivayapuram	286	887	423	464	99	50	49	0	0	0	734	387	347	153	36	117
27	Narthampatti	280	1036	509	527	475	224	251	0	0	0	816	414	402	220	95	125
28	Pandalkudi	2938	10751	5349	5402	675	318	357	18	8	10	8072	4284	3788	2679	1065	1614
29	Podampatti	229	766	367	399	136	60	76	0	0	0	502	276	226	264	91	173
30	Savasapuram	500	1800	887	913	257	131	126	0	0	0	1266	698	568	534	189	345
31	Silukkapatti	126	516	254	262	283	140	143	0	0	0	329	180	149	187	74	113
32	Sivalarpatti	685	2430	1223	1207	431	221	210	0	0	0	1764	969	795	666	254	412
33	Suthamadam	321	1161	571	590	94	51	43	0	0	0	882	488	394	279	83	196
34	Thirumalaipuram	161	617	319	298	206	107	99	0	0	0	406	256	150	211	63	148
35	Thoppalakarai	463	1899	925	974	256	119	137	0	0	0	1227	675	552	672	250	422
36	Thummakundu	282	936	471	465	74	39	35	0	0	0	661	362	299	275	109	166
37	Thummuchinnampatti	612	2469	1269	1200	269	140	129	0	0	0	1618	938	680	851	331	520
38	Vannipatti-Mela Arunachalapuram	185	575	296	279	1	0	1	0	0	0	401	239	162	174	57	117
39	Vedanatham	171	681	352	329	9	2	7	0	0	0	503	296	207	178	56	122
40	Velayudhapuram	427	1553	784	769	122	70	52	0	0	0	1192	656	536	361	128	233
Sub-total		16004	57434	28591	28843	6301	3106	3195	21	9	12	42506	23055	19451	14928	5536	9392
Study Area Total		17499	63239	31522	31717	6685	3295	3390	21	9	12	46811	25461	21350	16428	6061	10367
Percentage, %		-	-	49.85	50.15	10.57	5.21	5.36	0.03	0.01	0.02	74.02	40.26	33.76	25.98	9.58	16.39

Table : 3.35 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
0-5 km Radius																
1	Maravarperungudi	1971	1236	642	594	735	346	389	6	1069	6	145	0	1	0	9
2	Ramachandrapuram	918	586	305	281	332	156	176	105	324	0	94	0	56	1	6
3	Salukkuvarpatti	896	538	298	240	358	177	181	243	221	0	67	4	0	0	3
4	T.Koppuchithampatti	837	357	249	108	480	167	313	30	199	4	117	2	2	0	3
5	T.Meenakshipuram	727	448	232	216	279	128	151	124	30	3	268	3	2	0	18
6	Vadakkukoppuchithampatti	456	271	138	133	185	93	92	2	245	0	20	0	2	0	2
Sub-total		5805	3436	1864	1572	2369	1067	1302	510	2088	13	711	9	63	1	41
5-10 km Radius																
7	Aladipatti	2811	1582	807	775	1229	626	603	200	709	5	498	15	101	0	54
8	Bommakottai	815	432	213	219	383	186	197	41	229	0	160	0	0	0	2
9	Chettikurichi	4958	2630	1478	1152	2328	980	1348	400	702	25	876	18	517	6	86
10	Chettipatti	742	422	216	206	320	147	173	90	212	1	99	5	4	0	11
11	Erasinnampatti	373	133	77	56	240	99	141	9	41	0	20	5	55	0	3
12	Kalayarkarisalkulam	1971	1229	625	604	742	322	420	100	647	36	367	7	61	3	8
13	Kallorani	2798	1395	804	591	1403	612	791	115	330	15	897	0	6	1	31
14	Kallumadam	1934	1129	586	543	805	401	404	425	288	14	378	2	2	2	18
15	Kalyanasundarapuram	240	116	58	58	124	50	74	42	2	1	60	2	1	1	7
16	Kullampatti	855	448	268	180	407	163	244	43	104	23	263	1	6	1	7
17	Kumaralingapuram-Keela Arunachalapuram	181	110	54	56	71	35	36	9	101	0	0	0	0	0	0
18	Kumarasakkanapuram	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	Lakshmipuram	890	662	344	318	228	96	132	129	168	5	101	2	221	1	35
20	Mandapasalai	4691	2442	1346	1096	2249	967	1282	640	632	45	958	26	98	3	40
21	Maniakaranpatti	1028	623	344	279	405	161	244	28	463	0	38	3	90	0	1
22	Muthiahpuram	269	158	82	76	111	48	63	55	62	0	40	0	1	0	0
23	Muthuramalingapuram	1591	926	483	443	665	337	328	431	134	32	288	9	6	2	24
24	Muthusampuram	1645	1009	554	455	636	254	382	41	210	5	216	6	494	3	34
25	Nadukattur-Keela Arunachalapuram	1565	935	493	442	630	276	354	188	470	7	125	12	116	5	12
26	Namasivayapuram	887	574	280	294	313	143	170	41	506	0	27	0	0	0	0

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EC for Maravarperungudi Lime Kankar Quarry Lease-III - 158.865 Ha, Virudhunagar District

Table : 3.35 (Contn.) 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
27	Narthampatti	1036	515	295	220	521	214	307	3	230	9	128	6	129	2	8
28	Pandalkudi	10751	4516	3010	1506	6235	2339	3896	443	1719	131	1853	43	224	28	75
29	Podampatti	766	491	250	241	275	117	158	3	355	0	116	0	9	1	7
30	Savaspuram	1800	873	553	320	927	334	593	31	138	10	671	0	5	0	18
31	Silukkapatti	516	326	158	168	190	96	94	1	295	0	30	0	0	0	0
32	Sivalarpatti	2430	1560	839	721	870	384	486	38	892	7	237	26	288	7	65
33	Suthamadam	1161	671	345	326	490	226	264	70	475	11	102	9	2	0	2
34	Thirumalaipuram	617	332	172	160	285	147	138	5	272	5	47	0	0	0	3
35	Thoppalakurai	1899	1051	555	496	848	370	478	571	275	18	172	5	3	0	7
36	Thummakundu	936	536	273	263	400	198	202	17	349	0	141	1	20	0	8
37	Thummuchinnampatti	2469	1323	731	592	1146	538	608	33	449	7	200	5	447	15	167
38	Vannipatti-Mela Arunachalapuram	575	332	184	148	243	112	131	44	115	1	71	3	94	0	4
39	Vedanatham	681	411	232	179	270	120	150	6	61	1	76	1	170	2	94
40	Velayudhapuram	1553	986	523	463	567	261	306	77	206	0	79	25	392	2	205
Sub-total		30878	17232	13646	26556	11359	15197	4369	11841	414	9334	237	3562	85	1036	30878
Study Area Total		63239	34314	19096	15218	28925	12426	16499	4879	13929	427	10045	246	3625	86	1077
Percentage, %		-	54.26	30.20	24.06	45.74	19.65	26.09	7.72	22.03	0.68	15.88	0.39	5.73	0.14	1.70

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

*-Main and Marginal Workers.

Table : 3.36 Educational Facilities in the Study Area

Sl. No.	Name of the Village	PPS*	PS*	MS*	SS*	SSS*	DC*	EC*	MC*	MI*	PT*	VTS*	SSD*
0-5 km Radius													
1	Maravarperungudi	1	1	1	1	b	c	c	c	c	c	c	b
2	Ramachandrapuram	1	2	2	c	c	c	c	c	c	c	c	c
3	Salukkuvarpatti	1	1	b	b	b	c	c	c	c	c	c	b
4	T.Koppuchithampatti	1	1	b	b	b	c	b	c	c	c	c	c
5	T.Meenakshipuram	1	1	b	b	b	b	b	c	b	b	c	b
6	Vadakkukoppuchiampatti	a	a	b	b	b	c	c	c	c	c	c	c
5-10 km Radius													
7	Aladipatti	1	1	a	a	a	c	c	c	c	c	c	c
8	Bommakottai	1	2	a	a	a	c	c	c	c	c	c	c
9	Chettikurichi	1	1	1	1	1	b		c	b	b	c	b
10	Chettipatti	1	1	a	a	a	c	a	c	c	c	c	c
11	Erasinnampatti	1	1	a	a	a	c	c	c	c	c	c	c
12	Kalayarkarisalkulam	1	1	a	a	a	c	c	c	c	c	c	c
13	Kallumadam	1	1	1	a	a	c	c	c	c	c	c	c
14	Kallurani	1	1	a	a	a	c	c	c	c	c	c	c
15	Kalyanasundarapuram	1	1	a	a	a	c	c	c	c	c	c	c
16	Kullampatti	1	1	a	a	a	b	c	c	b	b	c	b
17	Kumaralingapuram-Keela Arunachalapuram	a	a	a	a	c	c	c	c	c	c	c	c
18	Kumarasakkanapuram	-	-	-	-	-	-	-	-	-	-	-	-
19	Lakshmipuram	1	1	1	a	a	c	c	c	c	c	c	c
20	Mandapasalai	1	1	1	1	1	c	c	c	c	c	c	c
21	Maniakaranpatti	1	1	1	b	b	c	c	c	c	c	c	c
22	Muthiahapuram	1	1	a	a	a	c	c	c	c	c	c	c
23	Muthuramalingapuram	1	1	1	1	1	c	c	c	c	c	c	c
24	Muthusampuram	1	1	1	a	a	b	c	c	c	c	b	c
25	Nadukattur-Keela Arunachalapuram	1	1	1	b	b	c	c	c	c	c	c	c
26	Namasivayapuram	1	1	a	a	a	c	c	c	c	c	c	c
27	Narthampatti	1	1	a	a	a	b	c	c	b	b	c	b
28	Pandalkudi	1	1	1	1	1	c	b	c	c	c	c	c

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EC for Maravarperungudi Lime Kankar Quarry Lease-III - 158.865 Ha, Virudhunagar District

Table : 3.36 (Contn.) Educational Facilities in the Study Area

Sl. No.	Name of the Village	PPS*	PS*	MS*	SS*	SSS*	DC*	EC*	MC*	MI*	PT*	VTS*	SSD*
29	Podampatti	1	1	a	a	c	c	b	c	c	c	c	c
30	Savaspuram	1	1	1	a	a	b	c	c	b	b	c	b
31	Sennamareddipatti	1	1	1	1	b	c	c	c	c	c	c	c
32	Silukkapatti	a	a	a	a	a	c	c	c	c	c	c	c
33	Sivalarpatti	1	1	1	a	a	c	c	c	c	c	b	c
34	Suthamadam	1	1	a	b	b	c	c	c	c	c	c	b
35	Thirumalaipuram	1	1	a	a	a	c	c	c	c	c	c	b
36	Thoppalakurai	1	1	1	b	b	c	c	c	c	c	c	a
37	Thummakundu	1	1	b	b	b	c	c	c	c	c	c	c
38	Thummuchinnampatti	1	1	1	1	1	c	c	c	c	c	c	b
39	Vannipatti-Mela Arunachalapuram	1	1	a	b	b	c	c	c	c	c	b	c
40	Vedanatham	1	2	b	b	b	c	c	c	c	c	c	c
41	Velayudhapuram	1	1	1	1	1	c	b	c	c	c	c	c

PPS-Pre-Primary School

PS-Primary School

MS-Middle School

SS-Secondary School

SSS-Senior Secondary School

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

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EC for Maravarperungudi Lime Kankar Quarry Lease-III - 158.865 Ha, Virudhunagar District

Table : 3.37 Medical Facilities in the Study Area

Sl. No.	Name of the Village	CHC	PHC	PHSC	MCW	TB	HA	HAM	D	VH	FWC
0-5 km Radius											
1	Maravarperungudi	b	b	1	b	c	c	c	b	b	b
2	Ramachandrapuram	c	c	1	1	c	c	c	c	1	c
3	Salukkuvarpatti	b	b	b	b	c	c	c	b	b	b
4	T.Koppuchithampatti	b	b	1	b	c	c	c	b	b	b
5	T.Meenakshipuram	b	a	a	b	b	b	b	a	b	a
6	Vadakkukoppuchithampatti	b	b	a	b	c	c	c	b	b	b
5-10 km Radius											
7	Aladipatti	c	a	1	a	c	c	c	a	b	a
8	Bommakottai	c	a	1	a	c	c	c	a	a	a
9	Chettikurichi	b	b	2	b	b	b	b	b	1	b
10	Chettipatti	a	a	a	a	c	c	c	a	a	a
11	Erasinnampatti	a	a	a	a	c	c	c	a	a	a
12	Kalayarkarisalkulam	a	a	a	a	c	c	c	a	a	a
13	Kallumadam	a	a	a	a	c	c	c	a	a	a
14	Kallurani	c	a	a	b	c	c	c	a	b	a
15	Kalyanasundarapuram	b	b	b	b	b	c	c	b	b	b
16	Kullampatti	c	a	a	a	b	b	b	a	b	a
17	Kumaralingapuram-Keela Arunachalapuram	c	a	a	a	a	c	c	a	1	a
18	Kumarasakkanapuram	-	-	-	-	-	-	-	-	-	-
19	Lakshmipuram	c	a	b	a	a	c	c	a	a	a
20	Mandapasalai	1	1	1	1	1	c	c	1	1	1
21	Maniakaranpatti	c	c	b	c	c	c	c	c	1	c
22	Muthiahapuram	c	c	1	1	c	c	c	c	c	c
23	Muthuramalingapuram	c	b	1	b	b	c	c	b	1	b
24	Muthusampuram	b	a	a	a	c	c	c	a	a	a
25	Nadukattur-Keela Arunachalapuram	b	b	b	b	b	c	c	b	b	b
26	Namasivayapuram	c	c	a	c	c	c	c	c	c	c
27	Narthampatti	b	b	a	b	c	b	b	b	a	b
28	Pandalkudi	1	1	1	1	1	c	c	1	1	1
29	Podampatti	b	b	a	b	c	c	c	b	b	b

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EC for Maravarperungudi Lime Kankar Quarry Lease-III - 158.865 Ha, Virudhunagar District

Table : 3.37 (Contn.) Medical Facilities in the Study Area

Sl. No.	Name of the Village	CHC	PHC	PHSC	MCW	TB	HA	HAM	D	VH	FWC
30	Savaspuram	c	a	1	a	b	b	b	a	b	a
31	Sennamareddipatti	c	c	2	c	c	c	c	c	c	c
32	Silukkapatti	a	a	a	a	c	c	c	a	a	a
33	Sivalarpatti	c	a	a	a	a	c	c	a	1	a
34	Suthamadam	b	b	a	b	b	c	c	b	b	b
35	Thirumalaipuram	b	b	a	b	c	c	c	b	b	b
36	Hoppalakarai	b	b	1	b	c	c	c	b	b	b
37	Thummakundu	b	b	a	b	c	c	c	b	b	b
38	Thummuchinnampatti	b	b	b	b	c	c	c	b	b	b
39	Vannipatti-Mela Arunachalapuram	b	b	1	b	b	c	c	b	a	b
40	Vedanatham	b	b	b	b	c	c	c	b	b	b
41	Velayudhapuram	a	a	a	a	c	c	c	a	a	a

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 Hospital

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

RCL

EC for Maravarperungudi Lime Kankar Quarry Lease-III - 158.865 Ha, Virudhunagar District

Table : 3.38 Communication & Transport Facilities in the Study Area

Sl. No.	Name of the Village	PO	SPO	P&T	T	PCO	MP	IC	PCF	BS	PBS	RS	NH	SH	MDR	BTR	GR	AWR
0-5 km Radius																		
1	Maravarperungudi	b	1	b	1	b	1	c	c	1	1	c	c	b	1	a	1	1
2	Ramachandrapuram	c	1	c	1	1	1	c	c	1	1	c	c	c	c	1	1	1
3	Salukkuvarpatti	b	1	b	1	b	1	c	b	1	a	c	c	a	1	1	1	1
4	T.Koppuchithampatti	b	1	b	1	c	1	c	1	1	1	c	1	1	1	1	1	1
5	T.Meenakshipuram	b	1	b	1	1	1	b	b	1	b	b	b	b	a	1	1	1
6	Vadakkukoppuchithampatti	b	a	b	a	c	1	c	a	1	1	c	b	b	b	a	1	1
5-10 km radius																		
7	Aladipatti	a	1	a	1	1	1	a	a	1	1	c	c	a	1	1	1	1
8	Bommakottai	a	1	a	1	a	1	c	a	1	1	c	c	c	1	1	1	1
9	Chettikurichi	b	1	b	1	1	1	b	b	1	1	b	1	1	1	1	1	1
10	Chettipatti	a	a	a	1	1	1	c	c	1	1	c	a	a	1	1	1	1
11	Erasinnampatti	a	a	a	a	a	1	c	c	1	a	c	c	a	a	a	1	1
12	Kalayarkarisalkulam	a	1	a	1	a	1	c	1	1	1	c	b	b	1	1	1	1
13	Kallumadam	a	1	a	1	c	1	c	c	1	1	c	c	c	1	1	1	1
14	Kallurani	b	b	b	1	1	1	b	c	1	1	c	c	b	1	1	1	1
15	Kalyanasundarapuram	b	a	b	1	b	1	c	c	1	1	c	c	c	1	1	1	1
16	Kullampatti	b	a	b	1	1	1	b	b	1	1	b	b	a	1	1	1	1
17	Kumaralingapuram-Keela Arunachalapuram	c	a	c	1	c	1	c	c	1	1	c	c	c	c	1	1	1
18	Kumarasakkanapuram	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	Lakshmipuram	c	b	c	1	1	1	c	1	b	b	c	c	c	1	1	1	1
20	Mandapasalai	b	1	b	1	1	1	c	c	1	1	c	c	1	1	1	1	1
21	Maniakaranpatti	c	1	c	1	c	1	c	c	1	b	c	c	1	1	1	1	1
22	Muthiahapuram	b	b	a	1	a	1	c	c	1	1	c	a	a	1	1	1	1
23	Muthuramalingapuram	c	a	c	1	1	1	c	1	1	1	c	c	1	1	1	1	1
24	Muthusampuram	a	a	a	1	1	1	a	a	1	1	c	b	1	1	1	1	1
25	Nadukattur-Keela Arunachalapuram	b	1	b	1	b	1	b	b	1	b	c	c	b	b	1	1	1
26	Namasivayapuram	a	a	c	1	1	1	a	a	1	a	c	b	b	b	1	1	1
27	Narthampatti	b	a	c	1	1	1	b	a	1	1	c	b	1	1	1	1	1
28	Pandalkudi	1	1	1	1	c	1	c	1	1	1	c	1	1	1	1	1	1
29	Podampatti	b	a	b	1	1	1	c	b	1	1	c	c	c	a	1	1	1

RCL

EC for Maravarperungudi Lime Kankar Quarry Lease-III - 158.865 Ha, Virudhunagar District

Table : 3.38 (Contn.) Communication & Transport Facilities in the Study Area

Sl. No.	Name of the Village	PO	SPO	P&T	T	PCO	MP	IC	PCF	BS	PBS	RS	NH	SH	MDR	BTR	GR	AWR
30	Savaspuram	b	a	b	1	1	1	b	1	1	1	c	b	1	1	1	1	1
31	Sennamareddipatti	c	1	c	1	c	1	c	c	1	1	c	1	1	1	1	1	1
32	Silukkapatti	b	a	b	1	a	1	c	c	a	a	c	c	a	1	1	1	1
33	Sivalarpatti	a	1	a	1	1	1	a	a	1	1	a	b	1	1	1	1	1
34	Suthamadam	b	1	b	1	1	1	c	b	1	a	c	c	b	1	1	1	1
35	Thirumalaipuram	b	a	b	1	a	1	c	b	1	a	c	c	1	1	1	1	1
36	Thoppalakarai	b	1	b	1	b	1	c	c	1	1	c	c	1	1	1	1	1
37	Thummakundu	b	a	b	1	1	1	c	b	1	1	c	a	a	1	1	1	1
38	Thummuchinnampatti	b	1	b	1	1	1	c	b	1	1	c	c	1	1	1	1	1
39	Vannipatti-Mela Arunachalapuram	a	a	a	1	b	1	b	b	1	a	c	b	b	1	1	1	1
40	Vedanatham	b	1	b	1	1	1	c	b	1	b	c	c	1	1	1	1	1
41	Velayudhapuram	a	a	a	1	a	1	c	a	1	a	c	1	1	1	a	1	1

PO-Post Office

SPO-Sub Post Office

P&T-Post/Telegraph Office

T-Telephones (landlines)

PCO- Public Call Office/Mobile PCO)

MP- Mobile Phone Coverage

IC-Internet Cafes / Common Service Centre

PCF-Private Courier Facility

BS-Public Bus Service

PBS-Private Bus Service

RS-Railway Station

NH-National Highway

SH-State Highway

MDR-Major District Road

BTR-Black Topped (Pucca) Roads

GR-Gravel (kuchha) Roads

AWR-All Weather Road

*-Status

1-Available

2-Not Available

a-Facility available at <5 Kms

b-Facility available at 5-10 Kms

c-Facility available at >10 Kms

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EC for Maravarperungudi Lime Kankar Quarry Lease-III - 158.865 Ha, Virudhunagar District

Table : 3.39 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
0-5 km Radius												
1	Maravarperungudi	1	2	2	2	2	2	2	2	1	1	2
2	Ramachandrapuram	1	2	2	2	1	2	2	1	1	1	1
3	Salukkuvarpatti	2	2	2	1	2	2	2	2	2	1	2
4	T.Koppuchithampatti	1	1	2	1	1	2	2	2	2	1	2
5	T.Meenakshipuram	1	1	2	1	1	2	2	2	1	1	2
6	Vadakkukoppuchithampatti	1	2	2	2	2	2	2	2	2	1	2
5-10 km Radius												
7	Aladipatti	1	2	2	1	1	2	2	2	1	1	2
8	Bommakottai	1	1	2	1	1	2	2	2	1	1	2
9	Chettikurichi	1	1	2	1	1	2	2	2	1	1	1
10	Chettipatti	1	1	2	1	1	2	2	2	2	1	1
11	Erasinnampatti	2	2	2	2	2	2	2	2	1	1	2
12	Kalayarkarisalkulam	1	2	2	2	2	2	2	2	1	1	1
13	Kallumadam	1	2	2	2	2	2	2	2	1	1	2
14	Kallurani	1	2	2	2	2	2	2	2	2	1	2
15	Kalyanasundarapuram	1	2	2	2	1	2	2	2	2	1	1
16	Kullampatti	1	2	2	2	2	2	2	2	1	2	1
17	Kumaralingapuram-Keela Arunachalapuram	2	2	1	2	2	2	2	2	2	2	2
18	Kumarasakkanapuram	-	-	-	-	-	-	-	-	-	-	-
19	Lakshmipuram	2	1	2	2	2	2	2	1	1	1	1
20	Mandapasalai	1	1	1	2	1	2	2	2	1	1	1
21	Maniakaranpatti	1	2	2	2	2	2	2	2	1	1	1
22	Muthiahpuram	1	2	2	2	2	2	2	1	1	1	1
23	Muthuramalingapuram	1	2	2	2	1	2	2	2	1	1	1
24	Muthusampuram	1	2	2	2	2	2	2	2	1	1	1
25	Nadukattur-Keela Arunachalapuram	1	1	2	1	1	2	1	2	1	1	1
26	Namasivayapuram	1	2	2	1	1	2	2	2	1	1	1
27	Narthampatti	1	2	1	1	2	2	2	2	1	1	2
28	Pandalkudi	1	2	2	2	2	2	2	2	1	1	1
29	Podampatti	1	2	2	1	1	2	2	2	1	1	1

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EC for Maravarperungudi Lime Kankar Quarry Lease-III - 158.865 Ha, Virudhunagar District

Table : 3.39 (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
30	Savaspuram	2	2	2	1	2	2	2	2	1	1	1
31	Sennamareddipatti	1	1	1	2	1	2	2	2	1	1	1
32	Silukkapatti	1	2	2	1	1	2	2	2	2	1	1
33	Sivalarpatti	1	2	2	1	1	2	2	2	1	1	1
34	Suthamadam	1	1	1	2	1	2	2	2	2	1	2
35	Thirumalaipuram	1	2	1	1	1	2	2	2	2	1	2
36	Thoppalakurai	1	1	2	1	2	2	2	2	1	1	1
37	Thummakundu	1	2	2	1	2	2	2	2	1	1	1
38	Thummuchinnampatti	1	2	2	2	2	2	2	2	1	1	2
39	Vannipatti-Mela Arunachalapuram	1	2	1	2	1	2	2	2	1	1	1
40	Vedanatham	1	2	2	1	1	2	2	2	1	1	1
41	Velayudhapuram	1	2	2	2	1	2	2	2	1	1	2

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 Public

*-Status

1-Available

2-Not Available

RCL

EC for Maravarperungudi Lime Kankar Quarry Lease-III - 158.865 Ha, Virudhunagar District

Table : 3.40 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
0-5 km Radius																		
1	Maravarperungudi	c	c	1	b	1	1	c	c	b	b	1	1	b	b	1	1	1
2	Ramachandrapuram	c	c	1	1	1	1	c	c	1	1	1	1	1	1	1	1	1
3	Salukkuvarpatti	b	c	a	b	1	1	c	1	1	1	b	b	1	1	1	1	1
4	T.Koppuchithampatti	b	b	1	b	1	1	c	c	1	1	1	b	1	1	1	1	1
5	T.Meenakshipuram	b	b	b	1	1	1	1	b	1	1	a	a	b	1	1	1	1
6	Vadakkukoppuchithampatti	c	c	b	b	1	a	b	c	a	a	1	a	a	a	a	a	1
5-10 km Radius																		
7	Aladipatti	b	c	b	b	1	1	a	c	2	a	1	1	a	1	1	1	1
8	Bommakottai	a	a	a	1	1	1	c	c	1	1	a	a	c	1	1	1	1
9	Chettikurichi	b	b	b	1	1	1	b	b	1	1	1	1	1	1	1	1	1
10	Chettipatti	a	c	a	1	1	1	c	c	1	1	a	1	1	1	1	1	1
11	Erasinnampatti	c	c	a	a	1	1	b	b	1	1	a	a	a	a	1	a	1
12	Kalayarkarisalkulam	b	a	a	1	1	1	c	c	1	1	1	1	a	1	1	1	1
13	Kallumadam	b	c	a	a	1	1	c	c	1	1	1	1	1	1	1	1	1
14	Kallurani	b	b	b	b	1	1	c	c	1	1	a	1	1	1	1	b	1
15	Kalyanasundarapuram	b	b	b	a	a	a	c	c	1	1	a	a	a	1	a	a	1
16	Kullampatti	b	b	a	a	1	1	b	b	1	1	1	a	b	1	1	1	1
17	Kumaralingapuram-Keela Arunachalapuram	c	c	a	a	1	a	c	c	a	a	a	a	a	1	a	b	1
18	Kumarasakkanapuram	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	Lakshmipuram	c	a	b	c	1	1	1	c	1	1	1	1	1	1	1	1	1
20	Mandapasalai	c	c	1	b	1	1	c	c	1	1	1	1	1	1	1	1	1
21	Maniakaranpatti	c	c	c	c	1	1	c	c	1	1	1	1	1	1	1	1	1
22	Muthiahapuram	c	c	b	c	1	1	c	c	1	1	1	1	b	1	a	1	1
23	Muthuramalingapuram	b	c	1	1	1	1	c	c	1	1	a	1	1	1	1	1	1
24	Muthusamypuram	b	a	a	a	1	1	a	a	1	1	a	1	1	1	1	1	1
25	Nadukattur-Keela Arunachalapuram	c	b	b	b	1	1	b	b	1	1	1	1	1	1	1	1	1
26	Namasivayapuram	c	c	c	b	1	1	c	a	1	1	1	1	c	1	1	1	1
27	Narthampatti	b	b	a	a	1	a	b	b	1	1	a	a	a	1	a	a	1
28	Pandalkudi	1	c	1	1	1	1	c	c	1	1	1	1	1	1	1	1	1
29	Podampatti	b	b	a	a	1	1	c	c	1	1	1	1	b	1	a	1	1

RCL

EC for Maravarperungudi Lime Kankar Quarry Lease-III - 158.865 Ha, Virudhunagar District

Table : 3.40 (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
30	Savaspuram	a	b	1	1	1	1	b	b	1	1	a	a	1	1	1	1	1
31	Sennamareddipatti	c	c	1	1	1	1	c	c	1	1	1	1	1	1	1	1	1
32	Silukkapatti	c	c	a	a	a	a	c	c	a	a	a	a	a	a	a	a	1
33	Sivalarpatti	a	b	1	1	1	1	b	a	1	1	1	1	1	1	1	1	1
34	Suthamadam	b	c	1	b	1	1	c	c	1	1	1	1	1	1	1	1	1
35	Thirumalaipuram	b	c	b	b	1	1	c	b	1	1	1	1	1	1	b	b	1
36	Thoppalakarai	b	c	b	b	1	1	c	c	1	1	1	b	1	1	1	1	1
37	Thummakundu	b	c	b	b	1	1	c	c	1	1	1	b	1	1	1	1	1
38	Thummuchinnampatti	b	c	b	b	1	1	c	c	1	1	1	1	1	1	1	1	1
39	Vannipatti-Mela Arunachalapuram	c	b	1	1	1	1	a	b	1	1	1	1	1	1	1	1	1
40	Vedanatham	c	c	b	b	1	1	c	c	1	1	b	b	1	1	1	1	1
41	Velayudhapuram	a	c	a	a	1	1	1	c	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

3.11 Summary of Baseline Status

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

- ❖ The collected meteorological data during this season represented local weather phenomena.
- ❖ The monitored ambient air quality in the study area was found to be in compliance with the NAAQ 24-hourly Norms for Industrial, Residential, Rural and other areas.
- ❖ Ambient equivalent noise levels (Leq) during day and night times were found to be well within the MoEF&CC Norms for Residential Areas.
- ❖ Surface water quality was found to be in compliance with CPCB Norms(C). Ground water quality was found to be in compliance with IS:10500-2012 Norms for Domestic consumption.
- ❖ Soil in the study area would very well support vegetation after amending it suitably.
- ❖ Schedule-I Fauna, Peafowl is omni present in the Study area for which Peafowl Conservation Plan has been prepared and submitted.
- ❖ Other than Peafowl, only domesticated animals exist.
- ❖ 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 and Secondary Impacts. **Primary Impacts** are those which are attributed directly to the project and **Secondary Impacts** are those which are indirectly induced by the 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 studied.

4.2 Construction Phase

Being a Quarry Project, it **does not involve any major establishment or construction**. A small Mine Office will be constructed on **temporary structures**.

4.3 Operation Phase

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. On the other hand, Cumulative Impact is aggregate impact of a number of projects on any component. Cumulative impacts can result from individually minor but collectively significant over a period of time. There are Cement Plants and Limestone Mines in the Study Area. However, following industrial activities are considered for **Cumulative Impact Assessment** for assessing their contribution (Table 4.1).

Cumulative Impact has been assessed for the identified Industries and assumed that the **pollution due to other existing Industrial/Mining activities have already been covered under baseline environmental status** and continue to remain same till the operation of the project.

Table : 4.1 Industrial Activities considered for Cumulative Impact

Sl. No.	Name of the Mine	Extent & Consented / Proposed Production	Distance & Direction from QL-IV	Bearing & Contribution during Study Period
I	Existing Industries/Mines in Operation:-			
1	Pandalgudi Centralised Crusher with Optical Ore Sorting Facility	29.610 Ha 2.0 MTPA Throughput	3.2 km in SW	Upwind side & contributing
2	Pandalgudi Mining Leases (Limestone) under GO Nos. 26, 28 & 33	200.885 Ha 0.3888 MTPA	3.2-5.4 km in WSW-SW	Upwind side & contributing

3	Maravarperungudi Quarry (Lime Kankar & Clay) Lease under GO No. 15823 along with Screening Plant	198.515 Ha 0.64 MTPA	6.2 km in SE	Downwind side – contributing in Traffic Volume
4	Sivalarpatti Mine (Limestone) under New GO No. 34	150.110 Ha 0.69 MTPA	8.3-12.0 km in SSE	Downwind side – contributing in Traffic Volume
5	Melvenkateswarapuram Mine (Limestone) under New GO No. 98	98.620 Ha 0.72	12.5 km in SSE	Not in the Study Area & contributing to Traffic Volume
II	Kankar Leases :-			
6	Maravarperungudi QL-II (EC in Pipeline)	23.290 Ha 0.254 MTPA	3.1 km in ESE	Will be contributing to Traffic Volume
7	Maravarperungudi QL-I	498.870 Ha 1.393 MTPA	7.1 km in SE	Will be contributing to Traffic Volume
8	Vadakkunatham QL-V	123.265 Ha 0.525 MTPA	12.2 km in SE	Not in the Study Area & will be contributing to Traffic Volume
9	T Koppuchi-thampatti QL-IV	123.265 Ha 1.267 MTPA	NW	Will be contributing to Traffic Volume

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.
- ❖ Biological Environment.
- ❖ Socio-economics.

4.3.1 Land Environment

Anticipated Impacts : In the total Lease Area of 158.865 Ha, effective quarry area will be 111.685 Ha. Out of which, mined out void backfilled & reclaimed area will be 4.872 Ha. About 47.180 Ha is the safety barrier area which will be under Green Belt/Afforestation (**29.70% Coverage**) at Conceptual Stage.

Mitigating Measures :

- ❖ It will be ensured that quarrying operations do not result in loss of soil biological properties and nutrients.

- ❖ Earthen bunds are to be strengthened along the boundaries to arrest wash-offs.
- ❖ Garland drains are to be provided and maintained periodically around the Lease.
- ❖ Green Belt has to be developed and maintained along the Lease boundary.
- ❖ No. of **trees planted shall be numbered** and referenced for review.
- ❖ The solid wastes shall be backfilled in the quarried out voids and the land shall be restored to its original conditions.
- ❖ Saplings shall also be planted along the foot of the dumps and unused slopes to arrest / prevent erosion.
- ❖ Bio remediation using micro organisms will be carried out to restore the soil environment to enable **carbon sequestration**.
- ❖ Actions will be taken to promote agro forestry/mixed plants to support biodiversity.
- ❖ Ponds/Reservoirs shall also be developed to recharge the Ground Water-table in the vicinity.

4.3.2 Traffic Volume

As stated earlier, existing Mines and Pandalgudi Crusher are connected to RR Nagar Cement Plant with Company owned Tar road. There is a Road-over-Bridge on the NH-38 for the dedicated Haulage Road which crosses Pandalgudi village Road. The village road intersection is manned by RCL's Security Personnel.

Baseline Status : For assessing the baseline status, the Traffic Survey based on Indian Road Congress-IRC:64/106 Norms at the Haul Road-Pandalgudi Road Junction, was carried out during a Week day (12.02.2025-Wednesday) and also during the Week end (16.02.2025-Sunday). Based on the Survey, existing Traffic Volumes at the Junction is computed in **Passenger Car Units (PCUs)** and given in **Table 4.2**. The existing traffic volume in the Project vicinity was found to be **1608 PCU/day @ 67.00 PCU/hour**.

Table : 4.2 Existing Traffic Volume - Baseline Status

Type of Vehicle	No. of Vehicles/day		Avg. Traffic per day, No. of Vehicles/day	PCU Factor as per IRC:106	No. of vehicles in PCU/day
	Week Day (12.02.2025-Wednesday)	Week End (16.02.2025-Sunday)			
2-wheelers	422	536	438.3	0.5	219.1
Autos	162	196	166.9	1	166.9
Vans/Tempos	116	150	120.9	1	120.9
Cars	224	232	225.1	1	225.1
Buses	136	102	131.1	3	393.4
Trucks	1228	623	1141.6	3	3424.7
Trailers	2	0	1.7	4.5	7.7
Total	2290	1839	2225.6	-	1608.0

Existing Traffic Volume at RCL Mines Road-Pandalgudi Junction was **4,558 PCUs i.e. 189.92 PCU/hr.** In the Post-Project Scenario, there will be an **addition of 536 vehicles/day (1608 PCU/day)** to the existing traffic in the vicinity. **The net (cumulative) traffic volume will be 6,166 PCU/day only @ 252.96 PCU/hour.** The existing Haulage Road will also be adequate to handle the proposed addition of traffic volume @ 63.04 PCU/hour. As the **haulages will be through the dedicated own Road, there will not be any impact on the existing Traffic volume of NH or other roads.**

Mitigating Measures :-

- ❖ Regular wetting of haul roads has to be undertaken to arrest fugitive emissions.
- ❖ Tippers are to be fully covered with Tarpaulin to avoid any spillage.
- ❖ No overloading of Tippers is allowed strictly.
- ❖ A strict Speed Limit of 30 km/hr. has to be enforced and monitored continuously.
- ❖ Compliance to 'Pollution under Control' Certification has to be ensured.
- ❖ Restriction of Truck parking in the Public Road has to be implemented.
- ❖ Security Guards to be posted at the public road junction.
- ❖ Compliance to 'Pollution under Control' Certification will be ensured and will be checked periodically.

4.3.3 Carbon Emission & Climate Change

Greenhouse gases include carbon dioxide, methane, nitrous oxides, and water vapour. For operating the quarrying equipments, High Speed Diesel (HSD) is required @ 2,000 Liters/day. A licensed fuel storage tank will be established at the Crusher and the daily requirement of HSD and other lubricants will be met by a licensed mobile bowser. By considering Green House Gases (GHG) Emission Factors as per US EPA 2014 Norms, consumption of this diesel quantity will generate the gaseous emissions as follows:

Total CO ₂ Emissions	:	199 kg/annum
Total CH ₄ Emissions	:	2.40 kg/annum
Total N ₂ O Emissions	:	1.60 kg/annum
Global warming potential of CO ₂ -e of CH ₄	:	60 kg/annum
Global warming potential of CO ₂ -e of N ₂ O	:	476.80 kg/annum

Thus, total **CO₂-e production will be 736 kg/annum** which is having low significant.

Mitigating Measures :

- ❖ **Carbon sequestration** is the long-term storage of carbon in oceans, soils, vegetation (especially forests) and geologic formations. Adequate Green Belt shall be developed around the project for **carbon sequestration**. As trees grow, they store carbon in woody tissues and soil organic matter (Ref. ESA).

- ❖ **Green Belt (47.180 Ha) Coverage will be 29.70%.** About, 11,250 local tree species like Neem, Pungan, Teak, etc. will be planted @ 500 Trees/Ha with a Survival Rate of about 90%.
- ❖ RCL has developed **Pandalgudi Recreational Eco Park with 3 Lakhs Trees** in one of the abandoned Mine Pits at Pandalgudi (near the proposed Site) which was opened by Hon'ble Chief Minister of Tamil Nadu on 06.03.2022. The Road Map is developing 5 Lakhs Trees in the Park by the Year 2030. This Eco Park with 0.5 Million Trees will be a significant carbon sequestration step to achieve climate goals in Pandalgudi vicinity. **Carbon dioxide is captured from the atmosphere by trees @ 30-40 Tonnes/year in an Hectare** with normal tree density.
- ❖ RCL has started utilizing wind power generated from own wind mills at Muppandal Region to the level of 6.5 MW/hr. In addition to this, it is planning to utilize additional 5.0 MW/hr of wind power for captive use of their Plants in the Region which will result in CO₂ emission @ 0.9 Tonne/MWhr. (about 90,666 Tonnes CO₂/Year) from Coal based Power Plants power generation (Ref. Central Electricity Authority).

4.3.4 Air Pollution

Anticipated Impacts : The Mining & Quarrying, Loading and Transporting activities would generate both fugitive dust emissions and smoke from HEM Machineries/Equipments & Transporting Tippers. Stack Emissions from Existing Crusher & Proposed Screening/Beneficiation Plants are considered along with Mines/Quarries **for Cumulative impact Assessment**. In general, dust generation (Particulate Matter) in the mines are due to :

- ❖ Drilling & Blasting operation of existing Mines.
- ❖ Excavation in Mines & Quarries.
- ❖ Transportation of the Mineral.

The equations used for Inputs of various activities are as detailed below :

<u>Activity</u>	<u>Equation</u>
Excavation of Waste & Limestone :	23.6 kg/hr particulate matter for every 1000 tonnes per hour material handling Dust emission = $P_a \times 23.6 / W_d \times W_h \times 1000$
Limestone & Waste transportation :	0.2 kg/vehicle/km. $DT = T_v \times 0.2 \times d$ DT = Dust emission in kg/hr T_v = No. of transport vehicles plying in one hour.
Drilling :	0.6 kg/hole

The respective Input values are used for individual Mine and Quarry for running the Model.

Prediction Modelling : AERMOD View Software is used for Predicting the maximum Ground Level Concentrations (GLCs) including Transportation Impact. As site specific mixing heights were not available, mixing heights based on CPCB publication, “Spatial Distribution of Hourly Mixing Depth over Indian Region”, PROBES/88/2002-03 has been considered (appended below).

Table : 4.3 Maximum Mixing Height (meter) with Standard Deviation over Indian Region

Name of Station	Seasons					
	Winter		Pre-monsoon		Post-monsoon	
	Mixing Ht.	Std. Dev.	Mixing Ht.	Std. Dev.	Mixing Ht.	Std. Dev.
Chennai	1063.75	153.92	1274.45	111.79	1010.5	109.39

Model Inputs and Outputs are appended. The predicted GLCs are given in **Table 4.4**. The predicted GLC is also **superimposed on the baseline maps** and given as **Figs. 4.1-4.2**.

Table : 4.4 Predicted GLCs - Cumulative (including Transportation)

Sl. No.	Pollutant	Background Concentration (24-hly. Avg.), ug/m ³	Max. Predicted Ground Level Concentration, ug/m ³	Distance from the Source (max.), km	Total Concentration, ug/m ³	Revised NAAQ Norms, ug/m ³	Buffer Available in the Atmosphere
1	PM2.5	21.7	0.24	0.8	21.94	60	63.43%
2	PM10	36.8	0.91	0.8	37.71	100	62.29%

The predicted maximum GLC-PM2.5 for cumulative activities is 0.24 ug/m³ and GLC-PM10 for cumulative activities is 0.91 ug/m³ and found to be confined locally i.e. within 0.8 km radius. Also, adequate Buffer Level available in the Air Environment for the Proposal.

Mitigating Measures : As mitigative measure to control air pollution, the following measures are to be implemented effectively :

- ❖ Eco friendly quarrying (with out Drilling & Blasting) shall be adopted.
- ❖ Green belt shall be developed along the periphery, haul roads, waste dumps, etc.
- ❖ Water sprinkling at excavation areas, loading, haul roads, etc. has to be carried out periodically.
- ❖ Periodical maintenance of mining equipments has to be carried out.
- ❖ Covering of Trucks/Tippers with tarpaulin shall be ensured during Mineral transportation.
- ❖ Over loading of Tippers has to be avoided to control the spillages during transportation.
- ❖ Periodical checkup of vehicles for ‘Emission Under Control’ Certificate is to be ensured.
- ❖ Periodical Air Quality Monitoring & Fugitive Emissions shall be carried out and Reports submitted.

RCL

EC for Maravarperungudi Lime Kankar Quarry Lease-III - 158.865 Ha, Virudhunagar District

PM 2.5 - Input & Output Data**Source Pathway - Source Inputs**

AERMOD

Point Sources

Source Type	Source ID	X Coordinate [m]	Y Coordinate [m]	Base Elevation (Optional)	Release Height [m]	Emission Rate [g/s]	Gas Exit Temp. [°C]	Gas Exit Velocity [m/s]	Stack Inside Diameter [m]
POINT	SIZER	190526.47	1035427.56	0.00	15.00	0.00115	323.15	18.00	0.65
		Sizer							
POINT	PGCRUSHER	179819.42	1040265.46	0.00	15.00	0.00115	323.15	18.00	0.65
		PG Crusher							
POINT	LKBP	180157.39	1040232.31	0.00	15.00	0.00150	323.15	18.00	0.65
		PG Kankar BP Sizer							

Source Pathway - Source Inputs

AERMOD

Area Sources

Source Type	Source ID	X Coordinate [m]	Y Coordinate [m]	Base Elevation (Optional)	Release Height [m]	Emission Rate [g/s-m²]	Length of X Side [m]	Length of Y Side [m]	Orientation Angle from North [deg]	Initial Vertical Disp. [m]
AREA	QL2	188574.55	1040055.36	0.00	1.50	2.70E-7	25.00	8.00	0.00	
AREA	SVP	188253.00	1032411.50	0.00	1.50	1.00E-6	50.00	20.00	0.00	
AREA	PG5	182570.32	1038782.78	0.00	1.50	1.10E-6	50.00	20.00	0.00	
AREA	MPG	190463.45	1035923.41	0.00	1.50	1.50E-6	25.00	8.00	0.00	
AREA	QL1	191124.02	1035131.36	0.00	1.50	2.70E-6	25.00	8.00	0.00	
		QL1 Area								
AREA	QL5	194721.65	1032563.51	0.00	1.50	9.30E-7	25.00	8.00	0.00	
		QL5 Area								
AREA	MVP	188873.11	1029159.24	0.00	1.50	2.90E-7	50.00	20.00	0.00	
		MVPuram Mine								
AREA	QL4	184420.48	1042088.03	0.00	1.50	2.90E-6	25.00	8.00	0.00	
		QL4								
AREA	QL3	188089.63	1039591.37	99.00	1.50	5.10E-8	25.00	8.00	0.00	
		QL3								

Results Summary

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PM2.5 - Concentration - Source Group: ALL

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
24-HR	1ST	0.23849	ug/m³	183664.60	1042576.36	97.00	0.00	97.00	28-02-2025, 24
24-HR	2ND	0.06443	ug/m³	194664.60	1032626.26	97.00	0.00	97.00	01-12-2024, 24
24-HR	3RD	0.06083	ug/m³	194664.60	1032626.26	97.00	0.00	97.00	17-12-2024, 24
24-HR	4TH	0.05916	ug/m³	194664.60	1032626.26	97.00	0.00	97.00	20-12-2024, 24
24-HR	5TH	0.04795	ug/m³	194664.60	1032626.26	97.00	0.00	97.00	28-02-2025, 24
24-HR	6TH	0.04658	ug/m³	194664.60	1032626.26	97.00	0.00	97.00	22-12-2024, 24
24-HR	7TH	0.03816	ug/m³	194664.60	1032626.26	97.00	0.00	97.00	25-12-2024, 24
24-HR	8TH	0.02867	ug/m³	194664.60	1032626.26	97.00	0.00	97.00	02-12-2024, 24
24-HR	9TH	0.01585	ug/m³	188664.60	1039591.33	97.00	0.00	97.00	18-02-2025, 24
24-HR	10TH	0.01555	ug/m³	188664.60	1039591.33	97.00	0.00	97.00	13-02-2025, 24
PERIOD		0.00800	ug/m³	188664.60	1039591.33	97.00	0.00	97.00	

RCL

EC for Maravarperungudi Lime Kankar Quarry Lease-III - 158.865 Ha, Virudhunagar District

PM 10 - Input & Output Data**Source Pathway - Source Inputs**

AERMOD

Point Sources

Source Type	Source ID	X Coordinate (m)	Y Coordinate (m)	Base Elevation (Optional) (m)	Release Height (m)	Emission Rate (g/s)	Gas Exit Temp. (K)	Gas Exit Velocity (m/s)	Stack Inside Diameter (m)
POINT	SIZER	190526.47 Sizer	1035427.56	0.00	15.00	0.01150	323.15	18.00	0.65
POINT	PGCRUSHER	179819.42 PG Crusher	1040266.49	0.00	15.00	0.01150	323.15	18.00	0.65
POINT	LKBP	180157.39 PG Kankar BP Sizer	1040232.31	0.00	15.00	0.01500	323.15	18.00	0.65

Source Pathway - Source Inputs

AERMOD

Area Sources

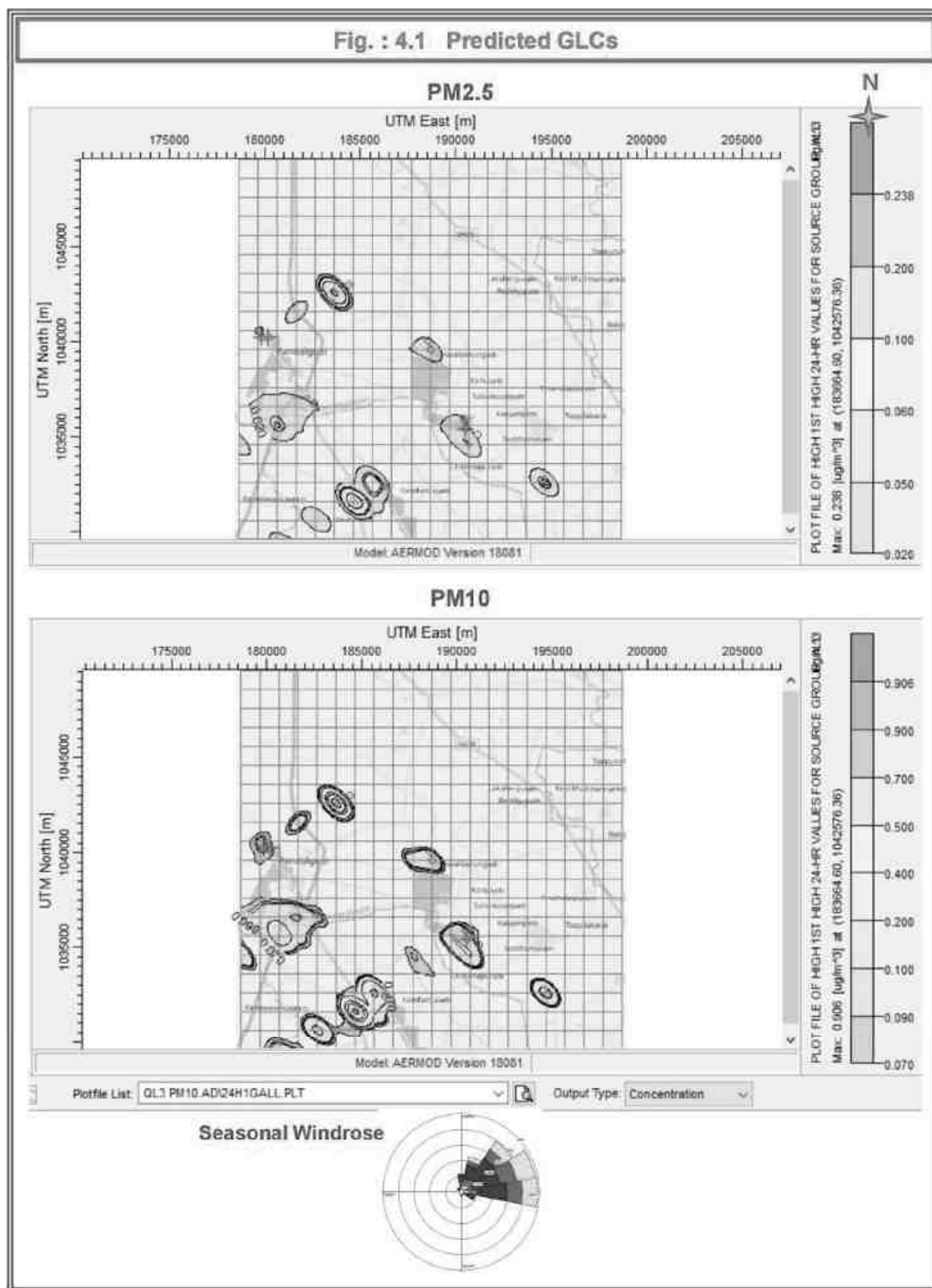
Source Type	Source ID	X Coordinate (m)	Y Coordinate (m)	Base Elevation (Optional) (m)	Release Height (m)	Emission Rate (g/s-m²)	Length of X Side (m)	Length of Y Side (m)	Orientation Angle from North (deg)	Initial Vertical Dis. (m)
AREA	QL2	186674.55	1040065.36	0.00	1.50	2.00E-6	25.00	8.00	0.00	
AREA	SVP	186253.00	1032411.50	0.00	1.50	5.10E-6	50.00	20.00	0.00	
AREA	PG5	182570.32	1036782.76	0.00	1.50	5.70E-6	50.00	20.00	0.00	
AREA	MPG	180463.45	1035923.41	0.00	1.50	7.70E-6	25.00	8.00	0.00	
AREA	QL1	191124.02 QL1 Area	1035131.36	0.00	1.50	0.00001	25.00	8.00	0.00	
AREA	QL5	194721.65 QL5 Area	1032563.51	0.00	1.50	3.70E-6	25.00	8.00	0.00	
AREA	MVP	188873.11 MV Puzam Mine	1029159.24	0.00	1.50	1.40E-6	50.00	20.00	0.00	
AREA	QL4	184420.48 QL4	1042988.03	0.00	1.50	0.00001	25.00	8.00	0.00	
AREA	QL3	186689.63 QL3	1039591.37	99.00	1.50	2.00E-7	25.00	8.00	0.00	

Results Summary

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PM10 - Concentration - Source Group: ALL

Averaging Period	Rank	Peak	Units	X (m)	Y (m)	ZELEV (m)	ZFLAG (m)	ZHILL (m)	Peak Date, Start Hour
24-HR	1ST	0.90567	ug/m³	183684.60	1042576.38	97.00	0.00	97.00	29-02-2025, 24
24-HR	2ND	0.32731	ug/m³	185664.60	1032626.26	97.00	0.00	97.00	25-12-2024, 24
24-HR	3RD	0.24210	ug/m³	194684.60	1032626.26	97.00	0.00	97.00	17-12-2024, 24
24-HR	4TH	0.23542	ug/m³	194684.60	1032626.26	97.00	0.00	97.00	20-12-2024, 24
24-HR	5TH	0.19083	ug/m³	194684.60	1032626.26	97.00	0.00	97.00	28-02-2025, 24
24-HR	6TH	0.18536	ug/m³	194684.60	1032626.26	97.00	0.00	97.00	22-12-2024, 24
24-HR	7TH	0.15196	ug/m³	194684.60	1032626.26	97.00	0.00	97.00	25-12-2024, 24
24-HR	8TH	0.11409	ug/m³	194684.60	1032626.26	97.00	0.00	97.00	02-12-2024, 24
24-HR	9TH	0.08218	ug/m³	188664.60	1039591.33	97.00	0.00	97.00	18-02-2025, 24
24-HR	10TH	0.06102	ug/m³	188664.60	1039591.33	97.00	0.00	97.00	13-02-2025, 24
PERIOD		0.03451	ug/m³	179684.60	1039591.33	97.00	0.00	97.00	



4.3.5 Noise Levels

Anticipated Impacts : There is **no Drilling and Blasting in this Quarry and thus, no vibration.** Excavation, Loading and Transportation activities are the sources of Noise. In general, work force will be exposed to <85 dB(A) levels during 8-hours Shift. Noise level at nearest Lease boundary will be <55 dB(A) during day times and <45 dB(A) during night times as stipulated by MoEF&CC-Leq Noise Norms for Residential & Rural Areas.

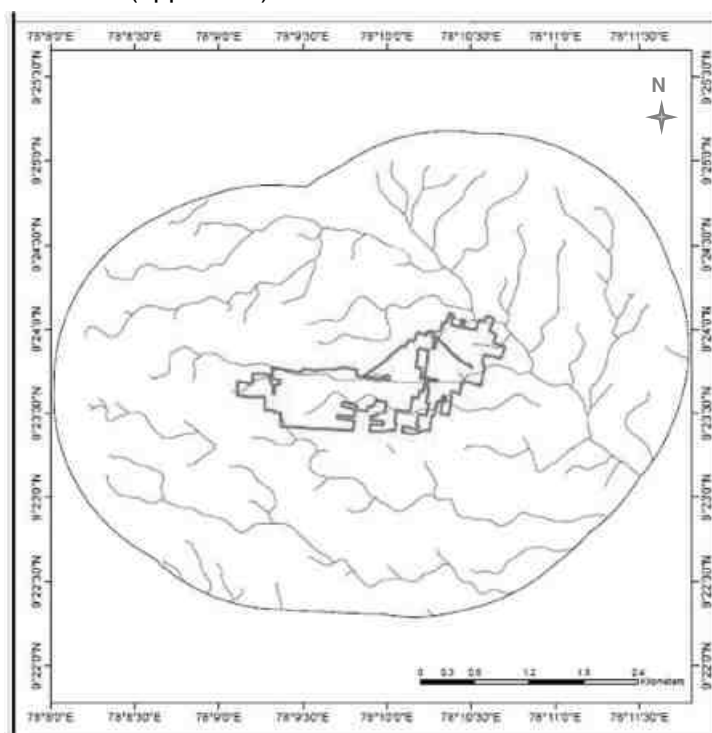
Mitigating Measures :

- ❖ Deploying equipments shall be with in-built mechanism for reducing noise.
- ❖ Providing sound proof operator's cabin of equipments.
- ❖ Provision of ear muffs/ear plugs to the workers in higher noise zones.
- ❖ Green Belt with thick foliage shall be maintained around lease boundary as acoustic barriers.
- ❖ Ambient Noise Levels at boundaries shall comply MoEF&CC Norms for Residential Areas.
- ❖ Periodical Noise Monitoring shall be carried out and Reports submitted to the Authorities.

4.3.6 Water Environment

Anticipated Impacts:-

Impact on Surface Waters : The area is almost flat and plain terrain with a gentle slope towards southeast. The seasonal Uppu Odai drains the area. There are **3 Nos. Seasonal First & Second order streams flows** through the QL Area and join Uppu Odai in the east. Another Seasonal Nalla flows in the southern boundary of the Lease Area. There is no lake or well or borewell within **2 km radius area** of the Lease (appended).



The Normal Rainfall of the Site is 726 mm. Pre-Project and Post Project Surface Runoffs from the Quarry Area are estimated as per Manual of Artificial Recharge of Ground Water (CGWB, 2007). Pre-Project Runoffs from Quarry Area will be 2,30,672 KL/Annum and Post Project Runoffs will be 2,13,546 KL/Annum. There will be less Runoffs in the Post-Project Scenario due to more green belt area. This is the impact on Surface Waters due to the Project. There is **no Quarry Pit Water Discharge**.

As per PAC, **safety barrier of 50 meters on either side of streams/odais are provided** and their **flows will be maintained as such** till the Conceptual Stage.

Impact on Ground Waters : There is **no ground water-table intersection** due to quarrying. The Quarry requires about 3 KLD drinking water for domestic consumption which will be supplied from the RO Plant at Pandalgudi Mine. The Quarry will also require about 2 KLD for Dust suppression measures and another 50 KLD for the development and maintenance of Green Belt. The required water will be sourced from existing Captive Mine Pits in Pandalgudi Region. **No workshop** and thus there is **no effluent generation**. Domestic sewage generation will be about 2.5 KLD which will be biologically treated in a Septic Tank followed by a Dispersion Trench. Thus, the impact on the Ground Waters would be minimum.

Mitigating Measures :

- ❖ Natural drains or nallas should not be disturbed.
- ❖ The existing Pre-Project Drainage Pattern should be maintained to the extent possible so that Post Project Runoff distribution is not affected.
- ❖ Runoffs from Quarry and Waste Dump should be regulated by constructing garland drains.
- ❖ Garland Drains and Settling Tanks are to be maintained and desilted periodically.
- ❖ Ground Water Levels and Water Quality are to be periodically monitored at identified Borewells & Dugwells in the Project vicinity.
- ❖ Monitored Water Quality data are to be periodically submitted to IBM, SEIAA-TN & IRO-MoEF&CC, Chennai.
- ❖ At the end, Ponds / Water Reservoir shall be created for common utilization.

4.3.7 Biological Environment

There is no Eco Sensitive Area/Zone (ESA/ESZ) in the Region. Only Native Flora and Fauna exists. Schedule-I Species Indian Pea Fowl (*Pavo cristatus*) is commonly found in the region. The **Approved Conservation Plan for Indian Pea Fowl** has been prepared in consultation with the Forest Department and submitted. With natural vegetation and domestic fauna predominant in the Study Area, impact on the existing flora-fauna would be nil/minimum. QL area is surrounded by barren lands and dry agricultural lands within 1.0 km area. As the baseline AAQ are in lower levels as well as Predicted GLC is very low/insignificant, there will be **no impact on the surrounding dry agricultural lands** due to the Project.

Mitigating Measures :

Existing Trees : There are 168 Neem Trees and 114 Pungan Trees along with thorny bushes in the Lease Area. **RCL shall number the Trees and preserved them as such.** Proposed quarrying should not disturb them.

Green Belt : **Green Belt (47.180 Ha) Coverage will be 29.70%.** About, **11,250 local tree species** like Neem, Pungan, Teak, etc. will be planted @ 500 Trees/Ha with a Survival Rate of about 90% (Table 4.5).

Table : 4.5 Proposed Green Belt

Year	Location	Extent, Ha	No. of Plants
I	Safety Barrier Zone all Along the Quarry Lease Local tree species like Neem, Pungan, Teak, etc. will be planted and maintained with a Survival Rate of about 90%	5.0	2,250
II		5.0	2,250
III		5.0	2,250
IV		5.0	2,250
V		5.0	2,250
	Total	25.0	11,250

The following other measures are to be implemented effectively :

- ❖ Effective Green Belt has to be developed and maintained with about 90% Survival Rate.
- ❖ Native species shall be preferred for Green Belt development.
- ❖ Fruit bearing trees may also be preferred.
- ❖ The primary way that carbon is stored in the soil is as **soil organic matter (SOM)**. Climatic conditions, natural vegetation, soil texture, and drainage all affect the amount and length of time carbon is stored.
- ❖ No trees in the Lease area will be removed and all the trees will be numbered and protected.
- ❖ It will be ensured that the quarrying activity does not disturb the biodiversity, flora & fauna in the ecosystem.
- ❖ It will be ensured that the quarrying activity does not result in invasion by invasive alien species.

4.3.8 Socioeconomics

There are 465 Direct Employees working in the Cement Complex. Indirect Employment to about 600 persons has been provided. The existing Mines & Quarries in Pandalgudi Region are providing Direct Employment to about 252 Persons and Indirect Employment to about 393 Persons. In the Existing Mines, more than 80% Employees are from local villages only. QL-III Project will provide Direct Employment to 72 persons and Indirect Employment to 50 persons. All the employees have been provided with housing accommodations established by the Company at Pandalgudi.

RCL is undertaking various CSR activities, @ **Rs.1.00 Crore per annum**, related to health, education, drinking water supply, sanitation, bio-toilets for individual household, infrastructure development activities, construction of bus shelters, road repair work, building class rooms, etc. for the nearby villages. RCL has the CSR Committee as per the provisions notified by the Ministry of Corporate Affairs on February 27, 2014. Based on the CSR Committee and declared CSR Policy of the Company, CSR activities are carried out and reported. The direct & indirect employment, CER & CSR activities, etc., will have a positive impact on the Socioeconomic Structure of the area.

Public Health : Local people are frequently suffering from fever, diarrhea, etc. and no occupational related disease recorded. Primary Health Centres Maternity & Child Welfare Centre are available only in some of the villages.

Mitigating Measures : In responses to the need based assessment study, the following social measures are proposed for the society :

- ❖ CSR activities shall be carried out by providing social and welfare measures for the local residents and nearby villages around the Lease area. The prime focus will be on the creating and maintaining of drinking water facilities for the students at the nearby Government Schools, establishing toilets especially for girl students at the schools, setting up of computer centres, maintenance of village roads & ponds, providing solar street lights, conducting free medical camps, etc.
- ❖ **Public Health :** Conducting Medical Camps and providing Ambulance for the villages and other medical facilities.
- ❖ **Perception of the Project :** Almost all villagers are aware about the Ramco Cement Plant & its Captive Mines & Kankar Quarries in the region and supporting the Proposal.

Need Based Assessment : Based on the details collected by Household Survey, the following assessments are made. In general, there have been the following demands/expectations from the public:

- ❖ Job opportunities.
- ❖ Training of local youths for suitable jobs.
- ❖ Training in computer typing, driving heavy vehicles, etc.
- ❖ Employment for older people and unskilled persons in gardening, cleaning, etc.
- ❖ Facilities like ambulance, health care, educational, community centres, etc.

4.3.9 Occupational Health

RCL is operating an **Occupational Health Centre at Factory and Mines** for supporting the health care needs of employees & their families. Periodic Health tests (Pulmonary test, Audiometric test, blood test, chest x-ray examination etc.) have been conducted every year for the employees.

Supported by test observations, adequate and need based treatment has been offered to employees.

RCL is committed to provide a Safety & Healthy working conditions in QL-III. The **first aid boxes** will be made available in the Site Office for immediate treatment. **Occupational health surveillance programme** will be carried out for all the employees regularly.

Mitigating Measures :

- ❖ All employees are to undergo Medical Check-up on recruitment and periodically during employment.
- ❖ Maintenance of Pre, during & Post Employment Records are to be kept for periodical review.
- ❖ Required Personal Protective Equipments for the employees are to be provided.
- ❖ Provision of ergonomically designed seats for drivers/operators has to be ensured.
- ❖ Standard operating procedures for all occupations and operations with respect to occupational safety and health will be provided.

4.3.10 Plastic Waste Management

There will be ban on one time use and throw away Plastic usage in the Quarry 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.

4.4 Evaluation of Impacts

Impacts during Operation Phase are critically examined and both Negative (Adverse) and Positive (Beneficial) Impacts are evaluated. The widely adopted **Matrix Method** for Evaluating the Impacts of the Project in its environs is used and dealt in **Table 4.6**. The potential significance (both Negative & Positive) of Impacts are denoted as :

- I** : Insignificant Impact & Short Term.
- S** : Significant Impact & Short Term.
- P** : Significant Impact but Control Measures Incorporated.
- R** : Significant Impact, Long Term & Permanent.
- Z** : Significant & Benefit.

To quantify the assessed impacts which are qualitatively described in the EIA Matrix, they are assigned certain arbitrary weightages (**Table 4.7**), with **(+)** for **Positive Impacts** and **(-)** for **Negative Impacts**.

Table : 4.6 EIA Matrix

Environmental Components & Parameters		Operation Phase						
		Land Use	Fugitive Emissions	Mineral Transport -ation	Noise Levels HEM	Green Belt	Pit Utilisation & RWH	CSR/CER
Land	Land Use Pattern	R	-	-	-	Z	S	-
	Soil Quality	S	I	I	-	S	S	-
	Agricultural Resources	-	I	I	-	-	S	-
	Backfilling & Reclamation	R	-	-	-	-	-	-
Air	Meteorology	-	-	-	-	-	-	-
	Air Quality	-	S	S	-	P	-	-
Noise	Intensity	-	-	S	S	P	-	-
	Duration / Frequency	-	-	S	S	-	-	-
Water	Surface Waters	I	-	-	-	-	-	-
	Ground Waters	-	-	-	-	-	Z	-
	Water-table	-	-	-	-	-	-	-
Biological (Flora & Fauna)	Species	I	-	-	-	I	-	-
	Population	I	-	-	I	I	-	-
	Habitat	I	-	-	S	Z	-	-
Socio-Economics	Infrastructures	-	-	-	-	-	-	Z
	Population	-	S	S	S	-	-	-
	Employment	-	-	Z	-	Z	-	Z
	Economy	-	-	Z	-	-	-	Z
	Occupational Health	-	S	S	S	-	-	-
	Public Health	-	I	S	-	-	-	Z
Aesthetic	-	R	-	-	-	Z	-	-

Note : - denotes 'No Impact/Impact Not Applicable'.

Table : 4.7 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 4.8). 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 : 4.8 Impact Quantification – Operation Phase

Envl. Component	Importance Value	Project Activity & Coefficient Values							Impact Value
		Land Use	Fugitive Emissions	Mineral Transport -ation	Noise Levels HEM	Green Belt	Pit Utilisation & RWH	CSR/ CER	
Land	200	-2	-2	-2		7	6		+1400
Air	200		-2	-2		3			-200
Noise	50			-4	-4	3			-250
Water	200	-1					5		+800
Biological	100	-3			-3	7			+100
Socio-economic	200		-5	4	-4	5		20	+4000
Aesthetic	50	-4				5			+50
Total	1000	-							+5900

The total impact value is **+5,900** 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

- ❖ The deployment of eco friendly quarrying (no drilling and blasting) is proposed.
- ❖ A part of the quarried out area will be backfilled, reclaimed and afforested.
- ❖ Ponds & Water Reservoirs are proposed to harvest the rain water and to recharge the Ground water-table levels.

5.2 Alternative Sites Considered

This is a Mineral bearing area and Mineral deposits are site specific. Thus, site selection criteria is not required.

6.0 Environmental Monitoring Programme

6.1 Environment Cell and Compliances

For effective implementations of Environmental Management Plan (EMP), RCL has the Environment Cell under the overall supervision of the Unit Head. Mines Manager, Geologists and Horticulturists form part of the Cell. RCL has provided One Online Ambient Air Quality Monitoring Station for the existing Mine which is electronically linked with CPCB/CARE Air Centre of TNPCB.

6.2 Post Project Monitoring

Periodical monitoring of the Ambient Air Quality (at 4 locations) as per NAAQ Norms, Fugitive/Workzone Air Quality/emissions (4 locations), Noise Levels (Ambient & Workzone areas), Water (4 Surface & 4 Ground waters) and Soil Quality (3 Locations) shall be undertaken. The monitoring details are given in **Table 6.1**.

Table : 6.1 Post Project Monitoring Schedule

Per Lease	Environmental Component				
	Ambient Air Quality	Fugitive Emissions	Noise Levels	Water Quality	Soil Quality
No. of Locations	4 (in & around Lease-Upwind & Downwind)	4 (Excavation area, Loading Area, Haul Road & Quarry Edge)	Ambient-4 Workzones-4	Surface waters-4 Ground waters-4	3
Frequency	24-hourly once in fortnight continuously for whole year	Two 8-hourly samples, once in a week for 2 weeks in a Season	Once in a month	Quarterly once	Once in a Season
No. of Samples	96	64	96	32	12
Parameters	All 12 Parameters	PM10, SPM, SO ₂ , NO _x & CO	Day & Night Leq Noise levels dB(A)	Physico-chemical & Trace Metals	Physico-chemical & Nutrients
Norms to be Complied	NAAQ Norms	IBM Norms for Limestone Mine	MoEF&CC and DGMS Norms	CPCB/IS:10500 & TNPCB Norms	Soil Fertility
Budget	Rs.4,80,000	Rs.3,20,000	Rs.96,000	Rs.96,000	Rs.36,000

About **Rs.10.28 Lakhs/annum per Lease** will be allotted for the Monitoring Works. The periodical reports shall be submitted to TNPCB monthly, IBM Quarterly and MoEF&CC Monitoring Cell/SEIAA as Half Yearly Status Reports.

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 proposed activities and assessment of the Risks to propose the Emergency Preparedness Plan (EPP). There is no storage of Hazardous Chemicals in the Quarry and thus, no Modelling is warranted. The Potential Hazards that could have impacts during Operation Phase are given in Table 7.1.

Table : 7.1 Potential Hazards due to Proposal

Potential Hazard	Probable Impact
Manmade :-	
Accident due to Quarrying Activities	Can occur at any time during the Quarrying.
Natural :-	
Natural Calamities	Can occur at any time.
Others :-	
Medical Emergency	Can occur at any time during the Operational Phase.

7.2 Emergency Preparedness Plan

The hazard scenarios were risk ranked using the Risk Matrix (R) are shown in Table 7.2.

Table : 7.2 Risk Matrix (R)

Potential Severity	Risk			
	Low (1)	Medium (2)	High (3)	Continuous (4)
Major (4)	2.5	3.0	3.5	4.0
Moderate (3)	2.0	2.5	3.0	3.5
Minor (2)	1.5	2.0	2.5	3.0
Negligible (1)	1.0	1.5	2.0	2.5

The Quarrying operations are ranked in Low-Major Risks with Score of 1-4. It shall be ensured that engaged Personnel are aware of the Hazards involved and are trained in responding to the Disasters. **First Aid Kits and Medical Supplies** should be maintained at the Lease. All personnel shall use **Personal Protective Equipment (PPEs)** like Safety Shoes, Helmets, Safety glasses, etc. They should be trained in Safety Procedures to ensure that accidents and injuries are minimised. Government Hospitals in the vicinity will be used for any Medical Emergencies.

7.3 Disaster Management Plan

The proposed Disaster Management Plan (DMP) for the Risks involved in the Quarrying Operations are listed in **Table 7.3**.

Table : 7.3 DMP Measures

Sl. No.	Factors	Causes of risks	Control measures
1	Removal of O.B	a) Top soil bench may slide due to its unconsolidated nature. b) Vibration due to movement of vehicles in the O.B benches	Not applicable. Both Top Soil & Kankar deposits will be quarried out.
2	Drilling	a) Due to high pressure of compressed air hoses may burst b) Drill rod may broken due to improper maintenance of the rod	Not applicable. No drilling and hence no compressors is required to quarry this deposit
3	Blasting	a) Fly rock, ground vibration and noise etc., b) Improper charging of explosives	Not applicable. No Blasting is proposed.
4	Excavation of Ore	a) Hauling and loading equipment are in such proximity while excavation b) Swinging of bucket over the body of tipper c) Driving of un authorized person	Operator shall not operate the machine when person & vehicles are in such proximity Shall not swing the bucket over the cab and operator leaves the machine after ensuring the bucket is on ground Shall not allow any unauthorized person to operate the machine by effective supervision
5	Transportation of ore	a) Operating the vehicle “ nose to tail” b) Overloading of material c) While reversal & overtaking of vehicle d) Operator of truck leaving his cabin when it is loaded	It will be ensured that all these causes will be nullified by giving training to the operators No over loading Audio visual reverse horn will be provided Proper training will be given
6	Fire due to electricity and Oil	a) Due to the short circuit of cables & other electrical parts b) Due to the leakage of inflammable liquid like diesel, oil.	All electrical parts shall be cleaned frequently with the help of dry air blower All fastening parts and places will be tightening.
7	Natural calamities	Unexpected happenings	The management is capable to deal with the situation

The management is able to deal with the situation efficiently to reduce confusion keeping in view of the likely sources of danger in the mine.

Proper fencing and bunds will help inadvertent entry of animals. RCL has Pit Safety Committee, which monitors safety, related aspects in the mine and has drawn a management plan to deal with any emergency. The contact persons in wake of any emergency are given below.

Mr. K Saravanan,
Sr. Dy. General Manager (Mines),
The Ramco Cements Limited,
Pandalgudi (Po), Virudhunagar District-626113.
Phone: 04562 256201; Mobile : 87540 02741.

Facilities available outside RCL : Government Hospital at Pandalgudi and Aruppukottai.

The possibility of “Offsite” emergency situation are ruled out as RCL Quarry is not likely to pose any offsite emergency and hence does not call for any preparation of an off-site emergency plan. Further, the residential quarters and living area are far from the Quarry. However, considering extreme situation, District authority including police would be informed about any offsite emergency if situation arises.

Care and maintenance during temporary discontinuance: If the Quarry will be discontinued temporarily for more than 120 days, notice will be given 30 days before the date of such discontinuance to the concerned authorities. During discontinuance period safety arrangement and fencing will be provided to avoid the entry of unauthorized persons. The accessibility to the Quarry from the surface will be prevented by providing fencing arrangement.

Emergency Plan:

- ❖ On realizing anything serious to happen anywhere in the Quarry, the nearest mining official is informed immediately.
- ❖ On being informed about the emergency it will be verified for the correctness of information and inform the Manager in particular by telephone and communicate with other part of the mine and managers of adjoining mine, so that persons may be withdrawn immediately from the scene of danger.
- ❖ On receiving information of emergency intimation will be sent to the consultative committee which is already formed. Shift in-charge will ensure that all the materials and transport system to deal with emergency situation.
- ❖ First aid facilities to be ready to receive the cases.

8.0 Project Benefits

Environmental Benefits : The proposal ensures continuous Raw Material supply to the Cement Plants. Effective utilization of the Minor Minerals for Cement manufacturing is a Mineral Conservation Measure.

Financial Benefits : Project cost is **Rs.4.75 Crores**. As per MMDR Act 2015, DMF amount @ 10% Seigniorage Fee & Green Fund @ 10% Seigniorage Fees and MBL Tax @ Rs.160 per Tonne to the Exchequer will improve local and regional economy.

Social Benefits : Project will employ 72 persons directly and 50 persons indirectly. Adequate **CER Budget** will be allotted. The direct & indirect employment, CSR/CER activities, etc., will have a positive impact on the Socioeconomic Structure of the area.

9.0 Environmental Cost Benefit Analysis

Cost Benefit Analysis is not applicable for the Proposal as there is no forest land is envisaged for the Project and also no tree cutting is proposed.

10.0 Environmental Management Plan

There will be **no Construction Phase** for the Project. Environmental Management Plan (EMP) is suggested to mitigate the possible negative impacts that may be caused to the various attributes of environment due to the proposed mining operations. The EMP Measures proposed are given in **Table 10.1**.

Table : 10.1 Proposed EMP Measures

Sl. No.	Environmental Component & Proposed EMP Measures
1	Land Environment :- ❖ Earthen bunds are to be strengthened along the boundaries to arrest wash-offs. ❖ Garland drains are to be provided and maintained periodically around the Lease. ❖ Green Belt has to be developed and maintained along the Lease boundary. ❖ No. of trees planted shall be numbered and referenced for review. ❖ The solid wastes shall be backfilled in the quarried out voids and the land shall be restored to its original conditions. ❖ Saplings shall also be planted along the foot of the dumps and unused slopes to arrest / prevent erosion.
2	Transportation :- ❖ Regular wetting of haul roads has to be undertaken to arrest fugitive emissions. ❖ Tippers are to be fully covered with Tarpaulin to avoid any spillage. ❖ No overloading of Tippers is allowed strictly. ❖ A strict Speed Limit of 30 km/hr. has to be enforced and monitored continuously. ❖ Compliance to 'Pollution under Control' Certification has to be ensured. ❖ Restriction of Truck parking in the Public Road has to be implemented. ❖ Security Guards to be posted at the public road junction.
3	Air Quality :- ❖ Eco friendly quarrying (with out Drilling & Blasting) shall be adopted. ❖ Green belt shall be developed along the periphery, haul roads, waste dumps, etc. ❖ Water sprinkling at excavation areas, loading, haul roads, etc. has to be carried out periodically. ❖ Periodical maintenance of mining equipments has to be carried out. ❖ Periodical Air Quality Monitoring & Fugitive Emissions shall be carried out and Reports submitted.
4	Noise Levels :- ❖ Deploying equipments shall be with in-built mechanism for reducing noise. ❖ Providing sound proof operator's cabin of equipments. ❖ Provision of ear muffs/ear plugs to the workers in higher noise zones. ❖ Green Belt with thick foliage shall be maintained around lease boundary as acoustic barriers. ❖ Ambient Noise Levels at boundaries shall comply MoEF&CC Norms for Residential Areas.

Sl. No.	Environmental Component & Proposed EMP Measures
	❖ Periodical Noise Monitoring shall be carried out and Reports submitted to the Authorities.
5	Water Environment :- ❖ Natural drains or nallas should not be disturbed. ❖ The existing Pre-Project Drainage Pattern should be maintained to the extent possible so that Post Project Runoff distribution is not affected. ❖ Runoffs from Quarry and Waste Dump should be regulated by constructing garland drains. ❖ Garland Drains and Settling Tanks are to be maintained and desilted periodically. ❖ Ground Water Levels and Water Quality are to be periodically monitored at identified Borewells & Dugwells in the Project vicinity. ❖ Monitored Water Quality data are to be periodically submitted to IBM, SEIAA-TN & IRO-MoEF&CC, Chennai.
6	Biological Environment :- ❖ Effective Green Belt has to be developed and maintained with about 90% Survival Rate. ❖ Native species shall be preferred for Green Belt development. ❖ Fruit bearing trees may also be preferred. ❖ The primary way that carbon is stored in the soil is as soil organic matter (SOM). Climatic conditions, natural vegetation, soil texture, and drainage all affect the amount and length of time carbon is stored.
7	Socio-economics :- CSR activities shall be carried out by providing social and welfare measures for the local residents and nearby villages around the Lease area. The prime focus will be on the creating and maintaining of drinking water facilities for the students at the nearby Government Schools, establishing toilets especially for girl students at the schools, setting up of computer centres, maintenance of village roads & ponds, providing solar street lights, conducting free medical camps, etc.
8	Occupational Health :- ❖ All employees are to undergo Medical Check-up on recruitment and periodically during employment. ❖ Maintenance of Pre, during & Post Employment Records are to be kept for periodical review. ❖ Required Personal Protective Equipments for the employees are to be provided. ❖ Provision of ergonomically designed seats for drivers/operators has to be ensured.

Plastic Waste Management : There will be ban on one-time use and throw away Plastic usage in the Lease. Encourage the use of eco friendly alternatives such as banana leaf, areca nut palm plate, stainless steel glass, porcelain plates / cups, cloth bag, jute bag etc.

EMP Budget : Project cost is **Rs.4.75 Crores**. An amount of **Rs. 30.00 Lakhs** has been earmarked as **EMP Capital Budget** and **Rs. 28.84 Lakhs per Annum as EMP Operating Cost** towards Green Belt maintenance, Environmental Monitoring, etc. As approved by DFO, the proposed budget for **Peafowl Conservation Plan** will be **Rs.15.80 Lakhs** for the ten years period. Public Hearing issued will be addressed and the **Action Plan with Budget will be included** in the EMP Budget for executing the Physical Activities as per MoEF&CC OM dated 30.09.2020. **CER Budget of Rs.9.50 Lakhs** is allotted for Maravarperungudi & T.Koppuchithampatti Villages.

6.0 Conservation Plan for Peafowl

6.1 General Information

The Indian Peafowl (*Pavo cristatus*) is a member of the Pheasant Family and is native to India.

Kingdom	:	Animalia
Phylum	:	Chordata
Class	:	Aves
Order	:	Galliformes
Family	:	Phasianidae
Genus	:	Pavo
Species	:	<i>Pavo cristatus</i>
Vernacularname	:	Indian Peafowl

Terminology : The term 'Peacock' is commonly used interchangeably when referring to male and/or female birds, 'peafowl' is the correct terminology when referring to populations of both sexes. The male peafowl are 'peacocks', the females are 'peahens' and the young are 'peachicks'. A group of peafowl is referred to as a party, ostentation or a muster.

Habitat : It is found in forests, but can live also in cultivated regions and around human habitations and is usually found where water is available. It is common and widely distributed in the Indian Subcontinent. The distribution is ranged from Himalayas in the north to peninsular India in the south. In Tamil Nadu, peafowl population is rich in Coimbatore, Madurai, Virudhunagar, Nilgiri and Tirunelveli Districts. The habitat of peafowl is mainly in dry deciduous forests, scrub jungle and in cultivated regions and around human habitations. In many parts of India, they are protected by religious practices.

Social Habits : Peafowl are forest birds that forage on the ground during the day and roost in tall trees at night. Peacocks (males) tend to roost alone or in groups. At the end of their second year young males leave the roosting sites of females and young to roost with other males or alone. Females with young less than four months old roost separately from other peafowl.

Peafowl descend from roost trees within the first two hours of dawn, and ascend to their roosts about half an hour after sunset. Peafowl are most active in the early morning and during the last two hours of daylight when they forage for food. Peacocks and peahens flock together outside of the breeding season but during the breeding season adult peacocks spend the majority of their day in display areas.

Physical Features : Peacocks (males) are admired for their iridescent green and blue long tail covert (the train), which is made up of elongated upper-tail covert feathers bearing colourful 'eyespot' or ocelli. The peacocks develop ornamental tail coverts in the breeding season. The females (peahens) lack the bright colours and do not develop the long upper tail coverts. Both sexes have crests on their heads. The peacocks are between 2.0 – 2.5 metres in length when in full plume (the tail covert can measure up to 1.4 metres long). Peahens are smaller at around one metre in length.

The male call is a series of repeated crowing 'ka' and shrill 'eow' calls of varying frequency given up to eight times in a row, primarily during the breeding season. Other distress and warning calls are given throughout the year. The females use clucking calls when with young and when pointing out food.

The peacock's train, which makes up around 60 percent of its total body length, is used during mating rituals and courtship displays to attract females. The long train is moulted at the end of each breeding season. Peacocks develop their first train in their second year but it is not as long as that of a full-grown male and lacks the ocelli. The tail gets longer and more vibrant each year after that until the age of five or six when the train reaches its maximum splendour.

The peacocks open the tail covert into a fan and do a complex dance to attract peahens. As part of the courting ritual the tail vibrates, making a rattling sound. Peacocks display in an expanded lek which consists of several males in vocal contact but out of view of each other. Groups of peahens visit the lek, compare the males' physiques and courtship displays and choose the most attractive male as their mate. It is thought that the female chooses her mate based on the size and colour of their feather trains.

Peacocks are polygamous and do not play any role in raising the chicks. Peahens nest in shallow scrapes in the ground that may be lined with sticks, leaves and other debris.

Clutch sizes range from four to six eggs. The eggs are laid over several days and remain dormant until the peahen has finished laying her clutch and commences incubating her eggs. Her body heat 'strikes' the eggs and the peachick embryos begin to develop. This ensures that all of the peachicks hatch at the same time regardless of the order in which they were laid. The incubation period is between 28 and 30 days. The chicks leave the nest shortly after hatching and forage for themselves with the peahen pointing at food with her beak.

Peafowl live for around 20 years in the wild.

Diet : Peafowl are omnivorous and their diet includes invertebrates and small vertebrates i.e. small mammals like mice, reptiles like lizards and snakes, amphibians, arthropods like insects, ticks, termites, ants, locusts and scorpions, seeds, fruit, vegetables, flowers, leaves, flower buds, shoots and minnows in shallow streams and so on. With its strong bill it is able to kill a snake, even a cobra. Around cultivated areas, peafowl feed on a wide range of crops such as groundnut, tomato, paddy, chilly, and even bananas. Around human habitations, they feed on a variety of food scraps and even human excreta.

Breeding : The peafowl breeding season is from September to January.

Conservation Status: IUCN Red List, Least Concern species.

Predators : The adult peafowl has few natural predators. Their main threats include domestic dogs, cats and foxes. Peachicks are particularly vulnerable to predation due to their size and their inability to fly until they are two weeks old which means they cannot roost in trees at night. In addition, peahens are not very attentive mothers and many chicks are taken by predators. Birds also fall victim to traffic accidents.

6.2 Threats

Poaching of peacocks for their meat, feathers and accidental poisoning by feeding on pesticide treated seeds are known threats to wild birds. Methods to identify if feathers have been plucked or have been shed naturally have been developed as Indian law allows the collection of feathers that have been shed. However, presently, there is no severe threat to this species, primarily for its status as a National bird and secondarily due to religious belief this species is protected. But its train feathers are in great demand for commercial purposes and are the main threat to its survival. Their loud calls make them easy to detect.

The threat to these birds are due to the followings :-

- ❖ Loss of habitat
- ❖ Loss of feeding and nesting places.
- ❖ Disturbances due to sound, dust and air pollution, water quality change, electrification and lighting, and other pollution causing factors.

Environmental Impacts : Peafowl can also have a negative impact on native plant and animal species. They can compete with other native birds for habitat, feed on native plants and animals, disturb native vegetation and spread weeds. Their foraging can destroy or hinder plant growth leaving bare ground exposed to weed invasion. In addition, they can introduce weed species via their droppings and compete with native fauna for food and roosting sites.

6.3 Perceived Threats in the Study Area

Direct observations of Pea fowl were recorded around the project area because of scrub vegetation, agriculture land, water bodies etc. The birds are observed to be socially moving in these areas along the human population and all the areas. **There are no major threats identified in this area** due to mining and industrial activity in the region.

The local village people have good information about the movement of peafowl and their habitats. During the discussion with local village people, many of them were saying that it normally found within the scrub thorny vegetation and rarely coming to village area. During the drought season the sighting was more in the agricultural fields and near water bodies of buffer zone. Peafowl uses agriculture and various rural habitats as a feeding ground during day time while during night time they take shelter on the trees as well as on the roof of the houses. It clearly indicates peafowl normally uses habitats adjacent to village.

However, during the drought season, the movement of Peafowl from one place to another place for their food, water requirement makes them in trouble. Poaching of peacocks is mainly for their meat and feathers and unintentional killing by feeding on pesticide treated seeds are known threats.

6.4 Proposed Conservations

The following measures are proposed for conservation of the species:

- ❖ Control of Air Pollution, water pollution, noise and other environmental parameters.
- ❖ Habitat improvement,
- ❖ Conservation or Restoration of Water bodies,
- ❖ Garbage Management,
- ❖ Conservation Education.

6.4.1 Control of Environmental Pollution

Mining/Quarrying and allied operations in the area may affect the existing environmental set up in the area unless proper mitigation measures are not taken. Hence, it is essential to assess the impacts of mining on various environmental parameters so that abatement measures could be planned in advance for systematic, sustainable and eco-friendly mining in the area.

RCL has established sound corporate Environmental Management System in all their working mines and Cement plants. Various environmental mitigate measures are implemented in the mining and cement plant areas to prevent any adverse impact on the environment and ecology.

Salient details of the control measures proposed for the QL Proposal are as follows:

Air Quality : Since the lime kankar is of shallow occurrence, there will be no drilling and blasting in the lease hold area. However, dust suppression system using water spraying on haul roads will be practiced. Crowding of trucks on the haul road will be avoided by properly spacing them to avert the concentration of dust emission at any time.

Waste Dump Management : The quarried out portion will be refilled simultaneous with the reject generated in the adjacent block. Hence, there will not be any reject dump in the lease area during the mining operations.

Noise :

- ❖ Planting rows of native trees along roads, around mine, dump area, in safety barriers and other noise generating centres to act as acoustic barriers.
- ❖ Sound proof operator's cabin for equipments like drills, dumpers, shovel, tippers, etc.
- ❖ Proper and regular maintenance of equipments may lead to less noise generation.
- ❖ Providing in-built mechanism for reducing sound emissions.
- ❖ Providing earmuffs to workers exposed to higher noise level.

6.4.2 Habitat Improvement

Towards habitat improvement the following measures are suggested:

Plantation : It is necessary to take up plantation of suitable species for providing adequate cover and fodder for the animals. Methodical and well-planned plantation scheme will be carried out depending upon the immediate need, priority and availability of land. The plantation will be done in multiple rows in a staggered way to cover the area to give the desired stratified appearance of multi tiers.

The objectives of the green belt cover will cover the following:

- ❖ Noise abatement
- ❖ Reuse of waste water to the extent possible
- ❖ Prevention of soil erosion
- ❖ Ecological restoration
- ❖ Aesthetic, biological and visual improvement of area due to improved vegetative and plantations cover.

During plantation development, the following aspects are considered in different areas:

- ❖ Tall growing, closely spaced, evergreen trees native to the area.
- ❖ Easy, quick early growth and establishment.
- ❖ Uniform spreading of crown habit.
- ❖ Timber trees having long gestation period.
- ❖ Trees with high foliage density, leaves with larger leaf area.

- ❖ Attractive appearance with both good flowering and fruit bearing.
- ❖ Bird and insect attracting species.
- ❖ Suitable green cover with minimal maintenance.

Avenue Trees:

- ❖ Trees with conical canopy and with attractive flowering.
- ❖ Trees with medium spreading branches to avoid obstruction to the traffic.
- ❖ Trees with branching at 10 feet and above.

With the provision of garland drains and vegetation of dumped areas, there will be reduction in soil erosion. This, in turn, will improve the natural vegetation growth by improving the species density. Apart from the lease areas, plantation can also be developed in the nearby lands owned by the company. The details of year-wise Plantation proposed in the mined out and backfilled area are as below

Year	Proposed Green Belt/Afforestation Location	Extent, Ha	No. of Plants	Species
I	Part Area of Safety barrier	5.00	2000	Bogania (Eruvachi), Phelltophorum, Sarakondrai (Cassia Fistula), Athi, pugai, Vembu, Tamarind, Vagai, Gulmohar, Naval Tree, Kodikai Tree, Aaavi, Arasu, Alam, Kombanbala etc.
II	Safety barrier and part of Reclaimed area	5.00	2000	
III	Part Area of Safety barrier	5.00	2000	
IV	Part Area of Safety barrier	5.00	2000	
V	Part Area of Safety barrier	5.00	2000	
VI-X	Mined out Area and safety barrier	34.89	13958	
Total		59.89	23,958	

The plantation of native tree species like Bogania (Eruvachi), Phelltophorum, Sarakondrai (Cassia Fistula), Athi, pugai, Vembu, Tamarind, Vagai, Gulmohar, Naval Tree, Kodikai Tree, Aaavi, Arasu, Alam, Kombanbala etc will help to improve the vegetation cover. The restoration of degraded scrub forest and afforestation program will act effective habitat for Peafowl and it prevent the movement of Peafowl. The Tentative timeline for afforestation operations is given below.

Operations (continued upto 3 year each batch)	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A
Soil stabilization	1	2	3	4												
Identify the suitable native species					5	6										
Procurement of good seedlings						6	7									
Afforestation / plantation							7									
Water management/ check dam							7									
Weeding								8	9							
Mulching / Manuring								8	9							
Watering									9	10						
2 nd time weeding											11	12				
Watering (if requires)													1	2	3	4

6.4.3 Conserving or Restoring Water bodies

Scarcity of water is main issue in the summer for movement of Peafowl during summer. Creating small water body at random places in their habitat at regular interval in buffer zone with the help of Forest Department shall be carried out.

6.4.4 Garbage Management

The following measures will be taken :-

- ❖ Entries of non-biodegradable materials which are likely to produce Garbage such as Polythene bags, Aluminium foils, Tin foils etc. are restricted in the Mining area.
- ❖ The Garbage generated in the Mining area is regularly collected and segregated in-to Bio-degradable and non-degradable materials.
- ❖ The non-degradable materials if any are sent for recycling.

The Bio-degradable substances after segregation will be put in the Compost pits for conversion in-to manure. The Manure obtained from these pits will be utilised for plantation purpose.

6.4.5 Conservation Education

Community Participation in Conservation : This is the most important part in the Conservation. The local community participation is vital in these birds conservation. To create awareness among the public, especially the students, youth, farmers & women and involve them in conservation by motivating them with the help of Forest Department. Conducting Awareness for school children by direct contact, posters, organizing seminars, related to the conservation etc., educating & creating awareness among the local villagers to enhance conservation ethic among locals. Encourage local farmers to use biopesticides, biofertilizers and vermicomposting in agriculture practices

The massive awareness development should be initiated on the importance of these birds, its benefits, eco system services provided, cultural and religious values through schools, panchayat meetings, seminars, workshops, meeting with veterinary doctors on peafowl conservation etc. Formation of bird clubs, organizing competition for school children, organizing bird count in backyard, involving officials of RCL in the various programmes should be undertaken.

7.0 Budget for Peafowl Conservation

The capital cost of the Project is Rs.45.00 crores. An amount of Rs.30.00 Lakhs has been earmarked as Capital EMP Budget and Rs.20.00 Lakhs per Annum is the Operating Cost towards EMP measures, Green Belt maintenance, Environmental Monitoring, etc. The proposed budget for Peafowl Conservation Plan will be Rs.15.80 Lakhs till the end of quarry life and additional 5 Years (total 10 years period) as furnished in the appended Table.

This plan will be executed and implemented through the Unit Head of RR Nagar Cement Plant and GM (Mines). Necessary guidance from Forest Department Officials will also be taken. After 5 years, the budget may be reviewed in the field based on rates prevailing at that time and other conditions. Proactive approach of The Ramco Cements Limited in these aspects will ensure habitat restoration, biodiversity conservation in the region.

9.0 Conclusion

Based on the study, peafowls were encountered in the Study Area for feeding and are omni present as domesticated birds. The Quarry operations will not affect the Peafowl population, habitat and other activities. However, it is necessary to take the Conservation Measure like habitat restoration in the area 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 commitment and proposals will be strictly enforced and the conservation of the Peafowl will be ensured in the Area.

[Signature]
Forest Range Officer
Watrap Range
Watrap

[Signature]
M. Selvanayagam, M.Sc., Ph.D.
A.Z. C. B. F. W. A. Sc (USA)
in

The proposed Peafowl conservation plan has to be followed in letter and spirit by the user agency. Progress of the activities has to be informed to the competent authorities in a periodical manner.

[Signature]
Wildlife Warden
Grizzled Squirrel
Wildlife Sanctuary
Srivilliputtur.

[Signature]
Approved
13/11/21
Principal Chief
and Chief
Wildlife Warden
S. 1 F
12/11/2021
12/10/21

11.0 Summary Environmental Impact Assessment

1.0 Introduction

1.1 Project Proponent

The Ramco Cements Limited (RCL), under RAMCO Group, 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. 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 is operating their Ramasamy Raja Nagar (RR Nagar) Cement Plant with CPP & Township at Tulukkappatti, Thammanayakkanpatti and Vachchakkarappatti Villages, Virudhunagar Taluk & District, Tamil Nadu State since Year 1961-62. 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. RCL intends to expand RR Nagar Cement Plant with inclusion of revamped Old Line-II operations to existing Lines I & III. On expansion, production of Clinker will be from 1.44 MTPA to 2.76 MTPA and Cement from 2.70 MTPA to 4.00 MTPA

Cement Plant Limestone requirements are met from Captive Limestone Mines and Lime Kankar Quarries in Pandalgudi Region. Captive Limestone Mines are in operation since 1976 and Kankar Quarries from 2021-22. 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) is also being operated at Pandalgudi. These Captive Mines and Pandalgudi Crusher & Beneficiation Plants are connected with **RCL's own Tar Road** (40+10 km) **for transportation of the Ore.**

RCL has proposed **Maravarperungudi Lime Kankar Quarry Lease (QL)-III** over an extent of 158.865 Ha for quarrying the Minor Minerals **Lime Kankar & Clay (Black Cotton Soil)** at S.F Nos. Parts of 100, 101, 103, 109, 119 to 132, 137 to 141, 404, 407 to 413, 415 to 416, 418, 429, 431 to 435, 437 to 440 & 442 to 457 of Maravarperungudi and Parts of 468, 538 to 544, 683 & 684 of (Therku) T.Koppuchithampatti villages, Aruppukottai Taluk in Virudhunagar District, Tamil Nadu (**Fig. 1.1**). The entire area is **patta land owned by RCL**. There is no Forest/Govt. Land involved. There is **no Rehabilitation & Resettlement (R&R)** issue. Also, there is **no litigation/pending case** against the Proposal. FMB Sketch is given as **Plate-I**. Lease Area in Google Earth Imagery & nearby Settlements are shown in **Plate-II**.

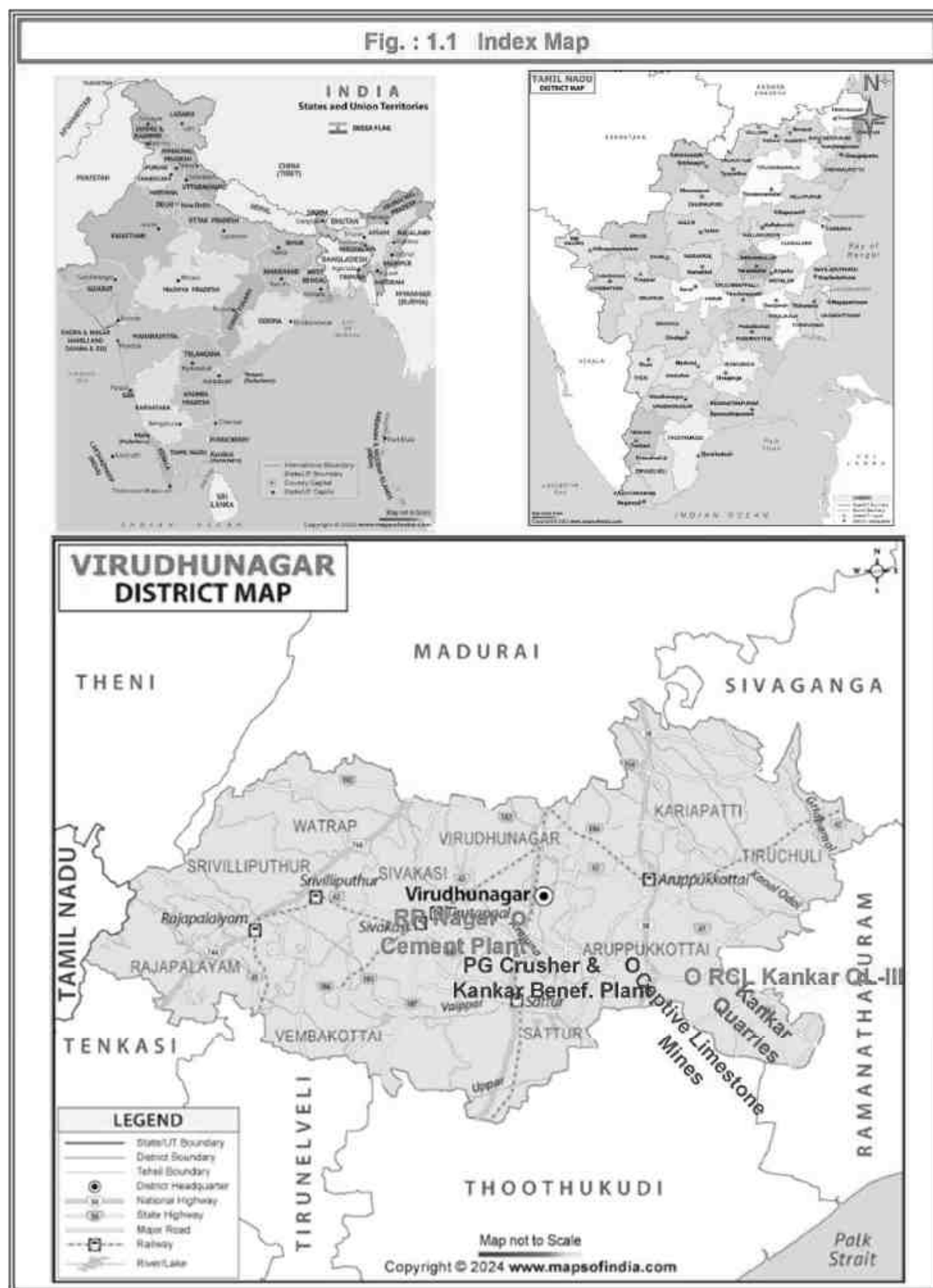
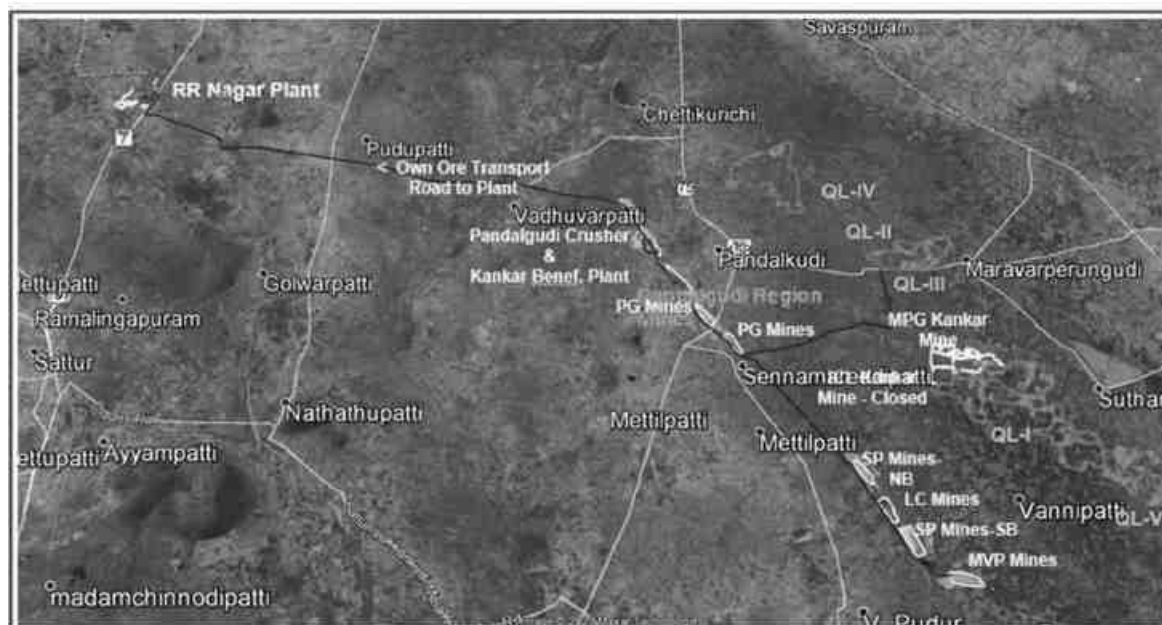


Plate : I Lease Area in Village FMB



Plate : II Lease Area in Google Earth Imagery



The **Contact information of RCL Corporate Office** is :

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The Contact Information of RR Nagar Cement Plant is as follows :

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 Ramasamy Raja Nagar Post,
 Virudhunagar District,
 Tamil Nadu-626 204.
 Tel. Nos. : 04562-256201 to 256203
 Fax : 04562-256268.

1.2 Project Profile

Project Name : Proposed Maravarperungudi Lime Kankar Quarry Lease-III for Quarrying of Lime Kankar & Clay (Black Cotton Soil) over an Extent of 158.865 Ha for Production of 28,00,000 Tonnes Lime Kankar (ROM) @ Maximum 1.00 MTPA & 20,00,000 Tonnes Clay (BC Soil) @ Maximum 1.00 MTPA - Upto 3.0 m BGL - during Plan Period at Maravarperungudi and T.Koppuchithampatti Villages, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu.

Project Location : Pandalgudi is located at a distance of 4.3 km (W) from the Lease. A black top road from Pandalgudi connects the area by a road distance of 7.0 km. The distance of the nearest villages- Maravarperungudi is at 0.4 km (ESE), Koppuchithampatti is about 1.2 km (N) from the Lease boundary. Now, adjacent Maravarperungudi Quarry Lease-II is at Conceptual Stage and thus, **there is no other Quarry within 500 m radius area.**

Statutory Approvals : Precise Area Communication has been issued by Industries (MMC.2) Department, Govt. of Tamil Nadu vide Letter No. 2171/MMC.2/2018-1 dated 02.04.2018 for a period of 10 years. Initial Mining Plan was approved by the Additional Director of Mining & Geology, Chennai vide Letter No. 583/MM10/2018/LK/Vnr. dated 08.06.2018 for Kankar ROM production of 6,00,050 Tonnes per Annum (TPA) & Clay (Black Cotton-BC Soil) @ 30,000 TPA. **Modified Mining Plan approval** by the Joint Director of Geology & Mining, Chennai vide Letter Rc.No.583/MM7/2018 dated 07.01.2025 for initial 5 Years.

Proposal : Mechanized **Non-Conventional Opencast Mining, without Drilling and Blasting** will be adopted. The deposit will be quarried by a simple system using Excavators & Dozers-Tippers combination. The quarried Lime Kankar will be transported by 25 T Tarus Tippers through own haulage road to Pandalgudi Lime Kankar Beneficiation Plant for further process. Black Cotton Top Soil will be transported by 25 T Tarus Tippers to RR Nagar Cement Plant for utilizing as corrective material in Cement manufacturing.

During the first Plan Period, 28,00,000 Tonnes of Lime Kankar as ROM @ 1.0 MTPA (max.) and 21,38,180 Tonnes of Clay (BC Soil) @ 1.0 MTPA (max.) will be quarried out from this Lease up to a maximum depth of **3.0 m BGL only**. About 20,00,000 Tonnes of Clay (BC Soil) will be utilised for Cement manufacturing and balance 1,38,180 Tons will be utilised for backfilling the mined out voids of the Quarry in 5th Year. **Ore:Waste Ratio works out to be 1:0.029. Life of the Lease is 10 Years.** As ground water-table fluctuates between 12-15 m BGL in the vicinity, **no ground water-table intersection** due to the quarrying. The Quarry Layout, with Green Belt development, is given as **Fig. 2.1**. Quarry Particulars are detailed in **Table 1.1**.

Mine Profile :

Mineable Reserves	:	Kankar-30,71,388 T & Clay (BC Soil)-23,45,385 T
Proposed Production (Max.)	:	Lime Kankar@1.0 MTPA & Clay@1.0 MTPA
Ore : OB Ratio	:	1: 0.029
Bench Height & Width	:	- (No benches)
Life of the QL	:	10 years
No. of working days/annum	:	300 (2 shifts)
Ultimate Pit Limit-Conceptual	:	3.0 m (BGL)

Quarrying activities will not intersect the ground water-table.

Fig. : 2.1 Quarry Layout with Green Belt Development

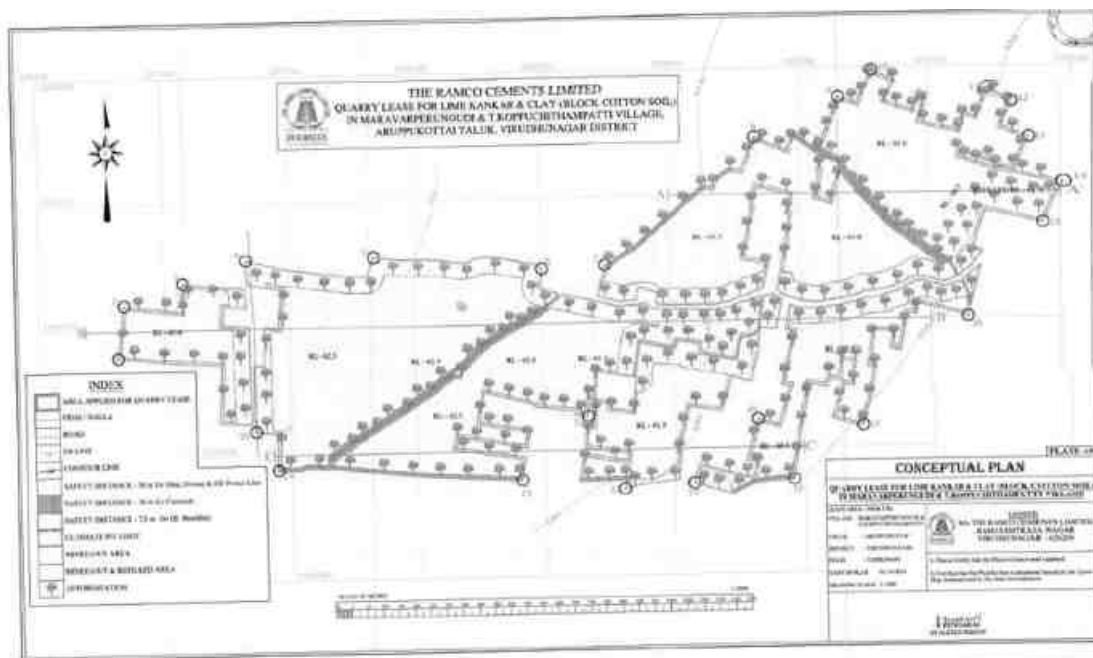


Table : 1.1 Quarry Particulars

Sl. No.	Details on	Particulars
1	Name of the Lease	Maravarperungudi Lime Kankar Quarry Lease-III
2	Lease Owner	The Ramco Cements Limited (RCL)
3	Extent of Lease	158.865 Ha
4	Dead Execution	New Lease; to be executed after obtaining EC
5	Lease Validity	10 Years from date of Lease Deed Execution
6	Lease Location	Maravarperungudi and T.Koppuchithampatti Villages, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu
7	Land Ownership	Own Land of RCL
8	Lithology	Black Cotton Top Soil : 0-1.5 m BGL (avg. depth of 1.25 m) Lime Kankar : 1.5-3.0 m BGL (avg. depth of 1.25 m).
9	Permitted Minerals	Lime Kankar & Clay (Black Cotton Soil)
10	Commencement on	New Lease; commencement will be after obtaining all statutory approvals.
11	Mining Plan / Scheme Approvals	Modified Mining Plan approval by the Joint Director of Geology & Mining, Chennai vide Letter Rc.No.583/MM7/2018 dated 07.01.2025 for initial 5 Years.
12	Past Production (since Commencement)	Not Applicable; New Lease
13	Assessed Reserves	Lime Kankar - 43,68,788 Tonnes & Clay (BC Soil) - 33,36,165 Tonnes
14	Mineable Reserves	Lime Kankar - 30,71,388 Tonnes & Clay (BC Soil) - 23,45,385 Tonnes
15	Production so far	Nil
16	Dispatch Quantity	Nil
17	Process Description	Mechanized Non-Conventional Opencast Mining, without Drilling and Blasting will be adopted. The deposit will be quarried by a simple system using Excavators & Dozers-Tippers combination. The quarried Lime Kankar will be transported by 25 T Tarus Tippers to Pandalgudi Lime Kankar Beneficiation Plant for further process. Clay (BC Soil) will be transported by 25 T Tarus Tippers to RR Nagar Cement Plant for Cement manufacturing-corrective material.
18	Proposed Production	During the Plan Period, 28,00,000 Tonnes of Lime Kankar as ROM @ 1.0 MTPA (max.) and 21,38,180 Tonnes of Clay (BC Soil) @ 1.0 MTPA (max.) will be quarried out from this Lease.
19	Ground water table intersection	The total depth of quarrying will be to a maximum of 3.0 m BGL only. As ground water-table fluctuates between 12-15 m BGL in the vicinity, thus, no ground water-table intersection .
20	Project Cost	Rs.4.75 Crores
21	Project Schedule	Life of the Lease is 10 Years.
22	R & R Issue	Nil
23	Litigation/Case Details	Nil
24	CER Budget	Rs.9.50 Lakhs
25	Financial Assurance	Not applicable now
26	Violation, if any	Nil

EIA Study : The Lime Kankar & Clay to be mined out from this Quarry are **Minor Minerals over an extent of 158.865 Ha (<250 Ha)** and falls in **Category 'B1'** of Sl. No. 1(a) of EIA Notification 2006, as amended, for prior EC from State Level Environmental Impact Assessment Authority (SEIAA), Tamil Nadu. Accordingly, TOR Application/Form-1 (Form 1M is Not Applicable) has been submitted by RCL vide Parivesh Online proposal No. SIA/TN/MIN/522992/2025 dated 07.02.2025. After paying Online Scrutiny Fees, etc., the File has been accepted by SEIAA on 01.03.2025.

The Proposal was deliberated by SEAC-TN in its 538th Meeting held on 01.03.2025 and SEIAA-TN in its 803rd Meeting held on 01.04.2025. TOR has been awarded vide Identification No. TO25B0108TN5802389N dated 01.04.2025 under **File No. 11826/2025**, with Public Hearing.

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 (**NABET**) vide Certificate NABET/EIA/2225/RA0290 dated 11.06.2023 with validity till 16.11.2025 (Sl. No. 4 of List). ABC Laboratory is accredited by the National Accreditation Board for Testing & Calibration Laboratories (**NABL**) vide Certificate No. TC-5770 dated 03.04.2024 - valid till 02.04.2026.

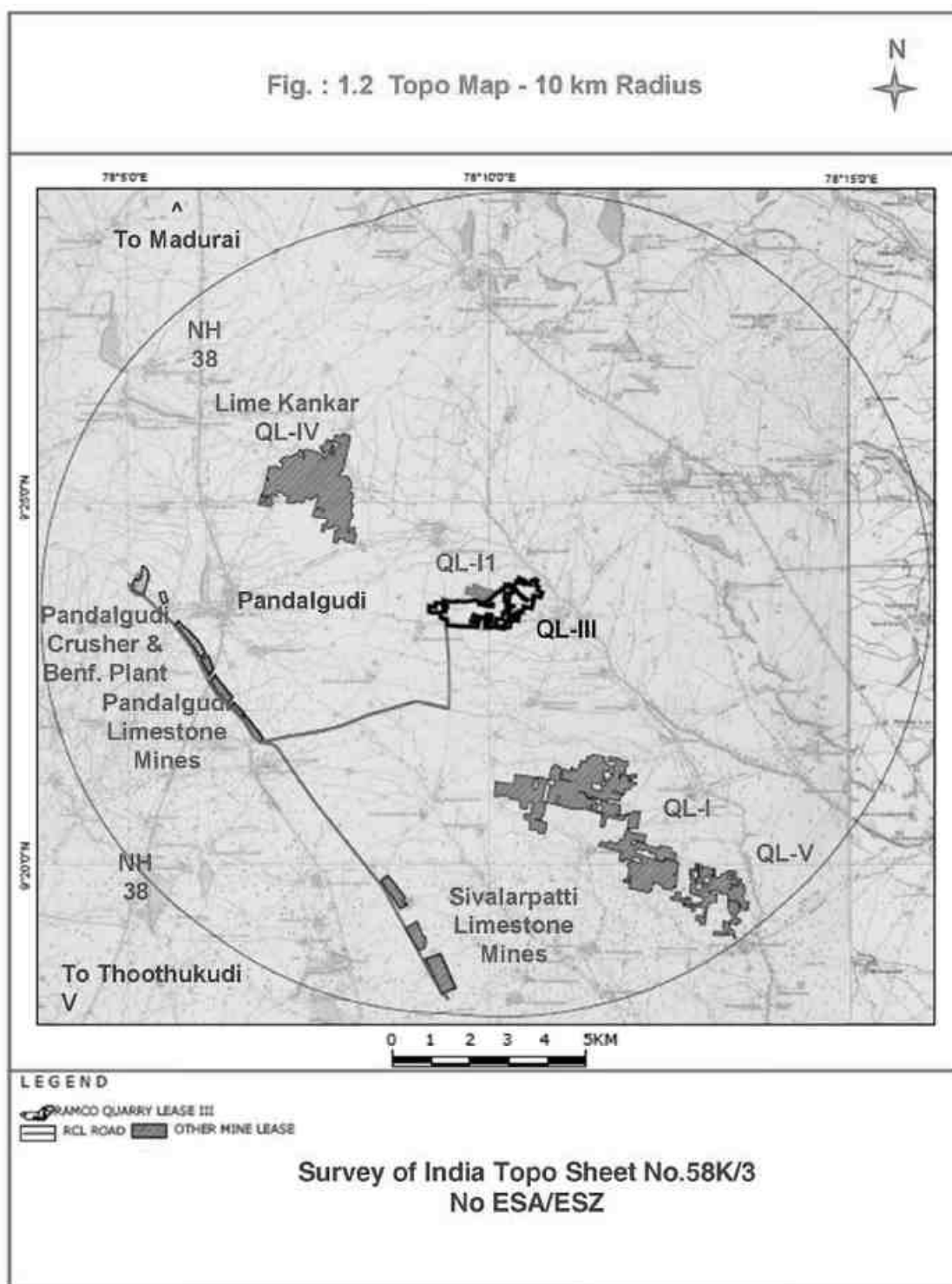
Baseline Data (BLD) has been collected during **Dec. 2024-Feb. 2025 (Winter Season)** for Environmental Impact Assessment (EIA) Study in compliance with MoEF&CC Office Memorandum No. J-11013/41/2006-IA-II(I)(Part) dated 29.08.2017. Draft EIA Report has been prepared in compliance with awarded TORs and submitted along with Summary EIA Reports (both in English and Tamil versions) for Public Consultation & Public Hearing.

2.0 Description of the Environment

2.1 Environmental Setting

Quarry Lease-III location falls in Survey of India Topo Sheet No.58K/3 and is located between North Latitudes **9°23'22.30" - 9°24'05.25"** and East Longitudes **78°09'06.02"E to 78°10'42.63"E** (Fig. 1.2). The site is free from seismic effects (Seismic Zone III). There is no environmental issue about the Quarry location. There are **no eco sensitive areas** like National Parks, Wildlife Sanctuaries, Biosphere Reserves, Reserved Forests, Elephant Corridor, Mangroves, Archaeological/Historical Monuments, Heritage sites, etc. **within 10 km from the site boundary**. **General Condition** of EIA Notification 2006 (as amended) **is not attracted** for the Quarry Lease.

Seasonal **Uppu Odai** drains the region (flows at 0.05 km in Northeast). Seasonal Vaippar River flows at a distance of 18 km in Southwest. Gulf of Mannar is at 40 km in SE. Madurai-Thoothukudi Section of NH-38 passes at a distance of 4.1 km in the West. Southern Railway Line of Virudhunagar-Aruppukottai-Manamathurai Section runs at 15.5 km distance in NNW from the Lease. Madurai Airport is at 48 km (NNW) & VOC Port-Thoothukudi is at 70 km (S).



The distance of the nearest villages- Maravarperungudi is at 0.4 km (ESE), Koppuchithampatti is about 1.2 km (N) from the Lease boundary. Pandalgudi is at 4.3 km (W). Taluk Headquarters Aruppukottai is at 13.5 km (NNW) and District Headquarters Virudhunagar is at 27.5 km (NW). There are existing Mines & Quarries of RCL in operation for the last 6 decades in the Region. A Textile Mill is in operation at Pandalgudi.

2.2 Baseline Environmental Status

The study area of 10 km radius (from ML boundary) (Fig. 3.1) has been considered for assessing the baseline environmental status during **Dec. 2024-Feb. 2025 (Winter Season)**. The monitoring stations are selected in such a way that baseline data reflects the **Cumulative Impact of existing Mines & Plants** in the Study area. The summary of baseline status is given in **Table 2.1**.

Table : 2.1 Environmental Baseline Status

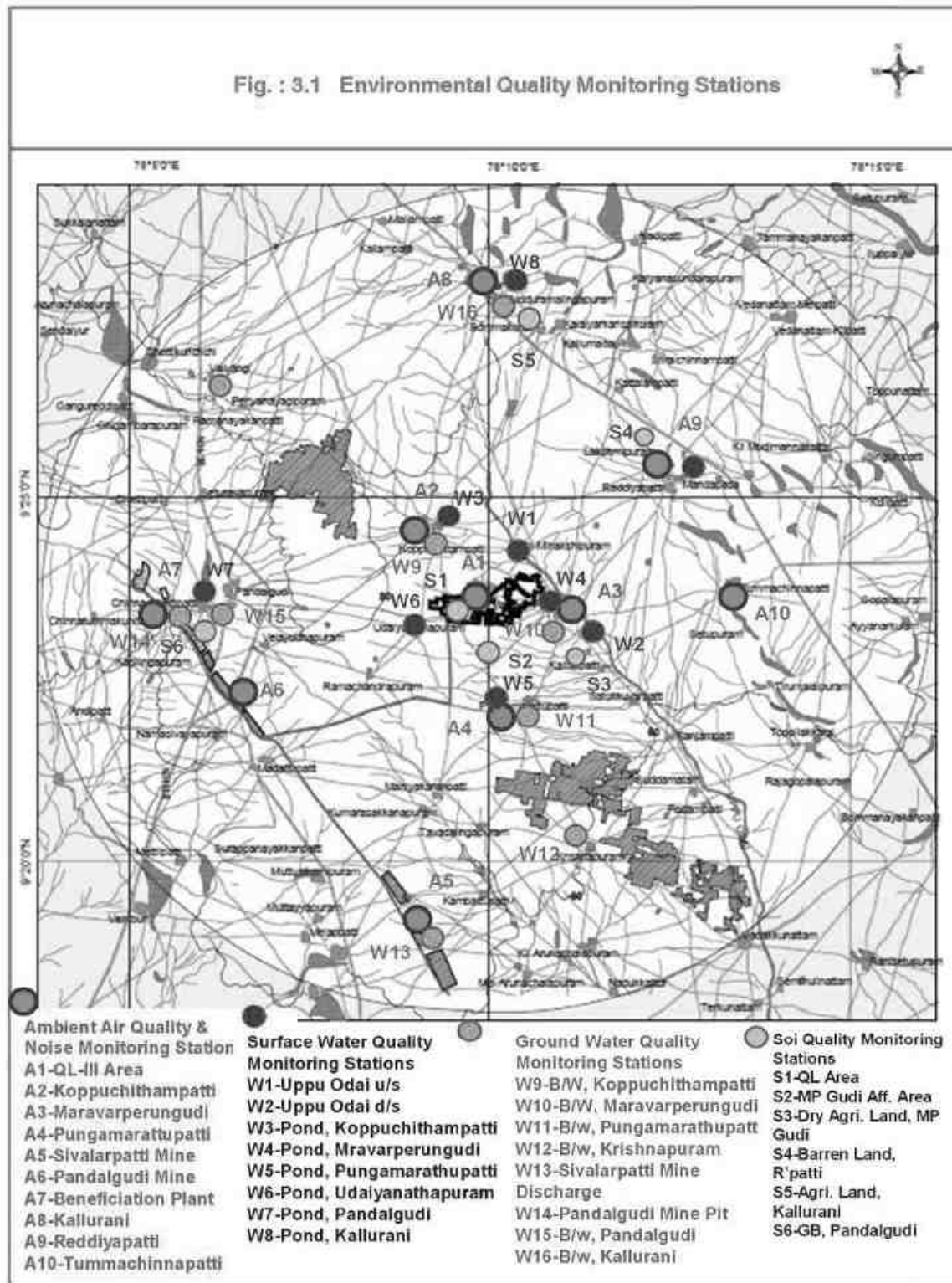
Envl. Component	Main Parameters	Minimum	Maximum	Mean	Desirable Norms
Ambient Air Quality, ug/m ³	PM2.5	10	44	21.7	60
	PM10	17	66	36.8	100
	SO ₂	6	23	13.2	80
	NOx	6	25	15.4	80
Ambient Noise, dB(A)	Leq-Day	38.9	47.0	43.7	55
	Leq-Night	38.2	44.8	42.1	45
Surface Waters	TDS, mg/l	260	370	-	500/2100
Ground Waters	TDS, mg/l	290	1120	-	500-2000
Soil Status	EC, mmhos/cm	1.48	1.74	-	0.2-0.5
	SAR	2.19	3.28	-	<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.

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

- ❖ The collected meteorological data during this season represented local weather phenomena.
- ❖ The monitored ambient air quality in the study area was found to be in compliance with the NAAQ 24-hourly Norms for Industrial, Residential, Rural and other areas.
- ❖ Ambient equivalent noise levels (Leq) during day and night times were found to be well within the MoEF&CC Norms for Residential Areas.
- ❖ Surface water quality was found to be in compliance with CPCB Norms(C). Ground water quality was found to be in compliance with IS:10500-2012 Norms for Domestic consumption.
- ❖ Soil in the study area would very well support vegetation after amending it suitably.
- ❖ Schedule-I Fauna, Peafowl is omni present in the Study area for which Peafowl Conservation Plan has been prepared and submitted. Other than Peafowl, only domesticated animals exist.
- ❖ 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 study area.



3.0 Anticipated Environmental Impacts

Being a Quarry Project, it **does not involve any major establishment or construction**. A small Mine Office will be constructed on **temporary structures**. The identified Impacts during Operation Phase are given in **Table 3.1**.

Table : 3.1 Identified Impacts

Sl. No.	Environmental Component & Anticipated Impacts
1	Land Environment : In the total Lease Area of 158.865 Ha, effective quarry area will be 111.685 Ha. Out of which, mined out void backfilled & reclaimed area will be 4.872 Ha. About 47.180 Ha is the safety barrier area which will be under Green Belt/Afforestation (29.70% Coverage) at Conceptual Stage.
2	Traffic Volume : Existing Traffic Volume at RCL Mines Road-Pandalgudi Junction was 4,558 Passenger Car Units (PCUs) i.e. 189.92 PCU/hr . In the Post-Project Scenario, there will be an addition of 536 vehicles/day (1608 PCU/day) to the existing traffic in the vicinity. The net (cumulative) traffic volume will be 6,166 PCU/day only @ 252.96 PCU/hour . The existing Haulage Road will also be adequate to handle the proposed addition of traffic volume @ 63.04 PCU/hour.
3	Air Quality : The Mining & Quarrying, Loading and Transporting activities would generate both fugitive dust emissions and smoke from HEM Machineries/Equipments & Transporting Tippers. Stack Emissions from Existing Crusher & Proposed Screening/Beneficiation Plants are considered along with Mines/Quarries for Cumulative impact Assessment . AERMOD View Software is used for Predicting the maximum Ground Level Concentrations (GLCs) including Transportation Impact. The predicted maximum GLC-PM _{2.5} for cumulative activities is 0.24 ug/m ³ and GLC-PM ₁₀ for cumulative activities is 0.91 ug/m ³ and found to be confined locally i.e. within 0.8 km radius. Also, adequate Buffer Level available in the Air Environment for the Proposal.
4	Noise Levels : There is no Drilling and Blasting in this Quarry and thus, no vibration . Excavation, Loading and Transportation activities are the sources of Noise. In general, work force will be exposed to <85 dB(A) levels during 8-hours Shift. Noise level at nearest Lease boundary will be <55 dB(A) during day times and <45 dB(A) during night times as stipulated by MoEF&CC- Leq Noise Norms for Residential & Rural Areas.
5	Water Environment : Impact on Surface Waters : The area is almost flat and plain terrain with a gentle slope towards southeast and southwest. The seasonal Uppu Odai drains the area. There are 3 Nos. Seasonal First & Second order streams flows through the QL Area and join Uppu Odai in the east. Another Seasonal Nalla flows in the southern boundary of the Lease Area. As per PAC, safety barrier of 50 meters on either side

Sl. No.	Environmental Component & Anticipated Impacts
	of streams/odais are provided and their flows will be maintained as such till the Conceptual Stage. The Normal Rainfall of the Site is 726 mm. Pre-Project and Post Project Surface Runoffs from the Quarry Area are estimated as per Manual of Artificial Recharge of Ground Water (CGWB, 2007). Pre-Project Runoffs from Quarry Area will be 2,30,672 KL/Annum and Post Project Runoffs will be 2,13,546 KL/Annum. There will be less Runoffs in the Post-Project Scenario due to more green belt area. This is the impact on Surface Waters due to the Project. There is no Quarry Pit Water Discharge. Impact on Ground Waters : There is no ground water-table intersection due to quarrying. The Quarry requires about 3 KLD drinking water for domestic consumption which will be supplied from the RO Plant at Pandalgudi Mine. The Quarry will also require about 2 KLD for Dust suppression measures and another 50 KLD for the development and maintenance of Green Belt. The required water will be sourced from existing Captive Mine Pits in Pandalgudi Region. No workshop and thus there is no effluent generation. Domestic sewage generation will be about 2.5 KLD which will be biologically treated in a Septic Tank followed by a Dispersion Trench. Thus, the impact on the Ground Waters would be minimum.
6	Biological Environment : There is no Eco Sensitive Area/Zone (ESA/ESZ) in the Region. Only Native Flora and Fauna exists. Schedule-I Species Indian Pea Fowl (<i>Pavo cristatus</i>) is commonly found in the region. The Approved Conservation Plan for Indian Pea Fowl has been prepared in consultation with the Forest Department and submitted. With natural vegetation and domestic fauna predominant in the Study Area, impact on the existing flora-fauna would be nil/minimum. ML area is surrounded by barren lands and dry agricultural lands within 1.0 km area. As the baseline AAQ are in lower levels as well as Predicted GLC is very low/insignificant, there will be no impact on the surrounding dry agricultural lands due to the Project.
7	Socio-economics : There are 465 Direct Employees working in the Cement Complex. Indirect Employment to about 600 persons has been provided. The existing Mines & Quarries in Pandalgudi Region are providing Direct Employment to about 252 Persons and Indirect Employment to about 393 Persons. In the Existing Mines, more than 80% Employees are from local villages only. QL-III Project will provide Direct Employment to 72 persons and Indirect Employment to 50 persons. RCL is carrying out number of social activities in and around the villages of its Mines and Factory under the Corporate Social Responsibility (CSR) Budget. RCL has the CSR Committee as per the provisions notified by the Ministry of Corporate Affairs

Sl. No.	Environmental Component & Anticipated Impacts
	on February 27, 2014. Based on the CSR Committee and declared CSR Policy of the Company, CSR activities are carried out and reported. The direct & indirect employment, CER & CSR activities, etc., will have a positive impact on the Socioeconomic Structure of the area.
8	Occupational Health : RCL is operating an Occupational Health Centre at Factory and Mines for supporting the health care needs of employees & their families. Periodic Health tests (Pulmonary test, Audiometric test, blood test, chest x-ray examination etc.) have been conducted every year for the employees. Supported by test observations, adequate and need based treatment has been offered to employees. RCL is committed to provide a Safety & Healthy working conditions in QL-III. The first aid boxes will be made available in the Site Office for immediate treatment. Occupational health surveillance programme will be carried out for all the employees regularly.
9	Climate Change : About 50 KVA industrial supply for lighting is required which will be met from TANGEDCO Grid. For operating the mining equipments, High Speed Diesel (HSD) is required @ 2,000 Liters/day. A licensed fuel storage tanks is established at the Factory and the daily requirement of HSD and other lubricants will be met by a licensed mobile bowser. There will be a standby DG set of 380 KVA with acoustic enclosures and stack as per CPCB/TNPCB Norms. Green Belt (47.180 Ha) Coverage will be 29.70%. About, 11,250 local tree species like Neem, Pungan, Teak, etc. will be planted @ 500 Trees/Ha with a Survival Rate of about 90%.

4.0 Environmental Monitoring Programme

Periodical monitoring of the Ambient Air Quality (at 4 locations) as per NAAQ Norms, Fugitive/Workzone Air Quality/emissions (4 locations), Noise Levels (Ambient & Workzone areas), Water (4 Surface & 4 Ground waters) and Soil Quality (3 Locations) shall be undertaken as per MoEF&CC/TNPCB Norms by appointing an accredited external agency. The status reports will be submitted periodically to TNPCB on monthly basis, IBM on quarterly basis and SEIAA & IRO, MoEF&CC Chennai on six monthly basis.

5.0 Additional Studies

Detailed Risk Assessment and mitigative measures are delineated and an effective Disaster Management Plan, for natural and man-made disasters, is also submitted. Safety aspects will also be ensured to reduce incidents, if any.

6.0 Project Benefits

Environmental Benefits : The proposal ensures continuous Raw Material supply to the Cement Plants. Effective utilization of the Minor Minerals for Cement manufacturing is a Mineral Conservation Measure.

Financial Benefits : Project cost is **Rs.4.75 Crores**. As per MMDR Act 2015, DMF amount @ 10% Seigniorage Fee & Green Fund 10% Seigniorage Fees and MBL Tax @ Rs.160 per Tonne to the Exchequer will improve local and regional economy.

Social Benefits : Project will employ 72 persons directly and 50 persons indirectly. Adequate **CER Budget** will be allotted. The direct & indirect employment, CSR/CER activities, etc., will have a positive impact on the Socioeconomic Structure of the area.

7.0 Environmental Management Plan

There will be **no Construction Phase** for the Project. Environmental Management Plan (EMP) is suggested to mitigate the possible negative impacts that may be caused to the various attributes of environment due to the proposed mining operations. The EMP Measures proposed are given in **Table 7.1**.

Table : 7.1 Proposed EMP Measures

Sl. No.	Environmental Component & Proposed EMP Measures
1	Land Environment :- ❖ Earthen bunds are to be strengthened along the boundaries to arrest wash-offs. ❖ Garland drains are to be provided and maintained periodically around the Lease. ❖ Green Belt has to be developed and maintained along the Lease boundary. ❖ No. of trees planted shall be numbered and referenced for review. ❖ The solid wastes shall be backfilled in the quarried out voids and the land shall be restored to its original conditions. ❖ Saplings shall also be planted along the foot of the dumps and unused slopes to arrest / prevent erosion.
2	Transportation :- ❖ Regular wetting of haul roads has to be undertaken to arrest fugitive emissions. ❖ Tippers are to be fully covered with Tarpaulin to avoid any spillage. ❖ No overloading of Tippers is allowed strictly. ❖ A strict Speed Limit of 30 km/hr. has to be enforced and monitored continuously. ❖ Compliance to 'Pollution under Control' Certification has to be ensured. ❖ Restriction of Truck parking in the Public Road has to be implemented. ❖ Security Guards to be posted at the public road junction.
3	Air Quality :- ❖ Eco friendly quarrying (with out Drilling & Blasting) shall be adopted. ❖ Green belt shall be developed along the periphery, haul roads, waste dumps, etc.

Sl. No.	Environmental Component & Proposed EMP Measures
	❖ Water sprinkling at excavation areas, loading, haul roads, etc. has to be carried out periodically. ❖ Periodical maintenance of mining equipments has to be carried out. ❖ Periodical Air Quality Monitoring & Fugitive Emissions shall be carried out and Reports submitted.
4	Noise Levels :- ❖ Deploying equipments shall be with in-built mechanism for reducing noise. ❖ Providing sound proof operator's cabin of equipments. ❖ Provision of ear muffs/ear plugs to the workers in higher noise zones. ❖ Green Belt with thick foliage shall be maintained around lease boundary as acoustic barriers. ❖ Ambient Noise Levels at boundaries shall comply MoEF&CC Norms for Residential Areas. ❖ Periodical Noise Monitoring shall be carried out and Reports submitted to the Authorities.
5	Water Environment :- ❖ Natural drains or nallas should not be disturbed. ❖ The existing Pre-Project Drainage Pattern should be maintained to the extent possible so that Post Project Runoff distribution is not affected. ❖ Runoffs from Quarry and Waste Dump should be regulated by constructing garland drains. ❖ Garland Drains and Settling Tanks are to be maintained and desilted periodically. ❖ Ground Water Levels and Water Quality are to be periodically monitored at identified Borewells & Dugwells in the Project vicinity. ❖ Monitored Water Quality data are to be periodically submitted to IBM, SEIAA-TN & IRO-MoEF&CC, Chennai.
6	Biological Environment :- ❖ Effective Green Belt has to be developed and maintained with about 90% Survival Rate. ❖ Native species shall be preferred for Green Belt development. ❖ Fruit bearing trees may also be preferred. ❖ The primary way that carbon is stored in the soil is as soil organic matter (SOM). Climatic conditions, natural vegetation, soil texture, and drainage all affect the amount and length of time carbon is stored.
7	Socio-economics :- CSR activities shall be carried out by providing social and welfare measures for the local residents and nearby villages around the Lease area. The prime focus will be on the creating and maintaining of drinking water facilities for the students at the nearby Government Schools, establishing toilets especially for girl students at the schools, setting up of computer centres, maintenance of village roads & ponds, providing solar street lights, conducting free medical camps, etc.

Sl. No.	Environmental Component & Proposed EMP Measures
8	Occupational Health :- ❖ All employees are to undergo Medical Check-up on recruitment and periodically during employment. ❖ Maintenance of Pre, during & Post Employment Records are to be kept for periodical review. ❖ Required Personal Protective Equipments for the employees are to be provided. ❖ Provision of ergonomically designed seats for drivers/operators has to be ensured.

Plastic Waste Management : There will be ban on one-time use and throw away Plastic usage in the Lease. Encourage the use of eco friendly alternatives such as banana leaf, areca nut palm plate, stainless steel glass, porcelain plates / cups, cloth bag, jute bag etc.

EMP Budget : Project cost is **Rs.4.75 Crores**. An amount of **Rs. 30.00 Lakhs** has been earmarked as **EMP Capital Budget** and **Rs. 28.84 Lakhs per Annum as EMP Operating Cost** towards Green Belt maintenance, Environmental Monitoring, etc. As approved by DFO, the proposed budget for **Peafowl Conservation Plan will be Rs.15.80 Lakhs** for the ten years period. Public Hearing issued will be addressed and the **Action Plan with Budget will be included** in the EMP Budget for executing the Physical Activities as per MoEF&CC OM dated 30.09.2020. **CER Budget of Rs.9.50 Lakhs** is allotted for Maravarperungudi & T.Koppuchithampatti Villages.

12.0 Disclosure of Consultants

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 (**NABET**) vide Certificate NABET/EIA/2225/RA0290 dated 11.06.2023 with validity till 16.11.2025 (Sl. No. 4 of List). 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. RCL has utilized the services of Ensysiscon, Chennai for the coordination of the Study.

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 the accomplishments/ clients list.

The **accredited Sectors and approved Experts** of ABC are appended.


**QUALITY COUNCIL
OF INDIA**
Creating an Ecosystem for Quality



**National Accreditation Board
for Education and Training**



Certificate of Accreditation

ABC Techno Labs India Private Limited, Chennai
 ABC Tower, 400, 13th Street, SIDCO Industrial Estate, North Phase, Ambattur, Chennai 600098

*The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA 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 (f)	A
10	Chemical fertilizers	16	5 (a)	A
11	Petro-chemical complexes	18	5 (c)	A
12	Petrochemical based processing	20	5 (e)	A
13	Synthetic organic chemicals industry	21	5 (f)	A
14	Distilleries	22	5 (g)	A
15	Integrated paint industry	23	5 (j)	B
16	Sugar industry	25	5 (i)	B
17	Oil & gas transportation pipeline, passing through national parks/sanctuaries/coral reefs / ecologically sensitive areas including LNG terminal	27	6 (a)	A
18	Airports	29	7 (a)	A
19	Industrial estates/ parks/ complexes/ Areas, export processing zones (EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	31	7 (c)	A
20	Ports, harbours, break waters and dredging	33	7 (e)	A
21	Highways	34	7 (f)	A
22	Common Effluent Treatment Plants (CETPs)	36	7 (h)	B
23	Common Municipal Solid Waste Management Facility (CMSWMF)	37	7 (i)	B
24	Building and construction projects	38	8 (a)	B
25	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated June 09, 2023 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/23/2795 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/EIA/2225/RA 0290

Valid up to
Nov 16, 2025

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to the QCI-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 400, 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: 02/04/2026
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)		
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



(EIA_LoginForm.aspx)

Online Portal for Scheme of Accreditation of EIA Consultant Organizat

**ABC Techno Labs India Private Limited (formerly known
as ABC Environ Solutions Pvt. Ltd.)**

S No	Name	Type	Designation	Sector	FA	Ren
1	Dr Devi Velusamy	In House	TM/FAE	33 Ports, harbours, break waters and dredging,38 Building and construction projects	WP,EB	
2	Dr Geetha S	In House	FAE		SE	
3	Dr Hemambika Balakrishnan	In House	FAE		EB	
4	Dr M Sangeetha	In House	EIA Coordinator	1. Mining of minerals including opencast/ underground mining,23 Integrated paint industry,38 Building and construction project,39. Townships and Area development projects,15 Leather/skin/hide processing industry	NV,AP	

S No	Name	Type	Designation	Sector	FA	Ren
5	Dr Mohit Kumar Ray	Empanelled	EIA Coordinator	4. Thermal power plants,10. Petroleum refining industry,18,Petrochemical complexes,20. Petrochemical based processing	RH,SHW,AQ	
6	Dr Muthiah Mariappan	In House	EIA Coordinator	4. Thermal power plants,15. Leather/skin/hide processing industry,16 Chemical fertilizers,10. Petroleum refining industry	AP,WP	SHV
7	Dr N Rama Krishnan	In House	EIA Coordinator	33. Ports, harbours, break waters and dredging	LU ,SE	
8	Dr R K Jayaseelan	In House	EIA Coordinator	1. Mining of minerals including opencast/ underground mining,21. Synthetic organic chemicals industry, industrial estates/ parks/ complexes/ Areas, export processing zones (EPZ Special economic zones (SEZs), Biotech parks, Leather complexes,37. Common Municipal Solid Waste Management Facility (CMSWMF),39. Townships and Area development projects	LU,HG,WP	SHV
9	Dr R Parmasivam	In House	EIA Coordinator	31. Industrial estates/ parks/ complexes/ Areas, export processing zones (EPZ Special economic zones (SEZs), Biotech parks, Leather complexes,36. Common Effluent Treatment Plants (CETPs)	HG,WP	

S No	Name	Type	Designation	Sector	FA	Ren
10	Dr S Veezhinathan	In House	EIA Coordinator	1. Mining of minerals including opencast/ underground mining,8.Metallurgical industries (ferrous & non-ferrous),27. Oil & gas transportation pipeline, passing through national parks/ sanctuaries/coral reefs / ecologically sensitive areas including LNG terminal,31. Industrial estates/ parks/ complexes/ Areas, export processing zones (EPZ Special economic zones (SEZs), Biotech parks, Leather complexes,39. Townships and Area development projects	Nuclear power projects and processing of nuclear fuel,Geo,HG	
11	Mr Abhik Saha	In House	EIA Coordinator	2. Offshore and onshore oil and gas exploration, development & production,21. Synthetic organic chemicals industry,22 Distilleries,9. Cement Plants,29. Airports	AP,WP,EB	SHV
12	Mr Arijit Panja	In House	FAE		AP,NV,LU	WP
13	Mr K R Haneesh	Empanelled	EIA Coordinator	36. Common Effluent Treatment Plants (CETPs),37. Common Municipal Solid Waste Management Facility (CMSWMF),38. Building and construction projects,39.Townships and Area development projects	AP,WP,NV	

RCL

EC for Maravarperungudi Lime Kankar Quarry Lease-III - 158.865 Ha, Virudhunagar District

S No	Name	Type	Designation	Sector	FA	Ren
14	Mr K Sekar	Empanelled	EIA Coordinator	1. Mining of minerals including opencast/ underground mining,7. Mineral beneficiation including pelletisation,9. Cement Plants,31. Industrial estates/ parks/ complexes/ Areas, export processing zones (EPZ) Special economic zones (SEZs), Biotech parks, Leather complexes,33. Ports, harbours, break waters and dredging		
15	Mr Mohammad Akhtar	Empanelled	EIA Coordinator	29 Airports,34. Highways,38. Building and construction projects	AP,AQ	
16	Mr P Swamirajan	Empanelled	EIA Coordinator	34. Highways		
17	Mr Vinod Kumar Gautam	Empanelled	EIA Coordinator	29. Airports		
18	Mr Widdhi Pratim Bose	In House	EIA Coordinator	2 Offshore and onshore oil and gas exploration, development & production,23 Integrated paint industry,38 Building and construction project,39. Townships and Area development projects	WP	SHV
19	Ms Kavita Zog	Empanelled	EIA Coordinator	3. River Valley projects,4. Thermal power plants,22. Distilleries,25. Sugar Industry,39. Townships and Area development projects	EB,SW,WP	

S No	Name	Type	Designation	Sector	FA	Ren
20	Ms Vaishnavi Dhinakaran	In House	EIA Coordinator	38 Building and construction projects	WP	SHV



Industries (MMC.2) Department,
Secretariat, Chennai – 600 009

Letter No.2171/MMC.2/2018 – 1, Dated: 02.04.2018

From

Thiru K.Gnanadesikan, I.A.S.,
Additional Chief Secretary to Government.

To

- ✓ The President (Manufacturing)
The Ramco Cements Ltd,
Ramasamyraja Nagar,
Virudhunagar District. (w.e.)
Tamil Nadu – 626 204.

Sir,

Sub: Industries - Mines and Minerals - Minor Mineral -
Quarry Lease Application of Tvl. The Ramco Cements
Ltd, for quarrying Limekankar and Clay (Black Cotton
Soil) in S.F.Nos. 100/9,10,etc., in Maravarperungudi
Village - and SF Nos.468/1A,1B1,1B2,etc., in
T.Koppuchithampatti Village, Aruppukottai Taluk,
Virudhunagar District - over an extent of 172.30.5
Hectares of Patta lands - Precise Area for an extent
of 158.86.5 hectares only recommended and
communicated - Approved Mining Plan and
Environment Clearance Certificate - Requested.

- Ref:** 1. Your Quarry Lease application dated 25.05.2017.
2. From the District Collector, Virudhunagar District,
Letter Rc.No.KV1/14465/2017 dated 25.01.2018.
3. From the Commissioner of Geology and Mining,
File Rc.No.583/MM10/2018, dated 13.02.2018.

I am directed to invite your attention to the reference third cited wherein the Commissioner of Geology and Mining has recommended your quarry lease application for quarrying Limekankar and Clay (Black Cotton Soil) over an extent of 158.86.5 Hectares only (Out of the total applied area of 172.30.5 hectares applied for) of Patta lands in S.F.Nos. 100/9,10,etc., in Maravarperungudi Village and SF Nos.468/1A,1B1,1B2,etc.,in



-2-

T.Koppuchithampatti Village, Aruppukottai Taluk, Virudhunagar District for a period of 10 years under Rule 43 of the Tamil Nadu Minor Mineral Concession Rules, 1959.

2. In this connection, I am directed to request you to furnish an approved mining plan for the above said precise area (as annexed herewith) by incorporating the following conditions to the Government through the Director of Geology and Mining within a period of 3 months as per sub-rule 13 of Rule 19-A of the Tamil Nadu Minor Mineral Concession Rules, 1959:

- i. A safety distance of 7.5 meters shall be maintained to the adjoining patta lands situated in and around the applied area for lease and the applicant company should take all precautionary measures while quarrying without disturbing the adjacent patta and agricultural lands.
- ii. The applicant company should maintain necessary safety distance of 50 metres around the Odai and vari and 10 meters to the cart track without any discrimination.
- iii. Safety distance of 50 meters should be left and maintained for the Low Tension electric line passing through the quarry lease applied area.
- iv. Approach to the intervening patta lands shall be provided and maintained.
- v. If any mineral other than limekankar and clay (black cotton soil) is discovered while quarrying, the applicant/ lessee shall not mine or dispose of such mineral and it should be intimated to Government within 30 days from the date of discovery of such new mineral(s) as per Rule 36(3) of the Tamil Nadu Minor Mineral Concession Rules, 1959.
- vi. The applicant company should make its own arrangement to form approach road.
- vii. No hindrance shall be caused to the adjoining patta land owners. Similarly, no hindrance shall be caused to the habitant who are living along the transportation pathway.
- viii. Quarrying operation should be confined within the revised area of 158.86.5 Hectares.
- ix. The applicant company should produce latest no mining dues certificate in respect of other lease areas before the execution of lease deed.
- x. In respect of lands where surface right was obtained by way of registered sale deeds, copies of Chitta and other village accounts shall be produced before the execution of the lease deed.

-3-



- xi. As the area applied for quarry lease is more than 50.00.0 hectares, necessary Environment Clearance has to be obtained from the Ministry of Environment, Forests and Climate Change, New Delhi.
- xii. Consent from the Tamil Nadu Pollution Control Board should be obtained before the commencement of quarrying operation.
- xiii. If any violation is found during quarrying operation, the penal provisions of the Tamil Nadu Minor Mineral Concession Rules, 1959 and other Act and Rules in force will attract.

3. I am also directed to request you to obtain and produce Environment Clearance Certificate from the Ministry of Environment, Forests and Climate Change, New Delhi before grant of quarry lease.

Yours faithfully,

S. R. Jeyaraj
31/12/18

for Additional Chief Secretary to Government

Jg
3/4/18

Copy to:

The Director of Geology and Mining,
Guindy, Chennai- 600 032.

The District Collector,
Virudhunagar District.

Annexure - I

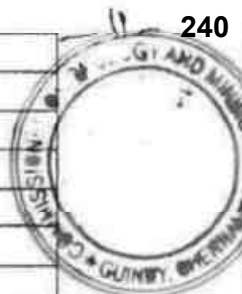
District: Virudhunagar

Village: Maravarperungudi

S.No.	SF.No.	Sub Div.No	Extent in Ha.	Sl.No.	SF.No.	Sub Div.No	Extent in Ha.
1	100	9	0.225	51	126	5	0.035
2	100	10	0.180	52	126	7A	0.750
3	101	1	0.485	53	126	7B	0.760
4	101	2	1.475	54	126	8	0.005
5	101	3	0.430	55	126	9	0.025
6	103	3	1.330	56	126	10	0.550
7	103	4	2.610	57	127	1	0.005
8	109	7	0.010	58	127	2	0.055
9	109	8A	0.035	59	127	3	0.160
10	109	8B	0.120	60	127	5	0.310
11	109	9	0.270	61	127	6	0.305
12	109	10A	0.490	62	127	7	0.310
13	109	10B	1.255	63	127	8	0.310
14	119	3 (part)	1.820	64	127	9	0.775
15	120	1	0.560	65	127	10	0.650
16	120	2A	0.230	66	127	11	0.340
17	120	2B	0.270	67	128	1A	0.830
18	120	3	0.370	68	128	1B	0.830
19	120	4	1.030	69	128	2A	0.570
20	121	1A	0.155	70	128	2B	0.510
21	121	2	0.265	71	128	4	0.030
22	121	3	0.285	72	128	5	0.865
23	121	4	0.225	73	129	2	0.080
24	121	5	1.090	74	129	4	0.440
25	121	6	0.140	75	129	5A	0.260
26	121	7	0.415	76	129	5B	1.075
27	121	1B	0.070	77	130	1	0.170
28	122	1	0.150	78	130	2	0.140
29	122	2	0.165	79	130	3	0.190
30	122	4	0.490	80	130	4	0.145
31	123	1	0.595	81	130	6	0.020
32	123	2	0.800	82	130	7	0.090
33	124	1	0.585	83	130	8	0.395
34	124	2	0.135	84	130	9	0.350
35	124	3	0.280	85	130	10	0.230
36	124	4	0.145	86	130	11	0.105
37	124	5	0.290	87	131	1B	2.185
38	124	6	0.310	88	131	2B	0.665
39	124	7	0.445	89	131	2C	0.760
40	124	8	0.430	90	131	2D	0.745
41	124	9	0.400	91	131	2E	0.180
42	125	1A	0.420	92	131	3	0.180
43	125	1B	0.520	93	132	1A	0.030
44	125	1C	0.910	94	132	1B	0.825
45	125	2	0.190	95	132	1C	0.740
46	125	5	0.300	96	132	2	0.135
47	125	6	0.105	97	132	3	0.160
48	126	1	0.070	98	132	4	0.875
49	126	3	0.065	99	137	3	0.395

101	138	1	1.215	151	418	6	0.220
102	138	2A	0.355	152	429	1	0.030
103	138	3A	0.205	153	429	2	0.185
104	138	4A	0.120	154	431	1	0.275
105	138	5A	0.470	155	431	4	0.735
106	139	1	0.295	156	431	5	0.985
107	139	3A	1.230	157	431	6	0.245
108	139	3B	0.150	158	431	7A	0.690
109	140	1	0.585	159	431	7B	0.380
110	140	3A	0.255	160	431	8	0.390
111	140	3B	0.205	161	431	9	0.200
112	140	3C	0.370	162	432	1	0.110
113	140	4	1.120	163	432	2	0.720
114	140	5	0.795	164	432	3	0.835
115	141	1	0.395	165	432	4	0.265
116	141	2	0.815	166	432	5	0.250
117	404	1A	0.880	167	432	6	0.425
118	404	1B	0.015	168	432	7	0.170
119	407	2	0.740	169	432	8	0.195
120	407	3	0.005	170	433	1A	0.110
121	407	4	0.040	171	433	1B	0.115
122	407	5	0.145	172	433	1C	0.230
123	407	6A	0.765	173	433	2	0.170
124	407	6B	0.070	174	433	3	0.310
125	408	3	0.755	175	433	4	0.395
126	409	1B	0.950	176	433	5A	0.060
127	410	4	0.740	177	433	5B	0.140
128	410	5	0.750	178	433	6	0.550
129	411	1A	0.120	179	433	7A	0.410
130	411	1B	0.115	180	433	7B	0.450
131	411	2A	0.330	181	434	1	0.025
132	411	3	0.220	182	434	2A	0.160
133	411	4	0.200	183	434	2B	0.095
134	411	5	0.215	184	434	2C	0.080
135	412	1	2.475	185	434	2D	0.180
136	412	2	0.590	186	434	2E	0.210
137	413	3	0.820	187	434	4A	0.025
138	413	4	0.895	188	434	4B	0.030
139	415	1	0.900	189	434	4C	0.170
140	415	2	0.300	190	434	5	0.255
141	415	3	0.330	191	434	6	0.285
142	416	1	0.160	192	435	1	1.910
143	416	2	0.145	193	437	1A	0.385
144	416	3	0.185	194	437	1B	0.325
145	416	4	0.170	195	437	2	1.550
146	416	8	0.170	196	438	2A	0.480
147	416	9	0.210	197	438	2B	0.495
148	416	10	0.480	198	438	3A	0.280
149	418	1	0.500	199	438	3B	0.285
150	418	2	0.285	200	438	4	0.880

201	438	5A	0.505	251	447	2	1.210
202	438	5B	0.315	252	447	3	0.575
203	439	1A	0.260	253	447	5	0.005
204	439	1B	0.035	254	447	6	0.065
205	439	1C	0.020	255	448	1	0.625
206	439	2A	0.130	256	448	2	0.810
207	439	2B	0.020	257	448	3	1.060
208	439	2C	0.005	258	449	2	0.460
209	439	3A	0.115	259	449	3A	0.465
210	439	3B	0.020	260	449	3B	0.495
211	439	3C	0.005	261	449	4	0.655
212	439	4A	0.590	262	449	5	0.520
213	439	4B	0.065	263	449	6	0.370
214	439	5A	0.505	264	449	7	0.150
215	439	5B	0.030	265	449	8	1.435
216	440	1A	0.340	266	450	1	1.555
217	440	2A	0.465	267	450	2	1.110
218	440	3A	0.235	268	451	1	0.680
219	442	1A	0.130	269	451	2	0.600
220	442	3B	0.155	270	451	3	0.990
221	442	4B	1.090	271	451	4	0.725
222	442	5	0.315	272	451	7	0.120
223	443	1	0.100	273	452	1	1.750
224	443	2	0.225	274	452	3	0.370
225	443	3	0.365	275	453	1	0.545
226	444	1A	0.790	276	453	2	0.405
227	444	1B	0.690	277	453	3	0.405
228	444	2	0.670	278	453	7	0.095
229	445	1	0.005	279	453	8	1.100
230	445	3	0.285	280	453	9	0.935
231	445	4	0.370	281	454	1	0.010
232	445	5	0.115	282	454	3	0.375
233	445	7	0.070	283	454	4	0.455
234	445	8	0.745	284	454	5	0.425
235	445	9	0.695	285	454	6	0.670
236	445	10	0.725	286	455	1	0.775
237	445	11A	0.205	287	455	3A	0.430
238	445	11B	0.600	288	455	3B	0.885
239	446	1	0.115	289	456	3	0.510
240	446	2A	0.400	290	456	4	0.230
241	446	2B	0.285	291	456	5A	1.315
242	446	3	0.275	292	456	5B	0.130
243	446	4	0.830	293	457	1	0.040
244	446	5	0.455	294	457	3A	0.380
245	446	6A	0.360	295	457	3B	0.470
246	446	6B	0.215	296	457	3C	0.085
247	446	8	0.115	297	457	4A	0.430
248	446	9A	0.140	298	457	4B	0.040
249	446	9B	0.240	299	457	5A	0.645
250	447	1	0.710	300	457	5B	0.065
Total				132.055			





S.F.No	Sub Div.No	Extent in Ha.	Sl.	SF.No	Sub Div.No	Extent in Ha.	
1	468	1A	0.490	22	542	1	0.370
2	468	1B1	0.425	23	542	2	0.965
3	468	1B2	0.070	24	542	3	0.920
4	468	2	0.295	25	543	1A1	0.030
5	468	3	0.135	26	543	1A2	0.780
6	468	4A	0.480	27	543	1B1	0.030
7	468	4B	0.040	28	543	1B2	0.555
8	468	5A	0.440	29	543	2B	0.260
9	468	5B	0.015	30	543	3	1.625
10	538	3A	0.040	31	544	1A	0.060
11	538	3B	0.810	32	544	1B	2.785
12	539	1B1	1.155	33	683	2	1.430
13	539	1B2	0.010	34	683	3	1.360
14	540	2	1.180	35	684	1	0.465
15	540	3	0.605	36	684	2A	0.320
16	540	4	1.585	37	684	2B	0.620
17	541	1	1.240	38	684	3	0.255
18	541	2A	1.480	39	684	4	0.425
19	541	2B	0.075	40	684	5	0.465
20	541	2C	0.375	41	684	6	0.235
21	541	2C	0.375	42	684	7	0.240
Total				26.810			
Grand Total =				158.865			

K. GNANADESIKAN
ADDITIONAL CHIEF SECRETARY TO GOVERNMENT

//True copy//

S.P. Ramprasad
31/12/18
Section Officer

5/1
31/1/18

DEPARTMENT OF GEOLOGY AND MINING

From

Thiru M.Kandan, M.Sc. M.Phil.,
Additional Director of Geology and Mining,
Department of Geology and Mining,
Guindy, Chennai - 600 032.

To

The Additional Chief Secretary to
Government,
Industries Department,
Secretariat,
Chennai - 600 009.

Lr. No. 583/MM10/2018/LK/Vnr, dated. 08.06.2018

Sir,

Sub: Mines and Minerals – Minor Mineral - Limekankar and clay (Black cotton soil) – Virudhunagar District – Aruppukottai Taluk – S.F.No.100/9, 10 etc of Maravarperungudi and S.F.No.468/1A, 1B1, 1B2 etc of T.Koppuchithampatti villages – over an extent of 158.86.5 hecets of patta lands – Quarry lease application preferred by Tvl. The Ramco Cements Limited – Precise area communicated by the Government - Approved Mining Plan called for – Mining Plan submitted for approval – Approval accorded – Reg.

- Ref: 1) Quarry lease application preferred by Tvl. The Ramco Cements Limited, dated 25.05.2017.
- 2) The District Collector, Virudhunagar letter Roc. No.KV1/14465/2017 dated 25.01.2018
- 3) The Commissioner of Geology and Mining, Chennai Lr No. 583/MM10/2018 Dated 13.02.2018.
- 4) Government letter No.2171/MMC2/2018-1 dated 02.04.2018.
- 5) Tvl. The Ramco Cements Limited letter dated 21.05.2018.
- 6) The Deputy Director, Geology and Mining, Virudhunagar letter Roc. No.KV1/14465/2017 dated 28.05.2018.
- 7) G.O.Ms.No.09, Industries (MMC1) Department Dated 08.2.2018.
- 8) G.O. (D) No. 23, Industries (MMC1) Department Dated 15.02.2018

-vvvvv-

Kind attention is invited to the references cited.

2) The Government in the reference 4th cited have communicated the precise area to the applicant Tvl. The Ramco Cements Limited with a direction to produce an approved Mining Plan in respect of the area applied for grant of quarry lease for quarrying Limekankar and clay (Black cotton soil)

over an extent of 158.86.5 hecets of patta lands in S.F.Nos. S.F.No.100/9, 10 etc of Maravarperungudi and S.F.No.468/1A, 1B1, 1B2 etc of T.Koppuchithampatti villages, Aruppukottai Taluk, Virudhunagar District for a period of 10 years as per Rule 43 of Tamil Nadu Minor Mineral Concession Rules, 1959 by incorporating the conditions stipulated in the Government letter dated 02.04.2018.

3) In response to the precise area communication letter issued by the Government vide in reference 4th cited, the applicant has submitted 5 copies of draft mining plan duly prepared by the Qualified Person for approval vide in the reference 5th cited.

4) The Deputy Director of Geology and Mining, Virudhunagar in the reference 6th cited has forwarded the draft mining plan recommending for approval and stating that, the mining plan has been verified with reference to field conditions and the details such as Geological reserves, Mineable reserves, year wise production and development program have been incorporated in the draft mining plan. Further, he has reported that, the conditions imposed in the precise area communication letter have also been incorporated in the Mining Plan. He has further reported that, in the draft mining plan the total mineable reserves in the applied area is 30,71,388 tonnes of Limekankar and 23,45,385 tonnes of clay (Black cotton soil).

5) The draft mining plan submitted in respect of the precise area communication and the report of the Deputy Director of Geology and Mining, Virudhunagar have been examined with reference to the provisions of Rule 43 of Tamil Nadu Minor Mineral Concession Rules, 1959 and the followings are observed:-

- i) All the following conditions stipulated in the Government letter No. 2171/MMC2/2018-1 dated 02.04.2018 have been incorporated in the mining plan.
 - a. A safety distance of 7.5mts shall be maintained to the adjoining patta lands situated in and around the applied area for lease and the applicant company should take all precautionary measures while quarrying in the applied area without disturbing the

adjacent patta lands, agricultural lands. Accordingly, 7.5 meters safety distance has been demarcated in the combined FMB sketch attached in the mining plan are noted.

- b. Approach to the intervening patta lands shall be provided and maintained have been demarcated and shown in the mining plan.
 - c. The applicant company should maintain necessary safety distance of 50 meters around the Odai, vari and 10mts to the cart track without any discrimination have been demarcated and shown in the mining plan.
 - d. Safety distance of 50mts should be left and maintained for the low tension electric line passing through the quarry lease applied area have been demarcated and shown in the mining plan.
 - e. Quarry operation should be confined within the revised area of 158.86.5 hect only have been demarcated and shown in the mining plan.
- ii) The boundary coordinates (GPS readings) for the entire boundary pillars of the area have been incorporated and shown in the mining plan.
 - iii) The total geological reserve (ROM) in the applied area is 43,68,788 tonnes of Limekankar and 33,36,165 tonnes of the clay (Black cotton soil). Mineable reserve after leaving safety distance with 100% recovery with an assumed depth of 1.25 mts is estimated as 30,71,388 tonnes of Limekankar and 23,45,385 tonnes of clay (Black cotton soil).
 - iv) The total quantity of production for the first 5 years has been estimated as 18,00,150 tonnes of Limekankar for a depth of 1.25mts and 1,50,000 tonnes of clay (Black cotton soil) for a depth persistence of 1.25 mtrs.

6) In the light of the above, in exercise of the powers conferred under Rule 43 (8) of Tamil Nadu Minor Mineral Concession Rules, 1959, read with

G.O.Ms.No.09, Industries (MMC1) Department Dated 08.2.2018 and G.O. (D) No. 23, Industries (MMC1) Department Dated 15.02.2018, I hereby approve the mining plan in respect of Limekankar and clay (Black cotton soil) mine of Tvl. The Ramco Cements Limited subject to the following conditions:-

- i) The mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time whether such Laws are made by the Central Government, State Government or any other authority.
- ii) The approval of the mining plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development and Regulation) Act 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Indian Explosives Act, 1884 (Central Act IV of 1884) and the rules made there under and the Tamil Nadu Minor Mineral Concession Rules, 1959.
- iii) The mining plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.
- iv) A safety distance of 7.5mts shall be maintained to the adjoining patta lands situated in and around the applied area for lease and the applicant company should take all precautionary measures while quarrying in the applied area without disturbing the adjacent patta lands, agricultural lands till expiry of lease.
- v) Approach to the intervening patta lands shall be provided and maintained.
- vi) The applicant company should maintain necessary safety distance of 50mts around Odai, ~~and~~ vari and 10mts to the cart track without any discrimination.
- vii) Safety distance of 50mts should be left and maintained for the low tension electric line passing through the quarry lease applied area.
- viii) The applicant is allowed to quarry limekankar and clay only. If any mineral other than limekankar and clay (black cotton soil) is discovered while quarrying, the applicant/ lessee shall not mine or dispose of such mineral and it should be intimated to Government within 30 days from the date of discovery of such new mineral(s) as per Rule 36 (3) of Tamilnadu Minor Mineral Concession Rules 1959.
- ix) The applicant should make his own arrangement to form approach road.
- x) No hindrance should be created to the adjoining patta land owners, similarly no hindrance should be created to the habitant who are living along the transportation path way.
- xi) Quarrying operation should be confined within the revised area of 158.86.5 Hects.

- xii) The applicant company should produce latest no mining lease certificate in respect of other lease areas before the execution of lease deed.
- xiii) No quarrying work should be carried out in the intervening land located within the lease applied blocks. Similarly, waste material generated during quarry operation should not be dumped in the non lease granted patta/government land area and dumped waste material in the area as marked in the mining plan.
- xiv) In respect of lands where surface right was obtained by way of registered sale deeds, patta has to be transferred and connected Chitta and other village accounts should be produced before the execution of lease deed.
- xv) As the area applied for quarry lease to quarry Limekankar and clay (black cotton soil) is more than 50.00.0Ha, necessary Environment Clearance has to be obtained from the Ministry of Environment and Forests, New Delhi.
- xvi) Consent from the Tamilnadu Pollution Control Board should be obtained before the commencement of quarrying operation.
- xvii) If any violation is found during quarrying operation, the penal provisions of Tamilnadu Minor Mineral Concession Rules 1959 and other rules and act in force will attract.
- xviii) The lessee shall strictly adhere to the statutory and safety requirements.
- xix) Quarrying operations and production of Limekankar and clay (Black cotton soil) and other activities shall be carried out as per the approved Mining Plan.
- xx) Scheme of mining along with the progressive mine closure plan shall be submitted within the time stipulated in the rules

A copy of the Approved Mining Plan is sent herewith for further necessary action.

Encl: Approved mining plan.

7/6/18
Additional Director of Geology and Mining

Copy to

- ✓ 1) Tvl. The Ramco Cements Limited ,
Ramasamyraja Nagar,
Virudhunagar District.
- 2) The District Collector, Virudhunagar (with AMP)
- 3) The Director General of Mines Safety,
Chennai-40 (with AMP).

COMMISSIONERATE OF GEOLOGY AND MINING

From
Tmt.N.Vijayalakshmi, M.Sc.,
Joint Director,
Commissionerate of Geology and Mining,
Guindy, Chennai - 600 032.

To
The President (Manufacturing),
The Ramco Cements Ltd.,
Ramasamyraja Nagar,
Virudhunagar District - 626 204.

Rc.No.583/MM7/2018, dated 07.01.2025

Sir,

Sub: Mines and Quarries - 31 Minor Minerals - Limekankar and Clay (Black Cotton Soil) - Virudhunagar District - Aruppukottai Taluk - Maravarperungudi Village - S.F.Nos.100/9, 10 etc., and S.F.Nos. 468/1A, 1B1, 1B2 etc., in T.Koppuchithampatti Village - over an extent of 158.86.5 Hectares - patta lands - M/s. The Ramco Cements Limited - Precise area communicated by the Government - Mining plan approved - Modified Mining Plan submitted for approval - Approval accorded.

- Ref:
1. Quarry lease application of M/s. The Ramco Cements Limited dated 25.5.2017.
 2. Government letter No.2171/MMC.2/2018-1, dt.02.04.2018.
 3. Tvl.The Ramco Cements Limited letter dt.11.05.2018.
 4. The Deputy Director, Geology and Mining, Virudhunagar letter Rc.No.KV1/478/2018 dt.18.05.2018.
 5. The Additional Director of Geology and Mining, Chennai Rc.No.585/MM10/LK/Vnr dt.29.05.2018.
 6. Tvl.The Ramco Cements Limited letter dt.15.10.2024.
 7. G.O.(Rt) No.99, Natural Resources (E.1) Department, dated 13.11.2024.
 8. The Assistant Director, Geology and Mining, Virudhunagar Rc.No.KV1/14465/2017, dt.28.11.2024.

-oOo-

The references cited may be seen.

2) In exercise of the powers conferred under Rule 43 (8) of Tamil Nadu Minor Mineral Concession Rules, 1959, read with G.O.(Rt) No.99, Natural Resources (E.1) Department, dated

13.11.2024 the modified mining plan presented by you is hereby approved.

3) This approval is subject to the following conditions.

- i. The modified mining plan is approved without prejudice to any other law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.
- ii. The approval of the modified mining plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development and Regulation) Act 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Indian Explosives Act, 1884 (Central Act IV of 1884) and the rules made there under and the Tamil Nadu Minor Mineral Concession Rules, 1959.
- iii. The modified Mining plan is approved without prejudice to any other order or direction from any court of competent Jurisdiction.
- iv. A safety distance of 7.5mts shall be maintained to the adjoin patta lands situated in and around the applied area for lease and the applicant company should take all precautionary measures while quarrying in the applied area without disturbing the adjacent patta lands, agricultural lands. Accordingly, 7.5meters safety distance has been demarcated in the combined FMB sketch attached in the modified mining plan are noted.
- v. Approach to the intervening patta lands shall be provided and maintained have been demarcated and shown in the modified mining plan.
- vi. The applicant company should maintain necessary safety distance of 50meters around the Odai and Vari and 10mts to the cart track without any discrimination have been demarcated and shown in the modified mining plan.
- vii. Safety distance of 50mts should be left and maintained for the low tension electric line passing through the quarry lease applied area have been demarcated and shown in the modified mining plan.
- viii. Quarry operation should be confined within the revised area of 158.86.5hect have been demarcated and shown in the modified mining plan.

- ix. The waste material generated during the course of quarrying should be dumped only within the lease hold area.
- x. The applicant company should produce latest no mining dues certificate in respect of other lease areas both major/minor mineral leases held by them before the execution of lease deed.
- xi. Quarrying should be restricted within the lease granted area and barbed wire fencing should be erected all along the boundary of the lease granted area before commencement of quarrying operation.
- xii. Quarrying should be carried out in scientific and systematic manner.
- xiii. If any mineral, other than Limekankar and Clay (Black Cotton Soil) is discovered while quarrying, the applicant shall not mine or dispose of such minerals and it should be intimated to the Government within 30 days from the date of discovery of such new mineral(s) as required under sub-rule (3) of Rule 36 of Tamil Nadu Minor Mineral Concession Rules, 1959.
- xv. The applicant company shall strictly adhere to the statutory and safety requirements.
- xvii. No quarrying operations and dumping of the mineral and waste shall be carried out in safety distances provided to the lease applied area.

Encl.: Approved Mining Plan.

[Signature]
Joint Director of Geology and Mining

Copy Submitted to:

The Additional Chief Secretary to Government (FAC),
Natural Resources Department,
Secretariat, Chennai - 600 009. (with ADMP)

Copy to:

- 1) The Director General of Mines Safety,
Lapis Lagoon, AA Block, Shanthi Colony,
Anna Nagar, Chennai. 600 040.
- 2) The Assistant Director,
Geology and Mining,
Virudhunagar District.
- 3) Stock file.

[Signature]
7/12/5

Doc - 4 Patta Copies (Part)

4/2/25, 1:03 PM

வட்டாட்சியர் அலுவலக இணைய சேவை - நில உரிமை விபரங்கள்



தமிழ்நாடு அரசு

வகவாய் மற்றும் பேரிடர் மேலாண்மைத் துறை

நில உரிமை விபரங்கள் : இ. எண் 10(1) பிரிவு

மாவட்டம் : விசுவநகர்

வட்டம் : அகப்புக்கோட்டை

வகவாய் இராமம் : மறவர்பெருங்குடி

பட்டா எண் : 1317

உரிமையாளர்கள் பெயர்

1. -- ... இராமகோசிமெண்டஸ் விமெட்ட

RCL Own Patta Lands in Maravarperungudi Village :

Patta No. 1179 : 607.41.30 Ha

Patta No. 1317 : 25.64.50 Ha.

RCL Own Patta Lands in T.Koppuchithampatti Village :

Patta No. 2241 : 435.41.87 Ha

Patta No. 2870 : 81.10.00 Ha

Patta No. 4127 : 17.49.00 Ha

Also, some of ICL Lands are exchanged with RCL Lands and registered.

4/2/25, 1:03 PM

வட்டாட்சியர் அலுவலக இணைய சேவை - நில உரிமை விபரங்கள்

புல எண்	உட்பிரிவு	புன்செய்		தன்செய்		மற்றவை		குறிப்புகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக்டர் - ஏர்	ரூ - பை	ஹெக்டர் - ஏர்	ரூ - பை	ஹெக்டர் - ஏர்	ரூ - பை	
109	5B	0 - 4.00	0.17	--	--	--	--	2018/0103/26/043738- Digitally signed: vijayalakshmi s Zonal Deputy Tahsildar 03/08/2018 04:20:13:PM
114	1	0 - 67.00	2.81	--	--	--	--	D2015/6549- Digitally signed: Rangasamy M Tahsildar 20/01/2016 09:23:48:PM
121	1B	0 - 7.00	0.29	--	--	--	--	2018/0103/26/040248- Digitally signed: vijayalakshmi s Zonal Deputy Tahsildar 03/07/2018 03:23:48:PM
122	4	0 - 49.00	2.04	--	--	--	--	2018/0103/26/040251- Digitally signed: vijayalakshmi s Zonal Deputy Tahsildar 03/07/2018 03:38:20:PM
132	1A	0 - 3.00	0.13	--	--	--	--	D2015/6549- Digitally signed: Rangasamy M Tahsildar 20/01/2016 09:26:22:PM
132	1B	0 - 82.50	3.43	--	--	--	--	D2015/6549- Digitally signed: Rangasamy M Tahsildar 20/01/2016 09:26:22:PM
132	1C	0 - 74.00	3.10	--	--	--	--	D2015/6549- Digitally signed: Rangasamy M Tahsildar 20/01/2016 09:26:22:PM

4/2/25, 1:03 PM

வட்டாட்சியர் அலுவலக இணைய சேவை - நில உரிமை விபரங்கள்

133	10	0 - 14.00	0.37	--	--	--	--	2019/0103/26/062110 ----- Digitally signed:DEVAMIRTHAM K Zonal Deputy Tahsildar 26/06/2019 03:50:21:PM
133	6	0 - 18.00	0.74	--	--	--	--	2018/0103/26/040255 ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 05/07/2018 04:06:02:PM
133	7	0 - 9.00	0.39	--	--	--	--	2018/0103/26/040256 ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 05/07/2018 04:18:29:PM
133	9	0 - 13.00	0.54	--	--	--	--	2018/0103/26/040257 ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 05/07/2018 04:37:07:PM
134	1	0 - 52.50	2.20	--	--	--	--	2018/0103/26/044189 ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 07/08/2018 05:00:46:PM
135	2A	0 - 46.50	1.96	--	--	--	--	D2015/6549----- Digitally signed:Rangasamy M Tahsildar 20/01/2016 09:26:22:PM
135	2B	0 - 47.00	1.96	--	--	--	--	2021/0103/26/109524 ----- Digitally signed:sonaiyan v Zonal Deputy Tahsildar 24/04/2021 03:46:15:PM
136	5	0 - 35.50	1.49	--	--	--	--	2018/0103/26/040259 ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 05/07/2018 03:48:47:PM

4/2/25, 1:03 PM

வட்டாட்சியர் அலுவலக இணைய சேவை - நில உரிமை விபரங்கள்

136	6	0 - 16.00	0.68	--	--	--	--	2018/0103/26/040259 ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 05/07/2018 03:48:47:PM
136	7	0 - 18.00	0.74	--	--	--	--	2018/0103/26/040259 ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 05/07/2018 03:48:47:PM
136	8	0 - 56.50	2.38	--	--	--	--	2018/0103/26/040260 ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 05/07/2018 04:43:16:PM
137	1	0 - 23.00	0.96	--	--	--	--	2019/0103/26/075900 ----- Digitally signed:DEVAMIRTHAM K Zonal Deputy Tahsildar 21/10/2019 12:05:01:PM
137	2	0 - 46.00	1.93	--	--	--	--	2018/0103/26/040261 ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 05/07/2018 04:19:38:PM
137	6	0 - 75.50	3.16	--	--	--	--	2018/0103/26/040295 ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 05/07/2018 03:58:41:PM
142	182	0 - 90.50	3.77	--	--	--	--	2018/0103/26/043738 ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 03/08/2018 04:20:13:PM
143	5A	0 - 26.50	1.10	--	--	--	--	2018/0103/26/040354 ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 05/07/2018 04:38:44:PM

254	3	2 - 68.00	11.19	--	--	--	2018/0103/26/040355- ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 05/07/2018 04:09:38:PM
258	8	0 - 25.50	1.06	--	--	--	2018/0103/26/043738- ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 03/08/2018 04:20:13:PM
262	10	0 - 19.00	0.79	--	--	--	2023/0103/26/201075- ----- Digitally signed:Jeyaraj K Zonal Deputy Tahsildar 16/07/2023 07:34:18:PM
304	2	0 - 46.50	1.94	--	--	--	2021/0103/26/109524- ----- Digitally signed:sonaiyan v Zonal Deputy Tahsildar 24/04/2021 03:46:15:PM
340	1	0 - 46.50	1.94	--	--	--	2018/0103/26/037752- ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 28/06/2018 12:46:36:PM
340	8	0 - 7.50	0.30	--	--	--	2018/0103/26/043738- ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 03/08/2018 04:20:13:PM
341	4	0 - 69.00	2.87	--	--	--	2022/0103/26/155559- ----- Digitally signed:Murugan P Zonal Deputy Tahsildar 09/06/2022 12:18:06:PM
345	10	0 - 65.00	2.72	--	--	--	2018/0103/26/040356- ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 05/07/2018 04:29:16:PM

2/25, 1:03 PM

வட்டாட்சியர் அலுவலக இலாபாய் செவை - நில உரிமை விபரங்கள்

345	11	0 - 62.50	2.60	--	--	--	2018/0103/26/040357- ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 05/07/2018 04:12:43:PM
345	18	0 - 64.00	2.69	--	--	--	2018/0103/26/043738- ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 03/08/2018 04:20:13:PM
346	4	0 - 47.00	1.96	--	--	--	2018/0103/26/042691- ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 02/08/2018 06:10:54:PM
346	5	0 - 45.50	1.89	--	--	--	2018/0103/26/040358- ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 05/07/2018 04:34:27:PM
347	1	0 - 33.50	1.40	--	--	--	2019/0103/26/061585- ----- Digitally signed:DEVAMIRTHAM K Zonal Deputy Tahsildar 02/05/2019 06:36:40:PM
348	2	0 - 78.00	3.26	--	--	--	2019/0103/26/061585- ----- Digitally signed:DEVAMIRTHAM K Zonal Deputy Tahsildar 02/05/2019 06:36:40:PM
348	3	0 - 35.50	1.49	--	--	--	2019/0103/26/061585- ----- Digitally signed:DEVAMIRTHAM K Zonal Deputy Tahsildar 02/05/2019 06:36:40:PM

பக்கம் 10001-10002

மூலக்கூறுகள் குடிநீர்வாங்கு இயந்திரம் மீட்டர் - நேரம் கட்டுப்பாடு செய்யப்பட்டது

350	1A	0 - 59.00	2.46	--	--	--	--	D2014/1762--- Digitally signed:Rangasamy M Tahsildar 20/01/2016 09:41:49:PM
350	1B	0 - 3.50	0.16	--	--	--	--	D2014/1762--- Digitally signed:Rangasamy M Tahsildar 20/01/2016 09:41:49:PM
350	3A	0 - 2.50	0.10	--	--	--	--	D2014/1762--- Digitally signed:Rangasamy M Tahsildar 20/01/2016 09:41:49:PM
350	3B	0 - 44.50	1.86	--	--	--	--	D2014/1762--- Digitally signed:Rangasamy M Tahsildar 20/01/2016 09:41:49:PM
353	1B	0 - 0.50	0.06	--	--	--	--	2018/0103/26/040359- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 05/07/2018 04:32:40:PM
354	2	0 - 25.50	1.06	--	--	--	--	2018/0103/26/046091- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 31/08/2018 05:14:22:PM
355	2B	0 - 10.00	0.42	--	--	--	--	2018/0103/26/046091- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 31/08/2018 05:14:22:PM
355	4	0 - 87.00	3.63	--	--	--	--	2018/0103/26/040301- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 05/07/2018 04:26:01:PM

பக்கம் 10001-10002

மூலக்கூறுகள் குடிநீர்வாங்கு இயந்திரம் மீட்டர் - நேரம் கட்டுப்பாடு செய்யப்பட்டது

355	7C	0 - 17.00	0.71	--	--	--	--	2018/0103/26/044033- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 03/08/2018 05:03:12:PM
382	2	0 - 20.50	0.06	--	--	--	--	D2015/6549--- Digitally signed:Rangasamy M Tahsildar 20/01/2016 09:44:26:PM
383	4	0 - 52.50	2.20	--	--	--	--	2018/0103/26/043738- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 03/08/2018 04:20:13:PM
410	5	0 - 75.00	3.13	--	--	--	--	D2015/6549--- Digitally signed:Rangasamy M Tahsildar 20/01/2016 09:47:01:PM
414	4	0 - 18.00	0.74	--	--	--	--	2018/0103/26/040256- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 05/07/2018 04:18:29:PM
414	8	0 - 21.00	0.88	--	--	--	--	2018/0103/26/044193- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 09/08/2018 05:59:34:PM
415	4	0 - 56.00	2.33	--	--	--	--	2021/0103/26/109887- Digitally signed:sonaiyan v Zonal Deputy Tahsildar 30/04/2021 06:16:01:PM
417	3	0 - 58.50	2.43	--	--	--	--	D2015/6549--- Digitally signed:Rangasamy M Tahsildar 20/01/2016 09:47:01:PM

2/25, 1:03 PM

வட்டாட்சியர் அலுவலக இணைய சேவை - நில உரிமை விபரங்கள்

418	8	0 - 89.50	3.77	--	--	--	--	2018/0103/26/040298- ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 05/07/2018 04:22:16:PM
422	5	0 - 14.00	0.59	--	--	--	--	2022/0103/26/155559- ----- Digitally signed:Murugan P Zonal Deputy Tahsildar 09/06/2022 12:18:06:PM
434	4A	0 - 2.50	0.10	--	--	--	--	D2014/1762--- ----- Digitally signed:Rangasamy M Tahsildar 20/01/2016 09:49:35:PM
434	4B	0 - 3.00	0.12	--	--	--	--	D2014/1762--- ----- நிலவியல்சாலை--- Digitally signed:Rangasamy M Tahsildar 20/01/2016 09:49:35:PM
435	2	0 - 50.50	2.11	--	--	--	--	2019/0103/26/065827- ----- Digitally signed:DEVAMIRTHAM K Zonal Deputy Tahsildar 08/07/2019 05:28:07:PM
442	3B	0 - 15.50	0.64	--	--	--	--	----- Digitally signed:Rangasamy M Tahsildar 20/01/2016 09:49:35:PM
451	6	0 - 2.00	0.08	--	--	--	--	2018/0103/26/040297- ----- Digitally signed:vijayalakshmi s Zonal Deputy Tahsildar 05/07/2018 04:42:04:PM
455	3A	0 - 43.00	1.80	--	--	--	--	D2015/6549--- ----- Digitally signed:Rangasamy M Tahsildar 20/01/2016 09:49:35:PM

4/2/25, 1:03 PM

வட்டாட்சியர் அலுவலக இணைய சேவை - நில உரிமை விபரங்கள்

522	3C	0 - 6.50	0.27	--	--	--	--	2019/0109/26/011265- ---பெயர் இருந்தும்--- Digitally signed:Vallikannu P Revenue Divisional Officer 23/01/2024 01:56:59:PM
		25 - 64.50	107.15					

குறிப்பு :

	1.	மேற்கண்ட தகவல் / சான்றிதழ் தகவல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் https://eservices.tn.gov.in என்ற இணைய தளத்தில் 26/06/063/01317/30332 என்ற குறிப்பு எண்ணை உள்ளிடு செய்து உறுதி செய்துகொள்ளவும்.
	2.	இத தகவல்கள் 02-04-2025 அன்று 01:02:15 PM நேரத்தில் அச்சடிக்கப்பட்டது.
	3.	கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

4/2/25, 1:05 PM

வட்டாட்சியர் அலுவலக இணைய சேவை - நில உரிமை விபரங்கள்



தமிழ்நாடு அரசு

வகுவாய் மற்றும் பேரிடர் மேலாண்மைத் துறை

நில உரிமை விபரங்கள் : இ. எண் 10(1) பிரிவு

மாவட்டம் : விசைநகர்

வட்டம் : அகப்புக்கோட்டை

வகுவாய் இராமம் : டி. கொப்புளித்தம்பட்டி

பட்டா எண் : 2870

உரிமையாளர்கள் பெயர்

1. -- -- மதராஸ் சிமெண்ட்ஸ் லிமிடெட்

2/25, 1:05 PM

வட்டாட்சியர் அலுவலக இணைய சேவை - நில உரிமை விபரங்கள்

புல எண்	உட்பிரிவு	புன்செய்		தன்செய்		மற்றவை		குறிப்புகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	
205	5	0 - 95.00	3.95	--	--	--	--	D2013139----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:55:56:AM
207	1A	0 - 82.00	3.43	--	--	--	--	D2013139----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:55:56:AM
209	2	0 - 58.50	2.45	--	--	--	--	D20131688----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:55:56:AM
209	3	0 - 33.50	1.40	--	--	--	--	D20131688----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:55:56:AM
210	1A	0 - 36.50	1.53	--	--	--	--	D20131688----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:55:56:AM
210	3B	0 - 50.00	2.09	--	--	--	--	D20131688----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:55:56:AM
214	3B	0 - 30.50	0.84	--	--	--	--	D2014/1018----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:55:56:AM
216	3	0 - 43.50	1.83	--	--	--	--	D2013139----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:55:56:AM

2/25, 1:05 PM

வட்டாட்சியர் அலுவலக இலணய சேவை - நில உரிமை விபரங்கள்

217	3A	0 - 46.00	1.93	--	--	--	--	D20131688--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:55:56:AM
220	5	0 - 34.00	1.42	--	--	--	--	D20131688--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:55:56:AM
221	2	0 - 22.50	0.95	--	--	--	--	D2013139--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:55:56:AM
222	2	0 - 53.00	2.21	--	--	--	--	D2013139--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:55:56:AM
226	5	0 - 64.50	1.78	--	--	--	--	D2014/1018--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:55:56:AM
229	1B	0 - 33.00	0.91	--	--	--	--	D2013139--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:55:56:AM
229	1C	0 - 33.00	0.91	--	--	--	--	D2013139--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:55:56:AM
231	1	0 - 59.00	1.64	--	--	--	--	D2014/1018--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:55:56:AM
232	1	0 - 59.00	1.64	--	--	--	--	--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:55:56:AM

2/25, 1:05 PM

வட்டாட்சியர் அலுவலக இலணய சேவை - நில உரிமை விபரங்கள்

232	3	0 - 58.50	1.61	--	--	--	--	D20131688--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:55:56:AM
248	2	0 - 54.50	1.51	--	--	--	--	D20131688--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:58:29:AM
248	4	0 - 28.50	0.78	--	--	--	--	D20131688--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:58:29:AM
248	6	0 - 30.50	0.84	--	--	--	--	D20131688--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:58:29:AM
248	7	2 - 87.50	7.96	--	--	--	--	D20131688--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:58:29:AM
249	1C	1 - 26.00	3.50	--	--	--	--	D1418/681--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:58:29:AM
249	2	0 - 17.50	0.48	--	--	--	--	D20131688--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:58:29:AM
249	3	0 - 18.00	0.50	--	--	--	--	D20131688--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:58:29:AM
249	4	0 - 44.00	1.22	--	--	--	--	D20131688--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:58:29:AM

2/25, 1:05 PM

வட்டாட்சியர் அலுவலக இலாபக்கேள்விகள் - நில உரிமை விபரங்கள்

253	4	0 - 46.00	1.28	--	--	--	--	D2013139----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:58:29:AM
259	1	0 - 28.00	0.78	--	--	--	--	D2013139----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:58:29:AM
259	6	1 - 41.00	3.90	--	--	--	--	D2013139----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:58:29:AM
260	2	1 - 27.00	3.52	--	--	--	--	D2013139----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:58:29:AM
262	1	0 - 74.50	2.06	--	--	--	--	D2013139----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:58:29:AM
264	4	1 - 36.50	3.77	--	--	--	--	Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:58:29:AM
269	4C	0 - 4.50	0.13	--	--	--	--	D2013139----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:58:29:AM
269	6	0 - 54.50	1.51	--	--	--	--	D2013139----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:58:29:AM
274	5	0 - 71.00	2.97	--	--	--	--	D20131688----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:58:29:AM

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274	6	0 - 65.00	2.70	--	--	--	--	D20131688----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:58:29:AM
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280	2	0 - 47.50	1.98	--	--	--	--	D20131688----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:58:29:AM
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298	7	0 - 81.50	3.41	--	--	--	--	D20131688----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 04:01:19:AM
391	4	0 - 42.00	1.76	--	--	--	--	D2013139----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 04:06:45:AM
391	5D	0 - 46.50	1.94	--	--	--	--	D2014/1018----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 04:06:45:AM
392	2	0 - 93.00	3.89	--	--	--	--	D20131688----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 04:06:45:AM

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வட்டாட்சியர் அலுவலக இணைய சேவை - நில உரிமை விபரங்கள்

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394	1B	0 - 60.00	2.49	--	--	--	--	D20131688----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 04:06:45:AM
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417	3	0 - 53.50	2.23	--	--	--	--	D2013139----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 04:09:20:AM
417	4	0 - 54.00	2.26	--	--	--	--	D20131069----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 04:09:20:AM

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வட்டாட்சியர் அலுவலக இணைய சேவை - நில உரிமை விபரங்கள்

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468	1B2	0 - 7.00	0.29	--	--	--	--	D20131068----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 04:16:02:AM
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505	3	1 - 4.50	4.36	--	--	--	--	D20131068----- Digitally signed:Rangasamy M Tahsildar 21/01/2016 04:18:34:AM
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537	7B	0 - 5.00	0.21	--	--	--	--	----- நிலவியல்சான்று--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 04:18:34:AM

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558	4B	0 - 34.50	1.45	--	--	--	--	D2014/1018--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 04:21:07:AM

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வட்டாட்சியார் குதுரவங்க இளைய சேனா - நில உரிமை விபரங்கள்

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659	6	0 - 69.00	2.88	--	--	--	--	Digitally signed:Rangasamy M Tahsildar 21/01/2016 04:26:09:AM
665	6	0 - 84.00	3.51	--	--	--	--	D2013139--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 04:26:09:AM
674	3	1 - 19.00	4.97	--	--	--	--	D20131068--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 04:26:09:AM
88	1A	0 - 5.50	0.14	--	--	--	--	D2013139--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:38:26:AM
88	1B	0 - 77.00	2.14	--	--	--	--	D2013139--- Digitally signed:Rangasamy M Tahsildar 21/01/2016 03:38:26:AM
		81 - 10.00	315.84					

DISTRICT SURVEY REPORT FOR LIMEKANKAR

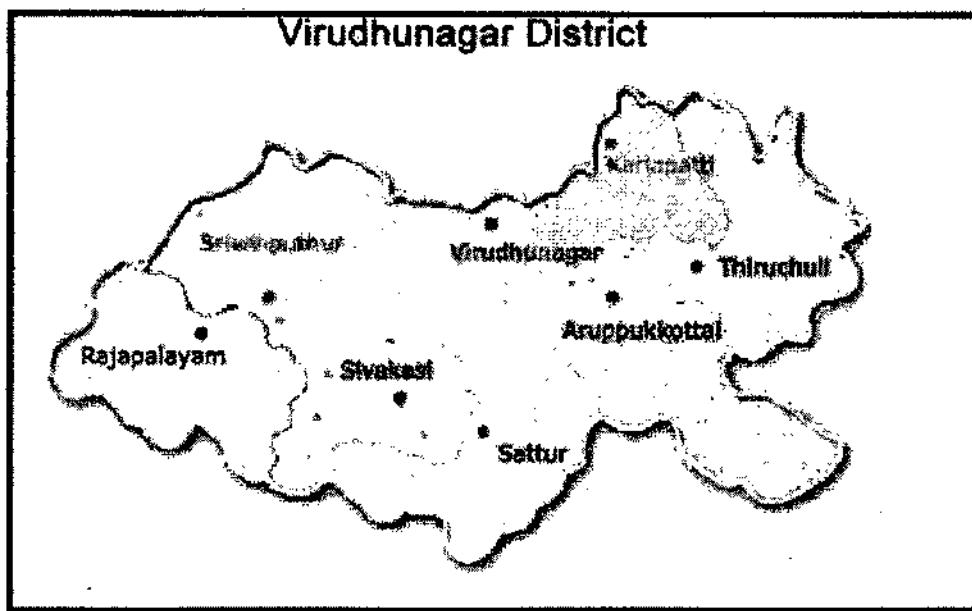
VIRUDHUNAGAR DISTRICT

TAMILNADU STATE

**(Prepared as per Gazette Notification S.O.3611 (E) dated 25.07.2018 of
Ministry of Environment, Forest and Climatic Change)**

1.INTRODUCTION

Virudhunagar District came into existence by the bifurcation of Ramanathapuram District vide State Government Notification, G.O. Ms. 347 dated 8.3.1985. It is bounded on North by Madurai and Sivagangai District, South by Tirunelveli and Tuticorin District, East by Ramanathapuram District, West by Kerala State and NorthWest by Theni District. The district headquarters is Virudhunagar town. It covers an area of 4232 sq.km. Virudhunagar District consists of 3 Revenue divisions namely Sivakasi, Aruppukottai and Sattur, 9 Taluks, namely Aruppukkottai, kariapatti, Rajapalayam, Sattur, Sivakasi, Srivilliputtur, Tiruchuli, Virudhunagar and Vembakottai, 39 Firkas and 600 Revenue Villages. It is located at on interactive map 11°00'N 77°28"E /12°N 78°50"E.



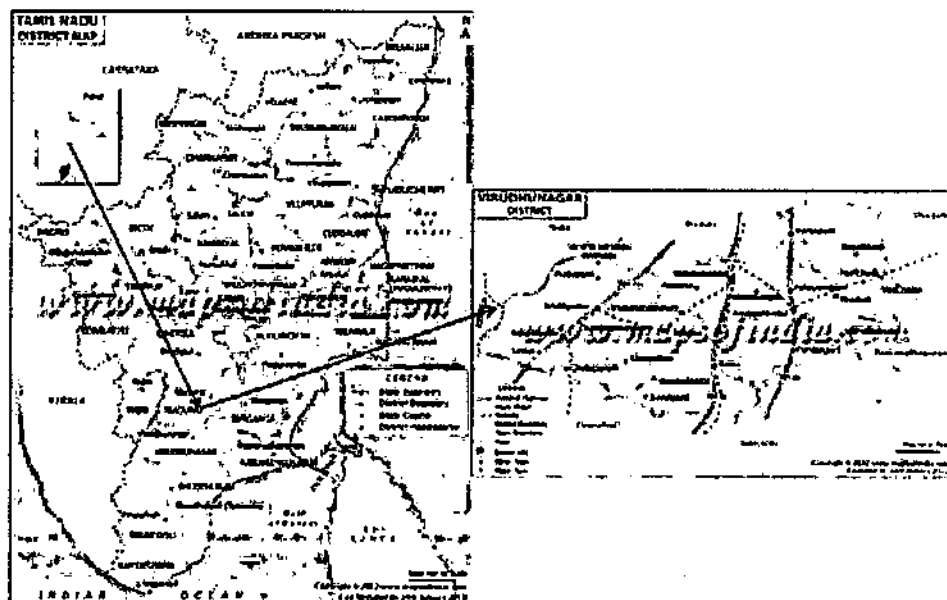
Virudhunagar is endowed with minor mineral resources like, granite (Leptynite), blue metal, gravel, brick soil, Limekankar, Clay (others) and sand deposit and the crystalline limestone is major mineral resource in the District. As a result of developmental activities and market demand for

carving out certain portions from Madurai and Tirunelveli Districts. The Government of Tamil Nadu decided to divide the large Districts into small Districts in order to ensure an effective and transparent administration. To fall in line with the above policy, the Government trifurcated the erstwhile Ramanthapuram District into Kamarajar District, Ramanathapuram District and Pasumpon District. Kamarajar District was formed on 15th July, 1984 and was named after the freedom fighter and former Chief Minister of Tamil Nadu, Sri. K. Kamaraj. The District started functioning on 15th March 1985. Subsequently the name of the district changed from Kamarajar to Virudhunagar on 1st July, 1997. Now, the District is functioning with Virudhunagar as its headquarters.

3.2 Location

The Virudhunagar District is located between 11°00' and 12°00' North Latitudes and 77°28' and 78°50' East Longitudes. It has an area of about 4243 square kilometers. It is bounded by the Western Ghats in West, Madurai District in North, Sivagangai District in North East, Ramanathapuram District in South-East and Thoothukkudi District in South. The location map of the Virudhunagar District is shown in Plate No 1.

PLATE NO: 1. LOCATION MAP OF VIRUDHUNAGAR DISTRICT



3.3 Area and Population

According to the Director of Statistics, Chennai, the Virudhunagar District covers an area of 4243 square kilometers or 1638 square miles. Virudhunagar District occupies the fifteenth rank among the Districts of the State of Tamil Nadu with regard to its size. The population of the District is 15,65,037. Of this total population, 7, 84,912 (50.15 per cent) are males and the remaining 7, 80,125 (49.85 per cent) are females.

3.4 Administrative Set-up

Virudhunagar District has been divided into three Revenue Divisions for administrative convenience, one at Sivakasi comprising Sivakasi and Srivilliputhur, the second one at Sattur covering Sattur, Rajapalayam and Vembakottai Taluks and the third one at Aruppukottai covering Aruppukottai, Kariapatti, Virudhunagar and Thiruchuli Taluks. It has 11 community development blocks namely, Rajapalayam, Sivakasi, Virudhunagar, Sattur, Aruppukottai, Vembakottai, Srivilliputhur, Watrap, Thiruchuli, Narikudi and Kariapatti. Seven municipalities namely, Aruppukottai, Virudhunagar, Sattur, Sivakasi, Srivilliputhur, Rajapalayam and Thiruthangal, 600 revenue villages, 464 village panchayats, 11 panchayat Unions and 10 town panchayats. It falls part of two parliamentary constituencies and seven assembly constituencies.

3.5 Agricultural Resources and Irrigation

Agriculture is the predominant occupation of the District. Nearly 66.3% of the total population of the District is dependent on agriculture and its allied occupations. The District is a drought prone District. The most striking feature of the District is the absence of dependable irrigation sources like perennial rivers.

Assured irrigation is available through wells only for 57 per cent. The remaining area is irrigated by rain fed tanks. The reservoirs namely Periyar and Kovilar at Pilavakkal in Watrap irrigate about 3000 hectares through 40 tanks. There are also a number of irrigation schemes like Anaikuttam, Kullursandai, Vembakottai and Golwarpatti. More than half of the total geographical area of the District is being utilized for cultivation and net

cultivated area amounts to 2,70,800 hectares. About 7.4 per cent of the cultivated area falls under double cropping; 5.82 per cent is covered by forests; 2.8 per cent is not suitable for cultivation. The permanent pasture and other fallow land constitute 15.67 per cent of the total area. Paddy, cumbu, sugarcane, groundnut, cotton, cholam, maize, ragi, varagu, plantain, samai, chillies, greengram, blackgram, horsegram, and gingelly are the important crops of the District. Paddy is the most predominant crop and it is cultivated in 27,892 hectares. Cotton is the next important crop grown in 38,859 hectares. Cotton is intensively cultivated in Rajapalayam, Srivilliputhur and Aruppukottai taluks. Teak and other trees are grown in some parts of the Western Ghats. The plains of Sattur taluk have black soil which is locally known as Karisal. This soil is suitable for cotton cultivation.

3.6 Trade and Commerce

Internal trade of the District is developing on a large scale. Fireworks, matches, polythene articles, litho-printed calendars, posters, diaries and the like are manufactured in Sivakasi. These products enter the markets situated in the different parts of the country. The products, which are produced in the District, have got insignificant local market. Market Committees are functioning in the District for the purchase and sale of cotton, groundnut, jaggery, chilli and other products.

A number of studies are held in the District at various places for helping the rural folk to purchase and sell their products such as food grain, vegetables, groceries, textiles, cattle.

There are two warehouses in this District, one at Virudhuangar and the other at Rajapalayam. The commodities of the chief wholesale trading in the District are pulses, cotton, groundnut and coffee (Virudhunagar block), cotton and groundnut (Rajapalayam block) and chillies (Sattur block).

4. GEOLOGY OF THE DISTRICT

The most of the area in Virudhunagar District is covered by a vast tract of black soil with residual hills and knolls. Since the area is covered by thick pediments, the geology of the area is studied in available exposure and quarry section opened up for limestone, dimension stone and blue metals for various purposes. The area exposes Khondalite Group of rocks and migmatite gneisses of Precambrian (V.R.Sowmi Narayanan, et al.). The Khondalite Group of rocks comprises Charnockite, crystalline limestone/calc gneiss, garnetiferous quartzofeldspathic gneiss (leptynite), all these litho units probably represent a sequence of metamorphosed sedimentary units of arenaceous, calcareous and argillaceous composition with various intermixtures of different proportions (V.R.Sowmi Narayanan, et al.). Granite and quartz veins form the younger intrusive.

4.1 Charnockite:

Generally, the Charnockite is grey to greenish colored, coarse to medium grained, greasy nature with or without garnet. Because of the limited outcrops, the quarry sections are studied to infer the various interrelationships between the litho units. Charnockite is interbanded nature with crystalline carbonate rocks are observed in most of the limestone quarry in Pandalgudi, Lakshmipuram, Gopalapuram villages (Field photograph. 1), suggested a metasedimentary origin for the charnockite (V.R.Sowmi Narayanan, et al.). Weathering of the Charnockite on the surface gives a deceptive look of gneiss and in the quarry sections at depth the fresh charnockite is exposed, which are well exemplified in almost all the Charnockite quarry sections. The specks of pyrites within the charnockite are seen in the Duraisampuram village. Banded charnockite is observed in Gopalapuram rough stone quarry (Field photograph. 2).

4.8 Limekankar

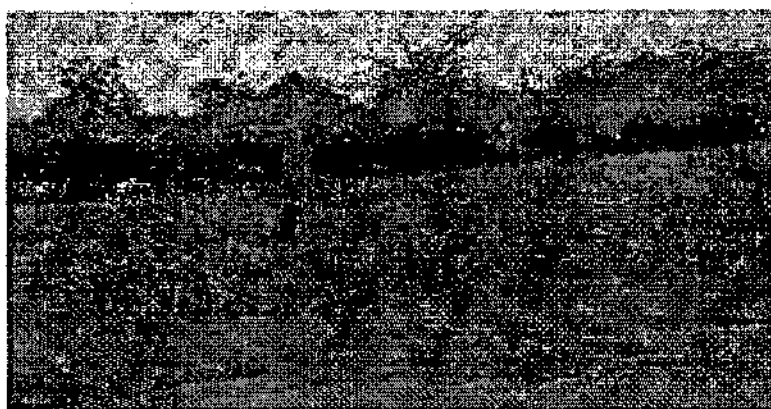
The Limekankar is found to be occurring in a vast stretch of area on the South of Aruppukottai Taluk, Virudhunagar District to Vilathikulam Taluk in Thoothukudi District. The deposits are all superficial, limited to depth of 1 to 2 meters. The Limekankar in this region is generally overlain by Clay. Limekankar is widely used for manufacturing burned lime and also being used for Cement Manufacturing. Limekankar deposit around Maravarperungudi village is currently being mined by Tvl. The Ramco Cements Limited, which is having around 38% CaO content. The estimated limekankar reserves of about 8 lacs tons for the average lime kankar thickness of 1.5 m. Potential deposits of Limekankar is also occurring in Kallurani, Muthuramalingapuram, Narttampatti, Sudhamadam, Vadakkunatham, Sallukuvarpatti, Velayuthapuram and T.Koppuchittampatti Villages of Aruppukottai Taluk. The average thickness of Limekankar deposit in these regions is 1.0 meters and the estimated Resources for ROM Kankar (Kankar plus intercalated clay) for each Square Kilometer is about 2 million Tonnes.



Field photograph 10. Limekankar overlain by Clay in Maravarperungudi Village of Aruppukottai Taluk.

4.9 Soil:

The area is mostly covered by black soil for 0 – 6m thickness, at places reddish in color where laterite formation are prominent as observed in gravel quarry in Kariapatti village. Moreover the black and red soil formations in the District are being quarried for manufacture of bricks and few good quality of black soil is using in cement industries (Field photograph. 11).



Field photograph 11. 2 to 3m thick black soil over calc gneissic rock in Seeniyapuram village.

4.10 Clay (Others)

A fine to silty clayey nature black soil (commonly known as black cotton soil) occurrence is identified in various parts of the District. The Clay layer is of 0 – 5m thickness and generally underlined by Limekankar or basement gneissic formation. This Clay deposit in the form of black cotton soil has a wide spread occurrence in the District. The clay is rich in Alumina and occurring in Kallurani, Muthuramalingapuram, Narttampatti, Sudhamadam, Vadakkunatham & T.Koppuchittampatti Villages of Aruppukottai Taluk.

5. DRAINAGE OF IRRIGATION PATTERN

5.1 Drainage

The major part of Virudhunagar District falls in Vaippar – Gundar river basin. Vaippar, Arjuna River, and the important rivers. The drainage pattern, in general, is dendritic. All the rivers are seasonal and carry substantial flows during monsoon period. Vaippar, which is one of the important rivers of the District, flow and drain in the vembakkam and Sattur blocks. The Arjuna River, flowing in the central part of the District, has its origin from the Sattur Watrap Hills and is formed by Kovillar, periyar and Chittar rivers. The Gundar River originates at an altitude of 500m. A msl near Kottaimalai of Sattur reserve forest in Varushanadu hills in Madurai District.

5.2 Irrigation practices:

The nine- fold land use classification (2005-06) for the District is given below.

S.No	Classification	Area (Ha)
1	Forests	26466
2	Barren & Uncultivable lands	4525
3	Land put to non-agricultural uses	70286
4	Cultivable waste	9663
5	Permanent pastures & other grazing lands	804
6	Groves not included in the area sown	6568
7	Current Fallows	3063
8	Other fallow lands	160066
9	Net Area sown	142882
	Total	424323

The chief irrigation sources in the area are the tanks, wells and tube/bore wells. Reservoirs and Tank irrigation is highest in Srivalliputtur, Thiruchuli and Kariyapatti blocks followed by Aruppukottai, Rajapalayam, Sivakasi,

Sattur, and Virudhunagar blocks.

The block – wise and source – wise net area irrigated (2005-06) (in Ha) is given below

S.No	Block	Canals	Tanks	Tube/ Bore wells	Ordinary wells	Other Sources	Total Net Area Irrigated
1	Srivilliputtur	0	1056	4211	439	0	5706
2	Watrap	0	1259	1983	4017	0	7259
3	Rajapalayam	32	2581	2794	1848	15	7270
4	Virudhunagar	98	289	6517	4679	0	11583
5	Sathur	0	650	1417	881	0	2498
6	Aruppukottai	7	481	764	3192	0	4444
7	Thiruchuli	20	1307	769	4678	0	6774
8	Narikudi	253	275	2881	1006	0	4415
9	Kariyapatti	313	1822	484	407	813	3839
10	Sivakasi	28	4756	7797	721	358	13660
11	Vembakottai	0	315	1716	524	93	2666
	Total	751	14791	31333	22410	1279	70564

6. LAND UTILISATION PATTERN IN THE DISTRICT: FOREST, AGRICULTURAL, HORTICULTURAL, MINING ETC.;

The land areas of Virudhunagar District are classified in to forest (Evergreen, Deciduos, Scrub, Swamp etc.), agricultural land (crop, plantation and fallow), wet land (River, lake, Dam etc.), buildup land (urban, rural and mining) and barren land. The forest lands are confined to the North-Western part of the District and the major part of the land is used for agricultural purpose. Vaippar, Gundar and Arjuna rivers are contributing to wet land classification. The land use statistics with reference to Virudhunagar District are furnished below.

Sl.No	Land Classification	Area in Ha	Percentage
1.	Forest	26466	6.24
2.	Uncultivable waste	4525	1.07
3.	Land put to Non- Agricultural use	70286	16.56
4.	Cultivable waste	9663	2.28
5.	Permanent pastures / grazing lands	864	0.19
6.	Land under miscellaneous tree crops	6568	1.55
7.	Current fallow	3063	0.72
8.	Other fallow	160066	37.72
9.	Net area zone	142882	33.67
10.	Area sown more than once	5961	1.40
11.	Gross cropped area	148843	35.08
12.	Geographical areas	424323	100.00

The land use and land cover map of Virudhunagar District, source from <http://Bhuvan.nrsc.gov.in/gis/thematic/index.php> is shown in (Plate No: 2).

7. SURFACE WATER AND GROUND WATER SCENARIO OF THE DISTRICT

7.1 Ground Water Scenario

Hydrogeology

The District is underlain by both porous and fissured formation Unconsolidated & Semi – consolidated formation and Weathered, Fissured and fractured crystalline rocks constitute the important aquifer systems in the District.

The porous formations in the District include sandstones and clays of Recent to sub- recent and Tertiary age (Quaternary). The alluvial formations comprising mainly sands, clays and gravels are confined to major drainage course in the District. The maximum thickness of alluvium is 35.0 m. whereas

the average thickness is about 25.0 m. ground water occurs under phreatic to dug wells and filter points. Alluvium, which forms a good aquifer system along the vaippar and Gundar river bed, which is one of the major source of water supply to the villages.

The water – bearing properties of crystalline formations, which lack primary porosity, depend on the extent of development of secondary intergranular porosity. The occurrence and movement of ground water in these rocks are generally confined to such spaces. These aquifers are highly heterogeneous in nature due to variation in lithology, texture and structure features even within short distances. Ground water generally occurs under phreatic conditions in the weathered mantle and under semi- confined conditions in the fissured and fractured zones at deeper levels.

The thickness of weathered zone in the District is in range of 4 to 15 m. the depth of dug wells ranged from 10 to 15 m bgl. The yield of large diameter wells in the District, tapping the weathered mantle of crystalline rocks from 40 to 110 lpm and are able to sustain pumping for 2 to 6 hours per day. The specific capacity of large diameter wells tested in crystalline rocks range from 6.26 to 183.8 lpm / m. of drawdown. The yield characteristics of wells vary considerably depending on the topographic set- up, lithology and nature of weathering.

The yield of bore wells drilled down to a depth of 40 to 70 m. by various state agencies mainly for domestic purposes ranged from 10 to 250 lpm. The yield of successful bore wells ranged up to 6 lps for the drawdown varying between 5.76 and 17.56 m drilled down to a depth of 200 m bgl during the ground water exploration programme of central Ground Water Board.

The depth to water level in the District varied between 0.67 and 12.12 m bgl during pre- monsoon (May 2006) and varied between 0.49 and 8.78 m bgl during post monsoon (Jan 2007). The seasonal fluctuation shows a rise in water level which ranges from 0.35 to 2.8 m. the piezometric head varied between 3.49 and 16.23 m bgl during pre monsoon (May 2006) and 1.29 and 8.06 m bgl during post monsoon (Jan 2007).

Long Term Fluctuation (1998 – 2007):

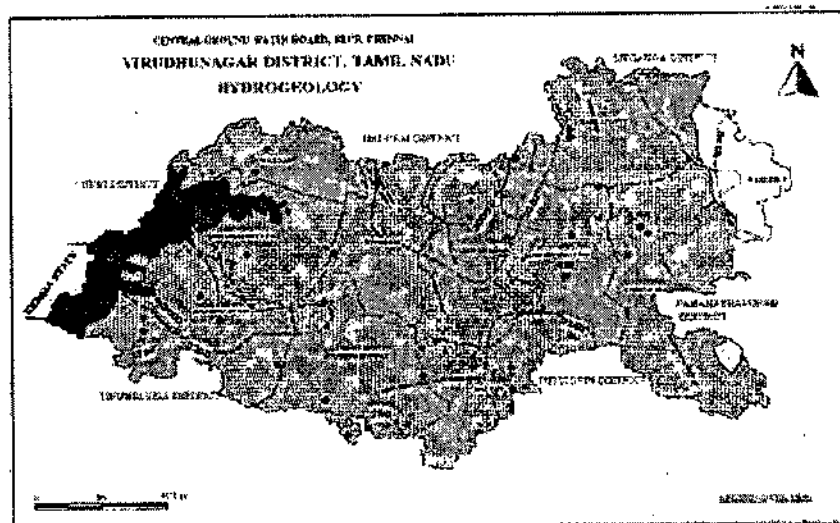
The long term water level fluctuation for the 1998 -2007 is indicates rise in water level in the range of 0.0009 – 0.3944 m/year. The fall in water level ranging between 0.0635 and 0.2693 m/year.

Aquifer parameters:

Formation	Transmissivity (m ² / day)	Storativity	Specific Yield (%)
Weathered Crystallines	-	-	<2
Fractured	1-548	3.41×10^{-5} to	-
Crystallines		7.0×10^{-3}	

Ground water resources:

The ground water resources have been computed jointly by central Ground Water Board and State Ground & surface water Resources and Data center (PWD, WRO, and Government of Tamil Nadu) as on 31st March 2004. The salient features of the computations are furnished below. The computation of ground water resources available in the District has been done using GEC 1997 methodology.



Block	Net Groundwater Availability (M.Cu.m)	Existing Gross Draft for Irrigation (M.Cu.m)	Existing Gross Draft for Domestic and industrial water supply (M.Cu.m)	Existing Gross Draft for all uses (M.Cu.m)	Allocation for Domestic and Industrial Requirement supply upto next 25 years (2029) (M.Cu.m)	Net groundwater Availability for future Irrigation Development (M.Cu.m)	Stage of Groundwater Development (%)	Category of Block
Srivilliputtur	45.30	36.89	20.40	38.93	23.3	62.8	86	Semi Critical
Warrap	52.27	49.03	25.80	51.6	26.8	0.5	99	Critical
Rajapalayam	67.37	65.48	20.2	67.5	21.1	-	100	Over
Virudhunagar	36.17	14.20	30.4	17.24	31.7	18.80	48	Safe
Sathur	26.13	87.60	19.30	10.69	20.1	15.36	41	Safe
Aruppukottai	26.33	86.30	18.00	10.43	18.8	15.82	40	Safe
Thiruchuli	47.35	19.87	18.00	21.66	18.7	25.61	46	Safe
Nazikudi	59.86	25.94	16.8	27.62	17.5	32.16	46	Safe
Kariyapatti	50.36	25.93	19.1	27.84	20.0	22.43	55	Safe
Sivakasi	31.82	18.85	46.30	23.48	48.3	8.1	74	Semi Critical
Vembakottai	26.82	13.14	23.7	15.51	24.7	11.22	58	Safe
Total	469.78	443.23	258.00	312.5	271.00	212.67	66.52	

Ground water quality:

The chemical characteristics of ground water in the phreatic zone in Virudhunagar District has been studied using the analytical data of ground water samples collected from Ground water monitoring wells of Central Ground Water Board. The study of quality of ground water in deeper aquifers in the District has been attempted using the data collected from exploratory bore/tube wells constructed in the District. Ground water in phreatic aquifers in Virudhunagar District, in general, is colorless, odourless and slightly alkaline in nature. The specific electrical conductance of ground water in phreatic zone (in Micro Seimens at 250 C) during May 2006 was in the range of 409 to 4350 in the District. It is between 750 μ S/Cm at 250 C in the major part of the District. Conductance below 750 μ S/Cm at 250 C have been observed in ground water in parts of Sathur and Watrap blocks, whereas conductance exceeding 2250 μ S/Cm at 250 C have been observed in part of Rajapalayam and Virudhunagar blocks.

It is observed that the ground water is suitable for drinking and domestic uses in respect of all the constituents except Total Hardness and Nitrate. Total hardness as CaCO₃ is observed to be in excess of permissible limits of treating water standard of BU in about 49 percent of samples analyzed whereas Nitrate is found in excess of 45 mg/l in about 30 percent samples

of available groundwater resources in the District. The yields of dug wells in crystalline and Tertiary formations can be improved at favorable locations by construction of extension bores and radial arms respectively to a length of 20-30 m. In recent years, farmers for irrigation purposes have also drilled a large number of bore wells. The development of ground water for irrigation in the District is mainly through dug wells tapping the weathered residuum or recent alluvial deposits. Bore wells have also become popular as the source for irrigation in the District in recent years. Dug wells with extension bores wherever necessary is ideal for hard rock areas whereas large diameter dug wells with radials is suitable for alluvial areas.

Water conservation and artificial recharge:

CGWB had prepared a master plan to augment groundwater potential by saturating the shallow aquifer taking into consideration the available unsaturated space during post monsoon and available uncommitted surplus run off. Subsequently, computations have been made for Drought Prone Area Program (DPAP) for over exploited and critical blocks in the Districts warranting immediate attention. Institute of Remote Sensing, Anna University had prepared block wise maps demarcating potential zones for artificial recharge for the State of Tamil Nadu. Subsequently, State Government agencies have constructed artificial recharge structures with their own fund or with fund from Central Government, dovetailing various government programs. Ministry of Water Resources, Government of India has initiated Dug Well Recharge Scheme in the State. The scheme is being implemented by the Nodal Department (SG&SWRDC, PWD, WRO, and Government of Tamil Nadu) with the technical guidance of CGWB. The subsidy of Rs. 4000/- for small and marginal farmers and Rs. 2000/- for the other farmers is credited to the beneficiaries' bank account through NABARD. The scheme after implementation will prove to be beneficial to the irrigation sector. The available uncommitted surplus run off has to be recomputed, taking into consideration the quantum of recharge effected through existing irrigation dug wells also. The existing structures and uncommitted surplus flow should be considered for further planning of artificial recharge program.

10. DETAILS OF ROYALTY OR REVENUE RECEIVED IN LAST THREE YEARS

Year	Royalty (in Lakhs Rs)	DMF (in Lakhs Rs)	NMET (in Lakhs Rs)
2015-16	388.16	77.76	1.83
2016-17	570.06	171.02	4.55
2017-18	658.74	197.62	5.34

11. DETAILS OF PRODUCTION OF LIMEKANKAR IN LAST THREE YEARS

Year	Lime kankar Production (Lakhs Ts)
2015-16	4.85
2016-17	7.12
2017-18	8.24

13.LIST OF LETTER OF INTENT (LOI) HOLDERS FOR LIMEKANKAR IN THE DISTRICT ALONG WITH ITS VALIDITY AS PER THE FOLLOWING FORMAT

Sl. No.	Name of the Mineral	Name of the Lessee	Address & Contact No. of Letter of Intent Holder	Letter of Intent Grant Order No. & date	Area of mining lease to be allotted	Validity of Loi	Use (Captiv e/ Non-Captive)	Location of the Mining lease (Latitude & Longitude)
1	2	3	4	5	6	7	8	9
1	Limekankar & Clay (others)	The Ramco Cements Limited	5th Floor, Auras Corporate Centre, Chennai - 600004 Ph: 044-28478666	Lr.No.14547/M MC.2/2016-1 dated 21.04.2017	498.870 Ha	-	Captive	N9°19'42" to N9°21'38" E78°10'03" to E78°12'39"
2	Limekankar & Clay (others)	The Ramco Cements Limited	5th Floor, Auras Corporate Centre, Chennai - 600004 Ph: 044-28478666	Ltr No. 14546/MMC.2/2 016-1, dt. 21.04.2017	23.290 Ha	-	Captive	N9°23'43" to N9°24'00" E78°09'37" to E78°10'05"
3	Limekankar & Clay (others)	The India Cements Limited	827, Dhun Building, Anna Salai, Chennai - 600 002. Ph: 0462 2300221	Lr. No. 16025/MMC.2/2 016-1 dated 23.05.2017	479.195 Ha	-	Captive	N9°25'32.9" to N9°27'10.7" E78°07'55.5" to E78°09'28.7"
4	Limekankar & Clay (others)	The Ramco Cements Limited	5th Floor, Auras Corporate Centre, Chennai - 600004 Ph: 044-28478666	Ltr No. 2171/MMC.2/20 18-1 dt. 02.04.2018	158.865 Ha	-	Captive	N9°23'24" to N9°24'05" E78°09'07" to E78°10'42"
5	Limekankar & Clay (Black Cotton Soil)	The Ramco Cements Limited	5th Floor, Auras Corporate Centre, Chennai - 600004 Ph: 044-28478666	Lr.No.2169/MM C.2/2018-1 dated 02.04.2018	123.265 Ha	-	Captive	N9°19'04" to N9°20'07" E78°12'32" to E78°13'38"
6	Limekankar & Clay (Black Cotton Soil)	The Ramco Cements Limited	5th Floor, Auras Corporate Centre, Chennai - 600004 Ph: 044-28478666	Lr.No.1769/MM C.2/2018 dated 12.03.2018	294.185 Ha	-	Captive	N9°26'08" to N9°24'33" E78°06'42" to E78°08'03"

14. TOTAL LIMEKANKAR RESERVE AVAILABLE IN THE DISTRICT

Sl. No.	Name of Lessee/ Lol Holder	Villages	Taluk	Limekankar Geological Reserves (Million Ts)
1	The Ramco Cements Limited	Suddhamadam	Aruppukottai	13.72
2	The Ramco Cements Limited	Marvarperungudi	Aruppukottai	0.64
3	The India Cements Limited	Kallurani, Muthuramalingapuram & Narttampatti Villages	Aruppukottai	9.58
4	The Ramco Cements Limited	Marvarperungudi & T.Koppuchittampatti	Aruppukottai	4.37
5	The Ramco Cements Limited	Vadakkunatham	Aruppukottai	3.39
6	The Ramco Cements Limited	T.Koppuchittampatti	Aruppukottai	8.09
7	The Ramco Cements Limited	Suddhamadam & Salukkuvarpatti	Aruppukottai	1.11

15. QUALITY /GRADE OF MINERAL AVAILABLE IN THE DISTRICT

The general chemical composition of the Limekankar available in the District is given below

CaO	- 35 % to 40%
SiO ₂	- 16 % to 22 %
MgO	- 01 % to 04 %
Al ₂ O ₃	- 03 % to 05 %
Fe ₂ O ₃	- 01 % to 03 %

16. USE OF MINERAL

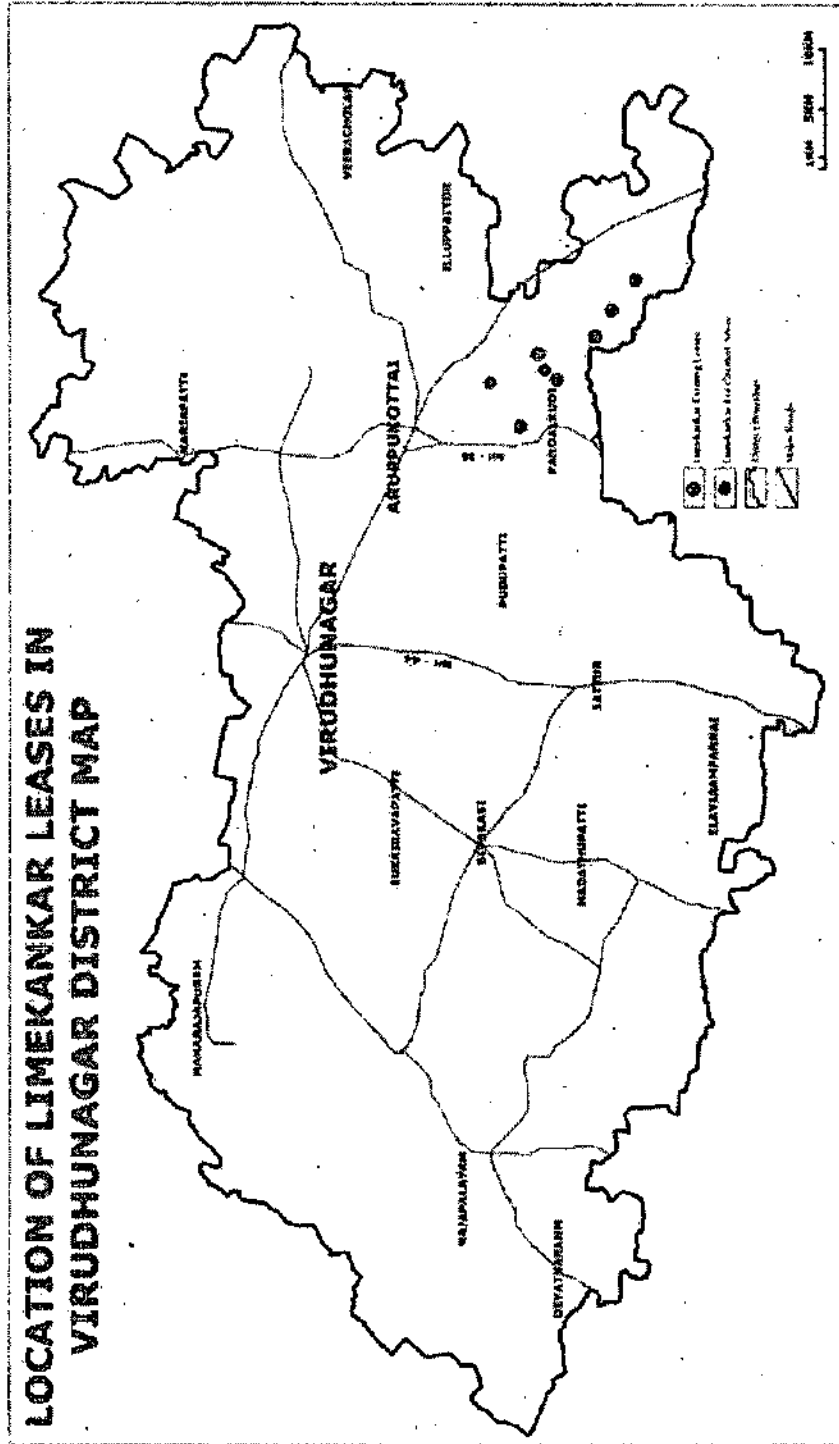
The Limekankar available in the District is mainly used as a raw material for manufacturing of Cement.

17. DEMAND AND SUPPLY OF LIMEKANKAR IN THE LAST THREE YEARS

Year	2015-16	2016-17	2017-18
Demand (Lakh Ts)	7.9	8.8	10.3
Supply (Lakh Ts)	4.85	7.12	8.24

18. MINING LEASES (LIMEKANKAR) MARKED ON THE MAP OF THE DISTRICT

LOCATION OF LIMEKANKAR LEASES IN
VIRUDHUNAGAR DISTRICT MAP



19. DETAILS OF THE AREA OF WHERE THERE IS A CLUSTER OF MINING LEASES VIZ. NUMBER OF MINING LEASES, LOCATION (LATITUDE AND LONGITUDE)

Sl.No	Name of the Mineral	Letter of Intent Grant Order No. & Date	Area of mining lease to be allotted (Ha)	Village	Taluk	District	Limekankar Geological Reserves (Mil.Tons)	Use (Captive/ non-captive)	Location of mining lease (Latitude & Longitude)
1	2	3	4	5	6	7	8	9	10
1	Lime kankar	Ltr No. 14546/MMC.2/2016-1, dt. 21.04.2017 & Ltr No. 2171/MMC.2/2018-1, dt. 02.04.2018	23.29.0	Maravarperungudi	Aruppukottai	Virudhunaga	0.64	Captive	Lat: 9°23'43" N to 9°24'00" N Long: 78°09'37" E to 78°10'05" E
			158.865	Maravarperungudi & T.Koppuchithampatti	Aruppukottai	Virudhunaga	4.37		Lat: 9°23'24" N to 9°24'05" N Long: 78°09'07" E to 78°10'42" E
		Ltr No. 14547/MMC.2/2016-1, dt. 21.04.2017	498.87.0	Suddhamadam	Aruppukottai	Virudhunaga	13.72	Captive	Lat: 9°19'42" N to 9°21'38" N Long: 78°10'03" E to 78°12'39" E
2	Lime kankar	Ltr No. 2169/MMC.2/2018-1 dated 02.04.2018	123.26.5	Vadakkunatham	Aruppukottai	Virudhunaga	3.39		Lat: 9°19'04" N to 9°20'07" N Long: 78°12'32" E to 78°13'38" E

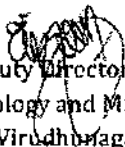
**26. PLANTATION AND GREEN BELT DEVELOPMENT IN RESPECT OF LEASES
ALREADY GRANTED IN THE DISTRICT**

It is necessary to develop Green Belt in and around the polluted site with suitable species to reduce the air pollution effectively. Implementation of afforestation program is of paramount importance. In addition to augmenting existing vegetation, it also checks soil erosion, make the ecosystem more complex and functionally more stable and make the climate more conducive.

Limekankar deposits being shallow in depth, mining and simultaneous backfilling method is being followed in most of the mining areas. The plantation is proposed and is being carried out in the safety barrier areas and also in the minedout and backfilled areas. Plantation is proposed in minimum 33% of the total lease area. There are around 1,56,000 trees has been planted in the existing mining areas in the District.

27. ANY OTHER INFORMATION

Nil


Deputy Director (i/c),
Geology and Mining,
Virudhunagar.

75

Chairperson / District Collector,
District Environment Impact Assessment Authority,
Virudhunagar.

DISTRICT SURVEY REPORT FOR CLAY (OTHERS)

VIRUDHUNAGAR DISTRICT

TAMILNADU STATE

(Prepared as per Gazette Notification S.O.3611 (E) dated 25.07.2018 of
Ministry of Environment, Forest and Climatic Change)

9. DETAILS OF THE MINING LEASES IN THE DISTRICT AS PER THE FOLLOWING FORMAT

Sl. No.	Name of the Mineral	Name of the lessee	Address & Contact Number of Lessee	Mining Lease grant order No. & date	Area of mining lease (Ha)	Period of mining lease (Initial)			Period of mining lease (1 st / 2 nd renewal)		Date of commencement of mining operation	Status (working/ non-working/ I emp. Working for despatch, etc)	Captive / non-captive	Obtained Environmental clearance (Yes/No) if yes letter No. with date of grant of EC	Location of mining lease (Latitude & Longitude)	Method of mining (open cast/ under ground)
						From	To		From	To						
1	2	3	4	5	6	7	8		9	10	11	12	13	14	15	16
1	Lime kankar and Clay	The Ramco Cements Limited	The Ramco Cements Limited, V floor, Auras Corporate Centre, 98-A, Dr. Radhakrishnan Road, Mylapore, Chennai -600 004. Phone: 044-28478666	Lr.No. 15823/MM 3/2002 dt.24.11.2010	198.51.5	11-3-2011	10-3-2041		NA	NA	05-09-2011	Working	Captive	Yes. Ltr.No. J-11015/69/2008-1A.II (M) dt. 26-03-2009	Latitudes 9°21'00"N to 9°22'00"N Longitudes 78°09'00"E to 78°11'00" E	Open cast

10.DETAILS OF ROYALTY OR REVENUE RECEIVED IN LAST THREE YEARS

Year	Royalty (in Rs.)	DMF (in Rs.)	NMET (in Rs.)
2015-16	6,00,000	1,80,000	Not applicable
2016-17	8,00,000	2,40,000	Not applicable
2017-18	4,00,000	1,20,000	Not applicable

11.DETAILS OF PRODUCTION OF CLAY (OTHERS) IN LAST THREE YEARS

Year	Clay Production (Tonnes)
2015-16	30000
2016-17	40000
2017-18	20000

**13. LIST OF LETTER OF INTENT (LOI) HOLDERS FOR
LIMEKANKAR/CLAY(OTHERS) IN THE DISTRICT ALONG WITH ITS VALIDITY
AS PER THE FOLLOWING FORMAT**

Sl. No.	Name of the Mineral	Name of the Lessee	Address & Contact No. of Letter of Intent Holder	Letter of Intent Grant Order No. & date	Area of mining lease to be allotted	Validity of Loi	Use (Captive/ Non-Captive)	Location of the Mining lease (Latitude & Longitude)
1	2	3	4	5	6	7	8	9
1	Limekankar & Clay (others)	The Ramco Cements Limited	5th Floor, Auras Corporate Centre, Chennai - 600004 Ph: 044-28478666	Lr.No.14547/MMC.2/2016-1 dated 21.04.2017	498.870 Ha	-	Captive	N9°19'42" to N9°21'38" E78°10'03" to E78°12'39"
2	Limekankar & Clay (others)	The Ramco Cements Limited	5th Floor, Auras Corporate Centre, Chennai - 600004 Ph: 044-28478666	Ltr.No. 14546/MMC.2/2016-1, dt. 21.04.2017	23.290 Ha	-	Captive	N9°23'43" to N9°24'00" E78°09'37" to E78°10'05"
3	Limekankar & Clay (others)	The India Cements Limited	827, Dhun Building, Anna Salai, Chennai - 600 002. Ph: 0462 2300221	Lr. No. 15025/MMC.2/2016-1 dated 23.05.2017	479.195 Ha	-	Captive	N9°25'32.9" to N9°27'10.7" E78°07'55.5" to E78°09'28.7"
4	Limekankar & Clay (Black Cotton Soil)	The Ramco Cements Limited	5th Floor, Auras Corporate Centre, Chennai - 600004 Ph: 044-28478666	Ltr No. 2171/MMC.2/2018-1 dt. 02.04.2018	158.865 Ha	-	Captive	N9°23'24" to N9°24'05" E78°09'07" to E78°10'42"
5	Limekankar & Clay (Black Cotton Soil)	The Ramco Cements Limited	5th Floor, Auras Corporate Centre, Chennai - 600004 Ph: 044-28478666	Lr.No.2169/MMC.2/2018-1 dated 02.04.2018	123.265 Ha	-	Captive	N9°19'04" to N9°20'07" E78°12'32" to E78°13'38"
6	Limekankar & Clay (Black Cotton Soil)	The Ramco Cements Limited	5th Floor, Auras Corporate Centre, Chennai - 600004 Ph: 044-28478666	Lr.No.1769/MMC.2/2018 dated 12.03.2018	294.185 Ha	-	Captive	N9°26'08" to N9°24'33" E78°06'42" to E78°08'03"

14. TOTAL CLAY(OTHERS) RESERVE AVAILABLE IN THE DISTRICT

Though the entire district is abundant with topsoil clay, the reserves of the area applied for Quarry lease in part of Aruppukottai Taluk is tabulated below.

Sl. No.	Name of Lessee/ Lot Holder	Villages	Taluk	Clay (Others) Geological Reserves (Million Ts)
1	The Ramco Cements Limited	Suddhamadam	Aruppukottai	9.20
2	The Ramco Cements Limited	Marvarperungudi	Aruppukottai	0.48
3	The India Cements Limited	Kallurani, Muthuramalingapuram & Narttampatti Villages	Aruppukottai	10.78
4	The Ramco Cements Limited	Marvarperungudi & T.Koppuchittampatti	Aruppukottai	3.34
5	The Ramco Cements Limited	Vadakkunatham	Aruppukottai	2.59
6	The Ramco Cements Limited	T.Koppuchittampatti	Aruppukottai	6.18
7	The Ramco Cements Limited	Suddhamadam & Salukkuvarpatti	Aruppukottai	2.95

15. QUALITY /GRADE OF MINERAL AVAILABLE IN THE DISTRICT

The general chemical composition of the Clay available in the District is given below

Al ₂ O ₃	- 12 % to 15 %
Fe ₂ O ₃	- 07 % to 12 %
CaO	- 07 % to 11%
SiO ₂	- 50 % to 55 %
MgO	- 03 % to 08 %

16. USE OF MINERAL

The Clay available in the district is mainly used as an additive/corrective material for manufacturing of Cement.

17. DEMAND AND SUPPLY OF CLAY (OTHERS) IN THE LAST THREE YEARS

Year	2015-16	2016-17	2017-18
Demand (Lakh Ts)	0.47	0.47	0.47
Supply (Lakh Ts)	0.30	0.40	0.20

19. DETAILS OF THE AREA OF WHERE THERE IS A CLUSTER OF MINING LEASES VIZ. NUMBER OF MINING LEASES, LOCATION (LATITUDE AND LONGITUDE)

Sl.No	Name of the Mineral	Letter of Intent Grant Order No. & Date	Area of mining lease to be allotted (Ha)	Village	Taluk	District	Clay (Others) Geological Reserves (Mill.Tons)	Use (Captive/ non-captive)	Location of mining lease (Latitude & Longitude)
1	2	3	4	5	6	7	8	9	10
1	Lime Kankar and Clay (Others/ Black Cotton Soil)	Ltr No. 14546/MMC.2/ 2016-1, dt. 21.04.2017 & Ltr No. 2171/MMC.2/2 018-1 dt. 02.04.2018	21.29.0	Maravarperungudi	Aruppukottai	Virudhunaga	0.48	Captive	Lat: 9°23'43" N to 9°24'00" N Long: 78°09'37" E to 78°10'05" E
			158.865	Maravarperungudi & T.Koppuchathampatti	Aruppukottai	Virudhunaga	3.34		Lat: 9°23'24" N to 9°24'05" N Long: 78°09'07" E to 78°10'42" E
2	Lime Kankar and Clay (Others/ Black Cotton Soil)	Ltr No. 14547/MMC.2/ 2016-1, dt. 21.04.2017 & Ltr No. 2169/MMC.2/2 018-1 dated 02.04.2018	498.87.0	Suddhamadam	Aruppukottai	Virudhunaga	9.19	Captive	Lat: 9°19'42" N to 9°21'38" N Long: 78°10'03" E to 78°12'39" E
			123.26.5	Vadakkunatham	Aruppukottai	Virudhunaga	2.59		Lat: 9°19'04" N to 9°20'07" N Long: 78°12'32" E to 78°13'38" E

**26. PLANTATION AND GREEN BELT DEVELOPMENT IN RESPECT OF LEASES
ALREADY GRANTED IN THE DISTRICT**

It is necessary to develop Green Belt in and around the polluted site with suitable species to reduce the air pollution effectively. Implementation of afforestation program is of paramount importance. In addition to augmenting existing vegetation, it also checks soil erosion, make the ecosystem more complex and functionally more stable and make the climate more conducive.

Limekankar/Clay(Others) deposits being shallow in depth, mining and simultaneous backfilling method is being followed in most of the mining areas. The plantation is proposed and is being carried out in the safety barrier areas and also in the minedout and backfilled areas. Plantation is proposed in minimum 33% of the total lease area. There are around 1,56,000 trees has been planted in the existing mining areas in the District.

27. ANY OTHER INFORMATION

Nil


Deputy Director (i/c),
Geology and Mining,
Virudhunagar.

3/5

Chairperson/District Collector,
District Environment Impact Assessment Authority,
Virudhunagar.